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**THIS CIRCULAR IS IMPORTANT AND REQUIRES YOUR IMMEDIATE ATTENTION**

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**If you are in any doubt** as to any aspect of this circular or as to the action to be taken, you should consult your licensed securities dealer, bank manager, solicitor, professional accountant or other professional adviser.

**If you have sold or transferred** all your shares **Zhejiang Expressway Co., Ltd.**, you should at once hand this circular to the purchaser or transferee or to the bank, licensed securities dealer or other agent through whom the sale or transfer was effected for transmission to the purchaser or transferee.

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*(A joint stock limited company incorporated in the People's Republic of China with limited liability)*  
(Stock code: 0576)

**DISCLOSEABLE AND CONNECTED TRANSACTION  
IN RELATION TO THE PROPOSED ACQUISITION OF  
30% INTEREST IN HANGNING CO  
AND  
DISCLOSEABLE AND CONNECTED TRANSACTION  
IN RELATION TO THE PROPOSED ACQUISITION OF  
THE ENTIRE INTEREST IN LONGLILILONG CO  
AND  
NOTICE OF EXTRAORDINARY GENERAL MEETING**

**Independent Financial Adviser to  
the Independent Board Committee and the Independent  
Shareholders of Zhejiang Expressway Co., Ltd.**



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A letter from the Board is set out on pages 5 to 29 of this circular.

A letter from the Independent Board Committee is set out on pages 30 to 31 of this circular.

A letter from Octal Capital Limited, the Independent Financial Adviser, containing its recommendations to the Independent Board Committee and the Independent Shareholders is set out on pages 32 to 72 of this circular.

A notice for convening the extraordinary general meeting (the "EGM") of the Company to be held at 10:00 a.m. on December 23, 2020 at 5/F, No. 2 Mingzhu International Business Center, 199 Wuxing Road, Hangzhou City, Zhejiang Province, the PRC is set out on pages EGM-1 to EGM-4 of this circular.

A form of proxy for the EGM is enclosed to this circular. Whether or not you are able to attend the EGM, you are requested to complete and return the enclosed form of proxy in accordance with the instructions printed thereon. In case of H Shares, the form of proxy shall be lodged with the Company's H Shares Registrar, Computershare Hong Kong Investor Services Limited, at 17M Floor, Hopewell Centre, 183 Queen's Road East, Wanchai, Hong Kong, not less than 24 hours before the time for holding the EGM (or any adjournment thereof). Completion and delivery of the form of proxy will not preclude you from attending and voting in person at the EGM or any adjournment thereof should you so wish.

December 7, 2020

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## DEFINITIONS

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*In this circular, unless the context specifies otherwise, the following expressions shall have the meanings stated below:*

“Absorption and Merger”	the absorption and merger of Jiaxing Co by LongLiLiLong Co subsequent to the completion of the LongLiLiLong Acquisition pursuant to the PRC Company Law and other applicable PRC Laws
“Announcement	the announcement dated November 10, 2020 made by the Company in relation to the HangNing Acquisition and the LongLiLiLong Acquisition
“associate(s)”	has the meaning ascribed to it under the Listing Rules
“Board”	the board of Directors of the Company
“business day”	any day other than a Saturday or Sunday or a public holiday in the PRC, on which banks are generally open for business in the PRC
“Communications Group”	Zhejiang Communications Investment Group Co., Ltd.* (浙江省交通投資集團有限公司), a wholly State-owned enterprise established in the PRC on December 29, 2001 and the controlling shareholder of the Company
“Company”	Zhejiang Expressway Co., Ltd. (浙江滬杭甬高速公路股份有限公司), a joint stock limited company established in the PRC on March 1, 1997, whose shares are listed on the main board of the Stock Exchange
“connected person(s)”	has the meaning ascribed to it under the Listing Rules
“controlling shareholder”	has the meaning ascribed to it under the Listing Rules
“Deloitte”	Deloitte Touche Tohmatsu, the auditors of the Company
“Director(s)”	directors of the Company
“Group”	the Company and its subsidiaries
“H Shares”	the overseas listed foreign shares of RMB1.00 each in the share capital of the Company which are primarily listed on the Hong Kong Stock Exchange and traded in Hong Kong dollars since May 15, 1997
“HangNing Co”	Zhejiang HangNing Expressway Co., Ltd.* (浙江杭寧高速公路有限責任公司), a limited liability company established in the PRC and owned as to 65.7% by Communications Group as at the Latest Practicable Date

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## DEFINITIONS

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“HangNing Acquisition”	the proposed acquisition of 30% equity interest in HangNing Co by the Company from Communications Group pursuant to the HangNing Equity Purchase Agreement
“HangNing Equity Purchase Agreement”	the equity purchase agreement dated November 10, 2020 entered into between the Company and Communications Group in relation to the HangNing Acquisition, pursuant to which the Company conditionally agreed to purchase from Communications Group 30% equity interest in HangNing Co
“HangNing Valuation Report”	the valuation report dated November 9, 2020 prepared by Cushman & Wakefield in relation to the 30% equity interest of HangNing Co
“HK\$”	Hong Kong dollars, the lawful currency of Hong Kong
“Hong Kong”	Hong Kong Special Administrative Region of the PRC
“Independent Board Committee”	an independent committee of the Board comprising all independent non-executive Directors, namely, Mr. Pei Ker-Wei, Ms. Lee Wai Tsang, Rosa, and Mr. Chen Bin
“Independent Financial Adviser”	Octal Capital Limited, a corporation licensed to carry out Type 1 (dealing in securities) and Type 6 (advising on corporate finance) regulated activities under the SFO, has been appointed by the Company to advise the Independent Board Committee and the Independent Shareholders in relation to the HangNing Acquisition and the LongLiLiLong Acquisition
“Independent Shareholders”	Shareholders who are independent within the meaning of the relevant provisions of the Listing Rules, and, in relation to the approval of each of the HangNing Acquisition and the LongLiLiLong Acquisition at the EGM to be convened by the Company for such purpose, means the Shareholders other than Communications Group and its associates
“Independent Third Party(ies)”	a party independent and not connected with the Company, any of its subsidiaries or any of their respective directors or substantial shareholders
“Jiaxing Co”	Zhejiang Jiaxing Expressway Co., Ltd.* (浙江嘉興高速公路有限責任公司), a 99.9995% owned subsidiary of the Company as at the Latest Practicable Date
“Jiaogong Maintenance”	Zhejiang Jiaogong High-grade Expressway Maintenance Co., Ltd* (浙江交工高等級公路養護有限公司), a indirectly non-wholly owned subsidiary of Communications Group

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## DEFINITIONS

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“KPMG”	KPMG Advisory (China) Limited, Hangzhou Branch, consultant to the Company in respect of the PRC tax regime
“Latest Practicable Date”	December 3, 2020, being the latest practicable date prior to the publication of this circular for ascertaining certain information contained herein
“Listing Rules”	the Rules Governing the Listing of Securities on The Stock Exchange of Hong Kong Limited, as amended, supplemented or otherwise modified from time to time
“LongLiLiLong Acquisition”	the proposed acquisition of the entire equity interest in LongLiLiLong Co by the Company from Communications Group pursuant to the LongLiLiLong Equity Purchase Agreement
“LongLiLiLong Co”	Zhejiang LongLiLiLong Expressway Co., Ltd.* (浙江龍麗麗龍高速公路有限公司), a limited liability company established in the PRC and entirely owned by Communications Group as at the Latest Practicable Date
“LongLiLiLong Equity Purchase Agreement”	the equity purchase agreement dated November 10, 2020 entered into between the Company and Communications Group in relation to the LongLiLiLong Acquisition, pursuant to which the Company conditionally agreed to purchase from Communications Group the entire equity interest in LongLiLiLong Co
“LongLiLiLong Expressways”	the LongLi Expressway and the LiLong Expressway
“LongLiLiLong Valuation Report”	the valuation report dated November 9, 2020 prepared by Jones Lang LaSalle in relation to the entire equity interest of LongLiLiLong Co
“LongLiLiLong PRC Valuation Report”	the valuation report dated October 9, 2020 prepared by the PRC Domestic Valuer and commissioned by Communications Group in relation to the entire equity interest of LongLiLiLong Co
“percentage ratio”	has the meaning ascribed to it under Rule 14.04(9) of the Listing Rules
“PRC”	the People’s Republic of China which, for the purpose of this circular only, excludes Hong Kong, the Macau Special Administrative Region of the PRC and Taiwan
“PRC Company Law”	the Company Law of the PRC (中華人民共和國公司法), which was first implemented on July 1, 1994 and as amended, supplemented or otherwise modified from time to time

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## DEFINITIONS

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“PRC Domestic Valuer”	Wide World Assets Appraisal Co., Ltd* (萬邦資產評估有限公司), a PRC qualified domestic valuer appointed by Communications Group in relation to the LongLiLiLong Acquisition
“RMB”	Renminbi, the lawful currency of the PRC
“SFO”	Securities and Futures Ordinance (Chapter 571 of the Laws of Hong Kong)
“Share(s)”	the ordinary shares in the capital of the Company with a nominal value of RMB1.00 each
“Shareholder(s)”	holder(s) of the Share(s)
“Stock Exchange”	The Stock Exchange of Hong Kong Limited
“subsidiary(ies)”	has the meaning ascribed to it under the Listing Rules
“substantial shareholder(s)”	has the meaning ascribed to it under the Listing Rules
“Traffic Study Report(s)”	the traffic and toll revenue forecast report(s) dated in October, 2020 prepared by WBG in respect of the traffic and toll revenue study of HangNing Expressway and the LongLiLiLong Expressways
“WBG”	WB Group Consulting (Shenzhen) Limited
“Zhejiang Commercial Group”	Zhejiang Commercial Group Co., Ltd.* (浙江省商業集團有限公司), a company established in the PRC and a fellow subsidiary of Communications Group, which has absorbed and merged Zhejiang Commercial Group Industrial Development Co., Ltd.* (浙江省交通投資集團實業發展有限公司) on June 20, 2019
“Zhejiang SASAC”	State-owned Assets Supervision and Administration Commission of the People’s Government of Zhejiang Province of the PRC* (中國浙江省人民政府國有資產監督管理委員會)
“%”	per cent

\* *In this circular, the English names of the PRC entities are translations of their Chinese names and included herein for identification purpose only. In the event of any inconsistency, the Chinese names shall prevail.*

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LETTER FROM THE BOARD

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**浙江滬杭甬高速公路股份有限公司**  
**ZHEJIANG EXPRESSWAY CO., LTD.**

*(A joint stock limited company incorporated in the People's Republic of China with limited liability)*

**(Stock code: 0576)**

*Chairman of the Company*

Mr. Yu Zhihong

*Executive Directors:*

Mr. CHEN Ninghui

Ms. LUO Jianhu

*Non-executive Directors:*

Mr. DAI Benmeng

Mr. YUAN Yingjie

Mr. FAN Ye

*Independent Non-executive Directors:*

Mr. PEI Ker-Wei

Ms. LEE Wai Tsang, Rosa

Mr. CHEN Bin

*Registered Office:*

12th Floor, Block A

Dragon Century Plaza

1 Hangda Road

Hangzhou City

Zhejiang Province

The People's Republic of China 310007

*Principal Place of Business:*

5/F., No. 2

Mingzhu International Business Center

199 Wuxing Road

Hangzhou City

Zhejiang Province

The People's Republic of China 310020

December 7, 2020

*To the Shareholders*

Dear Sir or Madam,

**DISCLOSEABLE AND CONNECTED TRANSACTION  
IN RELATION TO THE PROPOSED ACQUISITION OF  
30% INTEREST IN HANGNING CO  
AND  
DISCLOSEABLE AND CONNECTED TRANSACTION  
IN RELATION TO THE PROPOSED ACQUISITION OF  
THE ENTIRE INTEREST IN LONGLILILONG CO  
AND  
NOTICE OF EXTRAORDINARY GENERAL MEETING**

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## LETTER FROM THE BOARD

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### 1. INTRODUCTION

The purpose of this circular is to provide you with, among other things, (i) details of the HangNing Equity Purchase Agreement and the LongLiLiLong Equity Purchase Agreement and the transactions contemplated thereunder respectively; (ii) the recommendation of the Independent Board Committee to the Independent Shareholders in relation to the HangNing Equity Purchase Agreement and the LongLiLiLong Equity Purchase Agreement and the transactions contemplated thereunder respectively; (iii) the advice of the Independent Financial Adviser on the HangNing Equity Purchase Agreement and the LongLiLiLong Equity Purchase Agreement and the transactions contemplated thereunder respectively; (iv) other information as required under the Listing Rules; and (v) the notice of EGM, to enable you to make an informed decision on whether to vote for or against those resolutions at the EGM.

### 2. DISCLOSEABLE AND CONNECTED TRANSACTION IN RELATION TO THE HANGNING ACQUISITION

On November 10, 2020 (after trading hours), the Board announced that the Company and Communications Group entered into the HangNing Equity Purchase Agreement, pursuant to which Communications Group conditionally agreed to sell and the Company conditionally agreed to acquire 30% equity interest in HangNing Co at the consideration of RMB2,685,000,000.

#### HANGNING EQUITY PURCHASE AGREEMENT

The principal terms of the HangNing Equity Purchase Agreement are set out below:

*Date*

November 10, 2020 (after trading hours)

*Parties*

Vendor: Communications Group

Purchaser: the Company

*Assets to be acquired*

30% equity interest in HangNing Co

*Consideration and payment terms*

The consideration for the 30% equity interest in HangNing Co is RMB2,685,000,000, which will be payable by the Company in cash within five business days after the effective date of the HangNing Equity Purchase Agreement. The consideration will be funded by the Company's internal resources.



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## LETTER FROM THE BOARD

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### *Basis of consideration*

The consideration of RMB2,685,000,000 under the HangNing Equity Purchase Agreement was determined based on arm's length negotiations between the Company and Communications Group. A number of factors were considered by the parties when determining the consideration, including, among others, (i) the HangNing Valuation Report prepared by Cushman & Wakefield pursuant to which the appraised value of the 30% equity interest of HangNing Co as at August 31, 2020 was RMB2,685,000,000; (ii) the toll collection rights period of Wangjiabang to Qingshan Section of HangNing Expressway Phase I has been tentatively fixed at 30 years from December 27, 2000 to December 26, 2030; and (iii) the toll collection rights period of Hangzhou to Qingshan Section and Wangjiabang to Fuziling Section of HangNing Expressway Phase II has been tentatively fixed at 30 years from November 28, 2002 to November 27, 2032.

### *Consideration adjustment*

The General Office of the People's Government of Zhejiang Province has tentatively agreed on HangNing Co's entitlement to 30 years toll collection rights to Zhejiang Section of HangNing Expressway on January 13, 2003.

In the event that the actual toll collection rights period of the above expressways is less than 30 years, the Company and Communications Group agreed to enter into a supplemental agreement to adjust downward the consideration with reference to re-valuation of HangNing Co as at such time. For the avoidance of doubts, obtaining the approval of toll collection rights period of 30 years for the above mentioned expressways does not constitute a condition precedent for the HangNing Equity Purchase Agreement to become effective.

In addition, in the event that HangNing Co has paid for, in connection to events that occurred prior to August 31, 2020, (i) any tax, late payment or penalty as determined by competent authorities in relation to HangNing Expressway; (ii) any amount payable for projects or constructions after the completion of Qingshan Service Area of HangNing Expressway; (iii) any land transfer fee or tax payable for the transfer of any property or land owned by HangNing Expressway; and (iv) any material indebtedness incurred prior to August 31, 2020 which however was not included in the HangNing Valuation Report, Communication Group shall compensate the Company with an amount of 30% of the payment made by HangNing Co within 30 business days of HangNing Co's payment.

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## LETTER FROM THE BOARD

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### *Conditions precedent*

The HangNing Equity Purchase Agreement is conditional upon:

- (i) approval by the HangNing Co's shareholders having been obtained in connection with the HangNing Acquisition;
- (ii) approval by the board of directors of Communications Group having been obtained in connection with the HangNing Acquisition; and
- (iii) approval by the Company's Independent Shareholders having been obtained in connection with the HangNing Acquisition.

As at the Latest Practicable Date, the condition under paragraph (ii) above has been satisfied.

### *Completion*

Within 20 business days from the effective date of the HangNing Equity Purchase Agreement, the parties shall cooperate to apply with the relevant governmental authorities to alter the registration for industrial and commercial administration for Completion.

### **Principal assumptions for the income approach adopted for the HangNing Valuation Report**

The appraised value of the 30% equity interest of HangNing Co under the HangNing Valuation Report was prepared using the income approach, through the use of the discounted cash flow method. As a result, such valuation constitutes a profit forecast under Rule 14.61 of the Listing Rules.

### *Basic assumptions*

Details of the key assumptions used in determining the value of the 30% equity interest in HangNing Co upon which the HangNing Valuation Report was issued are set out below:

- there will be no material change in the existing political, taxation, legal, technological, fiscal or economic conditions, which might adversely affect the business of HangNing Co;
- the conditions in which the business is being operated and which are material to revenue and costs of business will remain unchanged;
- the business plan has been prepared on a reasonable basis after due and careful consideration by the management of HangNing Co;

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## LETTER FROM THE BOARD

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- all relevant legal approvals and business certificates or licenses to HangNing Co in the localities in which HangNing Co operates or intends to operate are properly in place or would be officially obtained;
- competent management, key personnel and technical staff will be maintained to support the ongoing operation and development of HangNing Co;
- the core business operation of HangNing Co will not differ materially from those of present or expected;
- natural weather can have an impact on toll roads, including flooding and other types of inclement weather and no extended closure will occur to the toll roads managed by HangNing Co; and
- there are no hidden or unexpected conditions associated with HangNing Co that might adversely affect the reported value and Cushman & Wakefield assumes no responsibility for changes in market conditions after August 31, 2020.

Deloitte, acting as the reporting accountants of the Company, has performed an assurance engagement in accordance with Hong Kong Standard on Assurance Engagements 3000 (Revised) “Assurance Engagement Other Than Audits or Reviews of Historical Financial Information” issued by the Hong Kong Institute of Certified Public Accountants to obtain reasonable assurance on whether the discounted future estimated cash flows, so far as the calculations are concerned, have been properly compiled in accordance with the bases and assumptions. Deloitte reported that the discounted future estimated cash flows, so far as the calculations are concerned, have been properly compiled, in all material respects, in accordance with the bases and assumptions.

Each Director has been provided with the HangNing Valuation Report, the Traffic Study Report in relation to HangNing Expressway and all relevant documents in connection with the HangNing Acquisition with sufficient time for review and consideration prior to the meeting of the Directors to consider the HangNing Acquisition. There have been comprehensive discussions and analysis in assessing the underlying assumptions including the discount rate and the growth rate and Directors have formed the view that such underlying assumptions are fair and reasonable. The Directors confirm that the valuation of the 30% equity interest of HangNing Co in the HangNing Valuation Report, which constitutes a profit forecast under Rule 14.61 of the Listing Rules, has been made after due and careful enquiry.

A letter from Deloitte in compliance with Rule 14.62(2) of the Listing Rules and a letter from the Board in compliance with Rule 14.62(3) of the Listing Rules are included in the Appendix III and Appendix IV to this circular.

As at the Latest Practicable Date, Deloitte does not have any shareholding, directly or indirectly, in any member of the Group or any right (whether legally enforceable or not) to subscribe for or to nominate person to subscribe for securities in any member of the Group. To the best of the Directors’ knowledge, information and belief, Deloitte is an Independent Third Party.

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## LETTER FROM THE BOARD

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Deloitte has given and has not withdrawn its written consent to the publication of this circular with inclusion of its report and all references to its name in the form and context in which it is included.

### *Original cost of the 30% equity interest in HangNing Co to Communications Group*

On March 13, 2020, Communications Group acquired 64.056% equity interest in HangNing Co in a public auction at the final auction price of RMB5,566 million. Proportionately, the original cost incurred by Communications Group for the 30% equity interest in HangNing Co was approximately RMB2,607 million. The Company believes that the appraised value of 30% equity interest in HangNing Co set out in the HangNing Valuation Report reflects its fair and reasonable value.

### INFORMATION OF HANGNING CO

HangNing Co is a limited liability company established in the PRC on April 21, 2004 with a registered capital of RMB100 million. HangNing Co is principally engaged in the operation and management of toll collection rights of Zhejiang Section of the HangNing Expressway with a total length 98.961 kilometers, a two-way four-lane expressway with designed speed limit of 120 kilometers per hour. HangNing Expressway Phase I, Wangjiabang to Qingshan Section, was completed and opened to traffic on December 27, 2000, with the tentative toll collection rights period up to December 26, 2030, and HangNing Expressway Phase II, Hangzhou to Qingshan Section and Wangjiabang to Fuzihing Section, was opened to traffic on November 28, 2002, with the tentative toll collection rights period up to November 27, 2032.

As at the date of the Latest Practicable Date, HangNing Co is owned as to 65.7% by Communications Group, 21.753% by Huzhou City Communications Investment Group Co., Ltd.\* (湖州市交通投資集團有限公司) and 12.547% by Changxing Communications Investment Group Co., Ltd.\* (長興交通投資集團有限公司). Upon completion of the HangNing Acquisition, HangNing Co will remain as a non-wholly owned subsidiary of Communications Group.

According to the audited financial information of HangNing Co for the financial years ended December 31, 2018 and 2019 prepared with reference to generally accepted accounting principles in the PRC by the PRC statutory auditor of HangNing Co, Baker Tilly China Certified Public Accountants\* (天職國際會計師事務所(特殊普通合夥)) (“**Baker Tilly**”), a summary of the audited financial information of HangNing Co for the financial years ended December 31, 2018 and 2019 is set out below:

	<b>As at December 31,</b>	
	<b>2018</b>	<b>2019</b>
	<i>RMB</i>	<i>RMB</i>
audited net profit before taxation	982,147,692.43	961,767,909.27
audited net profit after taxation	736,758,341.79	720,276,317.73

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## LETTER FROM THE BOARD

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The net asset value of HangNing Co as at August 31, 2020 was RMB2,642,218,966.97. A summary of the audited financial information of HangNing Co for the eight months ended August 31, 2020 is set out below:

	<b>As at August 31, 2020 RMB</b>
audited net profit before taxation	370,048,598.37
audited net profit after taxation	276,201,519.44

### *Qualified Opinions on HangNing Co*

Qualified opinions were issued by Baker Tilly in the auditor's report of HangNing Co for the financial year ended December 31, 2019 and eight months ended August 31, 2020 that (i) there are certain matters in HangNing Co that may result in the payment of Corporate Income Tax where the amount cannot be quantified; and (ii) the auditor was unable to obtain sufficient and appropriate evidence to determine the impact of the accounting adjustment regarding Qingshan Service Area on the financial statements, details of which are provided as below:

- (i) *certain matters in HangNing Co that may result in the payment of Corporate Income Tax where the amount cannot be quantified*

HangNing Co has received RMB252,446,600 in aggregate of tax refund from 2004 to 2012, and the amount of which was not included in the calculation and payment of Corporate Income Tax during the period. Further, HangNing Co paid its shareholders a total of RMB2,849,841,900 from 2003 to 2016, as interest repayments under certain financings, yet there is no evidence supporting the validity and legality of such interest repayments. Moreover, HangNing Co performed expense accounting treatment on a fixed asset of significant value of approximately RMB41,201,600 in 2006 to 2008. All of the above may adjust the amount of tax payable by HangNing Co. According to the Law of the People's Republic of China on the Administration of Tax Collection and other applicable laws and regulations in the PRC, HangNing Co is obliged to make good of the delinquent Corporate Income Tax, failing which HangNing Co may face the risk of tax penalty and overdue fines.

The Company has liaised with Baker Tilly about these contingent matters and understand that neither of the following materials have been provided at the point of the issuance of auditor's report of HangNing Co: (a) calculation sheets on accrual of the delinquent tax provisions and according penalties and overdue fines and (b) written documentation from local tax authorities explicitly confirming that no tax payments including penalties and fines are required. The Company will provide necessary support to promote the progress and evaluate on a continuous basis whether any present payment obligation occurs regarding these contingent matters. From 2016 to 2019, HangNing Co has already made an adjustment to over-accrued expenses of aggregate RMB3,297,595,100 to make good of the delinquent Corporate Income Tax. Despite of such payment, Hangning Co may still face the risk of tax penalty and overdue fines under the the Law of the People's Republic of China on the Administration of Tax Collection and other applicable laws and regulations in the PRC.

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## LETTER FROM THE BOARD

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From accounting perspective, the accrual of tax liabilities and penalties/fines will reduce the profit of HangNing Co thus impact the Company's share of results of associates to the extent of 30% in the financial statements of the Group. As provided in the previous section headed "HangNing Equity Purchase Agreement - Consideration adjustment" in this circular, Communications Group has undertaken to compensate the Company in proportion to the Company's shareholding in HangNing Co in the event that HangNing Co is required to pay any tax penalty and overdue fines under the applicable laws and regulations in the PRC.

Communications Group has been proactive to investigate and resolve the relevant tax issues since its acquisition of the controlling shareholding of HangNing Co. The Company will update the investors and its Shareholders when there is a firm timetable.

*(ii) accounting adjustment regarding Qingshan Service Area*

The book value of construction expenditure incurred by HangNing Co in building the Qingshan Service Area was approximately RMB41,201,600. Expense accounting treatment was carried out during the construction period from 2006 to 2008. The QingShan Service Area completed the fire protection inspection in December 2010 and was put into use in 2011. As at the issue date of the auditor's report for HangNing Co, HangNing Co has not yet provided (a) the final accounts of the completed capital construction project and (b) the statement of accuracy and completeness of the initial recognition of assets and liabilities of the Qingshan Service Area to Baker Tilly, and thus Baker Tilly cannot obtain sufficient and appropriate audit evidence of the original book value and the relevant depreciation of the Qingshan Service Area, nor can they assess the relevant impact on HangNing Co's financial statements.

The construction expenditure of the Qingshan Service Area undertaken by Hangning Co was subject to expense accounting treatment during the construction period. It should now be accounted for as fixed assets. Therefore, the auditor of HangNing Co was unable to assess the impact of accounting adjustments regarding the Qingshan Service Area on the financial statements. HangNing Co will assist the auditors to obtain relevant accounting information to verify the authenticity and completeness of the amounts recorded in the books during the construction period. However, the exact time when the rectification will be completed has not yet been confirmed.

*(iii) financial impact of the qualified opinions of HangNing Co*

Upon completion of the HangNing Acquisition, HangNing Co will remain as a subsidiary of Communications Group and the accounts of HangNing Co will not be consolidated into the accounts of the Company. The Group adopted equity method of accounting for investments made in associated companies like HangNing Co. From accounting perspective, any further accounting adjustment upon the further provision of audit evidence may cause a corresponding adjustment of the Company's share of results of associates to the extent of 30% in the financial statements of the Group.

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## LETTER FROM THE BOARD

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The issues which caused the qualified opinions were pre-existing conditions at the time of the acquisition of 64.056% equity interest in HangNing Co by Communications Group in a public auction. To further mitigate the potential impact on Group's interest, the Company entered into an agreement with Communication Group, pursuant to which Communication Group has committed to compensate the Company all the losses or payment arises from the contingent matters of HangNing Co including aforementioned matters. As such, the Company's financial position will not be materially impacted as a result of any future payments in this regard.

While the issues which caused the qualified opinions could potentially impact the net profit and net assets of HangNing Co and accordingly have an impact on the financial statements of the Group, the Company is of the view that the net impact to the net profit in the financial statements of the Group will be minimum as the Company will get compensated from Communication Group and recognise other income at the same amount. Therefore, the existing qualified opinions on HangNing Co do not necessarily lead to qualified opinions on the Group in the forthcoming annual audit of the Group.

Management of the Company has discussed with Deloitte, the Company's auditors, on the above matters, particularly the above proposed accounting treatment if any payment would arise and was advised by the Company's auditor that they are not aware of the proposed accounting treatment being inconsistent with the Company's accounting policies adopted or the accounting standards. However, the Company's auditors have not performed any audit procedures after the year ended 31 December 2019. Upon completion of the proposed acquisition, and at the time when the Company's auditors commence the annual audit of the Group, the Company's auditors will further consider and evaluate if this matter will have any material impact to the consolidated financial statements of the Group.

### REASONS FOR AND BENEFITS OF THE HANGNING ACQUISITION

The investment, construction, operation and management of tolled expressways are in the ordinary and usual course of business of the Company. The high-quality expressway assets with no interest-bearing leverage possessed by HangNing Co are expected to generate stable and considerable cash flows. HangNing Co has a track record of continuous stable high dividends payout and the Company thus expects sustainable financial returns generated from the HangNing Acquisition. During the period from 2003 to 2018, all the profits distributable to shareholders of HangNing Co were distributed to its shareholders at the total amount of RMB5,369,231,009.70.

While the Company may further acquire the rest of the equity interest in HangNing Co held by Communications Group in the future, the acquisition of 30% equity interest in HangNing Co provides the Company with an opportunity to benefit from the strong government relations of Communications Group which remains as the holding company of HangNing Co after completion of the HangNing Acquisition. The Directors thus are convinced that the HangNing Acquisition is in line with the Company's development strategy.

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## LETTER FROM THE BOARD

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The terms of the HangNing Equity Purchase Agreement were arrived at after arm's length negotiations between the Company and Communications Group, and are on normal commercial terms or better, taking into account various factors and with reference to the HangNing Valuation Report.

The Directors (including the independent non-executive Directors) consider that the terms of the HangNing Acquisition are fair and reasonable and are on normal commercial terms or better and in the interests of the Company and the Shareholders as a whole.

### **3. DISCLOSEABLE AND CONNECTED TRANSACTION IN RELATION TO THE LONGLILILONG ACQUISITION**

On November 10, 2020 (after trading hours), the Board announced that the Company and Communications Group entered into the LongLiLiLong Equity Purchase Agreement, pursuant to which Communications Group conditionally agreed to sell and the Company conditionally agreed to acquire the entire equity interest in LongLiLiLong Co at the consideration of RMB238,140,000. Upon completion of the LongLiLiLong Acquisition, LongLiLiLong Co will become a wholly owned subsidiary of the Company.

#### **LONGLILILONG EQUITY PURCHASE AGREEMENT**

The principal terms of the LongLiLiLong Equity Purchase Agreement are set out below:

***Date***

November 10, 2020 (after trading hours)

***Parties***

Vendor: Communications Group

Purchaser: the Company

***Assets to be acquired***

Entire equity interest in LongLiLiLong Co

***Consideration and payment terms***

The consideration for the entire equity interest of LongLiLiLong Co is RMB238,140,000. The consideration will be payable by the Company in cash within five business days after the effective date of the LongLiLiLong Equity Purchase Agreement. The consideration will be funded by the Company's internal resources.



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## LETTER FROM THE BOARD

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### *Basis of consideration*

The consideration of RMB238,140,000 under the LongLiLiLong Equity Purchase Agreement was determined based on arm's length negotiations between the Company and Communications Group. A number of factors were considered by the parties when determining the consideration, including, among others, (i) the LongLiLiLong Valuation Report prepared by Jones Lang LaSalle, as well as the LongLiLiLong PRC Valuation Report prepared by the PRC Domestic Valuer pursuant to the requirements of Zhejiang SASAC and relevant PRC laws and regulations; (ii) the toll collection rights period of Liandu Section of LiLong Expressway being assumed to be 25 years from December 25, 2007 to December 24, 2032; and (iii) the toll collection rights period of the LongLiLiLong Expressways other than Liandu Section being assumed to be 25 years from December 31, 2006 to December 30, 2031.

The Company relied on the LongLiLiLong Valuation Report and the LongLiLiLong PRC Valuation Report in determining the consideration. Pursuant to the LongLiLiLong Valuation Report, the appraised value of the entire equity interest of LongLiLiLong as at August 31, 2020 was RMB239,000,000.

When assessing the reasonableness of the valuation of LongLiLiLong Co, the Board has considered the basis of the valuation methodology and the experts' competence. Jones Lang LaSalle has considered three valuation methods, including income method, market method and cost method. The Board assessed each method and its respective reasonings provided by Jones Lang LaSalle. There are limited appropriate market transactions which are comparable to LongLiLiLong Co. The cost approach, which is a method of replacing the historical costs of the assets and liabilities shown in the statements of the financial position of LongLiLiLong Co, primarily involves the assessment of assets and liabilities to appraise the business value of the valuation subject. However, such approach does not take into consideration of traffic demand, traffic volume, toll revenue and future development of expressway. Having considered the limitations of market approach and cost approach, Jones Lang LaSalle was of the view that the market approach and cost approach may not result in a fair estimate of the business value of LongLiLiLong Co. In addition to the above, the income method is a common method for the valuation of expressway assets with stable cash flow and limited toll period. Jones Lang LaSalle thus considered that a discounted cash flow approach is the appropriate methodology for valuing LongLiLiLong Co which the Board concurred.

The Board also further considered the fact that Jones Lang LaSalle performed the valuation of LongLiLiLong Co based on the income estimate by WBG. In light of the extensive number of factors that WBG took into account, including but not limited to potential competition, government toll policies, historical traffic data, existing travel patterns and future development of the surrounding transportation network, the Board was not aware of anything which could cause them to doubt the reasonableness of the Traffic Study Report of LongLiLiLong Expressways and thus the Board considered it acceptable for Jones Lang LaSalle to premise their valuation on the results of the Traffic Study Report of LongLiLiLong Expressways.

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## LETTER FROM THE BOARD

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In addition to the LongLiLiLong Valuation Report and the Traffic Study Report of LongLiLiLong Expressways, the Board has also considered and assessed various factors that may have an impact on the consideration, including the net losses of LongLiLiLong Co incurred in the financial years of 2018 and 2019, the strategic benefits that the LongLiLiLong Acquisition to expand the Company's tolled expressway network in Zhejiang Province with lower costs, the toll revenue growth of LongLiLiLong Expressways with reference to the Traffic Study Report of LongLiLiLong Expressways, the synergy effect of the Group and the LongLiLiLong Co and the potential tax efficiency as a result of the Absorption and Merger. The details of the Board's considerations and views have been set forth below.

### *Longlililong PRC Valuation Report*

Pursuant to the LongLiLiLong PRC Valuation Report, the appraised value of the entire equity interest of LongLiLiLong Co as at August 31, 2020 was RMB238,140,000. The valuation of the LongLiLiLong PRC Valuation Report was conducted on income approach. The difference between the appraised values under the LongLiLiLong Valuation Report and the LongLiLiLong PRC Valuation Report was the result of the difference in selected parameters.

### *Consideration adjustment*

In the event that the toll collection rights period of the above mentioned expressways as finally approved is less than 25 years, or the actual toll collection rights period of the above mentioned expressways is less than 25 years, the Company and Communications Group agreed to enter into a supplemental agreement to adjust downwards the consideration with reference to re-valuation of LongLiLiLong Co as at such time.

According to the existing Regulation on the Administration of Toll Roads\* (收費公路管理條例) promulgated in 2004, the toll collection rights period of the above mentioned expressways will not exceed 25 years and according to the customary practice, the toll collection rights of the above mentioned expressways in principle would be 25 years. For the avoidance of doubts, obtaining the approval of toll collection rights period of 25 years for the above mentioned expressways does not constitute a condition precedent for the LongLiLiLong Equity Purchase Agreement to become effective.

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## LETTER FROM THE BOARD

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In addition, pursuant to the Notice on Waiving Fees for Toll Roads during the Prevention and Control of COVID-19\* (《關於新冠肺炎疫情防控期間免收收費公路車輛通行費的通知》) issued by the Ministry of Transport of the PRC, the above mentioned expressways were subject to a toll free period of 79 days from February 17, 2020 to May 5, 2020 (the “**Toll Free Period**”) and the toll collection rights period of the relevant expressways would be extended in accordance with the Toll Free Period. The Company and Communications Group agreed to enter into a supplemental agreement to adjust upwards the consideration in the event that (i) the Toll Free Period is extended as confirmed by the relevant competent authorities, or (ii) the relevant competent authorities decide to compensate LongLiLiLong Co in cash for the Toll Free Period. According to the valuation principle of the LongLiLiLong Acquisition, the amount of upward adjustment to the consideration is not expected to exceed RMB70 million, the LongLiLiLong Acquisition thus will remain as a discloseable transaction under Chapter 14A of the Listing Rules.

### *Conditions precedent*

The LongLiLiLong Equity Purchase Agreement is conditional upon:

- (i) approval by the LongLiLiLong Co’s sole shareholder having been obtained in connection with the LongLiLiLong Acquisition;
- (ii) approval by the board of directors of Communications Group having been obtained in connection with the LongLiLiLong Acquisition; and
- (iii) approval by the Company’s Independent Shareholders having been obtained in connection with the LongLiLiLong Acquisition.

As at the Latest Practicable Date, the conditions under paragraphs (i) and (ii) above have been satisfied.

### *Completion*

Within 20 business days from the effective date of the LongLiLiLong Equity Purchase Agreement, the parties shall cooperate to apply with the relevant governmental authorities to alter the registration for industrial and commercial administration for completion.

### **Principal assumptions for the income approach adopted for the LongLiLiLong Valuation Report**

The appraised value of the entire equity interest of LongLiLiLong Co under the LongLiLiLong Valuation Report was prepared using the income approach, through the use of the discounted cash flow method. As a result, such valuation constitutes a profit forecast under Rule 14.61 of the Listing Rules. Therefore, this circular is subject to the requirements under Rules 14.60A and 14.62 of the Listing Rules in relation to profit forecast.

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## LETTER FROM THE BOARD

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As required under Rule 14.62(1) of the Listing Rules, details of the key assumptions used in determining the value of the entire equity interest in LongLiLiLong Co upon which the LongLiLiLong Valuation Report was issued are set out below:

### *Major Assumptions*

Assumptions considered to have significant sensitivity effects in this valuation have been evaluated in order to provide a more accurate and reasonable basis for arriving at the assessed value.

In determining the fair value of the entire equity interest in LongLiLiLong Co, the following key assumptions have been made by Jone Lang LaSalle:

- the continuation of prudent and effective management policies over whatever period of time that is considered to be necessary in order to maintain the character and integrity of the assets valued;
- there will be no material change in the existing political, legal, technological, fiscal or economic conditions, which might adversely affect the business of LongLiLiLong Co;
- the operational and contractual terms stipulated in the relevant contracts and agreements will be honored;
- copies of the operating licenses and incorporation documents of Longlililong Co. have been provided and such information to be reliable and legitimate. Jones Lang LaSalle have relied to a considerable extent on such information provided in arriving at the opinion of value;
- share capital injection and shareholder loan when necessary in the valuation;
- the accuracy of the financial and operational information such as management accounts, contractual agreements and manufacturing capabilities, provided by LongLiLiLong Co and the Company relied to a considerable extent on such information in arriving at the opinion of value; and
- there are no hidden or unexpected conditions associated with the assets valued that might adversely affect the reported value. Further, Jones Lang LaSalle assumes no responsibility for changes in market conditions after August 31, 2020.

Deloitte, acting as the reporting accountants of the Company, has performed an assurance engagement in accordance with Hong Kong Standard on Assurance Engagements 3000 (Revised) “Assurance Engagement Other Than Audits or Reviews of Historical Financial Information” issued by the Hong Kong Institute of Certified Public Accountants to obtain reasonable assurance on whether the discounted future estimated cash flows, so far as the calculations are concerned, have been properly compiled in accordance with the bases and assumptions. Deloitte reported that the discounted future estimated cash flows, so far as the calculations are concerned, have been properly compiled, in all material respects, in accordance with the bases and assumptions.

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## LETTER FROM THE BOARD

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The Directors confirm that the valuation of the entire equity interest of LongLiLiLong Co in the LongLiLiLong Valuation Report, which constitutes a profit forecast under Rule 14.61 of the Listing Rules, has been made after due and careful enquiry.

A letter from Deloitte in compliance with Rule 14.62(2) of the Listing Rules and a letter from the Board in compliance with Rule 14.62(3) of the Listing Rules are included in the Appendix III and Appendix IV to this circular.

As at the Latest Practicable Date, Deloitte does not have any shareholding, directly or indirectly, in any member of the Group or any right (whether legally enforceable or not) to subscribe for or to nominate person to subscribe for securities in any member of the Group. To the best of the Directors' knowledge, information and belief, Deloitte is an Independent Third Party.

Deloitte has given and has not withdrawn its written consent to the publication of this circular with inclusion of its report and all references to its name in the form and context in which it is included.

### **Original cost of the entire equity interest in LongLiLiLong Co to Communications Group**

The original cost incurred by Communications Group for the entire equity interest in LongLiLiLong Co is RMB7,348,525,252. Communications Group first acquired 80% equity interest in the LongLiLiLong Co in November 2006, subsequent to which there were a series of capital increases to the LongLiLiLong Co. On December 23, 2019, Communications Group became the sole shareholder of the LongLiLiLong Co. By August 28, 2020, Communications Group injected an amount of RMB4,100,000,000 to the capital of the LongLiLiLong Co. The original cost incurred by Communications Group represents the accumulative capital contribution made by Communications Group to the LongLiLiLong Co up until the Latest Practicable Date.

### **INFORMATION OF LONGLILILONG CO**

LongLiLiLong Co is a limited liability company established in the PRC on April 8, 2005, the registered capital and paid up capital of which is RMB8,160,656,565 as at the Latest Practicable Date. LongLiLiLong Co is principally engaged in the operation and management of toll collection rights of the LongLiLiLong Expressways located in Zhejiang Province, the PRC, with a total length of 222.2 kilometers. As of the Latest Practicable Date, LongLiLiLong Co is a wholly owned subsidiary of Communications Group and upon completion of the LongLiLiLong Acquisition, LongLiLiLong Co will become a wholly owned subsidiary of the Company.

Lolililong Expressways comprise LongLi Expressway and LiLong Expressway in a T-shape structure. LongLi Expressway is connected to Hangqian Expressway in the north, and Beibu Interchange where LongLi Expressway and LiLong Expressway meet in the south. The total length of LongLi Expressway is 119.785 kilometers, a two-way four-lane expressway with designed speed of 100/80 kilometers per hour. The whole line was completed and opened to traffic on December 31, 2006 and the toll collection rights period is expected to last until December 30, 2031.

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## LETTER FROM THE BOARD

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LiLong Expressway is connected to Fuling Interchange of Jinliwen Expressway in the east and the starting point of the Longqing Expressway in the west. The total length of LiLong Expressway is 102.44 kilometers, a two-way four-lane expressway with designed speed of 100/80 kilometers per hour. Liandu Section of the LiLong Expressway was completed and opened to traffic on December 25, 2007, with the expected toll collection rights period up to December 24, 2032, and other sections of the LiLong Expressway were opened to traffic on December 31, 2006, with the expected toll collection rights period up to December 30, 2031.

According to the audited financial information of LongLiLiLong Co for the year ended December 31, 2018 and 2019 prepared with reference to generally accepted accounting principles in the PRC by the PRC statutory auditor of LongLiLiLong Co, Da Hua Certified Public Accountants (Special General Partnership)\* (大華會計師事務所(特殊普通合夥)), a summary of the audited financial information of LongLiLiLong Co for the financial years ended December 31, 2018 and 2019 is set out below:

	<b>As at December 31,</b>	
	<b>2018</b>	<b>2019</b>
	<i>RMB</i>	<i>RMB</i>
audited net loss before taxation	(425,309,234.94)	(466,133,894.19)
audited net loss after taxation	(425,309,234.94)	(466,133,894.19)

### ***Reasons for the net losses incurred in the financial years of 2018 and 2019***

As at August 31, 2020, the interest-bearing borrowings of LongLiLiLong Co, which account for approximately 93% of its total liabilities, have mainly been used to finance the construction of the LongLiLiLong Expressways and 97% of the total assets of LongLiLiLong Co mainly consist of the expressways and buildings. The net losses incurred in the financial years of 2018 and 2019 were mainly due to the excessive amount of interest expense and expressway depreciation expense but not the profitability of the business. The interest expense of LongLiLiLong Co incurred in 2018 and 2019 was approximately RMB414 million and RMB424 million respectively.

By August 28, 2020, Communications Group, the sole shareholder of the LongLiLiLong Co, has completed the capital increase of RMB4,100 million, which has been utilised by LongLiLiLong Co for repayment of debts. The interest-bearing borrowings of LongLiLiLong Co have thus decreased from RMB9,669 million as at December 31, 2019 to RMB5,779 million as at August 31, 2020. The finance cost including the interest expense of LongLiLiLong Co has thus been reduced by approximately RMB180 million per annum. The gearing ratio of LongLiLiLong Co (which is calculated based on the total interest-bearing loans divided by total assets) has been reduced from 1.37 as at December 31, 2019 to 0.89 as at August 31, 2020. The leverage and interest burden of LongLiLiLong Co has been substantially reduced. The net asset value of LongLiLiLong Co as at August 31, 2020 was approximately RMB225,479,926.28.

Before the traffic restrictions imposed by the authorities due to COVID-19, the revenue of LongLiLiLong Co increased from approximately RMB647,000,000 in 2018 to RMB664,000,000 in 2019, representing a year-on-year growth of approximately 2.6%. The Board has considered the reasons and background to the losses and noted that there is expected stable cash flow generated by LongLiLiLong Expressways. According to the LongLiLiLong Valuation Report, its earnings before interest and taxes and net profits are expected to turn positive in 2022 and 2026 respectively.

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## LETTER FROM THE BOARD

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A summary of the unaudited financial information of LongLiLiLong Co for the eight months ended August 31, 2020 checked by Deloitte is set out below:

	<b>As at</b> <b>August 31, 2020</b> <i>RMB</i>
unaudited net profit/(loss) before taxation	(1,082,850,567.74)
unaudited net profit/(loss) after taxation	(1,082,850,567.74)

The unaudited net loss of RMB1,082,850,567.74 of LongLiLiLong Co for the eight months ended August 31, 2020 was mainly due to the one-off impairment loss of RMB654,763,037.86 on its toll collection rights assets based on the LongLiLiLong PRC Valuation Report.

### **Effect of the LongLiLiLong Acquisition**

Upon completion of the LongLiLiLong Acquisition, the Company will beneficially own the entire equity interest in LongLiLiLong Co. As a result, LongLiLiLong Co will become a wholly-owned subsidiary of the Company and the accounts of LongLiLiLong Co will be consolidated into the accounts of the Company.

### **TRANSACTIONS BETWEEN LONGLILILONG CO AND COMMUNICATIONS GROUP AFTER COMPLETION OF THE LONGLILILONG ACQUISITION**

Upon completion of the LongLiLiLong Acquisition, LongLiLiLong Co will become a wholly owned subsidiary of the Company. As a result, should LongLiLiLong Co enter into any new transactions or continue any existing transactions with Communications Group and/or its associates after completion of the LongLiLiLong Acquisition, such transactions would constitute connected transactions or continuing connected transactions for the Company upon and following completion of the LongLiLiLong Acquisition. Further announcements will be made by the Company (if required) as and when appropriate in accordance with all application requirements of the Listing Rules.

### **Partially-exempt Continuing Connected Transaction**

On December 30, 2019, LongLiLiLong Co entered into a daily road maintenance agreement (the “**Maintenance Agreement**”) with Jiaogong Maintenance, an indirectly non-wholly owned subsidiary of Communications Group pursuant to which Jiaogong Maintenance agreed to provide daily maintenance services to the LongLiLiLong Expressways. Upon completion of the LongLiLiLong Acquisition, LongLiLiLong Co will become a subsidiary of the Company, therefore the Maintenance Agreement will become a continuing connected transaction of the Company. The transaction contemplated under the Maintenance Agreement will continue after the completion of the LongLiLiLong Acquisition. Details of the Maintenance Agreement are set out as below:

Date:	December 30, 2019
Parties:	LongLiLiLong Co Jiaogong Maintenance, an indirectly non-wholly owned subsidiary of Communications Group



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## LETTER FROM THE BOARD

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Term:	Three years
Subject:	Jiaogong Maintenance agreed to provide daily road maintenance services, including road inspection, minor repair works, traffic maintenance and emergency rescue, to the roadbed, pavement, bridges, culverts, tunnels, greening and safety facilities of the LongLiLiLong Expressways.
Service Fees:	<p>The total amount of service fee payable by LongLiLiLong Co to Jiaogong Maintenance for the year of 2020, 2021 and 2022 was agreed to be RMB62,984,280.</p> <p>The total amount of service fee expected to be incurred for the year or 2020 is approximately RMB21,743,000. The annual caps for the service fee payable by LongLiLiLong Co to Jiaogong Maintenance for the year of 2021 and 2022 have been agreed to be RMB22,000,000.</p>
Basis of Service Fees:	The service fees were determined by public tender procedures which were open to Jiaogong Maintenance and other independent third party service providers. The factors for assessment include, but are not limited to, tender quotation, tenderer's reputation and qualification and the tenderer's past performance records. Jiaogong Maintenance successfully won the tender.
Reasons for and benefits of the transaction:	Specific maintenance services including the maintenance services provided under the Maintenance Agreement are necessary for the operation of the LongLiLiLong Expressways. Jiaogong Maintenance has the relevant qualifications and expertise to provide such services to LongLiLiLong Co.
Information of Jiaogong Maintenance:	Jiaogong Maintenance is a subsidiary of Communications Group which was established under the laws of the PRC on January 18, 2006. Jiaogong Maintenance is principally engaged in the road construction projects and toll road maintenance.
Governing Laws:	The laws of the PRC
Listing Rules implications:	Jiaogong Maintenance is an indirect subsidiary of Communications Group. Therefore, Jiaogong Maintenance is a connected person of the Company and as a result, the transactions contemplated under the Maintenance Agreement constitute continuing connected transactions for the Company under Chapter 14A of the Listing Rules.



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## LETTER FROM THE BOARD

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As the highest of all applicable percentage ratios for the transactions contemplated under the Maintenance Agreement, are more than 0.1% but less than 5%, the Maintenance Agreement shall be subject to the reporting, announcement and annual review requirements, but exempt from Independent Shareholders' approval under the Listing Rules.

None of the Directors were involved in approving the signing of the Maintenance Agreement. The Directors (including the independent non-executive Directors) are of the view that the terms of the Maintenance Agreement are on normal commercial terms and are fair and reasonable and in the interests of the Company and the Shareholders as a whole.

### **Fully-exempt Continuing Connected Transactions**

As at the Latest Practicable Date, LongLiLiLong Co intends to enter into the following agreements with Zhejiang Commercial Group. Each of the following agreements will constitute a continuing connected transaction for the Company under Chapter 14A of the Listing Rules. It is expected that the highest applicable percentage ratios under the Listing Rules for each of the following agreements is less than 0.1%, so each of them will be exempted from the reporting, announcement, annual review and independent shareholders' approval requirements under Chapter 14A of the Listing Rules.

#### ***1. Service Area Operation Lease Agreement***

LongLiLiLong Co will enter into a service area operation lease agreement with Zhejiang Commercial Group, pursuant to which LongLiLiLong Co will agree to lease to Zhejiang Commercial Group the operation rights in relation to petrol station services, catering services, supermarket services and vehicle repair services in the service area of the LongLiLiLong Expressways for a term of three years. It is expected that the annual fee payable by Zhejiang Commercial Group to LongLiLiLong Co in respect of the lease of the operation rights will not exceed RMB10 million, to be determined based on parties' arm's length negotiation with reference to the prices of other service area operation lease agreements entered into between Zhejiang Commercial Group and other expressway operation companies in the market.

#### ***2. Service Area Utilities Services Agreement***

LongLiLiLong Co will enter into a service area utilities services agreement with Zhejiang Commercial Group, pursuant to which LongLiLiLong Co will engage Zhejiang Commercial Group to manage utilities facilities and provide utilities services in the service area of the LongLiLiLong Expressways such as washroom, lounge area, safety, cleaning services and utilities system maintenance for a term of three years. It is expected that the annual fee payable by LongLiLiLong Co to Zhejiang Commercial Group for the services provided under this agreement will not exceed RMB6 million, to be determined based on parties' arm's length negotiation with reference to the prices of other service area utilities services agreements entered into between Zhejiang Commercial Group and other expressway operation companies in the market.

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## LETTER FROM THE BOARD

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### REASONS FOR AND BENEFITS OF THE ACQUISITION OF LONGLILILONG CO

#### (a) Expansion of Company's tolled expressway network in Zhejiang Province with lower costs

Upon completion of the LongLiLiLong Acquisition, the total length of expressways operated by the Company will be increased from 802 kilometers to 1,024.2 kilometers.

The LongLiLiLong Acquisition is aligned with the Company's strategy to focus on its principal business and strengthen its leading position in the expressway network in Zhejiang Province. The LongLiLiLong Co owns a core passageway in the southwest region of Zhejiang Province linking Quzhou City and Lishui City, being two major areas in Zhejiang Province, the acquisition of which will enhance the Company's tolled expressways profile.

In addition, the LongLiLiLong Acquisition is beneficial for the Company to expand its presence in the southwest region of Zhejiang Province with lower costs. For expressways with the same grade, width and length as the LongLiLiLong Expressways, the cost for construction will be substantially higher than the cost for the LongLiLiLong Acquisition, due to the continuous increase in the acquisition cost of land, the cost of demolition and labour, and the price of construction materials.

Moreover, the LongLiLiLong Expressways, partially opened to traffic since December 31, 2006, are expected to generate stable cash flows to the Group once the LongLiLiLong Acquisition is completed. By contrast, it is generally observed that it takes years for newly constructed expressways to gradually generate stabilised cash flow after they are open to traffic. It is thus advantageous in terms of cash flow position for the Company to acquire existing expressways than construct new expressways.

#### (b) Synergy effect of the Group and LongLiLiLong Co

The latest trend of state-owned enterprises reform is resources allocation and consolidation, which will in turn increase the competitiveness of enterprises, and to improve the quality of securitized assets and optimize asset allocation of state-owned listed holding companies. With the LongLiLiLong Acquisition, the Company will be able to consolidate the core expressway assets within the region, increase its scale of assets and its operational efficiency and ensuring the continuing profitability of the Company.

The terms of the LongLiLiLong Equity Purchase Agreement were arrived at after arm's length negotiations between the Company and Communications Group, and are on normal commercial terms or better, taking into account various factors provided above.

Taking into consideration of the reasons attributable to the net losses of LongLiLiLong Co in the two financial years ended 2018 and 2019, the subsequent capital injection by Communications Group which has substantially reduced the interest expenses of LongLiLiLong Co, the positive profit forecast of LongLiLiLong Co in 2022 as provided in the LongLiLiLong Valuation Report, alignment of the LongLiLiLong Acquisition with the Company's principal business of development expressways and the benefits of the subsequent Absorption and Merger, the Directors (including the independent non-executive Directors) consider that the terms of the LongLiLiLong Acquisition are fair and reasonable and are on normal commercial terms or better and in the interests of the Company and the Shareholders as a whole.

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## LETTER FROM THE BOARD

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### SUBSEQUENT ABSORPTION AND MERGER

Subsequent to the completion of the LongLiLiLong Acquisition, LongLiLiLong Co will absorb and merge Jiaxing Co, pursuant to the PRC Company Law and other applicable PRC Laws. As at the Latest Practicable Date, Jiaxing Co is owned as to 99.9995% by the Company. Reorganization will take place prior to the Absorption and Merger where Jiaxing Co will become a wholly owned subsidiary of the Company.

Under the Absorption and Merger, Jiaxing Co will be de-registered in accordance with the PRC Company Law and the Administrative Regulations of the PRC Governing the Registration of Legal Enterprises and relevant legal provisions. Consequently, Jiaxing Co will cease to exist as a separate legal entity, which will be merged into LongLiLiLong Co, as a result of which the assets and liabilities (together with the rights and obligations attached to such assets) will be assumed by LongLiLiLong Co as the surviving corporation, and the employees of Jiaxing Co will be co-ordinated and arranged by LongLiLiLong Co.

For the avoidance of doubt, the Absorption and Merger will neither constitute a notifiable transaction as defined under Chapter 14 of the Listing Rules nor a connected transaction as defined under Chapter 14A of the Listing Rules.

Through the Absorption and Merger, the Company can restructure the management and administration operations of LongLiLiLong Co and Jiaxing Co, thereby enhance the management efficiency and reduce the administrative costs and increase the overall profitability of the Company.

Furthermore, as advised by KPMG, the tax advisor to the Company, the Absorption and Merger is unlikely to trigger Value-Added Tax, Land Appreciation Tax, Deed Tax and Stamp Duty liabilities since the transaction can enjoy the preferential treatments in accordance with relevant PRC tax regulations. The preferential tax treatments are subject to the tax authority's assessment. Furthermore, the Absorption and Merger, if qualified as a Special Restructuring pursuant to Caishui [2009] No. 59 (“**Circular 59**”), would enable LongLiLiLong Co to benefit from Corporate Income Tax deferral treatment. Therefore there will be no Corporate Income Tax payable at this stage. The eligibility of such tax deferral treatment is subject to the tax authority's assessment.

In accordance with relevant PRC tax laws, tax losses could be carried forward for up to five years. After the Absorption and Merger, the accumulated tax losses generated by LongLiLiLong Co during the five years ended December 31, 2020 (approximately RMB2,379,950,000) could be carried forward accordingly to offset the profits of LongLiLiLong Co in the subsequent years. Based on the financial forecast provided by the management of the Company, the estimated amount of profits which could be offset by the aforementioned accumulated tax losses after the Absorption and Merger is approximately RMB1,010,746,000 in the year ending December 31, 2021, approximately RMB1,197,221,000 in the year ending December 31, 2022 and approximately RMB171,983,000 in the year ending December 31, 2023, respectively. The Company expects the Absorption and Merger will significantly enhance the tax efficiency of the Company as a whole.

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## LETTER FROM THE BOARD

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The effect of the Absorption and Merger on the estimated net profits of the LongLiLiLong Co attributable to the Company for the upcoming five years ending December 31, 2025 is set out as follows:

	As at December 31,				
	2021	2022	2023	2024	2025
	<i>Approximately</i> RMB	<i>Approximately</i> RMB	<i>Approximately</i> RMB	<i>Approximately</i> RMB	<i>Approximately</i> RMB
LongLiLiLong Co					
Profits before taxation	(214,054,000)	(169,966,000)	(134,361,000)	(92,663,000)	(50,493,000)
Taxation	0	0	0	0	0
Net profits after taxation	(214,054,000)	(169,966,000)	(134,361,000)	(92,663,000)	(50,493,000)
Jiaxing Co					
Profits before taxation	1,351,914,000	1,478,015,000	1,606,148,000	1,627,592,000	1,757,043,000
Taxation	337,978,000	369,504,000	401,537,000	406,898,000	439,261,000
Net profits after taxation	1,013,935,000	1,108,511,000	1,204,611,000	1,220,694,000	1,317,782,000
LongLiLiLong Co (after the Absorption and Merger)					
Profits before taxation	1,067,869,000	1,254,334,000	1,434,368,000	1,513,795,000	1,701,702,000
Taxation	0	0	301,316,000	364,168,000	411,145,000
Net profits after taxation	1,067,869,000	1,254,334,000	1,133,052,000	1,149,627,000	1,290,557,000
Taxation reduction after the Absorption and Merger	337,978,000	369,504,000	100,221,000	42,730,000	28,116,000

### INFORMATION ON THE COMPANY AND COMMUNICATIONS GROUP

The Company is a joint stock company established in the PRC on March 1, 1997, the H Shares of which are listed on the Main Board of the Stock Exchange. It is principally engaged in investing in, developing and operating high-grade roads in the PRC. The Group is also engaged in the expressway related development and operation, as well as securities business.

Communications Group is a wholly state-owned enterprise established in the PRC on December 29, 2001 and is principally engaged in a diverse range of businesses, including investment, construction, operation, maintenance, toll collection and ancillary services of transportation infrastructure projects, as well as logistic services and hotel operations.

### LISTING RULES IMPLICATIONS

As one or more of the applicable percentage ratios in respect of the HangNing Acquisition is over 5% but less than 25%, the HangNing Acquisition constitutes a discloseable transaction for the Company and is subject to the reporting and announcement requirements under Chapter 14 of the Listing Rules.

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## LETTER FROM THE BOARD

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As one or more of the applicable percentage ratios in respect of the LongLiLiLong Acquisition is over 5% but less than 25%, the LongLiLiLong Acquisition constitutes a discloseable transaction for the Company and is subject to the reporting and announcement requirements under Chapter 14 of the Listing Rules.

As at the date of the Latest Practicable Date, Communications Group holds approximately 67% of the issued share capital of the Company. By virtue of this shareholding interest, Communications Group is a controlling shareholder of the Company. Therefore, Communications Group is a connected person of the Company and as a result, each of the HangNing Acquisition and the LongLiLiLong Acquisition constitutes a connected transaction for the Company and is subject to the reporting, announcement and Independent Shareholders' approval requirements under Chapter 14A of the Listing Rules.

### GENERAL

Given each of Mr. Yu Zhihong, Mr. Dai Benmeng, Mr. Yuan Yingjie and Mr. Fan Ye holds a position in Communications Group, so he has abstained from voting on the board resolutions with respect to the approval of each of the HangNing Equity Purchase Agreement and the LongLiLiLong Equity Purchase Agreement. Save for Mr. Yu Zhihong, Mr. Dai Benmeng, Mr. Yuan Yingjie and Mr. Fan Ye, none of the Directors has any material interest in the transactions contemplated under each of the HangNing Equity Purchase Agreement and the LongLiLiLong Equity Purchase Agreement or is required to abstain from voting on the relevant board resolutions approving each of the HangNing Equity Purchase Agreement, the LongLiLiLong Equity Purchase Agreement and the transactions contemplated thereunder.

The HangNing Acquisition and the LongLiLiLong Acquisition are not inter-conditional and are separately subject to the approval of the Independent Shareholders.

In view of the interest of Communications Group in the HangNing Equity Purchase Agreement and the LongLiLiLong Equity Purchase Agreement respectively, Communications Group and its associates will abstain from voting at the EGM to be convened by the Company to, among others, consider and approve the resolutions in relation to the HangNing Equity Purchase Agreement, the LongLiLiLong Equity Purchase Agreement and the transactions contemplated thereunder.

### THE EGM

You will find on page EGM-1 of this circular a notice of the EGM to be held at 10:00 a.m. on December 23, 2020, on 5/F, No. 2 Mingzhu International Business Center, 199 Wuxing Road, Hangzhou City, Zhejiang Province, the PRC. A form of proxy for use at the EGM is enclosed. Whether or not you are able to attend the meeting in person, you are requested to complete and return the accompanying form of proxy in accordance with the instructions printed thereon. In case of H Shares, the proxy form shall be lodged with the Company's H Shares Registrar, Computershare Hong Kong Investor Services Limited, at 17M Floor, Hopewell Centre, 183 Queen's Road East, Wanchai, Hong Kong, not less than 24 hours before the time for holding the EGM (or any adjournment thereof). Completion and delivery of the form of proxy will not preclude you from attending and voting in person at the EGM or any adjournment thereof should you so wish.

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## LETTER FROM THE BOARD

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To ascertain Shareholders' eligibility to attend and vote at the EGM, the register of members of the Company holding H Shares will be closed from December 18, 2020 to December 23, 2020 (both days inclusive), during which period no transfer of H shares in the Company will be effected. Holders of H Shares who intend to attend the EGM must deliver all transfer instruments and the relevant shares certificates to Hong Kong Registrars Limited at Shops 1712-1716, 17/F, Hopewell Center, 183 Queen's Road East, Wanchai, Hong Kong at or before 4:30 p.m. on December 17, 2020.

### RECOMMENDATION

The Independent Board Committee comprising all the independent non-executive Directors, namely, Mr. Pei Ker-Wei, Ms. Lee Wai Tsang, Rosa, and Mr. Chen Bin, has been formed to consider the HangNing Acquisition, the LongLiLiLong Acquisition and the transactions contemplated thereunder, and Octal Capital Limited has been appointed as the Company's Independent Financial Adviser to advise the Independent Board Committee and the Independent Shareholders as to whether the terms of each of the HangNing Equity Purchase Agreement and the LongLiLiLong Equity Purchase Agreement are fair and reasonable, whether each of the HangNing Equity Purchase Agreement, the LongLiLiLong Equity Purchase Agreement and the transactions contemplated thereunder is on normal commercial terms or better and in the ordinary and usual course of business of the Group, whether each of the HangNing Equity Purchase Agreement, the LongLiLiLong Equity Purchase Agreement and the transactions contemplated thereunder is in the interests of the Company and the Shareholders as a whole and whether the Independent Shareholder should vote in favour of each of the HangNing Equity Purchase Agreement, the LongLiLiLong Equity Purchase Agreement and the transactions contemplated thereunder.

The Directors (including the independent non-executive Directors) consider that the terms of the each of the HangNing Equity Purchase Agreement, the LongLiLiLong Equity Purchase Agreement and the transactions contemplated thereunder are fair and reasonable, on normal commercial or better terms and in the ordinary and usual course of business of the Group, and in the interests of the Company and the Shareholders as a whole.

The text of the letter from Independent Board Committee is set out on page 30 of this circular and the text of the letter from the Independent Financial Adviser containing its advice is set out on pages 32 of this circular.

### FURTHER INFORMATION

The HangNing Valuation Report on the valuation of the 30% equity interest in HangNing Co has been prepared by Cushman & Wakefield and is set out in Appendix I to this circular.

The LongLiLiLong Valuation Report on the valuation of the entire equity interest in LongLiLiLong Co has been prepared by Jones Lang LaSalle and is set out in Appendix I to this circular.

