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

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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)

**MAJOR TRANSACTION
IN RELATION TO THE PROPOSED ISSUANCE OF THE ABS AND THE
EQUITY TRANSFER AGREEMENT**

Capitalised terms used on this cover page have the same meanings as defined in this Circular, unless the context requires otherwise.

A letter from the Board is set out on pages 4 to 13 of this Circular.

The Company has received written Shareholders' approval for the proposed issuance of the ABS, the Equity Transfer Agreement and the transactions contemplated thereunder from the Communications Group, a Shareholder holding more than 50% of the issued share capital of the Company. Accordingly, no general meeting of Shareholders will be convened to approve the proposed issuance of the ABS, the Equity Transfer Agreement and the transactions contemplated thereunder pursuant to Rule 14.44 of the Listing Rules in lieu of a general meeting of the Company. This Circular is being despatched to the Shareholders for information only.

November 4, 2022

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DEFINITIONS

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

“ABS”	two classes of securities, namely senior class and subordinated class of securities to be issued by the Asset-backed Special Program based on the Underlying Assets in the expected total principal amount of RMB6,317 million
“Asset-backed Special Program”	a special program set up by CICC in relation to the issuance of the ABS based on the Underlying Assets
“Asset Management Agreement”	the asset management agreement to be entered into between the Company together with the Professional Investors, and CICC as the project manager of the Asset-backed Special Program
“Baicheng”	Baicheng (Beijing) Engineering Consulting Co. Ltd.*(百誠(北京)工程諮詢有限公司), an independent traffic study institution appointed by the Company in respect of Shenjiahuhang Co
“Board”	the board of Directors
“CICC”	China International Capital Corporation Limited, the project manager of Asset-backed Special Program and acting on behalf of the Asset-backed Special Program as the purchaser of the Equity Transfer Agreement
“Circular”	this circular to the Shareholders
“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, 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 with limited liability on March 1, 1997, the H Shares of which are listed on the Stock Exchange (stock code: 0576)
“connected person(s)”	has the meaning ascribed to it under the Listing Rules
“Deloitte”	Deloitte Touche Tohmatsu, the reporting accountant of the Company
“Director(s)”	the director(s) of the Company

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“Equity Transfer Agreement”	the agreement to be entered into between the Company and CICC acting on behalf of the Asset-backed Special Program as the purchaser (as may be amended and supplemented), pursuant to which the Company conditionally agreed to transfer the entire equity interests in Shenjiahuhang Co to the Asset-backed Special Program for the purpose of the proposed issuance of the ABS
“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
“Hong Kong”	the Hong Kong Special Administrative Region of the PRC
“Independent Third Party(ies)”	third party(ies) independent of and not connected with the Company or its connected persons
“Jones Lang LaSalle”	Jones Lang LaSalle Corporate Appraisal and Advisory Limited, an independent valuer appointed by the Company in respect of Shenjiahuhang Co
“Latest Practicable Date”	November 1, 2022, being the latest practicable date for ascertaining certain information contained in this Circular
“Listing Rules”	The Rules Governing the Listing of Securities on the Stock Exchange, as amended, supplemented or otherwise modified from time to time
“percentage ratio”	has the meaning ascribed to it under Rule 14.04(9) of the Listing Rules
“PRC”	the People’s Republic of China (for the purpose of this Circular, excludes Hong Kong, the Macau Special Administrative Region of the PRC and Taiwan)
“Professional Investor(s)”	the professional investors who fulfill the requirements and criteria as specified in the Asset Management Agreement and who will subscribe for the ABS under the Asset-backed Special Program
“Property Exchange”	the Zhejiang Property & Stock Exchange (浙江產權交易所) or other legally established property and stock exchange
“RMB”	Renminbi, the lawful currency of the PRC
“SFO”	Securities and Futures Ordinance (Chapter 571 of the Laws of Hong Kong), as amended, supplemented or otherwise modified from time to time

DEFINITIONS

“Share(s)”	share(s) of the Company
“Shareholder(s)”	holder(s) of the Share(s) of the Company
“Shenjiahuhang Co”	Zhejiang Shenjiahuhang Expressway Co., Ltd.* (浙江申嘉湖杭高速公路有限公司), a company established in the PRC and a wholly-owned subsidiary of the Company as at the Latest Practicable Date
“SSE”	The Shanghai Stock Exchange
“Stock Exchange”	The Stock Exchange of Hong Kong Limited
“subsidiary(ies)”	has the meaning ascribed to it under the Listing Rules
“Traffic Study Report”	the traffic study report prepared by Baicheng commissioned by the Company in relation to Shenjiahuhang Expressway
“Underlying Assets”	the entire equity interests in Shenjiahuhang Co together with all the income generated from the toll collection right of Huzhou Section and Lianhang Section held by Shenjiahuhang Co and other relevant assets of Shenjiahuhang Expressway with a period of 25 years
“Valuation Benchmark Date”	June 30, 2022
“Valuation Report”	the valuation report dated September 1, 2022, prepared by Jones Lang LaSalle commissioned by the Company in relation to the entire equity interest in Shenjiahuhang Co
“Zhejiang SASAC”	the 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)
“Zhoushan Co”	Zhejiang Zhoushan Bay Bridge Co., Ltd.(浙江舟山跨海大橋有限公司), the 51% equity interests in which were transferred from Shenjiahuhang Co to the Company pursuant to an equity transfer agreement dated September 19, 2022
“Zheshang Securities”	Zheshang Securities Co., Ltd.*(浙商證券股份有限公司), a company established in the PRC, a securities company in the PRC and is a 54.79% owned subsidiary of Zhejiang Shangsang Expressway Co., Ltd.* (浙江上三高速公路有限公司) as at the Latest Practicable Date
“%”	per cent.

* For identifications only.

LETTER FROM THE BOARD



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

Mr. Yuan Yingjie

Non-executive Directors:

Mr. Jin Chaoyang

Mr. Fan Ye

Mr. Huang Jianzhang

Independent Non-executive Directors:

Mr. Pei Ker-Wei

Ms. Lee Wai Tsang, Rosa

Mr. Chen Bin

Registered Address:

12/F, Block A,

Dragon Century Plaza

1 Hangda Road

Hangzhou City, Zhejiang 310007

People's Republic of China

Principal Place of Business:

5/F., No. 2

Mingzhu International Business Center

199 Wuxing Road

Hangzhou

Zhejiang Province 310020

The People's Republic of China

November 4, 2022

To the Shareholders

Dear Sir or Madam,

MAJOR TRANSACTION IN RELATION TO THE PROPOSED ISSUANCE OF THE ABS AND THE EQUITY TRANSFER AGREEMENT

1. INTRODUCTION

Reference is made to the announcement of the Company dated September 19, 2022 in relation to the proposed issuance of the ABS and the Equity Transfer Agreement. The Company proposes to launch an Asset-backed Special Program, which expects to issue the ABS on the SSE in November 2022 or a later date to be determined for the purpose of investing in and securitizing the Underlying Assets held by Shenjiahuhang Co, a wholly-owned subsidiary of the Company, and raising funds for the operation and development of the business of the Group. In order to issue the ABS, the Company has appointed CICC as the project manager of the Asset-backed Special Program. The Company as the vendor and the original interest owner and CICC as the project manager and acting on behalf of the Asset-backed Special Program as the purchaser, will enter into the Equity Transfer Agreement, pursuant to which the Company will conditionally agree to transfer the entire equity interests in Shenjiahuhang Co to the Asset-backed

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Special Program to be managed by CICC at a cash consideration expected to be not less than RMB2,943 million.

2. THE ABS

The Company proposes to appoint CICC as the project manager of the Asset-backed Special Program, pursuant to which the ABS will be issued on the SSE. The ABS is expected to be issued to Professional Investors in November 2022 or a later date to be determined. For the purpose of the Asset-backed Special Program, the Company will enter into the Equity Transfer Agreement with CICC, acting on behalf of the Asset-backed Special Program as the purchaser and will, together with the Professional Investors, enter into the Asset Management Agreement with CICC as the project manager.

The ABS will comprise two classes, namely senior class ABS and subordinated class ABS. The ABS shall be valid until the expiry date of the toll collection right of Shenjiahuhang Expressway under the Asset-backed Special Program. The distribution of the Asset-backed Special Program is categorised into ordinary distribution, disposal distribution and liquidation distribution. The holders of senior class ABS shall have a priority in receiving the distribution over the holders of subordinated class ABS in all types of distribution under the Asset-backed Special Program. There are two tranches under the subordinated class ABS, namely Tranche A ABS and Tranche B ABS. Tranche B ABS will be fully subscribed by the original interest owner (i.e. the Company) and/or its related parties. The holders of Tranche A ABS and Tranche B ABS are entitled to the same rights and order of distribution, and are subject to the same obligations under the Asset-backed Special Program except for: (i) holders of Tranche A ABS can apply for transfer of such ABS through the SSE while Tranche B ABS can only be transferred among the existing holders unless in certain exceptional circumstances; and (ii) if the entire equity interests in Shenjiahuhang Co are not transferred as contemplated under the Equity Transfer Agreement within a specified period of time, and the aforementioned period has not been extended, the liquidation and the distribution under liquidation will be triggered where holders of Tranche A ABS will prioritize in distribution over holders of Tranche B ABS. The holders of Tranche A ABS will be determined by CICC and the Company through consultation and negotiation, which has not yet been completed and the holders of Tranche A ABS are yet to be identified. The holders of Tranche A ABS are expected to be identified simultaneously with the bookbuilding of the senior class ABS. From the date of establishment of the Asset-backed Special Program to the third ordinary distribution date, the senior class ABS shall bear an interest at an expected rate to be determined with reference to the results of bookbuilding; from the third ordinary distribution date and for every three years, such rate shall be determined with reference to the coupon rate adjustment announcement of the Asset-backed Special Program. The subordinated class ABS will be entitled to the residual interest after distribution to the senior class ABS (if any). The senior class ABS is expected a credit rating of "AAAsf" from China Chengxin International Credit Rating Co. Ltd., an independent rating agency in the PRC where subordinated class ABS will not be subject to rating.

The principal sum of the ABS to be issued is approximately RMB6,317 million, which is estimated based on the value of the equity interests in and outstanding liabilities of Shenjiahuhang Co. The principal and interest of the ABS will be repaid by the Asset-backed Special Program on an annual basis entirely with the net cash flow generated from the Shenjiahuhang Expressway. The net cash flow of Shenjiahuhang Co is estimated to be sufficient for repayment of the principal and interests of the senior class ABS. Meanwhile, the Company will make up for the deficiency if the net cash flow generated from the Shenjiahuhang Expressway is insufficient to settle the distribution obligation for the senior class ABS for ordinary distribution. In return, the Company has the pre-emptive right to purchase the Underlying

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Assets if the Asset-backed Special Program in certain circumstances plans to sell the Underlying Assets but the Company is not obligated to purchase the same and there is no other obligation on the Company upon the expiry of the ABS under the Asset-backed Special Program.

The term of the Asset-backed Special Program is approximately 12 years, the expected size of which is set out in the table below. Details of the Asset-backed Special Program are subject to the approval by the SSE.

Class	Senior Class ABS	Subordinated Class ABS	
		Tranche A ABS	Tranche B ABS
Principal amount <i>(RMB million)</i>	6,067	175	75

3. THE ASSET MANAGEMENT AGREEMENT

The Company together with the Professional Investors propose to enter into the Asset Management Agreement with CICC as the project manager of the Asset-backed Special Program, pursuant to which CICC will provide management services in relation to the Underlying Assets and distribute interests derived from the Asset-backed Special Program.

4. EQUITY TRANSFER AGREEMENT

For the purpose of the proposed issuance of the ABS, the Company as the vendor and the original interest owner and CICC as the project manager and acting on behalf of the Asset-backed Special Program as the purchaser, propose to enter into the Equity Transfer Agreement, pursuant to which the Company will conditionally agree to transfer the entire equity interests in Shenjiahuhang Co to the Asset-backed Special Program to be managed by CICC at a cash consideration expected to be not less than RMB2,943 million via the Property Exchange.

The Company will enter into the Equity Transfer Agreement with CICC, as the project manager of the Asset-backed Special Program, after CICC successfully bid for the entire equity interests in Shenjiahuhang Co on the Property Exchange pursuant to the applicable PRC laws and regulations.

Principal terms of the Equity Transfer Agreement are summarized as follows.

Parties:

- (i) the Company, as the vendor and original interest owner; and
- (ii) CICC, as the project manager and acting on behalf of the Asset-backed Special Program as the purchaser

The Company, as the original interest owner of the Underlying Assets, will transfer the entire equity interests in Shenjiahuhang Co to the Asset-backed Special Program and will be responsible for the daily operation of the Shenjiahuhang Expressway pursuant to an operation service agreement for the Asset-backed Special Program.

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CICC, as the project manager of the Asset-backed Special Program, is responsible for receipt of the equity interests in Shenjiahuhang Co on behalf of the Asset-backed Special Program, establishment of the Asset-backed Special Program, continuing management of the Asset-backed Special Program over its Underlying Assets, distribution and all other aspects of the Asset-backed Special Program pursuant to the Asset Management Agreement.

Underlying Assets:

The Underlying Assets include the entire equity interests in Shenjiahuhang Co together with all the income generated from the toll collection right of Huzhou Section and Lianhang Section and other relevant assets of Shenjiahuhang Expressway held by Shenjiahuhang Co with a period of 25 years. According to the existing Regulation on the Administration of Toll Roads (收費公路管理條例) the toll collection rights period of Huzhou and Lianhang sections will not exceed 25 years and according to the customary practice, the toll collection rights of the Huzhou and Lianhang sections in principle would be 25 years. The 25-year toll collection rights commenced from the date when the relevant sections of Shenjiahuhang Expressway were completed and opened to traffic, which was 2008 for the Huzhou Section and 2010 for the Lianhang Section.

The Asset-backed Special Program, upon establishment, shall be entitled to all the rights and interests (present and future, existing and contingent) of the Underlying Assets.

Consideration and Payment Terms:

The consideration for the entire equity interests in Shenjiahuhang Co is expected to be not less than RMB2,943 million. A number of factors have been considered when determining the consideration, including, among others, the Valuation Report prepared by Jones Lang LaSalle, as well as the PRC valuation report prepared by a PRC domestic valuer commissioned by the Company pursuant to the requirements of Zhejiang SASAC and relevant PRC laws and regulations. The consideration will be payable by the Asset-backed Special Program within five business days after the effective date of the Equity Transfer Agreement.