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## LETTER FROM THE BOARD

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The Traffic Study Reports prepared by WBG are set out in Appendix II to this circular. WBG was selected by the Company in respect of the traffic and toll revenue study of HangNing Expressway and the LongLiLiLong Expressways through request for quotation, in which WBG and other two industry renowned traffic and toll revenue study consultant companies participated. The Company has taken into account various factors when assessing and valuing the submitted tenders including the participant's credit assessment, past performance records, industry experience and reputation. WBG is an internationally recognised transportation consultant with extensive experience in toll road traffic and revenue forecasts and a broad clientele. WBG has previously provided traffic study consulting services to the Company in the Company's acquisitions of Zhejiang Shenjiahuhang Expressway Co., Ltd. pursuant to an equity purchase agreement dated December 13, 2018, 80.614% equity interest in Zhejiang Hanghui Expressway Co., Ltd. pursuant to an equity purchase agreement dated August 8, 2015 and 76.55% equity interest in Zhejiang Jinhua Yongjin Expressway Co., Ltd. pursuant to equity purchase agreements dated March 20, 2013, under which the traffic and toll revenue forecast reports of Shenjiahuhang Expressway, Zhoushan Bridge, Hanghui Expressway and Jinhua Section of the Ningbo-Jinhua Expressway were prepared by WBG.

As the appraised value of the 30% equity interest of HangNing Co under the HangNing Valuation Report and the appraised value of the entire equity interest of LongLiLiLong Co under the LongLiLiLong Valuation Report respectively were prepared through the income approach based on the discounted cash flow method, each valuation constitutes a profit forecast under Rule 14.61 of the Listing Rules. Letters from Deloitte in compliance with Rule 14.62(2) of the Listing Rules are included in Appendix III to this circular and a letter from the Board in compliance with Rule 14.62(3) of the Listing Rules is included in Appendix IV to this Circular.

Your attention is drawn to the letter from the Independent Board Committee, the letter from the Independent Financial Adviser and the additional information set out in the appendices to this circular and the notice of the EGM.

By order of the Board  
**Zhejiang Expressway Co., Ltd.**  
**YU Zhihong**  
*Chairman*



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## LETTER FROM THE INDEPENDENT BOARD COMMITTEE

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**浙江滬杭甬高速公路股份有限公司**  
**ZHEJIANG EXPRESSWAY CO., LTD.**

*(A joint stock limited company incorporated in the People's Republic of China with limited liability)*  
**(Stock code: 0576)**

December 7, 2020

*To the Independent Shareholders*

Dear Sirs,

**Re: Discloseable and Connected Transaction in relation to Acquisition of 30% Interest in HangNing Co; and  
Discloseable and Connected Transaction in relation to Acquisition of the Entire Interest In LongLiLiLong Co**

We refer to the circular of the Company dated December 7, 2020 to the Shareholders (the “**Circular**”), of which this letter forms part. Terms defined in the Circular shall have the same meanings when used in this letter, unless the context otherwise requires.

We have been appointed by the Board as members of the Independent Board Committee to advise you as to (i) the fairness and reasonableness of the terms of each of the HangNing Equity Purchase Agreement and the LongLiLiLong Equity Purchase Agreement, (ii) whether the HangNing Equity Purchase Agreement, the LongLiLiLong Equity Purchase Agreement and the transactions contemplated thereunder are on normal commercial terms or better and in the ordinary and usual course of business of the Group, (iii) whether the HangNing Equity Purchase Agreement, the LongLiLiLong Equity Purchase Agreement and the transactions contemplated thereunder are in the interests of the Company and the Shareholders as a whole and (iv) the voting action that should be taken by the Independent Shareholders. Octal Capital Limited has been appointed as the independent financial adviser to advise you and us in this regard. Details of the recommendations from the Independent Financial Adviser are set out in its letter of advice on pages 32 to 72 of the Circular.

Your attention is also drawn to the letter from the Board set out on pages 5 to 29 of the Circular and the additional information set out in the appendices to the Circular.

Having considered the terms of the HangNing Equity Purchase Agreement, and taken into account the advice from the Independent Financial Adviser and in particular the principal factors and reasons considered by the Independent Financial Adviser as set out in its letter of advice, we are of the view that (i) the terms of the HangNing Equity Purchase Agreement are on normal commercial terms and are fair and reasonable so far as the Independent Shareholders are concerned; and (ii) the HangNing Acquisition is in the ordinary and usual course of business of the Company and in the interests of the Company and the Shareholders as a whole. Accordingly, we recommend the Independent Shareholders to vote in favour of the relevant resolutions to approve the HangNing Equity Purchase Agreement and the transactions contemplated thereunder at the EGM.



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## LETTER FROM THE INDEPENDENT BOARD COMMITTEE

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Having considered the terms of the LongLiLiLong Equity Purchase Agreement, and taken into account the advice from the Independent Financial Adviser and in particular the principal factors and reasons considered by the Independent Financial Adviser as set out in its letter of advice, we are of the view that (i) the terms of the LongLiLiLong Equity Purchase Agreement are on normal commercial terms and are fair and reasonable so far as the Independent Shareholders are concerned; and (ii) the LongLiLiLong Acquisition is in the ordinary and usual course of business of the Company and in the interests of the Company and the Shareholders as a whole. Accordingly, we recommend the Independent Shareholders to vote in favour of the relevant resolutions to approve the LongLiLiLong Equity Purchase Agreement and the transactions contemplated thereunder at the EGM.

Yours faithfully,

**Independent Board Committee**

**Mr. PEI Ker-Wei**

*Independent  
non-executive Director*

**Ms. LEE Wai Tsang, Rosa**

*Independent  
non-executive Director*

**Mr. CHEN Bin**

*Independent  
non-executive Director*

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## LETTER FROM INDEPENDENT FINANCIAL ADVISER

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*The following is the letter of advice from Octal Capital Limited to the Independent Board Committee and Independent Shareholders prepared for the purpose of inclusion in this circular.*



801-805, 8/F, Nan Fung Tower,  
88 Connaught Road Central,  
Hong Kong

7 December 2020

*To the Independent Board Committee and the Independent Shareholders*

Dear Sirs,

**DISCLOSEABLE AND CONNECTED TRANSACTION  
IN RELATION TO THE PROPOSED ACQUISITION OF  
30% INTEREST IN HANGNING CO;  
AND  
DISCLOSEABLE AND CONNECTED TRANSACTION  
IN RELATION TO THE PROPOSED ACQUISITION OF  
THE ENTIRE INTEREST IN LONGLILILONG CO**

### INTRODUCTION

We refer to our engagement as the Independent Financial Adviser to advise the Independent Board Committee and the Independent Shareholders in respect of the terms of HangNing Equity Purchase Agreement and LongLiLiLong Equity Purchase Agreement, particulars of which are set out in the letter from the Board (the “**Letter from the Board**”) of the circular of the Company dated 7 December 2020 (the “**Circular**”), of which this letter forms part. Unless the context requires otherwise, capitalized terms used in this letter shall have the same meanings as those defined under the definitions section of the Circular.

The Company entered into HangNing Equity Purchase Agreement and LongLiLiLong Equity Purchase Agreement with Communications Group on 10 November 2020, pursuant to which, (i) Communications Group conditionally agreed to sell and the Company conditionally agreed to acquire 30% equity interest in HangNing Co at a cash consideration of RMB2,685,000,000; and (ii) Communications Group conditionally agreed to sell and the Company conditionally agreed to acquire the entire equity interest in LongLiLiLong Co at a cash consideration of RMB238,140,000. The HangNing Acquisition and the LongLiLiLong Acquisition are not inter-conditional and are separately subject to the approval of the Independent Shareholders. Upon the Completion, HangNing Co will become an associate of the Company and LongLiLiLong Co will become a wholly-owned subsidiary of the Company.

Communications Group holds approximately 67% of the issued share capital of the Company and is a controlling shareholder of the Company. Therefore, Communications Group is a connected person of the Company and as a result, each of HangNing Acquisition and LongLiLiLong Acquisition constitutes a connected transaction for the Company and is subject to the reporting, announcement and Independent Shareholders’ approval requirements under Chapter 14A of the Listing Rules.

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## LETTER FROM INDEPENDENT FINANCIAL ADVISER

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An Independent Board Committee comprising all independent non-executive Directors, namely Mr. Pei Ker-Wei, Ms. Lee Wai Tsang, Rosa and Mr. Chen Bin, has been established to advise the Independent Shareholders whether the terms of each of the HangNing Equity Purchase Agreement and LongLiLiLong Equity Purchase Agreement are fair and reasonable, whether each of HangNing Equity Purchase Agreement, LongLiLiLong Equity Purchase Agreement and the transactions contemplated thereunder are on normal commercial terms or better and in the ordinary and usual course of business of the Group, whether each of HangNing Equity Purchase Agreement, LongLiLiLong Equity Purchase Agreement and the transactions contemplated thereunder are in the interests of the Company and the Shareholders as a whole.

As at the Latest Practicable Date, we were not connected with the Company or any of their respective substantial shareholders, directors or chief executives, or any of their respective associates and accordingly, are considered suitable to give independent advice to the Independent Board Committee and the Independent Shareholders in respect of HangNing Acquisition and LongLiLiLong Acquisition. In the last two years, we were engaged by the Company as an independent financial adviser to the Company in respect of a discloseable and connected transaction in relation to an acquisition transaction (details can be referred to the circular of the Company dated 15 January 2019). Apart from normal professional fees paid or payable to us in connection with the appointment as the Independent Financial Adviser, no arrangements exist whereby we had received or will receive any fees or benefits from the Company, its subsidiaries or their respective controlling shareholders that could reasonably be regarded as relevant to our independence. Accordingly, we consider that we are independent to act as the Independent Financial Adviser in respect of HangNing Acquisition and LongLiLiLong Acquisition pursuant to Rule 13.84 of the Listing Rules.

In formulating our opinion, we have relied on the accuracy of the information and representations contained in the Circular and have assumed that all information and representations made or referred to in the Circular as provided by the management of the Company were true at the time they were made and continue to be true as at the date of the Circular. We have also relied on our discussion with the management of the Company regarding HangNing Equity Purchase Agreement and LongLiLiLong Equity Purchase Agreement including the information and representations contained in the Circular. We have also assumed that all statements of belief, opinion and intention made by the management of the Company in the Circular were reasonably made after due enquiry. We consider that we have reviewed sufficient information to reach an informed view, to justify our reliance on the accuracy of the information contained in the Circular and to provide a reasonable basis for our advice. We have no reason to suspect that any material facts have been omitted or withheld from the information contained or opinions expressed in the Circular nor to doubt the truth, accuracy and completeness of the information and representations provided to us by the management of the Company. We have not, however, conducted an independent in-depth investigation into the business and affairs of the Group, Communications Group, HangNing Co and LongLiLiLong Co, and any of their respective subsidiaries and their respective associates, nor have we carried out any independent verification of the information supplied to us.

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## LETTER FROM INDEPENDENT FINANCIAL ADVISER

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### PRINCIPAL FACTORS AND REASONS CONSIDERED

In arriving at our opinions and recommendations in respect of HangNing Acquisition and LongLiLiLong Acquisition, we have taken into consideration the following principal factors and reasons:

#### I. Background of and reasons of entering into HangNing Equity Purchase Agreement and LongLiLiLong Equity Purchase Agreement

##### 1. Information of the Company

The Company is a joint stock company incorporated in the PRC on 1 March 1997, the H Shares of which are listed on the Main Board of the Stock Exchange. It is principally engaged in investment, development, and operation of high-grade roads in the PRC, expressway related development and operation as well as securities business. As at the Latest Practicable Date, the Group is operating seven expressways in which six of them are located within Zhejiang Province and one expressway is situated within Anhui Province.

Expressway	Length (km)	Origin	Destination	Average daily traffic in 2019 (No. of vehicles)
Shanghai-Hangzhou-Ningbo Expressway				64,127
– Shanghai-Hangzhou Section	102.6	Jiaxing	Hangzhou	64,490
– Hangzhou-Ningbo Section	145.3	Hangzhou	Ningbo	63,867
Shangsan Expressway	141.4	Shaoxing	Taizhou	30,347
Jinhua Section, Ningbo-Jinhua Expressway	69.7	Jinhua	Jinhua	24,332
Hanghui Expressway	122.3	Hangzhou	Hangzhou	21,430
Huihang Expressway	81.6	Huangshan	Huangshan	7,962
Shenjiahuhang Expressway				30,575
– Huzhou Section	42.0	Huzhou	Huzhou	
– Lianhang Section	50.9	Huzhou	Hangzhou	
Zhoushan Bay Bridge	46.3	Ningbo	Zhoushan	21,834
Total	<u>802.1</u>			

*Source: Annual Report*

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## LETTER FROM INDEPENDENT FINANCIAL ADVISER

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The table below summarizes the audited financial information of the Group for the years ended 31 December 2017, 2018 and 2019 (“FY2017”, “FY2018” and “FY2019”, respectively) and the six months ended 30 June 2019 and 2020 (“1H2019” and “1H2020”, respectively) as extracted from the annual reports of the Company for FY2018 and FY2019 (the “2018 Annual Report” and “2019 Annual Report”) and interim report of the Company for the six months ended 30 June 2020 (the “Interim Report”):

	FY2017	FY2018	FY2019	1H2019	1H2020
	<i>RMB</i>	<i>RMB</i>	<i>RMB</i>	<i>RMB</i>	<i>RMB</i>
	<i>million</i>	<i>million</i>	<i>million</i>	<i>million</i>	<i>million</i>
	(audited)	(audited)	(audited)	(unaudited)	(unaudited)
		<i>(Note)</i>			
Toll operation	5,986	7,854	8,061	3,882	1,773
Securities operation	3,491	2,921	3,301	1,641	2,092
Others	149	417	593	199	83
	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
<b>Total Revenue</b>	<b>9,626</b>	<b>11,192</b>	<b>11,955</b>	<b>5,722</b>	<b>3,948</b>
<b>Profit before taxation</b>	<b>5,183</b>	<b>5,108</b>	<b>5,767</b>	<b>3,042</b>	<b>1,226</b>
<b>Profit after taxation</b>	<b>3,991</b>	<b>3,995</b>	<b>4,415</b>	<b>2,349</b>	<b>947</b>

*Source: 2018 Annual Report, 2019 Annual Report and Interim Report*

*Note:*

On 13 December 2018, the Group entered into an equity purchase agreement with Communications Group to acquire 100% equity interest in Zhejiang Shenjiahuhang Expressway Co Ltd. and the acquisition completed on 9 April 2019. However, since the vendor (Communications Group), is the controlling shareholder of the Company, the said acquisition was regarded as business combinations involving entities under common control and were accounted in accordance with Accounting Guideline 5 “Merger Accounting for Common Control” issued by the Hong Kong Institute of Certified Public Accountants. As a result, the consolidated statements included in the 2018 Annual Report have been restated in order to include the financial performance and position of the combining entities since the date on which they first come under common control.

The Group recorded a growing revenue of approximately RMB9,626 million for FY2017 to RMB11,192 million for FY2018 and then the Group’s revenue further increased to RMB11,955 million for FY2019. The toll operation segment, which includes the operation of seven expressways in the PRC, accounted for approximately 62.2%, 70.2% and 67.4% of the Group’s revenue for the three years ended 31 December 2019, respectively and is the major operating segment of the Group.

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## LETTER FROM INDEPENDENT FINANCIAL ADVISER

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The table below summarizes the toll road operation income, which derives from the operation of the toll roads for FY2017, FY2018, FY2019, 1H2019 and 1H2020:

	Remaining years of operation as at 31 December	FY2017	FY2018	FY2019	1H2019	1H2020
	2019					
<i>RMB Million</i>						
Shanghai-Hangzhou-Ningbo Expressway	8-9	3,773	4,019	4,143	1,997	898
Shangsang Expressway	11	1,244	1,232	1,188	586	271
Jinhua Section, Ningbo-Jinhua Expressway	11	362	387	437	204	106
Hanghui Expressway	10-12	478	527	580	288	136
Huihang Expressway	14	129	137	138	77	35
Shenjiahuhang Expressway (Note)	14 -16	N/A	697	694	330	142
Zhoushan Bay Bridge (Note)	15	N/A	855	881	400	185
<b>Total</b>		5,986	7,854	8,061	3,882	1,773

*Source: 2018 Annual Report, 2019 Annual Report and Interim Report*

*Note:*

The revenue of Shenjiahuhang Expressway and Zhoushan Bay Bridge were recognized into the financial statements for the year ended 31 December 2018 due to the completion of the said acquisition on 9 April 2019 in accordance with Accounting Guideline 5 “Merger Accounting for Common Control” issued by the Hong Kong Institute of Certified Public Accountants.

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## LETTER FROM INDEPENDENT FINANCIAL ADVISER

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### FY2018 compared to FY2017

The total toll income increased by approximately RMB1,868 million or 31.2% from approximately RMB5,986 million for FY2017 to approximately RMB7,854 million for FY2018. The increase in the total toll income was mainly attributable to (i) the growth in traffic volume of the expressways operated by the Group during FY2018; and (ii) the acquisition of the Shenjiahuhang Expressway and Zhoushan Bay Bridge.

### FY2019 compared to FY2018

The total toll income recorded an increment of approximately RMB207 million or 2.6% from approximately RMB7,854 million for FY2018 to approximately RMB8,061 million for FY2019. The slow-down of the growth in total toll income was mainly due to (i) the negative effect brought by the toll discount policies for ETC registration, which started on 1 January 2019 and 1 July 2019 for trucks and vehicles respectively; and (ii) traffic diversion to other neighboring roadways and bridge. According to 2019 Annual Report, the traffic volume on the Shanghai-Hangzhou-Ningbo Expressway was negatively impacted by the opening of the Yuhang section of the Hangzhou Urban Elevated Highway and the completion of construction of the National Highway G320. The Ningbo-Taizhou-Wenzhou Expressway, which is connected to the Shangsans Expressway, closed due to construction work and the cease of toll collection of the Zhangzhen toll station on National highway G104 which is parallel to the Shangsans Expressway. These two factors negatively affected the traffic volume of the Shangsans Expressway. The opening of North Qiushi Road in December 2018, which is parallel to the Lianshi-Hangzhou Section of the Shenjiahuhang Expressway, caused significant traffic volume diversion and caused a decrease in toll revenue for this section.

### 1H2020 compared to 1H2019

The total toll income of 1H2020 exhibited a decline of approximately RMB2,109 million or 54.3% as compared to 1H2019, from approximately RMB3,882 million for 1H2019 to approximately RMB1,773 million for 1H2020. The significant drop in total toll revenue was arising from (i) the lower traffic volume due to the COVID-19; and (ii) the toll-free policy imposed by the PRC government during the period from 8 February 2020 to 5 May 2020.

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## LETTER FROM INDEPENDENT FINANCIAL ADVISER

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As set out in the table below, the major items of the unaudited consolidated financial statement of the Company as at 30 June 2020 is summarized as below:

	As at <b>30 June 2020</b> <i>RMB' million</i> (unaudited)
<b>Non-current assets</b>	
Expressway operating rights	21,910
Property, plant and equipment	4,180
Others	8,885
	34,975
<b>Non-current assets</b>	<b>34,975</b>
<b>Current assets</b>	
Bank balances and clearing settlement fund held on behalf of customers	24,499
Bank balances, clearing settlement fund, deposits and cash – time deposits with original maturity over three months	1,100
– cash and cash equivalents	6,312
Others	49,007
	80,918
<b>Current assets</b>	<b>80,918</b>
<b>Total assets</b>	<b>115,893</b>
<b>Non-current liabilities</b>	
Bank and other bank borrowings	8,399
Bonds payable and convertible bonds	17,827
Others	550
	26,776
<b>Non-current liabilities</b>	<b>26,776</b>
<b>Current liabilities</b>	
Account payable to customers arising from securities business	24,297
Bank and other bank borrowings	4,834
Short-term financing note payable	6,222
Bonds payable and convertible bonds	404
Others	22,142
	57,899
<b>Current liabilities</b>	<b>57,899</b>
<b>Total liabilities</b>	<b>84,675</b>
<b>Net current assets</b>	<b>23,019</b>
<b>Net assets</b>	<b>31,218</b>
<b>Gearing ratio (the aggregate of bank and other borrowings, bonds payables and convertible bonds, and short-term financing note payable/total equity)</b>	<b>120.7%</b>

Source: Interim Report



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## LETTER FROM INDEPENDENT FINANCIAL ADVISER

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As at 30 June 2020, the Group's total assets amounted to approximately RMB115,893 million in which the expressway operation rights (solely related to the toll road operation segment) amounted to approximately RMB21,910 million, representing 18.9% of the total assets. The Group has cash and cash equivalents of approximately RMB6,312.0 million (representing 5.4% of the total assets) as at 30 June 2020.

The Group's liabilities mainly include the bank and other bank borrowings, bonds payables and convertible bonds, and short-term financing note payable, which in aggregate amounted to approximately RMB37,686 million as at 30 June 2020, representing approximately 44.5% of the total liabilities as at 30 June 2020. The Group's gearing ratio (as defined above) as at 30 June 2020 was approximately 120.7%.

### **2. *Information of Communications Group***

Communications Group is a wholly state-owned enterprise incorporated in the PRC on 29 December 2001 and is principally engaged in a diverse range of businesses, including investment, construction, operation, maintenance, toll collection and ancillary services of transportation infrastructure projects, as well as logistics services and hotel operations.

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## LETTER FROM INDEPENDENT FINANCIAL ADVISER

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### 3. *Information of HangNing Co*

HangNing Co is a limited liability company incorporated in the PRC on 21 April 2004. HangNing Co is principally engaged in the operation and management of toll collection rights of Zhejiang Section of HangNing Expressway. As at the Latest Practicable Date, HangNing Co is a non-wholly owned subsidiary of Communications Group.

Zhejiang Section of HangNing Expressway is located within Zhejiang Province and is part of the G25 ChangShen Expressway. Zhejiang Section of HangNing Expressway connects to NingHang Expressway which ends in Nanjing. Therefore, Zhejiang Section of HangNing Expressway and NingHang Expressway are critical routes connecting Hangzhou and Nanjing, which are the provincial capital cities of Zhejiang Province and Jiangsu Province, respectively.

Zhejiang Section of HangNing Expressway starts from Fuziling of Changxing County, Huzhou, and ends in Nangzhuangdou Interchange of the Hangzhou Ring Road, connecting from Huzhou to Hangzhou which are two major and wealthy cities in Zhejiang Province. Zhejiang Section of HangNing Expressway is a two-way four-lane expressway with a total length of 98.961 kilometers and the designed speed limit is 120 kilometers per hour. The phase I of Zhejiang Section of HangNing Expressway (the “**Phase I**”) starts from Wangjiabang and ends in Qingshan section and was opened to traffic in 27 December 2000 with a total length of 34.335 kilometers. The phase II of Zhejiang Section of HangNing Expressway (“**Phase II**”) includes the section between Hangzhou and Qingshan, and another section between Wangjiabang and Fuziling section with a total length of 64.626 kilometers, and was opened to traffic on 28 November 2002. Zhejiang Section of HangNing Expressway has 11 toll stations. Zhejiang Section of HangNing Expressway connected to Shenjiahuhang Expressway at Lushan Hub. The General Office of the People’s Government of Zhejiang Province has tentatively agreed on HangNing Co’s entitlement to 30 years of toll collection rights to Zhejiang Section of HangNing Expressway on 13 January 2003.

Zhejiang Section of HangNing Expressway links two major cities of Hangzhou and Huzhou. This is one of the important transportation routes for transportation of goods and passengers within Yangtze Delta. Hangzhou and Huzhou City’s economic activities are well-developed, especially a booming high-tech and software sector and a fast growing e-commerce sector. The average daily traffic volume of Zhejiang Section of HangNing Expressway from 2013 to 2019 maintained a growing trend at a compound annual growth rate (“**CAGR**”) of approximately 6.47% from 33,694 vehicles per day to 49,069 vehicles per day.

In view of the expressway network of the Group as discussed in the above section, Zhejiang Section of HangNing Expressway did not overlap with the routes of the Group’s existing expressways and the target users of Zhejiang Section of HangNing Expressway are differentiated from the target users of the Group’s expressways based on the route of each expressway. Zhejiang Section of HangNing Expressway could enhance the Group’s market position in Zhejiang Province.

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## LETTER FROM INDEPENDENT FINANCIAL ADVISER

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The table below summarizes the major financial information of HangNing Co for the two years ended 31 December 2019 and the eight months ended 31 August 2020 extracted from the auditor's report prepared in accordance with the generally accepted accounting principles in the PRC by the PRC statutory auditor of HangNing Co and the management account of HangNing Co for the eight months ended 31 August 2019:

	FY2018	FY2019	Eight months ended 31 August	
			2019	2020
	(audited)	(audited)	(unaudited)	(audited)
	<i>RMB'million</i>			
Toll revenue	1,170	1,152	771	487
Other revenue	31	29	28	43
	<hr/>	<hr/>	<hr/>	<hr/>
Total revenue	1,201	1,181	799	530
Net profit after tax	737	720	503	276

*Source: Audited reports and management account of HangNing Co*

We noted that the PRC statutory auditor of HangNing Co issued a qualified opinion for the audited financial statements for the year ended 31 December 2019 and the eight months ended 31 August 2020. The basis of formulating the qualified opinion for the eight months ended 31 August 2020 include (i) there are certain matters that may result in the payment of corporate income tax and fines where the amount cannot be quantified; and (ii) the PRC statutory auditor was unable to obtain sufficient and appropriate evidence to determine the impact of the accounting adjustment regarding a service area located in Qingshan.

The toll revenue of HangNing Co slightly dropped from approximately RMB1,170 million to RMB1,152 million from FY2018 to FY2019, representing a decrease of approximately 1.5%. Such decrease was mainly caused by the road expansion work (which is expected to be completed around the end of 2020) which hindered the traffic flow of Zhejiang Section of HangNing Expressway. However, the traffic restrictions imposed by the PRC Government due to COVID-19 had been adversely reduced the traffic flow in Zhejiang Section of HangNing Expressway. During the period from 17 February 2020 to 5 May 2020, Zhejiang Section of HangNing Expressway is subject to a toll free period of 79 days. As a result, the toll revenue of HangNing Co was approximately RMB487 million during the first eight months of 2020, representing a decrease of approximately 36.8% as compared to the same period in 2019.

The operating cost of HangNing Co mainly includes the depreciation of fixed assets amounted to approximately RMB181 million, RMB177 million and RMB117 million during the two years ended 31 December 2019 and the eight months ended 31 August 2020, respectively, representing approximately 15%, 15% and 24% of the total revenue for the respective year/period.

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## LETTER FROM INDEPENDENT FINANCIAL ADVISER

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During the two years ended 31 December 2019, HangNing Co recorded stable net profit after tax of approximately RMB737 million and RMB720 million, respectively. The profit for the eight months ended 31 August 2020 was approximately RMB276 million represented a reduction of approximately RMB227 million as compared to the same period in 2019, due to the reduction in the revenue as discussed above.

The table below summarizes the financial position of Hanging Co as at 31 August 2020 extracted from the auditor's report prepared in accordance with the generally accepted accounting principles in the PRC by the PRC statutory auditor of HangNing Co:

	<b>As at 31 August 2020</b> <i>RMB million</i> (audited)
Fixed assets	433
Construction in progress	1,595
Cash and cash equivalents	891
Others	126
	<hr/>
Total assets	3,045
Trade payables	139
Tax payable	97
Other payables	136
Others	31
	<hr/>
Total liabilities	403
Net assets	2,642
	<hr/> <hr/>

*Source: Audited report of HangNing Co*

The fixed assets of HangNing Co mainly include expressway and buildings, which amounted to approximately RMB426 million as at 31 August 2020 and represented 14% of the total assets of HangNing Co. HangNing Co is currently constructing another two lanes and the construction in progress amounted to approximately RMB1,595 million as at 31 August 2020, representing 52% of the total assets of HangNing Co. As advised by the management of the Company that, the estimated budget for road expansion project is approximately RMB2,554 million and the expansion is expected to be completed by the end of 2020. HangNing Co has cash and cash equivalents of approximately RMB891 million as at 31 August 2020, representing 29% of the total assets.

As at 31 August 2020, the total liabilities of HangNing Co amounted to approximately RMB403 million. The net asset value of HangNing Co is approximately RMB2,642 million.

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## LETTER FROM INDEPENDENT FINANCIAL ADVISER

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Based on the audited financial statement of HangNing Co for the years ended 31 December 2017 and 31 December 2019, the distributable reserve was amounted to approximately RMB2,895 million and RMB3,017 million as at 31 December 2016 and 31 December 2018, respectively. During the years ended 31 December 2017 and 31 December 2019, HangNing Co declared and distributed dividend of approximately RMB1,480 million and RMB3,017 million to its shareholders, respectively. We noted that the dividend payout of HangNing Co considered the available distributable reserve and the available cash of HangNing Co. The management of the Company advised that the future dividend payout by HangNing Co will consider the following factors, including but not limited to (i) the cash position; (ii) the cashflow requirement in the coming years; and (iii) the position of distributable reserve.

We noted that the PRC statutory auditor of HangNing Co issued a qualified opinion on the audited financial statements of HangNing Co for the eight months ended 31 August 2020. We discussed with the auditor of HangNing Co about the basis of qualified opinions which is summarized as below:

- HangNing Co received tax refund of approximately RMB252,446,600 during the period from 2004 to 2012 but such tax refund was not reported in the respective tax filing reports of HangNing Co during that period.
- HangNing Co paid interests of approximately RMB2,849,841,900 in relation to the shareholders' loans during the period from 2003 to 2016. However, no tax invoices were received to support these interest payments.
- HangNing Co adjusted the over-accrued expenses of approximately RMB3,297,595,100, which was recognized during the period from 2003 to 2016, and paid additional corporate income tax during the period from 2016 to 2019. HangNing Co have not yet paid property tax and land use right tax in relation to its certain properties on a timely basis. As such, HangNing Co may be subject to the risk of tax penalty and overdue fines.
- The construction cost incurred by HangNing Co for building the Qingshan Service Area was approximately RMB41,201,600 which were charged to the statement of income statement during the period from 2006 to 2008. The PRC statutory auditor of HangNing Co advised that the construction cost of Qingshan Service Area should be capitalized in accordance with the depreciation policy of HangNing Co.

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## LETTER FROM INDEPENDENT FINANCIAL ADVISER

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The PRC statutory auditor of HangNing Co advised that they are unable to obtain the following sufficient and appropriate audit evidence, including but not limited to (a) calculation sheets on the potential underpayment of corporate income tax, penalties and overdue fines; and (b) written documentation from local tax authorities explicitly confirming that no tax payments including penalties and fines are required; (c) the completion account of Qingshan Service Area from the main contractor to ascertain the total construction cost incurred; and (d) the supporting accounting schedule for the initial recognition of the construction cost of Qingshan Service Area in 2006.

Pursuant to the HangNing Equity Purchase Agreement, Communications Group undertakes to compensate the Company in connection to events that occurred prior to 31 August 2020, including those qualified matters. The compensation will be an amount of 30% of the payment made by HangNing Co, being proportional to the Company's shareholding interest in HangNing Co., within 30 business days of HangNing Co's payment under the HangNing Equity Purchase Agreement.

The results and assets and liabilities of HangNing Co will be incorporated in the consolidated financial statements of the Group using the equity method of accounting. If any accounting adjustment is made to HangNing Co, this may cause a corresponding adjustment of the Company's share of results of associates to the extent of 30% in the consolidated financial statements of the Group. The undertaking provided by Communications Group will compensate the Company for any losses incurred by the above-mentioned qualified matter. Therefore, we are of the view that the financial impact of the qualified opinion of HangNing Co. to the consolidated financial statement of the Group will be minimized.

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## LETTER FROM INDEPENDENT FINANCIAL ADVISER

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#### 4. *Information of LongLiLiLong Co*

LongLiLiLong Co is a limited liability company incorporated in the PRC on 8 April 2005. LongLiLiLong Co is principally engaged in the operation and management of toll collection rights of LongLiLiLong Expressways located in Zhejiang Province with a total length of approximately 222.2 kilometers in a T-shape structure. As at the Latest Practicable Date, LongLiLiLong Co is a wholly owned subsidiary of Communications Group.

The basic information of these two expressways are summarized as below.

	<b>LongLi Expressway</b>	<b>LiLong Expressway</b>
Starting point	North of Hangqian Expressway	Fuling Interchange of JingLiWen Expressway
Ending point	Beibu Interchange	Starting point of Longqing Expressway
Length	119.785 km	102.44 km
Lane		4
No of toll stations		16
No of service area		3
Maximum designed speed	100/80 km/h	100/80 km/h
Commencement of traffic	31 December 2006	31 December 2006 and 25 December 2007
Expiry of toll collection right	30 December 2031	30 December 2031 and 24 December 2032

In view of the expressway network of the Group, LongLiLiLong Expressways mainly serves the traffic demand in the southwest region of Zhejiang Province while the Groups' existing expressways are located near the coastal area and the north-east area of Zhejiang Province. LongLiLiLong Expressways did not overlap with the Group's existing expressways. The target users of LongLiLiLong Expressways are differentiated from the target users of the Group's expressways based on the route of each expressway. In view of the location and routes of the Group, LongLiLiLong Expressways is not in competition with the Group's expressway network while it assists the Group to expand its expressway portfolio to the southwest region of Zhejiang Province.

The table below summarizes the major financial information of LongLiLiLong Co for the two years ended 31 December 2019 based on the auditor's report prepared in accordance with the generally accepted accounting principles in the PRC by the PRC statutory auditor of LongLiLiLong Co. The unaudited financial information of LongLiLiLong Co. for the eight months ended 31 August 2020 is reviewed by Deloitte under agreed-upon procedures.

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## LETTER FROM INDEPENDENT FINANCIAL ADVISER

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	FY2018	FY2019	Eight months ended	
			2019	2020
	<i>RMB million</i>		<i>RMB million</i>	
	(Audited)		(Unaudited)	
Toll revenue	647	664	451	287
EBITDA	451	447	331	194
				<i>(Note 1)</i>
EBIT <i>(Note 2)</i>	(11)	(42)	7	(804)
Net loss after tax	(425)	(466)	(275)	(1,083)

*Source: Auditor's reports and management account of LongLiLiLong Co for the respective year and period*

*Note 1: The one-off impairment loss in relation to the fixed assets amounted to approximately RMB655 million, which is proposed by the Group's auditor, is excluded.*

*Note 2: EBIT refers to earnings before interest expenses and income tax. EBITDA refers to earnings before interest expenses, income tax, depreciation and amortisation.*

The revenue of LongLiLiLong Co increased from approximately RMB647 million to RMB664 million from FY2018 to FY2019, representing a year-on-year growth of approximately 2.6%. The increment in revenue was mainly driven by the increase in traffic volume of LongLiLiLong Expressways in which the weighted average daily traffic volume increased from 11,409 vehicles to 12,257 vehicles. However, the traffic restrictions imposed by the PRC Government due to COVID-19 had been adversely reduced the traffic flow in LongLiLiLong Expressways. During the period from 17 February 2020 to 5 May 2020, LongLiLiLong Expressways is subject to a toll free period of 79 days. The toll revenue of LongLiLiLong Co was approximately RMB287 million for the first eight months of 2020, representing a decrease of approximately 37% as compared to the same period in 2019.

The operating cost of LongLiLiLong Co mainly includes the depreciation of fixed assets (mainly the expressways and buildings) which amounted to approximately RMB462 million, RMB490 million and RMB344 million during the two years ended 31 December 2019 and the eight months ended 31 August 2020, representing approximately 71%, 74% and 120% of the total revenue for the respective year/period. During the eight months ended 31 August 2020, the toll free arrangement substantially reduced the toll revenue and therefore the toll revenue is not sufficient to cover the depreciation for that period.



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## LETTER FROM INDEPENDENT FINANCIAL ADVISER

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During the two years ended 31 December 2019 and the eight months ended 31 August 2020, the interest expenses in relation to the interest-bearing borrowings amounted to RMB414 million, RMB424 million and RMB279 million, representing approximately 64%, 64% and 97% of the total revenue for the respective year/period. LongLiLiLong Co recorded losses of approximately RMB425 million, RMB466 million and RMB1,083 million during the two years ended 31 December 2019 and the eight months ended 31 August 2020, respectively. The losses for the two years ended 31 December 2019 were mainly attributable to the depreciation and the interest expenses. During the eight months ended 31 August 2020, the loss was further increased to RMB1,083 million because of the one-off impairment loss of approximately RMB655 million on its fixed assets based on the LongLiLiLong PRC Valuation Report.

The EBITDA of LongLiLiLong Co of RMB451 million and RMB447 million for the two years ended 31 December 2019 while the EBITDA (excluding one-off impairment loss) of LongLiLiLong Co for the eight months ended 31 August 2020 is approximately RMB194 million. We consider that the operation of LongLiLiLong Co has generated positive cash flow for paying its interest expenses.

The table below summarizes the unaudited financial position as at 31 August 2020 which is reviewed by Deloitte under agreed-upon procedures:

	<b>As at</b> <b>31 August 2020</b> <i>RMB million</i> (unaudited)
Fixed assets and intangible assets	6,027
Cash and cash equivalents	185
Others	32
	<hr/>
Total assets	6,244
Interest-bearing loans	5,779
Others	239
	<hr/>
Total liabilities	6,018
	<hr/>
Net assets	226
	<hr/> <hr/>

*Source: Management account of LongLiLiLong Co for the eight months ended 31 August 2020 (reviewed by Deloitte under agree-upon procedures)*

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## LETTER FROM INDEPENDENT FINANCIAL ADVISER

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LongLiLiLong Co's fixed assets mainly include the expressways and buildings amounted to approximately RMB6,027 million as at 31 August 2020, representing 97% of the total assets of LongLiLiLong Co. LongLiLiLong Co has cash and cash equivalents of approximately RMB185 million as at 31 August 2020, representing approximately 3% of the total assets.

As at 31 August 2020, LongLiLiLong Co's total liabilities mainly include the interest-bearing loans of approximately RMB5,779 million, representing approximately 96% of the total liabilities as at 31 August 2020. As advised by the management of LongLiLiLong Co, the loans are used to finance the construction of LongLiLiLong Expressways. As at 31 August 2020, LongLiLiLong Co recorded net assets of approximately RMB226 million.

We also noted that Communications Group made a capital injection to LongLiLiLong Co in an amount of RMB4,100 million in August 2020 for repayment of the interest-bearing loans. The interest-bearing loans considerably decreased from approximately RMB9,669 million as at 31 December 2019 to approximately RMB5,779 million as at 31 August 2020. The gearing ratio of LongLiLiLong Co (which is calculated based on the total interest-bearing loans divided by total assets) has been reduced from 1.37 as at 31 December 2019 to 0.89 as at 31 August 2020. The leverage level of LongLiLiLong Co has been improved after the capital injection from Communications Group and the interest expenses from September 2020 onwards will be substantially reduced.

Having discussed with the management of the Company, subsequent to the completion of LongLiLiLong Acquisition, LongLiLiLong Co will absorb and merge with Jiaxing Co. Jiaxing Co is a 99.9995% owned subsidiary of the Company and is principally engaged in management of Jiaxing Section of the Shanghai-Hangzhou Expressway. As disclosed in the Letter from the Board, after the Absorption and Merger, the accumulated tax losses generated by LongLiLiLong Co during the five years ended December 31 2020 (approximately RMB2,380 million) could be carried forward accordingly to offset the profits of LongLiLiLong Co in the subsequent years. We understand from the Company that, as stated in the Letter from the Board, the aforementioned tax losses may be used to offset the taxable profit of LongLiLiLong Co after the Absorption and Merger, subject to the relevant assessment and approval from the tax bureau. It is expected that the Absorption and Merger will enhance the tax efficiency of the Group as a whole.

The possible risk factors which may be faced by the Group in connection with LongLiLiLong Acquisition are as follows:

*Future profitability of LongLiLiLong Co*

After the completion of LongLiLiLong Acquisition, the result of LongLiLiLong Co will depend on a large extent whether the toll volume and toll revenue will maintain at the level estimated by the Traffic Study Expert as stated in the Traffic Study Reports in Appendix II of this Circular. Failure to achieve the estimated toll revenue of LongLiLiLong Expressways may reduce the profitability of LongLiLiLong Co and it may affect the Group's financial performance.

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## LETTER FROM INDEPENDENT FINANCIAL ADVISER

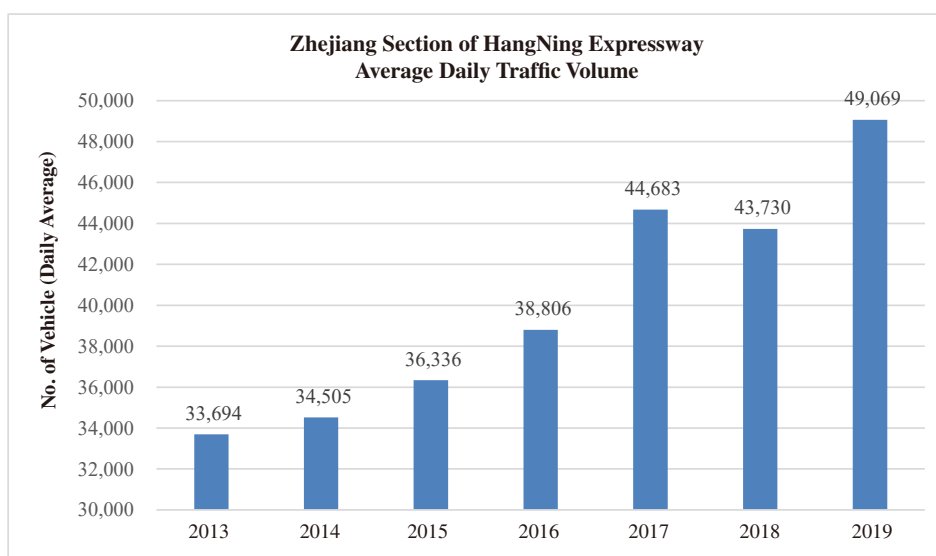
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### Uncertainties on securing additional funding for repayment of borrowings

During the two year ended 31 December 2019, the loss performance of LongLiLiLong Co is mainly caused by high interest expenses. Communications Group had made capital injection to LongLiLiLong Co in August 2020 for debt repayment, and therefore the interest-bearing loans substantially decreased from approximately RMB9,669 million as at 31 December 2019 to approximately RMB5,779 million as at 31 August 2020. However, LongLiLiLong Co may not be able to generate sufficient cash flows from its toll operation to fund its repayment obligations of the loans of RMB5,779 million during the period from 2021 to 2025. As such, LongLiLiLong Co may need additional funding through shareholder's loans or external financing. There is no assurance that the additional funding will be available on terms favourable to LongLiLiLong Co at this moment.

### 5. *Traffic volume and total revenue of Zhejiang Section of HangNing Expressway*

According to the Traffic Study Reports, the chart below summarizes the average daily traffic volume and annual toll revenue of Zhejiang Section of HangNing Expressway from 2013 to 2019.



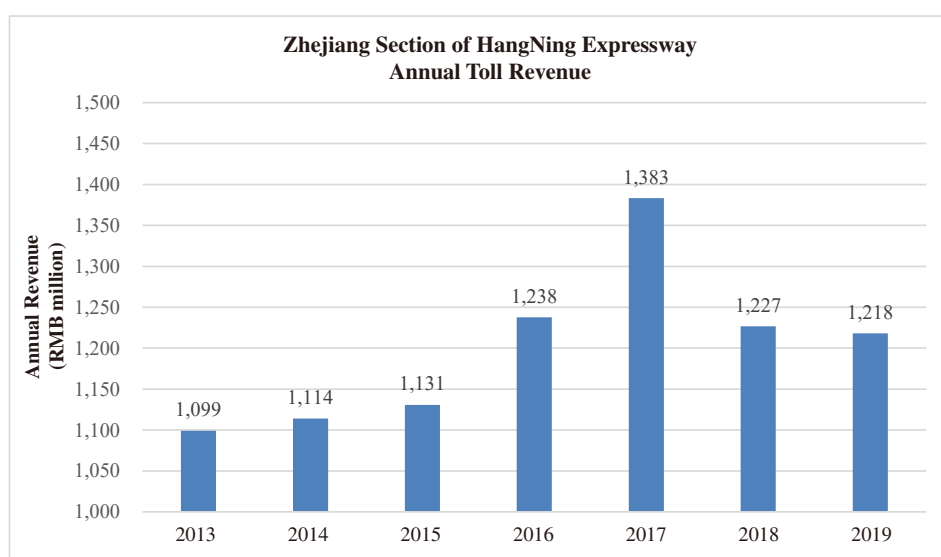
Source: Traffic Study Reports

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## LETTER FROM INDEPENDENT FINANCIAL ADVISER

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The average daily traffic volume from 2013 to 2019 maintained a growing trend at a CAGR of approximately 6.47%. The traffic volume kept growing from 2013 to 2017 and recorded a reduction of approximately 2.11% during the year 2018. The reduction is mainly attributable to expansion work (which expanded the expressway from four lanes to six lanes), leading to temporary suspension of traffic in certain part of Zhejiang Section of HangNing Expressway. The average daily traffic volume of 2019 increased to approximately 49,069 vehicles when the expansion work has been partially completed. The whole project of expansion work is expected to be completed by the end of 2020. Given that the estimated traffic capacity of Zhejiang Section of HangNing Expressway is 109,800 vehicles per day (based on the assumption that Zhejiang Section of HangNing Expressway has six lanes), indicating that Zhejiang Section of HangNing Expressway has room to take up more traffic flow.



*Source: Traffic Study Reports*

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## LETTER FROM INDEPENDENT FINANCIAL ADVISER

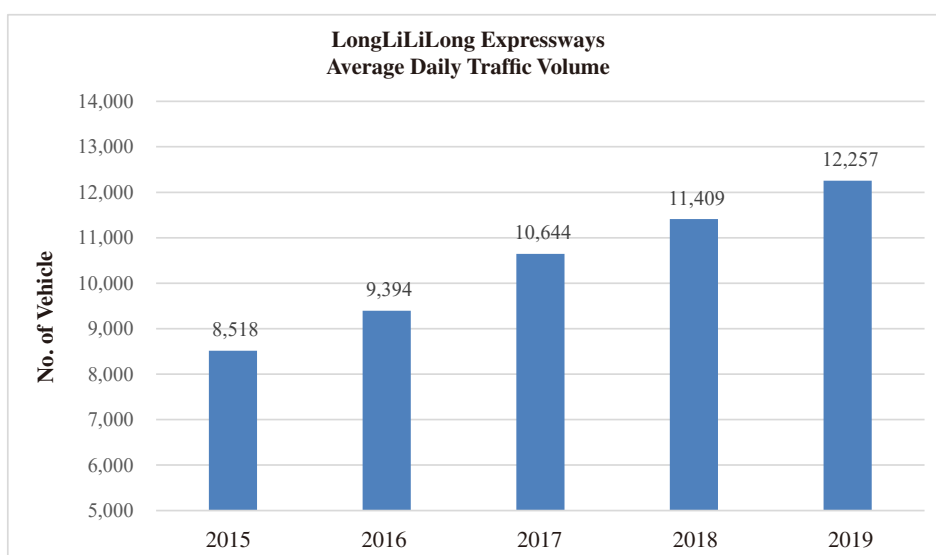
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The annual toll revenue (excluding value-added tax) increased from 2013 to 2017 but exhibited a decreasing trend since then, with CAGR of approximately 1.73% from 2013 to 2019. The revenue growth for the period from 2013 to 2017 was mainly driven by the increasing traffic volume, except for 2014, during which the daily average traffic volume slightly decreased by approximately 3.7%. As advised by the Traffic Study Expert, the expressway recorded rapid growth during 2017 to 2019 and recorded CAGR of approximately 10.6%,

The annual toll revenue gradually decreased to approximately RMB1,218 million in 2019, mainly attributable to the expressway expansion project which led to temporary closure of certain sections of Zhejiang Section of HangNing Expressway and limiting the entry of medium to large size of trucks using Zhejiang Section of HangNing Expressway.

### 6. *Traffic volume and toll revenue of LongLiLiLong Expressways*

According to the Traffic Study Reports, the two charts below summarize the average daily traffic volume and annual toll revenue of LongLiLiLong Expressways from 2015 to 2019.



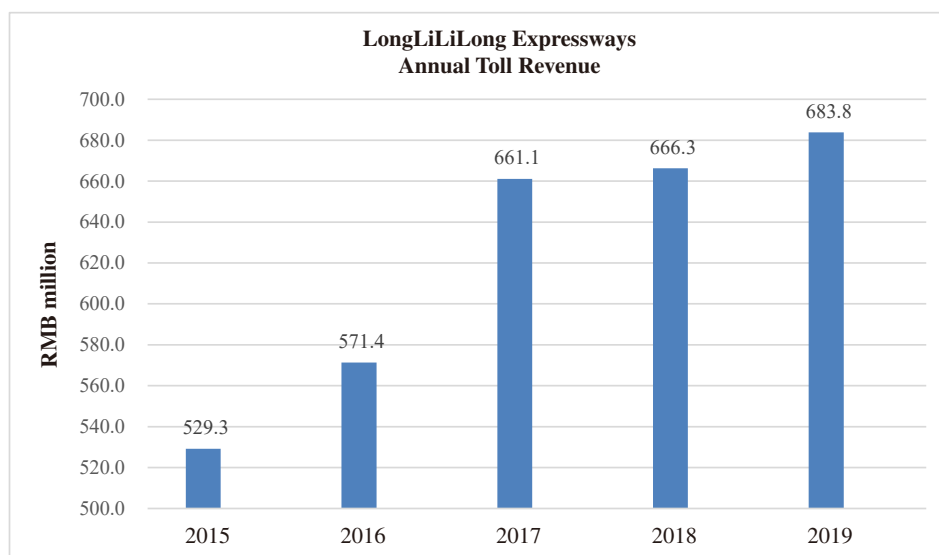
Source: Traffic Study Reports

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## LETTER FROM INDEPENDENT FINANCIAL ADVISER

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The average daily traffic volume from 2015 to 2019 maintained a steady growth with CAGR of approximately 9.52%. A year-on-year growth rate of 13.3% was recorded in 2017 due to the neighboring expressways underwent maintenance and more vehicles were directed to LongLiLiLong Expressways, and the strict control on speeding and over-loading of vehicles also increased the traffic volume in LongLiLiLong Expressways. Given that the expected traffic capacity of LongLiLiLong Expressways is approximately 53,200 vehicles per day, indicating that LongLiLiLong Expressways have room to take up more traffic flow.



*Source: Traffic Study Reports*

The annual toll revenue steadily increased from 2015 to 2019 with CAGR of approximately 6.6%. A year-on-year growth rate of 15.7% was recorded in 2017.

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## LETTER FROM INDEPENDENT FINANCIAL ADVISER

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### 7. *Economic and industry development of Zhejiang Province*

Zhejiang Section of HangNing Expressway and LongLiLiLong Expressways are located in Zhejiang Province. HangNing Expressway starts from the coastal city of Zhejiang Province and ends in Hangzhou. LongLiLiLong Expressways was located in the south-western area of Zhejiang Province.

The table below sets out the annual growth rate of the Real GDP and urbanization rate from 2015 to 2019 of the PRC, Zhejiang Province and the cities connected by the said expressways:

	2015	2016	2017	2018	2019
<b>Real GDP Growth Rate</b>					
– the PRC	6.9%	6.7%	6.9%	6.6%	6.1%
– Zhejiang Province	8%	7.5%	7.8%	7.1%	6.8%
major cities connected by Zhejiang Section of HangNing Expressway					
– Hangzhou	10.2%	9.5%	8.0%	6.7%	6.8%
– Huzhou	8.3%	7.5%	8.5%	8.1%	7.9%
major cities connected by LongLiLiLong Expressways					
– Lishui City	6.4%	7.1%	6.8%	8.2%	8.3%
– Quzhou City	6.6%	7.1%	7.3%	7.2%	6.7%
<b>Urbanization Rate (Note)</b>					
– the PRC	56.1%	57.4%	58.5%	59.6%	60.6%
– Zhejiang Province	65.8%	67.0%	68.0%	68.9%	70.0%
major cities connected by Zhejiang Section of HangNing Expressway					
– Hangzhou	75.3%	76.2%	76.8%	77.4%	78.5%
– Huzhou	59.2%	60.5%	62.0%	63.5%	N/A
major cities connected by LongLiLiLong Expressways					
– Lishui City	56.4%	58.0%	59.7%	61.5%	63.0%
– Quzhou City	50.2%	53.7%	55.7%	58.0%	60.0%

*Source: National Bureau of Statistics of China and Zhejiang Provincial Bureau of Statistics*

*Note:*

1. Urbanisation rate represents the percentage of urban population to total population.
2. N/A refers to the relevant information not available.

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## LETTER FROM INDEPENDENT FINANCIAL ADVISER

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According to the statistics from the National Bureau of Statistics of China, the real gross domestic product (“**Real GDP**”) in the PRC has been increasing at CAGR of approximately 8.4% between 2015 to 2019, while the Zhejiang Provincial Bureau of Statistics disclosed that the Real GDP in Zhejiang Province has been increasing at CAGR of 9.4%, exceeding the national growth rate, in the same period. Zhejiang Province is ranked fourth in term of Real GDP in the PRC in 2019. The economic growth of Zhejiang Province is mainly boosted by the digital and e-commerce industry there.

Hangzhou is the capital city of Zhejiang and is recognized as e-commerce hub in the China and many technologies companies set up their office and manufacturing bases in Hangzhou. During the period from 2015 to 2019, the real GDP growth rate of Hangzhou exceeds the national growth rate. Huzhou is located at the center of the Yangtze River Delta and the common hinterland of Shanghai, Hangzhou and Ningxia. Its real GDP ranked eighth in Zhejiang Province in 2019.

Compared to Hangzhou and Huzhou, Lishui City and Quzhou City are less developed cities. Their urbanization rates are lower than Hangzhou and Huzhou while their real GDP growth rates exhibited a growth trend during 2015 to 2019, indicating continued economic development in the cities. The real GDP growth in Lishui City from 2015 to 2019 recorded an increasing trend and the real GDP growth of Lishui City and Quzhou City in recent two years outperformed that of Zhejiang Province as a whole. The increasing urbanization rate and stable economic growth could drive economic development in these two cities.

As set out in the table above, Zhejiang Province outperformed the growth in the national GDP and Hangzhou is a top tier city in the PRC. On 26 September 2016, the Zhejiang Government published the “Thirteenth Five-Year” Plan on Comprehensive Traffic Transport Development of Zhejiang Province\* (《浙江省“十三五”綜合交通運輸發展規劃》) which outlined the development plan of Zhejiang Province’s transportation, followed by various construction projects for integrated transportation network, including proposed construction of highways with an estimated length of 1,000 kilometers and implementation of concept of “expressway sprawl for coverage of every county”\* (陸域縣縣通高速公路). In light of the above supportive government policies, it is expected that the transportation development plan in Zhejiang Province will boost up the traffic demand around the major cities covered by Zhejiang Section of HangNing Expressway, LongLiLiLong Expressways.

Taking into account of Zhejiang Province’s economic development in the past years and the initiatives in expanding and upgrading the transportation network by the Zhejiang Government, we concur with the Directors that the prospect of Zhejiang Province remains positive and it is beneficial for the Group to expand its expressway network in Zhejiang Province.



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## LETTER FROM INDEPENDENT FINANCIAL ADVISER

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8. *Reasons for and benefits of entering into HangNing Equity Purchase Agreement and LongLiLiLong Equity Purchase Agreement*

*Proven track record of HangNing Co*

HangNing Co. recorded net profit after tax of approximately RMB737 million, RMB720 million and RMB276 million during the two years ended 31 December 2019 and the eight months ended 31 August 2020, respectively. HangNing Co recorded net assets of RMB2,642 million as at 31 August 2020 with no interest-bearing leverage. HangNing Co is not only a profitable company without interest burden and it also generates remarkable cash flow from its operating activities of RMB788 million and RMB173 million, respectively during the two years ended 31 December 2019. As at 31 August 2020, HangNing Co had cash and cash equivalents of approximately RMB891 million. Moreover, during the years ended 31 December 2017 and 31 December 2019, HangNing Co declared and distributed dividend amounted to RMB1,480 million and RMB3,017 million to its shareholders, respectively. After the completion of HangNing Acquisition, the Company will share HangNing Co's profitability by using the equity method of accounting.

Furthermore, Zhejiang Section of HangNing Expressway is currently expanding from four lanes to six lanes and such expressway expansion is in the final stage of completion. The traffic capacity of Zhejiang Section of HangNing Expressway is estimated to further increase. According to the traffic study report of Zhejiang Section of HangNing Expressway, its toll revenue is expected to exhibit a CAGR of approximately 5.15% from 2021 to 2030, which is lower than the historical CAGR of average daily traffic volume of approximately 6.47% from 2013 to 2019.

Having considered the profitability, the stable and considerable cash flow from operating activities and the dividend distribution history of HangNing Co, the Directors consider that the Group's profitability will be enhanced through sharing HangNing Co's profit and derives additional cash inflow through the dividend distribution to be made by HangNing Co. In the long run, the Company may consider to further acquire more equity interests in HangNing Co when the appropriate opportunities arise.

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## LETTER FROM INDEPENDENT FINANCIAL ADVISER

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### Expansion to the southwest district in Zhejiang Province through LongLiLiLong Acquisition

LongLiLiLong Co is currently operating LongLiLiLong Expressways in the southwest region of Zhejiang Province linking Quzhou City and Lishui City, being two major areas in Zhejiang Province. Upon the completion of LongLiLiLong Acquisition, the LongLiLiLong Expressways enhance the Company toll road profile in the southwest region of Zhejiang Province. As discussed in the previous section, Lishui City and Quzhou City have experienced rapid development and therefore the vehicle flow in these areas is expected to increase.

After the completion of LongLiLiLong Acquisition, the Group will have direct control of eight expressways, covering a total network of approximately 1,024.2 kilometers. LongLiLiLong Expressways will assist the Group to expand its expressway profile to the southwest region of Zhejiang Province and strengthen the Company's leading position in the expressway network in Zhejiang Province.

According to the traffic study report of LongLiLiLong Expressways, its toll revenue is expected to maintain a growing trend from 2021 to 2030 with an estimated CAGR of approximately 6.0% (which is lower than the historical CAGR of toll revenue during 2015 to 2019). As advised by the Directors that there are no apparent factors that would negatively affect such growth trend and are confident that the toll revenue growth will maintain in the future.

### Cost-effective and time-saving approach to expand the expressway network

We discussed and understood from the management of the Group that the Group has considered organic growth through constructing new expressway, which is a lengthy process including but not limited to preliminary researching traffic flow, conducting feasibility study, obtaining various governmental approval, acquiring land, demolishing buildings, relocating local residents, recruiting construction companies, etc. On the other hand, the existing expressways have completed their construction and only require regular repair and maintenance, and the existing expressways have established their stable traffic flow. As compared with acquiring an existing expressway, building a new expressway is relatively more time-consuming and administratively burdensome. Therefore, the Directors regard that investing in HangNing Expressway and LongLiLiLong Expressways is a desirable way to strengthen the Group's competitiveness and enrich its expressways profile.

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## LETTER FROM INDEPENDENT FINANCIAL ADVISER

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### Positive market outlook with Government initiatives

As discussed in the previous section, Zhejiang Province is ranked fourth in term of Real GDP in the PRC in 2019. Hangzhou is a well-known city where headquarter offices of China's biggest tech giants locate. E-commerce is a core industry in Hangzhou. Huzhou, as located approximately 90km north of Hangzhou, also develops into an e-commerce and technology hub in China. Global summits and conferences in relation to technology have been held in Hangzhou and Huzhou, for example, 2016 G20 Hangzhou summit, 2019 6<sup>th</sup> World Internet Conference, 2020 World Young Scientists Summit and 2022 Hangzhou Asian Games. These international events held in the top-tier cities of Zhejiang Province attract lots of overseas visitors to Zhejiang Province and boost the economic and tourism activities in these areas. These cities require a reliable and convenient transportation network to facilitate the traffic between these cities and the traffic flow around the coastal area of Zhejiang Province is expected to exhibit a positive growth.

According to "Thirteenth Five-Year" Plan on Comprehensive Traffic Transport Development of Zhejiang Province, during the five years from 2016 to 2020, the Zhejiang Government planned to invest over RMB1,000 billion in the construction of the integrated transportation facilities in which more than RMB400 billion will be used for the road construction. It is expected that the total mileage of high-speed expressway will increase by 1,000 kilometers to 4,800 kilometers in 2020 and 80% of the expressways can be categorized as the second tier of national expressway. The Zhejiang Government will continue to accelerate the construction of expressways and further strengthen the interconnection of the expressways within Zhejiang Province. Given the provincial plan and the continuous improvement of the expressway facilities, the Directors are optimistic of the prospect of the toll road infrastructure in Zhejiang Province.

Regarding HangNing Acquisition, we have taken into consideration (i) HangNing Co is profitable and has a strong financial position without external borrowings; (ii) the growing trend of traffic volume and toll revenue of Zhejiang Section of HangNing Expressway since 2013; (iii) HangNing Expressway provides a comprehensive journey between two wealthy cities and complements the Company's existing network of expressways in Zhejiang Province; (iv) HangNing Acquisition is in-line with the business strategy of the Group to increase its investment in expressway within Zhejiang Province as discussed in the 2019 Annual Report, we concur with the Directors that HangNing Acquisition is in line with the Group's development strategy and is in the interest to the Company and its Shareholders.

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## LETTER FROM INDEPENDENT FINANCIAL ADVISER

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Regarding LongLiLiLong Acquisition, LongLiLiLong Co has been making loss during the two years ended 31 December 2019 and the eight months ended 31 August 2020 because of depreciation and interest expenses. As Communications Group made a capital injection of RMB4,100 million to LongLiLiLong Co in August 2020 for debt repayment, the leverage and interest burden of LongLiLiLong Co has been substantially reduced. Moreover, based on its traffic study report, the toll revenue of LongLiLiLong Co is expected to grow at CAGR of approximately 5.2% from 2021 to 2030. From a long run perspective, the Directors are of the view that LongLiLiLong Co's financial performance could be turned around based on the following assumptions:

1. toll revenue will increase from approximately RMB738 million in 2021 to approximately RMB1,021 million in 2026, representing CAGR of approximately 6.7% based on the estimated toll revenue shown in the Traffic Study Report;
2. costs will increase from approximately RMB763 million in 2021 to approximately RMB900 million in 2026 due to the estimation of annual growth rate for various direct costs within the range between 1% and 3%;
3. finance cost will decrease from approximately RMB236 million in 2021 to approximately RMB171 million in 2026 because the borrowings of LongLiLiLong Co will be reduced from approximately RMB5,616 million in 2021 to approximately RMB3,680 million in 2026;
4. an one-off impairment loss of approximately RMB655 million on its fixed assets has been made as at 31 August 2020.

LongLiLiLong Co's financial performance is hinged on interest expenses. The Directors expects LongLiLiLong Co to record a positive EBIT since and after 2021.

Although LongLiLiLong Acquisition will increase the financial burden of the Group, we understand that (i) LongLiLiLong Expressways have been well-established and no material capital expenditure for expressway expansion is required before the expiry of its toll collection rights; (ii) LongLiLiLong Acquisition helps the Group to expand its expressway business to the southwest region of Zhejiang Province; and (iii) LongLiLiLong Acquisition is in-line with the business strategy of the Group to focus on its principal business and strengthen its leading position in the expressway network in Zhejiang Province. Having considered the historical financial performance and long-term advantage of LongLiLiLong Acquisition, we concur with the Directors that there is a commercial justification for the Company to enter into the LongLiLiLong Equity Purchase Agreement.

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## LETTER FROM INDEPENDENT FINANCIAL ADVISER

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### II. HangNing Equity Purchase Agreement and the LongLiLiLong Equity Purchase Agreement

The major terms of HangNing Equity Purchase Agreement and LongLiLiLong Equity Purchase Agreement are summarized as below:

	<b>HangNing Equity Purchase Agreement</b>	<b>LongLiLiLong Equity Purchase Agreement</b>
Date of agreement	10 November 2020	10 November 2020
Assets to be acquired	30% equity interest in HangNing Co	the entire equity interest in LongLiLiLong Co
Consideration	RMB2,685,000,000	RMB238,140,000
Consideration adjustment	(i) In the event that the actual toll collection rights period of the above expressways is less than 30 years, the Company and the Communications Group agreed to enter into a supplemental agreement to adjust downward the consideration with reference to re-valuation of HangNing Co as at such time;	(i) In the event that the toll collection rights period of the above mentioned expressways as finally approved is less than 25 years, or the actual toll collection rights period of the above mentioned expressways is less than 25 years, the Company and the Communications Group agreed to enter into a supplemental agreement to adjust downwards the consideration with reference to re-valuation of LongLiLiLong Co as at such time.

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## LETTER FROM INDEPENDENT FINANCIAL ADVISER

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### HangNing Equity Purchase Agreement

### LongLiLiLong Equity Purchase Agreement

(ii)	In the event that HangNing Co has paid for, in connection to events that occurred prior to 31 August 2020, (i) any tax, late payment or penalty as determined by competent authorities in relation to HangNing Expressway; (ii) any amount payable for projects or constructions after the completion of Qingshan Service Area of HangNing Expressway; (iii) any land transfer fee or tax payable for the transfer of any property or land owned by HangNing Expressway; and (iv) any material indebtedness incurred prior to 31 August 2020 which however was not included in the HangNing Valuation Report, Communications Group shall compensate the Company with an amount of 30% of the payment made by HangNing Co within 30 days of HangNing Co's payment.	(ii)	The Company and the Communications Group agreed to enter into a supplemental agreement to adjust upwards the consideration in the event that the Toll Free Period is extended as confirmed by the relevant competent authorities.
		(iii)	In the event that the relevant competent authorities decide to compensate LongLiLiLong Co in cash for the Toll Free Period, the Company and Communications Group agreed to enter into a supplemental agreement to adjust upwards the consideration accordingly.
Payment terms	The consideration will be payable by the Company in cash within five business days after the effective date of the HangNing Equity Purchase Agreement.	The consideration will be funded by the Company's internal resources.	The consideration will be payable by the Company in cash within five business days after the effective date of the LongLiLiLong Equity Purchase Agreement.
	The consideration will be funded by the Company's internal resources.	The consideration will be funded by the Company's internal resources.	
Completion	Within 20 business days from the effective date of the relevant agreement, the parties shall cooperate to apply with the relevant government authorities to alter the registration for industrial and commercial administration for the Completion.		

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## LETTER FROM INDEPENDENT FINANCIAL ADVISER

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For further details of the terms of HangNing Equity Purchase Agreement and LongLiLiLong Equity Purchase Agreement, please refer to the Letter from the Board.

### HangNing Equity Purchase Agreement

The consideration of RMB2,685,000,000 (the “**HangNing Consideration**”) under the HangNing Equity Purchase Agreement was determined based on arm’s length negotiations between the Company and Communications Group. A number of factors were considered by the parties when determining the consideration, including, among others (i) the HangNing Valuation Report prepared by Cushman & Wakefield (the “**C&W**”); (ii) the toll collection rights period of Wangjiabang to Qingshan Section of HangNing Expressway Phase I has been tentatively fixed at 30 years from 27 December 2000 to 26 December 2030; and (iii) the toll collection rights period of Hangzhou to Qingshan Section and Wangjiabang to Fuziling Section of HangNing Expressway Phase II has been tentatively fixed at 30 years from 28 November 2002 to 27 November 2032.

HangNing Consideration is equal to the 30% of value of HangNing Co appraised by C&W as at 31 August 2020. In addition, HangNing Consideration represents a premium to the net asset value of HangNing Co as at 31 August 2020. However, the net asset value of HangNing Co is reflecting financial position of HangNing Co but had not reflected its financial results and business prospects after the completion of HangNing Acquisition, especially (i) the revenue growth of HangNing Co when the lanes are expanded from four to six; (ii) the substantial cash inflow from the toll operation; and (iii) the future dividend payout by HangNing Co. On the basis that (i) the Consideration is equal to the value of HangNing Co as at 31 August 2020 appraised by C&W; (ii) as a protective clause to the Company, the Consideration is subject to downward adjustment if the relevant expiry date of toll collection rights is earlier than 26 December 2030 and/or 27 November 2032; and (iii) Communications Group will compensate for the Company with an amount of 30% of the payment made by HangNing Co in relation to those specific items listed in HangNing Equity Purchase Agreement, we consider that HangNing Consideration (subject to adjustment) is fairly and reasonably determined.

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## LETTER FROM INDEPENDENT FINANCIAL ADVISER

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### LongLiLiLong Equity Purchase Agreement

The consideration of RMB238,140,000 (the “**LongLiLiLong Consideration**”) under the LongLiLiLong Equity Purchase Agreement was determined based on arm’s length negotiations between the Company and Communications Group. A number of factors were considered by the parties, including, among others, (i) the LongLiLiLong Valuation Report prepared by Jones Lang LaSalle (the “**JLL**”), as well as the LongLiLiLong PRC Valuation Report (which was commissioned by Communications Group) prepared by the PRC Domestic Valuer pursuant to the requirements of Zhejiang SASAC and relevant PRC laws and regulations; (ii) the toll collection rights period of Liandu Section of LiLong Expressway being assumed to be 25 years from 25 December 2007 to 24 December 2032; and (iii) the toll collection rights period of the LongLiLiLong Expressways other than Liandu Section being assumed to be 25 years from 31 December 2006 to 30 December 2031.

The LongLiLiLong Consideration represents a slight discount of 0.4% or RMB860,000 to the value of LongLiLiLong Co appraised by JLL as at 31 August 2020. Compared to the adjusted net asset value as at 31 August 2020, the LongLiLiLong Consideration represents a premium of approximately 5.6% or RMB12.6 million. We consider that such slight premium is justified on the basis that (i) the toll revenue of LongLiLiLong Expressways is expected to maintain a growing trend from 2021 to 2030 with an estimated CAGR of approximately 6.0%; (ii) the Directors estimate that LongLiLiLong Co’s financial performance could be turned around in the long run; and (iii) LongLiLiLong Co can generate positive EBITDA from its toll operation in future. Having considered that (i) the Consideration represents a slight discount to the value of LongLiLiLong Co as at 31 August 2020 appraised by JLL; (ii) as a protective clause, the Consideration is subject to a downward adjustment if the relevant toll collection rights expire earlier than 30 December 2031 and/or 24 December 2032, respectively; and (iii) the Communications Group made a substantial capital injection of RMB4,100 million in August 2020 to LongLiLiLong Co for debt repayment, we consider that LongLiLiLong Consideration (subject to adjustment) is fairly and reasonably determined.

LongLiLiLong Consideration and HangNing Consideration in aggregate of approximately RMB2,923 million will be financed by the Company’s internal resources. With reference to the third quarter result announcement of the Company dated 30 October 2020, the Group has cash and cash equivalents of approximately RMB9,640 million as at 30 September 2020. The Group’s cash resource is sufficient to finance the full payment of LongLiLiLong Consideration and HangNing Consideration.



### **III. Traffic Study Reports**

#### ***1. Competence of the Traffic Study Expert***

In order to assess the expertise and independence of the Traffic Study Expert, we have (i) reviewed the engagement letter between the Traffic Study Expert and the Company for the engagements of the traffic study of Zhejiang Section of HangNing Expressway and LongLiLiLong Expressways; (ii) conducted a phone interview with the core team members of the Traffic Study Expert for the two traffic study reports of HangNing Expressway and LongLiLiLong Expressways, in order to understand its experience and its relationship with the Company and the projection methodology; and (iii) discussed with the Traffic Study Expert about its previous experiences on traffic consulting projects.

We understand that (a) WB Group Consulting (Shenzhen) Limited (the “**Traffic Study Expert**”) is an experienced consultant in the traffic study for the PRC’s infrastructure and has been participated in acquisition of expressway projects of Hong Kong-listed companies; (b) the Traffic Study Expert has confirmed that it is an independent third party of the Company, Communication Group, HangNing Co and LongLiLiLong Co, and their connected persons; and (c) the scope of work of this engagement is appropriate and suitable for the preparation of the Traffic Study Reports. As such, we are not aware of any matters that could cause us to have doubts on the expertise and independence of the Traffic Study Expert.

#### ***2. Methodologies and assumptions***

We have reviewed and discussed with the Traffic Study Expert about Traffic Study Reports on the bases, assumptions and methodologies adopted to estimate the traffic volume and toll revenue of Zhejiang Section of HangNing Expressway for the period from September 2020 to November 2032 and that of LongLiLiLong Expressways for the period from September 2020 to December 2032. We note that the Traffic Study Expert has (i) collected economic data of Zhejiang Province and researched the future, development plan in Zhejiang Province; (ii) obtained historical traffic data (for example, traffic volume, types of vehicles, toll revenue) of HangNing Expressway and LongLiLiLong Expressways; (iii) analyzed the data in (i) and (ii) above; (iv) built a traffic model to estimate the traffic volume and toll revenue of the HangNing Expressway and LongLiLiLong Expressways; and (v) performed sensitivity analysis on the traffic volume and toll revenue under optimistic scenario, conservative scenario and extension of toll collection period for 79 days.

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## LETTER FROM INDEPENDENT FINANCIAL ADVISER

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In estimating the traffic volume and toll revenue of the HangNing Expressway and LongLiLiLong Expressways, we note that the Traffic Study Expert has considered (i) the existing travel patterns; (ii) the historical traffic data for the period from 2013 to 2019 for HangNing Expressway and 2015 to 2019 for LongLiLiLong Expressways; (iii) the toll fare of each type of vehicle is based on the official toll fare issued by the Zhejiang Government on 30 December 2019; and (iv) the future development of the surrounding transportation network. In addition, we understand from the Traffic Study Expert that they have also considered the potential competition factors and government toll policies in the traffic projection of the HangNing Expressway and LongLiLiLong Expressways. As stated in the Traffic Study Reports, the Traffic Study Expert adopted the generalized cost approach in determining users' route choice behaviors, which are affected by travel time, travel distance and costs. In addition, the upcoming road extension from four lanes to six lanes of HangNing Expressway is also considered in the traffic model.

On this basis, nothing has come to our attention that will cause us to doubt the reasonableness of the Traffic Study Reports prepared by the Traffic Study Expert. The Traffic Study Expert has advised that the underlying assumptions and the forecast procedures adopted in the Traffic Study Reports are commonly used in its previous relevant traffic projects in the PRC.

Based on our phone interview with the Traffic Study Expert and our review of Traffic Study Reports, we have not identified any major issues that would cause us to doubt the fairness and reasonableness of the bases, assumptions, and methodologies applied in the Traffic Study Reports. As such, we are of the opinion that the Traffic Study Reports provide a fair and reasonable basis for the preparation of the relevant valuation report.

#### **IV. Valuation Report**

C&W been engaged by the Company to assess the value of 30% equity interest of HangNing Co. (details of which are set out in the Appendix I to the Circular). According to the HangNing Valuation Report, the 30% equity interest of HangNing Co as at 31 August 2020 estimated by C&W was RMB2,685,000,000.

JLL has been engaged by the Company to assess the value of 100% equity interest of LongLiLiLong Co. (details of which are set out in the Appendix I to the Circular). According to the LongLiLiLong Valuation Report, the 100% equity interest of LongLiLiLong Co as at 31 August 2020 estimated by JLL was RMB239,000,000.

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## LETTER FROM INDEPENDENT FINANCIAL ADVISER

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### *1. Competence of the independent valuers*

We have reviewed and enquired the qualification and experience of C&W and JLL. We have (i) reviewed their respective engagement letter (including their scope of work); (ii) reviewed and phone-interviewed the qualification of C&W and JLL including its previous experience in conducting business valuation; (iii) enquired the current or previous working relationship between C&W, JLL, the Company, Communications Group and the respective connected persons. We understood that C&W and JLL are internationally-established valuation firm with solid experience in conducting business valuation. They have participated in other valuation projects of companies listed in Hong Kong and the PRC. We also confirmed with C&W and JLL that they are independent third parties of the Company, Communications Group and their respective connected persons. Moreover, we have reviewed their engagement letters and noted that the scope of work for the valuation is suitable for HangNing Acquisition and LongLiLiLong Acquisition. Furthermore, the valuation of HangNing Acquisition is led by Mr. Philip C Y Tsang and Mr. Bruce Oong. Both of them are qualified members of different surveyor institutions and possesses over 10 years' experience in the valuation sector. The team members are also qualified valuers and the teams have relevant experience in conducting valuation for toll road projects. The valuation of the LongLiLiLong Acquisition is led by Mr. Simon Chan who is a fellow member of HKICPA and qualified member of different surveyor institutions and possesses over 20 years' experience in the valuation sector. The team members are also qualified valuers and the team has relevant experience in conducting valuation for toll road projects.

Therefore, we consider that C&W and JLL are qualified and possesses sufficient relevant experience in performing the valuation of HangNing Co and LongLiLiLong Co.

### *2. Methodologies and assumptions*

We understood that C&W and JLL have considered three generally adopted valuation approaches, which are income approach, market approach and cost approach (asset-based approach) in performing the valuation of HangNing Co and LongLiLiLong Co.

The income approach is commonly adopted in the business valuation for valuation subject with supportable operating profit and cash flow forecast such as expressway company. Based on our discussion with C&W and JLL that the valuation of HangNing Co and LongLiLiLong Co is derived from the discounted cash flow forecast for the period between September 2020 and December 2032. The discounted cash flow forecasts were reviewed and confirmed by the Directors and the reporting accountants of the Company (the "**Reporting Accountants**"). The comfort letter on profit forecast of HangNing Co and LongLiLiLong Co issued by the Reporting Accountants is set out in Appendix III of this Circular. Given that (i) the profit forecast of HangNing Co and LongLiLiLong Co are made reference with the audited financial result for the year ended 31 December 2019; (ii) the discounted cash flow forecast could be reasonably estimated and has been reviewed by the Reporting Accountants; and (iii) the toll revenue is supported by the Traffic Study Reports, both C&W and JLL consider that income approach is the appropriate methodology for the valuation of HangNing Co and LongLiLiLong Co. We also discussed with C&W and JLL about the market approach and the cost approach in valuation of HangNing Co and LongLiLiLong Co. C&W and JLL advised that there are limited appropriate market transactions which are either

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## LETTER FROM INDEPENDENT FINANCIAL ADVISER

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similar or comparable to HangNing Co and LongLiLiLong Co and each of these comparable transactions has their own location characteristics, traffic characteristics, concession terms, operating environment, cost structure and ongoing maintenance schedule. The cost approach, which is a method of replacing the historical costs of the assets and liabilities shown in the statements of the financial position of HangNing Co and LongLiLiLong Co, primarily involves the assessment of assets and liabilities to appraise the business value of the valuation subject. However, the cost approach does not take into consideration of traffic demand, traffic volume, toll revenue and future development of expressway. Having considered the limitations of market approach and cost approach, both C&W and JLL are of the view that the market approach and cost approach may not result in a fair estimate of the business value of HangNing Co and LongLiLiLong Co and therefore C&W and JLL apply the income approach in the business valuation of HangNing Co and LongLiLiLong Co.

We have reviewed and discussed with C&W and JLL in respect of the assumptions applied in the valuation. Details of the valuation assumptions are set out in the Appendix I of this Circular.

Based on our discussion with C&W and our review of the profit and cash flow forecast of HangNing Co for the period between September 2020 and December 2032, we understand that (i) the projected annual revenue of HangNing Co is directly derived from the annual toll revenue estimated by the Traffic Study Expert (excluding 3% value-added tax); (ii) the projected operating cost of HangNing Co is primarily based on the historical costs and the current accounting policies of HangNing Co; (iii) the projected capital expenditure for HangNing Co. has taken into account of the current road expansion project with an estimated project cost of RMB2,554 million in which RMB1,553 million has been paid and the remaining amount will be paid in the two years ending 31 December 2022; (iv) the project capital expenditure also considered two large-scale maintenance and repair projects to be conducted during the two years ending 31 December 2025 and 2030; and (v) the projected working capital is mainly made reference to the historical working capital for maintaining the operation of HangNing Co. Regarding the above assumptions used in the profit and cash flow forecast, we (i) have cross-checked and compared the forecasted toll revenue (excluding 3% value-added tax) used in the valuation and the traffic study of Zhejiang Section of HangNing Expressway and no variance is noted; (ii) compared the projected operating cost against the historical operating cost for the year ended 31 December 2019 and noted that the growth of projected figures are mainly driven by the growth in toll revenue or made reference to the historical growth rate of respective items; (iii) reviewed the estimation basis of the capital expenditure; and (iv) discussed with the management of the Company for the future development of HangNing Co and the relevant financial impact to the profit and working capital forecast.

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## LETTER FROM INDEPENDENT FINANCIAL ADVISER

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Based on our discussion with JLL and our review of the profit and cash flow forecast of LongLiLiLong Co for the period between September 2020 and December 2032, we understand that (i) the projected annual revenue of LongLiLiLong Co is directly derived from the annual toll revenue estimated by the Traffic Study Expert (excluding 3% value-added tax); (ii) the projected operating cost of LongLiLiLong Co is primarily based on the historical costs and the current accounting policies of LongLiLiLong Co; (iii) the existing borrowings of RMB5,779 million will be gradually repaid in full in 2025; (iv) LongLiLiLong Co will obtain additional financing from the related financing company of the Communications Group with an estimated interest rate of 4.34% which is with reference to the current loan interest rate of LongLiLiLong Co for repaying the outstanding principals of loans; (v) large-scale ETC and surveillance system upgrade projects have been carrying out in 2020 and a large-scale maintenance and repair work will be performed during the years ending 31 December 2024, 2025 and 2026 to fulfil the requirements for upgrade of expressway class from National Tier 2 expressway to National Tier 1 expressway; and (vi) the projected working capital is mainly made reference to the historical working capital for maintaining the operation of LongLiLiLong Co. Regarding the above assumptions used in the profit and cash flow forecast, we (i) have cross-checked and compared the forecasted toll revenue (excluding 3% value-added tax) used in the valuation and its traffic study report and no variance is noted; (ii) compared the projected operating cost against the historical operating cost for the year ended 31 December 2019 and noted that the growth of projected figures are mainly driven by the growth in toll revenue or made reference to the historical growth rate of respective items; (iii) the loan repayment and loan drawdown timetable; and (iv) discussed with the management of the Company for the future development of LongLiLiLong Co and the relevant financial impact to the profit and working capital forecast.

C&W assumed that HangNing Expressway is entitled to 30 years toll collection rights until November 2032 and JLL assumed that LongLiLiLong Expressways is entitled to 25 years toll collection rights until December 2032. C&W and JLL advised that they have taken into consideration (i) the relationship of HangNing Co and LongLiLiLong Co with the local government; (ii) the Company will apply for the formal approval from the relevant government department; and (iii) the operation of HangNing Expressway and LongLiLiLong Expressways were conducted with full knowledge of the local government. Therefore, C&W and JLL conducted the valuation under an assumption that the toll collection rights of both expressways are valid until 2032.

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## LETTER FROM INDEPENDENT FINANCIAL ADVISER

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We understand from C&W and JLL that the valuations of HangNing Co and LongLiLiLong Co are based on the discounted cash flow forecast of HangNing Co and LongLiLiLong Co for the period between September 2020 and December 2032. Even though HangNing Co and LongLiLiLong Co are engaged in the same industry, they have different characteristics, for instance, debt structure, financial position, and different discount rates for these two companies are resulted. The discount rate of 9.5% for HangNing Co is derived by C&W through the Capital Asset Pricing Model (“**the CAPM Model**”), by utilizing on risk-free rate of return in the USA, market risk premium, country risk premium and company specific risk premium, with adjustment to discount for lack of marketability. On the other hand, the discount rate of 10.13% for LongLiLiLong Co is derived by JLL through the CAPM Model, by utilizing risk-free rate of return in Hong Kong, market risk premium, country risk premium and liquidity risk premium. In arriving at the beta being adopted in the CAPM Model, both of the valuers adopted the same eight companies which are primarily engaged in toll road operation in the PRC and listed on the Stock Exchange. We have further reviewed the background of these comparable companies and noted that the core businesses of these comparable companies are in same industry as HangNing Co and LongLiLiLong Co; and 50% or more of revenue is derived from expressway operation in the PRC, we are of the view that these comparable companies are fair and representative samples.

C&W and JLL also advised that the general assumptions used in the valuation of HangNing Co and LongLiLiLong Co including but not limited to no material change in the existing political, economic, social, legal, tax conditions where the business is currently in operation are common assumptions adopted in various business valuation projects.

With reference to the comfort letter included in Appendix III in this Circular, we understand that the Reporting Accountants has checked the arithmetical accuracy of the calculations of the discounted cash flow forecast and concluded that the discounted cash flow forecast have been properly compiled in all material respects in accordance with the bases and assumptions adopted by the Directors, who are solely responsible for the discounted cash flow forecast.

Taking into account (i) C&W and JLL are independent from the Company and have relevant experience in conducting the valuation similar to that of HangNing Co and LongLiLiLong Co; (ii) the reasonableness of the bases and assumptions adopted in the valuation of HangNing Co and LongLiLiLong Co; (iii) the key assumptions adopted in the forecast from September 2020 and December 2032 of HangNing Co and LongLiLiLong Co are fair and reasonable; (iv) the Directors have discussed and reviewed the assumptions adopted in the HangNing Valuation Report and LongLiLiLong Valuation Report; and (v) the forecast of HangNing Co and LongLiLiLong Co have been reviewed by the Reporting Accountants; we consider that the valuation methodologies behind the HangNing Consideration and LongLiLiLong Consideration are fair and reasonable.

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## LETTER FROM INDEPENDENT FINANCIAL ADVISER

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### V. Financial effect of the HangNing Acquisition and LongLiLiLong Acquisition on the Group

#### 1. *Accounting effects upon the completion of HangNing Acquisition and LongLiLiLong Acquisition*

Upon the completion of HangNing Acquisition, HangNing Co will be owned as to 30% by the Company and accounted for as an associate of the Group. The results of HangNing Co will be incorporated in the Group's consolidated financial statements based on the equity method of accounting.

Upon completion of LongLiLiLong Acquisition, LongLiLiLong Co will become a wholly owned subsidiary of the Company, the financial results of the LongLiLiLong Co will be consolidated in the Group's financial statements.

#### 2. *Earnings*

Having considered the net profit attributed to the shareholders of the Company for the year ended 31 December 2019 amounted to approximately RMB3,711 million. According to the audited financial statement of LongLiLiLong Co, LongLiLiLong Co recorded net loss after tax of approximately RMB466 million for FY2019. After the completion of LongLiLiLong Acquisition, the result of the Group will be affected by the loss-making result of LongLiLiLong Co..

Considering the profit-making performance of HangNing Co for the two years ended 31 December 2019 and the eight months ended 31 August 2020, we concur with the Directors that the HangNing Co is expected to have a positive impact on the Group's financial performance after the completion of HangNing Acquisition.

#### 3. *Bank balance and cash*

As set out in the Letter from the Board, HangNing Consideration and LongLiLiLong Consideration in aggregate of approximately RMB2,923 million will be settled by cash from the Company's internal resources.

With reference to the third quarter result announcement of the Company dated 30 October 2020, the Group has cash and cash equivalents of approximately RMB9,640 million as at 30 September 2020, which is sufficient for settlement of HangNing Consideration and LongLiLiLong Consideration.

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## LETTER FROM INDEPENDENT FINANCIAL ADVISER

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#### 4. *Net asset value*

According to the third quarter result announcement of the Company dated 30 October 2020, the Group recorded consolidated net asset value (excluding non-controlling interests) of the Group was approximately RMB23,264 million.

HangNing Consideration is equal to the market value of the 30% equity interest of HangNing Co as at 31 August 2020. It is expected that HangNing Acquisition would not have material impact on the net asset value of the Group upon the completion of HangNing Acquisition,

Upon completion of LongLiLiLong Acquisition, LongLiLiLong Co will be consolidated with the Company's financial statement. As LongLiLiLong Consideration is slightly higher than the net asset value of LongLiLiLong Co as at 31 August 2020 by approximately 5.6% or RMB12.6 million, it is expected that LongLiLiLong Acquisition would not have material impact on the net asset value of the Group upon the completion of LongLiLiLong Acquisition.

It should be noted that the aforementioned analyses are for illustrative purposes only and do not purport to represent how the financial position of the Group will be upon completion of HangNing Acquisition and LongLiLiLong Acquisition.

#### **Recommendations**

##### LongLiLiLong Acquisition

Apart from the possible risk factors associated with LongLiLiLong Acquisition, we understand that the merits of LongLiLiLong Acquisition is heavily dependent on the following future events, including but not limited to

- i. Toll revenue of LongLiLiLong Co maintains at the level as stated in the Traffic Study Reports in Appendix II of this Circular;
- ii. LongLiLiLong Co is able to reduce its interest burden and implement tight cost control on its operation;
- iii. LongLiLiLong Co could obtain continuing support from the Communications Group to refinance existing bank loans after the completion of LongLiLiLong Acquisition; and
- iv. LongLiLiLong Co's financial performance could be turn around as per forecast.



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## LETTER FROM INDEPENDENT FINANCIAL ADVISER

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However, taking into account of wider perspective and in particular:

- i. after a capital injection of RMB4,100 million, the interest-bearing borrowings have been substantially decreased to approximately RMB5,779 million as at 31 August 2020. The leverage level and the interest burden of LongLiLiLong Co will be considerably reduced after the completion of LongLiLiLong Acquisition;
- ii. based on the forecast, EBITDA of LongLiLiLong Co is sufficient to cover the estimated interest expenses, implying that the cash inflow generated from the expressway operation is sufficient for the payment of interest expenses;
- iii. LongLiLiLong Acquisition could expand the Company's presence in the southwest region of Zhejiang Province; and
- iv. LongLiLiLong Consideration is determined with reference to LongLiLiLong Valuation Report,

from an aggressive approach of putting more weight on the long-run commercial benefit derived from LongLiLiLong Acquisition, we concur with the Directors that the long run commercial benefits derived from LongLiLiLong Acquisition out-weigh the negative impacts to be brought by LongLiLiLong Co to the Group.

The Independent Shareholders are reminded that the financial performance of LongLiLiLong Co will be heavily dependent on the occurrence of a series of future events as discussed above which are uncertain at this stage. Nevertheless, taking into account of the above, we are of the opinion that (i) the terms of LongLiLiLong Equity Purchase Agreement are fair and reasonable so far as the Independent Shareholders are concerned; (ii) the transactions contemplated thereunder are on normal commercial terms and in the ordinary and usual course of business of the Group; and (iii) the entering into LongLiLiLong Equity Purchase Agreement is in the interests of the Company and the Shareholders as a whole. Therefore, we recommend the Independent Board Committee to advise the Independent Shareholders, and we recommend the Independent Shareholders, to vote in favour of the relevant ordinary resolution to be proposed at the EGM to approve the LongLiLiLong Equity Purchase Agreement and the transactions contemplated thereunder.

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## LETTER FROM INDEPENDENT FINANCIAL ADVISER

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### HangNing Acquisition

Having considered the principal factors and reasons as discussed above, and in particular the following:

- i. HangNing Co is profit-making in the past three years with a track record of dividend pay-out in FY2017 and FY2019;
- ii. the continuous growth of traffic volume and toll revenue of HangNing Expressway in the past five years from 2015 to 2019, and HangNing Co is expected to maintain its performance given the future growth of traffic volume and toll revenue as stated in the Traffic Study Reports in Appendix II of this Circular;
- iii. HangNing Acquisition is in line with the Group's business strategy to enhance its market position in Zhejiang Province; and
- iv. HangNing Consideration is determined with reference to HangNing Valuation Report,

we are of the opinion that (i) the terms of HangNing Equity Purchase Agreement are fair and reasonable so far as the Independent Shareholders are concerned; (ii) the transactions contemplated thereunder are on normal commercial terms and in the ordinary and usual course of business of the Group; and (iii) the entering into HangNing Equity Purchase Agreement is in the interests of the Company and the Shareholders as a whole. Therefore, we recommend the Independent Board Committee to advise the Independent Shareholders, and we recommend the Independent Shareholders, to vote in favour of the relevant ordinary resolution to be proposed at the EGM to approve the HangNing Equity Purchase Agreement and the transactions contemplated thereunder.

Yours faithfully,  
For and on behalf of  
**Octal Capital Limited**

**Alan Fung**                      **Wong Wai Leung**  
*Managing Director*              *Executive Director*

*Note:* Mr. Alan Fung has been a responsible officer of Type 1 (dealing in securities) and Type 6 (advising on corporate finance) regulated activities since 2003. Mr. Fung has more than 28 years of experience in corporate finance and investment banking and has participated in and completed various advisory transactions in respect of mergers and acquisitions, connected transactions and transactions subject to the compliance to the Takeovers Code of listed companies in Hong Kong. Mr. Wong Wai Leung has been a responsible officer of Type 1 (dealing in securities), Type 6 (advising on corporate finance) regulated activities since 2008 and is also a responsible officer Type 9 (asset management) regulated activities. Mr. Wong has more than 20 years of experience in corporate finance and investment banking and has participated in and completed various advisory transactions of listed companies in Hong Kong in respect of the Takeovers Code.



## Valuation Report

Zhejiang Expressway Co., Ltd.

The fair value of 30 percent equity interest in  
Zhejiang Hangning Expressway Co., Ltd. (“HangNing”)

Valuation as at 31 August 2020

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Valuation Report No. F20-003101-02  
PT/pcy



16/F Jardine House  
1 Connaught Place  
Central  
Hong Kong

19 November 2020

The Board of Directors  
Zhejiang Expressway Co., Ltd.  
12th Floor, Block A  
Dragon Century Plaza  
1 Hangda Road Hangzhou  
China 33007

Dear Sirs,

**Re: The fair value of 30 percent equity interest in Zhejiang Hangning Expressway Co., Ltd.**

#### **Instructions, Purpose & Date of Valuation**

In accordance with the instructions from Zhejiang Expressway Co., Ltd. (the “Company”) to us to conduct a valuation of the fair value of 30 percent equity interest in Zhejiang Hangning Expressway Co., Ltd. (“HangNing”), we are pleased to report that we have made relevant enquiries and obtained necessary information for the purpose of providing you with our fair value estimate of 30 percent equity interest in Zhejiang Hangning Expressway Co., Ltd. as at 31 August 2020 (the “Measurement Date”).

The purpose of this valuation is to provide a reference for share acquisition.

#### **Definition of Fair Value**

Our valuation was carried out on a fair value basis. Fair value is defined as “the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date.”

#### **Method of Valuation**

In arriving at our assessed value for the equity interest, we have considered three generally accepted approaches, namely, market approach, cost approach and income approach. The selection of a valuation approach is based on, among others, the quantity and quality of information provided, access to available data, availability of relevant market transactions, type and nature of subject assets, purpose and objective of the valuation and professional judgment and technical expertise. Among the three approaches, we consider that the Income Approach is more appropriate for this valuation.



### Source of Information

We have relied to a considerable extent on information provided by the management of the Company (the "Management") in arriving at our opinion of value. We are not in the position to verify the accuracy of all information provided to us. However, we have had no reason to doubt the truth and accuracy of the information provided to us and to doubt that any material facts have been omitted from the information provided. No responsibilities for the operation and financial information that have not been provided to us are accepted.

Our valuation relied on the assumption that financial forecast in respect of HangNing provided by the Management is reasonable, reflecting market conditions and economic fundamentals, and will be materialized. We did not independently investigate or otherwise verify whether the financial forecast can be achieved and do not express an opinion or offer any form of assurance on it.

Our opinion of the fair value was derived from generally accepted valuation procedures and practices that rely substantially on the use of various assumptions and the consideration of many uncertainties, not all of which can be easily quantified or ascertained. In the implementation of the valuation, we adhere to the principles of independence, objectivity and fairness. According to the information we collected during the practice, the contents of the valuation report are objective. We assume corresponding legal responsibility for the reasonableness of the valuation conclusions, whereas the evaluation conclusion should not be regarded as the guarantee for the valuation object's achievable price.

Based on the results of our investigation and analysis outlined in the report which follows, we are of the opinion that the fair value of 30 percent equity interest in HangNing as at the Measurement Date is reasonably stated as below:

Measurement Date	31 August 2020
Fair Value of 30% Equity of Zhejiang Hangning Expressway Co., Ltd.	RMB2,685,000,000 (RENMINBI TWO BILLION SIX HUNDRED EIGHTY FIVE MILLION)

The following pages outline the factors considered, methodologies and assumptions employed in formulating our opinions and conclusions. All opinions are subject to the assumptions and limiting conditions contained therein.

Yours faithfully,  
For and on behalf of  
**Cushman & Wakefield Limited**

Yours faithfully,  
For and on behalf of  
**Cushman & Wakefield Limited**

**Philip C Y Tsang**  
Registered Business Valuer registered with  
the Hong Kong Business Valuation Forum  
MSc, MHKIS  
Director

**Bruce Oong**  
CPA  
Senior Director



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## 1. INTRODUCTION

This report has been prepared in accordance with instructions from Zhejiang Expressway Co., Ltd. to express an independent opinion of the fair value of 30 percent equity interest in Zhejiang Hangning Expressway Co., Ltd. as at 31 August 2020.

## 2. PURPOSE OF VALUATION

The purpose of this valuation is a circular reference for Company.

## 3. BASIS OF VALUE

Our valuation has been carried out on a fair value basis. Fair value is defined as *“the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date.”*

We have conducted our valuation in accordance with International Valuation Standards issued by the International Valuation Standards Council. We planned and performed our valuation so as to obtain all the information and explanations which we considered necessary in order to provide us with sufficient evidence to express our opinion on the subject company. We believe that the valuation procedures we employed provide a reasonable basis for our opinion.

## 4. BACKGROUND

Hangning Expressway Co., Ltd. was established in 2004 and is a subsidiary of Zhejiang Communications Investment Group Co., Ltd. 浙江交通投资集团有限公司 (“CICO”). HangNing is principally engaged in the operation and management of toll rights of Zhejiang section of the Hangning Expressway (“Zhejiang Hangning Expressway”).

The Zhejiang Hangning expressway is 98.961 kilometres long with designed speed of 120 km/h. The first phase of the project (34.335 km), from Wangjiabang to Qingshan, was completed and opened to traffic on 27 December 2000, with the charging period up to 26 December 2030. The second phase of the project (64.626 km), including the section from Hangzhou to Qingshan and another section from Wangjiabang to Fuziling, were opened to traffic on 28 November 2002, with the charging period up to 27 November 2032.

## 5. QUALIFICATION

The subject valuation exercise is led and signed by Mr. Philip C Y Tsang and Mr. Bruce Oong.

Mr. Tsang is the Director of Cushman & Wakefield Limited (“C&W”). He is a Registered Business Valuer registered with the Hong Kong Business Valuation Forum who has over 20 years’ experience in the valuation of infrastructure projects in the PRC.

Mr. Oong is the Senior Director of Cushman & Wakefield Limited. He is a Certified Public Accountants of Canada (CPA (Canada) who has over 10 years’ experience in the valuation of infrastructure projects in the PRC.



## 6. SCOPE OF WORK

In the course of our valuation work, the following processes had been conducted to evaluate the reasonableness of the adopted bases and assumptions provided by the Management:

- Analyses of historical traffic data;
- Discussed with the Management and obtained relevant financial information in respect of HangNing;
- Review of available planning and feasibility reports related to the traffic;
- Examined the relevant bases and assumptions of the financial information in respect of HangNing;
- Conducted appropriate research to obtain enough market data and statistical figures and prepared the valuation based on generally accepted valuation procedures and practices; and
- Presented the purpose and basis of valuation, scope of work, overview of HangNing, related key business descriptions, source of information, major assumptions, valuation methodology and our financial analysis of investment value in this report.

## 7. SOURCE OF INFORMATION

To perform our valuation of the fair value of HangNing, we have relied on the following information that was provided by the Management, as well as other publicly available information that we have gathered through our own research, including, but not limited to, the following:

- Documents of background and operation of Company;
- Business licenses of Company;
- Detailed information and documentation relating to the toll road;
- Audited financial statements of HangNing for the financial year ended 31 December 2019;
- Audited financial statements of HangNing for the 8 months ended 31 August 2020;
- Financial due diligence report issued by Baker Tilly International Limited (Report Number of [2020]30377);
- Financial information and forecast of HangNing provided by the Management;
- Traffic and Revenue Forecast Study Report prepared by WB Group International Limited ("WBG") dated 10 October 2020;
- Publicly available information of comparable companies;
- Financial information obtained from WIND and Bloomberg Terminal; and
- Other public information relating to the valuation.

We have not independently verified any of the information, which has been provided to us. In analyzing that information, we have held discussions with Management. We have had no reason to doubt the truth and accuracy of the information provided to us which are material to the valuation. We were also advised that no material facts have been omitted from the information supplied.

## 8. TRAFFIC FLOW AND REVENUE FORECAST

We have considered and relied to a considerable extent on the Traffic Study Report for Zhejiang Hangning Expressway prepared by WBG.

We have had the discussions about the key assumptions in Traffic Study Report together with the Management. We understand WBG is a professional expert with extensive experience in expressway industry and the underlying assumptions used in the Traffic Study Report are consistent with industry practice. We believe that the assumptions adopted in the study are acceptable.





WBG prepared a projection for the traffic flow and revenue with respect to the subject toll road covering the respective concession period. The projection is mainly based on the expected annual GDP growth rate, vehicle types, existing road network and future transportation plan in the target area. We believe that the traffic growth rate and the toll charge growth rate projected by WBG are reasonable and accurate. Therefore, we have adopted their findings in developing the revenue forecast for Zhejiang Hangning Expressway.

## 9. VALUATION METHODOLOGY

There are generally three accepted approaches to obtain the fair value of HangNing, namely the Market Approach, the Income Approach and the Asset Based Approach. Each of these approaches is appropriate in one or more circumstances, and sometimes, two or more approaches may be used together. Whether to adopt a particular approach will be determined by the most commonly adopted practice in valuing business entities that are similar in nature.

### Market Approach

The market approach values a business entity by comparing prices at which other business entities in a similar nature changed hands in arm's length transactions. The underlying theory of this approach is that one would not pay more than one would have to for an equally desirable alternative. The market approach comprises two methods namely the guideline public company method and the guideline transaction method.

The guideline public company method focuses on analyzing the data and valuation multiples of companies that can be considered comparable to those being valued. Adjustments are made to the comparable companies to compensate for differences between those companies and HangNing. Finally, appropriate valuation multiples are applied to the subject company's normalized financial data to arrive at an indication of the value of the subject company.

The guideline transaction method measures value based on what other purchasers in the market have paid for companies that can be considered reasonably similar to those being valued. When the similar transaction method is utilized, data are collected on the prices paid for reasonably comparable companies. Adjustments are made to the comparable companies to compensate for differences between those companies and HangNing being valued. The application of the guideline transaction method results in an estimate of the price reasonably expected to be realized from the sale of HangNing.

### Income Approach

The income approach focuses on the economic benefits due to the income producing capability of the business entity. The underlying theory of this approach is that the value of the business entity can be measured by the present worth of the economic benefits to be received over the useful life of the business entity. Based on this valuation principle, the income approach estimates the future economic benefits and discounts them to their present values using a discount rate appropriate for the risks associated with realizing those benefits.

Alternatively, this present value can be calculated by capitalizing the economic benefits to be received in the next period at an appropriate capitalization rate. This is subject to the assumption that the business entity will continue to maintain stable economic benefits and growth rate.



#### Asset Based Approach

The asset-based approach is based on the general concept that the earning power of a business entity is derived primarily from its existing assets. The assumption of this approach is that when each of the elements of working capital, tangible and intangible assets is individually valued, their sum represents the value of a business entity and is equal to the value of its invested capital. In other words, the value of the business entity is represented by the money that has been made available to purchase the business assets needed. This money comes from investors who buy stocks of the business entity and investors who lend money to the business entity. After collecting the total amounts of money from equity and debt, and converted into various types of assets of the business entity for its operation, their sum equals the value of the business entity.

#### Selection of Valuation Methodology

The selection of a valuation approach is based on, among others, the quantity and quality of information provided, access to available data, availability of relevant market transactions, type and nature of subject assets, purpose and objective of the valuation and professional judgment and technical expertise. Among the three approaches, we consider that the Income Approach is more appropriate for this valuation.

While useful for certain purposes, the asset-based approach is not considered applicable to the valuation of HangNing, as it does not capture future earning potential of the business. Also, we consider that the market approach is inappropriate as we have not identified sufficient public companies or market transactions which are comparable in terms of business nature. Thus, we consider income approach to be more appropriate for valuing the 30 percent equity interest in Zhejiang Hangning Expressway Co., Ltd. as it takes the future potential economic benefits into consideration.

We have adopted Discounted Cash Flow ("DCF") Approach to assess the fair value of HangNing. The DCF approach involves discounting future net cash flows of HangNing to its present worth based on the Traffic Study Report and other relevant information and documents provided by HangNing.

### **10. MAJOR ASSUMPTIONS**

In determining the fair value of HangNing, the following principal assumptions have been adopted:

- There will be no material change in the existing political, taxation, legal, technological, fiscal or economic conditions, which might adversely affect the business of HangNing;
- The conditions in which the business is being operated and which are material to revenue and costs of business will remain unchanged;
- The business plan has been prepared on a reasonable basis after due and careful consideration by the Management;
- All relevant legal approvals and business certificates or licenses to HangNing in the localities in which HangNing operates or intends to operate are properly in place or would be officially obtained;
- Competent management, key personnel and technical staff will be maintained to support the ongoing operation and development of HangNing;
- The core business operation of HangNing will not differ materially from those of present or expected.
- Natural weather can have an impact on toll roads, including flooding and other types of inclement weather and no extended closure will occur to the toll roads managed by HangNing; and



- There are no hidden or unexpected conditions associated with HangNing that might adversely affect the reported value. Further, we assume no responsibility for changes in market conditions after the Measurement Date.

Our valuation is mainly based on the forecast provided by the Company. We have conducted discussions with the Management and industry analysis by comparing with the information of other expressway groups in the industry, which information include, but is not limited to: revenue growth rate, margin analysis, cost growth rate, interest expense and the depreciation and amortization policy etc. We also did time series analysis as well, with historical actual performance as the starting point. The analysis results could justify the fairness and rationality of the assumptions adopted.

The valuation result as at the Measurement Date is mainly based on the following assumptions:

#### A. CASH FLOW FORECAST

##### Revenue

The forecasted revenue includes the toll revenue as well the service area revenue.

In determining the toll revenue forecast, we referred to the Traffic Study Report prepared by WBG. We have had the discussions about the key assumptions in Traffic Study Report together with the Management. We understand WBG is a professional expert with extensive experience in expressway industry and the underlying assumptions used in the Traffic Study Report are consistent with industry practices.

The service area revenue is determined by Management based on historical rental.

The revenue forecast summarized as below:

Figures in RMB '000	2020.9-12	2021	2022	2023	2024	2025	2026
Toll revenue (excluding tax)	454,184	1,381,864	1,493,621	1,628,816	1,612,961	1,729,932	1,828,117
Other business revenue	19,332	35,450	30,536	30,536	30,536	30,536	30,536
<b>Total revenue</b>	<b>473,516</b>	<b>1,417,314</b>	<b>1,524,158</b>	<b>1,659,352</b>	<b>1,643,497</b>	<b>1,760,468</b>	<b>1,858,653</b>

Figures in RMB '000	2027	2028	2029	2030	2031	2032
Toll revenue (excluding tax)	1,901,184	2,019,379	2,110,757	2,171,476	1,411,990	1,322,320
Other business revenue	30,536	30,536	30,536	30,536	19,108	17,515
<b>Total revenue</b>	<b>1,931,721</b>	<b>2,049,915</b>	<b>2,141,293</b>	<b>2,202,012</b>	<b>1,431,098</b>	<b>1,339,836</b>

##### Cost of Revenue

Cost of revenue mainly includes staff cost, general administrative expense, operating and maintenance expenses, depreciation and other costs.

Staff costs, general administrative costs, operating expenses and road maintenance expenses are forecasted based on historical figures and Company's planning. Depreciation is calculated according to the current provision policies of HangNing. This valuation assumes the financial information provided by the Management is credible, the provision policies for depreciation will remain unchanged, and the relevant operation and maintenance contracts would continue to be performed in the subsequent period.



The forecasted cost of revenue is summarized as below:

Figures in RMB '000	2020.9-12	2021	2022	2023	2024	2025	2026
Cost of toll revenue	148,198	454,523	427,753	416,956	360,649	327,461	329,239
Staff cost	36,346	42,681	43,961	45,280	46,639	48,038	49,479
Administrative expense	553	1,555	1,586	1,618	1,650	1,683	1,717
Operating expense	4,087	6,730	6,865	7,002	7,142	7,285	7,430
System maintenance cost	3,482	4,057	4,138	4,221	4,306	4,392	4,480
Road maintenance cost	18,773	35,069	36,489	41,979	42,059	41,979	41,979
Other costs	2,220	1,009	1,091	1,189	1,178	1,263	1,335
D&A	82,735	363,421	333,623	315,667	257,676	222,821	222,820
Cost of other revenue	2,394	7,304	7,657	8,063	8,154	8,529	8,868
<b>Total cost of revenue</b>	<b>150,592</b>	<b>461,827</b>	<b>435,410</b>	<b>425,019</b>	<b>368,803</b>	<b>335,989</b>	<b>338,107</b>

Figures in RMB '000	2027	2028	2029	2030	2031	2032
Cost of toll revenue	331,067	338,250	340,175	342,211	301,992	278,567
Staff cost	50,963	52,492	54,067	55,689	37,284	36,056
Administrative expense	1,751	1,786	1,822	1,858	1,230	1,150
Operating expense	7,579	7,731	7,885	8,043	5,324	4,978
System maintenance cost	4,569	4,660	4,754	4,849	3,210	3,001
Road maintenance cost	42,059	47,349	47,349	47,429	35,110	32,185
Other costs	1,388	1,475	1,541	1,586	1,031	966
D&A	222,757	222,757	222,757	222,757	218,803	200,231
Cost of other revenue	9,158	9,547	9,884	10,161	6,873	6,468
<b>Total cost of revenue</b>	<b>340,225</b>	<b>347,798</b>	<b>350,060</b>	<b>352,372</b>	<b>308,865</b>	<b>285,035</b>

### Business Tax and Surcharges

HangNing's taxes and surcharges includes urban maintenance and construction tax, education surcharge, local education surcharge, property tax, land use tax, stamp duty, etc. The taxes and surcharges are calculated by the applicable tax rate provided by the Management.

The business tax and surcharges during the projection period is summarized as below:

Figures in RMB '000	2020.9-12	2021	2022	2023	2024	2025	2026
Business Tax	2,937	6,072	6,285	6,740	6,697	7,090	7,422

Figures in RMB '000	2027	2028	2029	2030	2031	2032
Business Tax	7,672	8,073	8,383	8,593	6,030	5,662



### Administrative Expenses

HangNing's administrative expenses mainly consist of staff costs, and other administrative expenditure. Selling expense is estimated to be minimal and insignificant considering the historical information.

The forecasted administrative expense is summarized as below:

Figures in RMB '000	2020.9-12	2021	2022	2023	2024	2025	2026
Administrative Expenses	2,172	2,602	2,631	2,662	2,693	2,725	2,759

Figures in RMB '000	2027	2028	2029	2030	2031	2032
Administrative Expenses	2,793	2,828	2,864	2,902	2,477	2,448

### Financial Expense

The financial expense is referred to the interest expense, bank charges and other fees. As the amount of bank charges and other fees are relatively small in history, and there is no outstanding loan and future loan plans as of the Measurement Date, the financial expense was not considered in this valuation.

### Other Income

Other income is referred to the investment income and reparation. The investment income is calculated based on the investment agreement and the reparation is based on the historical figures.

The forecasted other income is summarized as below:

Figures in RMB '0000	2020.9-12	2021	2022	2023	2024	2025	2026
Other Income	557	2,247	2,247	2,247	2,247	2,247	2,247

Figures in RMB '0000	2027	2028	2029	2030	2031	2032
Other Income	2,247	2,247	2,247	2,247	1,747	1,747

### Income Tax

HangNing's income tax rate is assumed to be 25% during the projection period.

The forecasted income tax is summarized as below:

Figures in RMB '0000	2020.9-12	2021	2022	2023	2024	2025	2026
Income Tax	78,258	237,265	270,520	306,795	316,888	354,228	378,153

Figures in RMB '0000	2027	2028	2029	2030	2031	2032
Income Tax	395,820	423,366	445,559	460,098	278,868	262,110



### Capital Expenditure, Depreciation and Amortization

Capital expenditure (“Capex”) is forecasted by the Management. Capex in the forecast period is for the expansion project and maintenance and renewal of existing equipment.

Capex, depreciation and amortization (“D&A”) during the projection period is summarized as below:

Figures in RMB '0000	2020.9-12	2021	2022	2023	2024	2025	2026
Capex	514,852	497,615	60,696	5,254	3,049	22,195	363
D&A	82,399	363,421	333,623	315,667	257,676	222,821	222,820

Figures in RMB '0000	2027	2028	2029	2030	2031	2032
Capex	1,659	6,209	2,926	68,873	331	-
D&A	222,757	222,757	222,757	222,757	218,803	200,231

### B. DISCOUNT RATE

Under the income approach, the discounted cash flow (DCF) method was adopted. In applying the DCF method, the free cash flows to equity for each year in the future were determined. The results were then discounted using a discount rate, or the cost of equity capital, to determine the present value of the expected cash flows. The present value of the expected cash flows was calculated as follows:

$$PVCF = CF_1/(1+r)^1 + CF_2/(1+r)^2 + \dots + CF_n/(1+r)^n$$

*In which*

*PVCF = Present value of the expected cash flow to equity*

*CF = Expected cash flow to equity*

*r = Discount rate*

*n = Number of years*

The cost of equity was determined using the Capital Asset Pricing Model (CAPM). The CAPM indicates the relationship between risk and expected return that investors require additional return to compensate for the additional risk assumed. The CAPM was computed using the following formula:

$$R_e = R_f + \beta * MRP + Other Risk Premium$$

*In which*

*R<sub>e</sub>* = cost of equity

*R<sub>f</sub>* = risk-free rate

*β* = beta coefficient

*MRP* = market risk premium



### Parameters for CAPM

In determining the equity discount rate for HangNing, the following parameters have been used as at the Measurement Date:

Measurement Date	2020-8-31
Listed Market	HK Market
Risk Free Rate	3.02%
Market Risk Premium	7.69%
Country Risk Premium	1.29%
The Beta Coefficient	0.62
Company Specific Risk Premium	1%
D/E Ratio	9.72%
Cost of Equity (Rounded)	9.5%

- a) The risk-free rate was determined with reference to 10-year yield of China Sovereign Curve, which was retrieved from Bloomberg Terminal™.
- b) The market risk premium represented the additional return required by an investor as compensation for investing in equities rather than a risk-free instrument. In the valuation, the equity risk premium was based on US equity risk as US equity market had a long history of records; the figure was extracted from Bloomberg Terminal™.
- c) A country risk premium was adopted in the valuation as an adjustment to the market risk premium from US market to China market, with reference to Dr. Aswath Damodaran's Research updated on 1<sup>st</sup> April 2020. Dr. Aswath Damodaran, is a Professor of Finance at the Stern School of Business at New York University, and the author of several highly-regarded and widely-used academic texts on Valuation, Corporate Finance, and Investment Management.
- d) The beta coefficient measured the risk of an asset relative to the overall market. In the valuation, the beta coefficient for HangNing was determined as the average of the betas of the comparable companies, with adjustment for differences in corporate tax rates and leverage compositions. The average of the unlevered betas of the comparable companies of HangNing was then being re-leveraged based on the specific corporate tax rate and the weight of debt applied to HangNing.

A list of comparable companies was identified based on the following criteria:

- The shares of comparable companies are publicly listed in The Stock Exchange of Hong Kong Limited;
- The companies derive most of their revenues from the toll road business in China;
- The comparable companies are searchable in WIND.

#### **Comparable Companies**

Sichuan Expressway Company Limited  
 Jiangsu Expressway Company Limited  
 Shenzhen Expressway Company Limited

#### **Wind Code**

0107.HK  
 0177.HK  
 0548.HK



Zhejiang Expressway Co., Ltd.	0576.HK
Shenzhen Investment Holdings Bay Area Development Company Limited	0737.HK
Anhui Expressway Company Limited	0995.HK
Yuexiu Transport Infrastructure Limited	1052.HK
Chengdu Expressway Co., Ltd.	1785.HK

- e) A company level specific risk premium of 1% was adopted in the valuation as an adjustment to the cost of equity based on the Company's operational risks and historical financial performance.

### C. DISCOUNT FOR LACK OF MARKETABILITY

The discount for lack of marketability is a downward adjustment to the value of an investment to reflect its reduced level of marketability. The concept of marketability deals with the liquidity of an ownership interest, that is, how quickly and easily it can be converted into cash if the owner chooses to sell. The discount for lack of marketability reflects the fact that there is no ready market for shares in a closely held company. Ownership interests in closely held companies are typically not readily marketable compared to similar interests in publicly listed companies. Therefore, a share of stock in a privately held company is usually worth less than an otherwise comparable share in a publicly listed company.

Based on an average-strike put option – Finnerty Model developed by Professor John D. Finnerty, a discount for lack of marketability of 2% was derived based on a time period of 1 year, a risk-free rate of 2.46%, and a volatility of 26.8% as of the Measurement Date.

## 11. SENSITIVITY ANALYSES

### Discount Rate

The following table summarize the result of sensitivity test of the Valuation Subject based on changes of discount rate:

Discount Rate	Fair Value (RNB Million)
10.5%	2,563
9.5%	2,685
8.5%	2,817

## 12. LIMITING CONDITIONS

The valuation reflects facts and conditions existing at the Measurement Date. Subsequent events have not been considered and we are not required to update our report for such events and conditions.

To the best of our knowledge, all data set forth in this report are reasonable and accurately determined. The data, opinions, or estimates identified as being furnished by others that have been used in formulating this analysis are gathered from reliable sources; yet, no guarantee is made nor liability assumed for their accuracy.





We have relied to a considerable extent on information provided by the management of the Company in arriving at our opinion of value. We are not in the position to verify the accuracy of all information provided to us. However, we have had no reason to doubt the truth and accuracy of the information provided to us and to doubt that any material facts have been omitted from the information provided. No responsibilities for the operation and financial information that have not been provided to us are accepted.

Our valuation relied on the assumption that financial forecast provided by the Management is reasonable, reflecting market conditions and economic fundamentals, and will be materialized. We did not independently investigate or otherwise verify whether the financial forecast can be achieved and do not express an opinion or offer any form of assurance on it.

The recent outbreak of the Novel Coronavirus (COVID-19) has brought high volatility to global financial markets and uncertainty to the real economy. It is expected that financial forecast and probability of each scenario will be very sensitive to development of the pandemic and changes in the financial markets. The extents of impact on different sectors of the market are different and the time for marketing and negotiating sale of shares will be longer than normal. There will be less certainty as to how long a valuation may sustain and share prices may fluctuate rapidly and materially over a short period of time. Our valuation of equity value valid only at the Measurement Date and any subsequent changes in market conditions as well as the resulting impacts on the fair value of equity value of HangNing after the Measurement Date cannot be taken into account. If any party intends to make reference to our valuation when entering into any transaction, he must bear in mind the high market volatility during this period of time and that the fair value of 30 percent equity interest in HangNing may or may not have changed since the Measurement Date.

Our opinion of the fair value was derived from generally accepted valuation procedures and practices that rely substantially on the use of various assumptions and the consideration of many uncertainties, not all of which can be easily quantified or ascertained.

Neither the whole nor any part of this report or any reference hereto may be included in any published document, circular or statement, or published in any way, without our prior written approval of the form and context in which it may appear.

Finally and in accordance with our standard practice, we must state that this report and valuation are for the exclusive use only of the addressee and for the purpose stated herein. No responsibility is accepted to any third party for the whole or any part of its contents.

### 13. REMARKS

Qualified opinions were issued by Baker Tilly International Limited in the audit reports of HangNing for the financial year ended 31 December 2019 and 8 months ended 31 August 2020. The basis of formulating the qualified opinion for the eight months ended 31 August 2020 is summarized as below:

- There are certain matters in HangNing that may result in the payment of corporate income tax and fines where the amount cannot be quantified;
- Auditor was unable to obtain sufficient and appropriate evidence to determine the impact of the accounting adjustment regarding Qingshan service area, on the financial statements.



The above mentioned items as well as the resulting impacts on the fair value of the equity value of HangNing cannot be taken into account.

Unless otherwise stated, all monetary amounts stated in this valuation report are in RENMINBI (RMB).

We hereby confirm that we have neither present nor prospective interests in HangNing.

#### 14. OPINION OF VALUE

Based on the results of our investigation and analysis outlined in the report which follows, we are of the opinion that the fair value of 30 percent equity interest in HangNing as at the Measurement Date is reasonably stated as below:

Measurement Date	31 August 2020
Fair Value of 30% Equity Value of Zhejiang Hangning Expressway Co., Ltd.	RMB 2,685,000,000 (RENMINBI TWO BILLION SIX HUNDRED EIGHTY FIVE MILLION)

Yours faithfully,  
For and on behalf of  
**Cushman & Wakefield Limited**

Yours faithfully,  
For and on behalf of  
**Cushman & Wakefield Limited**

**Philip C Y Tsang**  
Registered Business Valuer registered with  
the Hong Kong Business Valuation Forum  
MSc, MHKIS  
Director

**Bruce Oong**  
CPA  
Senior Director



## EXHIBIT A- VALUATION MODEL

Zhejiang Hangning Expressway Co., Ltd  
2020/6/31  
Valuation Date  
RMB'000  
Currency

	2020 9-12E	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	2032E	End
<b>Revenue</b>	473,516	1,417,314	1,524,158	1,659,352	1,643,487	1,760,468	1,858,663	1,931,721	2,049,915	2,141,283	2,202,012	1,431,088	1,339,836	
Cost of Revenue	(150,592)	(461,827)	(435,410)	(425,019)	(368,803)	(335,989)	(338,107)	(340,225)	(347,798)	(350,060)	(352,372)	(308,865)	(285,035)	
Business Tax	(2,937)	(6,072)	(6,285)	(6,740)	(6,687)	(7,090)	(7,422)	(7,672)	(8,073)	(8,383)	(8,593)	(6,030)	(5,662)	
<b>Gross Profit</b>	<b>319,987</b>	<b>949,415</b>	<b>1,082,462</b>	<b>1,227,592</b>	<b>1,267,997</b>	<b>1,417,389</b>	<b>1,513,124</b>	<b>1,593,824</b>	<b>1,694,045</b>	<b>1,782,851</b>	<b>1,841,047</b>	<b>1,116,203</b>	<b>1,049,139</b>	
Administrative Expenses	(2,172)	(2,602)	(2,631)	(2,662)	(2,693)	(2,725)	(2,759)	(2,793)	(2,828)	(2,864)	(2,902)	(2,477)	(2,448)	
EBIT	317,815	946,814	1,079,831	1,224,931	1,265,304	1,414,663	1,510,365	1,591,031	1,691,217	1,779,987	1,838,145	1,113,725	1,046,691	
Financial Expense	557	2,247	2,247	2,247	2,247	2,247	2,247	2,247	2,247	2,247	2,247	1,747	1,747	
Other Income	25%													
<b>EBT</b>	<b>318,372</b>	<b>949,061</b>	<b>1,082,079</b>	<b>1,227,178</b>	<b>1,267,552</b>	<b>1,416,911</b>	<b>1,512,613</b>	<b>1,593,279</b>	<b>1,693,464</b>	<b>1,782,234</b>	<b>1,840,393</b>	<b>1,115,473</b>	<b>1,048,438</b>	
Income Tax	(78,258)	(237,265)	(270,520)	(306,795)	(316,888)	(354,228)	(378,153)	(395,820)	(423,366)	(445,559)	(460,098)	(278,868)	(262,110)	
<b>Net Income</b>	<b>240,114</b>	<b>711,796</b>	<b>811,559</b>	<b>920,384</b>	<b>950,664</b>	<b>1,062,683</b>	<b>1,134,459</b>	<b>1,187,459</b>	<b>1,270,098</b>	<b>1,336,676</b>	<b>1,380,295</b>	<b>836,605</b>	<b>786,329</b>	
<b>Adjustments</b>														
Add: D&A	82,399	363,421	333,623	315,667	257,676	222,821	222,820	222,757	222,757	222,757	222,757	218,803	200,231	
Less: Capex	(514,852)	(497,615)	(60,686)	(5,254)	(3,049)	(22,195)	(363)	(1,659)	(6,209)	(2,926)	(68,873)	(331)	(8,656)	
Less: Change in NWC	5,754	(41,235)	6,057	12,499	1,640	6,020	5,532	4,832	12,018	5,496	4,616	(80,628)	(6,656)	
Add: Collection of NWC														
<b>Free Cash Flow to Equity</b>	<b>(186,656)</b>	<b>536,367</b>	<b>1,090,543</b>	<b>1,243,296</b>	<b>1,206,931</b>	<b>1,268,328</b>	<b>1,362,448</b>	<b>1,413,389</b>	<b>1,498,665</b>	<b>1,562,005</b>	<b>1,538,795</b>	<b>974,449</b>	<b>977,905</b>	<b>(151,991)</b>
<b>Discount Rate</b>	9.5%													
Discount factor (mid-term)	0.17	0.83	1.83	2.83	3.83	4.83	5.83	6.83	7.83	8.83	9.83	10.83	11.79	12.25
Discount adjustment factor	0.98	0.93	0.85	0.77	0.71	0.64	0.59	0.54	0.49	0.45	0.41	0.37	0.34	0.33
<b>PV of FCFE</b>	<b>(183,777)</b>	<b>497,257</b>	<b>923,310</b>	<b>961,314</b>	<b>852,234</b>	<b>818,533</b>	<b>802,358</b>	<b>760,144</b>	<b>736,079</b>	<b>700,629</b>	<b>630,337</b>	<b>364,533</b>	<b>335,461</b>	<b>(50,006)</b>
<b>Sum of PV of FCFE</b>	<b>8,148,407</b>													
Add: Cash	890,627													
Add: Non-operating Assets/Liabilities	93,317													
<b>Implied 100% Equity Value</b>	<b>9,132,351</b>													
DLOM	2.0%													
<b>Implied 100% Equity Value after DLOM (Rounded)</b>	<b>8,950,000</b>													
<b>Implied 30% Equity Value (Rounded)</b>	<b>2,685,000</b>													



## EXHIBIT B- COMPARABLE COMPANIES

Company Name	Ticker	Description
Sichuan Expressway Company Limited	0107.HK	Sichuan Expressway Company Limited offers expressway investment and construction services. It builds toll highway, bridge, tunnel, and other traffic projects. Sichuan Expressway also conducts city operation, energy, media and financial investment businesses.
Jiangsu Expressway Company Limited	0177.HK	Jiangsu Expressway Company Limited operates highway businesses. It provides toll highway investment, construction, and maintenance services. Jiangsu Expressway also conducts highway passenger transportation, refueling, catering, car repair, and advertisement businesses.
Shenzhen Expressway Company Limited	0548.HK	Shenzhen Expressway Company Limited offers toll expressway and road construction and investment services. It provides expressway operation, maintenance, and service station leasing services. Shenzhen Expressway also conducts real estate development, advertising, and engineering consulting businesses.
Zhejiang Expressway Co., Ltd.	0576.HK	Zhejiang Expressway Co., Ltd., through its subsidiaries, designs, constructs, operates, and manages high grade roads, as well as develops and operates certain ancillary services, such as technical consultation, advertising, automobile servicing, and fuel facilities.
Shenzhen Investment Holdings Bay Area Development Company Limited	0737.HK	Shenzhen Investment Holdings Bay Area Development Company Limited provides infrastructure construction services. It provides highway construction, bridge construction, and other related services. Shenzhen Investment Holdings Bay Area Development offers services in China.
Anhui Expressway Company Limited	0995.HK	Anhui Expressway Co. Ltd. principally holds, operates and develops toll expressways and highways in Anhui province in China.
Yuexiu Transport Infrastructure Limited	1052.HK	Yuexiu Transport Infrastructure Ltd., through its subsidiaries, invests in, develops, operates, and manages toll highways, expressways, and bridges in China.
Chengdu Expressway Co., Ltd.	1785.HK	Chengdu Expressway Company Limited offers transportation infrastructure construction services. It provides highway construction, bridge construction, and other related services. Chengdu Expressway also operates engineering construction and financial investment businesses.



# Valuation Report

Client: Zhejiang Expressway Co., Ltd.  
Target: 100 Percent Equity Interest in Zhejiang LongLiLiLong Expressway Co., Ltd.  
Ref.No: CON100389041 BV-1

9 November 2020





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9 November 2020

The Directors

Zhejiang Expressway Co., Ltd.

12th Floor, Block A

Dragon Century Plaza, 1 Hangda Road

Hangzhou, 310007

The People's Republic of China

Dear Sirs,

In accordance with the instructions from Zhejiang Expressway Co., Ltd. (the "Company"), we have undertaken an investigation and analysis to determine an independent opinion of the fair value of 100 percent equity interest in Zhejiang LongLiLiLong Expressway Co., Ltd. ("LongLiLiLong") as at 31 August 2020 (the "Valuation Date"). The report which follows is dated 9 November 2020 (the "Report Date").

The purpose of this valuation is a circular reference for the Company.

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Zhejiang Expressway Co., Ltd.

Valuation Report – 100 Percent Equity Interest in Zhejiang LongLiLiLong Expressway Co., Ltd.



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Our valuation was carried out on a fair value basis. Fair value is defined as “*the price that would be received to sell an asset, or paid to transfer a liability, in an orderly transaction between market participants at the measurement date*”.

Our valuation of the 100 percent equity interest in LongLiLiLong was developed through the application of an income approach known as discount cash flow methodology. Under this method, the equity result depends on the present worth of future economic benefits to be derived from the projected sales income. Indication of the result is developed by discounting projected future net cash flows available for payment of shareholders’ interest to their present worth.

As part of our analysis, we have been furnished with information prepared by LongLiLiLong and the Company regarding the business. We have relied to a considerable extent on such information in arriving at our opinion of value.

The conclusion of value is based on accepted valuation procedures and practices that rely substantially on our use of numerous assumptions and our consideration of various factors that are relevant to the operation of LongLiLiLong. We have also considered various risks and uncertainties that have potential impact on the businesses. Further, while the assumptions and consideration of such matters are considered by us to be reasonable, they are inherently subject to significant business, economic and competitive uncertainties and contingencies, many of which are beyond the control of LongLiLiLong and Jones Lang LaSalle Corporate Appraisal and Advisory Limited.

We do not intend to express any opinion on matters which require legal or other specialized expertise or knowledge, beyond what is customarily employed by valuers. Our conclusions assume continuation of prudent management of LongLiLiLong over whatever period of time that is reasonable and necessary to maintain the character and integrity of the assets valued.