The Directors are of the view that the terms of the Equity Transfer Agreement and the transactions contemplated thereunder are fair and reasonable and in the interest of the Company and the Shareholders as a whole. The Directors confirmed that the Equity Transfer Agreement and the transactions contemplated thereunder are conducted on normal commercial terms and will have no material adverse impact on the operations and financial position of the Group.

EFFECTIVENESS

The Equity Transfer Agreement will become effective upon satisfaction of the following:

- (i) all approval procedures required for the signing of the Equity Transfer Agreement, including but not limited to authorization, approval, and internal company decision-making, have been legally obtained and remain effective;

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- (ii) the preconditions and prerequisites for the establishment of the Equity Transfer Agreement have been fulfilled; and
- (iii) the Company and Shenjiahuhang Co have passed the relevant internal resolutions (including shareholders' resolution, board resolution, etc.) to approve the Equity Transfer Agreement, copies of which have been provided to CICC.

Completion of the Equity Transfer

Subject to the fulfillment (or where applicable, waived) in full of the conditions set out above, within 10 business days from obtaining the property right transaction voucher, the parties shall cooperate to apply with the relevant governmental authorities to alter the registration for industrial and commercial administration for completion under the Equity Transfer Agreement.

PRC valuation report

Pursuant to the PRC valuation report prepared for the purpose of the Asset-backed Special Program, the appraised value of the entire equity interests in Shenjiahuhang Co as at June 30 2022 was RMB2,943 million. The valuation of the PRC valuation report was conducted on income approach.

The appraised value under the PRC valuation report was arrived using the income approach. Key basic assumptions used in determining the value of the equity interests in Shenjiahuhang Co under the PRC valuation report include the transaction assumption, open market assumption, relatively stable macro-economic assumption, enterprise going concern assumption and assumption that all the information of the appraised entity is true, accurate and complete. Relevant special assumptions used under income approach include but not limited to the following:

- the accounting policies adopted by the appraised entity after the valuation benchmark date is consistent with the accounting policies adopted for the preparation of this valuation report in material aspects;
- Shenjiahuhang Co can get access to the funds required for operations;
- the management of Shenjiahuhang Co is capable and responsible;
- the toll collection rights of Shenjiahuhang Expressway will be 25 years commencing from the date when the relevant sections were completed; and
- the assumptions under the Traffic Study Report.

LETTER FROM THE BOARD

Principal assumptions for the income approach adopted for the Valuation Report

The appraised value of the entire equity interest in Shenjiahuhang Co under the 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.

Details of the key assumptions used in determining the value of the entire equity interests in Shenjiahuhang Co upon which the Valuation Report was issued are set out below:

Major assumptions

- 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, taxation, legal, technological, fiscal or economic conditions, which might adversely affect the business of Shenjiahuhang Co;
- the operational and contractual terms stipulated in the relevant contracts and agreements will be honored;
- copies of the operating licenses and company incorporation documents obtained by Jones Lang LaSalle are reliable and legitimate;
- 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 Shenjiahuhang Co;
- shareholder loan will be made to Shenjiahuhang Co when necessary;
- the financial and operational information such as management accounts, contractual agreements and manufacturing capabilities, provided to us by Shenjiahuhang Co and the Company is accurate; and
- there are no hidden or unexpected conditions associated with the assets valued that might adversely affect the reported values. Furthermore, Jones Lang LaSalle assumes no responsibility for changes in market conditions after the Valuation Benchmark Date.

Deloitte, acting as the reporting accountant 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.

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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. The Directors confirm that the valuation of the entire equity interests in Shenjiahuhang Co in the 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 appendix IV to this Circular.

As at the Latest Practicable Date, Deloitte did 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.

5. FINANCIAL EFFECT AND USE OF FUNDS FROM THE PROPOSED ISSUANCE OF THE ABS

Upon completion of the Equity Transfer Agreement, Shenjiahuhang Co will cease to be a subsidiary of the Company and the accounts of Shenjiahuhang Co will cease to be consolidated into the accounts of the Company. The unaudited total assets and liabilities of the Company will decrease by approximately RMB5,636 million and RMB4,628 million, respectively, in the consolidated financial statements of the Company as at 30 June 2022.

The Company is expected to recognize an unaudited estimated gain of approximately RMB1,935 million on a consolidated basis from the proposed issuance of the ABS, which represents the difference between the consideration under the Equity Transfer Agreement of not less than RMB2,943 million and the unaudited carrying value of the Underlying Assets of approximately RMB1,008 million as at the Valuation Benchmark Date as adjusted in accordance with the Company's accounting policy.

The funds received by the Company from the proposed issuance of the ABS originates from the transfer of Shenjiahuhang Co and the repayment of the related party loan and interest by Shenjiahuhang Co, and is subject to no restriction in respect of its usage under the terms of the ABS Program. Such fund is expected to be used for general working capital purposes of the Company and raising funds for the operation and development of the business of the Group.

6. INFORMATION OF THE COMPANY

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.

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7. INFORMATION OF SHENJIAHUHANG CO

Shenjiahuhang Co is a limited liability company established in the PRC on July 13, 2018. Shenjiahuhang Co holds the toll collection rights of Huzhou Section (S12) and Lianhang Section (S13) of Shenjiahuhang Expressway. As at the Latest Practicable Date, Shenjiahuhang Co was a wholly-owned subsidiary of the Company.

Shenjiahuhang Expressway is divided into Huzhou Section (S12) and Lianhang Section (S13). The Huzhou Section starts from Lianshi Town at Nanxun District, Huzhou City, and ends at Wuxing District at Huzhou City, for a total length of 41.978 kilometers. The Lianhang Section starts from Lianshi Town at Nanxun District, Huzhou City, and ends at Chongxian Town, Yuhang District for a total length of 50.938 kilometers.

As part of the reorganisation for the purpose of the proposed issuance of ABS under the Asset-backed Special Program, Shenjiahuhang Co transferred its 51% of equity interests in Zhoushan Co to the Company at the audited net asset value of Zhoushan Co as at 30 June 2022 pursuant to an equity transfer agreement dated 19 September 2022, which constitutes an intra-group restructuring and is not subject to the requirements under the Chapter 14 of the Listing Rules.

According to the audited financial information of Shenjiahuhang Co for the year ended December 31, 2020 and 2021 prepared with reference to generally accepted accounting principles in the PRC by the auditor of Shenjiahuhang Co, the net asset value of the Shenjiahuhang Co as at December 31, 2021 was approximately RMB1,672 million. A summary of the audited financial information of Shenjiahuhang Co for the financial years ended December 31, 2020 and 2021 is set out below:

	Year Ended December 31, 2021 <i>(RMB million)</i>	Year Ended December 31, 2020 <i>(RMB million)</i>
Revenue	784	561
Profit/(Loss) before taxation	73	(155)
Profit/(Loss) after taxation	53	(117)

As at June 30, 2022, the total liabilities of Shenjiahuhang Co was RMB4,629 million, of which the total amount of operating liabilities were RMB110 million, mainly comprising the accounts payable and employee compensation payable by Shenjiahuhang Co for the operation of Shenjiahuhang Expressway. The total non-operating liabilities of Shenjiahuhang Co were RMB4,519 million, mainly including (i) Shenjiahuhang Co's syndicated loan and interest of approximately RMB1,862 million; and (ii) the related party loan and interest of Shenjiahuhang Co from the Company and Zhejiang Communications Investment Group Finance Co., Ltd. of approximately RMB2,657 million.

Prior to the establishment of the Asset-backed Special Program, Shenjiahuhang Co will apply the proceeds received from the equity transfer of Zhoushan Co to repay part of its non-operating liabilities, after which the amount of the non-operating liabilities of Shenjiahuhang Co will drop to approximately RMB3,371 million.

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The remaining of the fund raised by the Asset-backed Special Program after payment for the acquisition of the Underlying Assets amounts to RMB3,374 million which will be utilised to (i) pay off the non-operating liabilities of Shenjiahuhang Co at the amount of no more than RMB3,371 million; and (ii) pay the relevant fees and taxes for the establishment of the Asset-backed Special Program and transactions contemplated thereunder, which is expected to be approximately RMB3 million.

8. INFORMATION OF CICC

CICC is a company whose H Shares are listed on the Stock Exchange (stock code: 3908). CICC is principally engaged in investment banking, equity sales and trading, wealth management, fixed income, commodities and currencies and investment management business.

As at the Latest Practicable Date, to the best knowledge, information and belief of the Directors, having made all reasonable enquiries, CICC and its ultimate beneficial owners were third parties independent of the Company and of the connected person(s) of the Company.

9. REASONS FOR AND BENEFITS OF THE PROPOSED ISSUANCE OF THE ABS

The Company is principally engaged in investing in, developing and operating high-grade roads. The proposed issuance of the ABS is conducted for the purpose of financing at a lower cost. The Directors believe that by proposed issuance of the ABS, the Company can securitise and revitalise the existing expressway assets, realise asset revaluation, raised funds which brings liquidity and thus improve asset utilization. Meanwhile, as disclosed above, the fund raised by the Asset-backed Special Program will be applied to pay off the existing non-operating liabilities of Shenjiahuhang Co at the blended interest rate of approximately 4.1%. While the pricing of the ABS will be determined by consultation and bookbuilding, the coupon rate of the senior class ABS is expected to fall between the range of 2.6% to 3.0% according to the prevailing market rates, which is more competitive than coupon rate of the existing liabilities and financial instruments in the market. Although the Company might have leveraged other forms of financing, they are either technically unavailable or come with a higher cost than the ABS. As such, the proposed issue of the ABS, also helps to lower the finance cost and promote the investment and financing capabilities of the Company.

The Directors are of the view that the terms of the proposed issuance of the ABS, the Equity Transfer Agreement and the transactions contemplated thereunder and are on normal commercial terms and are fair and reasonable and in the interests of the Company and its Shareholders as a whole.

10. LISTING RULES IMPLICATIONS

As the highest applicable percentage ratio in respect of the transactions contemplated under the Equity Transfer Agreement is over 25% but less than 75%, the transactions contemplated thereunder will constitute a major transaction for the Company and is subject to the reporting, announcement and shareholders' approval requirements under Chapter 14 of the Listing Rules.

LETTER FROM THE BOARD

Pursuant to Rule 14.44 of the Listing Rules, shareholders' approval may be obtained by written shareholders' approval without the need of convening a general meeting. To the best of the knowledge, information and belief of the Directors, after having made all reasonable enquiries, none of the Shareholders is materially interested in the Equity Transfer Agreement and transactions contemplated thereunder. As such, no Shareholder is required to abstain from voting if a general meeting is to be convened to approve the Equity Transfer Agreement and the transactions contemplated thereunder.

The Company has received written Shareholders' approval by the Communications Group in respect of the proposed issuance of the ABS, the Equity Transfer Agreement and the transactions contemplated thereunder, in accordance with Rule 14.44 of the Listing Rules. As at the Latest Practicable Date, Communications Group held 2,909,260,000 domestic shares of the Company, representing approximately 67% of the issued share capital of the Company. Accordingly, no Shareholders' meeting will be convened by the Company to approve the Equity Transfer Agreement and the transactions contemplated thereunder.

11. RECOMMENDATION

Although no general meeting will be convened for approving the Equity Transfer Agreement and the transactions contemplated thereunder, the Directors, are of the view that the terms thereof and the transactions contemplated thereunder are on normal commercial terms, fair and reasonable, in the interests of the Company and the Shareholders as a whole.

Accordingly, if the general meeting was convened for approving the Equity Transfer Agreement and transactions contemplated thereunder, the Directors would recommends the Shareholders to vote in favour of the ordinary resolution to be proposed at the general meeting to approve the Equity Transfer Agreement and the transactions contemplated thereunder.

12. OTHER INFORMATION

Your attention is also drawn to the additional information set out in the appendices to this Circular.

By order of the board of Directors
Zhejiang Expressway Co., Ltd.
YU Zhihong
Chairman

1. FINANCIAL INFORMATION OF THE GROUP

The published audited consolidated financial statements of the Group for each of the three years ended December 31, 2019, 2020 and 2021 and the unaudited consolidated financial statements of the Group for the six months ended June 30, 2022 are disclosed in the following documents, which can be accessed on both the websites of the Stock Exchange (<http://www.hkexnews.hk>) and the Company (www.zjec.com.cn).

- a. Annual report of the Company for the year ended December 31, 2019 (pages 102 – 280), which can be accessed via the link at:

<https://www1.hkexnews.hk/listedco/listconews/sehk/2020/0331/2020033100779.pdf>

- b. Annual report of the Company for the year ended December 31, 2020 (pages 108 – 263), which can be accessed via the link at:

<https://www1.hkexnews.hk/listedco/listconews/sehk/2021/0331/2021033100890.pdf>

- c. Annual report of the Company for the year ended December 31, 2021 (pages 102 – 277), which can be accessed via the link at:

<https://www1.hkexnews.hk/listedco/listconews/sehk/2022/0331/2022033101917.pdf>

- d. Interim report of the Company for the six months ended June 30, 2022 (pages 24-63), which can be accessed via the link at:

<https://www1.hkexnews.hk/listedco/listconews/sehk/2022/0831/2022083100595.pdf>

2. STATEMENT OF INDEBTEDNESS OF THE GROUP

As at the close of business on August 31, 2022, being the latest practicable date for the purpose of this indebtedness statement prior to the printing of this Circular, the Group had aggregate outstanding indebtedness of approximately RMB55,428.70 million comprising the following:

- (i) secured bank borrowings of approximately RMB13,835.75 million, secured mainly by toll collection rights of the relevant expressways, trade receivables, and advertisement operation right;
- (ii) unsecured bank borrowings of approximately RMB629.06 million;
- (iii) unsecured bonds and notes liabilities of approximately RMB34,964.07 million;
- (iv) secured bonds and notes liabilities of approximately RMB834.26 million;
- (v) secured other borrowings of approximately RMB981.92 million; and
- (vi) unsecured other borrowings of approximately RMB4,183.64 million.

The Group provided a financial guarantee to a 50% owned joint venture of the Group, in favour of a bank for 50% of its outstanding bank borrowings and interest, and accrued off-balance sheet provision in light of the financial guarantee. As at August 31, 2022, the bank borrowings of such joint venture and accrued interest amounted to RMB758.00 million. The Directors consider that the fair value of the guarantee is insignificant at initial recognition and default by the guaranteed party is not probable, therefore the provision under ECL model for financial guarantee contract is not material as at August 31, 2022.

Zhejiang Shenjiahuhang Expressway Co., Ltd. and Zhejiang Zhoushan Bay Bridge Co., Ltd., the subsidiaries of the Company, pledged their rights of toll on expressway for their bank borrowing, as at August 31, 2022, the remaining bank loan balance was RMB1,859.60 million and RMB5,890.17 million respectively. Deqing County De'an Highway Construction Co., Ltd., a subsidiary of the Company, pledged its trade receivables for its bank borrowing, as at August 31, 2022, the remaining bank loan balance was RMB551.83 million. Zhejiang LongLiLiLong Expressway Co., Ltd., a subsidiary of the Company, pledged its right of toll on expressway for its bank and other borrowing, as at August 31, 2022, the remaining bank and other borrowing balance was RMB4,840.00 million. Jiaxing Zhajiasu Expressway Co., Ltd., a subsidiary of the Company, pledged its right of toll on expressway for its bank borrowing, as at August 31, 2022, the remaining bank loan balance was RMB1,518.32 million. As at August 31, 2022, the remaining balance of RMB806.31 million in respect of the Zhejiang Expressway's Huihang Expressway asset backed securities of RMB2,013.00 million issued on September 23, 2019 is secured by the Company.

Save as aforesaid or otherwise mentioned herein, and apart from intra-group liabilities and normal trade payables in the ordinary course of the business, the Group did not have any other outstanding borrowings, mortgages, charges, debentures, loan capital and overdraft, debt securities or other similar indebtedness, finance leases or hire purchase commitment, liabilities under acceptances or acceptance credits or any guarantees or other material contingent liabilities at the close of business on August 31, 2022, being the latest practicable date for the purpose of this statement of indebtedness prior to printing of this Circular.

The Directors confirm that there had been no material change to the indebtedness and contingent liabilities of the Group since August 31, 2022 up to and including the Latest Practicable Date.

3. SUFFICIENCY OF WORKING CAPITAL

Taking into account the financial effect of the proposed issuance of the ABS and the financial resources of the Group (including the Group's internal resources, available banking and other borrowing facilities), in the absence of any unforeseen circumstances, the Directors are of the opinion that the Group will have sufficient working capital for the Group's requirements for at least the next 12 months from the date of the Circular.

4. MATERIAL CHANGES

As at the Latest Practicable Date, there had not been any material change in the financial or operation position or outlook of the Group since December 31, 2021, being the date to which the latest published audited consolidated financial statements of the Group were made up, up to and including the Latest Practicable Date.

5. FINANCIAL AND OPERATION PROSPECTS OF THE GROUP

The Group is principally engaged in the operation, management of high grade roads, as well as provision of security broking service and proprietary securities trading. The Company was incorporated on March 1, 1997 as an infrastructure company of the Zhejiang Provincial Government for investing in, developing and operating expressways and Class 1 roads in Zhejiang Province. The securities business is carried out by its subsidiary, Zheshang Securities, which was listed on the Shanghai Stock Exchange in June 2017. As at the Latest Practicable Date, the Group's revenue stream mainly consisted of i) toll road operation; ii) securities business; and (iii) other operation which includes but not limited to hotel and catering business.

In respect of the toll road operation business, the Group will actively accelerate the construction of the intelligent Shanghai-Hangzhou-Ningbo Expressway (Phase II), enrich and improve data integration applications such as "Intelligent Expressway", and continue to steer the digital reform process. It will also carry out reforms of its systems and mechanisms, strengthen the building of talent team, and constantly activate its organic growth capabilities.

As to the securities business, the Group will continue to optimize its business structure, enhance the coordination and synergies between each business segment, in order to steadily move towards becoming a top-tier securities company in the PRC. Zheshang Securities, the major operating company for conducting the securities business, will continue to grasp the market opportunities and improve its compliance and risk control standard as well as core competitiveness, resulting in a more stable and progressive operating results.

The following is the valuation report dated September 1, 2022 on the entire equity interest in Shenjiahuhang Co for the purpose of incorporation in this Circular.



仲量聯行

1 September 2022

The Board of Directors
Zhejiang Expressway Co., Ltd.
12th Floor, Block A, Dragon Century Plaza 1 Hangdog Road
Hangzhou, China 310007

Dear Sirs,

In accordance with the instructions from Zhejiang Expressway Co., Ltd. (the “Company”), we have undertaken an investigation and analysis to express an independent opinion of the fair value of 100 percent equity interest in Zhejiang Shenjiahuhang Expressway Co., Ltd. (“Shenjiahuhang”) as at 30 June 2022 (the “Valuation Date”). The report which follows is dated 1 September 2022 (the “Report Date”).

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

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.”*

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. In our opinion, the market approach and cost approach are inappropriate for valuing the subject asset. 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 the subject asset. We have therefore relied solely on the income approach, through the use of the discounted cash flow method, in determining our opinion of value.

As part of our analysis, we have been furnished with information prepared by Shenjiahuhang and the Company regarding the subject 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 Shenjiahuhang. 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 Shenjiahuhang 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 Shenjiahuhang over whatever period of time that is reasonable and necessary to maintain the character and integrity of the assets valued.

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 Shenjiahuhang as at the Valuation Date is reasonably stated as below:

Valuation Date	30 June 2022
Fair Value of 100% Equity Interest	RMB2,942,604,375

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
Jones Lang LaSalle Corporate Appraisal and Advisory Limited
Simon M.K. Chan
Executive Director

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 Shenjiahuhang Expressway Co., Ltd. (“Shenjiahuhang”) as at 30 June 2022 (the “Valuation Date”). The report which follows is dated 1 September 2022 (the “Report Date”).

PURPOSE OF VALUATION

The purpose of this valuation is a circular reference for 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.

BACKGROUND

Shenjiahuhang is a limited liability company established in the PRC on July 13, 2018. Shenjiahuhang holds the toll collection rights of Huzhou Section (S12) and Lianhang Section (S13) of Shenjiahuhang Expressway. As at the Valuation Date, Shenjiahuhang is a wholly-owned subsidiary of the Company.

Shenjiahuhang Expressway is divided into Huzhou Section (S12) and Lianhang Section (S13). The Huzhou section starts from Lianshi Town at Nanxun District, Huzhou City, and ends at Wuxing District at Huzhou City, for a total length of 41.978 kilometers, and was opened to traffic on 28 January 2008 with the charging period up to 27 January 2033. The Lianhang section starts from Lianshi Town at Nanxun District, Huzhou City, and ends at Chongxian Town, Yuhang District for a total length of 50.938 kilometers, and was opened to traffic on 6 February 2010 with the charging period up to 5 February 2035.

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 project than an amount equal to the present worth of anticipated future benefits (income) from the same or a substantially similar project 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 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 underlying asset. 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 the underlying asset. 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.

SOURCES OF INFORMATION

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

- Documents of background and operation of Shenjiahuhang;
- Financial information and forecasting of Shenjiahuhang as at the Valuation Date;
- Details and articles relating to the toll road; and
- Traffic Study Report prepared Baicheng (Beijing) Engineering Consulting Co. Ltd. ("Baicheng").

We conducted discussions with Shenjiahuhang and Company's senior 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 Shenjiahuhang prepared by Baicheng.

We have had the discussions about the key assumptions in Traffic Study Report together with the management of Shenjiahuhang, the company and Baicheng. We understand Baicheng 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.

Baicheng 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 Baicheng are reasonable and accurate. Therefore, we have adopted their findings in developing the forecast for Shenjiahuhang.

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.

The following key assumptions in determining the fair value of the equity interest 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 Shenjiahuhang;
- 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;
- Natural weather can have an impact on toll roads, including flooding and other types of inclement weather. We have assumed that no extended closure will occur;
- We have assumed 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 Shenjiahuhang 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 values. Furthermore, we assume no responsibility for changes in market conditions after the Valuation Date.

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

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

Revenue

The forecast revenue includes the toll revenue as well the service area revenue. The base case scenario as projected by Baicheng has been adopted as the traffic flow and toll revenue for Shenjiahuhang. The service area revenue is determined by the ancillary agreement signed between Shenjiahuhang and lessees.

Revenue	2022.7-12E	2023	2024	2025	2026	2027	2028
Toll Revenue (including tax)	438,518,729	885,257,300	958,054,800	998,185,600	1,062,025,100	1,131,154,100	1,185,211,500
<i>Growth Rate</i>		17.4%	8.2%	4.2%	6.4%	6.5%	4.8%
Toll Revenue (excluding tax)	425,746,339	859,473,107	930,150,291	969,112,233	1,031,092,330	1,098,207,864	1,150,690,777
Service Area Revenue	1,722,103	3,581,410	3,719,505	3,603,481	3,470,395	3,470,395	3,470,395
Total Revenue	427,468,442	863,054,516	933,869,796	972,715,714	1,034,562,725	1,101,678,259	1,154,161,172
Revenue	2029	2030	2031	2032	2033	2034	2/5/2035
Toll Revenue (including tax)	1,238,025,500	1,288,506,100	1,341,141,200	1,386,888,500	815,040,800	776,651,900	77,253,800
<i>Growth Rate</i>	4.5%	4.1%	4.1%	3.4%	-41.2%	-4.7%	-90.1%
Toll Revenue (excluding tax)	1,201,966,505	1,250,976,796	1,302,078,835	1,346,493,689	791,301,748	754,030,971	75,003,689
Service Area Revenue	3,610,395	3,610,395	3,610,395	3,610,395	1,847,210	1,963,102	193,621
Total Revenue	1,205,576,900	1,254,587,191	1,305,689,230	1,350,104,085	793,148,958	755,994,073	75,197,310

Surtax

The surtax includes urban maintenance and construction tax, education surcharge, local education surcharge, stamp duty, vehicle and vessel use tax, property tax and land use tax, etc.

Surtax	2022.7-12E	2023	2024	2025	2026	2027	2028
Total Surtax	1,950,824	3,938,103	4,259,845	4,436,337	4,717,333	5,022,265	5,260,716
<i>% of Revenue</i>	0.46%	0.46%	0.46%	0.46%	0.46%	0.46%	0.46%
Surtax	2029	2030	2031	2032	2033	2034	2/5/2035
Total Surtax	5,494,318	5,716,991	5,949,168	6,150,963	3,613,423	3,444,048	342,565
<i>% of Revenue</i>	0.46%	0.46%	0.46%	0.46%	0.46%	0.46%	0.46%

Cost of Service

Cost of services comprises mainly of depreciation, maintenance cost, labor cost, operation expense, obstacle clearance cost, service area cost and other expense.

The depreciation policy of the fixed assets is based on straight-line-method, which is consistent with Shenjiahuhang's accounting policy.

Maintenance cost includes road maintenance cost and system maintenance cost. Road maintenance cost is estimated by the management of Shenjiahuhang and the Company, which is based on the road mileage multiplied by the various unit road maintenance cost, including regular maintenance cost, special maintenance cost, comprehensive maintenance cost and etc. System maintenance cost is estimated in line with historical level and assumed to stay constant till 2032 and on a pro rata basis from 2033 till the end of operation.

Operation expenses mainly include ETC (Electronic Toll Collection), service fee, ticket fee, security fee, water and electricity fee and etc. The ETC service fee is projected to be paid at 0.125% of the toll revenue. Service fee, ticket fee, security fee, water and electricity fee etc. are based on historical level as well as the management best estimation and assumed to stay constant till 2032 and on a pro rata basis from 2033 till the end of operation.

Labor cost mainly includes wage, service fee and welfare, both are assumed to be increased by 8% per annum and the headcount will be controlled according to the management of Shenjiahuhang and the Company.

Obstacle clearance cost, service area cost and other expense are based on historical level as well as the management best estimation and assumed to stay constant till 2032 and on a pro rata basis from 2033 till the end of operation.

Cost of Service	2022.7-12E	2023	2024	2025	2026	2027	2028
Depreciation	219,504,315.37	453,643,890.33	454,010,467.10	452,395,824.57	451,954,273.73	451,884,616.27	448,025,270.59
Road Maintenance Cost	33,118,018.02	53,890,000.00	52,280,000.00	55,380,000.00	57,650,000.00	69,150,000.00	60,650,000.00
System Maintenance Cost	3,432,074.00	4,325,900.00	4,325,900.00	4,325,900.00	4,325,900.00	4,325,900.00	4,325,900.00
Operation Expense	3,308,728.04	6,324,441.38	6,412,787.86	6,461,490.29	6,538,965.41	6,622,859.83	6,688,463.47
Labor Cost	41,947,859.61	74,636,923.71	80,198,808.99	86,503,326.06	93,660,132.46	101,215,713.55	108,582,224.87
Obstacle Clearance Cost	7,281,200.00	7,280,500.00	7,280,500.00	7,280,500.00	7,280,500.00	7,280,500.00	7,280,500.00
Other Expense	1,830,917.23	2,601,000.00	2,601,000.00	2,601,000.00	2,601,000.00	2,601,000.00	2,601,000.00
Service Area Cost	1,244,528.36	2,200,000.00	2,200,000.00	2,200,000.00	2,200,000.00	2,200,000.00	2,200,000.00
Total Cost of Service	311,667,641	604,902,655	609,309,464	617,148,041	626,210,772	645,280,590	640,353,359
<i>GP margin</i>	28.9%	31.7%	36.4%	38.2%	41.0%	43.0%	46.0%

Cost of Service	2029	2030	2031	2032	2033	2034	2/5/2035
Depreciation	450,941,466.10	450,643,688.86	439,113,377.96	440,235,050.79	280,586,124.91	258,756,996.98	21,952,338.79
Road Maintenance Cost	63,080,000.00	79,160,000.00	67,710,000.00	55,710,000.00	27,220,000.00	27,420,000.00	530,000.00
System Maintenance Cost	4,325,900.00	4,325,900.00	4,325,900.00	4,325,900.00	2,516,095.98	2,371,525.83	233,903.92
Operation Expense	6,752,558.13	6,813,821.00	6,877,698.54	6,933,217.11	4,042,770.47	3,820,725.40	377,630.56
Labor Cost	115,392,419.35	122,354,580.96	129,911,634.43	139,218,163.20	140,262,454.83	150,004,968.61	15,908,256.33
Obstacle Clearance Cost	7,280,500.00	7,280,500.00	7,280,500.00	7,280,500.00	4,234,595.52	3,991,283.62	393,660.85
Other Expense	2,601,000.00	2,601,000.00	2,601,000.00	2,601,000.00	1,512,833.31	1,425,908.76	140,637.58
Service Aera Cost	2,200,000.00	2,200,000.00	2,200,000.00	2,200,000.00	1,100,000.00	1,100,000.00	99,452.05
Total Cost of Service	652,573,844	675,379,491	660,020,111	658,503,831	461,474,875	448,891,409	39,635,880
<i>GP margin</i>	<i>47.3%</i>	<i>47.6%</i>	<i>50.8%</i>	<i>52.5%</i>	<i>43.4%</i>	<i>42.2%</i>	<i>48.7%</i>

Administrative Expenses

The main proportion of administrative expense is professional fee, which is based on the management best estimation and assumed to stay constant till 2034 and on a pro rata basis in 2035.