Zhejiang Expressway Co., Ltd.

Valuation Report – 100 Percent Equity Interest in Zhejiang LongLiLiLong Expressway Co., Ltd.



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Based on the results of our investigation and analysis outlined in the report which follows, we are of the opinion that the fair value of 100 percent equity interest in LongLiLiLong as at the Valuation Date is reasonably stated as below:

Valuation Date	Fair Value of 100 Percent Equity Interest (RMB '000)
31 August 2020	239,000

The following pages outline the factors considered, methodology and assumptions employed in formulating our opinions and conclusions. Any opinions are subject to the assumptions and limiting conditions contained therein.

Yours faithfully,  
for and on behalf of

**Jones Lang LaSalle Corporate Appraisal and Advisory Limited**

Simon M.K. Chan

**Executive Director**

Zhejiang Expressway Co., Ltd.

Valuation Report – 100 Percent Equity Interest in Zhejiang LongLiLiLong Expressway Co., Ltd.





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Zhejiang Expressway Co., Ltd.

Valuation Report – 100 Percent Equity Interest in Zhejiang LongLiLiLong Expressway Co., Ltd.



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## INTRODUCTION

This report has been prepared in accordance with instructions from Zhejiang Expressway Co., Ltd. (the “Company”) to express an independent opinion of the fair value of 100 percent equity interest in Zhejiang LongLiLiLong Expressway Co., Ltd. (“LongLiLiLong”) as at 31 August 2020 (the “Valuation Date”). The report which follows is dated 9 November 2020 (the “Report Date”).

## PURPOSE OF VALUATION

The purpose of this valuation is a circular reference for the Company.

## BASIS OF VALUE

Our valuation was carried out on a fair value basis. Fair value is defined as “*the price that would be received to sell an asset, or paid to transfer a liability, in an orderly transaction between market participants at the measurement date*”.

We have conducted our valuation in accordance with HKFRS 13 - Fair Value Measurement and taken into account the International Valuation Standards issued by the International Valuation Standards Council. We planned and performed our valuation so as to obtain all the information and explanations which we considered necessary in order to provide us with sufficient evidence to express our opinion on the subject asset. We believe that the valuation procedures we employed provide a reasonable basis for our opinion.

Zhejiang Expressway Co., Ltd.

Valuation Report – 100 Percent Equity Interest in Zhejiang LongLiLiLong Expressway Co., Ltd.



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## BACKGROUND

Expressway in the West. The expressway is 102.44 kilometers long and has four lanes in both directions with designed speed of 100/80 km/h. Liandu Section (22.97 km) was completed and opened to traffic on December 25, 2007, with the charging period up to December 24, 2032, and other sections were opened to traffic on December 31, 2006, with the charging period up to December 30, 2031.

LongLiLiLong, a wholly owned subsidiary of Zhejiang Communications Investment Group Co., Ltd., was established in the PRC on April 8, 2005, the registered capital and paid up capital of which is RMB 8,160,656,565. LongLiLiLong is principally engaged in the operation and management of toll collection rights of the Longli Expressway and Lilong Expressway located in Zhejiang Province in China, with a total length of 222.2 kilometers.

Longli Expressway and Lilong Expressway are in a T-shape structure. Longli Expressway is connected to Hangqian Expressway in the north, and Beibu Interchange where Longli Expressway and Lilong Expressway meet in the south. It consists of 16 toll stations and two service areas. The total length is 119.785 km, and designed speed for the two-way four-lane expressway is 100/80 kilometers per hour. The whole line was completed and opened to traffic on December 31, 2006 and the charging period will last until December 30, 2031.

Lilong Expressway is connected to Fuling Interchange of Jingliwen Expressway in the east and the starting point of the Longqing

Zhejiang Expressway Co., Ltd.

Valuation Report – 100 Percent Equity Interest in Zhejiang LongLiLiLong Expressway Co., Ltd.



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## METHODOLOGY

In arriving at our assessed value, we have considered three generally accepted approaches, namely, market approach, cost approach and income approach.

**Market Approach** considers prices recently paid for similar assets, with adjustments made to market prices to reflect condition and utility of the appraised assets relative to the market comparative. Assets for which there is an established secondary market may be valued by this approach.

Benefits of using this approach include its simplicity, clarity, speed and the need for few or no assumptions. It also introduces objectivity in application as publicly available inputs are used. However, one has to be wary of the hidden assumptions in those inputs as there are inherent assumptions on the value of those comparable assets. It is also difficult to find comparable assets. Furthermore, this approach relies exclusively on the efficient market hypothesis.

**Cost Approach** considers the cost to reproduce or replace in new condition the assets appraised in accordance with current market prices for similar assets, with allowance for accrued depreciation or obsolescence present, whether arising from physical, functional or economic causes. The cost approach generally furnishes the most reliable indication of value for assets without a known secondary market.

Despite the simplicity and transparency of this approach, it does not directly incorporate information about the economic benefits contributed by the subject asset.

**Income Approach** is the conversion of expected periodic benefits of ownership into an indication of value. It is based on the principle that an informed buyer would pay no more for the asset than an amount equal to the present worth of anticipated future benefits (income) from the same or a substantially similar asset with a similar risk profile.

This approach allows for the prospective valuation of future profits and there are numerous empirical and theoretical justifications for the present value of expected future cash flows. However, this approach

Zhejiang Expressway Co., Ltd.

Valuation Report – 100 Percent Equity Interest in Zhejiang LongLiLiLong Expressway Co., Ltd.



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relies on numerous assumptions over a long time horizon and the result may be very sensitive to certain inputs. It also presents a single scenario only.

Selection of Valuation Approach and Methodology

In our opinion, the market approach and cost approach are inappropriate for valuing the 100 percent equity interest in the LongLiLiLong. Firstly, the market approach requires market transactions of comparable assets as an indication of value. However, we have not identified any current market transactions which are comparable. Secondly, the cost approach does not directly incorporate information about the economic benefits contributed by LongLiLiLong. We have therefore relied solely on the income approach in determining our opinion of value.

In this study, the value of the total equity was developed through the application of an income approach technique known as discounted cash flow method to devolve the future value of the business into a present fair value. This method eliminates the discrepancy in time value of money by using a discount rate to reflect all business risks including intrinsic and extrinsic uncertainties in relation to the business.

Under this method, value depends on the present worth of future economic benefit to be derived from the projected income. Indications of value have been developed by discounting projected future net cash flows available for payment of shareholders' interest to their present worth at discount rate which in our opinion is appropriate for the risks of the business. In considering the appropriate discount rate to be applied, we have taken into account a number of factors including the current cost of finance and the considered risk inherent in the business.

Zhejiang Expressway Co., Ltd.

Valuation Report – 100 Percent Equity Interest in Zhejiang LongLiLiLong Expressway Co., Ltd.



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#### SOURCES OF INFORMATION

This report was compiled after consideration of all relevant information obtained from LongLiLiLong and the Company. Documents received include, but were not limited to:

- Background information of LongLiLiLong;
- Financial information and forecasting of LongLiLiLong as at the Valuation Date;
- Details and articles relating to the toll road; and
- Traffic Study Report prepared by WB Group International Limited (WBG).

We conducted discussions with LongLiLiLong and Company's management. We have relied to a considerable extent on information provided by the management in arriving at our opinion of value. We have also analyzed the financial information and documents provided and conducted research using various sources.

#### TRAFFIC AND REVENUE FORECASTING

We have considered and relied to a considerable extent on the traffic flow and revenue study (the "Traffic Study Report") for LongLiLiLong prepared by WBG.

We understand WBG is a professional expert with extensive experience in expressway industry and the underlying assumptions used in the Traffic Study Report are in line with industry practice. We are of the opinion that the assumptions adopted in the study are acceptable.

WBG prepared a projection for the traffic flow and revenue with respect to the subject toll road covering the respective concession period. The projection is mainly based on the expected annual GDP growth rate, vehicle types, existing road network and future transportation plan in the target area.

We believe that the traffic growth rate and the toll charge growth rate projected by WBG are reasonable and accurate. Therefore, we have adopted their findings in developing the forecast for LongLiLiLong.



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**MAJOR ASSUMPTIONS**

Assumptions considered to have significant sensitivity effects in this valuation have been evaluated in order to provide a more accurate and reasonable basis for arriving at our assessed value.

In determining the fair value of the 100 percent equity interest in LongLiLiLong, the following key assumptions have been made:

- We assume continuation of prudent and effective management policies over whatever period of time that is considered to be necessary in order to maintain the character and integrity of the assets valued;
- We have assumed that there will be no material change in the existing political, legal, technological, fiscal or economic conditions, which might adversely affect the business of LongLiLiLong;
- We have assumed that the operational and contractual terms stipulated in the relevant contracts and agreements will be honored;

- We have been provided with copies of the operating licenses and company incorporation documents. We have assumed such information to be reliable and legitimate. We have relied to a considerable extent on such information provided in arriving at our opinion of value;
- We have assumed share capital injection and shareholder loan when necessary in the valuation;
- We have assumed the accuracy of the financial and operational information such as management accounts, contractual agreements and manufacturing capabilities, provided to us by LongLiLiLong and the Company relied to a considerable extent on such information in arriving at our opinion of value; and
- We have assumed that there are no hidden or unexpected conditions associated with the assets valued that might adversely affect the reported value. Further, we assume no responsibility for changes in market conditions after the Valuation Date.

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Our opinion of value was calculated using a financial projection based on a traffic flow and toll income projection prepared by WBG, and a management projection of cost of services, management expenses, surtax and others, provided to us by LongLiLiLong and the Company.

Key inputs of this cash flow projection and our analysis on this are summarized as below:

Revenue

- The forecast revenue includes the toll revenue as well the service area revenue.
- The base case scenario as projected by WBG has been adopted as the traffic flow and toll revenue for LongLiLiLong.
- The service area revenue is assumed to grow on an average of approximately 2% per annum from 2020 and onwards.

Revenue (RMB '000)	2020/9-12	2021	2022	2023	2024	2025	2026
Toll revenue	217,979	737,990	789,252	846,942	903,786	961,427	1,020,602
Growth rate		7%	7%	7%	7%	6%	6%
Service area revenue	3,351	10,182	10,385	10,593	10,805	11,021	11,241
Growth rate		2%	2%	2%	2%	2%	2%
<b>Total Revenue</b>	<b>221,330</b>	<b>748,172</b>	<b>799,638</b>	<b>857,535</b>	<b>914,591</b>	<b>972,448</b>	<b>1,031,843</b>
Growth rate		7%	7%	7%	7%	6%	6%

Revenue (RMB '000)	2027	2028	2029	2030	2031	2032
Toll revenue	1,079,854	1,142,184	1,198,000	1,249,835	1,130,573	192,214
Growth rate	6%	6%	5%	4%	-10%	-83%
Service area revenue	11,466	11,695	11,929	12,168	12,411	1,266
Growth rate	2%	2%	2%	2%	2%	-91%
<b>Total Revenue</b>	<b>1,091,320</b>	<b>1,153,880</b>	<b>1,209,929</b>	<b>1,262,003</b>	<b>1,142,984</b>	<b>193,480</b>
Growth rate	6%	6%	5%	4%	-9%	-83%

Cost of service

- Cost of services comprises mainly of depreciation and amortization, staff costs, general administrative costs, operating cost and road maintenance cost.
- The depreciation and amortization policy of the fixed assets and intangible assets is consistent with LongLiLiLong's accounting policy:
  - (i) Road and structures: traffic volume method, depreciation period till the end of forecast period;
  - (ii) Buildings structure and general & special equipment: straight-line-method.

- Road maintenance cost is scheduled to increase around 20% in 2023 due to that the management of LongLiLiLong estimates to increase the maintenance level in 2023. For the rest remaining years, the cost is assumed to be around 1%-3% per annum from

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2020 and onwards.

- Other cost of services, which include staff costs, general administrative costs, and operating cost, is projected to grow on about 1%-3% per annum from 2020 and onwards.

Cost of Service (RMB '000)	2020/9-12	2021	2022	2023	2024	2025	2026
Staff costs	36,811	73,956	76,154	78,458	80,792	83,215	85,712
General administrative costs	3,092	7,609	7,761	7,916	8,074	8,236	8,400
Operating cost	10,116	18,434	18,802	19,178	19,562	19,953	20,352
Depreciation and amortization	173,095	532,816	537,376	553,689	572,640	595,372	619,371
System maintenance cost	13,414	15,068	15,218	15,371	15,524	15,679	15,836
Road maintenance cost	90,827	106,770	108,830	132,390	134,970	138,000	140,700
Removing obstacles cost	2,165	2,627	2,809	3,015	3,217	3,422	3,633
Service area operating cost	1,984	5,953	5,953	5,953	5,953	5,953	5,953
<b>Total Cost of Service</b>	<b>331,504</b>	<b>763,212</b>	<b>772,903</b>	<b>815,949</b>	<b>840,731</b>	<b>869,831</b>	<b>899,958</b>
GP margin	-510%	-2%	3%	5%	8%	11%	13%

Cost of Service (RMB '000)	2027	2028	2029	2030	2031	2032
Staff costs	88,283	90,932	93,660	96,469	99,363	10,234
General administrative costs	8,568	8,740	8,915	9,093	9,275	946
Operating cost	20,759	21,174	21,598	22,030	22,470	2,292
Depreciation and amortization	642,468	651,604	663,114	680,460	612,375	149,216
System maintenance cost	15,995	16,155	16,316	16,479	16,644	1,681
Road maintenance cost	143,860	146,670	149,970	152,900	156,330	16,920
Removing obstacles cost	3,844	4,065	4,264	4,449	4,624	684
Service area operating cost	5,953	5,953	5,953	5,953	5,953	595
<b>Total Cost of Service</b>	<b>929,730</b>	<b>945,293</b>	<b>963,790</b>	<b>987,833</b>	<b>926,435</b>	<b>182,849</b>
GP margin	15%	18%	20%	22%	19%	6%

Surtax

- Surtax comprises urban maintenance and construction tax, education surcharge, local education surcharge, property tax, land use tax, stamp duty, etc.

Surtax (RMB '000)	2020/9-12	2021	2022	2023	2024	2025	2026
Surtax	1,277	3,931	4,087	4,273	4,446	4,622	4,802
As % of revenue	0.6%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%

Surtax (RMB '000)	2027	2028	2029	2030	2031	2032
Surtax	4,983	5,173	5,343	5,502	5,147	759
As % of revenue	0.5%	0.4%	0.4%	0.4%	0.5%	0.4%

Management expense

- Management expense comprises staff costs and other administrative expense, which are projected to grow on 3% and 1% respectively per annum from 2020 and onwards.

Management expense (RMB '000)	2020/9-12	2021	2022	2023	2024	2025	2026
Staff costs	3,359	5,684	5,854	6,030	6,211	6,397	6,589
Other administrative expense	1,375	2,024	2,044	2,065	2,085	2,106	2,127
<b>Total Management expense</b>	<b>4,734</b>	<b>7,708</b>	<b>7,899</b>	<b>8,095</b>	<b>8,296</b>	<b>8,503</b>	<b>8,716</b>
Growth rate		2.5%	2.5%	2.5%	2.5%	2.5%	2.5%

Management expense (RMB '000)	2027	2028	2029	2030	2031	2032
Staff costs	6,787	6,990	7,200	7,416	7,639	3,934
Other administrative expense	2,148	2,170	2,192	2,214	2,236	1,129
<b>Total Management expense</b>	<b>8,935</b>	<b>9,160</b>	<b>9,392</b>	<b>9,630</b>	<b>9,874</b>	<b>5,063</b>
Growth rate		2.5%	2.5%	2.5%	2.5%	-48.7%

Interest expense

- Interest expense is calculated based on the interest rate and outstanding principal according to the borrowing and repayment projection provided by LongLiLiLong and the Company based on



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Income tax (RMB '000)	2027	2028	2029	2030	2031	2032
Income tax	-	-	-	1,252	4,611	84
Effective tax rate	0%	0%	0%	0%	25%	25%

Capital expenditure, depreciation and amortization

- Due to the particularity of expressway industry, a large amount of investment has been made in road, structures, buildings and equipment from the beginning. Therefore, capital expenditure in the projection period is mainly for the maintenance and renewal of existing equipment.

Capex and DCA (RMB '000)	2020/9-12	2021	2022	2023	2024	2025	2026
Capex	44,900	11,000	10,700	21,200	47,000	57,000	53,100
DCA	173,095	52,816	537,376	553,689	572,640	595,572	619,371

Capex and depreciation (RMB '000)	2027	2028	2029	2030	2031	2032
Capex	32,250	8,500	12,900	6,500	2,000	2,000
DCA	642,468	651,604	665,114	680,400	612,375	149,216

Net borrowing

- The borrowing and repayment schedule are prepared by the management of LongLiLiLong and the Company. As at the Valuation Date, the outstanding loan of LongLiLiLong is RMB 5.78 billion, including PRC bank loan and loan from non-banking financial institution.

- the relevant loan agreements.
- The long-term interest rate of the loan from licensed PRC bank is 4.21% per year.
- The long-term and short-term interest rate of the loan from non-banking financial institution in the PRC is 4.34% and 4.21% respectively per year.

Interest expense (RMB '000)	2020/9-12	2021	2022	2023	2024	2025	2026
Interest expense	80,989	236,355	235,578	216,525	208,411	196,499	170,779

Interest expense (RMB '000)	2027	2028	2029	2030	2031	2032
Interest expense	146,562	118,005	85,455	49,541	17,100	1,714

Income tax

- Income tax rate is assumed to be 25% on taxable income during the projection period after consideration of tax loss carried-forward and the temporary differences arising from the difference between the carrying amount of road and structures and its tax base.

Income tax (RMB '000)	2020/9-12	2021	2022	2023	2024	2025	2026
Income tax	-	-	-	-	-	-	-
Effective tax rate	0%	0%	0%	0%	0%	0%	0%

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	2020/9-12	2021	2022	2023	2024	2025	2026
<b>Net borrowing (RMB'000)</b>							
Beginning balance	5,778,630	5,860,130	5,615,630	5,323,130	4,984,130	4,615,000	4,190,000
Addition	430,000	1,790,000	630,000	645,000	615,000	80,000	-
Repayment	-348,500	-2,034,500	-922,500	-984,000	-984,130	-505,000	-510,000
<b>Net borrowing</b>	<b>5,860,130</b>	<b>5,615,630</b>	<b>5,323,130</b>	<b>4,984,130</b>	<b>4,615,000</b>	<b>4,190,000</b>	<b>3,680,000</b>

	2027	2028	2029	2030	2031	2032
<b>Net borrowing (RMB'000)</b>						
Beginning balance	3,680,000	3,074,000	2,364,000	1,574,000	709,000	79,000
Addition	-	-	-	-	-	-
Repayment	-606,000	-710,000	-790,000	-865,000	-630,000	-79,000
<b>Net borrowing</b>	<b>3,074,000</b>	<b>2,364,000</b>	<b>1,574,000</b>	<b>709,000</b>	<b>79,000</b>	<b>-</b>

**DISCOUNT RATE**

In applying the discounted cash flow method, it is necessary to determine an appropriate discount rate for the assets under review. The discount rate represents an estimate of the rate of return required by a third party investor for an investment of this type. The rate of return expected from an investment by an investor relates to perceived risk. Risk factors relevant in our selection of an appropriate discount rate include:

- Interest rate risk, which measures variability of returns caused by changes in the general level of interest rates.
- Purchasing power risk, which measures loss of purchasing power over time due to inflation.
- Liquidity risk, which measures the ease with which an instrument can be sold at the prevailing market price.
- Market risk, which measures the effects of the general market on the price behavior of securities.
- Business risk, which measures the uncertainty inherent in projections of operating income.



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Consideration of risk, burden of management, degree of liquidity, and other factors affect the rate of return acceptable to a given investor in a specific investment. An adjustment for risk is an increment added to a base or safe rate to compensate for the extent of risk believed involved in the investment.

Required Return on Equity Capital

We have used Capital Assets Pricing Model (the “CAPM”) to estimate the required return on equity capital. The CAPM is a fundamental tenet of modern portfolio theory which has been generally accepted basis for marketplace valuations of equity capital. The CAPM technique is widely accepted in the investment and financial analysis communities for the purpose of estimating a company’s required return on equity capital.

The equation of CAPM is shown as follow:

$$\text{Expected Return on Equity} = \text{Risk Free} + \text{Nominal Beta} (\beta) \times \text{Risk Premium} + \varepsilon$$

The return on equity required of a company represents the total rate of return investors expect to earn, through a combination of dividends and capital appreciation, as a reward for risk taking. The Capital Asset Pricing Model (“CAPM”) is used to calculate the required rate of return on equity investment by using publicly-traded companies.



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Parameters for CAPM

In determining the equity discount rate for LongLiLiLong, the following parameters have been used:

Valuation Date	31 August 2020
Listed Market	Hong Kong
Risk Free Rate	0.587% (Yield of 10-year Hong Kong Government BVAL Curve as at Valuation Date, Source: Bloomberg)
Market Return	12.350% (Hong Kong Market Return, Source from Bloomberg)
Risk Premium	11.76% (Market Return – Risk Free Rate)
Estimated Beta	0.617 (indicated by the median beta of listed companies in similar industry as at Valuation Date, Source: Bloomberg)
<b>CAPM</b>	<b>7.84%</b> (0.587% + 0.617 x 11.763%)

Comparable companies

In determining the estimated beta, a list of comparable companies was identified. The selection criteria include the followings:

- The shares of comparable companies are publicly listed in The Stock Exchange of Hong Kong Limited;
- The companies derive most, if not all, of their revenues from the toll road business in China;
- The beta of comparable companies from Bloomberg is statistically significant; and
- The comparable companies are searchable in Bloomberg.

Details of these comparable companies are shown below:

Stock Code	Company Name
107 HK	Sichuan Expressway Company Limited
177 HK	Jiangsu Expressway Company Limited
548 HK	Shenzhen Expressway Company Limited
576 HK	Zhejiang Expressway Co., Ltd.
737 HK	Shenzhen Investment Holdings Bay Area Development Company Limited
995 HK	Anhui Expressway Company Limited
1052 HK	Yuexiu Transport Infrastructure Limited
1785 HK	Chengdu Expressway Co., Ltd.

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Discount Rate

Valuation Date	31 August 2020
Listed Market	Hong Kong
CAPM	7.84%
Country Premium	0.29% (with reference to Dr. Aswath Damodaran's Research, NYU, 2019)
Liquidity Risk Premium	2% (with reference to "Marketability and Value: Measuring the Illiquidity Discount" of Stern School of Business, NYU, June 2005, by Aswath Damodaran)
<b>Cost of Equity (Rounded)</b>	<b>10.13%</b>

Considering the parameters in determining the CAPM, the risk free rate and market return are based on the parameter of Hong Kong market, which is different from LongLiLiLong. Hence a country risk premium is considered to adjust CAPM to reflect the cost of equity of the Company. Per the latest research on country risk premium performed by Dr. Aswath Damodaran ([http://pages.stern.nyu.edu/~adamodar/New\\_Home\\_Page/datafile/ctryprem.html](http://pages.stern.nyu.edu/~adamodar/New_Home_Page/datafile/ctryprem.html)), the country risk premium to adjust from Hong Kong market to China market is 0.29%. We thus apply 0.29% as country risk premium in this valuation exercise.

As suggested by "Marketability and Value: Measuring the Illiquidity Discount", a 4% of general liquidity premium is normally applied for general industrial companies. Since the liquidity premium in this study is estimated using the returns of venture capital investor over the return on traded stocks, while venture capital investors usually focus on emerging and fast growing industry. Having considered the characteristics of the expressway industry, which is a defensive industry, the cash flow of an expressway company is believed more stable than other industry. We believe the liquidity premium for expressway industry could be substantially lower than the rate adopted

To calculate the cost of equity of the Company, we have considered country risk premium and liquidity premium besides CAPM result to justify the unique risk attached with the Company compared with risk of comparable companies. These risks are referred to various research paper and we have made assessment on the assumption adopted in the research and adjustment of the risks to make sure the risks applied are reasonable and justified.

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in the research. We thus, applied 2% as illiquidity premium in this valuation exercise.

**SENSITIVITY ANALYSES**

Discount Rate

The following table summarize the resulting values based on changes of discount rate:

Discount Rate (%)	Fair Value (RMB million)
10.63%	237
10.13%	239
9.63%	240



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#### VALUATION COMMENTS

The conclusion of value is based on accepted valuation procedures and practices that rely substantially on the use of numerous assumptions and the consideration of many uncertainties, not all of which can be easily quantified or ascertained. Further, while the assumptions and consideration of such matters are considered by us to be reasonable, they are inherently subject to significant business, economic and competitive uncertainties and contingencies, many of which are beyond the control of LongLiLiLing, the Company and Jones Lang LaSalle Corporate Appraisal and Advisory Limited.

We do not intend to express any opinion on matters which require legal or other specialized expertise or knowledge, beyond what is customarily employed by valuers. Our conclusions assume continuation of prudent management of LongLiLiLing over whatever period of time that is reasonable and necessary to maintain the character and integrity of the assets valued.

We are instructed to provide our opinion of value as per the valuation date only. It is based on economic, market and other conditions as they exist on, and information made available to us as of, the valuation date and we assume no obligation to update or otherwise revise these materials for events in the time since then. In particular, it has come to our attention that since the Valuation Date, the outbreak of Novel Coronavirus disease (COVID-19) has caused significant disruption to economic activities around the world. It may also have a negative impact towards investment sentiment, and hence any form of required rate of return as well as liquidity of any asset. As of the Report Date, it is uncertain how long the disruption will last and to what extent it will affect the economy. As a result, it has caused volatility and uncertainty that values may change significantly and unexpectedly even over short periods. The period required to negotiate a transaction may also extend considerably beyond the normally expected period, which would also reflect the nature and size of the asset. Readers are reminded that we do not intend to provide an opinion of value as of any date after the Valuation Date in this Report.

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## RISK FACTORS

### ➤ Traffic Volume

Traffic volume is affected by a number of factors including alternative means of transport, toll rates, fuel prices, and general economic conditions in the region. Any significant change in these factors could have a material impact on the profitability of the toll road. Furthermore, any major maintenance in the near future will also affect the traffic volume of LongLiLiLong.

### ➤ Traffic Forecast

The forecast traffic flow and revenue of LongLiLiLong are affected by a number of statistical factors, including the selection of samples, variance of independent variables, stability of correlations, etc. Any development in the future which deviates from the historical trends may affect the value of LongLiLiLong.

### ➤ Uncertainty of Market Competition

The profitability of LongLiLiLong may be affected by the existence of other means of transportation, including railways and planes and alternative routes to the toll roads. There can be no assurance that better quality competing roads which may allow for higher travelling speed and lower or even free tolls will not be built in the latter years of this projection.

### ➤ Toll Rate Increase

The profitability of LongLiLiLong is affected by the possibility of toll rate increases in the future. Any application for increase in the toll rate is required to be approved by local authorities. Any deviation from the estimated toll rate increase applied in this valuation will affect the resulting value.

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**OPINION OF VALUE**

Based on the results of our investigation and analysis outlined in the report which follows, we are of the opinion that the fair value of 100 percent equity interest in LongLiLiLong as at the Valuation Date is reasonably stated as below:

<b>Valuation Date</b>	<b>Fair Value of 100 Percent Equity Interest (RMB '000)</b>
<b>31 August 2020</b>	<b>239,000</b>

**LIMITING CONDITIONS**

This report and opinion of values are subject to our Limiting Conditions as included in Exhibit A of this report.

Yours faithfully,  
 for and on behalf of

**Jones Lang LaSalle Corporate Appraisal and Advisory Limited**

**Simon M.K. Chan**  
 Executive Director

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**EXHIBIT A – LIMITING CONDITIONS**

1. In the preparation of our reports, we relied on the accuracy, completeness and reasonableness of the financial information, forecast, assumptions and other data provided to us by the Company/engagement parties and/or its representatives. We did not carry out any work in the nature of an audit and neither are we required to express an audit or viability opinion. We take no responsibility for the accuracy of such information. Our reports were used as part of the Company's/engagement parties' analysis in reaching their conclusion of value and due to the above reasons, the ultimate responsibility of the derived value of the subject property rests solely with the Company/engagement parties.
2. We have explained as part of our service engagement procedure that it is the director's responsibility to ensure proper books of accounts are maintained, and the financial information and forecast give a true and fair view and have been prepared in accordance with the relevant standards and companies ordinance.
3. Public information and industry and statistical information have been obtained from sources we deem to be reputable; however we make no representation as to the accuracy or completeness of such information, and have accepted the information without any verification.
4. The management and the Board of the Company/engagement parties have reviewed and agreed on the report and confirmed that the basis, assumptions, calculations and results are appropriate and reasonable.
5. Jones Lang LaSalle Corporate Appraisal and Advisory Limited shall not be required to give testimony or attendance in court or to any government agency by reason of this exercise, with reference to the project described herein. Should there be any kind of subsequent services required, the corresponding expenses and time costs will be reimbursed from you. Such kind of additional work may incur without prior notification to you.
6. No opinion is intended to be expressed for matters which require legal or other specialised expertise, which is out of valuers' capacity.
7. The use of and/or the validity of the report is subject to the terms of engagement letter/proposal and the full settlement of the fees and all the expenses.
8. Our conclusions assume continuation of prudent and effective management policies over whatever period of time that is considered to be necessary in order to maintain the character and integrity of the assets valued.

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9. We assume that there are no hidden or unexpected conditions associated with the subject matter under review that might adversely affect the reported review result. Further, we assume no responsibility for changes in market conditions, government policy or other conditions after the Valuation/Reference Date. We cannot provide assurance on the achievability of the results forecasted by the Company/engagement parties because events and circumstances frequently do not occur as expected; difference between actual and expected results may be material; and achievement of the forecasted results is dependent on actions, plans and assumptions of management.

10. This report has been prepared solely for internal use purpose. The report should not be otherwise referred to, in whole or in part, or quoted in any document, circular or statement in any manner, or distributed in whole or in part or copied to any third party without our prior written consent. Even with our prior written consent for such, we are not be liable to any third party except for our client for this report. Our client should remind of any third party who will receive this report and the client will need to undertake any consequences resulted from the use of this report by the third party. We shall not under any circumstances whatsoever be liable to any third party.

11. This report is confidential to the client and the calculation of values expressed herein is valid only for the purpose stated in the engagement letter/or proposal as of the Valuation / Reference Date.

In accordance with our standard practice, we must state that this report and exercise is for the use only by the party to whom it is addressed to and no responsibility is accepted with respect to any third party for the whole or any part of its contents.

12. Where a distinct and definite representation has been made to us by party/parties interested in the assets valued, we are entitled to rely on that representation without further investigation into the veracity of the representation.

13. You agree to indemnify and hold us and our personnel harmless against and from any and all losses, claims, actions, damages, expenses or liabilities, including reasonable attorney's fees, to which we may become subjects in connection with this engagement. Our maximum liability relating to services rendered under this engagement (regardless of form of action, whether in contract, negligence or otherwise) shall be limited to the fee paid to us for the portion of its services or work products giving rise to liability. In no event shall we be liable for consequential, special, incidental or punitive loss, damage or expense (including without limitation, lost profits, opportunity costs, etc.), even if it has been advised of their possible existence.

14. We are not environmental, structural or engineering consultants or auditors, and we take no responsibility for any related actual or potential liabilities exist, and the effect on the value of the asset is encouraged to obtain a professional assessment. We do not

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- conduct or provide such kind of assessments and have not considered the potential impact to the subject property.
15. This exercise is premised in part on the historical financial information and future forecast provided by the management of the Company/engagement parties and/or its representatives. We have assumed the accuracy and reasonableness of the information provided and relied to a considerable extent on such information in our calculation of value. Since projections relate to the future, there will usually be differences between projections and actual results and in some cases, those variances may be material. Accordingly, to the extent any of the above mentioned information requires adjustments, the resulting value may differ significantly.
16. This report and the conclusion of values arrived at herein are for the exclusive use of our client for the sole and specific purposes as noted herein. Furthermore, the report and conclusion of values are not intended by the author, and should not be construed by the reader, to be investment advice or as financing or transaction reference in any manner whatsoever. The conclusion of values represents the consideration based on the information furnished by the Company/engagement parties and other sources. Actual transactions involving the subject assets / business might be concluded at a higher or lower value, depending upon the circumstances of the transaction and the business, and the knowledge and motivation of the buyers and sellers at that time.
17. The management or staff of the Company/engagement parties and/or its representatives have confirmed to us that the transaction or themselves or the parties involved in the pertained assets or transaction are independent to our firm and JLL in this valuation or calculation exercise. Should there be any conflict of interest or potential independence issue that may affect our independency in our work, the Company/engagement parties and/or its representatives should inform us immediately and we may need to discontinue our work and we may charge our fee to the extent of our work performed or our manpower withheld or engaged.

Zhejiang Expressway Co., Ltd.

Valuation Report – 100 Percent Equity Interest in Zhejiang LongLiLiLong Expressway Co., Ltd.



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**EXHIBIT B – VALUERS’ PROFESSIONAL DECLARATION**

The following valuers certify, to the best of their knowledge and belief, that:

- Information has been obtained from sources that are believed to be reliable. All facts which have a bearing on the value concluded have been considered by the valuers and no important facts have been intentionally disregarded.
- The reported analyses, opinions, and conclusions are subject to the assumptions as stated in the report and based on the valuers’ personal, unbiased professional analyses, opinions, and conclusions. The valuation exercise is also bounded by the limiting conditions.
- The reported analyses, opinions, and conclusions are independent and objective.
- The valuers have no present or prospective interest in the asset that is the subject of this report, and have no personal interest or bias with respect to the parties involved.

- The valuers’ compensation is not contingent upon the amount of the value estimate, the attainment of a stipulated result, the occurrence of a subsequent event, or the reporting of a predetermined value or direction in value that favours the cause of the client.
- The analyses, opinions, and conclusions were developed, and this report has been prepared, in accordance with the International Valuation Standards published by the International Valuation Standards Council.
- The under mentioned persons provided professional assistance in the compilation of this report:

**Simon M. K. Chan**  
Executive Director

**Michael Q. Ding**  
Local Director

**Joyce J. Xu**  
Senior manager

Zhejiang Expressway Co., Ltd.

Valuation Report – 100 Percent Equity Interest in Zhejiang LongLiLong Expressway Co., Ltd.



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**EXHIBIT C – VALUATION MODEL**

**Business Equity Valuation**

Target Company: Zhejiang LongLiLiLong Expressway Co., Ltd.  
Client: Zhejiang Expressway  
Valuation Date: 8/31/2020  
Unit: RMB '000

	2020	9-12E	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	2032E
For the Projected 12 Months Ending December 31														
Revenue	221,330	748,172	799,638	857,535	914,591	972,448	1,031,843	1,091,320	1,153,880	1,209,929	1,262,003	1,320,300	1,382,884	193,460
Cost of Service	(331,504)	(763,212)	(772,903)	(815,949)	(840,731)	(869,831)	(899,958)	(929,730)	(958,293)	(983,790)	(1,009,329)	(1,034,833)	(1,060,384)	(182,569)
Surplus	(112,174)	(315,040)	(73,265)	(58,414)	(26,140)	(97,383)	(168,115)	(238,410)	(305,413)	(373,861)	(442,400)	(511,533)	(581,544)	(79,109)
Gross Profit	(11,450)	(16,970)	22,648	37,312	69,414	97,995	127,083	156,607	186,121	215,635	245,149	274,663	304,177	10,152
Management expense	(4,734)	(7,708)	(7,899)	(8,095)	(8,296)	(8,503)	(8,716)	(8,935)	(9,160)	(9,392)	(9,630)	(9,874)	(10,123)	(5,063)
EBIT (before fixed asset impairment dep. adjust)	(116,184)	(26,678)	14,750	29,218	61,118	89,492	118,367	147,672	177,007	206,345	235,637	264,933	294,230	5,089
Interest expense	(80,989)	(236,355)	(235,578)	(216,325)	(208,411)	(196,499)	(179,779)	(163,052)	(146,562)	(130,005)	(113,448)	(96,891)	(80,334)	(1,714)
EBT (before fixed asset impairment dep. adjust)	(197,173)	(263,033)	(220,828)	(187,107)	(147,294)	(107,007)	(52,412)	1,110	76,249	145,950	209,487	281,042	354,894	3,374
Fixed asset impairment dep. adjust	15,698	48,979	50,863	52,746	54,630	56,514	58,398	60,282	62,166	64,049	65,933	67,817	69,701	5,592
EBT (after fixed asset impairment dep. adjust)	(181,474)	(214,054)	(169,966)	(134,361)	(92,663)	(50,493)	5,986	61,392	138,415	209,999	275,430	343,229	414,595	8,967
Income Tax	-	-	-	-	-	-	-	-	-	-	-	-	-	(844)
Net Profit (before fixed asset impairment dep. adjust)	(197,173)	(263,033)	(220,828)	(187,107)	(147,294)	(107,007)	(52,412)	1,110	76,249	145,950	209,999	281,042	354,894	2,531
Net Profit (after fixed asset impairment dep. adjust)	(181,474)	(214,054)	(169,966)	(134,361)	(92,663)	(50,493)	5,986	61,392	138,415	209,999	275,430	343,229	414,595	8,123
<b>Cash Flow Adjust:</b>														
Add: dep.	173,095	532,816	537,376	553,689	572,640	595,372	619,371	642,468	661,604	681,793	702,036	722,335	742,684	149,216
Fixed asset impairment dep. adjust	(15,698)	(48,979)	(50,863)	(52,746)	(54,630)	(56,514)	(58,398)	(60,282)	(62,166)	(64,049)	(65,933)	(67,817)	(69,701)	(5,592)
Less: capex	(44,800)	(11,000)	(10,700)	(21,200)	(47,000)	(57,000)	(63,100)	(69,500)	(76,500)	(84,000)	(92,000)	(100,500)	(109,500)	(2,000)
Add: net borrowing	81,500	(244,500)	(282,500)	(339,000)	(389,130)	(425,000)	(450,000)	(475,000)	(500,000)	(525,000)	(550,000)	(575,000)	(600,000)	(79,000)
Less: net working capital change	6,384	(3,227)	865	7,792	4,091	5,062	5,518	5,401	5,284	5,167	5,050	4,933	4,816	(31,596)
Add: net working capital collect	-	-	-	-	-	-	-	-	-	-	-	-	-	(33,448)
<b>FCFE</b>	<b>18,906</b>	<b>11,056</b>	<b>14,212</b>	<b>14,173</b>	<b>13,308</b>	<b>11,428</b>	<b>9,378</b>	<b>10,730</b>	<b>11,739</b>	<b>9,385</b>	<b>10,215</b>	<b>8,055</b>	<b>5,702</b>	<b>5,702</b>
Date adjustment factor (mid-year)	0.17	0.83	1.83	2.83	3.83	4.83	5.83	6.83	7.83	8.83	9.83	10.83	11.83	12.83
Discount factor	0.98	0.82	0.64	0.46	0.29	0.13	0.05	0.02	0.01	0.01	0.01	0.01	0.01	0.01
PV of FCFE	18,604	10,202	11,908	10,783	9,193	7,168	5,341	5,549	5,513	4,002	3,955	2,832	1,820	1,820
<b>FCFE Valuation Summary</b>														
NPV of FCFE Forecasts														
Add: Cash														
Less: Non-operating asset														
<b>100% Equity Value</b>	<b>239,000</b>													

Zhejiang Expressway Co., Ltd.

Valuation Report – 100 Percent Equity Interest in Zhejiang LongLiLiLong Expressway Co., Ltd.



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## EXHIBIT D – BETA CALCULATION

Comparable Companies (HK)	Ticker	D/E	Levered Beta	Effective Tax Rate	Unlevered Beta
Sichuan Expressway Company Limited	107 HK	1.52	0.672	22.57%	0.309
Jiangsu Expressway Company Limited	177 HK	0.36	0.675	22.12%	0.527
Shenzhen Expressway Company Limited	548 HK	0.62	0.693	0.00%	0.428
Zhejiang Expressway Co., Ltd.	576 HK	1.73	0.789	23.44%	0.339
Shenzhen Investment Holdings Bay Area Development Company Limited	737 HK	0.03	0.606	6.43%	0.589
Anhui Expressway Company Limited	995 HK	0.24	0.762	32.14%	0.655
Yuexiu Transport Infrastructure Limited	1052 HK	1.77	0.648	16.07%	0.261
Chengdu Expressway Co., Ltd.	1785 HK	1.00	0.539	17.64%	0.296
Median Unlevered Beta					0.384
D/E ratio					0.810
Tax Rate					0.250
<b>Levered Beta</b>					<b>0.617</b>

Zhejiang Expressway Co., Ltd.

Valuation Report – 100 Percent Equity Interest in Zhejiang LongLiLiLong Expressway Co., Ltd.





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# Zhejiang HangNing Expressway Traffic and Revenue Forecast Study

Final Report



施伟拔咨询（深圳）有限公司  
WB Group International



**Zhejiang Hangning Expressway  
Traffic and Revenue Forecast Study**

**Final Report**

**October 2020**

**WB Group Consulting (Shenzhen) Limited**



A handwritten signature in black ink, appearing to be 'DL'.

Version	Type	Date	Prepared by	Reviewed by	Approved by
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## 1 Introduction

### 1.1 Study Background

WB Group Consulting (Shenzhen) Company Limited (“the Consultant”) was commissioned by Zhejiang Expressway Company Limited (“Zhejiang Expressway Co. Ltd”) to conduct an independent study on the traffic volume and toll revenue forecasts on the HangNing Expressway in the Zhejiang Province. This report presents the final results of traffic volume and toll revenue forecasts from 2020 to 2032.

As an important section of the Yangtze-Shenzhen Expressway (G25), the HangNing Expressway is a crucial traffic trunk line in the Yangtze River Delta of Shanghai, Jiangsu and Zhejiang, and an important expressway connecting Jiangsu and Zhejiang Provinces. It is also the golden link between Nanjing and Hangzhou, the two provincial capitals for tourism activities.

The HangNing Expressway is 245.96 km long, and its Zhejiang Section (“the Project Highway”) is 98.961km long. It starts from the Fuziling of Changxing County, which is located at the boundary of Zhejiang and Jiangsu Provinces. It is connected with the Jiangsu Section of the HangNing Expressway to the south through Changxing County, Wuxing District, Deqing County, Yuhang District, and ended at the Nangzhuangdou Interchange of the Hangzhou Ring Road. The Zhejiang Section of the HangNing Expressway has a design speed of 120 Km/h. It was implemented in two phases. The first phase of the project, which is 34.335 km long from Wangjiabang to Qingshan, was completed and opened to traffic on December 27,2000, and the second phase, which is 64.626 km long, including sections from Hangzhou to Qingshan and from Wangjiabang to Fuziling, was completed and opened to traffic on November 28,2002.

The location of the Project Highway is shown in Figure 1-1.



**Figure1-1 Location of HangNing Expressway**

Source: Consultant,2020

## 1.2 Study Approach

Based on careful analysis on the characteristics of the Project Highway, the Consultant completed the tasks through different stages of works such as data collection, base year traffic characteristics analysis, development of traffic model, socio-economic assessments, and traffic & toll revenue forecasting. The overall study approach consists of the following tasks.

**Step1: Mobilization and Data Collection**— It involved the collection of all available data and information of the Project Highway, the socio-economic and the transportation data of the Zhejiang Province, the Hangzhou City, the Huzhou City, the Jiangsu Province and the Shanghai City. These informations included future goals regarding economic and transport developments in the study area.

**Step2: Base Year Traffic Condition Analysis** - Using the data and information obtained, the Consultant established and evaluated the traffic conditions along the Project Highway. Based on the analysis of the collected traffic data on the Project Highway, the Consultant estimated the 2019 annual average daily traffic (AADT) volumes of the Project Highway. Time values and operating costs were also estimated in this stage.

Step 3: Transport Network Development — This step was to create a computer simulation model to replicate the current traffic conditions along the Project Highway. The EMME/3 traffic model system was used to establish the road network and the subsequent adjustments and evaluations.

Step 4: Socio-economic Assessments — Socio-economic assessments of the Zhejiang Province and adjacent cities were other important elements of the Study. The Consultant conducted analysis and assessments on the latest and available government data. The purpose was to find the relationships between socio-economic statistics and historical traffic flows. The more and detailed data are available, the more reliable relationship functions could be established.

Step 5: Transport Model Development — Steps 2 to 4 provided basic data to develop a transport model for this Study. The remaining tasks were to design a transport assignment model to conduct typical toll road traffic diversion and assignment tasks. The calibrated model should generate traffic flows and conditions that would be similar to the actual traffic conditions. In the Study, the assignments of future traffic flows were adjusted according to the results in Task 5.

Step 6: Traffic and Toll Revenue Analysis — When future year network assumptions, socio-economic conditions, economic developments, inflations and toll strategies were finalized and verified, detailed traffic and toll revenue analyses could be conducted. The consensus of the assumptions listed above would be regarded as the main model assumptions.

### 1.3 Basis of Traffic Forecasts

The Consultant received the station-to-station traffic data on the Project Highway from the Zhejiang Expressway Co., Ltd. from 16th to 22<sup>nd</sup> of June in 2018 and 2019. These data included each entry and exiting vehicle on the HangNing Expressway, including its entry time and station, exit time and station, vehicle type, toll charge and gross weight (truck). These data represented the latest traffic situations in a normal week and would enable the Consultant to understand the traffic composition, the origins and destinations of the and the average travelled distances of the vehicles.

The advantages of using flow data from surveys to derive traffic distribution on the highway, are:

- The information was recorded by electronic equipment instead of field survey, which eliminated the disturbance to normal traffic operation;
- The information was extracted directly from the expressway's toll clearing system which could avoid manual input error such as OD recording and coding errors. It enhanced data accuracy;
- The information was recorded at 24 hours per day (i.e. sampling rate was almost



100% except non-permit vehicles);

- It eliminated the problems associated with survey sampling discrepancies and manual collection mistakes would be eliminated.

Besides the station-to-station traffic data on the HangNing Expressway, the Consultant also collected the following data from the Zhejiang Expressway Co. Ltd. in order to analyze the historical traffic variations on the Project Highway.

1. The sectional mileage, number of lanes, toll lanes at stations and connecting roads on the Project Highway;
2. Toll charging scheme, the recent changes in charging policies and traffic management measures on the Project Highway;
3. From January 2013 to December 2019, monthly traffic volumes by vehicle types at all 11 toll stations on the Project Highway;
4. From January 2013 to December 2019, monthly traffic volumes by road section vehicle types and directions on the Project Highway;
5. From January 2013 to December 2019, monthly toll incomes after clearance on the Project Highway.

Although OD survey was not carried out in this study due to time and other constraints, the station-to-station traffic data of the HangNing Expressway can be adopted as a reliable data source to accurately reflect the traffic patterns. The elasticity ratios were also developed based on the historical traffic volumes on Project Highway and the related economic growth patterns in the study area. The traffic and revenue forecasting results from this model could be regarded as reliable.

#### 1.4 Report Structure

This report presents the final forecasting results of traffic volumes and toll revenues on the HangNing Expressway. The report structure is presented as follows: Chapter 1 is the introduction of the Project Highway. Chapter 2 describes the details of the economic and traffic development of the regions along the project corridor. Chapter 3 discusses the development of the transport forecasting model. Chapter 4 summarizes the results of traffic volume and toll revenue forecasts on the Project Highway.

## 2 Existing Conditions of Project Highway Affected Area

### 2.1 Existing Development Region along Project Highway

#### 2.1.1 Socio-economic Development in Zhejiang Province

Zhejiang Province is located in the southern part of Yangtze River Delta of the southeast coast of China. It is bounded by East China Sea to the east, Fujian Province to the south, Jiangxi and Anhui Province to the west, and Shanghai and Jiangsu Province to the north. Zhejiang Province is one of the greatest economic development vitalities in China. Since the economy reform and market opening up, people in Zhejiang Province have been working hard to seize opportunities, deepen economic reform, expand the market opening up, and promote the development of the "Economic Province". The overall strength of Zhejiang Province has increased dramatically. The main socio-economic data of Zhejiang Province were shown on Tables 2-1 to 2-5.

#### Population in Zhejiang Province

**Table2-1 Historical Permanent Resident Population in Zhejiang Province**

Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
<b>Permanent Population (10,000)</b>	5275.5	5446.5	5463.0	5477.0	5498.0	5508.0	5539.0	5590.0	5657.0	5737.0

Source: Zhejiang Province Statistical Yearbook 2019

#### Gross Domestic Product (GDP) in Zhejiang Province

**Table2-2 Historical GDP in Zhejiang Province**

Year	GDP (RMB 100 million)	Growth	Primary industry	Secondary industry	Tertiary industry	GDP Per Capita (RMB)
2009	22998.24	8.9%	1163.08	11860.16	9975.01	43857
2010	27747.65	11.9%	1360.56	14187.36	12199.74	51758
2011	32363.38	9.0%	1583.04	16331.27	14449.07	59331
2012	34739.13	8.0%	1667.88	17000.09	16071.16	63508
2013	37756.58	8.2%	1760.34	18047.52	17948.72	68805
2014	40173.03	7.6%	1777.18	19175.06	19220.79	73002
2015	42886.49	8.0%	1832.91	19711.67	21341.91	77644
2016	47251.36	7.6%	1965.18	21194.61	24091.57	84916

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Year	GDP (RMB 100 million)	Growth	Primary industry	Secondary industry	Tertiary industry	GDP Per Capita (RMB)
2017	51768.26	7.8%	1933.92	22232.08	27602.26	92057
2018	56197.15	7.1%	1967.01	23505.88	30724.26	98643

Source: Zhejiang Province Statistical Yearbook 2019

**Car Ownership in Zhejiang Province****Table2-3 Historical Car Ownership in Zhejiang Province (Unit: Vehicle)**

Year	Passenger Car	Truck	Others	Total Vehicles
2009	3514725	766460	51846	4333031
2010	4508344	872865	54509	5435718
2011	5555814	969984	56647	6582445
2012	6640840	1050189	58060	7749089
2013	7850003	1123643	59398	9033044
2014	8959921	1115620	56595	10132136
2015	10124578	1039966	51739	11216283
2016	11403051	1128714	51693	12583458
2017	12668371	1245274	52845	13966490
2018	13913234	1367849	56193	15337276

Source: Zhejiang Province Statistical Yearbook (2010-2019)

**Passenger and Freight Traffic in Zhejiang Province****Table2-4 Passenger and Freight Traffic in Zhejiang Province**

Year	Passengers (10,000)	Passenger Turnover (100 million passenger-km)	Freight Volume (10,000 tons)	Freight Turnover (100 million ton-km)
2009	210584	853.63	95802	1188.70
2010	215708	882.04	103394	1298.71
2011	218415	908.15	108654	1434.82
2012	220517	921.18	113393	1525.59
2013	121185	582.99	107186	1322.13



Year	Passengers (10,000)	Passenger Turnover (100 million passenger-km)	Freight Volume (10,000 tons)	Freight Turnover (100 million ton-km)
2014	112915	558.06	117070	1419.43
2015	92304	544.76	122547	1513.92
2016	83033	465.12	133999	1626.78
2017	80099	431.56	151920	1821.21
2018	72013	402.80	166533	1964.10

Source: Zhejiang Province Statistical Yearbook 2019  
 Note: New statistical method was adopted since 2013

### Port Cargo Throughput in Zhejiang Province

**Table2-5 Historical Port Cargo Throughput in Zhejiang Province**

Year	Coastal Port (10,000 tons)	Inland Port (10,000 tons)	Container Throughput (10,000 standard units)
2009	71462	32282	1110.59
2010	78846	33941	1388.76
2011	86700	35673	1563.27
2012	92760	39171	1709.08
2013	100591	37459	1852.09
2014	108177	30894	2061.41
2015	109930	28206	2176.76
2016	114202	26664	2276.04
2017	125744	33088	2460.32
2018	133534	35676	2635.00

Source: Zhejiang Province Statistical Yearbook 2019, Zhejiang Province Social and Economic Development Statistical Bulletin, 2018

Note: Container throughput is based on the total container throughput of Ningbo-Zhoushan Port, Wenzhou Port, Taizhou Port and Jiaxing Port

#### **2.1.2 Socio-economic Development in Hangzhou City**

Hangzhou City is located on the southeast coast of China, at the northern part of Zhejiang Province, along the northern bank of the lower reaches of the Qiantang River, and at the southern end of the Beijing-Hangzhou Grand Canal. It is also the provincial capital of the Zhejiang Province. It occupies an area of 16,596 square kilometers. Hangzhou is a pivotal city for national communications, e-commerce, e-government and digital TV applications, as well as a national software and an integrated circuit design base. Hangzhou City is



committed to build a “Binjiang Paradise Silicon Valley”. The high-tech industry, led by information on new medicine, environmental protection and green materials, has generated a good momentum for future development of Hangzhou City. The main social-economic data of Hangzhou City were shown in Tables 2-6 to 2-9.

### Population in Hangzhou City

**Table 2-6 Historical Permanent Population in Hangzhou City**

Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
<b>Permanent Population (10,000)</b>	810.00	689.12	873.80	880.20	884.40	889.20	901.80	918.80	946.80	980.60

Source: Hangzhou City Social and Economic Development Statistical Bulletin, 2009-2018

### Gross Domestic Product (GDP) in Hangzhou City

**Table 2-7 Historical GDP in Hangzhou City**

Year	GDP (100 million RMB)	Growth	Primary Industry	Secondary Industry	Tertiary Industry	GDP Per Capita (RMB)
2009	5111.40	10.0%	190.51	2365.76	2555.13	61821
2010	5965.71	12.0%	208.41	2819.81	2937.49	70024
2011	7037.28	10.1%	236.77	3280.52	3519.99	80689
2012	7833.62	9.0%	255.11	3500.13	4078.37	89323
2013	8398.58	8.0%	261.60	3574.25	4562.73	95190
2014	9206.16	8.2%	274.35	3845.58	5086.24	103813
2015	10050.21	10.2%	287.95	3909.01	5853.25	112230
2016	11313.72	9.6%	304.21	4120.93	6888.59	124286
2017	12603.36	8.1%	311.08	4362.48	7929.80	135113
2018	13509.15	6.7%	305.51	4571.93	8631.71	140180

Source: Hangzhou City Statistical Yearbook 2019

**Car Ownership in Hangzhou City****Table 2-8 Historical Car Ownership in Hangzhou City (Unit: Vehicle)**

Year	Passenger Car	Trucks	Others	Total Vehicles
2009	842384	140624	10011	993019
2010	1076983	155546	10558	1243087
2011	1313307	171039	11157	1495503
2012	1570099	179399	11503	1761001
2013	1860794	173227	11597	2045618
2014	1992112	180475	11413	2184000
2015	2056143	177674	10950	2244767
2016	2127393	202775	11368	2341536
2017	2210376	229038	11812	2451226
2018	2310070	248614	12546	2571230

Source: Hangzhou City Statistical Yearbook (2010-2019)

**Passenger and Freight Traffic in Hangzhou City****Table 2-9 Passenger and Freight Traffic in Hangzhou City**

Year	Passengers (10,000)	Passenger Turnover (10,000 passenger-km)	Freight Volume (10,000 tons)	Freight Turnover (10,000 ton-km)
2009	26454	1316143	16536	1389556
2010	29671	1416057	19148	2153961
2011	30305	1522055	21755	2451057
2012	31126	1590435	23243	2643428
2013	30994	1566046	23884	2719204
2014	17431	1143750	23202	2760873
2015	16591	1078054	23800	3003728
2016	12282	936574	25194	3217983
2017	13019	897116	29378	3615581
2018	10027	821267	30593	3875561

Source: Hangzhou City Statistical Yearbook 2019

Note: New statistical method was adopted since 2014.



### 2.1.3 Socio-economic Development in Huzhou City

Huzhou City is a local city under the jurisdiction of the Zhejiang Province. It is a member of the Yangtze River Delta City Group and a central city in both the Hangzhou Bay and along the G60 Science and Technology Corridor. It is located to the north of Zhejiang Province, adjacent to Jiaxing to the east and Hangzhou to the south. It is adjacent to Guangde and Ningguo counties in the Anhui Province to the west and the Yixing City and Taihu Lake in Jiangsu Province to the north. It faces Suzhou and Wuxi across the Taihu Lake. Huzhou is located at the center of the Yangtze River Delta. It is the common hinterland of Shanghai, Hangzhou and Ningxia. It is a pivotal city connecting the north and south wings of the Yangtze River Delta as well as the eastern and central regions. It is 75 kilometers from Hangzhou, 130 kilometers from Shanghai and 220 kilometers from Nanjing. The main social and economic data of Huzhou City were shown in Tables 2-10 to 2-13.

#### Population in Huzhou City

**Table 2-10 Historical Resident Population in Huzhou City**

Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
<b>Population (10,000)</b>	259.17	259.98	261.05	262.38	262.49	263.78	263.71	264.84	266.14	267.06

Source: Huzhou City Statistical Yearbook 2019

#### Gross Domestic Product (GDP) in Huzhou City

**Table 2-11 Historical GDP in Huzhou City**

Year	GDP (RMB 100 million)	Growth	Primary Industry	Secondary Industry	Tertiary Industry	GDP Per Capita (RMB)
2009	1111.50	10.2%	89.74	617.76	404.00	39206
2010	1301.56	12.1%	104.61	714.61	482.34	50142
2011	1518.02	10.8%	116.02	824.55	578.26	58302
2012	1664.44	9.7%	122.65	883.79	658.01	57355
2013	1812.95	9.0%	119.80	934.58	758.56	62290
2014	1956.00	8.4%	120.34	999.10	836.56	66917
2015	2084.26	8.3%	122.60	1021.05	940.60	70893
2016	2284.37	7.6%	127.42	1099.47	1057.49	77110
2017	2476.13	8.5%	129.12	1171.75	1175.26	82952
2018	2719.07	8.1%	127.69	1273.63	1317.75	90304

Source: Huzhou City Statistical Yearbook, 2010-2019



**Car Ownership in Huzhou City****Table 2-12 Historical Car Ownership in Huzhou City (Unit: Vehicle)**

Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
<b>Car Ownership for Civil Use</b>	167741	218000	275450	338897	506647	471480	553092	642262	733755	812440

Source: Huzhou City Statistical Yearbook 2019

**Highways Passenger and Freight Volumes in Huzhou City****Table 2-13 Highways Passenger and Freight Volumes in Huzhou City**

Year	Passengers (10,000)	Passenger Turnover (10,000 passenger-km)	Freight Volume (10,000 tons)	Freight Turnover (10,000 ton-km)
2009	9735	324189	6332	329156
2010	9938	332719	6798	383672
2011	9962	337847	7129	436247
2012	9431	328203	7081	482758
2013	8325	283551	7192	529669
2014	6244	221026	7463	568898
2015	5976	208661	7819	602367
2016	4925	178259	8618	658185
2017	5166	171172	9817	773712
2018	5242	184204	11504	841179

Source: Huzhou City Statistical Yearbook 2019

Note: New statistical method was adopted since 2014.

**2.1.4 Socio-economic Development in Jiangsu Province**

Jiangsu Province is bordered with the Yellow Sea, Shanghai and the Zhejiang, Anhui and Shandong Provinces. The Yangtze River Delta Economic Zone, which is made up of the Jiangsu Province, Shanghai and the Zhejiang Province, has become one of the six major global city clusters. The per capita GDP, the regional development intensity and people's Livelihood Index (Dli) of the Jiangsu Province are ranked first among the Provinces. It has also achieved the "middle to upper" level standards of developed countries. The Jiangsu Province has a total area of 107,200 square kilometers, with a resident population of 80.507 million at the end of 2018. The main socio-economic data of Jiangsu Province were summarized in Tables 2-14 to 2-17.

**Population in Jiangsu Province****Table2-14 Historical Permanent Resident Population in Jiangsu Province**

Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Permanent Population (10,000)	7810.3	7869.3	7898.8	7920.0	7939.5	7960.1	7976.3	7998.6	8029.3	8050.7

Source: Jiangsu Province Statistical Yearbook 2019

**Gross Domestic Product (GDP) in Jiangsu Province****Table2-15 Historical GDP in Jiangsu Province**

Year	GDP (RMB 100 million)	Growth	Primary industry	Secondary industry	Tertiary industry	GDP Per Capita (RMB)
2009	34912.00	12.4%	2261.86	18939.12	13711.02	44837
2010	41971.34	12.7%	2540.10	22201.79	17229.45	53536
2011	49801.59	11.0%	3064.77	25790.21	20946.61	63167
2012	54888.84	10.2%	3418.29	27821.77	23648.78	69397
2013	60712.81	9.6%	3469.86	29888.45	27354.50	76563
2014	66150.64	8.7%	3634.33	31742.04	30774.27	83211
2015	71289.51	8.6%	3986.05	33031.06	34272.40	89468
2016	77388.28	7.8%	4077.18	34619.50	38691.60	96887
2017	85900.94	7.2%	4076.65	38654.85	43169.44	107189
2018	92595.40	6.7%	4141.72	41248.52	47205.16	115168

Source: Jiangsu Province Statistical Yearbook 2019

**Car Ownership in Jiangsu Province****Table2-16 Historical Car Ownership in Jiangsu Province (Unit: Vehicle)**

Year	Passenger Car	Truck	Others	Total Vehicles
2009	3705753	612318	262512	4580583
2010	4727833	725008	224280	5677121
2011	5865894	823920	194002	6883816
2012	7062709	892911	175588	8131208
2013	8405278	967900	170643	9543821

Year	Passenger Car	Truck	Others	Total Vehicles
2014	9911322	971682	156761	11039765
2015	11435703	903860	139037	12478600
2016	13267338	941706	136112	14345156
2017	14997212	1056452	140966	16194630
2018	16521036	1162403	148849	17832288

Source: Jiangsu Province Statistical Yearbook 2010-2019

### Passenger and Freight Traffic in Jiangsu Province

**Table2-17 Passenger and Freight Traffic in Jiangsu Province**

Year	Passengers (10,000)	Passenger Turnover (100 million passenger-km)	Cargo Volume (10,000 tons)	Cargo Turnover (100 million ton-km)
2009	191001	1058.01	104002	971.13
2010	215850	1196.59	123500	1149.10
2011	235673	1307.30	140803	1315.27
2012	255358	1418.40	153696	1452.45
2013	135555	847.28	103709	1790.40
2014	137270	852.00	114449	1978.50
2015	134553	835.00	113351	2072.96
2016	113493	779.98	117166	2140.33
2017	104566	746.89	128915	2377.90
2018	97025	716.64	139251	2544.35

Source: Jiangsu Province Statistical Yearbook 2019

Note: New statistical method was adopted since 2013

#### **2.1.5 Socio-economic Development in Shanghai**

Shanghai is the largest city and one of the four municipalities in China. Other than being a central city, it is also one of the largest economic, technology, industrial, financial, trade, exhibition and shipping centers in the nation. Located in the middle of the Chinese mainland coastline, Shanghai has the largest foreign trade ports and industrial base in China. It faces the island of Kyushu (Japan) across the water, Hangzhou Bay to the south, and Jiangsu and Zhejiang Provinces to the west. The main social and economic data of Shanghai were shown in Tables 2-18 to 2-22.