Administrative Expense	2022.7-12E	2023	2024	2025	2026	2027	2028
Professional Fee	185,000	210,000	210,000	210,000	210,000	210,000	210,000
<i>As% of Total Revenue</i>	<i>0.04%</i>	<i>0.02%</i>	<i>0.02%</i>	<i>0.02%</i>	<i>0.02%</i>	<i>0.02%</i>	<i>0.02%</i>
Administrative Expense	2029	2030	2031	2032	2033	2034	2/5/2035
Professional Fee	210,000	210,000	210,000	210,000	210,000	210,000	20,712
<i>As% of Total Revenue</i>	<i>0.02%</i>	<i>0.02%</i>	<i>0.02%</i>	<i>0.02%</i>	<i>0.03%</i>	<i>0.03%</i>	<i>0.03%</i>

Financial Expense

Financial expense is calculated based on the interest rate and outstanding principal according to the borrowing and repayment projection provided by Shenjiahuhang and the Company based on the relevant loan agreements.

Given the applicable interest rate for the PRC bank is LPR minus 55bp according to the loan agreement, the forecasted interest rate of the loan from PRC bank is assumed to be 4.1% per year. The interest rates of the loan from Zhejiang Communications Investment Group Co., Ltd. are 3.6% and 3.64% per year.

Financial Expense	2022.7-12E	2023	2024	2025	2026	2027	2028
Financial Expense	40,788,116	155,989,353	137,740,367	115,913,189	93,313,189	68,933,408	41,016,038
<i>As% of Total Revenue</i>	9.30%	17.62%	14.38%	11.61%	8.79%	6.09%	3.46%
Financial Expense	2029	2030	2031	2032	2033	2034	2/5/2035
Financial Expense	31,660,312	25,913,573	19,551,271	13,003,627	5,795,760	-	-
<i>As% of Total Revenue</i>	2.56%	2.01%	1.46%	0.94%	0.71%	0.00%	0.00%

Non-operating Income

Non-operating income mainly includes the net income from road compensation. It is based on historical level and assumed to stay constant till 2032 and on a pro rata basis from 2033 till the end of operation.

Non-operating Income	2022.7-12E	2023	2024	2025	2026	2027	2028
Non-operating Income	1,907,200	3,720,500	3,720,500	3,720,500	3,720,500	3,720,500	3,720,500
Non-operating Income	2029	2030	2031	2032	2033	2034	2/5/2035
Non-operating Income	3,720,500	3,720,500	3,720,500	3,720,500	2,164,000	2,039,600	201,200

Income Tax

The income tax rate is assumed to be 25% during the projection period.

Income Tax	2022.7-12E	2023	2024	2025	2026	2027	2028
EBT	74,784,061	101,734,904	186,070,620	238,728,647	313,831,932	385,952,496	471,041,559
<i>Income Tax rate</i>	25%	25%	25%	25%	25%	25%	25%
Income Tax	18,696,015	25,433,726	46,517,655	59,682,162	78,457,983	96,488,124	117,760,390
Income Tax	2029	2030	2031	2032	2033	2034	2/5/2035
EBT	519,358,926	551,087,637	623,679,180	675,956,163	324,218,900	305,488,216	35,399,353
<i>Income Tax rate</i>	25%	25%	25%	25%	25%	25%	25%
Income Tax	129,839,732	137,771,909	155,919,795	168,989,041	81,054,725	76,372,054	8,849,838

Capital Expenditure and Depreciation

Capital expenditure is forecasted the by the management of Shenjiahuhang. Due to the particularity of expressway industry, massive investment has been invested in road, structures, and buildings at the very beginning, therefore the capital expenditure in forecast period is mainly for maintenance and renovation from time to time.

Capex and Depreciation	2022.7-12E	2023	2024	2025	2026	2027	2028
Updated Capex	124,474,080	13,830,130	25,579,770	10,545,680	10,989,220	4,003,570	53,955,360
Additional Capex	123,045,801	8,435,551	3,770,957	3,172,609	1,000,000	1,200,000	1,200,000
Total Capex	247,519,881	22,265,681	29,350,727	13,718,289	11,989,220	5,203,570	55,155,360
Depreciation	219,504,315	453,643,890	454,010,467	452,395,825	451,954,274	451,884,616	448,025,271
Capex and Depreciation	2029	2030	2031	2032	2033	2034	2/5/2035
Updated Capex	6,621,350	105,589,670	6,513,560	58,872,450	4,286,300	10,746,300	302,540
Additional Capex	1,200,000	1,440,000	1,440,000	1,440,000	1,005,066	947,317	351,630
Total Capex	7,821,350	107,029,670	7,953,560	60,312,450	5,291,366	11,693,617	654,170
Depreciation	450,941,466	450,643,689	439,113,378	440,235,051	280,586,125	258,756,997	21,952,339

Net Borrowing

The borrowing and repayment schedule are prepared by the management of Shenjiahuhang and the Company. As at the Valuation Date, the outstanding loan of Shenjiahuhang is RMB4,459.6 million, including PRC bank loan and loan from Zhejiang Communications Investment Group Co., Ltd.

Net Borrowing	2022.7-12E	2023	2024	2025	2026	2027	2028
Beginning Balance	4,459,600,000	4,459,600,000	3,999,600,000	3,469,600,000	2,869,600,000	2,269,600,000	1,649,600,000
New Borrowing	2,660,000,000	2,320,000,000	1,950,000,000	1,550,000,000	1,150,000,000	700,000,000	100,000,000
Repayment	(2,660,000,000)	(2,780,000,000)	(2,480,000,000)	(2,150,000,000)	(1,750,000,000)	(1,320,000,000)	(840,000,000)
Net Borrowing	-	(460,000,000)	(530,000,000)	(600,000,000)	(600,000,000)	(620,000,000)	(740,000,000)
Ending Balance	4,459,600,000	3,999,600,000	3,469,600,000	2,869,600,000	2,269,600,000	1,649,600,000	909,600,000
Net Borrowing	2029	2030	2031	2032	2033	2034	2/5/2035
Beginning Balance	909,600,000	669,600,000	519,600,000	359,600,000	189,600,000	-	-
New Borrowing	-	-	-	-	-	-	-
Repayment	(240,000,000)	(150,000,000)	(160,000,000)	(170,000,000)	(189,600,000)	-	-
Net Borrowing	(240,000,000)	(150,000,000)	(160,000,000)	(170,000,000)	(189,600,000)	-	-
Ending Balance	669,600,000	519,600,000	359,600,000	189,600,000	-	-	-

Net Excess Asset

As at the valuation date, Net excess asset is as below.

Net Excess Asset

Valuation Date	6/30/2022
Excess Asset	1,264,361,982
Cash	213,207,311
Other Receivable	990,902,981
Deferred Tax Asset	60,251,689
Excess Liability	28,151,778
Deferred Revenue	17,979,650
Other Payable	10,172,128
Net Excess Asset	<u><u>1,236,210,204</u></u>

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:

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

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:

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

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.

Parameters for CAPM

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

Valuation Date	30 June 2022
Listed Market	Hong Kong
Risk Free Rate	3.00% (Long-term (10-year) U.S. Treasury Bills and Bond Yield at Valuation date; Source: Bloomberg)
Market Risk Premium	7.25% (Long-horizon expected equity risk premium (historical): large company stock total returns minus long-term government bond income returns; Source: Duff & Phelps 2021 SBBI Valuation Handbook)
Estimated Beta	0.61 (Indicated by the average beta of listed companies in similar industry as at Valuation Date, Source: Bloomberg)
CAPM	7.43% (3.0% + 0.61 x 7.25%)

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.

To the best knowledge and ability of ours, the companies listed in the table below represent an exhaustive list of companies which meet the selection basis mentioned above. Details of these comparable companies are shown below:

Stock Code	Company Name
107 HK	Sichuan Expressway Company Limited
177 HK	Jiangsu Expressway Company Limited
576 HK	Zhejiang Expressway Co., Ltd.
548 HK	Shenzhen Expressway Company Limited
995 HK	Anhui Expressway Company Limited
737 HK	Shenzhen Investment Holdings Bay Area Development Company Limited
1052 HK	Yuexiu Transport Infrastructure Limited
1785 HK	Chengdu Expressway Co., Ltd.
1576 HK	Qilu Expressway Company Limited
1823 HK	Huayu Expressway Group Ltd.

Discount Rate

Valuation Date	30 June 2022
Listed Market	Hong Kong
CAPM	7.43%
Country Risk Premium	0.59% (with reference to Dr. Aswath Damodaran's Research, NYU, 2021)
Liquidity Premium	2.0% (with reference to "Marketability and Value: Measuring the Illiquidity Discount" of Stern School of Business, NYU, June 2005, by Aswath Damodaran)
Cost of Equity	10.02%

To calculate the cost of equity of Shenjiahuhang, we have considered country risk premium and liquidity premium besides CAPM result to justify the unique risk attached with Shenjiahuhang 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.

Considering the parameters in determining the CAPM, the risk free rate and market return are based on the parameter of US market, which is different from Shenjiahuhang. Hence a country risk premium is considered to adjust CAPM to reflect the cost of equity of Shenjiahuhang. Per the latest research on country risk premium performed by Dr. Aswath Damodaran (http://pages.stern.nyu.edu/~adamodar/New_Home_Page/datafile/ctry_prem.html).

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

SENSITIVITY ANALYSES

Discount Rate

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

Discount Rate (%)	Fair Value of 100% Equity Interest (RMB)
10.52%	2,881,421,748
10.02%	2,942,604,375
9.52%	3,006,645,635

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 Shenjiahuhang, 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 Shenjiahuhang 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.

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 Shenjiahuhang.

➤ **Traffic Forecast**

The forecast traffic flow and revenue of Shenjiahuhang 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 Shenjiahuhang.

➤ **Uncertainty of Market Competition**

The profitability of Shenjiahuhang 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 Shenjiahuhang 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.

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 Shenjiahuhang as at the Valuation Date is reasonably stated as below:

Valuation Date	30 June 2022
Fair Value of 100% Equity Interest	RMB2,942,604,375

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

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 specialized 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.

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 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.

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

Senior Director

Joyce J. Xu

Director

Yao Y. Luo

Analyst

EXHIBIT C – VALUATION MODEL

Business Equity Valuation

Subject Company: Zhejiang Shenjiahuhang Expressway Co., Ltd.

Valuation Date: 2022/06/30

Unit: CNY

	2022-7-12E	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2/5/2035	Terminal
Revenue	427,468,442	863,054,516	933,869,796	972,715,714	1,034,562,725	1,101,678,259	1,154,161,172	1,205,576,900	1,254,587,191	1,305,689,230	1,350,104,085	793,148,958	755,994,073	75,197,310	
Growth		17.37%	8.22%	4.19%	6.40%	6.51%	4.78%	4.46%	4.08%	4.08%	3.41%	-41.23%	-4.71%	-90.05%	
Business Tax	1,950,824	3,938,103	4,259,845	4,436,337	4,717,333	5,022,265	5,260,716	5,494,318	5,716,991	5,949,168	6,150,963	3,613,423	3,444,048	342,565	
Business Tax Rate	0.46%	0.46%	0.46%	0.46%	0.46%	0.46%	0.46%	0.46%	0.46%	0.46%	0.46%	0.46%	0.46%	0.46%	
Cost of Service	311,667,641	604,902,655	609,309,464	617,148,041	626,210,772	645,280,590	640,353,359	652,573,844	675,379,491	660,020,111	658,503,851	461,474,875	448,891,409	39,635,880	
Gross Profit	113,849,977	254,213,758	320,300,487	351,131,336	403,634,621	451,375,404	508,547,097	547,508,738	573,490,709	639,719,951	685,449,291	328,060,660	303,658,616	35,218,865	
GP Margin	26.63%	29.46%	34.30%	36.10%	39.01%	40.97%	44.06%	45.41%	45.71%	48.99%	50.77%	41.36%	40.17%	46.84%	
Operating Expense	185,000	210,000	210,000	210,000	210,000	210,000	210,000	210,000	210,000	210,000	210,000	210,000	210,000	20,712	
% of Revenue	0.04%	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%	0.03%	0.03%	0.03%	
EBIT	113,664,977	254,003,758	320,090,487	350,921,336	403,424,621	451,165,404	508,337,097	547,298,738	573,280,709	639,509,951	685,239,291	327,850,660	303,448,616	35,198,153	
EBIT Margin	26.59%	29.43%	34.28%	36.08%	38.99%	40.95%	44.04%	45.40%	45.69%	48.98%	50.75%	41.34%	40.14%	46.81%	
Financial Expense	40,788,116	155,989,353	137,740,367	115,913,189	93,313,189	68,933,408	41,016,038	31,660,312	25,913,573	19,551,271	13,003,627	5,795,760	-	-	
Non-Operating Income	1,907,200	3,720,500	3,720,500	3,720,500	3,720,500	3,720,500	3,720,500	3,720,500	3,720,500	3,720,500	3,720,500	2,164,000	2,039,600	201,200	
EBT	74,784,061	101,734,904	186,070,620	238,728,647	313,831,932	385,952,496	471,041,559	519,358,926	551,087,637	623,679,180	675,956,163	324,218,900	305,488,216	35,399,353	
Income Tax	18,696,015	25,433,726	46,517,655	59,682,162	78,457,983	96,488,124	117,760,390	129,839,732	137,771,909	155,919,795	168,989,041	81,054,725	76,372,054	8,849,838	
Net Income	56,088,046	76,301,178	139,552,965	179,046,485	235,373,949	289,464,372	353,281,169	389,519,195	413,315,727	467,759,385	506,967,123	243,164,175	229,116,162	26,549,514	
Net Profit Margin	13.12%	8.84%	14.94%	18.41%	22.75%	26.27%	30.61%	32.31%	32.94%	35.82%	37.55%	30.66%	30.31%	35.31%	
Add: D&A	219,504,315	453,643,890	454,010,467	452,395,825	451,954,274	451,884,616	448,025,271	450,941,466	450,643,689	439,113,378	440,235,051	280,586,125	258,756,997	21,952,339	
Less: Capex	247,519,881	22,265,681	29,350,727	13,718,289	11,989,220	5,203,570	55,155,360	7,821,350	107,029,670	7,953,560	60,312,450	5,291,366	11,693,617	654,170	
Less: increase in NWC	(27,505,059)	(1,691,424)	1,155,382	(32,841)	367,910	(736,355)	1,863,775	(270,402)	(1,629,677)	3,113,486	1,250,970	10,879,132	656,834	34,007,757	
Add: Collection of NWC															(3,071,596)
Add: Net Borrowing	-	(460,000,000)	(530,000,000)	(600,000,000)	(600,000,000)	(620,000,000)	(740,000,000)	(240,000,000)	(150,000,000)	(160,000,000)	(170,000,000)	(189,600,000)	-	-	
Free Cash Flow to Equity	55,577,539	49,370,812	33,057,323	17,756,862	74,971,093	116,881,773	4,287,304	592,909,712	608,559,423	735,805,716	715,638,754	317,979,802	475,522,708	13,839,926	(3,071,596)
Date adjustment factor	0.25	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00	12.00	12.55	12.60
Discount factor (mid-point)	10.02%	1.02	1.10	1.21	1.33	1.46	1.61	1.77	1.95	2.15	2.36	2.60	2.86	3.14	3.31
PV of FCFE	54,266,983	44,876,164	27,312,330	13,335,293	51,177,098	72,522,717	2,418,004	303,953,217	283,574,142	311,653,670	275,516,995	111,275,494	151,257,428	4,177,415	(922,770)