**Population in Shanghai****Table 2-18 Historical Resident Population in Shanghai**

Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Population (10,000)	2210.28	2302.66	2347.46	2380.43	2415.15	2425.68	2415.27	2419.70	2418.33	2423.78

Source: Shanghai Statistical Yearbook 2019

**Gross Domestic Product (GDP) in Shanghai****Table 2-19 Historical GDP growth in Shanghai**

Year	GDP (RMB 100 million)	Growth	Primary Industry	Secondary Industry	Tertiary Industry	GDP Per Capita (RMB)
2009	15287.56	8.4%	115.80	6143.59	9028.17	70273
2010	17436.85	10.2%	117.79	7376.81	9942.25	77275
2011	19539.07	8.3%	130.17	8128.44	11280.46	84037
2012	20558.98	7.5%	133.26	8063.93	12361.79	86969
2013	22264.06	7.9%	131.29	8147.16	13985.61	92852
2014	24068.20	7.1%	131.59	8434.97	15501.64	99438
2015	25659.18	7.0%	125.53	8259.03	17274.62	106009
2016	28183.51	6.8%	114.34	8406.28	19662.89	116582
2017	30632.99	6.9%	110.78	9330.67	21191.54	126634
2018	32679.87	6.6%	104.37	9732.54	22842.96	134982

Source: Shanghai Statistical Yearbook 2019

**Car Ownership in Shanghai****Table 2-20 Historical Car Ownership in Shanghai (Unit: 10,000 vehicles)**

Year	Passenger Cars	Trucks	Others	Total Vehicles
2009	124.90	22.19	0.20	147.30
2010	146.24	23.81	0.20	170.25
2011	163.91	24.83	6.21	194.96
2012	185.71	20.73	6.41	212.86
2013	207.99	20.14	6.97	235.10
2014	228.58	19.56	7.05	255.19
2015	256.26	19.49	6.57	282.32

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Year	Passenger Cars	Trucks	Others	Total Vehicles
2016	293.85	21.86	7.23	322.94
2017	328.17	30.81	2.04	361.02
2018	358.37	32.87	2.18	393.42

Source: Shanghai Statistical Yearbook 2019

**Highways Passenger and Freight Volumes in Shanghai****Table 2-21 Highways Passenger and Freight Volumes in Shanghai (Unit: Vehicle)**

Year	Passengers (10,000)	Passenger Turnover (100 million passenger-km)	Freight Volume (10,000 tons)	Freight Turnover (100 million ton-km)
2009	2995	99.57	37745	244
2010	3634	115.44	40890	266
2011	3477	106.74	42685	284
2012	3748	112.72	42911	288
2013	3720	108.71	43809	299
2014	3754	124.34	42848	301
2015	3766	125.45	40627	290
2016	3402	114.98	39055	282
2017	3419	116.67	39743	298
2018	3151	105.81	39595	299

Source: Shanghai Statistical Yearbook 2019

**Port Freight Throughput in Shanghai****Table 2-22 Port Freight Throughput in Shanghai**

Year	Port Freight Throughput (10,000 tons)	Container Throughput (10,000 standard units)
2009	59205	2500.2
2010	65339	2906.9
2011	72758	3173.9
2012	73559	3252.9
2013	77575	3361.7
2014	75529	3528.5
2015	71740	3653.7





Year	Port Freight Throughput (10,000 tons)	Container Throughput (10,000 standard units)
2016	70177	3713.3
2017	75051	4023.3
2018	73048	4201.0

Source: Shanghai Statistical Yearbook 2019

## 2.2 Historical Traffic and Toll Revenue Analysis on Project Highway

### 2.2.1 Historical Traffic Analysis on Project Highway

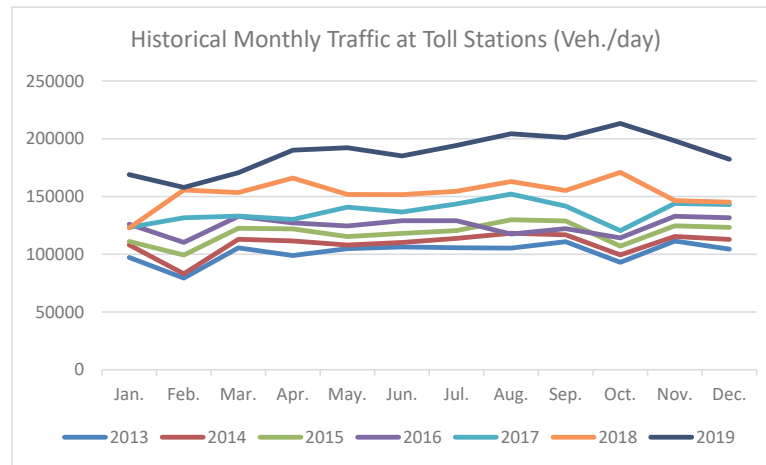
The Consultant collected the monthly traffic volume data by vehicle types (January 2013 to December 2019) from the Zhejiang Expressway Co. Ltd. Through analysis, it was found that the traffic volumes on the Project Highway have the following characteristics in the past years:

- The traffic volumes on the Project Highway were mainly passenger cars, accounting for more than 70% of the total traffic usage. Of the passenger cars, Class 1 accounted for 68.5%. The other main users were Truck Classes 1 & 5.
- Since 2013, the traffic volumes at the entrances and exits of the Project Highway increased steadily. Even in 2018 and 2019, the daily average traffic volumes increased by more than 10% under the conditions of the Project Highway widening construction works, which indicated the relatively strong traffic demands along the route and there's not many alternative paths available for the drivers.
- Because of the Project Highway widening construction works in May 2018, the section from Lijiexiang interchange to Nanzhuangdou interchange was closed to semi-trailers. This had negative impacts on the traffic volumes and revenues of the Project Highway, affecting mainly truck classes 4 & 5 and container trucks.

The traffic growth patterns at the 11 toll stations on the Project Highway in the past years were shown in Figure 2-1.

**Historical Monthly Traffic at Toll Stations**

**Figure2-1 Historical Monthly Traffic at Toll Stations**



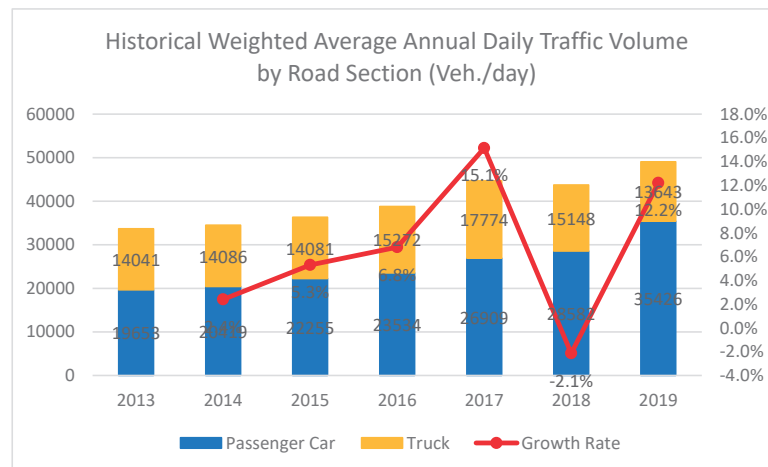
Source: Zhejiang Expressway Co., Ltd., 2020

Note: there were 10 toll stations in 2013. The Changxing toll station was opened in April 2014, and Deqingbei toll station was opened in December 2016.

**Historical Traffic Volumes by Cross Sections**

According to the traffic data collected from the Zhejiang Expressway Co. Ltd., the weighted annual average daily traffic volumes by road sections on the Project Highway from 2013 to 2019 were shown in Figure 2-2.

**Figure2-2 Historical Weighted Annual Average Daily Traffic Volumes by Road Sections**



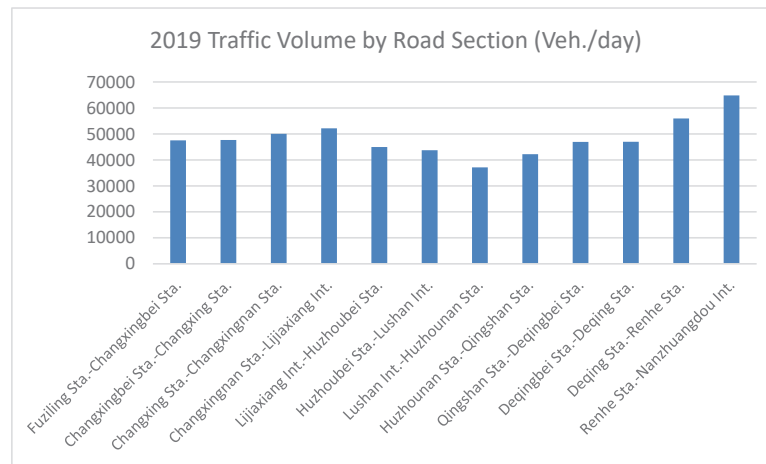
Source: Zhejiang Expressway Co., Ltd., 2020



**Base Year Traffic Volumes and Vehicle Composition by Cross Sections**

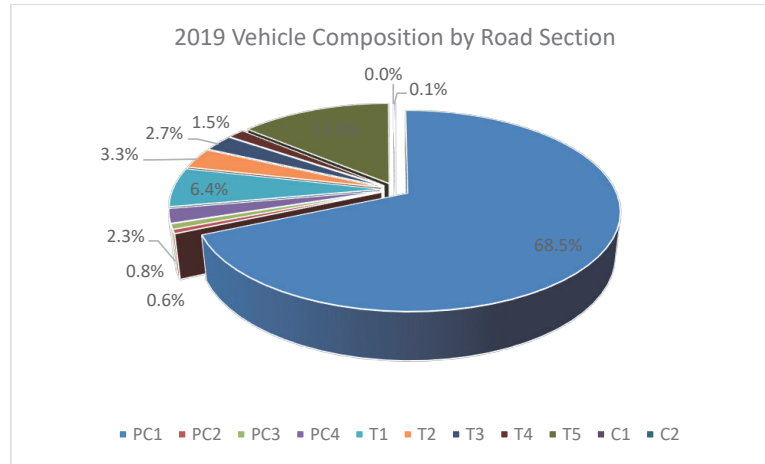
According to traffic data provided by the Zhejiang Expressway Company Limited, the sectional traffic volumes in 2019 and the vehicle composition of weighted average traffic volumes were shown in Figure 2-3 and Figure 2-4 respectively. According to the distribution of traffic volumes on the Project Highway, the closer to major cities, such as the Hangzhou City and the Huzhou City, the higher the traffic volumes were recorded. According to the vehicle composition, the top three categories were Passenger Car – Class 1, Truck - Class 1 and Truck – Class 5. They accounted for 68.5%, 13.8% and 6.4% respectively. The significant decreases in the truck traffic when compared with the previous yearss were due to the widening works on the Project Highway from May 2018. The partial banning of medium and large trucks in some directions and during some time periods, had resulted in significant increases in the passenger car traffic by 2019. In 2017, passenger cars and trucks constituted only 60.2% and 39.8% respectively.

**Figure2-3 Traffic Volumes by Road Sections in 2019**



Source: Zhejiang Expressway Co., Ltd. , 2020

Figure2-4 Vehicle Composition of Traffic by Road Sections in 2019



Source: Zhejiang Expressway Co., Ltd., 2020

Notes: According to the Vehicle Classification of the Toll for Highway, JT/T 489-2003 1, "PC1" to "PC4" refer to Passenger Car - Class 1 to Class 4 respectively, "T1" to "T5" refer to Truck - Class 1 to Class 5 respectively; "CV1" and "CV2" refer to 20 foot container vehicles and 40 foot container vehicles respectively.

2.2.2 Historical Toll Revenues on Project Highway

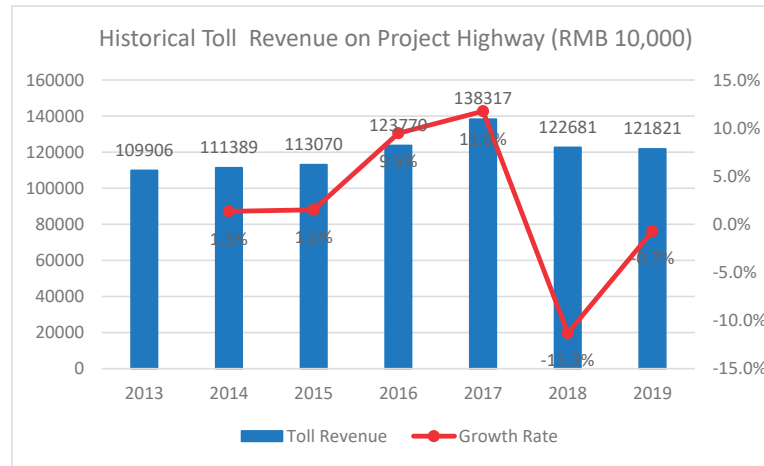
**Historical Toll Revenues**

In the past few years, the toll revenues of the Project Highway could be divided into three stages. From 2013 to 2015, the toll revenues maintained a compound annual growth rate of 1.4% due to the opening of Jiashao Bridge. From 2015 to 2017, toll revenues sustained a higher growth at a compound annual rate of 10.6%. The widening construction works on the Project Highway were initiated in May 2018, providing only limited access to medium and large trucks for certain directions and during certain time periods. These restrictions resulted in a negative growth of -11.3% in 2018.

<sup>1</sup>The definition of the Vehicle Classification of the Toll for Highway, JT/T 489-2003: Passenger Car 1 is a passenger car with no more than 7 seats; Passenger Car 2 with 8 to 19 seats, Passenger Car 3 with 20 to 39 seats; Passenger Car 4 with no less than 40 seats; Truck 1 is a truck with loading with no more than 2 tons; Truck 2 with 2 to 5 tons inclusive; Truck 3 with 5 to 10 tons inclusive; Truck 4 with 10 to 15 tons inclusive and 20 foot container truck; Truck 5 with no less than 15 tons and 40 foot container truck.



**Figure2-5 Historcial Toll Revenues on the Project Highway**



Source: Zhejiang Expressway Co., Ltd., 2020  
 Note: The toll revenues were pre tax incomes.

**Average Toll Charges of Various Vehicle Classifications**

Based on the two-week data collected on the Project Highway, the Consultant summarized the average toll charges for each vehicle classification. The results, based on the averages of all toll vehicles, were shown in the table below:

**Table 2-23 Average Charges of Vehicle Classifications (RMB/km)**

Class <sup>2</sup>	PC1	PC2	PC3	PC4	Truck1	Truck2	Truck3	Truck4	Truck5	Truck6	Truck7
Charge Rate	0.46	0.46	0.87	1.33	0.42	0.72	1.15	1.36	1.62	1.07	1.12

Source: Consultant, 2019  
 Note: the toll-free vehicles were included in average charge caculations.

<sup>2</sup> PC is the abbreviation of passenger car.

### 3 Traffic Forecast Model

This forecast study employed the four-stage model, commonly used in urban city traffic studies. Building this type of mathematical model needs a lot of data and time. Building a normal traffic forecast model for a medium or small city would need about half a year to a year. The general process of the model development is as follows:

- Trip generation: The main goal of this stage is to estimate the total trip productions of every zone based on population and trip rates, and the total attractions by the weighed employment figures;
- Trip distribution: To build O-D matrices based on the distribution functions derived from resident trip surveys or large-scale home interview surveys;
- Mode split: Calculating modal splits of trip making using binary or multinomial logit models;
- Trip Assignment: To carry out trip assignment using generalized cost.

The advantages of this kind of model is that it can accurately reflect the impacts of land use and population changes on travel needs. The limitations are usually due to insufficient modeling time and inadequate planning data, especially in China.

Considering the above-mentioned limitations and different forecasting needs, a simplified four-stage model, which is commonly used in inter-city traffic studies, was employed. The major difference is that this simplified model establishes traffic patterns and flows based on the results of traffic surveys that cover the study area and do not involve any modeling procedures or functions for the Mode Split. Traffic surveys normally include OD survey and station to station data collection.

In short, the simplified four-stage model generates trips and establishes trip distribution based on traffic surveys. It then forms several single-mode trip matrices which are used in trip assignment process using a computer road network. Because the data for trip generation and distribution were mainly derived from OD surveys or station-to-station records, detailed data verification and expansion procedures were required. Also, the verification of the computerized assignment model is another important factor for the forecasting accuracy.

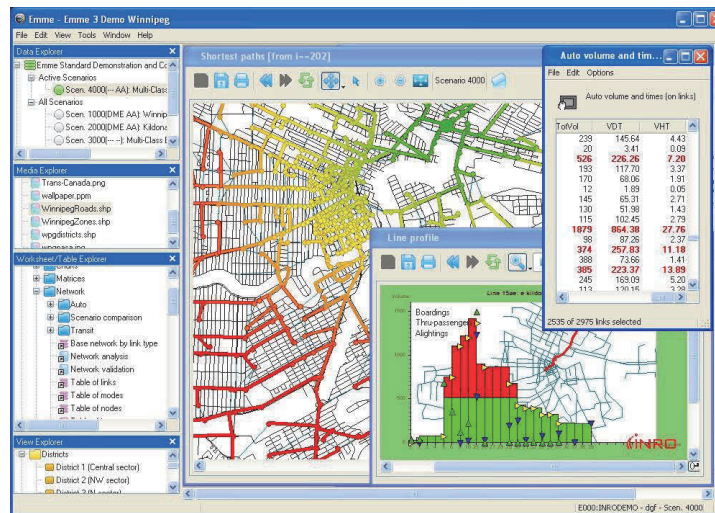
The consultant built the expressway network model for the Zhejiang Province, the Jiangsu Province and Shanghai in order to analyze future traffic needs on the Project Highway. This chapter presents a brief introduction of the traffic forecasting model.

### 3.1 Traffic Software—EMME/3

EMME/3 has been used to simulate traffic patterns on current road networks. As a reputable urban and regional transportation planning software, it provides a complete and flexible platform for travel demand modeling, network analysis and travel evaluation works. It was first introduced in 1976 by INRO, which was formerly known as the Transport Research Center of the Montreal University in Canada. Currently, EMME/3 is deemed to be the leading software in the transport planning industry with over 600 organizational users worldwide.

One of the reasons for the popularity of EMME/3 is that it allows the users to set up their own databases, supports quantitative analysis and carries out evaluation with preset variations. The input data includes transport infrastructures (e.g. road network), economic activities, social-economic characteristics, etc.

Figure3-1 Model Components of EMME/3



Source: Consultant, 2020

Once the database is set up, the user can perform transport planning by utilizing the strong capabilities of the software including interactive data input, visual presentation of assignment results and precise traffic engineering calculations.

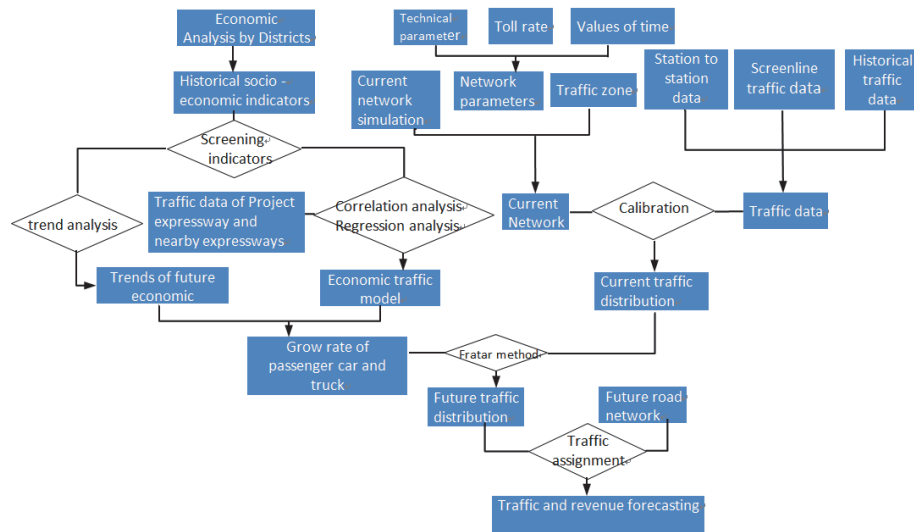
There are two main issues related to transport modeling: transport demand and transport supply. Transport supply refers to the availability of a road network. Transport demand implies the magnitude of travel (i.e. OD matrices) to be determined by the demand module, incorporated in the overall transport forecasting model. The “equilibrium” condition achieved during the modeling process means the transport demand and the transport supply are at a “balanced” state on the road facilities.

**3.2 Technical Approach to Traffic Modeling**

In order to accurately predict the future traffic volumes and revenue growth of the Project Highway, the Consultant established a complex socio-economic-traffic model, which was divided into two interrelated sub-models. They are:

- Economic Analysis Model: the driving factor for determining traffic growth;
- Traffic Forecasting Model: To check and distribute traffic flows, analyze traffic diversions and inducements.

**Figure3-2 Technical Approach to Traffic Modeling**



Source: Consultant,2020

**3.3 Economic-Traffic Model Analysis**

**3.3.1 Economic Analysis Zones**

In this study, the Consultant compared a number of socio-economic drivers to establish a more comprehensive economic-traffic model. Therefore, in the economic analysis, it included the following parts:

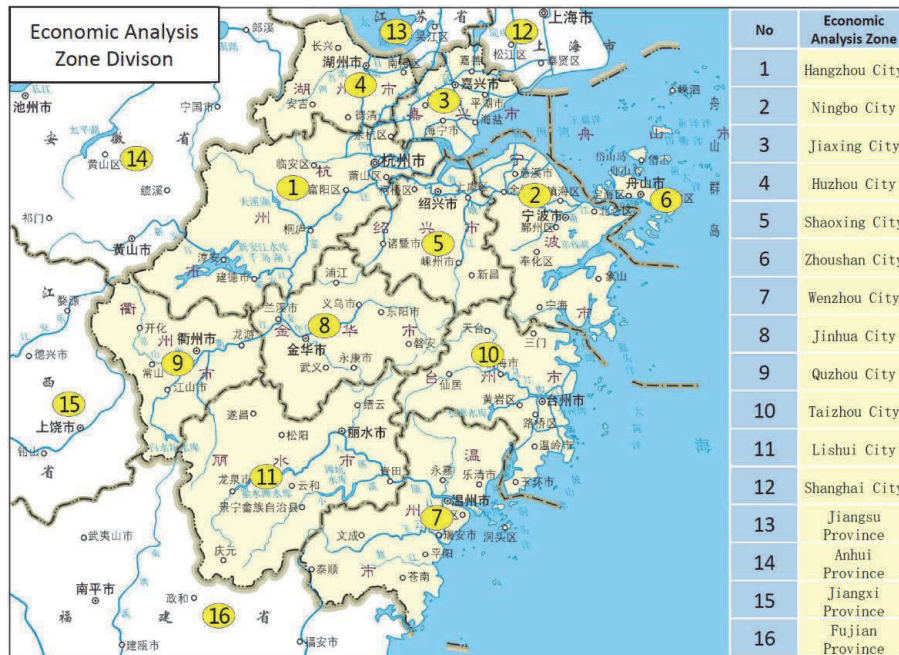
- Selection of Socio-Economic Indicators Related to Transportation;
- Correlation Between Economic Indicators and Traffic Growths through Regression Analysis;



- Analysis of the Elasticity Coefficient of the Economic Indicators and Traffic Growth
- Analysis of future growth trends of Economic Indicators.

In the study, it was necessary to conduct economic analysis on each of the Economic Analysis Zones (TAZ), to establish a regression model of TAZ traffic productions and the economic indicators, and to apply it to each of the TAZ. Because there were 436 TAZs, the amount of data and analysis would be extremely difficult and time consuming. Therefore, the Consultant decided to aggregate these TAZs into 16 superzones (Economic Analysis Zones), and to analyze their respective economic indicators. The Consultant collected the historical traffic volumes on the Project road and the nearby expressways, and established an economic-traffic prediction model between traffic demands and the economic indicators that were closely related to the Project Highway. By applying the growth trends of TAZ's economic indicators in the economic-traffic model, the Consultant was able to predict the future traffic growth of each TAZ. The 16 Economic Analysis Zones were shown in Figure 3-3 and Table 3-1:

Figure 3-3 Economic Analysis Zones



**Table 3-1 Jurisdiction of Economic Analysis Zones**

Middle Zone	Name	Jurisdiction
1	Hangzhou City	Hangzhou City and its counties
2	Ningbo City	Ningbo City and its counties
3	Jiaxing City	Jiaxing City and its counties
4	Huzhou City	Huzhou City and its counties
5	Shaoxing City	Shaoxing City and its counties
6	Zhoushan City	Zhoushan City and its counties
7	Wenzhou City	Wenzhou City and its counties
8	Jinhua City	Jinhua City and its counties
9	Quzhou City	Quzhou City and its counties
10	Taizhou City	Taizhou City and its counties
11	Lishui City	Lishui City and its counties
12	Shanghai	Shanghai and its counties
13	Jiangsu Province	Jiangsu Province and northern districts
14	Anhui Province	Anhui Province and northern districts
15	Jiangxi Province	Jiangxi Province and western districts
16	Fujian Province	Fujian Province and southern districts

Source: Consultant, 2020

### 3.3.2 Economic Indicators Analysis

A typical economic and traffic forecasting model uses the relationship developed between historic GDP growths and traffic demands to forecast future traffic generation. In order to be more comprehensive and scientific, the Consultant also investigated other economic parameters to develop more comprehensive economic-traffic correlations.

In order to investigate the impacts of different district economic parameters on traffic growth patterns (passenger cars and trucks) by various vehicle types, the historic traffic data by vehicle types at the toll station locations and the corresponding variations in the economic parameters were closely studied. The selected economic parameters were also prioritized before they were subjected to correlation and regression analyses (note: In the selection of the indicators, attention was also paid to the difficulties of obtaining the related data in each region):



- Passenger car Types 1 & 2 are basically small vehicles that are owned by individuals or units. The most relevant indicator for their growth in this Study was identified as: **Passenger Car Ownership**.
- Passenger car Types 3 & 4 are basically for inter-city passenger travel or tourist trips. The most relevant indicator for their growth was: **Road Passenger Traffic Volume**
- Truck Types 1-6 are basically self-used or for transport of bulk cargo goods. They have more relevant relationships with economic activities, product production and transport circulation industries. The most relevant indicator for their growth was: **GDP**.
- Truck Type 7 is for container trucks, which are mainly used for import and export trade transportation. The most relevant indicator for their growth was: **Port Container Throughput**.

After determining the relevant economic indicators for the growth of various vehicle types, the elasticity analysis of passenger and freight demands against economic growth was carried out. Finally, a economy-traffic growth model was developed.

$$Y_n = b \cdot (a \cdot X_1 + c)$$

Note: Dependent variable  $Y_n$  – traffic growths in different areas;

Independent variable  $X_1$ - Historic growth patterns of socio-economic parameters in Project Road influenced areas;

$a$ 、 $c$  - regression coefficients;

$b$  – correlation factor between time value and traffic volume.

Through the regression analysis, the values of various coefficients in the economic-traffic model were determined as follows:

**Table3-2 Parameters of Traffic Growth Model**

Vehicle Types <sup>3</sup>	a	$X_1$	c	b
Passenger Car Types 1 & 2	1.740	Passenger car ownership	0.014	0.85-1.00
Passenger Car Types 3 & 4	0.481	Road passenger travel	0.031	0.85-1.00
Truck Types 1 & 2	0.577	GDP	0.010	0.85-1.00
Truck Types 3 - 6	0.689	GDP	0.017	0.85-1.00
Container vehicles	0.509	Port container throughput	0.012	0.85-1.00

Source: Consultant,2020

<sup>3</sup>The new vehicle types are according to “the definition of toll highway vehicle classifications, JT/T 489-2019”, see Table 3-9.

### 3.3.3 Future Time Elasticity Coefficient Assumption

Based on foreign and domestic experience, the time adjustment factors of economic and traffic parameters would remain relatively stable in the coming 3-5 years. When the economy of a society is low, transportation demand would increase and hence economic growth would be more dependent on transportation services. Thus, the time adjustment factors would be relatively high. On the contrary, the time adjustment factors would diminish when the economy prospers to a certain level. The main reason for the decline is that rapid growth of high-tech industries and tertiary industries would normally go hand in hand with overall economic growth, this would likely reduce the dependence on transportation needs. This will in turn result in smaller transport demands to offset the persistent needs for transport services.

Through more than ten years of relevant working experience in mainland China, the Consultant completed traffic volume forecasting studies of many toll highways in Provinces such as Zhejiang, Northeast, Tianjin, Hebei, Jiangsu, Jiangxi, Guangdong, Sichuan, Shanghai, Anhui, etc. In particular, the Consultant has been actively involved in traffic volume and revenue forecasting works on numerous toll highways in the Zhejiang Province. From the previously completed toll highway studies, the Consultant attained data on traffic growth rates and GDP growth patterns. It can be concluded that the future time elasticity coefficients will be basically between “0.50-0.95”.

The time adjustment factors of the Project Highway for the coming years were estimated as shown in Table 3-3.

**Table3-3 Future Time Elasticity Coefficient (b)**

Vehicle Types	2019-2020	2021-2025	2026-2030	2031-2035
Passenger Car Types 1 & 2	1.00	0.95	0.90	0.85
Passenger Car Types 3 & 4	1.00	0.95	0.90	0.85
Truck Types 1 & 2	1.00	0.95	0.90	0.85
Truck Types 3 - 6	1.00	0.95	0.90	0.85
Container vehicles	1.00	0.95	0.90	0.85

Source: Consultant,2020

### 3.3.4 Future Development Trends of Economic Indicators

In general, it is difficult to predict the future growth patterns of the economic parameters. It may be unreasonable to adopt a uniform trend for all the economic parameters. Consequently, we determined the future growth trends of the parameters based on the following considerations:



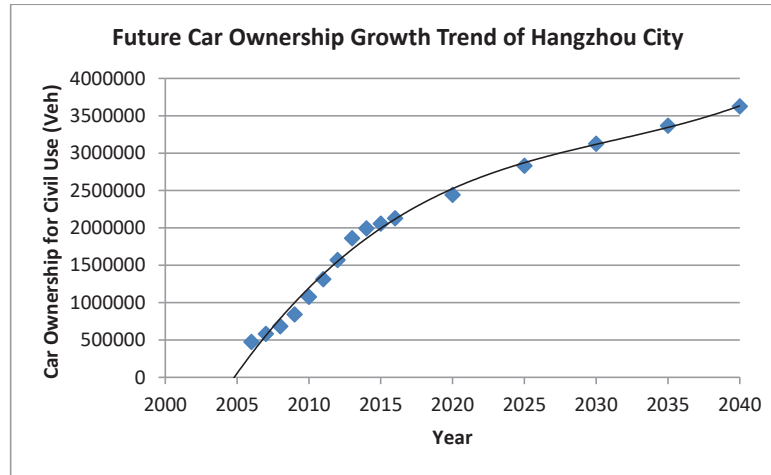
- To understand historic growth trends based on collection and assessment of historic data;
- To consult the “Thirteenth Five-Year Plan” : Referred to the goals and requirements for future growth in the Plan;
- To consult urban City Master Plans: Referred to the goals and requirements for future growth in relevant Master Plans;
- To compare experience on international and domestic urban city development processes around the world. Studied the changes in the economic parameter values for various phases of successful cities in developing countries.
- To investigate current and future planning guidelines of other industries.

#### **Future Trends of Selected Economic Indicators Analysis**

The future growth trends of the selected economic indicators of each TAZ are mainly based on the economic development goals and objectives of the 13th Five-Year Plan. The future economic development trends are expected to reflect the control points of the economic growth patterns, the development policies and the overall growth of the indicators in the next five years.

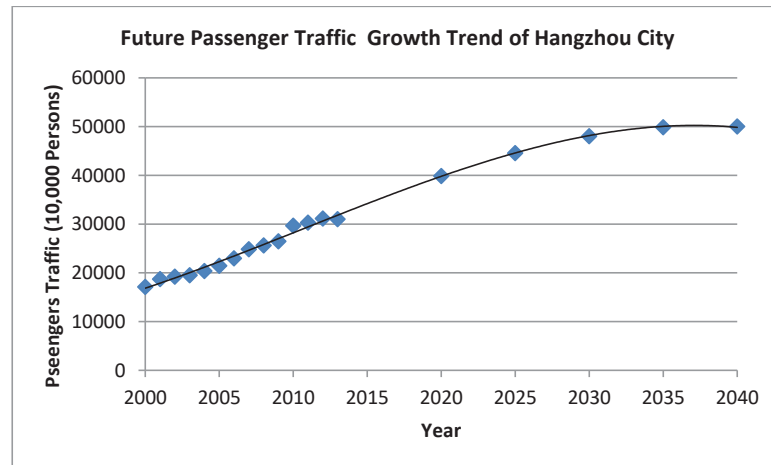
The understanding of the historic development, the future development patterns of each TAZ based on the "13th Five-Year Plan", and the development guidelines of local Master Plans would enable the Consultant to predict the annual average growth rates of the GDP. In the Zhejiang Province for the next 5 years, the GDP growth is expected to be between 7%-10%. A more stable future economic development trend will likely replace the more aggressive growth in the past. Figures 3-4 to 3-7 presented the economic indicators of Hangzhou and the container throughput of the Ningbo-Zhoushan Port respectively. The economic analysis of other TAZs was quite similar. In the future forecasting of economic growth trends, the Consultant also considered the various domestic growth development patterns of individual TAZs in recent years.

Figure3-4 Future Car Ownership Growth Trend of Hangzhou City



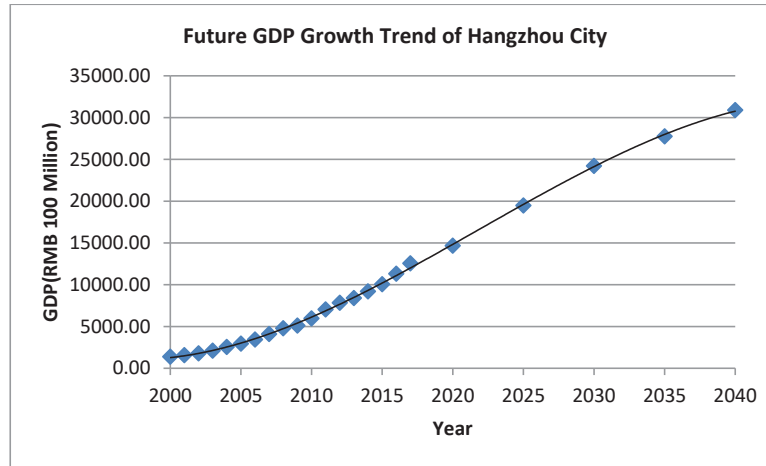
Source: Consultant, 2020

Figure3-5 Future Passenger Traffic Growth Trend of Hangzhou City



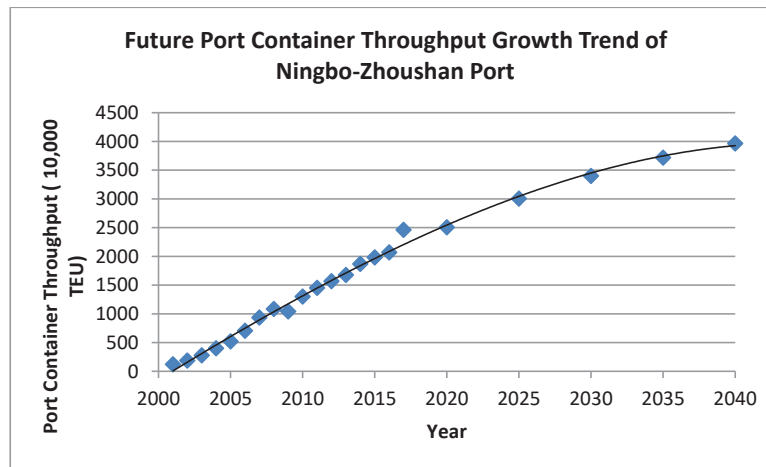
Source: Consultant, 2020

**Figure3-6 Future GDP Growth Trend of Hangzhou City**



Source: Consultant, 2020

**Figure3-7 Future Container Throughput Growth Trend of the Ningbo-Zhoushan Port**



Source: Consultant, 2020

Based on the above various planning and referencing exercises, the Consultant was able to determine the control values of future growth trends of the economic indicators. Combining with the results of the regression analysis (trending curve), the future growth trends of the economic indicators of the 16 TAZs were determined and summarized in Tables 3-4 to 3-7. Applying these growth patterns to the previously developed economic-traffic model, the future annual traffic growth rates for each corresponding TAZ were calculated.

**Table3-4 Future Assumptions of Passenger Car Ownership for Civil Use by TAZs**

TAZ	2019-2020	2021-2025	2026-2030	2031-2035
Hangzhou City	4.0%	4.0%	3.0%	2.5%
Ningbo City	9.0%	4.0%	3.0%	2.5%
Jiaying City	9.0%	5.5%	4.0%	3.0%
Huzhou City	9.0%	5.5%	4.0%	3.0%
Shaoxing City	9.0%	5.5%	4.0%	3.0%
Shaoshan City	9.0%	5.5%	4.0%	3.0%
Wenzhou City	9.0%	5.5%	4.0%	3.0%
Jinhua City	9.0%	5.5%	4.0%	3.0%
Quzhou City	11.0%	8.0%	6.0%	4.0%
Taizhou City	9.0%	5.5%	4.0%	3.0%
Lishui City	9.0%	5.5%	4.0%	3.0%
Shanghai City	9.0%	5.5%	4.0%	3.0%
Jiansu Province	9.0%	5.5%	4.0%	3.0%
Anhui Province	12.0%	8.0%	6.0%	4.0%
Jianxi Province	12.0%	8.0%	6.0%	4.0%
Fujian Province	12.0%	8.0%	6.0%	4.0%

Source: Consultant,2020

Note: With reference to the observation at more developed cities over the world, the average passenger car ownership per capita would seldom exceed 0.4 vehicles/person. Therefore, it was assumed that the growth will be constrained when it reached 0.3 vehicles/person, and the maximum would not exceed 0.4 vehicles/person by the end of the forecast period.

**Table3-5 Future Road Passenger Travel Growth Assumptions in TAZs**

TAZ	2019-2020	2021-2025	2026-2030	2031-2035
Hangzhou City	4.0%	2.0%	1.0%	0.5%
Ningbo City	9.0%	6.0%	3.0%	1.5%
Jiaying City	4.0%	2.0%	1.0%	0.5%



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TAZ	2019-2020	2021-2025	2026-2030	2031-2035
Huzhou City	1.0%	0.0%	0.0%	0.0%
Shaoxing City	0.0%	0.0%	0.0%	0.0%
Shaoshan City	3.0%	2.0%	1.0%	0.5%
Wenzhou City	4.0%	3.0%	2.0%	1.0%
Jinhua City	4.0%	3.0%	2.0%	1.0%
Quzhou City	6.0%	4.0%	2.5%	1.5%
Taizhou City	4.0%	3.0%	2.0%	1.0%
Lishui City	1.0%	0.0%	0.0%	0.0%
Shanghai City	3.0%	2.0%	1.0%	0.5%
Jiansu Province	1.0%	0.0%	0.0%	0.0%
Anhui Province	2.0%	1.0%	0.0%	0.0%
Jianxi Province	4.0%	3.0%	2.0%	1.0%
Fujian Province	5.0%	3.5%	2.5%	1.5%

Source: Consultant,2020

Table3-6 Future GDP Growth Rate Assumptions in TAZs

TAZ	2019-2020 <sup>*</sup>	2021-2025	2026-2030	2031-2035
Hangzhou City	3.0%	5.5%	4.5%	3.5%
Ningbo City	3.0%	5.5%	4.5%	3.5%
Jiaxing City	3.5%	5.5%	4.5%	3.5%
Huzhou City	4.5%	6.5%	5.5%	4.0%
Shaoxing City	4.0%	6.0%	4.5%	3.5%
Shaoshan City	5.0%	6.5%	5.5%	4.0%
Wenzhou City	4.5%	6.5%	5.5%	4.0%
Jinhua City	3.0%	5.5%	4.5%	3.5%
Quzhou City	3.5%	5.5%	4.5%	3.5%



TAZ	2019-2020*	2021-2025	2026-2030	2031-2035
Taizhou City	3.0%	5.5%	4.5%	3.5%
Lishui City	4.5%	6.0%	4.5%	3.5%
Shanghai City	2.5%	5.0%	4.0%	3.0%
Jiansu Province	3.0%	5.5%	4.5%	3.5%
Anhui Province	4.5%	6.0%	4.5%	3.5%
Jianxi Province	5.0%	6.5%	5.0%	3.5%
Fujian Province	4.5%	6.0%	4.5%	3.5%

Source: Consultant,2020

Note: with reference to other global economic prediction sources such as the Organization for Economic Cooperation and Development (OECD), the GDP growth rates after 2020 were estimated based on a declining trend of 1.0-2.0% every five years.

\*According to the data on the website of the National Bureau of Statistics, the GDP growth rate in the first half of 2020 was - 1.6% due to the new COVID-19. If the same growth rate as observed in 2019, is restored to the second half of 2020, the overall GDP growth rate of 2020 would fall between 2% - 3% which is 3.5% lower than the normal value.

**Table3-7 Future Container Throughput Growth Assumptions at Ports**

Ports	2019-2020	2021-2025	2026-2030	2031-2035
Ningbo Port	6.0%	4.0%	3.0%	2.0%
Wenzhou Port	14.5%	8.0%	5.0%	3.0%
Taizhou Port	10.0%	6.5%	4.5%	2.5%
Jiaxing Port	8.0%	5.5%	3.5%	2.0%
Shanghai Port	3.0%	2.0%	1.0%	0.5%
Zhoushan Port	10.0%	6.5%	4.5%	3.0%

Source: Consultant,2020

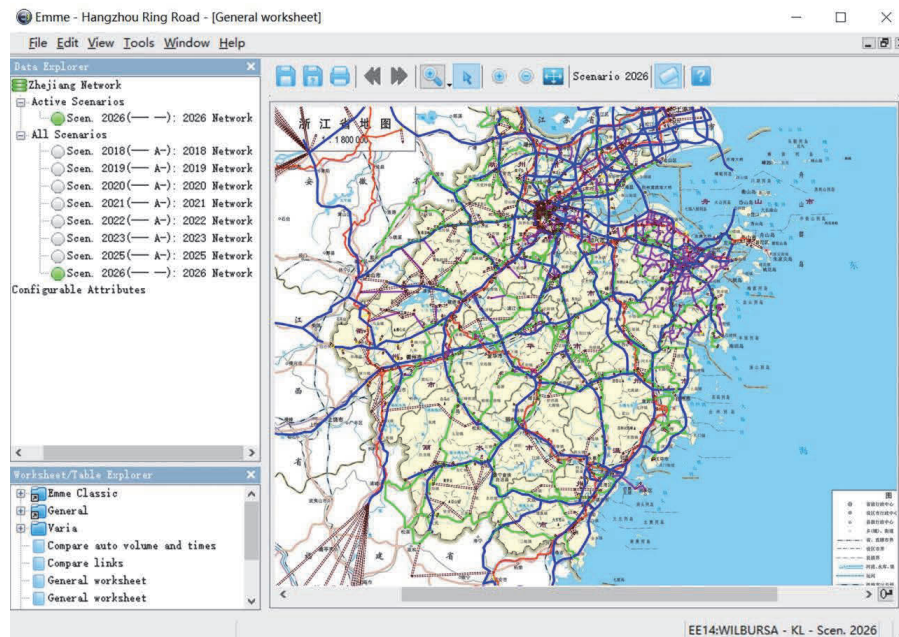
### 3.4 Traffic Forecast Model Development

#### 3.4.1 Road Network

In the base year road network development process, the Consultant made use of the existing Zhejiang road network data from the highway toll clearance system, the provincial expressway network map and the Zhejiang future expressway plan as building blocks to develop the highway supply model to be coded into EMME/3. All major highway facilities were included in the EMME/3 network, including expressways and national highways.

All the major highways in the network would include characteristics such as speed, capacity, distance and levels of operation (expressed in delays and cost indices). The distances between stations on the road network were derived from the current toll system. As for the the locations and distances of the national and provincial highways, the Consultant referred to Zhejiang Province Road Map for verification purposes. Figure 3-8 shows the EMME/3 Road Network for this Study.

**Figure3-8 Road Network of Zhejiang Province**



Source: Consultant, 2020

3.4.2 Volume Delay Functions

Travel time is usually derived directly from speed which in turn would be influenced by the level of congestion on the road. As a popular expressway, the Project Highway has a relatively high degree of congestion. To estimate future travel speeds under continuous traffic growths, the use of a “capacity constrained” assignment model would be necessary. The resultant travel volumes and levels of service were stored in the data bank. The Volume Delay Function (VDF) used in the study model could be represented as:

$$VDF = Len * [60 / Sf + A * (V/C - R1) + B * (V/C - R2)]$$

- Note:
- VDF = Volume Delay Functions
  - Len = Distance
  - Sf = Free Flow Speed
  - V/C = Volume to Capacity Ratio
  - R1, R2 = Volume to Capacity Ratio Coeff
  - A, B = Model Coefficient

3.4.3 Passenger Car Unit (PCU)

All vehicles were converted into equivalent “passenger car units (PCU)” before they were taken into account in the forecasting model. The PCU conversion factors used by the Consultant in this study were summarised in Table 3-8.

Table3-8 Passenger Car Unit (PCU) Conversion Factors

Mode	Type	Description	Conversion Factor
Passenger Car	# 1	9 seats or less (less than 6 meters long)	1.0
	# 2	10-19 seats (less than 6 meters long)	1.0
	# 3	39 seats or less (more than 6 meters long)	1.5
	# 4	40 seats or more (more than 6 meters long)	1.5
Truck	# 1	2 axles (the vehicle length is less than 6 meters and the maximum allowable total mass is less than 4500 kg)	1.0
	# 2	2 axles (the vehicle length is not less than 6 meters or the maximum allowable total mass is not less than 4500 kg)	1.5
	# 3	3 axles	2.5
	# 4	4 axles	2.5



Mode	Type	Description	Conversion Factor
	# 5	5 axles	4.0
	# 6	6 or more axles	4.0
	Container	20/40/45 feet container	4.0

Source: Highway Engineering Design Standards (JTG B01-2014)

#### 3.4.4 Toll Rate Assumptions

On May 16, 2019, the General Office of the State Council issued the guidelines of “Implementation Plan of Advancing Reform of Toll highway systems and Removal of the Provincial Boundary Expressway Toll Stations”. From January 1, 2020, the reform proposed to convert the truck weight charging system to a toll levying mechanism according to the truck types (axle). The strategy was to ensure that the overall toll costs for trucks would not be increased, and at the same time to implement a no-stop weighing detection scheme on entrances at toll stations. In consideration of the inputs from the General Office of the Zhejiang Provincial People's Government on the above State Council's guidelines (ZheZhengBanHan[2019] No. 96-- December 30, 2019), the resultant toll standards of passenger cars and trucks on the Project Highway were shown in Table 3-9.

**Table3-9 Toll Charge Rates by Vehicle Types on Project Highways (Post Reform)**

Classification	Passenger Car/Truck	Distance Rate (RMB/Veh.-Km)	Vehicle Rate(RMB/Vehicle)
Passenger Car Type #1	9 seats or less (less than 6 meters long)	0.40	5
Passenger Car Type # 2	10-19 seats (less than 6 meters long)	0.40	5
Passenger Car Type # 3	39 seats or less (more than 6 meters long)	0.80	10
Passenger Car Type # 4	40 seats or more (more than 6 meters long)	1.20	15
Truck Type # 1	2 axles (the vehicle length is less than 6 meters and the maximum allowable total mass is less than 4500 kg)	0.450	0
Truck Type # 2	2 axles (the vehicle length is not less than 6 meters or the maximum allowable total mass is not less than 4500 kg)	0.841	0



Classification	Passenger Car/Truck	Distance Rate (RMB/Veh.-Km)	Vehicle Rate(RMB/Vehicle)
Truck Type # 3	3 axles	1.321	0
Truck Type # 4	4 axles	1.639	0
Truck Type # 5	5 axles	1.675	0
Truck Type # 6	6 or more axles	1.747	0
Container	20/40/45 feet container	1.4	15

Source: Zhejiang Expressway Co. Ltd, 2020

Note: the container vehicles of international standards and would only operate within provincial boundaries would be charged at designated toll stations at discounts of 70% (less than 100 km travel distance) and 60% (over 100 km of travel distance) of the standard distance-based charge rates. For inter-provincial container traffic, the discount rates would be 50% of the standard rates.

The Zhejiang Provincial Highway Administration Bureau issued an announcement to confirm that operating Companies and road sections are authorized to implement the “Preferential Policy of 15% Discount for Non-Cash Paying Trucks”. This would become effective from January 1, 2019 to December 31, 2020. This preferential policy applied to all state-owned, wholly-owned and controlled expressway sections within provincial, municipal and county (city) jurisdictions. **This policy also applies to the Project Highway.**

**In the beginning of 2020, the Ministry of Transport issued a Notice on “Lifting of Toll Charges on Toll Highways During the Control Period of the Novel Coronavirus Disease (Jiao Gong Lu Ming Dian [2020] No. 62)” A subsequent Notice on “Resumption of Toll Collection on Toll Highways” was also issued by the Ministry of Transport. From February 17, 2020 to May 5, 2020 (79 days), all vehicles were exempted from charges on toll highways.**

**Since ETC will be required for future vehicle registration, it is expected that the ETC vehicles on highways will approach 90% in the near future. This Study assumed 90% ETC usage in 2021 and beyond and these vehicles will also enjoy a 95% discount on their charges.**

Based on the above assumptions, the changes in charging standards in the future forecast periods were summarized as follows.



**Table3-10 Changes in Charging Standards on Project Highway in Future Forecast Periods**

Year	Passenger Cars/Container Vehicles	Ordinary Trucks
2020	<ol style="list-style-type: none"> <li>1. Implemented according to the Table 3-9.</li> <li>2. In response to the COVID-19 epidemic in 2020, (i) 9 more toll exemption days were assigned to small passenger cars on toll highways, (ii) Due to the impacts of the epidemic in 2020, some toll stations were closed; (iii) toll exemption started on February 17, 2020, and ended on May 5, 2020.</li> <li>3. The ETC usage rate will reach 85%, and vehicle tolls will be charged at 95% discount.</li> <li>4. The current container vehicles of international standards will enjoy toll preferential policy of 65% discount on all provincial expressway network instead of at only 10 designated toll locations.</li> </ol>	<ol style="list-style-type: none"> <li>1. Implemented according to the Table 3-9.</li> <li>2. In response to the COVID-19 epidemic in 2020, (i) 9 more toll exemption days were assigned to small passenger cars on toll highways, (ii) Due to the impacts of the epidemic in 2020, some toll stations were closed; (iii) toll exemption started on February 17, 2020, and ended on May 5, 2020.</li> <li>3. The ETC usage rate will reach 85%, and vehicle tolls will be charged at 95% discount.</li> <li>4. The Project Highway offered a 15% toll discount for the trucks of legal loading and using the non cash payment card and ETC.</li> </ol>
2021 and After	<ol style="list-style-type: none"> <li>1. Implemented according to Table 3-9.</li> <li>2. The ETC usage rate will reach 90%, and the tolls of ETC vehicles will be charged at a discount of 95%.</li> <li>3. The current container vehicles of international standards will enjoy toll preferential policy of 65% discount on all provincial expressway network instead of at only 10 designated toll locations.</li> </ol>	<ol style="list-style-type: none"> <li>1. Implemented according to Table 3-9.</li> <li>2. The ETC usage rate will reach 90%, and vehicle tolls will be charged at a discount of 95%.</li> </ol>

Source: Consultant, 2020

According to the “Implementation Plan for the Toll Exemption of Small Vehicles for Major Holidays” issued on July 24, 2012, small vehicles will be exempted from toll on the statutory holidays in the Spring Festival, the Ching Ming Festival, the Labor Day, and the National Day. The toll exempted vehicles would include those of less than 7 seats (including 7 seats) passenger vehicles and motorcycles. The exemption period starts at 00:00 on the first day till the 24:00 on the last day of the holidays. The toll exemption is applied on toll roads (including the Project Highways), bridges and tunnels that are subject to the approval of the Highway Law of the People's Republic of China and the Regulations for the Administration of Toll Roads. In this study, the Consultant considered the impacts of the above preferential scheme and made relevant adjustments when forecasting the Project Highway traffic and revenue, in order to attain more accurate results.

In order to determine the average number of days affected by this preferential scheme each year, the Consultant referred to the “Implementation Plan for the Toll Exemption of Small Vehicles for Major Holidays”. It was assumed that the number of days of the four national holidays in the Spring Festival, the Ching Ming Festival, the Labor Day and the National Day are:

- Spring Festival - 7 days
- Ching Ming Festival -3 days
- Labor Day -3 days
- National Day – 7days

There is a total of 20 days for the above four major public festivals. This assumption was incorporated into the revenue calculations for the Project Highways. The Consultant also assumed this treatment will last till the end of the Project Highway’s concession period.

#### 3.4.5 Future Road Network Assumptions

In order to analyze the impact of changes in the surrounding road network on the traffic flows of the Project Highway (induced or diverted), the Consultant consulted the “13th Five-Year Plan” and the most recent expressway construction plans of the vicinity areas. The Consultant also reviewed the progress of the roads currently under construction and summarized the changes in the future road network in Zhejiang Province as shown in Table 3-11 and Figure 3-9.

**Table3-11 Future Road Network Constrction Plans**

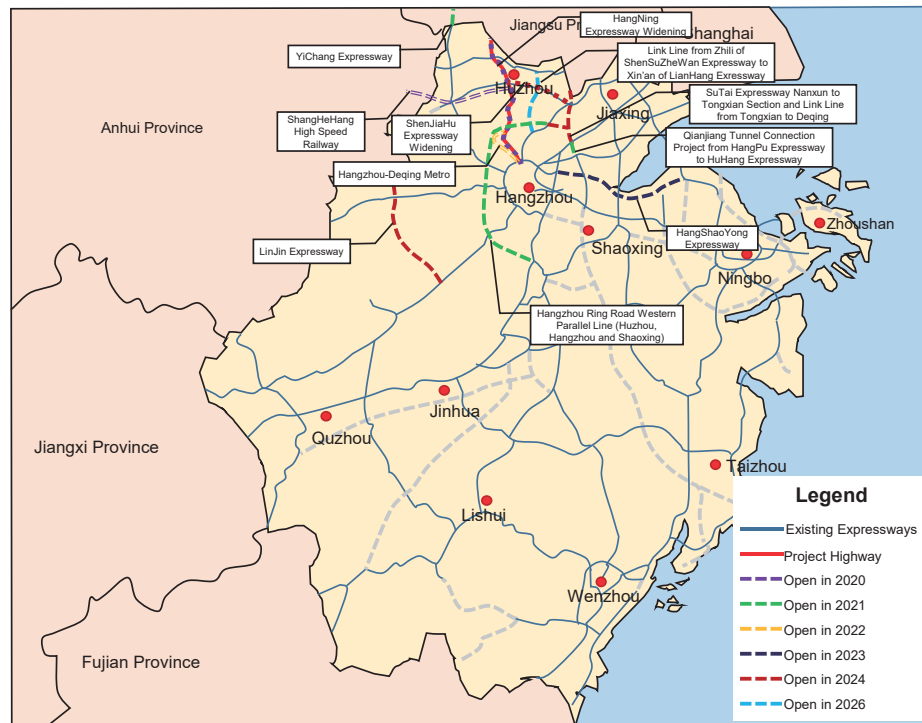
No.	Road Name	Opening Year	Length (Km)	No. of Lanes	Design Speed (Km/h)
1	HangNing Expressway Widening	End of September 2020	77	4 to 6	120
2	ShangHeHang High Speed Railway	End of June 2020	794.55	2	350
3	YiChang Expressway	End of 2020	26	6	120
4	Qianjiang Tunnel Connection Project from HangPu Expressway to HuHang Expressway	End of 2020	11.415	6	100
5	Hangzhou Ring Road Western Parallel Line (Huzhou, Hangzhou and Shaoxing)	December 2020	149	6	100



No.	Road Name	Opening Year	Length (Km)	No. of Lanes	Design Speed (Km/h)
6	Hangzhou-Deqing Metro	Beginning of 2022	34.6	2	120
7	HangShaoYong Expressway	End of 2022	137	6	120 以上
8	SuTai Expressway sections from Nanxun to Tongxian Section and from Tongxian to Deqing	End of 2023	40	6	100
9	ShenJiaHuHang Expressway Lianshi Hub to Lushan Hub Widening	End of 2023	39.98	4 to 6	120
10	LinJin Expressway	Beginning of 2024	146.95	4	100
11	Link Line from Zhili of ShenSuZheWan Expressway to Xin'an of the LianHang Expressway	Beginning of 2026	44	6	120

Source: Consultant, 2020

Figure3-9 Location of Future Highways



Source: Consultant, 2020

Note: The time shown in this figure is when the new road would have an impact on the Project Highway. If it is opened at the beginning of the year, its impacts will be included in that year. If it is opened at the end of the year, its impacts will be accounted for in the next year.

### 3.4.6 Road Capacity

Major factors that may affect the capacity of a highway include design standards (design speed), vehicle type composition, hourly distribution of daily traffic demands (peak hour factor) etc. The assumptions adopted for the planning and design of the Project Highway were: design speed of 120 km/hr, level of service C, capacity of 1650 pcu/lane/hr (Highway Engineering Technical Specifications – JTG B01-2014), a peak hour factor of 6.51% (derived from survey data) and the average passenger car conversion factor of 1.385 pcu/veh (derived from survey data). The capacity of the Project Highway could be estimated as:

$$1650(\text{pcu/lane/hr}) \times 6(\text{lanes}) \div 1.385(\text{pcu/veh}) \div 6.51\% = 109,800(\text{vehicles/day})$$

**Table3-12 Relationship of Expressway Levels of service and Maximum Capacity**

Level of Service	Volume/Capacity (V/C)	Design Speed		
		120	100	80
		Maximum Capacity [pcu/(h·ln)]	Maximum Capacity [pcu/(h·ln)]	Maximum Capacity [pcu/(h·ln)]
A	$V/C \leq 0.35$	750	730	700
B	$0.35 < V/C \leq 0.55$	1200	1150	1100
C	$0.55 < V/C \leq 0.75$	1650	1600	1500
D	$0.75 < V/C \leq 0.90$	1980	1850	1800
E	$0.90 < V/C \leq 1.00$	2200	2100	2000
F	$V/C > 1.00$	0~2200	0~2100	0~2000

Source: Highway Engineering Technical Specifications – JTG B01-2014

### 3.4.7 Trip Distribution

This Study adopted the “Generalized Cost” as the factor to influence the decisions to select travel paths by the trip makers. It will arrive at a balanced trip distribution of traffic on the road network within the study area. The “generalized cost” includes all elements and factors (such as travel time, travel distance, vehicle operation cost and toll costs etc) that may affect the choice of travel paths of the car drivers. The “generalized cost” of a road section can be estimated as:



$$GC_{ij} = T_{ij} + [C_{ij} + Tol_{ij}] / VOT$$

Note:  $GC_{ij}$  = Travel Generalized Cost

$T_{ij}$  = Travel Time between TAZ<sub>i</sub> to TAZ<sub>j</sub>

$C_{ij}$  = Travel Cost between TAZ<sub>i</sub> and TAZ<sub>j</sub>, such as vehicle operating cost.

$Tol_{ij}$  = Toll Cost from TAZ<sub>i</sub> and TAZ<sub>j</sub>

VOT = Value of Time for different vehicle types

The distribution model used by the Consultant has taken into consideration of road users' willingness to pay certain travel costs and travelling speed/congestion levels on the Project Highway in comparison to other competing toll highways. From the trip matrices, the trips between any two TAZs would be allocated to the path of the least generalized cost. Traffic assignment is an iterative process, in which every trip during an iteration would be assigned to the path of the least generalized cost. Generalized cost includes travel time, travel distance, toll charges and vehicle operation costs. For example: if there are 2 highways of the same class and distance are available during certain iteration, the highway which carries the lower traffic volume would be selected as the travel path. However, in subsequent iterations, these 2 highways may have different generalized costs which would then dictate which would be the more attractive path. This process will be repetitive until traffic volumes on the competing highway facilities would reach an equilibrium condition.

### 3.5 Project Highway OD Travel by Modes

After the traffic distribution of the OD matrices was completed in Zhejiang Province, the future traffic demands between each pair of traffic zones using the Project Highway could be determined. To facilitate easier understanding and summarization, the Consultant aggregated the 436 traffic zones (OD) into 16 superzones or TAZ (see economic analysis section).

According to the model allocation results, the Consultant found that the proportion of future passenger car and truck traffic, travelling among the Hangzhou City, the Huzhou City and the Jiangsu Province, on the Project Highway were 73.3% and 69.5% respectively. In summary, regional travel represents a significant proportion of the total traffic on the Project Highway.

Table 3-13 and Table 3-14 showed the future OD patterns of passenger cars and trucks on the Project Highway.



Table3-13 Passenger Car OD Patterns on Project Highway

OD	Hangzhou	Ningbo	Jiaxing	Huzhou	Shaoxing	Zhoushan	Wenzhou	Jinhua	Quzhou	Taizhou	Lishui	Shanghai	Jiangsu	Anhui	Jiangxi	Fujian	Total
Hangzhou	10.0%			12.0%									5.7%				28.1%
Ningbo													0.9%				1.5%
Jiaxing				1.9%									1.9%	0.7%			4.7%
Huzhou	12.5%		1.9%	10.8%	0.6%							0.8%	7.1%	0.9%			35.7%
Shaoxing				0.6%									0.7%				1.4%
Zhoushan																	
Wenzhou													0.6%				0.8%
Jinhua													0.8%				1.1%
Quzhou																	
Taizhou																	
Lishui																	
Shanghai				0.9%										0.5%			1.8%
Jiangsu	6.2%	1.0%	1.8%	7.0%	0.8%		0.6%	0.8%					2.0%				21.2%
Anhui			0.8%	1.1%								0.5%					2.8%
Jiangxi																	
Fujian																	
Total	29.1%	1.6%	4.7%	35.3%	1.5%		0.7%	1.0%		0.5%		1.6%	20.9%	2.5%			100.0%

Source: Consultant, 2020

\* Less than 0.1% of OD trips was omitted.



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Table3-14 Truck OD Patterns on Project Highway

OD *	Hangzhou	Ningbo	Jiaxing	Huzhou	Shaoxing	Zhoushan	Wenzhou	Jinhua	Quzhou	Taizhou	Lishui	Shanghai	Jiangsu	Anhui	Jiangxi	Fujian	Total
Hangzhou	6.0%			9.6%									4.3%				20.3%
Ningbo				1.4%									0.9%				2.5%
Jiaxing				2.2%									1.4%	0.6%			4.5%
Huzhou	6.3%	0.8%	1.3%	8.2%	0.9%								14.2%				33.6%
Shaoxing				1.9%									0.9%				3.0%
Zhoushan																	
Wenzhou				0.9%									1.1%				2.1%
Jinhua				1.0%									1.5%				2.5%
Quzhou																	
Taizhou				0.5%													1.0%
Lishui																	
Shanghai				0.5%													1.0%
Jiangsu	3.3%		0.5%	15.4%			0.5%	1.0%					2.4%				25.3%
Anhui																	1.4%
Jiangxi													0.6%				1.0%
Fujian													0.7%				1.0%
Total	16.3%	1.3%	2.5%	43.0%	1.5%		0.9%	1.5%		0.5%			29.5%	1.6%			100.0%

Source: Consultant, 2020

\* Less than 0.1% of OD trips was omitted.



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## 4 Traffic and Toll Revenue Forecast Results

### 4.1 Description of Forecast Options

Based on the previous research and analysis, the base year of 2019 was referenced in forecasting traffic volumes from 2020 to 2032, in which the concessions on the Wangjiabang to Qingshan Section would end on December 26, 2030 and other sections would end on November 27, 2032. The traffic volumes in subsequent years were based on the traffic data of the base year (2019) and the annual average daily traffic volumes were forecasted by the computer assignment model. **The toll revenue forecasting was based on the current prices. As non-economic professionals, the Consultant has not made assumptions related to the future inflation rates.**

**Table4-1 Description of Forecast Options**

Cases	Assumption
(1) Base Case	<p>1、 Growth rate determined according to the details described in the socio-economic-transport-model in Chapter 3.</p> <p>2、 In 2020, tolling by weight for trucks will be cancelled. The ETC usage rate will reach 85% and vehicle toll charges will be discounted at 95%. In 2021, the ETC usage rate will reach 90%, and vehicle tolls will also be discounted at 95%.</p> <p>3、 In response to the COVID-19 epidemic in 2020, (i) 9 more toll exemption days were assigned to small passenger cars on all toll highways, (ii) due to the impacts of the epidemic in 2020, some toll stations were closed; (iii) toll exemption started on February 17, 2020, and ended in May 5, 2020.</p> <p>4、 In 2020, container vehicles of international standards will enjoy a toll preferential policy of 65% discount not only at 10 designated stations but on the entire provincial expressway network.</p> <p>5、 By the end of September 2020, HangNing Expressway Widening Construction will be completed.</p> <p>6、 By the end of June 2020, Shangqiu-Hefei-Hangzhou High Speed Railway will be opened.</p> <p>7、 By the end of 2020, Qianjiang Tunnel Connection Project from HangPu Expressway to HuHang Expressway will be opened.</p> <p>8、 By the end of 2020, Hangzhou Ring Road Western Parallel Line (Huzhou, Hangzhou and Shaoxing Section) will be opened.</p> <p>9、 By the end of 2020, YiChang Expressway will be opened.</p> <p>10、 The Project Highway offered 15% toll discount for trucks of legal loading and using the non cash payment card (ETC). Starting from 2021, this policy will be cancelled.</p> <p>11、 At the beginning of 2022, Hangzhou-Deqing Metro will be opened.</p> <p>12、 By the end of 2022, HangShaoYong Expressway will be opened.</p> <p>13、 By the end of 2023, SuTai Expressway (Nanxun to Tongxian Section and from Tongxian to Deqing) will be opened.</p>

	14、 By the end of 2023, ShenJiaHuHang Expressway widening works will be completed. 15、 At the beginning of 2024, LinJin Expressway will be opened. 16、 At the beginning of 2026, the section from Zhili of ShenSuZheWan Expressway to Xin'an of LianHang Expressway will be opened.
(2) Test 1- Conservative Case	1、 Based on the “Base Case” assumptions, the economic growth rate will be reduced by 20%.
(3) Test 2- Optimistic Case	1、 Based on the “Base Case” assumptions, the economic growth rate will be increased by 20%.

Source: Consultant, 2020

#### 4.2 Traffic Impacts Caused by the New Highways

According to the model analysis, the impacts of new highways on the Project Highway will be more profound in 2020, 2021, 2023, 2024 and 2026. The impacts in the above years were shown in Table 4-2 below.

**Table4-2 Traffic Impacts Due to New Highways and Toll Policy Changes**

Highway/Toll Policy	Schedule	Diversion/Inducement Impacts on Project Highway	Magnitude of Impacts
The ETC usage rate will reach 90%, and vehicle tolls will be charged at 95% discount.	2020	In 2020, it is estimated that the ETC usage will reach 85%, and the vehicle tolls will be charged at 95% discount.	Traffic impacts: +0% Revenue impacts: -1.6%
The impacts due to COVID-19 epidemic.	2020	In response to the COVID-19 epidemic in 2020, (i) 9 more toll exemption days were assigned to small passenger cars on all toll highways, (ii) due to the impacts of the epidemic in 2020, some toll stations were closed; (iii) toll exemption started on February 17, 2020, and ended in May 5, 2020.	Traffic impacts: -18.4% Revenue impacts: -17.9%

Highway/Toll Policy	Schedule	Diversion/Inducement Impacts on Project Highway	Magnitude of Impacts
The preferential policy for container vehicles.	2020	In 2020, container vehicles of international standards will enjoy a toll preferential policy of 65% discount not only at 10 designated stations but on the entire provincial expressway network.	Traffic impacts: 0% Revenue impacts: -0.6%
Completion of HangNing Widening Works	End of September 2020	After the completion of the widening works on the HangNing Expressway, the medium and large trucks will no longer be restricted. As a result, part of the traffic will come back to the Project Highway.	Traffic impacts: +4.7% Revenue impacts: +11.4%
Opening of Shangqiu-Hefei-Hangzhou High Speed Railway	End of June 2020	The effect is minimal.	--
Opening of Qianjiang Tunnel Connection Project from HangPu Expressway to HuHang Expressway	End of 2020	The effect is minimal.	--
Opening of Hangzhou Ring Road Western Parallel Line (Huzhou, Hangzhou and Shaoxing Section) and Yichang Expressway	End of 2020	With the opening of the YiChang Expressway and the Hangzhou Ring Road Western Parallel Line (Huzhou, Hangzhou and Shaoxing Section), part of the traffic to/from Jiangsu, Huzhou and Deqing County will be diverted onto the Hangzhou Ring Road Western Parallel Line and the Hangchang Expressway.	Traffic impacts: -15.3% Revenue impacts: -19.9%



Highway/Toll Policy	Schedule	Diversion/Inducement Impacts on Project Highway	Magnitude of Impacts
The Project Highway offered 15% toll discount for trucks of legal loading and using the non cash payment card (ETC). Starting from 2021, this policy will be cancelled.	Beginning of 2021	With the cancellation of the preferential policy of a 15% discount for trucks, the toll rate of trucks would be increased, but the impact on traffic volume would be small.	Traffic impacts: 0% Revenue impacts: +3.4%
Hangzhou-Deqing Metro	Beginning of 2022	With the opening of Hangzhou-Deqing Metro, Deqing County will be integrated into the Hangzhou metropolitan area, and a large part of the commuting between Deqing County and Hangzhou City will choose this metro service.	Traffic impacts: -0.6% Revenue impacts: -0.4%
Opening of HangShaoYong Expressway	End of 2022	With the opening of HangShaoYong Expressway, part of the traffic from Jiangsu and Huzhou to Cixi and Ningbo New District will be diverted onto the HangNing Expressway and the HangShaoYong Expressway.	Traffic impacts: +0.8% Revenue impacts: +0.8%
By the end of 2023, SuTai Expressway (Nanxun to Tongxian Section and from Tongxian to Deqing) will be opened.	End of 2023	With the opening of SuTai Expressway (Nanxun to Tongxiang and Tongxiang to Deqing), part of the traffic from Jiangsu and Huzhou to Cixi and Shaoxing will be diverted onto the ShenJiaHuHang Expressway and the SuTai Expressway.	Traffic impacts: -7.9% Revenue impacts: -7.2%

Highway/Toll Policy	Schedule	Diversion/Inducement Impacts on Project Highway	Magnitude of Impacts
ShenJiaHuHang Expressway Widening	End of 2023	The effect is minimal.	--
LinJin Expressway	Beginning of 2024	With the opening of LinJin Expressway, part of the long-distance traffic from Nanjing to South of the Zhejiang Province could choose to travel by Liyang, Ningguo and Lin'an. This route is more advantageous than the HangNing Expressway.	Traffic impacts: -0.7% Revenue impacts: -1.1%
At the beginning of 2026, the section from Zhili of the ShenSuZheWan Expressway to Xin'an of the LianHang Expressway will be opened.	Beginning of 2026	With the opening of the section from Zhili of the ShenSuZheWan Expressway to Xin'an of the LianHang Expressway, part of the traffic from Huzhou to Hangzhou will be diverted onto this new facility.	Traffic impacts: -1.0% Revenue impacts: -1.0%

Source: Consultant, 2020

### 4.3 Forecast Results for Base Case

Based on the assumptions stipulated in Table 4-1 and the application of the traffic prediction model (see Chapter 3), the Consultant was able to develop the traffic and toll revenue forecasts for the Base Case. The results were summarized in Tables 4-3 to 4-5.

Table4-3 Annual Average Daily Traffic Volumes by Vehicle Type on Project Highway for Base Case

Year	PC1	PC2	PC3	PC4	Truck1	Truck2	Truck3	Truck4	Truck5	Truck6	Container	Total	Growth Rate
2020.1.1-8.31 <sup>(2)</sup>	31,535	163	223	632	4,695	2,114	1,848	1,497	193	4,939	57	47,896	--
2020.9.1-12.31	35,996	162	221	627	6,829	3,075	2,688	2,178	280	7,184	101	59,341	--
2021 <sup>(3)</sup>	38,283	167	230	675	5,946	2,684	2,492	2,184	283	6,565	113	59,622	13.0%
2022 <sup>(4)</sup>	42,409	169	234	689	6,256	2,858	2,654	2,326	302	6,944	117	64,958	8.9%
2023 <sup>(5)</sup>	47,464	174	241	712	6,614	3,060	2,844	2,495	324	7,387	122	71,437	10.0%
2024 <sup>(6)</sup>	47,784	162	243	714	6,283	2,905	2,774	2,458	319	7,109	106	70,857	-0.8%
2025	52,508	166	248	731	6,580	3,076	2,938	2,603	338	7,481	110	76,779	8.4%
2026 <sup>(7)</sup>	56,497	168	250	745	6,788	3,210	3,057	2,712	352	7,752	112	81,643	6.3%
2027	61,118	171	255	761	7,016	3,338	3,035	2,630	340	7,846	115	86,625	6.1%
2028	65,715	175	260	776	7,283	3,496	3,173	2,748	356	8,170	117	92,269	6.5%
2029	69,621	178	265	790	7,509	3,632	3,297	2,854	369	8,451	120	97,086	5.2%
2030 <sup>(8)</sup>	72,547	181	269	801	7,685	3,732	3,387	2,928	379	8,661	121	100,691	3.7%
2031	74,753	183	272	810	7,827	3,818	3,459	2,988	387	8,830	123	103,450	2.7%
2032	76,946	185	276	820	7,968	3,903	3,532	3,047	394	9,000	124	106,195	2.7%

Source: Consultant, 2020

Note:

(1) Traffic volumes include general toll-free vehicles, but exclude toll free vehicles during the major festival holidays and COVID-19 epidemic periods. The latest vehicle classifications, as shown in Table 3-9, were used.

(2) In 2020, (i) tolling by weight for trucks will be cancelled, (ii) the ETC usage rate will reach 85%, and the vehicle tolls will be charged at 95% discount., (iii) at the end of September 2020, HangNing Expressway Widening works was completed., (iv) at the end of June 2020, Shangqiu-Hefei-Hangzhou High Speed Railway was opened, (v) in response to the COVID-19 epidemic, 9 more toll exemption days were assigned to small passenger cars on toll highways, some toll stations were closed and toll exemption on highways started from February 17, 2020 to May 5, 2020, (vi) the current container vehicles of international standards would enjoy a toll discount of 65% not only at 10 designated toll stations but on the provincial expressway network.



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- (3) In 2021, (i) Hang Ring Road Western Parallel Line (Huzhou, Hangzhou and Shaoxing Section) will be opened, (ii) the Qianjiang Tunnel Connection Project from HangPu Expressway to HuHang Expressway will be opened, (iii) the YiChang Expressway will be opened, (iv) the policy of 15% toll discount for trucks of legal loading and using the non cash payment card( ETC) will be cancelled.
- (4) In 2022, Hangzhou-Deqing Metro will be opened.
- (5) In 2023, HangShaoYong Expressway will be opened.
- (6) In 2024, (i) SuTai Expressway (Nanxun to Tongxiang and Tongxiang to Deqing) will be opened, (ii) ShenJiaHuHang Expressway Widening works will be completed, (iii) the LinJin Expressway will be opened.
- (7) In 2026, the section from Zhili of ShenSuZheWan Expressway to Xin'an of LianHang Expressway will be opened.
- (8) After December 27, 2030, toll charges on the HangNing Expressway from Wangjiabang to Qingshan will be lifted.
- (9) Annual average daily traffic volume is the weighted average daily traffic volume by road section: refers as the summation of the production of the annual daily average traffic volume and the mileage of each section, divided by sum of the mileages.



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Table4-4 Annual Average Daily Traffic Volumes by Road Section on Project Highway for Base Case

Year	Nanzhuan Int.-Renhe Sta.	Renhe Sta.-Deqing Sta.	Deqing Sta.-Hangzhou Ring Road Western Parallel Line	Hangzhou Ring Road Western Parallel Line - Deqing Station	Deqing Station - Qingsha Station	Qingsha Station - Huzhou Station	Huzhou Station - Lushan Int.	Lushan Int. - Huzhou Station	Huzhou Station - Lijiaxiang Int.	Lijiaxiang Int. - Changning Station	Changning Station - Changning Station	Changning Station - Fuziling Station
2020.1.1-8.31 <sup>(2)</sup>	63,399	53,899	44,813	44,813	44,728	41,954	36,726	44,688	44,824	50,908	48,194	46,502
2020.9.1-12.31	78,261	66,938	56,171	56,171	56,065	52,591	46,624	56,137	56,036	61,902	58,505	55,989
2021 <sup>(3)</sup>	73,587	61,153	50,515	59,093	58,926	55,151	47,939	59,393	59,611	64,011	59,973	56,846
2022 <sup>(4)</sup>	77,642	65,358	55,223	64,566	64,399	60,476	52,553	65,455	65,858	70,370	65,877	62,548
2023 <sup>(5)</sup>	85,156	72,076	61,321	71,458	71,293	67,214	58,413	71,265	71,879	77,023	72,055	68,522
2024 <sup>(6)</sup>	80,092	66,189	56,096	65,662	65,497	61,216	53,510	77,501	78,355	83,533	78,057	74,318
2025	85,864	71,132	60,602	70,910	70,750	66,334	58,019	84,539	85,659	90,869	84,867	81,694
2026 <sup>(7)</sup>	90,007	74,521	63,654	74,595	74,389	69,850	61,282	91,265	92,271	97,904	91,399	88,008
2027	94,097	77,829	66,616	78,279	78,076	73,419	64,285	98,267	99,535	105,125	98,106	94,491
2028	99,498	82,442	70,905	83,306	83,107	78,335	68,628	105,475	107,023	108,636	104,964	101,124
2029	105,006	87,153	75,310	88,463	88,270	83,385	73,127	112,874	110,875	108,636	104,964	104,476
2030 <sup>(8)</sup>	110,588	91,929	79,793	93,712	93,524	88,527	77,690	116,669	114,783	108,636	104,964	104,476
2031	115,927	96,494	84,086	98,740	98,557	93,453	82,056	116,669	114,783	108,636	104,964	104,476
2032	121,143	100,924	88,578	103,805	103,627	98,413	86,451	116,669	114,783	108,636	104,964	104,476

Source: Consultant, 2020

Note:

(1) Traffic volumes include general toll-free vehicles, but exclude toll free vehicles during the major festival holidays and COVID-19 epidemic periods. The latest vehicle classifications, as shown in Table 3-9, were used.



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- (2) In 2020, (i) tolling by weight for trucks will be cancelled, (ii) the ETC usage rate will reach 85%, and the vehicle tolls will be charged at 95% discount., (iii) at the end of September 2020, HangNing Expressway Widening works was completed., (iv) at the end of June 2020, Shangqiu-Hefei-Hangzhou High Speed Railway was opened., (v) in response to the COVID-19 epidemic, 9 more toll exemption days were assigned to small passenger cars on toll highways, some toll stations were closed and toll exemption on highways started from February 17, 2020 to May 5, 2020, (vi) the current container vehicles of international standards would enjoy a toll discount of 65% not only at 10 designated toll stations but on the provincial expressway network.
- (3) In 2021, (i) Hang Ring Road Western Parallel Line (Huzhou, Hangzhou and Shaoxing Section) will be opened, (ii) the Qianjiang Tunnel Connection Project from HangPu Expressway to HuHang Expressway will be opened, (iii) the YiChang Expressway will be opened, (iv) the policy of 15% toll discount for trucks of legal loading and using the non cash payment card(ETC) will be cancelled.
- (4) In 2022, Hangzhou-Deqing Metro will be opened.
- (5) In 2023, HangShaoYong Expressway will be opened.
- (6) In 2024, (i) SuTai Expressway (Nanxun to Tongxiang and Tongxiang to Deqing) will be opened, (ii) ShenJiaHuHang Expressway Widening works will be completed, (iii) the LinJin Expressway will be opened.
- (7) In 2026, the section from Zhili of ShenSuZheWan Expressway to Xin'an of LianHang Expressway will be opened.
- (8) After December 27, 2030, toll charges on the HangNing Expressway from Wangjiabang to Qingshan will be lifted.
- (9) Annual average daily traffic volume is the weighted average daily traffic volume by road section: refers to the summation of the production of the annual daily average traffic volume and mileage of each section, divided by sum of the mileage.



Table4-5 Toll Revenue Forecasts on Project Highway for Base Case

Year	Average Daily Toll Revenue (RMB)	Daily Growth Rate	Annual Toll Revenue (RMB 10,000)	Annual Growth Rate
2020.1.1-8.31 <sup>(1)</sup>	¥3,001,274	--	¥49,521	--
2020.9.1-12.31	¥3,834,539	--	¥46,781	--
2021	¥3,899,504	16.2%	¥142,332	47.8%
2022	¥4,214,885	8.1%	¥153,843	8.1%
2023	¥4,596,386	9.1%	¥167,768	9.1%
2024	¥4,539,195	-1.2%	¥166,135	-1.0%
2025	¥4,881,719	7.5%	¥178,183	7.3%
2026	¥5,158,792	5.7%	¥188,296	5.7%
2027	¥5,364,981	4.0%	¥195,822	4.0%
2028	¥5,682,943	5.9%	¥207,996	6.2%
2029	¥5,956,383	4.8%	¥217,408	4.5%
2030	¥6,127,722	2.9%	¥223,662	2.9%
2031	¥3,984,516	-35.0%	¥145,435	-35.0%
2032	¥4,114,773	3.3%	¥136,199	-6.4%
<b>Total</b>	--	--	¥2,219,381	--

Source: Consultant, 2020

Note:

- (1) In 2020, (i) in response to the COVID-19 epidemic, 9 more toll exemption days were assigned to small passenger cars on toll highways, some toll stations were closed and toll exemption on highways started from February 17, 2020 to May 5, 2020,
- (2) The toll revenue forecasting was based on the current price. As non-economic professional, the Consultant has not made assumptions related to the future inflation rates.
- (3) Toll revenue forecast results excluded toll free vehicles
- (4) The forecast results also took into account that there would be free passage of passenger cars with 7 seats or less in holidays, such as Spring Festival, Qingming Festival, Labor Day and National Day. The number of free passage days in the future will be 20 days per year;
- (5) The concessions on the Section from Wangjiabang to Qingshan of the HangNing Expressway will end by December 27, 2030.
- (6) The concessions of the Project Highway will end by November 28, 2032.

**4.4 Test1-Forecast Results for Conservative Case**

Based on the assumptions stipulated in Table 4-1 and the application of the traffic prediction model (see Chapter 3), the Consultant was able to develop traffic and toll revenue forecasts for the Conservative Case. The results were summarized in Tables 4-6 to 4-8.





Table 4-6 Annual Average Daily Traffic Volumes by Vehicle Type on Project Highway for Conservative Case

Year	PC1	PC2	PC3	PC4	Truck1	Truck 2	Truck 3	Truck 4	Truck 5	Truck 6	Container	Total	Growth Rate
2020.1.1-8.31 <sup>(2)</sup>	31,535	163	223	632	4,695	2,114	1,848	1,497	193	4,939	57	47,896	--
2020.9.1-12.31	35,186	162	221	627	6,785	3,055	2,670	2,164	278	7,137	101	58,386	--
2021 <sup>(3)</sup>	36,688	166	229	673	5,849	2,640	2,462	2,158	280	6,469	113	57,727	10.3%
2022 <sup>(4)</sup>	39,883	169	233	687	6,105	2,784	2,598	2,277	295	6,785	116	61,932	7.3%
2023 <sup>(5)</sup>	43,858	173	239	709	6,404	2,956	2,758	2,421	314	7,158	120	67,110	8.4%
2024 <sup>(6)</sup>	43,461	161	241	711	6,038	2,782	2,668	2,365	307	6,833	104	65,671	-2.1%
2025	47,007	165	246	726	6,278	2,921	2,803	2,484	323	7,137	107	70,197	6.9%
2026 <sup>(7)</sup>	49,868	166	248	739	6,436	3,027	2,895	2,569	334	7,345	110	73,737	5.0%
2027	53,247	170	253	754	6,658	3,160	3,022	2,682	348	7,629	112	78,035	5.8%
2028	56,669	173	258	769	6,861	3,279	3,080	2,709	351	7,813	115	82,077	5.2%
2029	60,030	176	263	784	7,046	3,388	3,095	2,684	348	7,932	116	85,862	4.6%
2030 <sup>(8)</sup>	63,417	180	268	799	7,259	3,517	3,207	2,779	360	8,191	118	90,095	4.9%
2031	66,335	183	272	813	7,443	3,630	3,311	2,868	371	8,424	121	93,771	4.1%
2032	68,703	186	277	825	7,597	3,723	3,396	2,940	381	8,615	122	96,765	3.2%

Source: Consultant, 2020

Note:

- (1) Traffic volumes include general toll-free vehicles, but exclude toll free vehicles during the major festival holidays and COVID-19 epidemic periods. The latest vehicle classifications, as shown in Table 3-9, were used.
- (2) In 2020, (i) tolling by weight for trucks will be cancelled, (ii) the ETC usage rate will reach 85%, and the vehicle tolls will be charged at 95% discount., (iii) at the end of September 2020, HangNing Expressway Widening works was completed., (iv) at the end of June 2020, Shangqiu-Hefei-Hangzhou High Speed Railway was opened, (v) in response to the COVID-19 epidemic, 9 more toll exemption days were assigned to small passenger cars on toll highways, some toll stations were closed and toll exemption on highways started from February 17, 2020 to May 5, 2020, (vi) the current container vehicles of international standards would enjoy a toll discount of 65% not only at 10 designated toll stations but on the provincial expressway network.



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- (3) In 2021, (i) Hang Ring Road Western Parallel Line (Huzhou, Hangzhou and Shaoxing Section) will be opened, (ii) the Qianjiang Tunnel Connection Project from HangPu Expressway to HuHang Expressway will be opened, (iii) the YiChang Expressway will be opened, (iv) the policy of 15% toll discount for trucks of legal loading and using the non cash payment card( ETC) will be cancelled.
- (4) In 2022, Hangzhou-Deqing Metro will be opened.
- (5) In 2023, HangShaoYong Expressway will be opened.
- (6) In 2024, (i) SuTai Expressway (Nanxun to Tongxiang and Tongxiang to Deqing) will be opened, (ii) ShenJiaHuHang Expressway Widening works will be completed, (iii) the LinJin Expressway will be opened.
- (7) In 2026, the section from Zhili of ShenSuZheWan Expressway to Xin'an of LianHang Expressway will be opened.
- (8) After December 27, 2030, toll charges on the HangNing Expressway from Wangjiabang to Qingshan will be lifted.
- (9) Annual average daily traffic volume is the weighted average daily traffic volume by road section: refers to the summation of the production of the annual daily average traffic volume and mileage of each section, divided by sum of the mileage.



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Table4-7 Annual Average Daily Traffic Volumes by Road Section on Project Highway for Conservative Case

Year	Nanzhuangdoutan Int.-Renhe Sta.	Renhe Sta.-Deqing Sta.	Deqing Sta.-Hangzhou Ring Road Western Parallel Line	Hangzhou Ring Road Western Parallel Line - Deqingbei Sta.	Deqingbei Sta.-Qingsha Huzhou Int.	Qingsha Huzhou Int.-Lushan Huzhou Int.	Lushan Huzhou Int.-Huzhou Nan Lushan Int.	Huzhou Nan Lushan Int.-Lijiaxia Huzhou Int.	Lijiaxia Huzhou Int.-Changxi Huzhou Int.	Changxi Huzhou Int.-Changxi Huzhou Int.	Changxi Huzhou Int.-Changxi Huzhou Int.	Changxi Huzhou Int.-Changxi Huzhou Int.	
2020.1.1-8.31 <sup>(2)</sup>	63,399	53,899	44,813	44,813	44,728	41,954	36,726	44,688	44,824	50,908	48,194	46,502	46,647
2020.9.1-12.31	77,088	65,906	55,300	55,300	55,193	51,730	45,868	55,168	55,048	60,865	57,545	55,573	55,054
2021 <sup>(3)</sup>	71,441	59,301	48,941	57,302	57,135	53,386	46,416	57,367	57,531	61,908	58,041	55,815	54,974
2022 <sup>(4)</sup>	74,363	62,495	52,704	61,680	61,512	57,632	50,095	62,172	62,476	66,969	62,744	60,352	59,509
2023 <sup>(5)</sup>	80,504	67,992	57,684	67,291	67,123	63,102	54,852	66,625	67,082	72,179	67,587	65,026	64,185
2024 <sup>(6)</sup>	74,995	61,820	52,138	61,108	60,939	56,731	49,577	71,305	71,933	77,102	72,124	69,387	68,552
2025	79,505	65,670	55,600	65,147	64,980	60,646	53,014	76,608	77,421	82,675	77,302	74,388	73,562
2026 <sup>(7)</sup>	82,515	68,085	57,708	67,733	67,521	63,070	55,287	81,597	82,240	87,956	82,211	79,130	78,314
2027	86,705	71,659	60,955	71,530	71,318	66,753	58,547	86,726	87,541	93,314	87,192	83,943	83,138
2028	90,380	74,715	63,696	74,828	74,617	69,938	61,298	91,942	92,937	98,736	92,234	88,815	88,024
2029	93,775	77,487	66,161	77,856	77,646	72,853	63,777	97,227	98,409	101,338	97,330	93,741	92,964
2030 <sup>(8)</sup>	97,920	81,004	69,376	81,640	81,431	76,524	67,010	102,578	103,951	103,957	102,459	98,699	97,936
2031	101,920	84,405	72,491	85,297	85,089	80,072	70,142	107,649	106,557	106,442	102,459	103,402	102,653
2032	105,934	87,813	75,611	88,960	88,752	83,624	73,276	112,795	109,199	106,442	102,459	103,402	104,989

Source: Consultant, 2020

Note:

(1) Traffic volumes include general toll-free vehicles, but exclude toll free vehicles during the major festival holidays and COVID-19 epidemic periods. The latest vehicle classifications, as shown in Table 3-9, were used.



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- (2) In 2020, (i) tolling by weight for trucks will be cancelled, (ii) the ETC usage rate will reach 85%, and the vehicle tolls will be charged at 95% discount., (iii) at the end of September 2020, HangNing Expressway Widening works was completed., (iv) at the end of June 2020, Shangqiu-Hefei-Hangzhou High Speed Railway was opened., (v) in response to the COVID-19 epidemic, 9 more toll exemption days were assigned to small passenger cars on toll highways, some toll stations were closed and toll exemption on highways started from February 17, 2020 to May 5, 2020, (vi) the current container vehicles of international standards would enjoy a toll discount of 65% not only at 10 designated toll stations but on the provincial expressway network.
- (3) In 2021, (i) Hang Ring Road Western Parallel Line (Huzhou, Hangzhou and Shaoxing Section) will be opened, (ii) the Qianjiang Tunnel Connection Project from HangPu Expressway to HuHang Expressway will be opened, (iii) the YiChang Expressway will be opened, (iv) the policy of 15% toll discount for trucks of legal loading and using the non cash payment card(ETC) will be cancelled.
- (4) In 2022, Hangzhou-Deqing Metro will be opened.
- (5) In 2023, HangShaoYong Expressway will be opened.
- (6) In 2024, (i) SuTai Expressway (Nanxun to Tongxiang and Tongxiang to Deqing) will be opened, (ii) ShenJiaHuHang Expressway Widening works will be completed, (iii) the LinJin Expressway will be opened.
- (7) In 2026, the section from Zhili of ShenSuZheWan Expressway to Xin'an of LianHang Expressway will be opened.
- (8) After December 27, 2030, toll charges on the HangNing Expressway from Wangjiabang to Qingshan will be lifted.
- (9) Annual average daily traffic volume is the weighted average daily traffic volume by road section: refers to the summation of the production of the annual daily average traffic volume and mileage of each section, divided by sum of the mileage.



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**Table4-8 Toll Revenue Forecasts on Project Highway for Conservative Case**

Year	Average Daily Toll Revenue (RMB)	Daily Growth Rate	Annual Toll Revenue (RMB 10,000)	Annual Growth Rate
2020.1.1-8.31 <sup>(1)</sup>	¥3,001,274	--	¥49,521	--
2020.9.1-12.31	¥3,787,863	--	¥46,212	--
2021	¥3,801,508	14.0%	¥138,755	44.9%
2022	¥4,054,061	6.6%	¥147,973	6.6%
2023	¥4,363,986	7.6%	¥159,285	7.6%
2024	¥4,258,548	-2.4%	¥155,863	-2.1%
2025	¥4,525,222	6.3%	¥165,171	6.0%
2026	¥4,730,304	4.5%	¥172,656	4.5%
2027	¥4,983,503	5.4%	¥181,898	5.4%
2028	¥5,189,792	4.1%	¥189,946	4.4%
2029	¥5,362,854	3.3%	¥195,744	3.1%
2030	¥5,576,538	4.0%	¥203,544	4.0%
2031	¥3,638,897	-34.7%	¥132,820	-34.7%
2032	¥3,750,658	3.1%	¥124,147	-6.5%
<b>Total</b>	--	--	¥2,063,535	--

Source: Consultant, 2020

Note:

- (1) In 2020, (i) in response to the COVID-19 epidemic, 9 more toll exemption days were assigned to small passenger cars on toll highways, some toll stations were closed and toll exemption on highways started from February 17, 2020 to May 5, 2020,
- (2) The toll revenue forecasting was based on the current price. As non-economic professional, the Consultant has not made assumptions related to the future inflation rates.
- (3) Toll revenue forecast results excluded toll free vehicles
- (4) The forecast results also took into account that there would be free passage of passenger cars with 7 seats or less in holidays, such as Spring Festival, Qingming Festival, Labor Day and National Day. The number of free passage days in the future will be 20 days per year;
- (5) The concessions on the Section from Wangjiabang to Qingshan of the HangNing Expressway will end by December 27, 2030.
- (6) The concessions of the Project Highway will end by November 28, 2032.

**4.5 Test2-Forecast Results for Optimistic Case**

Based on the assumptions stipulated in Table 4-1 and the application of the traffic prediction model (see Chapter 3), the Consultant was able to develop the traffic and toll revenue forecasts for the Optimistic Case. The results were summarized in Tables 4-9 to 4-11.



Table 4-9 Annual Average Daily Traffic Volumes by Vehicle Type on Project Highway for Optimistic Case

Year	PC1	PC2	PC3	PC4	Truck1	Truck 2	Truck 3	Truck 4	Truck 5	Truck 6	Container	Total	Growth Rate
2020.1.1-8.31 <sup>(2)</sup>	31,535	163	223	632	4,695	2,114	1,848	1,497	193	4,939	57	47,896	--
2020.9.1-12.31	36,806	162	221	628	6,853	3,086	2,697	2,186	281	7,210	101	60,231	--
2021 <sup>(3)</sup>	39,913	167	230	676	6,033	2,726	2,528	2,216	287	6,661	114	61,551	15.8%
2022 <sup>(4)</sup>	45,045	170	235	691	6,399	2,929	2,717	2,381	309	7,106	119	68,101	10.6%
2023 <sup>(5)</sup>	51,297	175	242	715	6,817	3,164	2,936	2,577	334	7,621	124	76,002	11.6%
2024 <sup>(6)</sup>	52,460	163	244	718	6,524	3,031	2,890	2,560	333	7,392	108	76,423	0.6%
2025	58,558	167	250	735	6,867	3,224	3,032	2,668	346	7,762	112	83,721	9.5%
2026 <sup>(7)</sup>	63,732	169	252	750	7,092	3,362	3,063	2,662	345	7,929	115	89,471	6.9%
2027	69,580	173	257	766	7,406	3,544	3,209	2,780	360	8,287	117	96,479	7.8%
2028	73,345	176	261	777	7,618	3,662	3,316	2,870	371	8,539	119	101,054	4.7%
2029	76,367	178	265	787	7,800	3,769	3,407	2,944	381	8,754	122	104,774	3.7%
2030 <sup>(8)</sup>	79,449	180	268	796	7,982	3,879	3,499	3,019	391	8,970	123	108,556	3.6%
2031	81,396	182	271	803	8,087	3,943	3,555	3,065	396	9,098	119	110,915	2.2%
2032	82,659	183	272	807	8,159	3,979	3,586	3,090	400	9,177	115	112,427	1.4%

Source: Consultant, 2020

Note:

(1) Traffic volumes include general toll-free vehicles, but exclude toll free vehicles during the major festival holidays and COVID-19 epidemic periods. The latest vehicle classifications, as shown in Table 3-9, were used.

(2) In 2020, (i) tolling by weight for trucks will be cancelled, (ii) the ETC usage rate will reach 85%, and the vehicle tolls will be charged at 95% discount, (iii) at the end of September 2020, HangNing Expressway Widening works was completed, (iv) at the end of June 2020, Shangqiu-Hefei-Hangzhou High Speed Railway was opened, (v) in response to the COVID-19 epidemic, 9 more toll exemption days were assigned to small passenger cars on toll highways, some toll stations were closed and toll exemption on highways started from February 17, 2020 to May 5, 2020, (vi) the current container vehicles of international standards would enjoy a toll discount of 65% not only at 10 designated toll stations but on the provincial expressway network.



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- (3) In 2021, (i) Hang Ring Road Western Parallel Line (Huzhou, Hangzhou and Shaoxing Section) will be opened, (ii) the Qianjiang Tunnel Connection Project from HangPu Expressway to HuHang Expressway will be opened, (iii) the YiChang Expressway will be opened, (iv) the policy of 15% toll discount for trucks of legal loading and using the non cash payment card( ETC) will be cancelled.
- (4) In 2022, Hangzhou-Deqing Metro will be opened.
- (5) In 2023, HangShaoYong Expressway will be opened.
- (6) In 2024, (i) SuTai Expressway (Nanxun to Tongxiang and Tongxiang to Deqing) will be opened, (ii) ShenJiaHuHang Expressway Widening works will be completed, (iii) the LinJin Expressway will be opened.
- (7) In 2026, the section from Zhili of ShenSuZheWan Expressway to Xin'an of LianHang Expressway will be opened.
- (8) After December 27, 2030, toll charges on the HangNing Expressway from Wangjiabang to Qingshan will be lifted.
- (9) Annual average daily traffic volume is the weighted average daily traffic volume by road section: refers to the summation of the production of the annual daily average traffic volume and mileage of each section, divided by sum of the mileage.



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Table 4-10 Annual Average Daily Traffic Volumes by Road Section on Project Highway for Optimistic Case

Year	Nanzhuangdoutan Int.-Renhe Sta.	Renhe Sta.-Deqing Sta.	Deqing Hangzhou Ring Road Western Parallel Line	Hangzhou Ring Road Western Parallel Line - Deqingbei Sta.	Deqingbei Sta.-Qingsha Station	Qingsha Station-Huzhou Station	Huzhou Station-Lushan Int.	Lushan Int.-Huzhoubei Sta.	Huzhoubei Sta.-Lijiaxing Int.	Lijiaxing Int.-Changxing Station	Changxing Station-Changning Station	Changning Station-Changbei Station	Changbei Station-Fuziling Station
2020.1.1-8.31 <sup>(2)</sup>	63,399	53,899	44,813	44,813	41,954	36,726	44,688	44,824	50,908	48,194	46,502	46,647	
2020.9.1-12.31	79,357	67,897	56,969	56,969	53,389	47,324	57,050	56,962	62,868	59,391	57,356	56,857	
2021 <sup>(3)</sup>	75,766	63,035	52,118	60,918	56,951	49,494	61,465	61,739	66,160	61,949	59,580	58,762	
2022 <sup>(4)</sup>	81,026	68,316	57,837	67,559	63,431	55,109	68,878	69,390	73,910	69,140	66,519	65,714	
2023 <sup>(5)</sup>	90,025	76,358	65,156	75,852	71,560	62,178	76,192	76,980	82,150	76,784	73,901	73,118	
2024 <sup>(6)</sup>	85,484	70,818	60,334	70,534	66,030	57,736	84,204	85,317	90,459	84,447	81,285	80,536	
2025	92,273	76,594	65,642	76,772	72,139	63,078	93,272	94,752	99,834	93,142	89,688	88,985	
2026 <sup>(7)</sup>	96,870	80,259	68,966	80,909	76,108	66,675	102,111	103,553	104,169	101,595	97,862	97,210	
2027	103,521	85,944	74,315	87,183	82,278	72,121	111,375	113,199	108,671	105,872	106,356	105,762	
2028	110,487	91,927	80,003	93,827	88,825	77,955	116,286	118,269	108,671	105,872	106,356	105,762	
2029	117,546	97,988	85,899	100,659	95,567	83,953	116,286	118,269	108,671	105,872	106,356	105,762	
2030 <sup>(8)</sup>	124,610	104,037	92,072	107,663	102,487	90,102	116,286	118,269	108,671	105,872	106,356	105,762	
2031	124,610	108,921	98,910	111,079	109,146	96,023	116,286	118,269	108,671	105,872	106,356	105,762	
2032	124,610	114,826	104,841	111,079	110,940	102,077	116,286	118,269	108,671	105,872	106,356	105,762	

Source: Consultant, 2020

Note:

(1) Traffic volumes include general toll-free vehicles, but exclude toll free vehicles during the major festival holidays and COVID-19 epidemic periods. The latest vehicle classifications, as shown in Table 3-9, were used.



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## Zhejiang HangNing Expressway Traffic and Revenue Forecast Study

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- (2) In 2020, (i) tolling by weight for trucks will be cancelled, (ii) the ETC usage rate will reach 85%, and the vehicle tolls will be charged at 95% discount., (iii) at the end of September 2020, HangNing Expressway Widening works was completed., (iv) at the end of June 2020, Shangqiu-Hefei-Hangzhou High Speed Railway was opened., (v) in response to the COVID-19 epidemic, 9 more toll exemption days were assigned to small passenger cars on toll highways, some toll stations were closed and toll exemption on highways started from February 17, 2020 to May 5, 2020, (vi) the current container vehicles of international standards would enjoy a toll discount of 65% not only at 10 designated toll stations but on the provincial expressway network.
- (3) In 2021, (i) Hang Ring Road Western Parallel Line (Huzhou, Hangzhou and Shaoxing Section) will be opened, (ii) the Qianjiang Tunnel Connection Project from HangPu Expressway to HuHang Expressway will be opened, (iii) the YiChang Expressway will be opened, (iv) the policy of 15% toll discount for trucks of legal loading and using the non cash payment card(ETC) will be cancelled.
- (4) In 2022, Hangzhou-Deqing Metro will be opened.
- (5) In 2023, HangShaoYong Expressway will be opened.
- (6) In 2024, (i) SuTai Expressway (Nanxun to Tongxiang and Tongxiang to Deqing) will be opened, (ii) ShenJiaHuHang Expressway Widening works will be completed, (iii) the LinJin Expressway will be opened.
- (7) In 2026, the section from Zhili of ShenSuZheWan Expressway to Xin'an of LianHang Expressway will be opened.
- (8) After December 27, 2030, toll charges on the HangNing Expressway from Wangjiabang to Qingshan will be lifted.
- (9) Annual average daily traffic volume is the weighted average daily traffic volume by road section: refers to the summation of the production of the annual daily average traffic volume and mileage of each section, divided by sum of the mileage.



**Table4-11 Toll Revenue Forecasts on Project Highway for Optimistic Case**

Year	Average Daily Toll Revenue (RMB)	Daily Growth Rate	Annual Toll Revenue (RMB 10,000)	Annual Growth Rate
2020.1.1-8.31 <sup>(1)</sup>	¥3,001,274	--	¥49,521	--
2020.9.1-12.31	¥3,870,771	--	¥47,223	--
2021	¥3,999,273	18.6%	¥145,973	50.9%
2022	¥4,381,293	9.6%	¥159,917	9.6%
2023	¥4,840,371	10.5%	¥176,674	10.5%
2024	¥4,838,191	0.0%	¥177,078	0.2%
2025	¥5,230,389	8.1%	¥190,909	7.8%
2026	¥5,501,249	5.2%	¥200,796	5.2%
2027	¥5,882,859	6.9%	¥214,724	6.9%
2028	¥6,136,478	4.3%	¥224,595	4.6%
2029	¥6,344,968	3.4%	¥231,591	3.1%
2030	¥6,524,077	2.8%	¥238,129	2.8%
2031	¥4,272,205	-34.5%	¥155,935	-34.5%
2032	¥4,333,917	1.4%	¥143,453	-8.0%
<b>Total</b>	--	--	¥2,356,518	--

Source: Consultant, 2020

Note:

- (1) In 2020, (i) in response to the COVID-19 epidemic, 9 more toll exemption days were assigned to small passenger cars on toll highways, some toll stations were closed and toll exemption on highways started from February 17, 2020 to May 5, 2020,
- (2) The toll revenue forecasting was based on the current price. As non-economic professional, the Consultant has not made assumptions related to the future inflation rates.
- (3) Toll revenue forecast results excluded toll free vehicles
- (4) The forecast results also took into account that there would be free passage of passenger cars with 7 seats or less in holidays, such as Spring Festival, Qingming Festival, Labor Day and National Day. The number of free passage days in the future will be 20 days per year;
- (5) The concessions on the Section from Wangjiabang to Qingshan of the HangNing Expressway will end by December 27, 2030.
- (6) The concessions of the Project Highway will end by November 28, 2032.

## 5 Conclusion

The HangNing Expressway is an important traffic trunk line in the Yangtze River Delta Region including Shanghai, Jiangsu and Zhejiang. It is also an important expressway connecting Jiangsu and Zhejiang Provinces as well as a critical link between Nanjing and Hangzhou, the two provincial and tourism capitals.

The forecasting of future traffic volume and toll revenues were from 2020 to 2032. This Study was based on the latest data collection and the expertise in toll highway experience of the Consultant. The prediction process of this study used the state-of-art technical methods and recognized industry practices. However, it should be noted that there are still uncertainties in the forecasting of future traffic volumes and revenues for any toll road. As a result, there may be discrepancies between the predicted values and the actual results in the future. In addition, the traffic volume and revenue forecasts shown in this report only represent the overall long-term trend. In any given year, the differences between predicted and actual results may also be influenced by other factors. Therefore, although the Consultant endeavors to ensure the technicality of the information provided, it does not guarantee the accuracy or reliability of the data provided, and will not be held liable for any losses or damages caused by the forecasting results. The forecast results were summarized as follows:

- 1) From 2020 to 2032, it was estimated that the total toll revenue on the Project Highway would be RMB 22.194 billion.
- 2) Under the Conservative scenario, the total revenue on the Project Highway was estimated to be RMB 20.635 billion from 2020 to 2032.
- 3) Under the Optimistic scenario, the total revenue on the Project Highway was estimated to be RMB 23.565 billion from 2020 to 2032.



# Zhejiang LongLiLiLong Expressway Traffic and Revenue Forecast Study

Final Report



施伟拔咨询（深圳）有限公司  
WB Group International Limited



**Zhejiang Longlilong Expressway  
Traffic and Revenue Forecast Study**

**Final Report**

**5 August 2020**

**WB Group Consulting (Shenzhen) Limited**



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## 1 Introduction

### 1.1 Study Background

WB Group Consulting (Shenzhen) Company Limited ("the Consultant") was commissioned by Zhejiang Expressway Company Limited ("Zhejiang Expressway Co. Ltd") to conduct an independent study on the traffic volume and toll revenue forecasts on the LongLiLiLong Expressway ("the Project Highway") in Zhejiang Province. This report presents the final result of traffic volume and toll revenue forecasts from 2020 to 2032.

LongLiLiLong Expressway is composed of LongLi Expressway and LiLong Expressway with a T-shape structure. LongLi Expressway is connected to Hangqian Expressway in the north, and Beibu Interchange where LongLi Expressway and LiLong Expressway meet in the south. The total length is 119.785 km and the two-way four-lane, designed speed is 100/80 km/h. The whole line was completed and opened to traffic on December 31, 2006 and the charging period will last until December 30, 2031. LiLong Expressway is connected to Fuling Interchange of JingLiWen Expressway in the east and the starting point of the LongQing Expressway in the West, is 102.44 kilometers long and has four lanes in both directions, designed speed 100/80 km/h, of which the Liandu Section (22.97 km) was completed and opened to traffic on December 25, 2007, with the charging period up to December 24, 2032, and other sections were opened to traffic on December 31, 2006, with the charging period up to December 30, 2031.

LongLiLiLong Expressway is one link of the "two vertical, two horizontal, eighteen links, three circulars and three passageways" Planned Highway Network in Zhejiang Province and an important part of the National Expressway Network G25 ChangShen Expressway and G4012 LiNing Expressway. The entire roadway is a two-way four-lane, fully enclosed, fully grade-separated highway with asphalt concrete pavement. It consists of 16 toll stations and 3 service areas. The location of the Project Highway is shown in Figure 1-1.



**Figure1-1 Location of LongLiLiLong Expressway**



Source: Consultant,2020

**1.2 Study Approach**

Based on careful analysis on the characteristics of the project, the consultant completed the tasks through different stages of work such as data collection, base year traffic characteristics analysis, development of traffic model, socio-economic assessments, and traffic & toll revenue forecasting. The study approach consists of the following tasks.

Step1: Mobilization and Data Collection— It involved the collection of all available data and information of the Project Highway, the socio-economic and the transportation data of the Zhejiang Province, Jinhua City, Quzhou City, Lishui City and Fujian Province. These informations included future goods regarding economic and transport developments in the study area.

Step2: Base Year Traffic Condition Analysis - Using the data and information obtained, the consultant established and evaluated the traffic conditions along the Project Highway. Based on the analysis of the collected traffic data on the Project Highway, the Consultant estimate 2019 annual average daily traffic (AADT) volume of the Project Highway. Time value and operating cost were also estimated in this stage.

Step 3: Transport Network Development — This work was to create a computer simulation model to replicate the current traffic conditions along the Project Highway. The EMME/3 traffic model system was used for the establishment of the road network and subsequent adjustments and evaluations.

Step 4: Socio-economic Assessment — Socio-economic assessments of the Zhejiang Province and adjacent cities were other important elements of the Study. The consultant conducted analysis and assessments on the latest and available government data. The purpose is to find the relationship between socio-economic statistics and historical traffic flow. The more and detailed data are available, the more reliable relationship function will be.

Step 5: Transport Model Development — Steps 2 to 4 provided basic data to develop a transport model. The remaining tasks were to design a transport assignment model to conduct typical toll road traffic diversion and assignment tasks. The calibrated model should generate traffic flows and conditions that would similar to the actual traffic conditions. In the Study, the assignments of future traffic flows were adjusted according to the results in Task 5.

Step 6: Traffic and Toll Revenue Analysis — When future year network assumptions, socio-economic conditions, economic development, inflations and toll strategies were finalized and verified, detailed traffic and toll revenue analyses would be conducted. The consensus of the assumptions listed above would be regarded as the main model assumptions.

### 1.3 Basis of Traffic Forecasts

The consultant received the station-to-station traffic data from the Zhejiang Expressway Co., Ltd. for 1 to 7 December 2019 and 7 to 13 June 2020 of the Project Highway. These data included the entry and exit vehicles on the LongLiLiLong Expressway, including entry time and its stations, exit time and its exit station, vehicle type, toll charge, gross weight (truck). These data showed the latest traffic situations in a normal week and helped the Consultant to understand the traffic composition, the origins and destinations of the vehicles and the average travelled distances.

The advantages of using flow data from surveys to derive traffic distribution on the highway, are:

- The information was recorded by electronic equipment instead of field survey, which eliminated the disturbance to normal traffic operation;
- The information was extracted directly from the expressway's toll clearing system which could avoid manual input error such as OD recording and coding errors. It enhanced data accuracy;



- The information was recorded at 24 hours per day (i.e. sampling rate was almost 100% excluding non-permit vehicles);
- It eliminated the problems associated with survey sampling discrepancies and manual collection mistakes would be eliminated.

Besides the station-to-station traffic data on the LongLiLiLong Expressway, the Consultant also collected the following data from the Zhejiang Expressway Co. Ltd. in order to analyze the historical traffic variations of the Project Highway.

1. The highway mileage, number of lanes on road sections;
2. Toll charging scheme, the recent changes in charging policies and traffic management measures on the Project Highway;
3. From January 2015 to May 2020, monthly traffic volumes by vehicle types at 16 toll stations on the Project Highway;
4. From January 2015 to December 2019, monthly traffic volumes by road sections by vehicle types and by directions on the Project Highway;
5. From January 2015 to December 2019, monthly toll income after clearing on the Project Highway.

Although OD survey was not carried out in this study due to time and condition constraints, the station-to-station traffic data of the LongLiLiLong Expressway can be adopted as a reliable data source to accurately reflect the trip patterns. The elasticity ratios were also developed based on the historical traffic volumes of Project Highway and the related economic growth in the study area. The traffic and revenue forecasting results from this model could be regarded as reliable.

#### 1.4 Report Structure

This report presents the final forecast results of traffic and toll revenue on the LongLiLiLong Expressway. The report structure is presented as follows. Chapter 1 is the introduction of the Project Highway. Chapter 2 describes the details of the economic and traffic development of the regions along the project corridor. Chapter 3 discusses the development of the transport forecasting model. Chapter 4 summarizes the results of traffic volume and toll revenue forecasts on the Project Highway.



## 2 Existing Condition of Project Highway Affected Area

### 2.1 Existing Development Region along Project Highway

#### 2.1.1 Socio-economic Development in Zhejiang Province

Zhejiang Province is located in the southern part of Yangtze River Delta of the southeast coast of China. It is bounded by East China Sea to the east, Fujian province to the south, Jiangxi and Anhui province to the west, and Shanghai and Jiangsu province to the north. Zhejiang Province is one of the greatest economic development vitalities in China. Since the reform and opening up, people in Zhejiang province have been working hard to seize opportunities, deepen reform, expand opening up, and promote the development of the "Economic Province". The overall strength of Zhejiang province has increased dramatically. The main socio-economic data of Zhejiang Province were shown on Tables 2-1 to 2-5.

#### Population in Zhejiang Province

**Table 2-1 Historical Permanent Resident Population in Zhejiang Province**

Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
<b>Permanent Population (10,000)</b>	5275.5	5446.5	5463.0	5477.0	5498.0	5508.0	5539.0	5590.0	5657.0	5737.0

Source: Zhejiang Province Statistical Yearbook 2019

#### Gross Domestic Product (GDP) in Zhejiang Province

**Table 2-2 Historical GDP in Zhejiang Province**

Year	GDP (RMB 100 million)	Growth	Primary industry	Secondary industry	Tertiary industry	GDP Per Capita (RMB)
2009	22998.24	8.9%	1163.08	11860.16	9975.01	43857
2010	27747.65	11.9%	1360.56	14187.36	12199.74	51758
2011	32363.38	9.0%	1583.04	16331.27	14449.07	59331
2012	34739.13	8.0%	1667.88	17000.09	16071.16	63508
2013	37756.58	8.2%	1760.34	18047.52	17948.72	68805
2014	40173.03	7.6%	1777.18	19175.06	19220.79	73002
2015	42886.49	8.0%	1832.91	19711.67	21341.91	77644

Year	GDP (RMB 100 million)	Growth	Primary industry	Secondary industry	Tertiary industry	GDP Per Capita (RMB)
2016	47251.36	7.6%	1965.18	21194.61	24091.57	84916
2017	51768.26	7.8%	1933.92	22232.08	27602.26	92057
2018	56197.15	7.1%	1967.01	23505.88	30724.26	98643

Source: Zhejiang Province Statistical Yearbook 2019

### Car Ownership in Zhejiang Province

**Table2-3 Historical Car Ownership in Zhejiang Province (Unit: Vehicle)**

Year	Passenger Car	Truck	Others	Total Vehicles
2009	3514725	766460	51846	4333031
2010	4508344	872865	54509	5435718
2011	5555814	969984	56647	6582445
2012	6640840	1050189	58060	7749089
2013	7850003	1123643	59398	9033044
2014	8959921	1115620	56595	10132136
2015	10124578	1039966	51739	11216283
2016	11403051	1128714	51693	12583458
2017	12668371	1245274	52845	13966490
2018	13913234	1367849	56193	15337276

Source: Zhejiang Province Statistical Yearbook (2010-2019)

### Passenger and Freight Traffic in Zhejiang Province

**Table2-4 Passenger and Freight Traffic in Zhejiang Province**

Year	Passengers (10,000)	Passenger Turnover (100 million passenger-km)	Cargo Volume (10,000 tons)	Cargo Turnover (100 million ton-km)
2009	210584	853.63	95802	1188.70
2010	215708	882.04	103394	1298.71
2011	218415	908.15	108654	1434.82



Year	Passengers (10,000)	Passenger Turnover (100 million passenger-km)	Cargo Volume (10,000 tons)	Cargo Turnover (100 million ton-km)
2012	220517	921.18	113393	1525.59
2013	121185	582.99	107186	1322.13
2014	112915	558.06	117070	1419.43
2015	92304	544.76	122547	1513.92
2016	83033	465.12	133999	1626.78
2017	80099	431.56	151920	1821.21
2018	72013	402.80	166533	1964.10

Source: Zhejiang Province Statistical Yearbook 2019

Note: New statistical method was adopted since 2013

### Port Cargo Throughput in Zhejiang Province

**Table2-5 Historical Port Cargo Throughput in Zhejiang Province**

Year	Coastal Port (10,000 tons)	Inland Port (10,000 tons)	Container Throughput (10,000 standard units)
2009	71462	32282	1110.59
2010	78846	33941	1388.76
2011	86700	35673	1563.27
2012	92760	39171	1709.08
2013	100591	37459	1852.09
2014	108177	30894	2061.41
2015	109930	28206	2176.76
2016	114202	26664	2276.04
2017	125744	33088	2460.32
2018	133534	35676	2635.00

Source: Zhejiang Province Statistical Yearbook 2019, Zhejiang Province Social and Economic Development Statistical Bulletin, 2018

Note: Container throughput is based on the total container throughput of Ningbo-Zhoushan Port, Wenzhou Port, Taizhou Port and Jiaxing Port

### 2.1.2 Socio-economic Development in Lishui City

Lishui City is located in the southwest of Zhejiang Province, with an area of 17300 square kilometers. It is the largest prefecture level city in Zhejiang Province with 9 counties under its jurisdiction, with a total population of 2.7 million. Lishui City has unparalleled ecological advantages, known as "China's first ecological city", there are 20 high-level scenic spots above 4A level in the territory, and tourism contributes more than half of GDP. The main social-economic data of Lishui City are shown in Table2-6 to Table 2-9.

#### Population in Lishui City

**Table2-6 Historical Permanent Population in Lishui City**

Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Permanent Population (10,000)	257.39	259.65	261.33	262.59	263.92	265.65	266.38	268.03	269.27	270.19

Source: Lishui City Statistical Yearbook, (2010-2019)

#### Gross Domestic Product (GDP) in Lishui City

**Table2-7 Historical GDP in Lishui City**

Year	GDP (10,000 RMB)	Growth	Primary Industry	Secondary Industry	Tertiary Industry	GDP Per Capita (RMB)
2009	5467185	10.6%	586600	2605431	2275154	25752
2010	6647571	12.9%	629332	3269876	2748363	31365
2011	7988250	11.5%	726175	3981439	3280636	37735
2012	8922640	10.5%	793661	4397342	3731637	42158
2013	9880317	9.2%	841764	4836888	4201665	46616
2014	10517517	7.0%	885587	5055675	4576255	49459
2015	11032922	6.4%	913582	5039119	5080221	51676
2016	12102414	7.1%	956264	5434231	5711919	56238
2017	12982025	6.8%	994548	5569593	6417884	59674
2018	13946650	8.2%	941558	5777920	7227172	63611

Source: Lishui City Statistical Yearbook, (2019)



**Car Ownership in Lishui City****Table2-8 Historical Car Ownership in Lishui City (Unit: Vehicle)**

Year	Passenger Car	Trucks	Others	Total Vehicles
2009	82648	27442	1768	111858
2010	107024	34320	2481	143825
2011	132490	38531	2735	173756
2012	159064	41370	2872	203306
2013	184047	41648	2342	228037
2014	212934	41261	2212	256407
2015	244596	34981	2158	281735
2016	281389	36886	2682	320957
2017	316340	39689	2615	358644
2018	348022	42864	2760	393646

Source: Lishui City Statistical Yearbook, (2019)

**Passenger and Freight Traffic in Lishui City****Table2-9 Passenger and Freight Traffic in Lishui City**

Year	Passengers (10,000)	Passenger Turnover (10,000 passenger-km)	Cargo Volume (10,000 tons)	Cargo Turnover (10,000 ton-km)
2009	5615	237630	6546	799079
2010	5697	241949	7028	849956
2011	5722	249851	4417	689778
2012	5732	250924	4496	711499
2013	5731	250698	4498	711536
2014	4479	222039	4915	709464
2015	4017	209989	4982	713713
2016	3244	149278	4832	731304
2017	2556	122238	4985	769877

Year	Passengers (10,000)	Passenger Turnover (10,000 passenger-km)	Cargo Volume (10,000 tons)	Cargo Turnover (10,000 ton-km)
2018	2074	106514	4950	809109

Source: Lishui City Statistical Yearbook, (2019)

Note: New statistical method was adopted since 2014.

### 2.1.3 Socio-economic Development in Quzhou City

Quzhou is located in the west of Zhejiang Province, the upper reaches of Qiantang River and the western end of the Jin (Hua)Qu (Zhou) basin, with a total area of 8844.79 square kilometers. Quzhou is bordered by Nanping to the south, Shangrao and Jingdezhen to the West, Huangshan City to the North and Jinhua, Lishui and Hangzhou to the east. There are Kecheng District, Qujiang District, Jiangshan City, Longyou County, Changshan County and Kaihua County under its jurisdiction. By the end of 2019, Quzhou had a total registered population of 2,576,300, with a total GDP of 157,351 million RMB, or 71,087 RMB per capita.

#### Population in Quzhou City

**Table2-10 Historical Permanent Population in Quzhou City**

Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Permanent Population (10,000)	249.86	251.24	252.55	252.83	254.21	255.67	256.38	257.49	257.81	257.88

Source: Quzhou City Statistical Yearbook (2010-2019)

#### Gross Domestic Product (GDP) in Quzhou City

**Table2-11 Historical GDP in Quzhou City**

Year	GDP(10,000 RMB)	Growth	Primary Industry	Secondary Industry	Tertiary Industry	GDP Per Capita (RMB)
2009	6262897	10.6%	596169	3302789	2363939	25116
2010	7608909	13.7%	646776	4115069	2847064	30369
2011	9267127	11.2%	761548	5093514	3412064	36789
2012	9753242	8.2%	797519	5139863	3815859	38597
2013	10618578	9.2%	822777	5437305	4358496	41885
2014	11150977	7.2%	826352	5589001	4735624	43740

Year	GDP(10,000 RMB)	Growth	Primary Industry	Secondary Industry	Tertiary Industry	GDP Per Capita (RMB)
2015	11461322	6.5%	844624	5348270	5268427	53847
2016	12515883	7.2%	882257	5646779	5987847	58281
2017	13312714	7.3%	874039	5870245	6568431	61250
2018	14705816	7.2%	809336	6616814	7279666	66936

Source: Quzhou City Statistical Yearbook (2019)

### Car Ownership in Quzhou City

**Table2-12 Historical Car Ownership in Quzhou City (Unit: 10,000 Vehicle)**

Year	Passenger Car	Trucks	Others	Total Vehicles
2009	6.39	3.11	0	9.50
2010	8.78	--	--	12.14
2011	11.40	2.85	0.9	15.15
2012	13.77	3.10	0.86	17.73
2013	15.34	4.53	1.38	21.25
2014	20.16	3.59	0.73	24.48
2015	24.31	3.23	0.64	28.18
2016	28.93	3.62	0.56	33.11
2017	34.00	4.04	0.49	38.53
2018	35.12	2.95	10.77	48.84

Source: Quzhou City Social and Economic Development Statistical Bulletin, 2009-2018

### Passenger and Freight Traffic in Quzhou City

**Table2-13 Passenger and Freight Traffic in Quzhou City**

Year	Passengers (10,000)	Passenger Turnover (10,000 passenger-km)	Cargo Volume (10,000 tons)	Cargo Turnover (10,000 ton-km)
2009	10747	356810	6013	908359
2010	11058	376531	8603	942430
2011	11282	388504	8111	1046476



Year	Passengers (10,000)	Passenger Turnover (10,000 passenger-km)	Cargo Volume (10,000 tons)	Cargo Turnover (10,000 ton-km)
2012	11485	391760	8364	1106324
2013	5266	231102	8209	906901
2014	5112	234787	8877	964604
2015	4687	204860	8936	979049
2016	4913	196744	9975	1054098
2017	5210	174928	11263	1201414
2018	3966	152967	13162	1294535

Source: Quzhou City Statistical Yearbook (2010-2019)

Note: New statistical method was adopted since 2014.

#### 2.1.4 Socio-economic Development in Fujian Province

Fujian Province is located on the southeast coast of China. It is bordered by Zhejiang Province in the northeast, Jiangxi Province in the northwest, Guangdong Province in the southwest, and the Taiwan Strait and Taiwan Province in the southeast. Fujian Province has a total land area of 121,400 square kilometers and 9 prefectural-level cities under its jurisdiction. At the end of 2019, the permanent population was 39.73 million. In 2019, the total GDP was 4,239.5 billion RMB, or 107139 RMB per capita.

#### Population in Fujian Province

Table2-14 Historical Permanent Population in Fujian Province

Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Permanent Population (10,000)	3666	3693	3720	3748	3774	3806	3839	3874	3911	3941

Source: Fujian Province Statistical Yearbook (2019)

#### Gross Domestic Product (GDP) in Fujian Province

Table2-15 Historical GDP in Fujian Province

Year	GDP (RMB 100 million)	Growth	Primary industry	Secondary industry	Tertiary industry	GDP Per Capita (RMB)
2009	12236.53	12.3%	1182.74	6005.3	5048.49	33437





Year	GDP (RMB 100 million)	Growth	Primary industry	Secondary industry	Tertiary industry	GDP Per Capita (RMB)
2010	14737.12	13.9%	1363.67	7522.83	5850.62	40025
2011	17560.18	12.3%	1612.24	9069.2	6878.74	47377
2012	19701.78	11.4%	1776.71	10187.94	7737.13	52763
2013	21868.49	11.0%	1874.23	11329.6	8664.66	58145
2014	24055.76	9.9%	2014.8	12515.36	9525.6	63472
2015	25979.82	9.0%	2118.1	13064.82	10796.9	67966
2016	28519.15	8.4%	2363.22	13844.96	12310.97	73951
2017	32182.09	8.1%	2215.13	15354.29	14612.67	82677
2018	35804.04	8.3%	2379.82	17232.36	16191.86	91197

Source: Fujian Province Statistical Yearbook (2019)

### Car Ownership in Fujian Province

**Table2-16 Historical Car Ownership in Fujian Province (Unit: Vehicle)**

Year	Passenger Car	Trucks	Others	Total Vehicles
2009	1192518	384572	45033	1622123
2010	1502963	451130	42436	1996529
2011	1863029	517735	41500	2422264
2012	2244527	574870	41847	2861244
2013	2685948	623600	39897	3349445
2014	3180576	664812	39542	3884930
2015	3677895	654994	35141	4368030
2016	4271132	644292	35515	4950939
2017	4864625	683473	34245	5582343
2018	5456288	747687	35213	6239188

Source: Fujian Province Statistical Yearbook (2019)



**Passenger and Freight Traffic in Fujian Province****Table2-17 Passenger and Freight Traffic in Fujian Province**

Year	Passengers (10,000)	Passenger Turnover (100 million passenger-km)	Cargo Volume (10,000 tons)	Cargo Turnover (1000 million ton- km)
2009	71586	360.26	40317	507.23
2010	70714	346.68	45575	578.32
2011	73259	360.15	52558	659.52
2012	75044	368.52	59431	771.09
2013	46895	330.64	69876	821.44
2014	48580	334.95	82573	974.8
2015	40394	267.29	79802	1020.25
2016	39137	251.95	85770	1094.7
2017	37585	227.83	95599	1214.05
2018	34081	212.04	96576	1289.52

Source: Fujian Province Statistical Yearbook (2019)

Note: New statistical method was adopted since 2013

**2.2 Historical Traffic and Toll Revenue Analysis****2.2.1 Historical Traffic Analysis on Project Road**

The Consultant collected the monthly traffic volume data by vehicle types (January 2015 to December 2019) from the Zhejiang Expressway Co. Ltd. Through analysis, it was found that the traffic volume on the project highway has the following characteristics in the past five years:

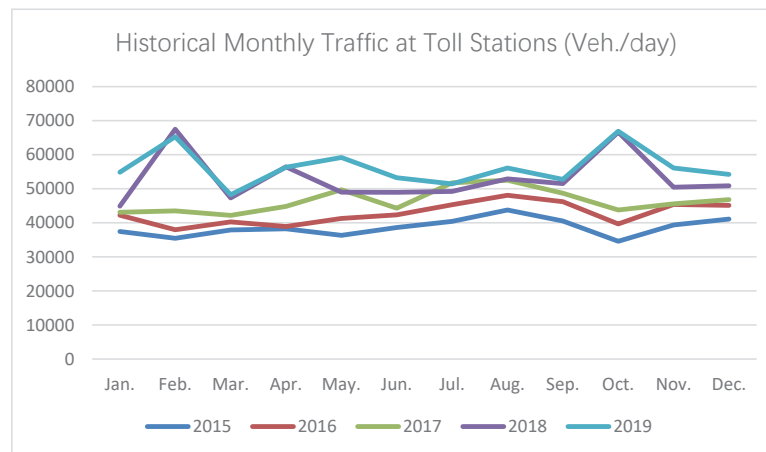
- The traffic volume on the Project Highway was mainly passenger cars, accounting for about 75% of the total traffic usage. Of the passenger cars, Class 1 accounted for 70.7%. The other main users were Truck Classes 1 & 5.

- The growth of the passenger cars on the Project Highway is fairly stable. From 2015 to 2019, the yearly growth rate of the weighted average daily traffic volume by road section has been maintained between 8.1% and 12.5%, with a compound annual growth rate of 9.6%. From 15 July 2016 to 31 December 2016, due to the road surface repair works of the S222(Songyang County Section) in Lishui City and the restriction to the movement of large vehicles, heavy vehicles with a load of more than 10 tonnes and passenger vehicles with a load of more than 20 seats, the traffic was diverted to the Project Highway. From 22 July 2016 to 24 January 2017, the S222 in Longyou County was semi-closed for major repairs. Due to the impact of the construction of surrounding provincial roads and the control of overweighted vehicles, the growth of the trucks on the Project Highway reached 12.7% and 15.5% in 2016 and 2017. From 1 November 2018, the policy that overloading vehicles would be included in the list of illegal breach of trust was implemented in Lishui City. The trucks exceeding the legal limit three times or more were prohibited the entrance to the expressway. From 1 August 2019, the policy extened to the whole province. As the implement of this prohibition entrance policy for the trucks, the growth rate of trucks in 2018 and 2019 reduced to 4.4% and 5.4%. From 2015 to 2019, the compound annual growth rate for trucks was 9.4%.
- From 2015 to 2019, the growth of the traffic at the entrance and exit is fairly stable, and the compound annual growth rate of the traffic at the entrance and exit was 7.5%.

The traffic growth at the 16 toll stations on the Project Highway in the past years were shown in Figure 2-1.

**Historical Monthly Traffic at Toll Stations**

**Figure2-1 Historical Monthly Traffic at Toll Stations**

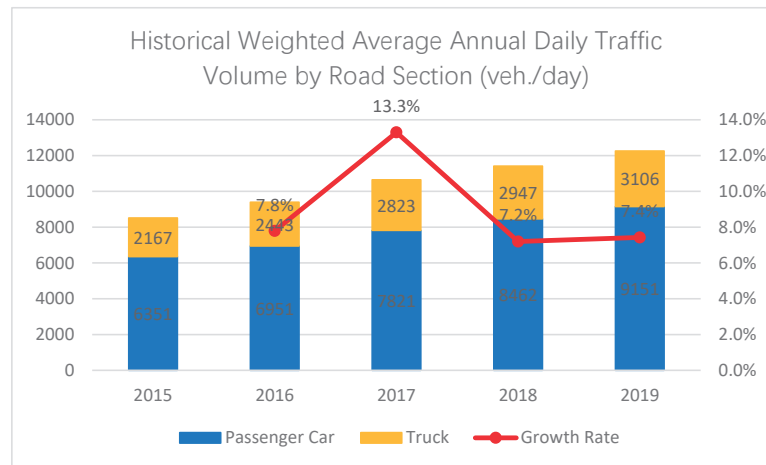


Source: Zhejiang Expressway Co., Ltd., 2020

**Historical Traffic Volume by Cross Section**

According to the traffic data collected from the Zhejiang Expressway Co. Ltd., the weighted annual average daily traffic volume by road section on the Project Highway from 2015 to 2019 was shown in Figure 2-2.