FCFE Valuation Summary

PV of FCFE forecast

1,706,394,171

Net Excess Asset

1,236,210,204

100% Equity Value

2,942,604,375

EXHIBIT D – BETA CALCULATION

CAPM Model

Comparable Companies (HK)	Ticker	D/E Ratio	Levered Beta	Effective Tax Rate	Unlevered Beta	Weight
Sichuan Expressway Company Limited	107 HK	1.52	0.58	15%	0.25	10.0%
Jiangsu Expressway Company Limited	177 HK	0.69	0.52	24%	0.34	10.0%
Zhejiang Expressway Co., Ltd.	576 HK	3.26	0.55	23%	0.16	10.0%
Shenzhen Expressway Company Limited	548 HK	1.41	0.53	15%	0.24	10.0%
Anhui Expressway Company Limited	995 HK	0.47	0.57	27%	0.42	10.0%
Shenzhen Investment Holdings Bay Area Development Company Limited	737 HK	0.28	0.49	12%	0.40	10.0%
Yuexiu Transport Infrastructure Limited	1052 HK	2.65	0.49	19%	0.16	10.0%
Chengdu Expressway Co., Ltd.	1785 HK	1.04	0.46	17%	0.25	10.0%
Qilu Expressway Company Limited	1576 HK	0.51	0.47	25%	0.34	10.0%
Huayu Expressway Group Ltd.	1823 HK	0.86	0.92	31%	0.58	10.0%

Equity Market

HK Market

Unlevered Beta	0.31
D/E Ratio	1.27
Tax Rate	25.00%
Levered Beta	0.61
Risk Free Rate	3.00%
Market Risk Premium	7.25%
CAPM	7.43%
Country Risk Premium	0.59%
Liquidity Premium	2.00%
Cost of Equity	10.02%

Beijing	Shanghai	Shenzhen	Guangzhou	Chengdu
Room 801, 8/F, Jinghui Building No.118 Jianguo Road Yi, Chaoyang District, Beijing 100022, China	22/F HKRI Centre One HKRI Taikoo Hui 288 Shimen Road No.1, Shanghai 200040, China	Room 1901,1903-04, 19/F Tower Three, Kerry Plaza 1 Zhongxinsi Road, Futian District, Shenzhen 518048, China	Room 2801-03, 2807-08, 28/F Guangzhou CTF Finance Centre, No.6 Zhujiang East Road, Zhujiang New Town, Guangzhou 510623, China	29/F, Tower 1, Chengdu International Finance Square 1 Hongxing Road Section 3, Chengdu 610021, China
T +86 10 5922 1300 F +86 10 5922 3608	T +86 21 6393 3333 F +86 21 6393 3080	T +86 755 8826 6608 F +86 755 2263 8966	T +86 20 2338 8088 F +86 20 2338 8118	T +86 28 6680 5091 F +86 28 6680 5096
Hong Kong	Macao	Taiwan	Singapore	
7/F, One Taikoo Place 979 King's Road, Hong Kong SAR	Unit H, 16/F, Finance and IT of Macau Nam Van Lake, Quarteirao 5 Lote A, Macao SAR	Center 20F-1, Taipei 101 Tower, 7 Xinyi Road, Sec. 5, Xinyi District, Taipei City, Taiwan 11049	1 Paya Lebar Link, #10-08 Paya Lebar Quarter Tower 2, Singapore 408533	
T +852 2846 5000 F +852 2169 6001	T +853 2871 8822 F +853 2871 8800	T +886 8758 9898 F +886 8758 9899	T +65 6220 3888	

The following is the report on traffic and toll revenue forecast report of the Huzhou Section (S12) and Lianhang Section (S13) of the expressways in Zhejiang Province prepared by Baicheng for the purpose of incorporation in this circular.

1. OVERVIEW

1.1 Basic Information

The Shenjiahuhang Expressway is one of the five major channels from Zhejiang to Shanghai in the “Yangtze River Delta” economic zone, and is also one connection of the “two vertical and two horizontal expressways, eighteen connections, three ring expressways and three channels” in the plan for Zhejiang highway network. The Shenjiahuhang Expressway is Y-shape with a 90-degree counterclockwise rotation, connecting Shanghai, Jiaxing, Huzhou and Hangzhou. It is connected to the Hangzhou-Nanjing Expressway in the west, to the Chongxian Junction of North Route of Hangzhou Ring Expressway in the south and to Shanghai Pudong Airport in the east.

The Project, located in Zhejiang Province, spans the economically important cities including Huzhou, Jiaxing and Hangzhou, and is an alternative highway to Shanghai.

The Jiaxing Section continues the S32 Expressway (Shanghai Section of Shenjiahu Expressway) which leads straight to Pudong Airport. It starts from Changbin, South Fengjing Town, Shanghai, running from northeast to west through Xitang, Jiashan and crossing the planned Northern Connection of Hangzhou Bay Bridge (Phase II) and Zhajiasu Expressway via Xincheng, Jiaxing and Wuzhen, Tongxiang, and ends at Lianshi Town, Huzhou, with a total length of 59.1 km. It was completed and opened to traffic on January 28, 2008.

The Huzhou Section starts from Lianshi Town via Shuanglin, Hefu, Balidian, Daochang and Huzhou Economic and Technological Development Zone, and ends at the Interchange connecting Lushan Junction to the Hangzhou-Nanjing Expressway Junction. It was fully opened to traffic on January 28, 2008.

The Lianhang Section starts from Lianshi Junction via Lianshi, Heshan, Zhouquan, Xinshi, Xin’an, Leidian, Tangqi and Chongxian, and ends at Chongxian Junction between Hangzhou Ring Banshan and Nanzhuangdou. It was completed and opened to traffic on February 6, 2010.

1.2 Scope of the Study

The scope of this study covers the Huzhou Section and the Lianhang Section.

The Shenjiahuhang Expressway covered in the Project has a total length of 92.916 km with 4 lanes in both directions, of which the Huzhou Section (S12) is 41.978 km and the Lianhang Section (S13) is 50.938 km.

Huzhou Section (S12) starts from Lianshi Town, Nanxun District, Huzhou and ends at Wuxing District, Huzhou, intersecting Lianhang Section at Lianshi Junction (59K) and Hangzhou-Nanjing Expressway (G25) at Lushan Junction, Huzhou (100K+978). It has three interchange toll stations (Nanxun South 68K+45, Shuanglin 72K+508 and Huzhou East 90K+500), a pair of service areas (Nanxun Service Area 82K+400), one maintenance area, and management and service rooms, and was completed and opened to traffic on January 28, 2008. The Huzhou Section is an expressway with two reserved lanes and two-way six lanes with the designed speed of 120 km/h.

Lianhang Section (S13) starts from Lianshi Town, Nanxun District, Huzhou (0K) and ends at Chongxian Town, Yuhang District (50K+938), intersecting Hangzhou Ring Expressway at Chongxian Junction (50K+938) via Huzhou, Tongxiang, Deqing and Yuhang. It has seven interchange toll stations (Lianshi 5K+340, Tongxiang West 16K+394, Xinshi 25K+704, Xin'an 31K+201, Leidian 37K+574, Tangqi 42K+882 and Chongxian 49K+591), a pair of service areas (Deqing Service Area 21K+688), one maintenance area, and management and service rooms, which was completed and opened to traffic on February 6, 2010. The Lianshi Junction is constructed on a two-way six-lane basis, and the remaining sections are two-way four-lane expressways, with the designed speed of 120km/h.

The location of the Project is shown on the map below.



Figure 1 Location Map of the Project



Figure 2 Map of the Shenjiahuhang Expressway

2. BASIS

Baicheng has collected the data on the turnover of traffic revenue and traffic volume of the Shenjiahuhang Expressway from January 2017 to June 2022, turnover of S12 from March to June 2022 and turnover of S13 from March to June 2022, which was summarised and recorded on a monthly basis and used as the key reference data for this forecast. Further understanding is provided through the map of Shenjiahuhang Expressway and the transportation planning map of Zhejiang Province provided by Zhejiang Expressway to support this forecast.

The data collected are as follows:

- (1) the monthly revenue from January 2017 to June 2022;
- (2) the turnover of S12 from March to June 2022;
- (3) the turnover of S13 from March to June 2022;
- (4) the table of mileage for Lianhang Section of the Shenjiahuhang Expressway in 2022;
- (5) the mileage stakes and the length of tunnels exceeding 1 km at the Lianhang Expressway Interchange Junction;

- (6) the map of the Shenjiahuhang Expressway;
- (7) the transportation planning map of Zhejiang Province;
- (8) the Statement of Zhejiang Province Department of Transport on the Term of Tolling of the Shenjiahuhang Expressway;
- (9) other information.

The data collected by Baicheng on the traffic volumes and toll revenues for the expressways in the Project accurately reflects the pattern and characteristics of the transportation, and the forecasted traffic volumes and the results of revenue projection are credible based on the evolution of historical traffic volumes of the expressways in the Project and historical economic growth as well as traditional forecasting methods such as OD surveys.

3. EXISTING SOCIO-ECONOMIC DEVELOPMENT OF THE LOCATION OF THE PROJECT

3.1 Existing Socio-economic Development in Zhejiang Province

(1) Geographical overview

Qiantang River, the largest river in Zhejiang Province, is called Jiang or Zhejiang because of its twists and turns. The province is named after the river, referred to as “Zhe”. Located on the southeast coast of China in the south of the Yangtze River Delta, Zhejiang Province is one of the ten coastal provinces and cities in China, and is adjacent to Shanghai, Jiangsu, Anhui, Jiangxi and Fujian Provinces from the north to the south, bordering by the East China Sea in the east, with extremely convenient marine traffic. The province has a land area of 105,500 square kilometres, accounting for about 1% of the total land area in China, which is one of the smallest provinces in China in terms of land area. The mountainous area accounts for 70.4%, the plain area accounts for 23.2% and the lake area accounts for 6.4% of the total land area.

Zhejiang Province is located in the subtropical monsoon climate zone, with prominent monsoons, four seasons, moderate annual temperature, more sunshine, abundant rainfall, humid air, synchronous changes in rain and heat seasons, diverse distribution of climatic resources and numerous meteorological disasters. The average annual temperature in Zhejiang is 15 to 18 degrees Celsius, with the extreme maximum of 33 to 43 degrees Celsius and the extreme minimum of -2.2 to -17.4 degrees Celsius. The average annual rainfall in the province is 980-2,000 mm and the average annual sunshine hours are 1,710-2,100 hours.

(2) *Demographic profile*

The province has 11 cities and prefecture-level cities under its jurisdiction, including Hangzhou and Ningbo, with the provincial capital being Hangzhou. The population density is 439 persons per square kilometre. The population distribution across the province is very uneven, with material differences among regions. In particular, there is more population in the northern and eastern coastal regions and relatively less population in the mountainous areas of southern and western Zhejiang. According to the National Bureau of Statistics, the permanent residence in Zhejiang Province was 65.4 million in 2021.

(3) *Hydrological profile*

There are more than 30 lakes within Zhejiang Province, including West Lake and Dongqian Lake, with a volume of over 1 million cubic metres, and the coastline (including the islands) has a length of more than 6,400 kilometres. There are eight major water systems, namely Shaoxi, Beijing-Hangzhou Canal (Zhejiang Section), Qiantang River, Yong River, Ling River, Ou River, Feiyun River and Ao River from north to south, with the Qiantang River being the largest river. and all of the above eight major rivers, except for Shaoxi and Beijing-Hangzhou Canal, flow into the sea separately.

Zhejiang Province, which is located in a subtropical monsoon climate zone, has abundant precipitation with an average annual amount of precipitation of about 1,600 mm, and is one of the regions with abundant precipitation in China. Although the total average water resources in Zhejiang Province over years amounts to 93.7 billion cubic metres, the per capita water resources possession is only 2,008 cubic metres due to high population density, among which, Zhoushan and other islands have the least per capita water resources possession of only 600 cubic metres.

(4) *Overview of major resources*

Zhejiang Province is always known as a “land of fish and rice”, and its rice, tea, silk, oranges, bamboo products and aquatic products occupy an important position in China. In particular, green tea production ranks the first in China, silkworm cocoon production ranks the second in China, the volume of silk exported accounts for 30% of the total in China, oranges production ranks the third in China, and moso bamboo production ranks the first in China. Zhejiang Province, being a highly productive and integrated agricultural region in China, occupies a key position in China in terms of its tea, silk, oranges, seafood and bamboo products.

Zhejiang is a major fishery province in China. Its fishery industry has transitioned from the traditional production to an industrialised operation that integrates fishing, breeding and processing, and provides the comprehensive development of domestic and foreign trade. Shipu Fishing Port and Shenjiamen Fishing Port are two of the four major central fishing ports in China in the earliest stage, the marine fishing volume of which is the largest in China. The Hangjiahu Plain is one of the three major freshwater fish farming centres in China.

In October 2017, Zhejiang Province was listed in the first batch of national pilot demonstration areas for agricultural sustainable development.

In 2021, the added value of industries above the scale was RMB2,024.8 billion, stepping onto a new stage over RMB2,000 billion, representing an increase of 12.9% as compared to the previous year and an average growth of 9.1% over the two years. It increased by 34.1%, 20.8% and 16.6% year-on-year in the first quarter, the first half of the year and the first three quarters, respectively, with the two-year average growth of 9.7%, 10.1% and 9.6% respectively. Among the ten pillar industries, the two-year average growth of added value was faster than that of 2019, except for the textile and garment industry and non-metallic mineral products industry. Based on the results of the survey on production, operation and market conditions, in the fourth quarter, the capacity utilization rate of the industries above the scale in the province was 82.9%, 0.2 percentage point higher than that in the same period of the previous year and the third quarter. The annual industrial capacity utilisation rate was 82.5%, increased by 3.4 percentage points from the previous year.