**Figure2-2 Historical Weighted Annual Average Daily Traffic Volume by Road Section**

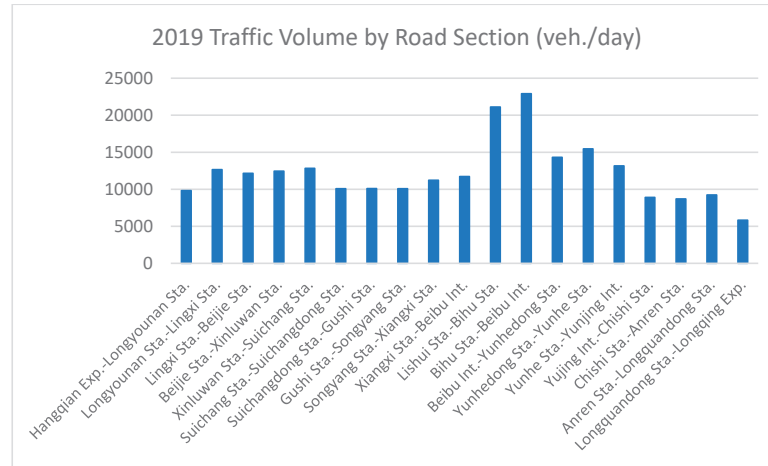


Source: Zhejiang Expressway Co., Ltd. , 2020

**Base Year Traffic Volume by Cross Section and Vehicle Composition**

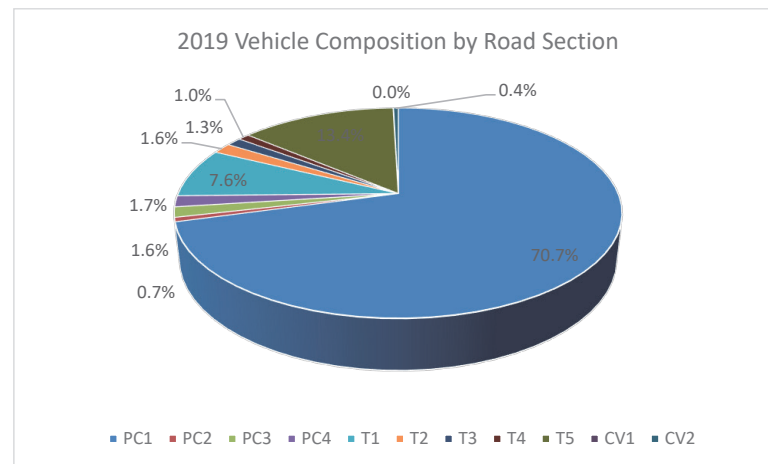
According to traffic data provided by Zhejiang Expressway Company Limited, the section traffic volumes in 2019 and the vehicle composition of weighted average traffic volumes were shown in Figure 2-3 and Figure 2-4 respectively. According to the distribution of traffic volumes on the Project Highway, the closer to cities such as Lishui City and Yunhe County, the higher the traffic volume was recorded. According to the vehicle composition, the top three were Passenger Car – Type 1, Truck - Type 1 and Truck – Type 5, accounting for 81.9%, 6.6% and 3.8% respectively. From 2015, the proportion of trucks on the project roads remained stable, with changes of 25.4% and 26.5% and little change in the future

**Figure2-3 Traffic Volume by Road Section in 2019**



Source: Zhejiang Expressway Co., Ltd. , 2020

**Figure2-4 Vehicle Composition of Traffic by Road Section in 2019**



Source: Zhejiang Expressway Co., Ltd. , 2020

Notes: According to the Toll Highway Vehicle Classification, JT/T 489-2003<sup>1</sup>: "PC1" to "PC4" refer to Passenger Car - Type 1 to Type 4 respectively, "T1" to "T5" refer to Truck - Type 1 to Type 5 respectively; "CV1" and "CV2" refer to 20 foot container vehicles and 40 foot container vehicle respectively.

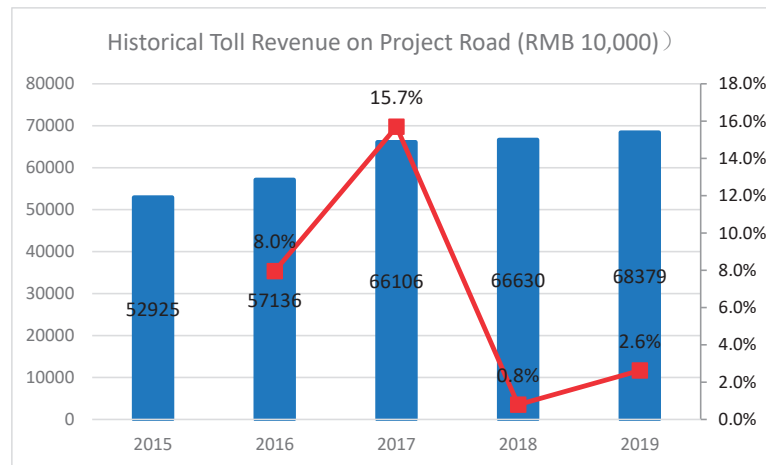
<sup>1</sup>The definition of toll highway vehicle classifications, JT/T 489-2003: Passenger Car 1 is a passenger car with no more than 7 seats; Passenger Car 2 with 8 to 19 seats, Passenger Car 3 with 20 to 39 seats; Passenger Car 4 with no less than 40 seats; Truck 1 is a truck with loading with no more than 2 tons; Truck 2 with 2 to 5 tons inclusive; Truck 3 with 5 to 10 tons inclusive; Truck 4 with 10 to 15 tons inclusive and 20 foot container truck; Truck 5 with no less than 15 tons and 40 foot container truck.

2.2.2 Historical Toll Revenue on Project Highway

**Historical Toll Revenue**

In the past few years, the toll revenue of the Project Highway has been divided into three stages. From 2015 to 2016, the toll revenue maintained normal growth. From 2016 to 2017, toll revenue gained higher growth due to the construction of surrounding provincial roads and the impact of the control of overloading. From 2017 to 2019, due to the prohibition of multiple overloading trucks on the Project Highway, as a result, the volume of truck traffic and the revenue per vehicle were both decreased, and the toll income was lower in these two years. From 2015 to 2019, the toll revenue grew at a compound annual rate of 6.6%.

**Figure2-5 Historical Toll Revenue on Project Road**



Source: Zhejiang Expressway Co., Ltd., 2020  
 Note: The toll revenue is pre tax income.

**Proportion of Free Vehicles and ETC Vehicles by Vehicle Types**

According to the collected two-week traffic data on the Project Highway, the Consultant summarized the proportion of free vehicles and ETC vehicles for each vehicle types as shown in the table 2-18. Free vehicle does not include the free Passenger Car - Type1 during the major festival holidays.

**Table2-18 Proportion of Free Vehicles and ETC Vehicles by Vehicle Types**

Type	PC1	PC2	PC3	PC4	T1	T2	T3	T4	T5	CV1	CV2
Free Vehicles	1.8%	12.9%	2.0%	0.2%	10.6%	10.8%	10.3%	6.7%	7.9%	0.9%	0.2%
ETC Vehicles	69.3%	71.1%	95.8%	92.7%	29.4%	33.9%	42.4%	39.0%	43.9%	59.5%	77.1%

Source: Consultant,2020  
 Note: The proportion of free vehicles does not include free Passenger Car - Type 1 during the major festival holidays.



### 3 Traffic Forecast Model

This forecast study employs the four-stage model, commonly used in inter-city traffic studies. Building this type of mathematical model needs a lot of data and time that a normal medium or small city would need about half a year to a year. The general process of the model development is as follows:

- Trip generation: The main goal of this stage is to estimate the total productions of every zone by population and trip rates, and the total attractions by the weight of employment figures;
- Trip distribution: To build O-D matrices based on the distribution function received from resident trip survey or large-scale home interview survey;
- Mode split: Calculating modal splits using binary or multinomial logit model;
- Trip Assignment: Trip assignment using generalized cost.

The advantages of this kind of model is that it can accurately reflect the impacts of land use and population changes to travel needs. The limitation is usually insufficient modeling time and planning data, especially in China.

Considering the mentioned limitations and different forecasting needs, a simplified four-stage model, which is commonly used in inter-city traffic studies, was employed. The major difference is that this model establishes traffic patterns and flows with a traffic survey which covers the study and does not involve any modeling procedure or functions for mode split. Traffic surveys normally include OD survey and station to station data collection.

In short, the simplified four-stage model generates trips and establishes trip distribution with reference to traffic surveys. It then forms several single-mode trip matrices which are used in trip assignment process with a computer road network. Because the data for trip generation and distribution are mainly obtained from OD surveys or station-to-station records, detailed data examination and expansion procedures are required. Also, the verification of the computerized assignment model is another important factor of the forecasting accuracy.

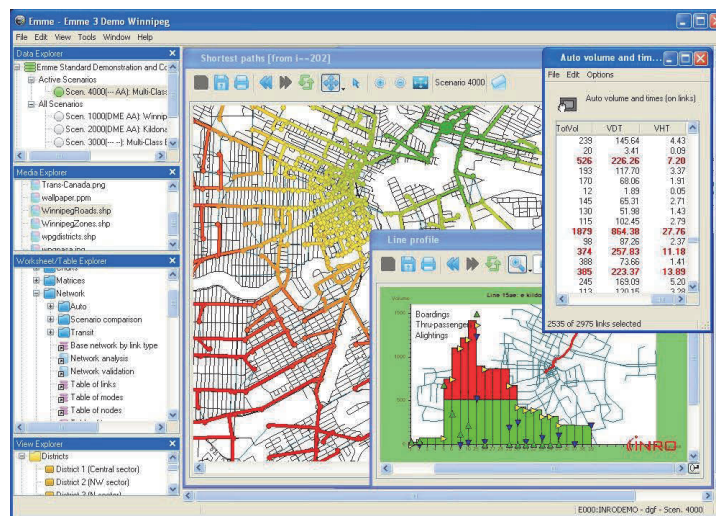
The consultant has already built the highway network model for Zhejiang Province, Fujian Province and the adjacent areas of Shanghai, in order to analyze future traffic needs for project road. This chapter gives a brief introduction of the traffic model.

3.1 Traffic Software—EMME/3

EMME/3 is used to simulate current road network. As a renowned urban and regional transportation planning software, it provides a complete and flexible platform for travel demand modeling, network analysis and evaluation works. It was first introduced in 1976 by INRO. INRO was formerly known as the transport research center of Canada Montreal University. Currently, EMME/3 is deemed to be the leading software in the industry with over 600 organization users worldwide.

One of the reasons for the popularity of EMME/3 is that it allows the user to set up its own database and support quantitative analysis and evaluation with preset variations. The input data includes transport infrastructure (e.g. road network), economic activity, social-economic characteristics, etc.

Figure3-1 Model Components of EMME/3



Source: Consultant, 2020

Once the database is set up, the user can perform transport planning by utilizing the strong capability of the software including interactive data input, visual presentation of assignment results and precise traffic engineering calculations.

There are two main issues related to transport modeling: Transport demand and transport supply. Transport supply means the availability of road network. Transport demand is the quantity (i.e. OD matrices) determined by the demand module which is incorporated in the mentioned transport model. The “equilibrium” condition achieved during the modeling process means the demand side and the supply side are at the “balance” state that it can provide the traffic volume using the road facilities.

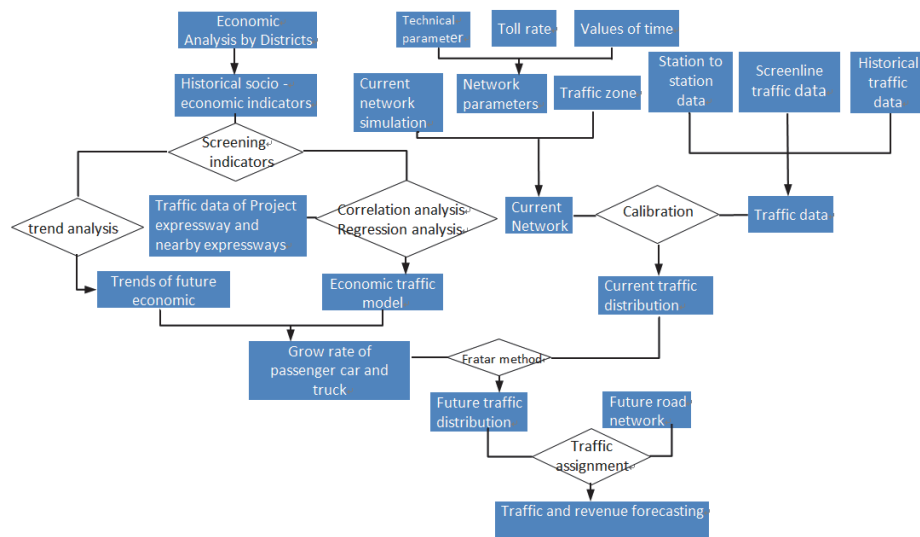


**3.2 Technical Approach to Traffic Modeling**

In order to accurately predict the future traffic volumes and revenue growth of the Project Highway, the Consultant established a complex socio-economic-traffic model, which can be divided into two interrelated sub-models. They are:

- Economic Analysis Model: the driving factor for determining traffic growth;
- Traffic Forecasting Model: used to check and distribute traffic flow, analyze traffic diversion and inducement.

**Figure3-2 Technical Approach to Traffic Modeling**



Source: Consultant,2020

**3.3 Economic-Traffic Model Analysis**

**3.3.1 Economic Analysis Zones**

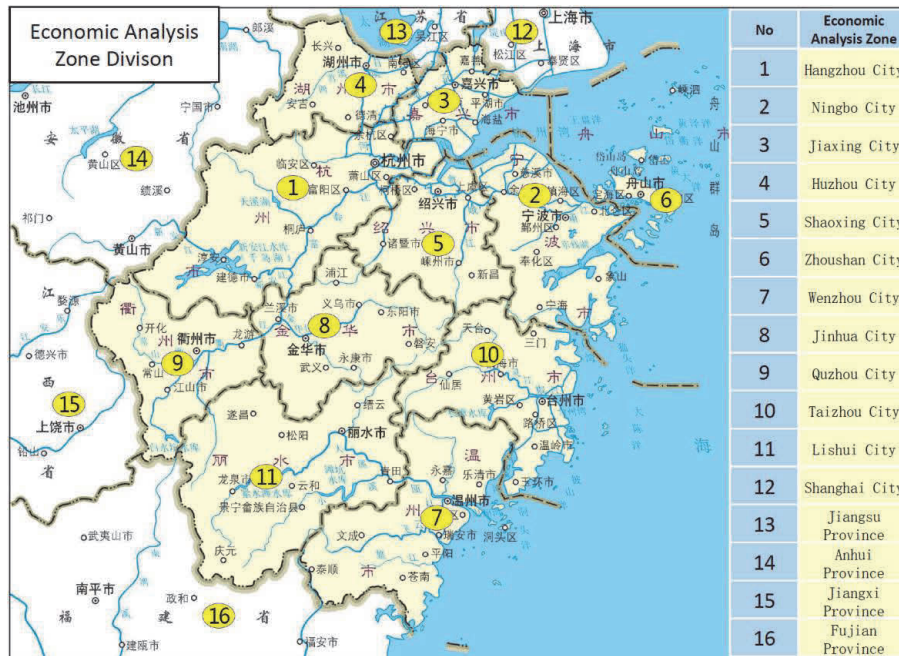
In this study, the Consultant compared a number of socio-economic drivers to establish a more comprehensive economic-traffic model. Therefore, in the economic analysis, it will mainly include the following parts:

- Selection of Socio-Economic Indicators Related to Transportation;
- Correlation Between Economic Indicators and Traffic Growth and Regression Analysis;

- Analysis of the Elasticity Coefficient of the Economic Indicators and Traffic Growth
- Analysis of future growth trend of Economic Indicators.

In the study, it is necessary to conduct economic analysis on each of the Economic Analysis Zone (TAZ), to establish a regression model of TAZ traffic production and economic indicators, and to apply it to each TAZ. In consideration of 436 TAZs, the amount of data and analysis would be extremely difficult and time consuming. Therefore, the Consultant have aggregated these TAZs into 16 middle zones (Economic Analysis Zones), and analyzed their respective economic indicators. The Consultant collected the historical traffic volumes of the Project road and the nearby expressways, and established a prediction model between traffic demands and the economic indicators of the areas closely related to the Project Highway, namely the economic-traffic model. By substituting each TAZ's economic indicator growth forecast into the economic-traffic model. With the future forecasts on the economic indicators, the Consultant can predict the traffic growth of each TAZ's. The 16 Economic Analysis Zones were shown in Figure 3-3 and Table 3-1:

Figure 3-3 Economic Analysis Zones



**Table 3-1 Jurisdiction of Economic Analysis Zones**

Middle Zone	Name	Jurisdiction
1	Hangzhou City	Hangzhou City and its counties
2	Ningbo City	Ningbo City and its counties
3	Jiaxing City	Jiaxing City and its counties
4	Huzhou City	Huzhou City and its counties
5	Shaoxing City	Shaoxing City and its counties
6	Zhoushan City	Zhoushan City and its counties
7	Wenzhou City	Wenzhou City and its counties
8	Jinhua City	Jinhua City and its counties
9	Quzhou City	Quzhou City and its counties
10	Taizhou City	Taizhou City and its counties
11	Lishui City	Lishui City and its counties
12	Shanghai	Shanghai and its counties
13	Jiangsu Province	Jiangsu Province and northern districts
14	Anhui Province	Anhui Province and northern districts
15	Jiangxi Province	Jiangxi Province and western districts
16	Fujian Province	Fujian Province and southern districts

Source: Consultant, 2020

### 3.3.2 Economic Indicators Analysis

The typical economic and traffic forecasting model uses the relationship developed between historic GDP and traffic demand to forecast future traffic generation. In order to be more comprehensive and scientific, the Consultant also investigated other economic parameters to develop more comprehensive economic-traffic correlations.

In order to investigate the impacts of different district economic parameters on traffic growth (passenger cars and trucks) of various vehicle types, the historic traffic data by vehicle types at the toll station locations and the historic variations of economic parameters were closely studied. The selected economic parameters were also prioritized before they were subjected to correlation and regression analyses (note: In the selection of the indicators, attention was also paid to the difficulty of obtaining the related data in each region):



- Passenger car Types 1 & 2 were basically small vehicles that are owned by individuals or units. Finally, the most relevant indicator for their growth was selected: **Passenger Car Ownership**.
- Passenger car Types 3 & 4 were basically for inter-city passenger travel or tourist trips. Finally, the most relevant indicator for their growth was selected: **Road Passenger Travel**
- Truck Types 1-6 were basically self-used or for transport of bulk cargo goods. They have more relevant relationship with economic activities, product production and transport circulation. Finally, the most relevant indicator for their growth was selected: **GDP**.
- Truck Types 7 are container trucks, which are mainly used for import and export trade transportation. Finally, the most relevant indicator for their growth was selected: **Port Container Throughput**.

After determining the relevant economic indicators for the growth of various vehicle classes, the elasticity analysis of passenger and freight demand against economic growth was carried out. Finally, the economy-traffic growth model was developed.

$$Y_n = b \cdot (a \cdot X_1 + c)$$

Note: Dependent variable  $Y_n$  – traffic growths at different areas;

Independent variable  $X_1$ - Historic growth pattern of socio-economic parameters at Project Road influenced areas;

$a$  、  $c$  - regression coefficient;

$b$  – correlation factor between time value and traffic volume.

Through the regression analysis, the values of various coefficients in the economic-traffic model were determined as follows:

**Table3-2 Parameters of Traffic Growth Model**

Vehicle Types <sup>2</sup>	a	$X_1$	c	b
Passenger Car 1 & 2	1.006	Passenger car ownership	0.014	0.85-1.00
Passenger Car 3 & 4	0.789	Road passenger Travel	-0.028	0.85-1.00
Truck 1 & 2	0.933	GDP	-0.002	0.85-1.00
Truck 3	0.351	GDP	-0.002	0.85-1.00
Truck 4 & 5 & 6	1.210	GDP	-0.007	0.85-1.00
Container vehicle	1.284	Port container throughput	0.046	0.85-1.00

Source: Consultant,2020

<sup>2</sup>The new vehicle types are according to “the definition of toll highway vehicle classifications, JT/T 489-2019”, see Table 3-9.

### 3.3.3 Future Time Elasticity Coefficient Assumption

Based on foreign and domestic experience, the time adjustment factors of economic and traffic parameters would remain relatively stable in the coming 3-5 years. When the economy of society is low, transportation demand would increase and hence economic growth would be more dependent on transportation services. Thus, the time adjustment factors would be relatively high. On the contrary, the time adjustment factors would diminish when the economy prospers to a certain level. The main reason for the decline is that rapid growth of high-tech industries and tertiary industries would normally go hand in hand with overall economic growth, this would likely reduce the dependence on transportation needs. This will in turn result in a slower transport demand which offsets the persistent need for transport services.

Through more than ten years of relevant working experience in mainland China, the Consultant completed the traffic volume forecasting of many toll roads in provinces such as Zhejiang, Northeast, Tianjin, Hebei, Jiangsu, Jiangxi, Guangdong, Sichuan, Shanghai, Anhui, etc. In particular, the Consultant has been actively involved in traffic volume and revenue forecasting of numerous toll roads in the Zhejiang Province. From the completed toll road studies, the Consultant attained data on traffic growth rates and GDP growth. It can be concluded that the future time elasticity coefficient will be basically between “0.50-0.95”.

The time adjustment factors of the Project Highway in the coming years were shown in Table 3-3.

**Table3-3 Future Time Elasticity Coefficient (b)**

Vehicle Types	2019-2020	2021-2025	2026-2030	2031-2035
Passenger Car 1 & 2	1.00	0.95	0.90	0.85
Passenger Car 3 & 4	1.00	0.95	0.90	0.85
Truck 1 & 2	1.00	0.95	0.90	0.85
Truck 3	1.00	0.95	0.90	0.85
Truck 4 & 5 & 6	1.00	0.95	0.90	0.85
Container vehicle	1.00	0.95	0.90	0.85

Source: Consultant,2020

### 3.3.4 Future Development and Trends of Economic Indicators

In general, it is difficult to predict the future growth pattern of economic parameters. It may be unreasonable to adopt a uniform trend for all the economic parameters. Consequently, we determined the future trends of the parameters based on the following considerations:



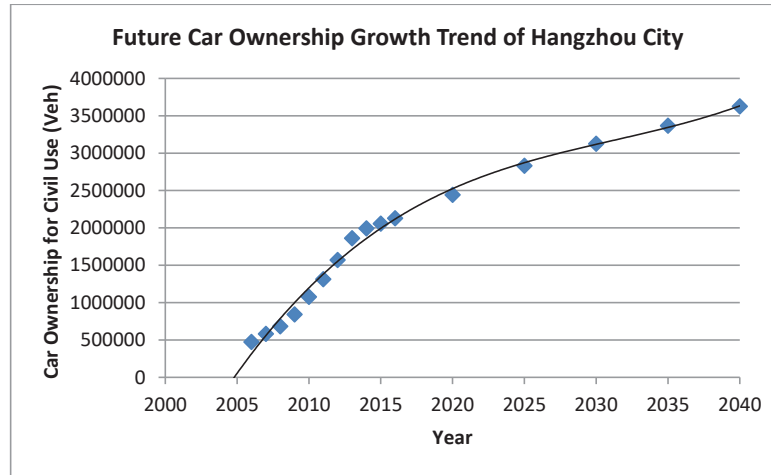
- Understand historic growth trend based on collection and assessment of historic data;
- “Thirteenth Five-Year Plan” : Refer to the goals and requirements for future growth in the plan;
- Urban Master Plans: Refer to the goals and requirements for future growth in relevant Master Plans;
- Compare experience on international and domestic urban city development process around the world. Study the changes in the economic parameter values for various phases of successful cities in developing countries.
- Current and future planning guidelines of other industries were also referenced.

#### **Future Trends of Selected Economic Indicators Analysis**

The future trends of the selected economic indicators of each TAZ is mainly based on the economic development goals and objectives of the 13th Five-Year Plan. The future economic development trends are expected to reflect the economic growth patterns, development policies and the overall growth of the indicators in the next five years. In summary, the indicator growth rates are normally used as control points for future development trends.

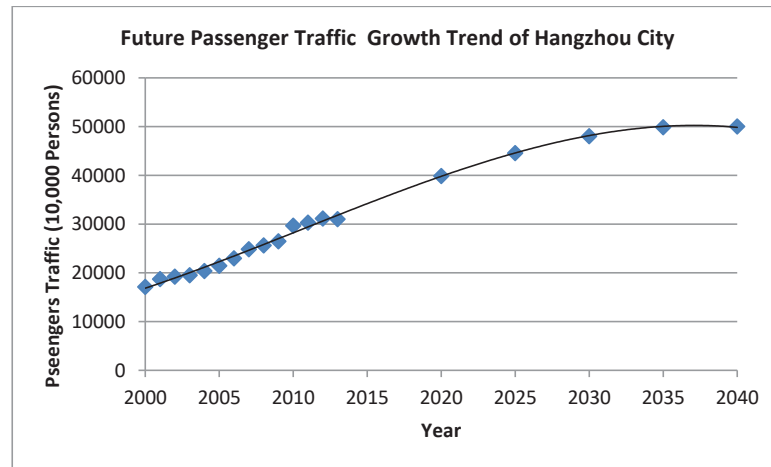
The understanding of the historic development, the future development patterns of each city based on the "13th Five-Year Plan", and the guidelines of local Master Plans, the annual average growth rates of the GDP could be predicted. In the Zhejiang Province for the next 5 years, the GDP growth is expected to be between 7%-10%. A more stable future economic development trend will likely replace the more rapid growth in the past. Figure 3-4 to Figure 3-7 present the economic indicators of Hangzhou and the growth trend of container throughput of the Ningbo-Zhoushan Port, respectively. The economic analysis of other sub-districts is quite similar. In the future forecasting of economic growth trends, the Consultant has considered the various domestic growth development patterns of individual districts in recent years.

Figure3-4 Future Car Ownership Growth Trend of Hangzhou City



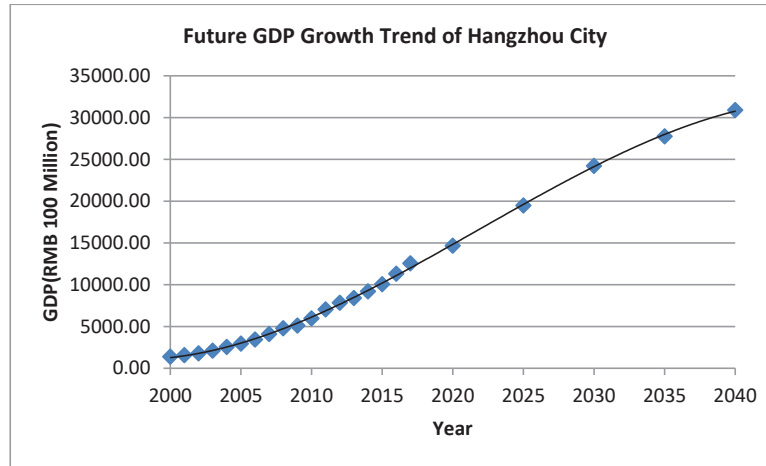
Source: Consultant, 2020

Figure3-5 Future Passenger and Freight Traffic Growth Trend of Hangzhou City



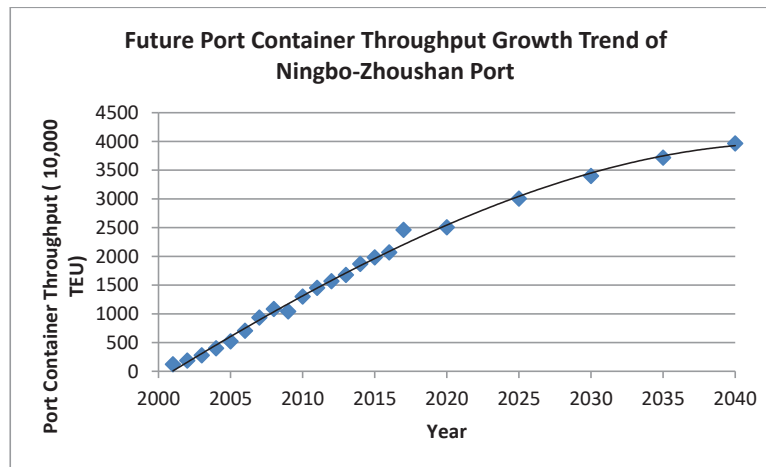
Source: Consultant, 2020

**Figure3-6 Future GDP Growth Trend of Hangzhou City**



Source: Consultant, 2020

**Figure3-7 Future Port Container Throughput Growth Trend of Ningbo-Zhoushan Port**



Source: Consultant, 2020

Through the above various planning and reference basis, the control values of the future growth trends of economic indicator values were determined, and combined with results of the regression analysis (trending curve) of the historical data of each economic analysis zone, the growths of future economic indicators of the 16 middle zones were summarized in Table 3-4 to Table 3-7. Applying these increases to the previously developed economic-traffic model, the future annual traffic growth rates for each corresponding TAZ were calculated.



**Table3-4 Future Passenger Car Ownership for Civil Use Growth Rate Assumption in TAZs**

Economic Analysis Zones	2019-2020	2021-2025	2026-2030	2031-2035
Hangzhou City	4.0%	4.0%	3.0%	2.5%
Ningbo City	9.0%	4.0%	3.0%	2.5%
Jiaxing City	9.0%	5.5%	4.0%	3.0%
Huzhou City	9.0%	5.5%	4.0%	3.0%
Shaoxing City	9.0%	5.5%	4.0%	3.0%
Shaoshan City	9.0%	5.5%	4.0%	3.0%
Wenzhou City	9.0%	5.5%	4.0%	3.0%
Jinhua City	9.0%	5.5%	4.0%	3.0%
Quzhou City	11.0%	8.0%	6.0%	4.0%
Taizhou City	9.0%	5.5%	4.0%	3.0%
Lishui City	9.0%	5.5%	4.0%	3.0%
Shanghai City	9.0%	5.5%	4.0%	3.0%
Jiansu Province	9.0%	5.5%	4.0%	3.0%
Anhui Province	12.0%	8.0%	6.0%	4.0%
Jianxi Province	12.0%	8.0%	6.0%	4.0%
Fujian Province	12.0%	8.0%	6.0%	4.0%

Source: Consultant,2020

Note: With reference to the more developed cities over the world, the average passenger car ownership per capita should not exceed 0.4 vehicles/person. Therefore, it is assumed that the growth will be limited to 0.3 vehicles/person, and the maximum is no more than 0.4 vehicles/person by the end of the forecast period.

**Table3-5 Future Road Passenger Travel Growth Rate Assumption in TAZs**

Economic Analysis Zones	2019-2020	2021-2025	2026-2030	2031-2035
Hangzhou City	4.0%	2.0%	1.0%	0.5%
Ningbo City	9.0%	6.0%	3.0%	1.5%
Jiaxing City	4.0%	2.0%	1.0%	0.5%

Economic Analysis Zones	2019-2020	2021-2025	2026-2030	2031-2035
Huzhou City	1.0%	0.0%	0.0%	0.0%
Shaoxing City	0.0%	0.0%	0.0%	0.0%
Shaoshan City	3.0%	2.0%	1.0%	0.5%
Wenzhou City	4.0%	3.0%	2.0%	1.0%
Jinhua City	4.0%	3.0%	2.0%	1.0%
Quzhou City	6.0%	4.0%	2.5%	1.5%
Taizhou City	4.0%	3.0%	2.0%	1.0%
Lishui City	1.0%	0.0%	0.0%	0.0%
Shanghai City	3.0%	2.0%	1.0%	0.5%
Jiansu Province	1.0%	0.0%	0.0%	0.0%
Anhui Province	2.0%	1.0%	0.0%	0.0%
Jianxi Province	4.0%	3.0%	2.0%	1.0%
Fujian Province	5.0%	3.5%	2.5%	1.5%

Source: Consultant,2020

Table3-6 Future GDP Growth Rate Assumption in TAZs

Economic Analysis Zones	2019-2020*	2021-2025	2026-2030	2031-2035
Hangzhou City	3.0%	5.5%	4.5%	3.5%
Ningbo City	3.0%	5.5%	4.5%	3.5%
Jiaxing City	3.5%	5.5%	4.5%	3.5%
Huzhou City	4.5%	6.5%	5.5%	4.0%
Shaoxing City	4.0%	6.0%	4.5%	3.5%
Shaoshan City	5.0%	6.5%	5.5%	4.0%
Wenzhou City	4.5%	6.5%	5.5%	4.0%
Jinhua City	3.0%	5.5%	4.5%	3.5%
Quzhou City	3.5%	5.5%	4.5%	3.5%

Economic Analysis Zones	2019-2020*	2021-2025	2026-2030	2031-2035
Taizhou City	3.0%	5.5%	4.5%	3.5%
Lishui City	4.5%	6.0%	4.5%	3.5%
Shanghai City	2.5%	5.0%	4.0%	3.0%
Jiansu Province	3.0%	5.5%	4.5%	3.5%
Anhui Province	4.5%	6.0%	4.5%	3.5%
Jianxi Province	5.0%	6.5%	5.0%	3.5%
Fujian Province	4.5%	6.0%	4.5%	3.5%

Source: Consultant,2020

Note: with reference to other global economic prediction sources such as the organization for economic cooperation and development (OECD), the GDP growth rate after 2020 is estimated based on the growth rate assumption from 2019 to 2020, with a decrease of 1.0-2.0% every five years.

\*According to the data on the website of the National Bureau of statistics, the GDP growth rate in the first half of 2020 is - 1.6% affected by the new COVID-19. If the same growth rate in 2019 is restored in the second half of 2020, the GDP growth rate in the whole year of 2020 can maintain 2% - 3%, 3.5% lower than the normal value.

**Table3-7 Future Port Container Throughput Growth Rate Assumption in TAZs**

Ports	2019-2020	2021-2025	2026-2030	2031-2035
Ningbo Port	6.0%	4.0%	3.0%	2.0%
Wenzhou Port	14.5%	8.0%	5.0%	3.0%
Taizhou Port	10.0%	6.5%	4.5%	2.5%
Jiaxing Port	8.0%	5.5%	3.5%	2.0%
Shanghai Port	3.0%	2.0%	1.0%	0.5%
Zhoushan Port	10.0%	6.5%	4.5%	3.0%

Source: Consultant,2020

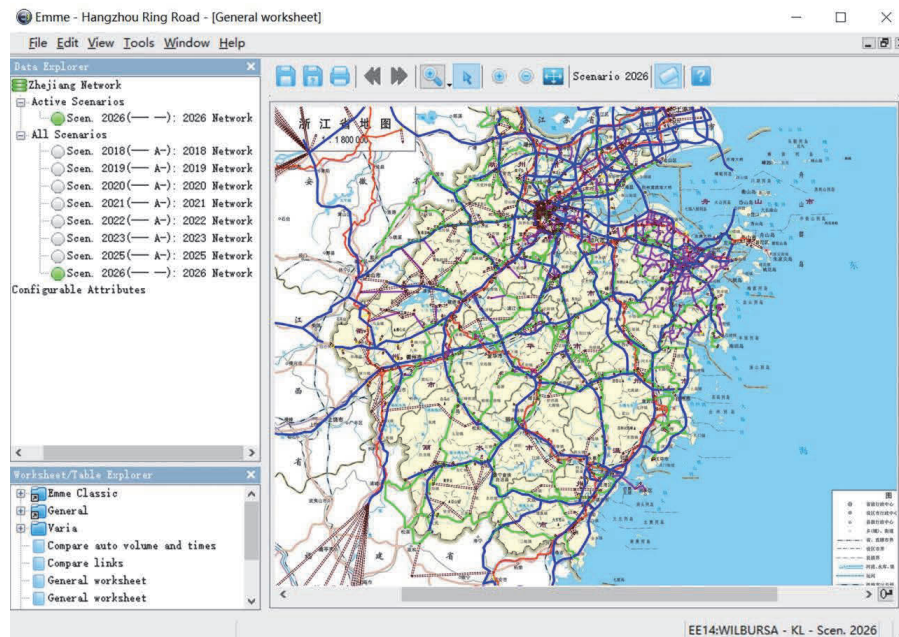
**3.4 Traffic Forecast Model Development**

**3.4.1 Road Network**

In the base year road network development process, the Consultant made use of the existing Zhejiang road network data in the highway toll clearance system, the provincial expressway network map and the Zhejiang future expressway plan as building blocks to develop the highway supply model which was later coded into EMME/3. All major highway facilities were included in the EMME/3 network, including expressways and national highways.

All the major highways in the network would include characteristics such as speed, capacity, distance and levels of operation (expressed in delays and cost indices). The distances between stations in the road network were based on the data in the current toll system. As for the the locations and distances of the national and provincial roads, the Consultant referred to Zhejiang Province Road Map for verification purposes. Figure 3-8 shows the EMME/3 Road Network for this Study.

**Figure3-8 Road Network of Zhejiang Province**



Source: Consultant, 2020

3.4.2 Volume Delay Functions

Travel time is usually derived directly from speed which in turn would be influenced by level of congestion on the road. As a popular expressway, the Project Highway has a relatively high degree of congestion. To estimate future travel speed under continuous traffic growth, the use of a “capacity constrained” assignment model would be necessary. The resultant travel volumes and levels of service were stored in the data bank. The Volume Delay Function (VDF) used in the study model could be represented as:

$$VDF = Len * [60 / Sf + A * (V/C - R1) + B * (V/C - R2)]$$

- Note: VDF = Volume Delay Functions
- Len = Distance
- Sf = Free Flow Speed
- V/C = Volume to Capacity Ratio
- R1, R2 = Volume to Capacity Ratio Coeff
- A, B = Model Coefficient

3.4.3 Passenger Car Unit (PCU)

All types of vehicles were converted into equivalent “passenger car units (PCU)” before they were taken into account in the forecasting model. The PCU conversion factors used by the Consultant in this study were summarised in Table 3-8.

Table3-8 Passenger Car Unit (PCU) Conversion Factor

Type	Number	Description	Conversion Factor
Passenger Car	Passenger Car 1	9 seats or less (less than 6 meters long)	1.0
	Passenger Car 2	10-19 seats (less than 6 meters long)	1.0
	Passenger Car 3	39 seats or less (more than 6 meters long)	1.5
	Passenger Car 4	40 seats or more (more than 6 meters long)	1.5
Truck	Truck 1	2 axles (the vehicle length is less than 6 meters and the maximum allowable total mass is less than 4500 kg)	1.0
	Truck 2	2 axles (the vehicle length is not less than 6 meters or the maximum allowable total mass is not less than 4500 kg)	1.5



Type	Number	Description	Conversion Factor
	Truck 3	3 axles	2.5
	Truck 4	4 axles	2.5
	Truck 5	5 axles	4.0
	Truck 6	6 or more axles	4.0
	Container	20/40/45 feet container	4.0

Source: Highway Engineering Design Standards (JTG B01-2014)

#### 3.4.4 Toll Rate Assumption

On May 16, 2019, the general office of the State Council issued the Implementation Plan of Deepening the Reform of Toll Road System and Canceling the Provincial Boundary Toll Station of Expressway, proposing to cancel the truck weight charging from January 1, 2020, unify the charging according to the vehicle (axle) type, ensure that the overall burden of the truck toll is not increased, and synchronously implement the closed expressway toll station entrance non parking weighing detection. According to the reply of the general office of Zhejiang Provincial People's Government on the Adjustment of Toll Policy of Deepening the Reform of Toll Road System and Canceling the Provincial Boundary Toll Stations (ZheZhengBanHan[2019] No. 96) on December 30, 2019, the toll standard of passenger cars and trucks for the project road is shown in table 3-9.

**Table3-9 Toll Charge Rates by Types on Project Highways**

Type	Passenger Car/Truck	Distance Rate (RMB/Veh.-Km)	Vehicle Rate(RMB/Vehicle)
Passenger Car 1	9 seats or less (less than 6 meters long)	0.40	5
Passenger Car 2	10-19 seats (less than 6 meters long)	0.40	5
Passenger Car 3	39 seats or less (more than 6 meters long)	0.80	10
Passenger Car 4	40 seats or more (more than 6 meters long)	1.20	15
Truck 1	2 axles (the vehicle length is less than 6 meters and the maximum allowable total mass is less than 4500 kg)	0.450	0



Type	Passenger Car/Truck	Distance Rate (RMB/Veh.-Km)	Vehicle Rate(RMB/Vehicle)
Truck 2	2 axles (the vehicle length is not less than 6 meters or the maximum allowable total mass is not less than 4500 kg)	0.841	0
Truck 3	3 axles	1.321	0
Truck 4	4 axles	1.639	0
Truck 5	5 axles	1.675	0
Truck 6	6 or more axles	1.747	0
Container	20/40/45 feet container	1.4	15

Source: Zhejiang Expressway Co. Ltd, 2020

Note: the current international standard container transport vehicle toll preferential policy is extended from 10 designated toll stations to the provincial high-speed road network, which is charged at a uniform rate of 65%.

In addition, there is bridge / tunnel extra fee for the Project Highway, as shown in the table 3-10:

**Table3-10 Tunnel Extra Fee of Project Highway**

Tunnel Name	Length	Tunnel Extra Fee
Muchen Tunnel	Left 1285 m, Right 1285 m	1 RMB/Vehicle
Xitian Tunnel	Left 2321 m, Right 2300 m	1 RMB/Vehicle
Qingyunling Tunnel	Left 2180 m, Right 2130 m	1 RMB/Vehicle
Dongtian Tunnel	Left 1245 m, Right 1240 m	1 RMB/Vehicle
Malingtou Tunnel	Left 1890 m, Right 1890 m	1 RMB/Vehicle
Zhulingtou Tunnel	Left 2405 m, Right 2405 m	1 RMB/Vehicle
Anjitou Tunnel	Left 1659 m, Right 1663 m	1 RMB/Vehicle
Chishiling Tunnel	Left 2740 m, Right 2781 m	2 RMB/Vehicle
Wanyaoling Tunnel	Left 1396 m, Right 1399 m	1 RMB/Vehicle
Huanggang Tunnel	Left 2078 m, Right 1995 m	1 RMB/Vehicle
Yanshanling Tunnel	Left 2275 m, Right 2285 m	1 RMB/Vehicle
Aotoumeng Tunnel	Left 1144 m, Right 1240 m	1 RMB/Vehicle



Tunnel Name	Length	Tunnel Extra Fee
Tashiling Tunnel	Left 1070 m, Right 1105 m	1 RMB/Vehicle

Source: Zhejiang Expressway Co. Ltd, 2020

Note: For Expressway Independent Tunnels (including left and right tunnels) with ventilation and monitoring facilities of a certain length, the specific superimposed standards are: 1000-2500 m (including) 1 RMB/Vehicle, 2500-4000 m (including) 2 RMB/Vehicle, 4000-5500 m (including) 5 RMB/Vehicle, 5,500-7,000 m (including) 8 RMB/Vehicle, 7,000-8,500 m (including) 10 RMB/Vehicle, 8,500-10,000 m (including) 12 RMB/Vehicle, 10,000 m or more 15 RMB/Vehicle.

**According to the letter of Zhejiang Provincial Highway Administration Bureau on Confirming the Companies and Road Sections which Implement the Preferential Policy of 15% Discount for Non Cash Payment Trucks, it is specified that from January 1, 2019 to December 31, 2020, the provincial, municipal and county (city) state-owned wholly-owned and controlled expressway sections will offer 15% discount charging for the trucks which is the legal loading and using the non cash payment card and ETC.**

**Pursuant to the Notice from the Ministry of Transport in relation to the Toll Fees Payable for Toll Roads during the Control Period of the Novel Coronavirus Disease (Jiao Gong Lu Ming Dian [2020] No. 62) and the Announcement of the Ministry of Transport on Resumption of Toll Collection for Toll Roads issued by the Ministry of Transport on 15 February 2020 and 28 April 2020, respectively, the toll-free period due to COVID-19 is from 17th February 2020 to 5th May 2020.**

Based on the above discussion, the changes in charging standards in the future forecast period are summarized as follows.



**Table3-11 The Changes in Charging Standards of Project Highway in Future Forecast Period**

Year	Passenger Car/Container Vehicle	Ordinary Truck
2020	<ol style="list-style-type: none"> <li>1. Implemented according to the Table 3-9.</li> <li>2. In response to the COVID-19 epidemic in 2020, (i) 9 more toll exemption days were assigned to small passenger cars on toll highways, (ii) Due to the impacts of the epidemic in 2020, some toll stations were closed; (iii) toll exemption started in February 17, 2020, and ended in May 5, 2020.</li> <li>3. The ETC usage rate will reach 85%, and vehicle tolls will be charged at 95%.</li> <li>4. The current international standard container vehicles toll preferential policy is extended from 10 designated toll stations to the provincial expressway network, which is charged at 65%.</li> </ol>	<ol style="list-style-type: none"> <li>1.Implemented according to the Table 3-9.</li> <li>2. In response to the COVID-19 epidemic in 2020, (i) 9 more toll exemption days were assigned to small passenger cars on toll highways, (ii) Due to the impacts of the epidemic in 2020, some toll stations were closed; (iii) toll exemption started in February 17, 2020, and ended in May 5, 2020.</li> <li>3. The ETC usage rate will reach 85%, and vehicle tolls will be charged at 95%.</li> <li>4. The project road offered 15% discount charging for the trucks which is the legal loading and using the non cash payment card and ETC.</li> </ol>
2021 and After	<ol style="list-style-type: none"> <li>1. Implemented according to Table 3-9.</li> <li>2.The ETC usage rate will reach 90%, and the tolls of ETC vehicles will be charged at 95%.</li> <li>3. The current international standard container vehicles toll preferential policy is extended from 10 designated toll stations to the provincial expressway network, which is charged at 65%.</li> </ol>	<ol style="list-style-type: none"> <li>1.Implemented according to Table 3-9.</li> <li>2. The ETC usage rate will reach 90%, and vehicle tolls will be charged at 95%.</li> </ol>

Source: Consultant, 2020

According to the “Implementation Plan for the Toll Exemption of Small Vehicles for Major Holidays” issued on July 24, 2012, small vehicles will be exempted from toll on the statutory holidays in Spring Festival, the Ching Ming Festival, the Labor Day, and the National Day. The toll exempted vehicles include those of less than 7 seats (including 7 seats) passenger vehicles and motorcycles. The exemption period starts at 00:00 on the first day till the 24:00 on the last day of the holidays. The toll exemption is applied to toll roads, bridges and tunnels (including the Project Highways), which are subject to the approval of the Highway Law of the People's Republic of China and the Regulations for the Administration of Toll Roads. In this study, the Consultant considered the impacts of the above preferential scheme and made relevant adjustments when forecasting Project Highway traffic and revenue in order to attain more accurate forecasts.



In order to determine the average number of days affected by this preferential scheme each year, the Consultant referred to the “Implementation Plan for the Toll Exemption of Small Vehicles for Major Holidays”. It was assumed that the number of days of the four national holidays in the Spring Festival, the Ching Ming Festival, the Labor Day and the National Day are:

- Spring Festival - 7 days
- Ching Ming Festival -3 days
- Labor Day -3 days
- National Day – 7days

There is a total of 20 days for the above four major public festivals. This assumption was incorporated into the revenue calculations for the Project Highways.

#### 3.4.5 Future Road Network Assumption

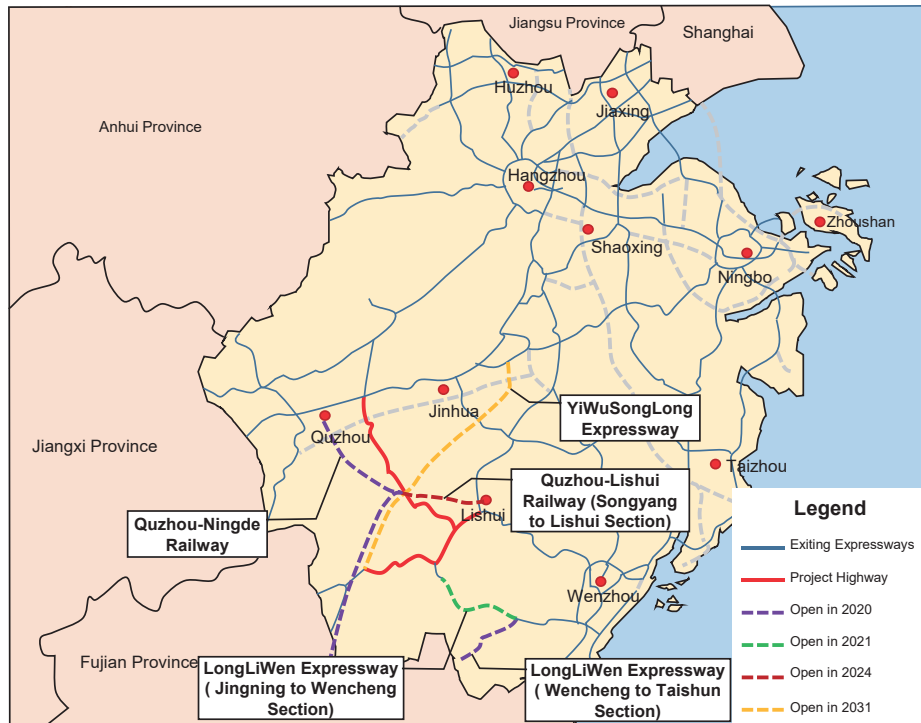
In order to analyze the impact of changes in the surrounding road network on the traffic flows of the Project road (induced or diverted), the Consultant collected the “13th Five-Year Plan” and the most recent expressway construction plans of the vicinity areas. The Consultant also reviewed the progress of the roads currently under construction and summarized the changes in the future road network in Zhejiang Province as shown in Table 3-12 and Figure 3-9.

**Table3-12 Future Road Network Construction Plan**

No.	Road Name	Opening Year	Length (Km)	No. of Lanes	Design Speed (Km/h)
1	LongLiWen Expressway (Wencheng to Taishun Section)	End of 2020	55.963	4	80
2	Quzhou-Ningde Railway	End of September 2020	379	2	160
3	LongLiWen Expressway (Jingning to Wencheng Section)	End of 2021	67.4	4	80
4	Quzhou-Lishui Railway (Songyang to Lishui Section)	Beginning of 2024	65.232	2	200
5	YiWuSongLong Expressway	Beginning of 2031	200	4	80

Source: Consultant, 2020

Figure3-9 Location of Future Roads



Source: Consultant, 2020

Note: The time shown in this figure is the time when the new road has an impact on the Project Highway. If it is opened at the beginning of the year, it will be affected in that year. If it is opened at the end of the year, it will be affected in the next year.

3.4.6 Road Capacity

Major factors that may affect the capacity of a highway include design standards (design speed), vehicle type composition, hourly distribution of daily traffic demands (peak hour factor) etc. The assumptions adopted for the planning and design of the Project road were: design speed of 80 km/hr, level of service C, capacity of 1500 pcu/lane/hr (Highway Engineering Technical Specifications – JTG B01-2014), peak hour factor of 7.65% (derived from survey data) and the average passenger car conversion factor of 1.474 pcu/veh (derived from survey data). The capacity of the Project road could be estimated as:

$$1500(\text{pcu/lane/hr}) \times 4(\text{lanes}) \div 1.474(\text{pcu/veh}) \div 7.65\% = 53,200(\text{vehicles/day})$$

**Table3-13 Expressway Levels of service and Maximum Capacity**

Level of Service	Volume/Capacity (V/C)	Design Speed		
		120	100	80
		Maximum Capacity [pcu/(h•ln)]	Maximum Capacity [pcu/(h•ln)]	Maximum Capacity [pcu/(h•ln)]
A	$V/C \leq 0.35$	750	730	700
B	$0.35 < V/C \leq 0.55$	1200	1150	1100
C	$0.55 < V/C \leq 0.75$	1650	1600	1500
D	$0.75 < V/C \leq 0.90$	1980	1850	1800
E	$0.90 < V/C \leq 1.00$	2200	2100	2000
F	$V/C > 1.00$	0~2200	0~2100	0~2000

Source: Highway Engineering Technical Specifications – JTG B01-2014

### 3.4.7 Trip Distribution

This Study adopted “Generalized Cost” as the factor to influence the decisions to select travel paths by the trip makers. It will arrive at a balanced trip distribution on the road network within the study area. The “generalized cost” includes all elements and factors (such as travel time, travel distance, vehicle operation cost and toll costs etc) that may affect the choice of travel paths of the car drivers. The “generalized cost” of a road section can be estimated as:

$$GC_{ij} = T_{ij} + [C_{ij} + Tol_{ij}] / VOT$$

Note:  $GC_{ij}$  = Travel Generalized Cost

$T_{ij}$  = Travel Time between TAZ<sub>i</sub> to TAZ<sub>j</sub>

$C_{ij}$  = Travel Cost between TAZ<sub>i</sub> and TAZ<sub>j</sub>, such as vehicle operating cost.

$Tol_{ij}$  = Toll Cost from TAZ<sub>i</sub> and TAZ<sub>j</sub>

VOT = Value of Time for different vehicle types

The distribution model used by the Consultant has taken into consideration of road users’ willingness to pay certain travel costs and travelling speed/congestion levels on the Project road in comparison to other competing toll roads. From the trip matrices, the trips between any two TAZs would be allocated to the path of the least generalized cost. Traffic assignment is an iterative process, in which every trip during an iteration would be assigned to the path of the least generalized cost. Generalized cost includes travel time, travel distance, toll charges and vehicle operation costs. For example: If there are 2 highways of the same class are included during certain iteration, the highway which carries the lower volume would be selected as the travel path. However, in subsequent iterations, these 2 highways may have different generalized costs which would then dictate which would be the more attractive path. This process will be repetitive until traffic volumes on the competing highway facilities would reach an equilibrium condition.

### 3.5 Project Highway OD Travel by Modes

After the traffic distribution of the OD matrices in Zhejiang Province, the future traffic demands between each pair of traffic zones using the Project Highway could be determined. To facilitate easier understanding and summarization, the Consultant also aggregated 436 traffic zones (OD) into 16 superzones (see economic analysis section).

According to the model allocation results, the Consultant found that the proportion of future passenger car and truck traffic on the Project Highway, which traveled within Quzhou City and Lishui City was more than 72.9% and 63.4% respectively. In summary, regional travel represents a significant proportion of the total traffic on the Project Highway.

Table 3-14 and Table 3-15 showed the future OD patterns of passenger cars and trucks on the Project Highway.

Table3-14 Passenger Car OD Patterns on Project Highway

OD	Hangzhou	Ningbo	Jiaxing	Huzhou	Shaoxing	Zhoushan	Wenzhou	Jinhua	Quzhou	Taizhou	Lishui	Shanghai	Jiangsu	Anhui	Jiangxi	Fujian	Total
Hangzhou							0.1%		0.4%		2.4%					0.1%	3.0%
Ningbo									0.0%		0.3%					0.1%	0.3%
Jiaxing									0.0%		0.2%					0.1%	0.2%
Huzhou									0.0%		0.1%					0.0%	0.1%
Shaoxing									0.0%		0.4%					0.1%	0.5%
Zhoushan											0.0%					0.0%	0.0%
Wenzhou	0.1%								0.7%		2.3%			0.1%	0.6%	0.5%	4.3%
Jinhua									0.2%		2.0%					0.3%	2.5%
Quzhou	0.4%	0.0%	0.0%	0.0%	0.0%		0.7%	0.2%	5.3%	0.0%	4.3%	0.0%	0.0%	0.1%	0.0%	11.1%	
Taizhou									0.0%		0.4%					0.2%	0.6%
Lishui	2.4%	0.3%	0.2%	0.1%	0.4%	0.0%	2.3%	2.1%	4.1%	0.4%	59.2%	0.2%	0.2%	0.2%	0.4%	0.6%	73.1%
Shanghai									0.0%		0.2%					0.2%	0.4%
Jiangsu									0.0%		0.2%					0.1%	0.4%
Anhui							0.1%		0.0%		0.2%					0.0%	0.3%
Jiangxi							0.6%		0.1%		0.4%						1.2%
Fujian	0.1%	0.1%	0.1%	0.0%	0.1%	0.0%	0.5%	0.3%	0.0%	0.2%	0.5%	0.2%	0.1%	0.0%	0.0%	2.1%	
Total	3.0%	0.3%	0.2%	0.1%	0.5%	0.0%	4.3%	2.6%	11.0%	0.6%	73.1%	0.4%	0.4%	1.2%	2.1%	100.0%	

Source: Consultant, 2020



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Table3-15 Truck OD Patterns on Project Highway

OD	Hangzhou	Ningbo	Jiaxing	Huzhou	Shaoxing	Zhoushan	Wenzhou	Jinhua	Quzhou	Taizhou	Lishui	Shanghai	Jiangsu	Anhui	Jiangxi	Fujian	Total
Hangzhou							0.0%		0.3%		1.3%					0.3%	1.8%
Ningbo									0.0%		0.6%					0.1%	0.8%
Jiaxing									0.0%		0.2%					0.2%	0.4%
Huzhou									0.0%		0.4%					0.0%	0.5%
Shaoxing									0.0%		0.5%					0.1%	0.6%
Zhoushan									0.0%		0.0%					0.0%	0.0%
Wenzhou	0.0%								1.7%		2.1%			0.2%	0.9%	0.5%	5.4%
Jinhua									0.1%		2.0%					0.7%	2.8%
Quzhou	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	1.7%	0.1%	1.4%	0.0%	13.1%	0.0%	0.1%	0.0%	0.2%	0.0%	17.1%
Taizhou									0.0%		0.7%					0.5%	1.2%
Lishui	1.3%	0.6%	0.2%	0.4%	0.5%	0.0%	2.1%	2.1%	13.1%	0.7%	35.7%	0.2%	0.4%	0.5%	1.2%	1.2%	60.2%
Shanghai									0.0%		0.2%					0.3%	0.4%
Jiangsu									0.1%		0.4%					0.6%	1.1%
Anhui							0.2%		0.0%		0.5%					0.0%	0.7%
Jiangxi							0.9%		0.2%		1.2%					0.0%	2.3%
Fujian	0.3%	0.1%	0.2%	0.0%	0.1%	0.0%	0.6%	0.7%	0.0%	0.5%	1.1%	0.3%	0.6%	0.0%	0.0%		4.6%
Total	1.8%	0.8%	0.4%	0.5%	0.6%	0.0%	5.6%	2.9%	17.1%	1.2%	60.0%	0.4%	1.1%	0.7%	2.3%	4.5%	100.0%

Source: Consultant, 2020



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## 4 Traffic and Toll Revenue Forecast Results

### 4.1 Description of Forecast Cases

Based on the previous research and analysis, the base year of 2019 were referenced in forecasting traffic volumes from 2020 to 2032, in which the concessions on the Liandu section of LiLong Expressway and others would end on December 24, 2032 and December 30, 2031 respectively. The traffic volumes in subsequent years were based on the traffic data of the base year and the annual average daily traffic volume were forecasted by the computer assignment model. **The toll revenue forecasting was based on the current price. As non-economic professional, the Consultant has not made assumptions related to the future inflation rates.**

**Table4-1 Description of Forecast Cases**

Cases	Assumption
(1) Base Case	1、 Growth rate determined according to the socio-economic-transport-model in Chapter 3. 2、 In 2020, weight toll for trucks will be cancelled, the ETC usage rate will reach 85%, and vehicle tolls will be charged at 95%. In 2021, the ETC usage rate will reach 90%, and vehicle tolls will be charged at 95%. 3、 In response to the COVID-19 epidemic in 2020, (i) 9 more toll exemption days were assigned to small passenger cars on toll highways, (ii) Due to the impacts of the epidemic in 2020, some toll stations were closed; (iii) toll exemption started in February 17, 2020, and ended in May 5, 2020. 4、 In 2020, the current international standard container vehicles toll preferential policy is extended from 10 designated toll stations to the provincial expressway network, which is charged at 65%. 5、 By the end of 2020, LongLiWen Expressway (Wencheng to Taishun Section) will be opened. 6、 By the end of September 2020, Quzhou-Ningde Railway Zhejiang Section will be opened. 7、 By the end of 2021, LongLiWen Expressway (Jingning to Wencheng Section) will be opened. 8、 The project road offered 15% discount charging for the trucks which is the legal loading and using the non cash payment card and ETC. Starting from 2021, this policy will be cancelled. 9、 At the beginning of 2024, Quzhou-Lishui Railway (Songyang to Lishui Section) will be opened. 10、 At the beginning of 2031, YiWuSongLong Expressway will be opened.
(2) Test 1- Conversative Case	1、 On the basis of the base case assumptions, the economic growth rate will be reduced by 10%. 2、 The project road offered 15% discount charging for the trucks which is the legal loading and using the non cash payment card and ETC. This policy will continue in the chareing period.
(3) Test 2- Optimistic Case	1、 On the basis of the base case assumptions, the economic growth rate will be increased by 10%.

Source: Consultant, 2020



#### 4.2 Traffic Impacts Caused by the New Highways

According to the model analysis, the coming years that would have greater impacts on the Project Highway are 2020, 2021, 2023 and 2024. The impacts of the newly opened highways on the Project Highway in the above years were shown in Table 4-2 below.

**Table4-2 Traffic Impacts Due to New Highways and Charging Policy**

Highway/Policy	Schedule	Diversion/Inducement Impacts on Project Highway	Magnitude of Impacts
The ETC usage rate will reach 85%, and vehicle tolls will be charged at 95%.	2020	By the beginning of December 2019, the ETC usage of the LongLiLiLong Expressway reached 79.4%. In 2020, it is estimated that the ETC usage will reach 85%, and the vehicle tolls will be charge at 95%.	Traffic impacts: +0% Revenue impacts: -1.2%
The impacts due to COVID-19 epidemic.	Beginning of 2020	In response to the COVID-19 epidemic in 2020, (i) 9 more toll exemption days were assigned to small passenger cars on toll highways, (ii) Due to the impacts of the epidemic in 2020, some toll stations were closed; (iii) toll exemption started in February 17, 2020, and ended in May 5, 2020.	Traffic impacts: -28.6% Revenue impacts: -27.8%
The preferential policy for container vehicles.	Start at 2020	The current international standard container vehicles toll preferential policy is extended from 10 designated toll stations to the provincial expressway network, which is charged at 65%.	Traffic impacts: 0% Revenue impacts: -0.3%
Opening of LongLiWen Expressway (Wencheng to Taishun Section)	End of 2020	With the opening of LongLiWen Expressway (Wencheng to Taishun Section), it would mainly divert traffic between Taizhou City, Wenzhou City and Fujian Province, but there would be less traffic in this part.	Traffic impacts: -0.8% Revenue impacts: -1.0%
Opening of Quzhou-Ningde Railway	End of 2020	With the opening of Quzhou-Ningde Railway, some passenger vehicles and trucks between Quzhou City, Songyang County, Longquan County and Fujian Province will disappear, these passengers and goods will choose train.	Traffic impacts: -1.5% Revenue impacts: -1.1%

Highway/Policy	Schedule	Diversion/Inducement Impacts on Project Highway	Magnitude of Impacts
Cancellation the policy of 15% discount charging for the trucks which is the legal loading and using the non cash payment card and ETC.	Start at the beginning of 2021	With the cancellation of the preferential policy of 15% discount for trucks, the toll rate of trucks would be risen, but the impact on traffic volume would be small.	Traffic impacts: 0% Revenue impacts: +1.6%
Opening of LongLiWen Expressway (Jingning to Wencheng Section)	End of 2021	With the opening of LongLiWen Expressway (Jingning to Wencheng Section), a small part of the original taking "LiLong Expressway + Jinliwen Expressway" vehicles will divert, less take part of the Project Highway.	Traffic impacts: -0.5% Revenue impacts: -0.4%
Opening of Quzhou-Lishui Railway (Songyang to Lishui Section)	Beginning of 2024	With the opening of Quzhou-Lishui Railway (Songyang to Lishui Section), there will be direct trains from Quzhou to Lishui in the future, and a small portion of passengers will choose train.	Traffic impacts: -0.9% Revenue impacts: -0.6%
Opening of YiWuSongLong Expressway	Beginning of 2031	YiWuSongLong Expressway connects Yiwu County, Wuyi County, Songyang County and Longquan County. The opening of the expressway will divert some vehicles that used to take "Hangxinjing Expressway, LongLi Expressway", and some vehicles that used to take "Zhuyong Expressway, Dongyong Expressway, Jinliwen Expressway, LiLong Expressway".	Traffic impacts: -13.1% Revenue impacts: -12.9%

Source: Consultant, 2020

### 4.3 Forecast Results for Base Case

Based on the assumptions stipulated in Table 4-1 and the application of the traffic prediction model (see Chapter 3), the Consultant was able to develop the traffic and toll revenue forecasts for the Base Case. The results were summarized in Tables 4-3 to 4-6.