Zhejiang Province has a wide variety of minerals, including iron, copper, lead, zinc, gold, molybdenum, aluminium, antimony, tungsten and manganese, as well as alumite, fluorite, chlorite, limestone, coal, marble, bentonite and zeolite. Alumite ore reserves rank first in the world (60%) and fluorite ore reserves rank second in China.

113 types of minerals have been discovered within Zhejiang Province. As of the end of 2009, mineral reserves for 93 types of minerals (excluding oil and gas and radioactive minerals) have been measured in Zhejiang Province. In Zhejiang Province, 2,392 mining areas have been included in the statistics, including 2,343 solid mineral mining areas and 49 geothermal mineral water mining areas, a decrease of 302 over the previous year.

There are abundant non-metallic minerals in Zhejiang Province, with some mineral species ranking among the top in China in terms of proven resource reserves. In terms of proven resource reserves, alunite and chlorite rank top in the country; fluorite, illite and cast gabbro rank second in the country; decorated amphibole ranks third; and zeolite, wollastonite, tremolite, boron ore, bentonite and perlite rank among the top ten. Most of the mineral deposits are large in scale, shallowly buried and under good mining conditions.

Metallic minerals are widespread, though small in scale. In Zhejiang Province, there are numerous iron, copper, molybdenum, lead, zinc, gold, silver, tungsten and tin minerals, most of which are small deposits or ore sites though. Only a few mining areas are medium and large in scale, with complex ore composition and a variety of concomitant elements.

Zhejiang province has poor geological conditions for coal formation and scarce coal resources. No oil and gas resources have been found in the land area, but the prospect in the sea area is promising.

In 2019, the total import and export of goods in Zhejiang Province amounted to RMB3,083.2 billion, an increase of 8.1% over the previous year. In particular, the export value was RMB2,307.0 billion, representing an increase of 9.0% and accounting for 13.4% of the total export value in the country, 0.5 percentage point higher than the previous year; the import value was RMB776.2 billion, representing an increase of 5.8%. The export value in the private sector was RMB1,841.5 billion, representing an increase of 11.5% and accounting for 79.8% of the total export value, 1.8 percentage points higher than the previous year. The export value of electrical and mechanical products and high-tech products were RMB1,013.1 billion and RMB160.5 billion, representing an increase of 10.0% and 14.0%, respectively. The total value of import from and export to countries along the “Belt and Road” was RMB1,045.8 billion, representing an increase of 16.7%, of which the export value was RMB796.1 billion, representing an increase of 16.8%.

In 2020, the annual added value of the transport, storage and postal industry was RMB196.8 billion, representing an increase of 0.6% over the previous year.

As of the end of 2020, the total road mileage across the province was 123,300 kilometres, including 5,096-kilometre highways, realising county-to-county highways in land areas. There are seven civil aviation airports, with an annual passenger throughput of 49.96 million, of which 25.23 million passengers were delivered. Railway, expressway and waterway freight turnover volume was 1,232.3 billion tonne-kilometres, a decrease of 0.5% as compared to the previous year, while the volume of passenger transportation was 67.4 billion person-kilometres, representing a decrease of 40.3%. The port cargo throughput across the province was 1.85 billion tonnes, representing an increase of 6.0%, of which 1.41 billion tonnes were from coastal ports, representing an increase of 4.5%. At Ningbo Zhoushan Port, the cargo throughput was 1.17 billion tonnes, ranking first in the world for 12 consecutive years, and the container throughput was 28.72 million TEUs, ranking third in the world for three consecutive years.

As of the end of 2020, there were 15.86 million small passenger cars in the province, including 14.6 million private cars (private small and micro passenger cars).

(5) *Basic data*

The data on the permanent population, historical GDP growth, historical car ownerships, road passenger and cargo traffic volume, and port cargo throughput in Zhejiang Province are all sourced from the Statistical Communiqué on the National Economy of Zhejiang Province (2017, 2018, 2019, 2020 and 2021).

(i) *Permanent population in Zhejiang Province*

Table 1 Number of Historical Permanent Population in Zhejiang Province

Year	2017	2018	2019	2020	2021
Population (10,000)	5,567	5,737	5,850	6,468	6,540

*(ii) Historical GDP growth in Zhejiang Province***Table 2 Historical GDP Growth in Zhejiang Province**

Year	GDP (RMB 100 million)	Growth rate (%)	Primary industry (RMB 100 million)	Secondary industry (RMB 100 million)	Tertiary industry (RMB 100 million)	GDP per capita (RMB)
2017	52,403	7.8	2,017	22,472	27,279	92,057
2018	56,197	7.1	1,967	23,506	30,724	98,643
2019	62,462	6.8	2,097	26,567	33,688	107,624
2020	64,689	3.6	2,169	26,413	36,031	100,014
2021	73,515	8.5	2,209	31,189	40,118	113,032

*(iii) Historical car ownership in Zhejiang Province***Table 3 Historical Car Ownership in Zhejiang Province**

Year	Passenger cars (10,000 units)	Trucks (10,000 units)	Other vehicles (10,000 units)	Total automobiles (10,000 units)
2017	1,228	126.45	4.90	1,397
2018	1,347	136.78	5.62	1,534
2019	1,367	147.47	6.22	1,486
2020	1,460	161	6.67	1,586
2021	1,593	–	–	1,726

*(iv) Road passenger and freight traffic volume in Zhejiang Province***Table 4 Road Passenger and Freight Traffic Volume in Zhejiang Province**

Year	Passenger volume (10,000 persons)	Passenger turnover volume (100 million person-km)	Cargo volume (10,000 tonnes)	Freight turnover volume (100 million tonne-km)
2017	80,579	434.56	9,859	1,821.21
2018	95,200	495	10,800	2,185
2019	7,015	582	12,391	2,317
2020	133,000	674	12,323	2,440
2021	140,000	709	12,936	2,906

(v) *Cargo throughput of ports in Zhejiang Province***Table 5 Port Cargo Throughput in Zhejiang Province**

Year	Coastal ports (10,000 tonnes)	Inland river ports (10,000tonnes)	Container throughput (10,000 TEUs)
2017	130,000	30,000	2,686.27
2018	134,000	35,000	2,635
2019	135,000	37,000	2,753
2020	185,000	44,000	2,872
2021	193,000	44,000	3,108

3.2 Existing Socio-economic Development in Hangzhou

Hangzhou, the provincial capital of Zhejiang Province, is located on the southeastern coast of China, in the northern part of Zhejiang Province, on the northern bank of the lower reach of Qiantang River and at the southern end of the Beijing-Hangzhou Grand Canal, and has an area of 16,596 square kilometres under its jurisdiction. Hangzhou is also a national pilot city for informatization, e-commerce, e-government and digital TV, as well as a national base for software industrialization and IC design industrialization. It is committed to building a “Riverside Paradise Silicon Valley”, and its high-tech industries, dominated by information and new medicines, environmental protection and novel materials, are developing well, which have become one of the major features and strengths of Hangzhou.

The basic data are as follows:

The data on the permanent population, historical GDP growth, historical car ownerships, road passenger and cargo traffic volume, and port cargo throughput in Hangzhou are all sourced from the Statistical Communiqué on the National Economy of Hangzhou (2017, 2018, 2019, 2020 and 2021) and statistical yearbooks.

(i) *Historical permanent population in Hangzhou***Table 6 Number of Historical Permanent Population in Hangzhou**

Year	2017	2018	2019	2020	2021
Population (10,000)	946	980.6	1,036	1,120	1,220.4

*(ii) Historical GDP growth in Hangzhou***Table 7 Historical GDP Growth in Hangzhou**

Year	GDP (RMB 100 million)	Growth rate (%)	Primary industry (RMB 100 million)	Secondary industry (RMB 100 million)	Tertiary industry (RMB 100 million)	GDP per capita (RMB)
2017	12,556	8	312	4,387	7,857	134,607
2018	13,509	6.7	306	4,572	8,632	140,180
2019	15,373	6.8	326	4,875	10,172	152,465
2020	15,419	3.9	326	4,821	10,959	151,420
2021	16,207	8.5	333	5,489	12,287	149,857

*(iii) Historical car ownership in Hangzhou***Table 8 Historical Car Ownership in Hangzhou**

Year	Cars (10,000 units)
2017	245.12
2018	288.1
2019	297.6
2020	311.9
2021	376.6

*(iv) Road passenger and freight traffic volume in Hangzhou***Table 9 Road Passenger and Freight Traffic Volume in Hangzhou**

Year	Passenger volume (10,000 persons)	Passenger turnover volume (100 million person-km)	Cargo volume (10,000 tonnes)	Freight turnover volume (100 million tonne-km)
2017	13,019	89.71	29,378	361.56
2018	10,027	82.13	35,000	387.56
2019	9,360	69.00	36,000	392.88
2020	4,535	38.18	42,000	459.94
2021	5,042	42.58	47,000	512.35

3.3 Existing Socio-economic Development in Huzhou

Huzhou, a prefecture-level city under the jurisdiction of Zhejiang Province, is a member of the “Yangtze River Delta City Cluster”, a core city of the Greater Bay Area around Hangzhou Bay, and the centre of the G60 Science and Technology Innovation Corridor. It is located in the north of Zhejiang Province, and bordered by Jiaxing to the east, Hangzhou to the south, Guangde and Ningguo in Anhui Province to the west, and Yixing and Taihu in Jiangsu Province to the north, facing Suzhou and Wuxi across the lake. Huzhou, located in the heart of the Yangtze River Delta, is the common hinterland of Shanghai, Hangzhou and Nanjing, and is a key city connecting the north and south of the Yangtze River Delta and the central and eastern China. It is 75 km from Hangzhou, 130 km from Shanghai and 220 km from Nanjing. Huzhou has been firmly following the path of “lucid waters and lush mountains are invaluable assets”, by conscientiously implementing the “eight strategies” released by the provincial party committee and government, and insisting on the same blueprint all the way. It is developing and catching up with other cities based on the concept of “five major developments”, striving to build a big modern ecological lakeside city with high quality and a well-off society at a high level in an all-round way.

The basic data are as follows:

The data on the permanent population, historical GDP growth, historical car ownerships, road passenger and cargo traffic volume, and port cargo throughput in Huzhou are all sourced from the Statistical Communiqué on the National Economy of Huzhou (2017, 2018, 2019, 2020 and 2021) and statistical yearbooks.

(i) *Historical permanent population in Huzhou*

Table 10 Number of Historical Permanent Population in Huzhou

Year	2017	2018	2019	2020	2021
Population (10,000)	266.14	301.09	280.84	320.1	340.7

(ii) *Historical GDP growth in Huzhou*

Table 11 Historical GDP Growth in Huzhou

Year	GDP (RMB 100 million)	Growth rate (%)	Primary industry (RMB 100 million)	Secondary industry (RMB 100 million)	Tertiary industry (RMB 100 million)	GDP per capita (RMB)
2017	2,476.1	8.5	127.3	1,173.7	1,175.1	82,952
2018	2,719	8.1	127.7	1,273.6	1,152.5	90,304
2019	2,881.2	7.9	133.8	1,595.4	1,422.1	102,593
2020	3,201.4	3.3	140.5	1,587.6	1,473.3	100,012
2021	3,644.9	9.5	148.6	1,865	1,631.3	107,534

*(iii) Historical car ownership in Huzhou***Table 12 Historical Car Ownership in Huzhou**

Year	2017	2018	2019	2020	2021
Civil automobile ownership (units)	734,000	812,000	887,000	950,000	1,005,000

*(iv) Road passenger and freight traffic volume in Huzhou***Table 13 Road Passenger and Freight Traffic Volume in Huzhou**

Year	Passenger volume (10,000 persons)	Passenger turnover volume (100 million person-km)	Cargo volume (10,000 tonnes)	Freight turnover volume (100 million tonne-km)
2017	5,261	17.2	16,756	176.3
2018	5,340	18.5	18,783	186.6
2019	5,645	19.3	21,002	199.5
2020	3,542	18.0	10,600	185.00
2021	5,261	17.2	16,756	176.3

3.4 Existing Socio-economic Development in Jiaxing

Jiaxing, located in the northeast of Zhejiang Province and in the heart of the Hangjiahu Plain in the Yangtze River Delta, is one of the key cities in the Yangtze River Delta. The city is bordered by the sea to the east, Qiantang River to the south, Taihu Lake to the north, and Tianmu Lake to the west, and the Grand Canal runs through the city. It is located at the intersection of rivers, the sea and lakes, and is the throat of the South Taihu Lake Corridor. It is less than 100 kilometres away from such cities as Shanghai, Hangzhou, Suzhou and Huzhou, with a significant geographical advantage. The city has 7 counties (cities and districts) under its jurisdiction, namely Jiashan, Pinghu, Haiyan, Haining, Tongxiang, Xiucheng and Xiuzhou, and has a total area of 3,915 square kilometres, and permanent population of 3.49 million persons, of which the urban area is 968 square kilometres.

The basic data are as follows:

The data on the permanent population, historical GDP growth, historical car ownerships, road passenger and cargo traffic volume, and port cargo throughput in Jiaxing are all sourced from the Statistical Communiqué on the National Economy of Jiaxing (2017, 2018, 2019, 2020 and 2021) and statistical yearbooks.