Table4-3 Annual Average Daily Traffic Volume by Vehicle Type on Project Highway for Base Case

Year	PC1	PC2	PC3	PC4	Truck1	Truck2	Truck3	Truck4	Truck5	Truck6	Container	Total	Growth Rate
2020 <sup>(2)</sup>	6,695	65	136	146	744	159	120	98	66	1,281	46	9,556	-22.2%
2021 <sup>(3)</sup>	10,107	92	173	185	1,069	228	164	142	97	1,857	69	14,183	48.4%
2022 <sup>(4)</sup>	10,871	99	164	174	1,130	243	168	153	105	2,004	76	15,187	7.1%
2023	11,729	106	156	164	1,202	258	171	165	113	2,167	84	16,315	7.4%
2024 <sup>(5)</sup>	12,470	113	148	154	1,277	274	175	178	122	2,336	92	17,339	6.3%
2025	13,356	121	140	145	1,351	290	179	190	131	2,506	100	18,509	6.7%
2026	14,227	128	134	137	1,424	306	182	203	140	2,674	109	19,664	6.2%
2027	15,097	136	127	130	1,497	322	186	215	148	2,841	118	20,817	5.9%
2028	15,965	143	121	123	1,568	337	189	228	157	3,009	127	21,967	5.5%
2029	16,830	151	116	116	1,639	352	192	240	166	3,175	137	23,114	5.2%
2030	17,507	156	110	110	1,709	367	195	252	174	3,339	147	24,066	4.1%
2031 <sup>(6)</sup>	15,864	148	97	99	1,553	315	164	211	165	3,072	101	21,789	-9.5%
2032	16,580	154	93	94	1,612	327	166	221	173	3,211	108	22,739	4.4%

Source: Consultant, 2020

Note:

- (1) Traffic volume includes general toll-free vehicles, excluding toll free vehicles during the major festival holidays and COVID-19 epidemic periods, and the latest vehicle classifications were shown in Table 3-9.
- (2) In 2020, weight toll for trucks will be cancelled, the ETC usage rate will reach 85%, and vehicle tolls will be charged at 95%. In 2020, in response to the COVID-19 epidemic, (i) 9 more toll exemption days were assigned to small passenger cars on toll highways, (ii) Due to the impacts of the epidemic in 2020, some toll stations were closed; (iii) toll exemption started in February 17, 2020, and ended in May 5, 2020; In 2020, the current international standard container vehicles toll preferential policy is extended from 10 designated toll stations to the provincial expressway network, which is charged at 65%.
- (3) In 2021, LongLiWen Expressway (Wencheng to Taishun Section) will be opened. In 2021, Quzhou-Ningde Railway Zhejiang Section will be opened. From 2021, the policy of 15% discount charging for the trucks which is the legal loading and using the non cash payment card and ETC will be cancelled.



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- (4) In 2022, LongLiWen Expressway (Jingning to Wencheng Section) will be opened.
- (5) In 2024, Quzhou-Lishui Railway (Songyang to Lishui Section) will be opened.
- (6) In 2031, YiWuSongLong Expressway will be opened. After December 30, 2031, all sections will stop changing except Liandu Section of LiLong Expressway.
- (7) Annual average daily traffic volume is the weighted average daily traffic volume by road section: refers to the summation of the production of the annual daily average traffic volume and mileage of each section, divided by sum of the mileage.



Table 4-4 Annual Average Daily Traffic Volume by Road Section on Project Highway for Base Case (LongLi Expressway)

Year	Hangqian Exp.-Longyouna n Sta.	Longyouna n Sta.-Lingxi Sta.	Lingxi Sta.-Beijie Sta.	Beijie Sta.-Xinluwan Sta.	Xinluwan Sta.-Suichang Sta.	Suichang Sta.-Suichangong Sta.	Suichangong Sta.-Gushi Sta.	GUSHI Sta.-YiWuSong Long Exp.	YiWuSong Long Exp.-Songyang Sta.	Songyang Sta.-Xiangxi Sta.	Xiangxi Sta.-Beibu Int.
2020 <sup>(2)</sup>	7,528	9,982	9,784	9,754	9,936	7,795	7,975	7,874	7,874	8,782	9,146
2021 <sup>(3)</sup>	11,340	14,553	14,344	14,193	14,381	11,570	11,896	11,766	11,766	13,243	13,831
2022 <sup>(4)</sup>	12,297	15,793	15,519	15,347	15,546	12,521	12,862	12,720	12,720	14,309	14,931
2023	13,271	17,055	16,711	16,519	16,729	13,487	13,844	13,690	13,690	15,393	16,050
2024 <sup>(5)</sup>	14,281	18,364	17,946	17,732	17,954	14,489	14,861	14,606	14,606	16,011	16,629
2025	15,302	19,689	19,194	18,957	19,190	15,501	15,889	15,616	15,616	17,113	17,763
2026	16,309	20,994	20,421	20,161	20,406	16,497	16,900	16,611	16,611	18,196	18,879
2027	17,318	22,303	21,650	21,368	21,624	17,495	17,913	17,607	17,607	19,282	19,997
2028	18,327	23,612	22,877	22,572	22,839	18,491	18,924	18,601	18,601	20,366	21,114
2029	19,334	24,916	24,100	23,772	24,049	19,484	19,931	19,592	19,592	21,443	22,224
2030	20,120	25,218	24,702	24,206	24,375	20,317	20,930	20,574	20,574	22,511	23,325
2031 <sup>(6)</sup>	19,853	25,200	24,626	24,128	24,307	20,095	21,412	21,385	25,188	26,280	26,989
2032	20,772	26,364	25,733	25,208	25,392	21,004	22,371	22,341	26,305	27,441	28,175

Source: Consultant, 2020

Note:

- (1) Traffic volume includes general toll-free vehicles, excluding toll free vehicles during the major festival holidays and COVID-19 epidemic periods, and the latest vehicle classifications were shown in Table 3-9.
- (2) In 2020, weight toll for trucks will be cancelled, the ETC usage rate will reach 85%, and vehicle tolls will be charged at 95%. In 2020, in response to the COVID-19 epidemic, (i) 9 more toll exemption days were assigned to small passenger cars on toll highways, (ii) Due to the impacts of the epidemic in 2020, some toll stations were closed; (iii) toll exemption started in February 17, 2020, and ended in May 5, 2020; In 2020, the current international standard container vehicles toll preferential policy is extended from 10 designated toll stations to the provincial expressway network, which is charged at 65%.
- (3) In 2021, LongLiWen Expressway (Wencheng to Taishun Section) will be opened. In 2021, Quzhou-Ningde Railway Zhejiang Section will be opened. From 2021, the policy of 15% discount charging for the trucks which is the legal loading and using the non cash payment card and ETC will be cancelled.



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- (4) In 2022, LongLiWen Expressway (Jingning to Wencheng Section) will be opened.
- (5) In 2024, Quzhou-Lishui Railway (Songyang to Lishui Section) will be opened.
- (6) In 2031, YiWuSongLong Expressway will be opened. After December 30, 2031, all sections will stop changing except Liandu Section of LiLong Expressway.
- (7) Annual average daily traffic volume is the weighted average daily traffic volume by road section: refers to the summation of the production of the annual daily average traffic volume and mileage of each section, divided by sum of the mileage.



Table4-5 Annual Average Daily Traffic Volume by Road Section on Project Highway for Base Case (LiLong Expressway)

Year	Lishui Sta.- Bihu Sta.	Bihu Sta.- Beibu Int.	Beibu Int.- Yunhedong Sta.	Yunhedong Sta.-Yunhe Sta.	Yunhe Sta.- Yunjing Int.	Yunjing Int.- Chishi Sta.	Chishi Sta.- Anren Sta.	Anren Stan.- Longquandon g Sta.	Longquandon g Sta.- LongQing Exp.
2020 <sup>(2)</sup>	16,302	17,723	11,107	11,983	10,167	6,876	6,754	7,204	4,455
2021 <sup>(3)</sup>	24,518	26,686	16,562	17,859	15,119	10,132	9,946	10,419	6,438
2022 <sup>(4)</sup>	25,636	27,974	17,454	18,865	16,050	10,912	10,712	11,224	6,943
2023	27,491	30,002	18,693	20,201	17,191	11,703	11,489	12,040	7,456
2024 <sup>(5)</sup>	28,821	31,519	19,971	21,579	18,369	12,521	12,293	12,884	7,988
2025	30,722	33,600	21,258	22,967	19,555	13,346	13,103	13,735	8,526
2026	32,591	35,644	22,523	24,329	20,720	14,157	13,899	14,571	9,054
2027	34,455	37,683	23,780	25,684	21,893	14,968	14,696	15,407	9,584
2028	36,322	39,724	25,039	27,041	23,053	15,777	15,491	16,241	10,113
2029	38,178	41,753	26,292	28,390	24,207	16,581	16,281	17,070	10,639
2030	40,018	43,764	27,532	29,725	25,349	17,378	17,064	17,891	11,162
2031 <sup>(6)</sup>	36,400	40,315	20,313	22,601	18,034	9,670	9,342	10,328	4,856
2032	37,953	42,034	21,146	23,526	18,772	10,070	9,728	10,756	5,054

Source: Consultant, 2020

Note:

- (1) Traffic volume includes general toll-free vehicles, excluding toll free vehicles during the major festival holidays and COVID-19 epidemic periods, and the latest vehicle classifications were shown in Table 3-9.
- (2) In 2020, weight toll for trucks will be cancelled, the ETC usage rate will reach 85%, and vehicle tolls will be charged at 95%; In 2020, in response to the COVID-19 epidemic, (i) 9 more toll exemption days were assigned to small passenger cars on toll highways, (ii) Due to the impacts of the epidemic in 2020, some toll stations were closed; (iii) toll exemption started in February 17, 2020, and ended in May 5, 2020; In 2020, the current international standard container vehicles toll preferential policy is extended from 10 designated toll stations to the provincial expressway network, which is charged at 65%.
- (3) In 2021, LongLiWen Expressway (Wencheng to Taishun Section) will be opened. In 2021, Quzhou-Ningde Railway Zhejiang Section will be opened. From 2021, the policy of 15% discount charging for the trucks which is the legal loading and using the non cash payment card and ETC will be cancelled.



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- (4) In 2022, LongLiWen Expressway (Jingning to Wencheng Section) will be opened.
- (5) In 2024, Quzhou-Lishui Railway (Songyang to Lishui Section) will be opened.
- (6) In 2031, YiWuSongLong Expressway will be opened. After December 30, 2031, all sections will stop changing except Liandu Section of LiLong Expressway.
- (7) Annual average daily traffic volume is the weighted average daily traffic volume by road section: refers to the summation of the production of the annual daily average traffic volume and mileage of each section, divided by sum of the mileage.





**Table4-6 Toll Revenue Forecasts on Project Highway for Base Case**

Year	Average Daily Toll Revenue (RMB)	Daily Growth Rate	Annual Toll Revenue (RMB 10,000)	Annual Growth Rate
2020 <sup>(1)</sup>	¥1,402,811	-25.1%	¥51,343	-24.9%
2021	¥2,082,547	48.5%	¥76,013	48.0%
2022	¥2,227,201	6.9%	¥81,293	6.9%
2023	¥2,389,995	7.3%	¥87,235	7.3%
2024	¥2,543,455	6.4%	¥93,090	6.7%
2025	¥2,713,071	6.7%	¥99,027	6.4%
2026	¥2,880,056	6.2%	¥105,122	6.2%
2027	¥3,047,250	5.8%	¥111,225	5.8%
2028	¥3,214,349	5.5%	¥117,645	5.8%
2029	¥3,380,655	5.2%	¥123,394	4.9%
2030	¥3,526,925	4.3%	¥128,733	4.3%
2031	¥3,190,382	-9.5%	¥116,449	-9.5%
2032	¥551,490	-82.7%	¥19,798	-83.0%
合共	--	--	¥1,210,367	--

Source: Consultant, 2020

Note:

- (1) In 2020, in response to the COVID-19 epidemic, (i) 9 more toll exemption days were assigned to small passenger cars on toll highways, (ii) Due to the impacts of the epidemic in 2020, some toll stations were closed; (iii) toll exemption started in February 17, 2020, and ended in May 5, 2020.
- (2) The toll revenue forecasting was based on the current price. As non-economic professional, the Consultant has not made assumptions related to the future inflation rates.
- (3) Toll revenue forecast results have eliminated free vehicles
- (4) The forecast result also takes into account that there will be free passage of passenger cars with 7 seats or less in holidays, such as Spring Festival, Qingming Festival, Labor Day and National Day. The number of free passage days in the future will be 20 days per year;
- (5) The concessions on the section except LongLi Expressway Liandu Section will end by December 30, 2031.
- (6) The concessions of Project Highway will end by December 24, 2032.

#### 4.4 Test1-Forecast Results for Conservative Case

Based on the assumptions stipulated in Table 4-1 and the application of the traffic prediction model (see Chapter 3), the Consultant was able to develop traffic and toll revenue forecasts for the Conservative Case. The results were summarized in Tables 4-7 to 4-10.

Table4-7 Annual Average Daily Traffic Volume by Vehicle Type on Project Highway for Conservative Case

Year	PC1	PC2	PC3	PC4	Truck1	Truck2	Truck3	Truck4	Truck5	Truck6	Container	Total	Growth Rate
2020 <sup>(2)</sup>	6,695	65	136	146	744	159	120	98	66	1,281	46	9,556	-22.2%
2021 <sup>(3)</sup>	10,035	92	173	184	1,062	227	164	141	96	1,840	69	14,083	47.4%
2022 <sup>(4)</sup>	10,724	97	163	172	1,114	239	167	150	103	1,969	75	14,973	6.3%
2023	11,499	104	155	161	1,179	253	170	161	110	2,112	82	15,986	6.8%
2024 <sup>(5)</sup>	12,154	110	146	151	1,245	267	174	172	118	2,258	90	16,885	5.6%
2025	12,946	117	138	142	1,310	281	177	183	126	2,404	98	17,922	6.1%
2026	13,721	124	131	133	1,373	295	180	193	133	2,548	106	18,937	5.7%
2027	14,493	131	125	126	1,436	309	183	204	141	2,690	114	19,952	5.4%
2028	15,262	137	118	119	1,498	322	185	214	148	2,830	123	20,956	5.0%
2029	16,023	144	113	112	1,558	335	188	225	155	2,969	132	21,954	4.8%
2030	16,607	148	107	106	1,618	348	190	235	162	3,106	141	22,768	3.7%
2031 <sup>(6)</sup>	14,992	140	94	95	1,464	297	160	196	153	2,842	97	20,530	-9.8%
2032	15,618	146	90	90	1,514	307	162	203	159	2,957	103	21,349	4.0%

Source: Consultant, 2020

Note:

- (1) Traffic volume includes general toll-free vehicles, excluding toll free vehicles during the major festival holidays and COVID-19 epidemic periods, and the latest vehicle classifications were shown in Table 3-9.
- (2) In 2020, weight toll for trucks will be cancelled, the ETC usage rate will reach 85%, and vehicle tolls will be charged at 95%. In 2020, in response to the COVID-19 epidemic, (i) 9 more toll exemption days were assigned to small passenger cars on toll highways, (ii) Due to the impacts of the epidemic in 2020, some toll stations were closed; (iii) toll exemption started in February 17, 2020, and ended in May 5, 2020; In 2020, the current international standard container vehicles toll preferential policy is extended from 10 designated toll stations to the provincial expressway network, which is charged at 65%.
- (3) In 2021, LongLiWen Expressway (Wencheng to Taishun Section) will be opened. In 2021, Quzhou-Ningde Railway Zhejiang Section will be opened.



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- (4) In 2022, LongLiWen Expressway (Jingning to Wencheng Section) will be opened.
- (5) In 2024, Quzhou-Lishui Railway (Songyang to Lishui Section) will be opened.
- (6) In 2031, YiWuSongLong Expressway will be opened. After December 30, 2031, all sections will stop charging except Liandu Section of LiLong Expressway.
- (7) Annual average daily traffic volume is the weighted average daily traffic volume by road section: refers to the summation of the production of the annual daily average traffic volume and mileage of each section, divided by sum of the mileage.



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Table 4-8 Annual Average Daily Traffic Volume by Road Section on Project Highway for Conservative Case (LongLi Expressway)

Year	Hangqian Exp.-Longyouna n Sta.	Longyouna n Sta.-Lingxi Sta.	Lingxi Sta.-Beijie Sta.	Beijie Sta.-Xinluwan Sta.	Xinluwan Sta.-Suichang Sta.	Suichang Sta.-Suichang Gushi Sta.	Suichang Gushi Sta.-Gushi Sta.-YiWuSong Long Exp.	YiWuSong Long Exp.-Songyang Sta.	Songyang Sta.-Xiangxi Sta.	Xiangxi Sta.-Beibu Int.
2020 <sup>(2)</sup>	7,528	9,982	9,784	9,754	9,936	7,795	7,975	7,874	8,782	9,146
2021 <sup>(3)</sup>	11,253	14,440	14,235	14,087	14,274	11,482	11,807	11,678	13,146	13,730
2022 <sup>(4)</sup>	12,115	15,555	15,291	15,125	15,323	12,337	12,676	12,537	14,106	14,720
2023	12,985	16,682	16,355	16,172	16,380	13,199	13,554	13,404	15,076	15,721
2024 <sup>(5)</sup>	13,882	17,844	17,449	17,249	17,468	14,087	14,458	14,209	15,581	16,184
2025	14,783	19,011	18,548	18,329	18,559	14,979	15,366	15,102	16,555	17,187
2026	15,666	20,155	19,623	19,386	19,627	15,852	16,254	15,975	17,509	18,170
2027	16,547	21,297	20,695	20,441	20,692	16,723	17,140	16,847	18,460	19,149
2028	17,424	22,433	21,760	21,488	21,750	17,588	18,021	17,713	19,405	20,123
2029	18,294	23,560	22,816	22,527	22,799	18,446	18,894	18,571	20,342	21,089
2030	18,958	23,749	23,286	22,839	23,008	19,151	19,757	19,421	21,266	22,042
2031 <sup>(6)</sup>	18,608	23,612	23,099	22,655	22,834	18,845	20,119	20,096	24,738	25,412
2032	19,394	24,607	24,044	23,580	23,764	19,622	20,942	20,917	25,738	26,434

Source: Consultant, 2020

Note:

- (1) Traffic volume includes general toll-free vehicles, excluding toll free vehicles during the major festival holidays and COVID-19 epidemic periods, and the latest vehicle classifications were shown in Table 3-9.
- (2) In 2020, weight toll for trucks will be cancelled, the ETC usage rate will reach 85%, and vehicle tolls will be charged at 95%; In 2020, in response to the COVID-19 epidemic, (i) 9 more toll exemption days were assigned to small passenger cars on toll highways, (ii) Due to the impacts of the epidemic in 2020, some toll stations were closed; (iii) toll exemption started in February 17, 2020, and ended in May 5, 2020; In 2020, the current international standard container vehicles toll preferential policy is extended from 10 designated toll stations to the provincial expressway network, which is charged at 65%.
- (3) In 2021, LongLiWen Expressway (Wencheng to Taishun Section) will be opened. In 2021, Quzhou-Ningde Railway Zhejiang Section will be opened.



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- (4) In 2022, LongLiWen Expressway (Jingning to Wencheng Section) will be opened.
- (5) In 2024, Quzhou-Lishui Railway (Songyang to Lishui Section) will be opened.
- (6) In 2031, YiWuSongLong Expressway will be opened. After December 30, 2031, all sections will stop charging except Liandu Section of LiLong Expressway.
- (7) Annual average daily traffic volume is the weighted average daily traffic volume by road section: refers to the summation of the production of the annual daily average traffic volume and mileage of each section, divided by sum of the mileage.



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Table 4-9 Annual Average Daily Traffic Volume by Road Section on Project Highway for Conservative Case (LiLong Expressway)

Year	Lishui Sta.- Bihu Sta.	Bihu Sta.- Beibu Int.	Beibu Int.- Yunhedong Sta.	Yunhedong Sta.-Yunhe Sta.	Yunhe Sta.- Yunjing Int.	Yunjing Int.- Chishi Sta.	Chishi Sta.- Anren Sta.	Anren Stan.- Longquandon g Sta.	Longquandon g Sta.- Longqing Exp.
2020 <sup>(2)</sup>	16,302	17,723	11,107	11,983	10,167	6,876	6,754	7,204	4,455
2021 <sup>(3)</sup>	24,347	26,500	16,451	17,739	15,016	10,062	9,878	10,347	6,392
2022 <sup>(4)</sup>	25,292	27,600	17,228	18,620	15,841	10,766	10,569	11,074	6,847
2023	26,955	29,418	18,342	19,820	16,865	11,476	11,266	11,806	7,307
2024 <sup>(5)</sup>	28,092	30,723	19,485	21,051	17,917	12,207	11,984	12,560	7,781
2025	29,780	32,571	20,631	22,286	18,973	12,940	12,704	13,316	8,257
2026	31,432	34,379	21,753	23,493	20,005	13,657	13,408	14,055	8,723
2027	33,073	36,174	22,863	24,689	21,040	14,372	14,111	14,793	9,189
2028	34,711	37,966	23,973	25,883	22,062	15,083	14,808	15,525	9,651
2029	36,334	39,741	25,071	27,065	23,072	15,786	15,500	16,250	10,110
2030	37,937	41,494	26,157	28,231	24,071	16,481	16,182	16,966	10,564
2031 <sup>(6)</sup>	34,393	38,097	19,267	21,422	17,095	9,159	8,848	9,779	4,596
2032	35,741	39,590	19,995	22,229	17,738	9,507	9,184	10,152	4,768

Source: Consultant, 2020

Note:

- (1) Traffic volume includes general toll-free vehicles, excluding toll free vehicles during the major festival holidays and COVID-19 epidemic periods, and the latest vehicle classifications were shown in Table 3-9.
- (2) In 2020, weight toll for trucks will be cancelled, the ETC usage rate will reach 85%, and vehicle tolls will be charged at 95%; In 2020, in response to the COVID-19 epidemic, (i) 9 more toll exemption days were assigned to small passenger cars on toll highways, (ii) Due to the impacts of the epidemic in 2020, some toll stations were closed; (iii) toll exemption started in February 17, 2020, and ended in May 5, 2020; In 2020, the current international standard container vehicles toll preferential policy is extended from 10 designated toll stations to the provincial expressway network, which is charged at 65%.
- (3) In 2021, LongLiWen Expressway (Wencheng to Taishun Section) will be opened. In 2021, Quzhou-Ningde Railway Zhejiang Section will be opened.



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- (4) In 2022, LongLiWen Expressway (Jingning to Wencheng Section) will be opened.
- (5) In 2024, Quzhou-Lishui Railway (Songyang to Lishui Section) will be opened.
- (6) In 2031, YiWuSongLong Expressway will be opened. After December 30, 2031, all sections will stop charging except Liandu Section of LiLong Expressway.
- (7) Annual average daily traffic volume is the weighted average daily traffic volume by road section: refers to the summation of the production of the annual daily average traffic volume and mileage of each section, divided by sum of the mileage.



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**Table4-10 Toll Revenue Forecasts on Project Highway for Conservative Case**

Year	Average Daily Toll Revenue (RMB)	Daily Growth Rate	Annual Toll Revenue (RMB 10,000)	Annual Growth Rate
2020 <sup>(1)</sup>	¥1,402,811	-25.1%	¥51,343	-24.9%
2021	¥2,030,699	44.8%	¥74,121	44.4%
2022	¥2,156,187	6.2%	¥78,701	6.2%
2023	¥2,298,056	6.6%	¥83,879	6.6%
2024	¥2,429,296	5.7%	¥88,912	6.0%
2025	¥2,575,329	6.0%	¥94,000	5.7%
2026	¥2,718,316	5.6%	¥99,219	5.6%
2027	¥2,860,769	5.2%	¥104,418	5.2%
2028	¥3,002,504	5.0%	¥109,892	5.2%
2029	¥3,142,931	4.7%	¥114,717	4.4%
2030	¥3,264,107	3.9%	¥119,140	3.9%
2031	¥2,939,690	-9.9%	¥107,299	-9.9%
2032	¥509,689	-82.7%	¥18,298	-82.9%
合共	--	--	¥1,143,939	--

Source: Consultant, 2020

Note:

- (1) In 2020, in response to the COVID-19 epidemic, (i) 9 more toll exemption days were assigned to small passenger cars on toll highways, (ii) Due to the impacts of the epidemic in 2020, some toll stations were closed; (iii) toll exemption started in February 17, 2020, and ended in May 5, 2020.
- (2) The toll revenue forecasting was based on the current price. As non-economic professional, the Consultant has not made assumptions related to the future inflation rates.
- (3) Toll revenue forecast results have eliminated free vehicles
- (4) The forecast result also takes into account that there will be free passage of passenger cars with 7 seats or less in holidays, such as Spring Festival, Qingming Festival, Labor Day and National Day. The number of free passage days in the future will be 20 days per year;
- (5) The concessions on the section except LongLi Expressway Liandu Section will end by December 30, 2031.
- (6) The concessions of Project Highway will end by December 24, 2032.

#### 4.5 Test2-Forecast Results for Optimistic Case

Based on the assumptions stipulated in Table 4-1 and the application of the traffic prediction model (see Chapter 3), the Consultant was able to develop the traffic and toll revenue forecasts for the Optimistic Case. The results were summarized in Tables 4-11 to 4-14.





Table4-11 Annual Average Daily Traffic Volume by Vehicle Type on Project Highway for Optimistic Case

Year	PC1	PC2	PC3	PC4	Truck1	Truck2	Truck3	Truck4	Truck5	Truck6	Container	Total	Growth Rate
2020 <sup>(2)</sup>	6,695	65	136	146	744	159	120	98	66	1,281	46	9,556	-22.2%
2021 <sup>(3)</sup>	10,178	93	174	186	1,077	230	165	144	97	1,874	69	14,287	49.5%
2022 <sup>(4)</sup>	11,020	100	165	176	1,145	246	168	156	107	2,040	77	15,400	7.8%
2023	11,962	108	158	166	1,226	263	173	169	116	2,224	85	16,650	8.1%
2024 <sup>(5)</sup>	12,793	116	150	157	1,310	281	177	184	126	2,416	94	17,804	6.9%
2025	13,777	124	143	149	1,395	300	181	198	136	2,611	103	19,117	7.4%
2026	14,747	133	136	141	1,477	318	185	212	146	2,805	112	20,412	6.8%
2027	15,722	141	130	134	1,560	335	189	227	157	3,000	122	21,717	6.4%
2028	16,699	150	124	127	1,643	353	192	242	167	3,197	132	23,026	6.0%
2029	17,674	158	119	121	1,725	371	196	256	177	3,393	143	24,333	5.7%
2030	18,453	163	113	115	1,806	388	199	271	187	3,588	154	25,437	4.5%
2031 <sup>(6)</sup>	16,783	156	100	103	1,648	334	168	228	179	3,317	106	23,122	-9.1%
2032	17,596	163	96	99	1,717	348	170	239	188	3,486	114	24,216	4.7%

Source: Consultant, 2020

Note:

- (1) Traffic volume includes general toll-free vehicles, excluding toll free vehicles during the major festival holidays and COVID-19 epidemic periods, and the latest vehicle classifications were shown in Table 3-9.
- (2) In 2020, weight toll for trucks will be cancelled, the ETC usage rate will reach 85%, and vehicle tolls will be charged at 95%. In 2020, in response to the COVID-19 epidemic, (i) 9 more toll exemption days were assigned to small passenger cars on toll highways, (ii) Due to the impacts of the epidemic in 2020, some toll stations were closed; (iii) toll exemption started in February 17, 2020, and ended in May 5, 2020; In 2020, the current international standard container vehicles toll preferential policy is extended from 10 designated toll stations to the provincial expressway network, which is charged at 65%.
- (3) In 2021, LongLiWen Expressway (Wencheng to Taishun Section) will be opened. In 2021, Quzhou-Ningde Railway Zhejiang Section will be opened. From 2021, the policy of 1.5% discount charging for the trucks which is the legal loading and using the non-cash payment card and ETC will be cancelled.



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- (4) In 2022, LongLiWen Expressway (Jingning to Wencheng Section) will be opened.
- (5) In 2024, Quzhou-Lishui Railway (Songyang to Lishui Section) will be opened.
- (6) In 2031, YiWuSongLong Expressway will be opened. After December 30, 2031, all sections will stop charging except Liandu Section of LiLong Expressway.
- (7) Annual average daily traffic volume is the weighted average daily traffic volume by road section: refers to the summation of the production of the annual daily average traffic volume and mileage of each section, divided by sum of the mileage.



Table 4-12 Annual Average Daily Traffic Volume by Road Section on Project Highway for Optimistic Case (LongLi Expressway)

Year	Hangqian Exp.-Longyouna n Sta.	Longyouna n Sta.-Lingxi Sta.	Lingxi Sta.-Beijie Sta.	Beijie Sta.-Xinluwan Sta.	Xinluwan Sta.-Suichang Sta.	Suichang Sta.-Suichangong Sta.	Suichangong Sta.-Gushi Sta.	GUshi Sta.-YiWuSong Long Exp.	YiWuSong Long Exp.-Songyang Sta.	Songyang Sta.-Xiangxi Sta.	Xiangxi Sta.-Beibu Int.
2020 <sup>(2)</sup>	7,528	9,982	9,784	9,754	9,936	7,795	7,975	7,874	7,874	8,782	9,146
2021 <sup>(3)</sup>	11,427	14,666	14,453	14,299	14,488	11,658	11,985	11,854	11,854	13,341	13,933
2022 <sup>(4)</sup>	12,481	16,033	15,749	15,571	15,772	12,707	13,049	12,906	12,906	14,516	15,145
2023	13,560	17,434	17,074	16,871	17,083	13,780	14,138	13,982	13,982	15,717	16,385
2024 <sup>(5)</sup>	14,689	18,897	18,455	18,226	18,451	14,900	15,274	15,012	15,012	16,452	17,084
2025	15,837	20,387	19,858	19,603	19,839	16,038	16,428	16,147	16,147	17,688	18,357
2026	16,975	21,863	21,247	20,963	21,212	17,165	17,570	17,269	17,269	18,909	19,614
2027	18,121	23,351	22,644	22,333	22,592	18,299	18,718	18,399	18,399	20,138	20,880
2028	19,273	24,846	24,047	23,707	23,978	19,437	19,870	19,532	19,532	21,370	22,149
2029	20,427	26,341	25,449	25,080	25,362	20,575	21,022	20,664	20,664	22,601	23,417
2030	21,349	26,771	26,197	25,649	25,818	21,547	22,168	21,791	21,791	23,825	24,679
2031 <sup>(6)</sup>	21,176	26,886	26,246	25,690	25,869	21,422	22,784	22,751	26,766	27,913	28,658
2032	22,244	28,239	27,533	26,942	27,126	22,478	23,894	23,857	28,050	29,247	30,021

Source: Consultant, 2020

Note:

- (1) Traffic volume includes general toll-free vehicles, excluding toll free vehicles during the major festival holidays and COVID-19 epidemic periods, and the latest vehicle classifications were shown in Table 3-9.
- (2) In 2020, weight toll for trucks will be cancelled, the ETC usage rate will reach 85%, and vehicle tolls will be charged at 95%. In 2020, in response to the COVID-19 epidemic, (i) 9 more toll exemption days were assigned to small passenger cars on toll highways, (ii) Due to the impacts of the epidemic in 2020, some toll stations were closed; (iii) toll exemption started in February 17, 2020, and ended in May 5, 2020; In 2020, the current international standard container vehicles toll preferential policy is extended from 10 designated toll stations to the provincial expressway network, which is charged at 65%.
- (3) In 2021, LongLiWen Expressway (Wencheng to Taishun Section) will be opened. In 2021, Quzhou-Ningde Railway Zhejiang Section will be opened. From 2021, the policy of 15% discount charging for the trucks which is the legal loading and using the non cash payment card and ETC will be cancelled.



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- (4) In 2022, LongLiWen Expressway (Jingning to Wencheng Section) will be opened.
- (5) In 2024, Quzhou-Lishui Railway (Songyang to Lishui Section) will be opened.
- (6) In 2031, YiWuSongLong Expressway will be opened. After December 30, 2031, all sections will stop charging except Liandu Section of LiLong Expressway.
- (7) Annual average daily traffic volume is the weighted average daily traffic volume by road section: refers to the summation of the production of the annual daily average traffic volume and mileage of each section, divided by sum of the mileage.



Table 4-13 Annual Average Daily Traffic Volume by Road Section on Project Highway for Optimistic Case (LiLong Expressway)

Year	Lishui Sta.- Bihu Sta.	Bihu Sta.- Beibu Int.	Beibu Int.- Yunhedong Sta.	Yunhedong Sta.-Yunhe Sta.	Yunhe Sta.- Yunjing Int.	Yunjing Int.- Chishi Sta.	Chishi Sta.- Anren Sta.	Anren Sta.- Longquandon Sta.	Longquandon Sta.- Longqing Exp.
2020 <sup>(2)</sup>	16,302	17,723	11,107	11,983	10,167	6,876	6,754	7,204	4,455
2021 <sup>(3)</sup>	24,690	26,873	16,674	17,980	15,221	10,202	10,015	10,492	6,484
2022 <sup>(4)</sup>	25,985	28,355	17,684	19,114	16,263	11,059	10,857	11,376	7,040
2023	28,036	30,596	19,050	20,588	17,522	11,933	11,715	12,277	7,608
2024 <sup>(5)</sup>	29,567	32,334	20,468	22,118	18,830	12,842	12,608	13,215	8,200
2025	31,693	34,659	21,904	23,667	20,154	13,764	13,514	14,165	8,802
2026	33,783	36,945	23,311	25,186	21,466	14,673	14,407	15,103	9,397
2027	35,892	39,252	24,732	26,718	22,777	15,587	15,305	16,045	9,995
2028	38,003	41,559	26,152	28,250	24,088	16,501	16,203	16,988	10,595
2029	40,112	43,864	27,569	29,778	25,395	17,414	17,100	17,929	11,194
2030	42,208	46,154	28,977	31,295	26,693	18,322	17,992	18,864	11,791
2031 <sup>(6)</sup>	38,517	42,656	21,414	23,841	19,022	10,208	9,863	10,906	5,129
2032	40,292	44,619	22,361	24,896	19,863	10,664	10,304	11,395	5,356

Source: Consultant, 2020

Note:

- (1) Traffic volume includes general toll-free vehicles, excluding toll free vehicles during the major festival holidays and COVID-19 epidemic periods, and the latest vehicle classifications were shown in Table 3-9.
- (2) In 2020, weight toll for trucks will be cancelled, the ETC usage rate will reach 85%, and vehicle tolls will be charged at 95%; In 2020, in response to the COVID-19 epidemic, (i) 9 more toll exemption days were assigned to small passenger cars on toll highways, (ii) Due to the impacts of the epidemic in 2020, some toll stations were closed; (iii) toll exemption started in February 17, 2020, and ended in May 5, 2020; In 2020, the current international standard container vehicles toll preferential policy is extended from 10 designated toll stations to the provincial expressway network, which is charged at 65%.
- (3) In 2021, LongLiWen Expressway (Wencheng to Taishun Section) will be opened. In 2021, Quzhou-Ningde Railway Zhejiang Section will be opened. From 2021, the policy of 15% discount charging for the trucks which is the legal loading and using the non cash payment card and ETC will be cancelled.



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- (4) In 2022, LongLiWen Expressway (Jingning to Wencheng Section) will be opened.
- (5) In 2024, Quzhou-Lishui Railway (Songyang to Lishui Section) will be opened.
- (6) In 2031, YiWuSongLong Expressway will be opened. After December 30, 2031, all sections will stop charging except Liandu Section of LiLong Expressway.
- (7) Annual average daily traffic volume is the weighted average daily traffic volume by road section: refers to the summation of the production of the annual daily average traffic volume and mileage of each section, divided by sum of the mileage.



**Table4-14 Toll Revenue Forecasts on Project Highway for Optimistic Case**

Year	Average Daily Toll Revenue (RMB)	Daily Growth Rate	Annual Toll Revenue (RMB 10,000)	Annual Growth Rate
2020 <sup>(1)</sup>	¥1,402,811	-25.1%	¥51,343	-24.9%
2021	¥2,098,422	49.6%	¥76,592	49.2%
2022	¥2,260,422	7.7%	¥82,505	7.7%
2023	¥2,442,095	8.0%	¥89,136	8.0%
2024	¥2,616,031	7.1%	¥95,747	7.4%
2025	¥2,807,796	7.3%	¥102,485	7.0%
2026	¥2,997,458	6.8%	¥109,407	6.8%
2027	¥3,188,676	6.4%	¥116,387	6.4%
2028	¥3,380,521	6.0%	¥123,727	6.3%
2029	¥3,572,372	5.7%	¥130,392	5.4%
2030	¥3,743,577	4.8%	¥136,641	4.8%
2031	¥3,401,148	-9.1%	¥124,142	-9.1%
2032	¥588,194	-82.7%	¥21,116	-83.0%
合共	--	--	¥1,259,620	--

Source: Consultant, 2020

Note:

- (1) In 2020, in response to the COVID-19 epidemic, (i) 9 more toll exemption days were assigned to small passenger cars on toll highways, (ii) Due to the impacts of the epidemic in 2020, some toll stations were closed; (iii) toll exemption started in February 17, 2020, and ended in May 5, 2020.
- (2) The toll revenue forecasting was based on the current price. As non-economic professional, the Consultant has not made assumptions related to the future inflation rates.
- (3) Toll revenue forecast results have eliminated free vehicles
- (4) The forecast result also takes into account that there will be free passage of passenger cars with 7 seats or less in holidays, such as Spring Festival, Qingming Festival, Labor Day and National Day. The number of free passage days in the future will be 20 days per year;
- (5) The concessions on the section except LongLi Expressway Liandu Section will end by December 30, 2031.
- (6) The concessions of Project Highway will end by December 24, 2032.

## 5 Conclusion

LongLiLiLong Expressway is an important part of the National Expressway Network G25 ChangShen Expressway and G4012 LiNing Expressway. It is also one link of the "two vertical, two horizontal, eighteen links, three circulars and three passageways" Planned Highway Network in Zhejiang Province, play the role of communication between southern Zhejiang Province and northern Fujian Province.

The forecasting of future traffic volume and toll revenue works were for 2020 to 2032. This Study was based on the latest data collection, the expertise and years of toll highway experience of the Consultant. The prediction process of this study used the state-of-art technical methods and recognized industry practices. However, it should be noted that there are still uncertainties in the forecasting of future traffic volume and revenue for any toll road. As a result, there may be discrepancies between the predicted values and the actual results in the future. In addition, the traffic volume and revenue forecasts shown in this report represent the overall long-term trend. In any given year, the differences between predicted and actual results may also be caused by other factors. Therefore, although the Consultant endeavors to ensure the technicality of the information provided, it does not guarantee the accuracy or reliability of the data provided, and will not be held liable for any losses or damages caused by the forecasting results. The forecast results were summarized as follows:

- 1) From 2020 to 2032, it was estimated that the total toll revenue on the Project Highway would be RMB 12.104billion.
- 2) Under the Conservative scenario, the total revenue on the Project Highway was estimated to be RMB 11.439 billion from 2020 to 2032.
- 3) Under the Optimistic scenario, the total revenue on the Project Highway was estimated to be RMB 12.596 billion from 2020 to 2032.





**INDEPENDENT ASSURANCE REPORT ON THE CALCULATIONS OF DISCOUNTED FUTURE  
ESTIMATED CASH FLOWS IN CONNECTION WITH THE VALUATION OF 30% EQUITY  
INTEREST IN ZHEJIANG HANGNING EXPRESSWAY CO., LTD. (THE “TARGET A”)****TO THE DIRECTORS OF ZHEJIANG EXPRESSWAY CO., LTD. (THE “COMPANY”)**

We have examined the calculations of the discounted future estimated cash flows on which the valuation prepared by Cushman & Wakefield Limited dated November 9, 2020, of 30% equity interest in the Target A as at August 31, 2020 (the “**Valuation A**”) is based. The Target A is a company incorporated in the People’s Republic of China. The Target A is principally engaged in operation and management of toll collection rights of Zhejiang section of the HangNing Expressway. The Valuation A based on the discounted future estimated cash flows is regarded as a profit forecast under Rule 14.61 of the Rules Governing the Listing of Securities on The Stock Exchange of Hong Kong Limited (the “**Listing Rules**”) and will be included in an announcement dated November 10, 2020 to be issued by the Company” in connection with the discloseable and connected transaction in relation to proposed acquisition of 30% equity interest in the Target A (the “**Announcement**”).

**Directors’ Responsibility for the Discounted Future Estimated Cash Flows**

The directors of the Company are responsible for the preparation of the discounted future estimated cash flows in accordance with the bases and assumptions determined by the directors and set out in “Principal assumptions for the income approach adopted for the HangNing Valuation Report” section of the Announcement (the “**Assumptions A**”). This responsibility includes carrying out appropriate procedures relevant to the preparation of the discounted future estimated cash flows for the Valuation A and applying an appropriate basis of preparation; and making estimates that are reasonable in the circumstances.

**Our Independence and Quality Control**

We have complied with the independence and other ethical requirements of the “Code of Ethics for Professional Accountants” issued by the Hong Kong Institute of Certified Public Accountants (the “**HKICPA**”), which is founded on fundamental principles of integrity, objectivity, professional competence and due care, confidentiality and professional behavior.

Our firm applies Hong Kong Standard on Quality Control 1 “Quality Control for Firms that Perform Audits and Reviews of Financial Statements, and Other Assurance and Related Services Engagements” issued by the HKICPA and accordingly maintains a comprehensive system of quality control including documented policies and procedures regarding compliance with ethical requirements, professional standards and applicable legal and regulatory requirements.

**Reporting Accountants' Responsibility**

Our responsibility is to express an opinion on whether the calculations of the discounted future estimated cash flows have been properly compiled, in all material respects, in accordance with the Assumptions A on which the Valuation A is based and to report solely to you, as a body, as required by Rule 14.62(2) of the Listing Rules, and for no other purpose. We do not assume responsibility towards or accept liability to any other person for the contents of this report.

Our engagement was conducted in accordance with Hong Kong Standard on Assurance Engagements 3000 (Revised) "Assurance Engagements Other Than Audits or Reviews of Historical Financial Information" issued by the HKICPA. This standard requires that we comply with ethical requirements and plan and perform the assurance engagement to obtain reasonable assurance on whether the discounted future estimated cash flows, so far as the calculations are concerned, have been properly compiled in accordance with the Assumptions A. Our work was limited primarily to making inquiries of the Company's management, considering the analyses and assumptions on which the discounted future estimated cash flows are based and checking the arithmetic accuracy of the compilation of the discounted future estimated cash flows. Our work does not constitute any valuation of the Target A.

Because the Valuation A relates to discounted future estimated cash flows, no accounting policies of the Company have been adopted in its preparation. The Assumptions A include hypothetical assumptions about future events and management actions which cannot be confirmed and verified in the same way as past results and these may or may not occur. Even if the events and actions anticipated do occur, actual results are still likely to be different from the Valuation A and the variation may be material. Accordingly, we have not reviewed, considered or conducted any work on the reasonableness and the validity of the Assumptions A and do not express any opinion whatsoever thereon.

**Opinion**

Based on the foregoing, in our opinion, the discounted future estimated cash flows, so far as the calculations are concerned, have been properly compiled, in all material respects, in accordance with the Assumptions A.

**Other Matter**

Qualified opinions were issued by Baker Tilly International Limited in the audit reports of the Target A for the financial year ended December 31, 2019 and 8 months period ended August 31, 2020. The basis of formulating the qualified opinion is summarized as below:

- There are certain tax matters in the Target A that may result in the payment of corporate income tax and fines where the amount cannot be quantified;
- Auditor was unable to obtain sufficient and appropriate evidence to determine the impact of the accounting adjustment regarding Qingshan service area, an asset of the Target A, on the financial statements.

The above-mentioned items as well as the resulting impacts on the fair value of the equity value of the Target A is not taken into account for the Valuation A.

**Deloitte Touche Tohmatsu**  
*Certified Public Accountants*  
Hong Kong

November 10, 2020

**INDEPENDENT ASSURANCE REPORT ON THE CALCULATIONS OF DISCOUNTED FUTURE ESTIMATED CASH FLOWS IN CONNECTION WITH THE VALUATION OF THE ENTIRE EQUITY INTEREST IN ZHEJIANG LONGLILILONG EXPRESSWAY CO., LTD. (THE “TARGET B”)****TO THE DIRECTORS OF ZHEJIANG EXPRESSWAY CO., LTD. (THE “COMPANY”)**

We have examined the calculations of the discounted future estimated cash flows on which the valuation prepared by Jones Lang LaSalle Corporate Appraisal and Advisory Limited dated November 9, 2020, of the entire equity interest in the Target B as at August 31, 2020 (the “**Valuation B**”) is based. The Target B is a company incorporated in the People’s Republic of China. The Target B is principally engaged in the operation and management of toll collection rights of the LongLiLiLong Expressways. The Valuation B based on the discounted future estimated cash flows is regarded as a profit forecast under Rule 14.61 of the Rules Governing the Listing of Securities on The Stock Exchange of Hong Kong Limited (the “**Listing Rules**”) and will be included in an announcement dated November 10, 2020 to be issued by the Company” in connection with the discloseable and connected transaction in relation to proposed acquisition of the entire equity interest in the Target B (the “**Announcement**”).

**Directors’ Responsibility for the Discounted Future Estimated Cash Flows**

The directors of the Company are responsible for the preparation of the discounted future estimated cash flows in accordance with the bases and assumptions determined by the directors and set out in “Principal assumptions for the income approach adopted for the LongLiLiLong Valuation Report” section of the Announcement (the “**Assumptions B**”). This responsibility includes carrying out appropriate procedures relevant to the preparation of the discounted future estimated cash flows for the Valuation B and applying an appropriate basis of preparation; and making estimates that are reasonable in the circumstances.

**Our Independence and Quality Control**

We have complied with the independence and other ethical requirements of the “Code of Ethics for Professional Accountants” issued by the Hong Kong Institute of Certified Public Accountants (the “**HKICPA**”), which is founded on fundamental principles of integrity, objectivity, professional competence and due care, confidentiality and professional behavior.

Our firm applies Hong Kong Standard on Quality Control 1 “Quality Control for Firms that Perform Audits and Reviews of Financial Statements, and Other Assurance and Related Services Engagements” issued by the HKICPA and accordingly maintains a comprehensive system of quality control including documented policies and procedures regarding compliance with ethical requirements, professional standards and applicable legal and regulatory requirements.

**Reporting Accountants' Responsibility**

Our responsibility is to express an opinion on whether the calculations of the discounted future estimated cash flows have been properly compiled, in all material respects, in accordance with the Assumptions B on which the Valuation B is based and to report solely to you, as a body, as required by Rule 14.62(2) of the Listing Rules, and for no other purpose. We do not assume responsibility towards or accept liability to any other person for the contents of this report.

Our engagement was conducted in accordance with Hong Kong Standard on Assurance Engagements 3000 (Revised) "Assurance Engagements Other Than Audits or Reviews of Historical Financial Information" issued by the HKICPA. This standard requires that we comply with ethical requirements and plan and perform the assurance engagement to obtain reasonable assurance on whether the discounted future estimated cash flows, so far as the calculations are concerned, have been properly compiled in accordance with the Assumptions B. Our work was limited primarily to making inquiries of the Company's management, considering the analyses and assumptions on which the discounted future estimated cash flows are based and checking the arithmetic accuracy of the compilation of the discounted future estimated cash flows. Our work does not constitute any valuation of the Target B.

Because the Valuation B relates to discounted future estimated cash flows, no accounting policies of the Company have been adopted in its preparation. The Assumptions B include hypothetical assumptions about future events and management actions which cannot be confirmed and verified in the same way as past results and these may or may not occur. Even if the events and actions anticipated do occur, actual results are still likely to be different from the Valuation B and the variation may be material. Accordingly, we have not reviewed, considered or conducted any work on the reasonableness and the validity of the Assumptions B and do not express any opinion whatsoever thereon.

**Opinion**

Based on the foregoing, in our opinion, the discounted future estimated cash flows, so far as the calculations are concerned, have been properly compiled, in all material respects, in accordance with the Assumptions B.

**Deloitte Touche Tohmatsu**  
*Certified Public Accountants*  
Hong Kong

November 10, 2020

Hong Kong Exchanges and Clearing Limited  
12/F, Two Exchange Square,  
8 Connaught Place, Central,  
Hong Kong

November 10, 2020

Dear Sirs

**Re: Discloseable and Connected Transaction – Acquisition of 30% Equity Interest in Zhejiang HangNing Expressway Co., Ltd. (“HangNing Co”)**  
**Discloseable and Connected Transaction – Acquisition of the Entire Interest in Zhejiang LongLiLiLong Expressway Co., Ltd. (“LongLiLiLong Co”)**

We refer to the announcement of Zhejiang Expressway Co., Ltd. dated November 10, 2020 (the “**Announcement**”) in relation to the captioned matter and:

- (i) the valuation report dated November 9, 2020 (the “**HangNing Valuation Report**”) prepared by Cushman & Wakefield in relation to the valuation of 30% equity interest of HangNing Co; and
- (ii) the valuation report dated November 9, 2020 (the “**LongLiLiLong Valuation Report**”) prepared by Jones Lang LaSalle in relation to the valuation of the entire equity interest of LongLiLiLong Co.

We understand that Cushman & Wakefield prepared the HangNing Valuation Report and Jones Lang LaSalle prepared the LongLiLiLong Valuation Report based on the discounted cash flow method, and each constitutes a profit forecast under Rule 14.61 of the Rules Governing the Listing of Securities on The Stock Exchange of Hong Kong Limited (the “**Hong Kong Listing Rules**”). Unless otherwise defined or if the context otherwise requires, all terms defined in the Announcement shall have the same meaning when used in this letter.

We have reviewed and discussed the bases and assumptions upon which the valuation of 30% equity interest of HangNing Co has been made with Cushman & Wakefield and the valuation of the entire equity interest of LongLiLiLong Co has been made with Jones Lang LaSalle, and reviewed the respective valuation for which Cushman & Wakefield and Jones Lang LaSalle is responsible.

We have also considered the report from, Deloitte Touche Tohmatsu, dated November 10, 2020 regarding whether the discounted future estimated cash flows, so far as the calculations are concerned, have been properly compiled in accordance with the bases and assumptions set out in the HangNing Valuation Report and the LongLiLiLong Valuation Report. We have noted that the discounted future estimated cash flows do not involve the adoption of accounting policy.

On the basis of the foregoing, we are satisfied that the forecast included in the HangNing Valuation Report and the valuation therein prepared by Cushman & Wakefield, and the forecast included in the LongLiLiLong Valuation Report and the valuation therein prepared by Jones Lang LaSalle have been made after due and careful enquiry.

This letter is for the sole purpose of Rule 14.62(3) of the Hong Kong Listing Rules and for no other purpose. We accept no responsibility to any other person in respect of, arising out of or in connection with this letter.

Yours faithfully,  
On behalf of the Board  
**Zhejiang Expressway Co., Ltd.**  
**LUO Jianhu**  
*Executive Director*

**1. RESPONSIBILITY STATEMENT**

This circular, for which the Directors collectively and individually accept full responsibility, includes particulars given in compliance with the Listing Rules for the purpose of giving information with regard to the Group. The Directors, having made all reasonable enquiries, confirm that to the best of their knowledge and belief the information contained in this circular is accurate and complete in all material respects and not misleading or deceptive, and there are no other matters the omission of which would make any statement herein or this circular misleading.

**2. DISCLOSURE OF INTERESTS****(a) Interests in the Company and its associated corporation**

As at the Latest Practicable Date, none of the Directors, supervisors and chief executives of the Company had an interest or short position in any shares, underlying shares or equity derivatives or debentures of the Company or any associated corporations (within the meaning of Part XV of the SFO) which is required to be (i) notified to the Company and the Stock Exchange pursuant to Divisions 7 and 8 of Part XV of the SFO (including interests and short positions which the Directors, supervisors or chief executives of the Company was taken or deemed to have under such provisions of the SFO); or (ii) entered in the register kept by the Company pursuant to section 352 of the SFO; or (iii) notified to the Company and the Stock Exchange pursuant to the Model Code for Securities Transactions by Directors of Listed Companies.

As at the Latest Practicable Date, none of the Directors, supervisors or chief executives of the Company or their spouses or children under 18 years of age were granted or had exercised any right to subscribe for any equity or debt securities of the Company or any of its associated corporations (within the meaning of Part XV of the SFO).



**(b) Substantial Shareholders**

As at the Latest Practicable Date, so far as is known to the Directors and chief executives of the Company, persons (other than the Directors and the chief executives of the Company) who had interests and short positions in the Shares and underlying Shares of the Company (within the meaning of Part XV of the SFO) as recorded in the register required to be kept under section 336 of the SFO, or as otherwise notified to the Company and the Stock Exchange, were set out as follows:

<b>Name of substantial shareholder</b>	<b>Capacity</b>	<b>Number of Shares</b>	<b>Approximate % of shareholding (Domestic Shares)</b>
Communications Group	Beneficial owner	2,909,260,000	100%

<b>Name of substantial shareholder</b>	<b>Capacity</b>	<b>Number of Shares</b>	<b>Approximate % of shareholding (H Shares)</b>
BlackRock, Inc.	Interest of controlled corporation	115,096,522 (L)	8.03%
Citigroup Inc.	Interest of controlled corporation/ approved lending agent	113,389,054 (L)	7.90%
		52,000 (S)	0.00%
		112,492,327 (P)	7.84%
JP Morgan Chase & Co.	Beneficial owner, investment manager and custodian corporation/approved lending agent	85,530,536 (L)	5.96%
		7,009,144 (S)	0.48%
		57,632,016 (P)	4.01%

*Notes:*

(1) *The letter "L" denotes the person's long position in such Shares.*

(2) *The letter "S" denotes the person's short position in such Shares.*

(3) *The letter "P" denotes the person's interests in a lending pool.*

Save as disclosed above, as at the Latest Practicable Date, the Company had not been notified by any persons (other than the Directors and chief executives of the Company) who had interests or short positions in the Shares or underlying Shares of the Company which would fall to be disclosed to the Company under the provisions of Divisions 2 and 3 of Part XV of the SFO, or which were recorded in the register required to be kept by the Company under section 336 of the SFO.

### 3. OTHER INTERESTS OF DIRECTORS

Save as disclosed in this circular and as at the Latest Practicable Date,

#### (a) Interests in service contracts

none of the Directors had or was proposed to have a service contract with any member of the Group other than contracts expiring or determinable by the employer within one year without the payment of compensation other than the statutory compensation;

#### (b) Interests in assets

none of the Directors had any direct or indirect interest in any assets which have, since December 31, 2019, being the date to which the latest published audited consolidated accounts of the Group were made up, been acquired or disposed of by or leased to any member of the Group upon Completion or were proposed to be acquired or disposed of by or leased to, any member of the Group upon Completion; and

#### (c) Interests in contracts or arrangements

none of the Directors was materially interested in any contract or arrangement entered into with any member of the Group, which contract or arrangement is subsisting as at the Latest Practicable Date and which is significant in relation to the business of the Group upon Completion taken as a whole.

### 4. DIRECTORS' COMPETING INTERESTS

As at the Latest Practicable Date, save as disclosed above, none of the Directors or their associates was interested in any business which competes or is likely to compete, either directly or indirectly, with the business of the Group other than those businesses to which the Directors and their associates were appointed to represent the interests of the Company and/or the Group.

### 5. LITIGATION

As at the Latest Practicable Date, so far as the Directors are aware, there was no litigation or claim of material importance known to the Directors to be pending or threatened against any member of the Group.

## 6. EXPERT AND CONSENT

The following is the qualification of the expert who has provided its opinion or advice, which are contained in this circular:

<b>Name</b>	<b>Qualification</b>
Cushman & Wakefield	a Hong Kong qualified independent valuer
Deloitte Touche Tohmatsu	certified public accountants
Jones Lang LaSalle	a Hong Kong qualified independent valuer
Octal Capital Limited	a licensed corporation licensed to conduct type 1 (dealing in securities) and type 6 (advising on corporate finance) regulated activities under the SFO
WB Group Consulting (Shenzhen) Limited	traffic consultants

The above mentioned experts are Independent Third Parties and its connected persons and are collectively referred to as the “**Experts**” hereinafter.

As at the Latest Practicable Date, none of the Experts had any shareholding in any member of the Group nor has any right, whether legally enforceable or not, to subscribe for or to nominate persons to subscribe for securities in any member of the Group.

Each of the Experts has given and has not withdrawn its written consent to the issue of this circular with the inclusion of its letter(s) or report(s) in the form and context in which they are included.

The letter and recommendation from Octal Capital Limited are set out on pages 32 to 72 of this circular and were given as at the Latest Practicable Date for incorporation herein.

The report from Cushman & Wakefield is set out in Appendix I to this circular and was given as at the Latest Practicable Date for incorporation herein.

The report from Jones Lang LaSalle is set out in Appendix I to this circular and was given as at the Latest Practicable Date for incorporation herein.

The Traffic Study Reports from WBG are set out in Appendix II to this circular and were given as at the Latest Practicable Date for incorporation herein.

The letters from Deloitte are set out in Appendix III to this circular and were given as at the Latest Practicable Date for incorporation herein.

None of the Experts has, or has had, direct or indirect interest in any assets which have been acquired or disposed of by, or leased to, any member of the Group or are proposed to be acquired or disposed of by, or leased to, any member of the Group since December 31, 2019, the date to which the latest published audited accounts of the Group was made up.

## **7. MATERIAL ADVERSE CHANGES**

As disclosed in the interim results announcement of the Company published on August 31, 2020, revenue of the Group for the six months ended June 30, 2020 was RMB3,947.84 million, representing a year-on-year decrease of 31.0%. Profit attributable to owners of the Company for the six months ended June 30, 2020 was RMB687.10 million, representing a year-on-year decrease of 65.3%. Such decrease was mainly attributable to the novel coronavirus epidemic which resulted in significant decrease in the Group's toll revenue, and the toll-free policy during the epidemic and other policy adjustments.

Save as disclosed above, as at the Latest Practicable Date, the Directors were not aware of any material adverse change in the financial position or trading position of the Group since December 31, 2019, being the date to which the latest published audited financial statements of the Group were made up.

## **8. DOCUMENTS AVAILABLE FOR INSPECTION**

Copies of the following documents are available for inspection during normal business hours at the Company's principal place of business in Hong Kong for a period of 14 days from the date of this circular:

- (a) the memorandum and articles of association of the Company;
- (b) the annual reports of the Company for the two financial years ended December 31, 2019;
- (c) the HangNing Equity Purchase Agreement;
- (d) the LongLiLiLong Equity Purchase Agreement;
- (e) the letter from the Independent Board Committee, as set out on pages 30 to 31 of this circular;
- (f) the letter from the Independent Financial Adviser, as set out on pages 32 to 72 of this circular;
- (g) the HangNing Valuation Report, which is out in Appendix I to this circular;

- (h) the LongLiLiLong Valuation Report, which is set out in Appendix I to this circular;
- (i) the Traffic Study Reports, which are set out in Appendix II to this circular;
- (j) the letters from Deloitte on discounted future estimated cash flows which are set out in Appendix III to this circular;
- (k) the letter from the Board in relation to the profit forecast which is set out in Appendix IV to this circular;
- (l) the written consent of the Experts referred to in the paragraph headed “Expert and Consent” in this Appendix V; and
- (m) this circular.

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## NOTICE OF EGM

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# 浙江滬杭甬高速公路股份有限公司 **ZHEJIANG EXPRESSWAY CO., LTD.**

*(A joint stock limited company incorporated in the People's Republic of China with limited liability)*  
(Stock code: 0576)

### NOTICE OF EXTRAORDINARY GENERAL MEETING

**NOTICE IS HEREBY GIVEN THAT** the extraordinary general meeting (the “**EGM**”) of Zhejiang Expressway Co., Ltd. (the “**Company**”) will be held at 10:00 a.m. on December 23, 2020 at 5/F, No. 2 Mingzhu International Business Center, 199 Wuxing Road, Hangzhou City, Zhejiang Province, the People's Republic of China (the “**PRC**”), for the purpose of considering and, if thought fit, passing with or without modification or amendment the following resolutions:

### AS ORDINARY RESOLUTIONS

“**THAT:**

1. To consider and approve the following resolutions as ordinary resolutions:
  - (a) the agreement dated November 10, 2020 (the “**HangNing Equity Purchase Agreement**”) entered into between the Company and Zhejiang Communications Investment Group Co., Ltd. (the “**Communications Group**”) in relation to the acquisition of 30% interest in Zhejiang HangNing Expressway Co., Ltd. (a copy of which is produced to the EGM marked “A” and initialed by the chairman of the EGM for the purpose of identification), and the terms and conditions thereof, including the potential consideration adjustment provided thereof, and the transactions contemplated thereunder and the implementation thereof be and are hereby approved and confirmed; and
  - (b) the authorization to any one of the directors of the Company (the “**Directors**”), or any other person authorized by the board of the Directors (the “**Board**”) from time to time, for and on behalf of the Company, among other matters, to sign, seal, execute, perfect, perform and deliver all such agreements, instruments, documents and deeds, and to do all such acts, matters and things and take all such steps as he or she or they may in his or her or their absolute discretion consider to be necessary, expedient, desirable or appropriate to give effect to and implement the HangNing Equity Purchase Agreement and the transactions contemplated thereunder and all matters incidental to, ancillary to or in connection thereto, including agreeing and making any modifications, amendments, waivers, variations or extensions of and entering into supplemental agreement to the HangNing Equity Purchase Agreement or the transactions contemplated thereunder be and are hereby approved, ratified and confirmed.

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## NOTICE OF EGM

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2. To consider and approve the following resolutions as ordinary resolutions:
- (a) the agreement dated November 10, 2020 (the “**LongLiLiLong Equity Purchase Agreement**”) entered into between the Company and Communications Group in relation to the acquisition of the entire interest in Zhejiang LongLiLiLong Expressway Co., Ltd. (a copy of which is produced to the EGM marked “B” and initialed by the chairman of the EGM for the purpose of identification), and the terms and conditions thereof, including the potential consideration adjustment provided thereof, and the transactions contemplated thereunder and the implementation thereof be and are hereby approved and confirmed; and
  - (b) the authorization to any one of the Directors, or any other person authorized by the Board from time to time, for and on behalf of the Company, among other matters, to sign, seal, execute, perfect, perform and deliver all such agreements, instruments, documents and deeds, and to do all such acts, matters and things and take all such steps as he or she or they may in his or her or their absolute discretion consider to be necessary, expedient, desirable or appropriate to give effect to and implement the LongLiLiLong Equity Purchase Agreement and the transactions contemplated thereunder and all matters incidental to, ancillary to or in connection thereto, including agreeing and making any modifications, amendments, waivers, variations or extensions and entering into supplemental agreement to the LongLiLiLong Equity Purchase Agreement or the transactions contemplated thereunder be and are hereby approved, ratified and confirmed.”

Yours faithfully,  
On behalf of the Board  
**Zhejiang Expressway Co., Ltd.**  
**YU Zhihong**  
*Chairman*

Hangzhou, the PRC  
December 7, 2020

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## NOTICE OF EGM

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*Notes:*

**1. Registration procedures for attending the EGM**

A shareholder or his/her/its proxy should produce proof of identity when attending the EGM. If a corporate shareholder appoints its legal representative to attend the meeting, such legal representative shall produce proof of identity and a copy of the resolution of the board of directors or other governing body of such shareholder appointing such legal representative to attend the meeting.

**2. Proxy**

- (a) A shareholder eligible to attend and vote at the EGM is entitled to appoint, in written form, one or more proxies to attend and vote at the EGM on behalf of him/her/it. A proxy need not be a shareholder of the Company.
- (b) A proxy shall be appointed by a written instrument signed by the appointor or an attorney authorized by him/her/it for such purpose. If the appointor is a corporation, the same shall be affixed with the seal of such corporation, or signed by its director(s) or duly authorized representative(s). If the instrument appointing a proxy is signed by a person authorized by the appointor, the power of attorney or other authorization document(s) shall be notarized.
- (c) To be valid, the power of attorney or other authorization document(s) (which have been notarized) together with the completed form of proxy must be delivered, in the case of holders of Domestic Shares, to the Company at the address shown in paragraph 5(b) below and, in the case of holders of H Shares, to Hong Kong Registrars Limited at 17M Floor, Hopewell Center, 183 Queen's Road East, Wanchai, Hong Kong by no later than 10 a.m. on December 22, 2020).
- (d) Any vote of the shareholders of the Company present in person or by proxy at the EGM must be taken by poll.

**3. Book closing period**

For the purpose of the EGM, the register of members holding H Shares will be closed from December 18, 2020 to December 23, 2020 (both days inclusive).

**4. Last Day of Transfer and Record Date**

Holders of H Shares who intend to attend the EGM must deliver all transfer instruments and the relevant shares certificates to Hong Kong Registrars Limited at Shops 1712–1716, 17/F, Hopewell Center, 183 Queen's Road East, Wanchai, Hong Kong, at or before 4:30 p.m. on December 17, 2020. For the purpose of the EGM, the record date will be December 17, 2020.



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## NOTICE OF EGM

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### 5. Miscellaneous

- (a) The EGM will not last for more than one day. Shareholders who attend shall bear their own traveling and accommodation expenses.
- (b) The principal place of business of the Company in the PRC is:

5/F, No. 2 Mingzhu International Business Center  
199 Wuxing Road  
Hangzhou City, Zhejiang Province  
People's Republic of China  
310020  
Telephone No.: (+86)-571-8798 7700  
Facsimile No.: (+86)-571-8795 0329

*As at the date of this notice, the Chairman of the Company is Mr. YU Zhihong; the executive Directors of the Company are: Mr. CHEN Ninghui and Ms. LUO Jianhu; the other non-executive Directors of the Company are: Mr. DAI Benmeng, Mr. YUAN Yingjie and Mr. FAN Ye; and the independent non-executive Directors of the Company are: Mr. PEI Ker-Wei, Ms. LEE Wai Tsang, Rosa and Mr. CHEN Bin.*