(i) *Historical permanent population in Jiaxing*

Table 14 Number of Historical Permanent Population in Jiaxing

Year	2017	2018	2019	2020	2021
Population (10,000)	465.6	360.44	363.7	367.38	371.85

(ii) *Historical GDP growth in Jiaxing*

Table 15 Historical GDP Growth in Jiaxing

Year	GDP (RMB 100 million)	Growth rate (%)	Primary industry (RMB 100 million)	Secondary industry (RMB 100 million)	Tertiary industry (RMB 100 million)	GDP per capita (RMB)
2017	4,355.24	7.8	134.67	2,309.3	1,911.27	93,964
2018	4,871.98	7.6	115.03	2,624.49	2,132.46	103,858
2019	5,370.32	7	120.89	2,892.55	2,356.88	112,751
2020	5,509.52	3.5	124.18	2,861.09	2,524.25	
2021	6,355.28	8.5	131.97	3,453.75	2,769.56	116,323

(iii) *Historical car ownership in Jiaxing*

Table 16 Historical Car Ownership in Jiaxing

Year	2017	2018	2019	2020	2021
Civil automobile ownership (units)	1,195,100	1,655,300	1,741,000	1,827,000	1,939,000

(iv) *Road passenger and freight traffic volume in Jiaxing*

Table 17 Road Passenger and Freight Traffic Volume in Jiaxing

Year	Passenger turnover volume (100 million person-km)	Freight turnover volume (100 million tonne-km)
2017	21.61	311.38
2018	21.3	333.63
2019	21.7	354.09
2020	8.19	384.86
2021	8.09	410.08

3.5 Existing Socio-economic Development in Shanghai

Shanghai, the largest city in China, is one of the four municipalities directly under the central government, and the national centre as well as the economy, science and technology, industry, finance, trade, exhibition and shipping centre of China. Located at the mouth of the Yangtze River in the middle of the coastline of Mainland China, Shanghai has the largest foreign trade port and the largest industrial base in China. It faces the island of Kyushu, Japan across the sea, and is bordered by Hangzhou Bay to the south, and Jiangsu and Zhejiang provinces to the west. Shanghai is also an emerging tourist city with a rich cultural heritage of modern cities and numerous historical sites, and has successfully hosted the 2010 World Expo. Today Shanghai has developed into a shining international metropolis and is committed to becoming an international finance and shipping centre by 2020.

The basic data are as follows:

The data on the permanent population, historical GDP growth, historical car ownerships, road passenger and cargo traffic volume, and port cargo throughput in Shanghai are all sourced from the Statistical Communiqué on the National Economy of Shanghai and statistical yearbooks (2017, 2018, 2019, 2020 and 2021).

(i) *Historical permanent population in Shanghai*

Table 18 Number of Historical Permanent Population in Shanghai

Year	2017	2018	2019	2020	2021
Population (10,000)	2,466.28	2,423.78	2,481.34	2,488.36	2,492

(ii) *Historical GDP growth in Shanghai*

Table 19 Historical GDP Growth in Shanghai

Year	GDP (RMB 100 million)	Growth rate (%)	Primary industry (RMB 100 million)	Secondary industry (RMB 100 million)	Tertiary industry (RMB 100 million)	GDP per capita (RMB)
2017	30,133.86	6.9	98.99	9,251.40	20,783.47	124,600
2018	32,679.87	6.6	104.37	9,732.54	22,842.96	13.5
2019	38,155.32	6	103.88	10,299.16	27,752.28	15.73
2020	38,700.58	1.7	103.57	10,289.47	28,307.54	25.58
2021	43,214.85	8.1	99.97	11,449.32	31,665.56	17.34

(iii) *Historical car ownership in Shanghai*

Table 20 Historical Car Ownership in Shanghai

Year	Passenger cars (10,000 units)	Trucks (10,000 units)	Other vehicles (10,000 units)	Automobiles (10,000 units)
2017	328.17	30.81	2.04	361.02
2018	358.37	32.87	2.18	393.42
2019	378.5	33.07	2.3	441.55
2020	408.14	31.79	2.45	442.38
2021	420	33	2.5	445

(iv) *Road passenger and freight traffic volume in Shanghai*

Table 21 Road Passenger and Freight Traffic Volume in Shanghai

Year	Passenger volume (10,000 persons)	Passenger turnover volume (100 million person-km)	Cargo volume (10,000 tonnes)	Freight turnover volume (100 million tonne-km)
2017	3,419	116.67	39,743	298
2018	3,151	105.81	39,595	299
2019	3,168	108.49	38,750	297
2020	1,332	44.47	46,051	685
2021	1,467.7	52.05	52,899.4	702

(v) *Cargo throughput of ports in Shanghai*

Table 22 Port Cargo Throughput in Shanghai

Year	Port cargo throughput (10,000 tonnes)	Container throughput (10,000 TEUs)
2017	75,050.79	4,023.31
2018	73,047.94	4,201.02
2019	72,031.32	4,330.26
2020	71,670	4,350.3
2021	77,635.43	4,703.33

4. TRAFFIC FLOW SURVEY AND ANALYSIS

4.1 Breakdown of Vehicle Types in the Traffic Flow Survey

The traffic flow survey aims to understand the characteristics of the road traffic volume in the areas of the Project, and grasp the underlying information on road traffic flow, flow direction and vehicle composition, so as to provide a basis for the analysis of the traffic volume forecast on the Shenjiahuhang Expressway.

The survey team conducted a traffic volume survey and OD survey sampling in the Huzhou Section of Shenjiahuhang Expressway, and had a basic understanding of the characteristics of its traffic travel by studying and analysing the current road network and the characteristics of traffic flow on the highways involved in the areas affected by the Project.

In the areas of the Project, the highways related thereto are mainly the Hangzhou-Nanjing Expressway, the Shanghai-Hangzhou Expressway, Zhajiasu Expressway, Shensuzhewan Expressway, Huqingping Expressway, Tingfeng Expressway (within Shanghai), National Highway 104, National Highway 320, National Highway 318, Provincial Highway 11, Provincial Highway 09, Provincial Highway 07, Provincial Highway 01, Huyan Line and Pingli Highway.

In order to understand the actual situation of the existing traffic volume of the road network in the areas of the Project and the major affected areas, and to facilitate the planning and study of trunk roads, the departments and units in charge have organised and implemented several special surveys on motor vehicle traffic volume, and motor vehicle origin and destination (OD) surveys in those areas, and conducted intermittent traffic volume observations on trunk roads on a monthly basis for a long time, which has given a large amount of valuable information and provided a reliable basis for the planning and study on the road network. In order to satisfy the needs of the study for the Project, our staff conducted an OD survey and a cross-sectional traffic volume observation, giving comprehensive, detailed and complete information. In addition, the traffic volume survey also collected information on the historical traffic volume in the major affected areas by the Project, and with reference to the OD surveys on Hangzhou Bay Bridge, Shensuzhewan Expressway and Zhajiasu Expressway, we have understood the features of the connection intensity and distribution characteristics of traffic travel between Huzhou City, Jiaxing City and the surrounding areas.

In September 2014, the General Office of the Ministry of Transport released the Technical Standards for Highway Engineering (JTGB01-2014, implemented on January 1, 2015), which re-specified the criteria for vehicle classification. The traffic survey for the Project was conducted and information was assorted according to the adjusted criteria for vehicle classification.

The table below sets out the criteria for the classification of vehicles.

Table 23 Classification of Vehicles

Vehicle type	Primary classification	Secondary classification	Vehicle conversion factor	Rated load parameters
Automobiles	Passenger cars	Small and medium-sized passenger cars	1.0	Rated seating capacity \leq 19 seats
		Minivans		Load capacity \leq 2 tonnes
	Medium-sized vehicles	Coaches	1.5	Rated seating capacity $>$ 19 seats
		Medium trucks		2 tonnes $<$ load capacity \leq 7 tonnes
	Large vehicles	Large trucks	2.5	7 tonnes $<$ load capacity \leq 20 tonnes
Combination vehicles	Extra large trucks	4.0	Load capacity $>$ 20 tonnes	
	Container trucks			
Motorbikes	Motorbikes		1	Engine driven
Tractors	Tractors		4	

4.2 Traffic Zoning

The zoning of the OD traffic of the Project is based on the principle that focuses on the areas where the Project's roads are located, and is supplemented by the surrounding areas. At the same time, in order to correspond to the economic and traffic statistics, the zoning is made based on the administrative division of the Project's areas. Subject to the regional highway network distribution, urban and town systems and the characteristics of economic development, and combining with the features of the Project, the origins and destinations of the traffic volume survey are divided into 12 traffic zones. The breakdown of the division is shown in the table and the figure below.

Table 24 Division of OD Zones

No.	Zones
1	Changxing County, Yixing in Jiangsu, Liyang, Nanjing and areas to the north
2	Downtown Huzhou, Yangjiabu, Baizhu, Bailidian, Daochang
3	Zhili Town and Jiuguan Town in Huzhou
4	Hefu Town in Huzhou
5	Shuanglin Town in Huzhou
6	Daixi, Linghu, Donglin Town and Zhongguang Town, Deqing County in Huzhou
7	Qianjinshizong, Shanlian Town and Xinshi Town, Deqing County in Huzhou
8	Nanxun Town and Lianshi Town in Huzhou
9	Wukang Town, Fatou, Nanlu, Moqianshan, Sanhe and Luoshe in Deqing County
10	Chengguan Town, Qianshan, Shilin, Xiashe, Leidian, Gaoqiao, Gouli and Xujiashuang in Deqing County
11	Anji County and Changxing Heping Town
12	Downtown Jiaxing, Qixing, Daqiao, Xinfeng, Honghe, Yuxin, Fengqiao, Wangdian Town, and etc.

4.3 Data Processing in the OD Survey

1. Formation of the regional OD table

The original data from the OD survey points are counted to form a table of the distribution of traffic volume by vehicle type at each survey point. As the OD survey is conducted on a specific date and for a specific time period, and the traffic volume analysis is based on the annual average daily traffic volume, the data from the survey should be corrected and extrapolated to the distribution of the annual average daily traffic volume in 2035.

The following formula is used to make the correction:

$$Q_{ijk} = q_{ijk} \times \alpha_k$$

where: Q_{ijk} – the annual average daily traffic volume of vehicle type k between Zone i to Zone j ;
 q_{ijk} – the actual traffic volume in survey of vehicle type k between Zone i to Zone j ;
 α_k – the correction factor for vehicle type k samples;

$$\alpha_k = Q_k \div q_k$$

where: Q_k – the annual average daily traffic volume of vehicle type k ;
 q_k – the traffic volume of OD survey samples of vehicle type k .

Based on the above formula, an OD distribution table for all vehicle types in the subject areas of the Project in 2023 (the base year) was generated. See table below.

Table 25 OD Table of Vehicles in 2023 Unit: unit/d

O/D	1	2	3	4	5	6	7	8	9	10	11	12	SUM
1	0	67	4	61	32	3	6	168	34	3,632	35	684	4,726
2	80	0	3	46	14	6	8	142	24	1,625	16	321	2,285
3	5	4	0	13	6	4	9	162	11	1,306	8	236	1,763
4	73	55	16	0	5	1	10	162	9	1,125	7	365	1,828
5	38	17	7	6	0	1	6	5	3	62	16	66	227
6	4	7	5	1	1	0	8	9	4	8	3	45	95
7	7	10	11	12	7	10	0	17	36	24	6	36	175
8	202	170	194	194	6	11	20	0	7	12	1	49	867
9	41	29	13	11	4	5	43	8	0	8	5	47	214
10	4,358	1,950	1,567	1,350	74	10	29	14	10	0	9	38	9,409
11	42	19	10	8	19	4	7	1	6	11	0	27	154
12	821	385	283	438	79	54	43	59	56	46	32	0	2,296
SUM	5,671	2,713	2,113	2,141	248	107	190	748	200	7,858	138	1,914	24,041

4.4 Forecasting Idea and Methodology

Forecasting traffic volume is the prediction of the traffic volume of the highways for each characteristic year in the future, the results of which are the main basis for project construction adjustment and cost adjustment justification. Traffic volume forecasting aims to provide a basis of analysis for determining national economic and financial evaluations, provide real-time data for project decision makers and provide a basis for making scientific decisions.

Highway traffic volume reflects the highway traffic demand of economic and social development, and its occurrence and development are closely correlated with the economic and social development of the regions. Therefore, the future traffic volume should be projected based on the future economic development objectives of the subject areas. The general idea is: upon the collection and survey of the data on the current economic, social and traffic conditions, to analyze the correlation between the economy and society and transportation development, and to study the future traffic generation and distribution in the subject areas on the basis of forecasting the future economic development levels, so as to project the trend-based traffic volume with a normal growth, and thus to predict the traffic volume of the Project for each characteristic year in the future while taking into account the induced incremental and transferred traffic volume in the affected areas upon the completion of the Project.

The prospective traffic volume forecast for the Project consists of three components:

- (1) Trend-based traffic volume with a natural growth
- (2) Transferred traffic volume
- (3) Traffic volume increase induced by land development

4.5 Traffic Volume Forecast

4.5.1 Determination of the Forecast Characteristic Year

Since the forecast for the Project started from July 2022, the forecast period is from July 2022 to 2035. In alignment with the national economic and social development plan of the affected areas by the Project, we determine the year 2023 as the forecast characteristic year and year 2023 as the forecast base year. The year 2023 is used as the example for this forecast.

4.5.2 Traffic Generation

Commonly used methods for forecasting traffic growth rates include, among others, regression analysis, analogy analysis, elasticity coefficient method and intensity indicator method. Transportation demand is generated by economic and social activities, and the growth of transportation and economic development are mutually causal, i.e. transportation restricts the economy and the economy also influences transportation. Therefore, by analysing the change rules of the economic development and its relationship with transportation, we can accurately understand the change rules of transportation demand. The elasticity coefficient method is to grasp the correlation between economic development and transportation in general, which can directly reflect the impact of economic growth on highway traffic. Therefore, it is easy to combine qualitative factors, and has good practicability and reliability in forecasting traffic volume for the medium and long term. In view of this, the Project uses the elasticity coefficient method for forecasting traffic growth. The formula for calculating the elasticity coefficient is as follows:

$$\text{Elasticity factor } e = \frac{\text{Percentage of change in transport indicators}}{\text{Percentage of change in economic indicators}}$$

Different transport indicators are selected for regression analysis with GDP to derive their elasticity coefficients. Through a comprehensive analysis of the correlation between transport indicators, such as car ownership, traffic volume and transportation volume, and economic indicators in the affected areas over the past years, it is found that the change rules of the elasticity coefficients of the indicators are not very clear. One of the important reasons for which is that each department has different statistical standards, which makes it difficult to accurately reflect the actual situation of transport development in the society as a whole. Therefore, the elasticity coefficient in relation to future transportation has to be determined by a combination of qualitative and quantitative methods.

Based on the experience of developed countries, there is a certain regularity in the development of the transportation elasticity coefficient. Generally speaking, in the economically backward regions, economic activities mainly focus on agriculture and mining of mineral resources at the initial stage of development. The value per unit output of agricultural and sideline products and resource-based industrial products such as coal and ore is low, that is to say, the output of industrial and agricultural products included in the calculation of unit value is relatively large. Therefore, economic development has a high demand for transportation in the initial stage of economic development, and the growth of traffic travel volume is faster than the development of the economy, in such event the transport elasticity coefficient is greater than 1. When the economy is more developed, with deep processing of industrial and agricultural products, their technical components and value will be gradually increasing, and the output of industrial and agricultural products generated per unit value will be gradually declining, with a decreasing intensity of demand for transportation, in such event the development trend of the traffic travel volume will change gradually from being in line with to lagging behind the development of the economy, and thus the transport elasticity coefficient will decline gradually from nearly 1 to less than 1.

Based on the respective industrial layout, structure, regional development planning and other relevant factors in the affected areas by the Project, and according to the findings of relevant research reports of the Planning and Research Institute of the Ministry of Transport, there is a probability of 78.97% that the elasticity coefficient of passenger and freight transportation in China in the future will range between 0.7 and 0.9. Based on the social and economic development and future development plans of the subject areas, we consider that there is a higher probability that the future elasticity coefficient in those areas will fall in the range as referred to in such findings.

In addition, from the law of economic and social development, with the gradual improvement of people's living standards, the demand for travel will be increasing with more trips per capita. Passenger transportation will maintain a faster growth rate in the process of development, that means, in the middle and late stages of economic development, the elasticity coefficient of passenger transportation is greater than that of cargo transportation. In order to offset the uncertainties of various transport indicators caused by different statistical standards as much as possible, the weighted average elasticity coefficient is calculated based on the correlation between each indicator and the OD survey data, as a reference for quantitative determination of the elasticity coefficient of future traffic volume (generation and attraction volume).

Through the above comprehensive analysis, based on the evolvement of transport elasticity coefficients and future economic and social development forecasts in the affected areas by the Project, and with reference to the results of study on several projects in relevant regions in China, the elasticity coefficients in relation to transportation development in the significantly affected areas by the Project in future years have been comprehensively determined, as shown in the table below.

Table 26 Elasticity Coefficients of Road Passenger and Freight Traffic Volume in the Affected Areas by the Project

Year		2021~2030	2031~2040	2041~2042
Zhejiang Province	Passenger vehicles	0.75	0.7	0.65
	Trucks	0.7	0.65	0.6
Huzhou	Passenger vehicles	0.75	0.7	0.65
	Trucks	0.7	0.65	0.6
Jiaying	Passenger vehicles	0.75	0.7	0.65
	Trucks	0.7	0.65	0.6
Hangzhou	Passenger vehicles	0.75	0.7	0.65
	Trucks	0.7	0.65	0.6

The growth rate of the traffic volume of passenger vehicles and trucks in each zone is calculated using the elasticity coefficient method in the formula of

$$\gamma_k(h) = T_k(h) \cdot E_i$$

Where: $\gamma_k(h)$ – the growth rate (%) of passenger vehicle (truck) travel in each zone;
 $T_k(h)$ – the transport elasticity coefficient of passenger vehicles (trucks);
 E_i – the GDP growth rate (%) in each zone.

We plug the GDP growth rate in each zone into the above formula to predict the growth rate of the generation and attraction volume of passenger vehicles and trucks for each zone, which are shown in the table below.

Table 27 Forecast on the Growth Rates of Future Traffic Volume by Zone

Year		2021~2030	2031~2040	2041~2042
Zhejiang Province	Passenger vehicles	4.79%	4.07%	3.39%
	Trucks	4.47%	3.78%	3.13%
Huzhou	Passenger vehicles	6.16%	5.35%	4.54%
	Trucks	5.75%	4.97%	4.19%
Jiaxing	Passenger vehicles	6.16%	5.35%	4.54%
	Trucks	5.75%	4.97%	4.19%
Hangzhou	Passenger vehicles	6.16%	5.35%	4.54%
	Trucks	5.75%	4.97%	4.19%

4.5.3 Traffic Volume Distribution

Based on the current travel characteristics of each zone and the forecast of the generated and attracted traffic volume in future, we use the frater method for convergence calculation to derive the distribution of future traffic volume among the zones, which is compiled into a future trend-based OD table. The formula is as follows:

$$Q(1)_{ij} = Q_{ij} \frac{p_i}{P_i} \cdot \frac{A_j}{a_j} \cdot \frac{(L_i + L_j)}{2}$$

$$L_i = \frac{p_i}{\sum_j Q_{ij} \cdot A_j / a_j} \quad L_j = \frac{a_i}{\sum_i Q_{ij} \cdot P_i / p_i}$$

- Q_{ij} – the traffic volume between zone i and zone j in the base year;
- Q(1)_{ij} – the traffic volume between zone i and zone j in the first distribution;
- p_i – the traffic volume generated in zone i in the base year;
- a_j – the traffic volume generated in zone j in the base year;
- P_i – the traffic volume generated in zone i in the characteristic year;
- A_j – the traffic volume attracted to zone j in the characteristic year.

Through the first approximation calculation above, the given future generation volume P_i and the attraction volume A_j are usually different. We have to replace p_i and a_j in the above formula with the calculated $P_i(1)$ and $A_j(1)$ and repeat the calculation, until the ratio of the future attraction volume forecasted to the distribution of attraction volume calculated converges approximately to 1.0, at which point the differences can be eliminated.

The trend-based OD table for 2023 is set out in the table below.

Table 28 Trend-based Auto OD Table for 2023 **Unit: unit/d**

O/D	1	2	3	4	5	6	7	8	9	10	11	12	SUM
1	0	80	5	73	38	4	7	202	41	4,358	42	821	5,671
2	96	0	4	55	17	7	10	170	29	1,950	19	385	2,742
3	6	4	0	16	7	5	11	194	13	1,567	10	283	2,116
4	88	66	19	0	6	1	12	194	11	1,350	8	438	2,194
5	46	20	9	7	0	1	7	6	4	74	19	79	273
6	4	9	6	1	1	0	10	11	5	10	4	54	114
7	9	12	13	14	9	12	0	20	43	29	7	43	210
8	242	204	233	233	7	13	24	0	8	14	1	59	1,040
9	49	35	16	13	4	6	52	10	0	10	6	56	256
10	5,230	2,340	1,881	1,620	89	12	35	17	12	0	11	46	11,291
11	50	23	12	10	23	4	9	1	7	13	0	32	185
12	985	462	340	526	95	65	52	71	68	55	38	0	2,756
SUM	6,805	3,256	2,536	2,569	297	129	228	897	240	9,430	166	2,297	28,849

4.5.4 Forecast of Induced Incremental Traffic Volume

Induced incremental traffic volume is the additional traffic volume as a result of this highway construction project. The main factor taken into account in forecasting the induced traffic volume is the running time among zones, and it is calculated according to the principle of “existence or absence comparison”, using the idea of the gravity model.

(1) The basic formula under the gravity model is:

$$T_{ij} = K \times \frac{P_i^\alpha \times A_j^\beta}{t_{ij}^\gamma}$$

- where:
- T_{ij} – the traffic volume of travelling from zone i to zone j (unit/day);
 - P_i – the traffic volume generated in zone i (unit/day);
 - A_j – the traffic volume attracted to zone j (unit/day);
 - t_{ij} – the travel time (in minutes) from zone i to zone j;
 - K, α, β, γ – inputs into the gravity model

(2) For zones without travel volume, the formula is:

$$T_{ij}' = K \times \frac{P_i^\alpha \times A_j^\beta}{(t_{ij}')^\gamma} - K \times \frac{P_i^\alpha \times A_j^\beta}{(T_{ij})^\gamma}$$

where t_{ij}' – induced incremental traffic volume from zone i to zone j (unit/day);
 T_{ij} – the travel time (in minutes) from zone i to zone j without this item;
 T_{ij}' – the travel time (in minutes) from zone i to zone j with this item
 – inputs into the gravity model.

Based on the development experience of relevant zones, the growth of induced incremental traffic volume will gradually slowdown after a period of continuous and rapid increase, and then stop when being up to a certain level. The number of years for the induced incremental traffic volume traffic to stabilize varies from country to country and zone to zone.

The inputs into the induced incremental traffic volume model are selected with reference to empirical data from relevant regions and the actual situation in the affected areas by the Project. The calculated induced incremental traffic volume has been included in the total OD table for each characteristic year.

4.5.5 Forecast of Transferred Traffic Volume

The transfer of traffic volume between roads and other modes of transport mainly arises from two factors:

The impact on other modes of transport due to the construction of road projects.

The impact on existing road traffic volume due to the construction of projects in respect of other modes of transport.

Theoretically, for an area with relatively stable economic activities after years of operation, the road, railway, waterway and other modes of transport in the same corridor should be in a relatively stable proportion to the total amount of materials transported in the corridor for each mileage. This is mainly because after repeated practice, each of the transporters has had a clear understanding of various modes of transport in the corridor, and has found the most economic and reasonable transport routes and modes according to the characteristics of its own cargo. However, when the traffic conditions of the corridor change (for example, there is a new project or a significant increase in the transport capacity of an existing transport mode), the existing equilibrium will be broken and the proportion will change to some extent. Predicting the future equilibrium is the basic means and purpose of the transferred traffic volume forecast. There are roads, railways and other modes of transport in the area where the Project is located.

Considering that the Project’s area is in another major corridor between Zhejiang and Shanghai focusing on passenger travel, and that the highways such as the Eastern Section of the Ring Expressway Parallel Line and the Xinzhi Line will be opened to traffic successively, which is expected to have a great impact on the Project, it is necessary to take into account the transferred traffic volume. The expert forecasting method is considered in predicting the transferred traffic volume. In this report, we predict the transferred traffic volume in the area with reference to the traffic network plan in the Zhejiang Provincial Traffic Planning Map and in combination with the characteristics of the Project.

The table below shows the transferred OD table for the characteristic year 2023.

Table 29 Transferred Auto OD Table for 2023 **Unit: unit/d**

O/D	1	2	3	4	5	6	7	8	9	10	11	12	SUM
1	0	24	1	22	12	1	2	60	12	1,308	13	246	1,701
2	29	0	1	17	5	2	3	51	9	585	6	116	823
3	2	1	0	5	2	1	3	58	4	470	3	85	635
4	26	20	6	0	2	0	4	58	3	405	3	131	658
5	14	6	3	2	0	0	2	2	1	22	6	24	82
6	1	3	2	0	0	0	3	3	1	3	1	16	34
7	3	3	4	4	3	3	0	6	13	9	2	13	63
8	73	61	70	70	2	4	7	0	3	4	0	18	312
9	15	10	5	4	1	2	16	3	0	3	2	17	77
10	1,569	702	564	486	27	3	10	5	3	0	3	14	3,387
11	15	7	3	3	7	1	3	0	2	4	0	10	56
12	295	139	102	158	29	19	16	21	20	16	12	0	827
SUM	2,042	977	761	771	89	39	68	269	72	2,829	50	689	8,655

4.5.6 Traffic Volume Assignment

1. Methods of assignment

With regard to the trend and the transferred traffic volume assignment, TransCAD offers various options for traffic assignment models: all-or-nothing, incremental assignment, capacity-limited assignment, user balancing, random user balancing, system optimizing, multiple vehicle types assignment and comprehensive expenses assignment. Each model requires different attributes input. The necessary network attributes include time, capacity of road sections, pre-loaded traffic volume of road sections, and codes indicating the types of road sections; α and β parameters of the BPR function (the traffic flow formula of Federal Highway Administration); the maximum number of iterations to run and the convergence criteria. Taking into account the impact of toll highways on route selection, a broad fee approach can also be used, that is, to include the fee on top of the original approach so that the route selection criteria is a combination of time and fee.

After repeated testing, this traffic assignment uses the random user balancing assignment model offered by TransCAD (Stochastic User Equilibrium model) to predict the traffic flow on the road sections in question.

2. Road network model

Based on the external field survey in this forecast and with reference to the relevant road network information of the affected areas of the Project, a traffic volume simulated road network map for the affected areas of the Project in the base year (2021) has been prepared.

- a. The development of a road network model document for the future characteristic year is an important preparation for the “four-stage” traffic volume forecast on the road network. The following principles have been followed in developing the road network model for traffic volume forecast for the future characteristic year in this report:
 - (i) same coverage of the road network as that in the base year;
 - (ii) satisfying the specific needs of the traffic analysis for the Project;
 - (iii) complying with the road network plan in the area and the highway and urban road plans in the areas along the route.

Based on the planned road network in the affected areas of the Project for future years, the road network model for traffic volume forecast for the characteristic year is developed.

- b. OD distribution matrix

The current and future OD distribution matrixes. As an input to the traffic assignment, the ID (code) of the matrix must match the ID (code) of the centre of the zone. If not, a matrix index is required to match.

5. ANALYSIS OF NATIONAL ECONOMIC BENEFITS

The Project has significant national economic benefits and insignificant financial benefits. This revenue analysis is conducted from two aspects, i.e. national economic benefits and financial revenue.

5.1 Parameter Selection and Determination

With reference to the Methodology and Parameters for Economic Evaluation of Construction Projects (《建設項目經濟評價方法與參數》) and relevant information, the parameters for the national economic evaluation of the Project are determined as follows:

1. social discount rate of 8%.
2. trade expense ratio taken as 6%.
3. shadow exchange rate: based on the latest quoted foreign exchange rate released by the State Administration of Foreign Exchange, i.e. US\$1 = RMB6.75, the shadow exchange rate translation factor is 1.08, and the shadow exchange rate is US\$1 = RMB7.29.
4. residual value: the residual value of the Project takes 50% of the construction cost and is included in the economic cost as a negative value in the final year of the evaluation.

5.2 Costs of Items

The economic cost of a highway construction project includes two parts: the economic cost during construction and the economic cost during operation, where the operational cost includes ordinary maintenance cost, administration expense and overhaul cost.

5.3 Calculation of Benefits

National economic benefits refer to the contribution of the Project to the national economy upon its implementation with certain capital investment. As all costs are used for the economic evaluation of the Project, we use the “existence or absence comparison method” to determine the full national economic benefits of the Project in calculating the national economic benefits, with reference to the principle of same calibre of costs and benefits, and considering that the Project is the alteration of an existing expressway interchange.

The national economic benefits of a highway project refer to the cost savings to highway users, mainly consisting of the benefits arising from lower auto operating costs for the Project and the existing associated highways, time savings for passengers in transit and reduction of traffic accidents for the Project.

1. Benefits from lower operating costs (B1)

$$B_1 = B_{11} + B_{12}$$

where: B_{11} – the benefit arising from lower operating cost of the Project (RMB/year);
 B_{12} – the benefit arising from lower operating cost of the existing associated highways (RMB/year).

(1) Calculation formula of B_{11}

$$B_{11} = 0.5 \times (T_{1p} + T_{2p}) \times (\text{VOC}_{1b}' \times L' - \text{VOC}_{2p}' \times L) \times 365$$

where: T_{1p} – the normal traffic volume (natural numbers, unit/day) of the Project with the existence of this item;
 T_{2p} – the total traffic volume (natural numbers, unit/day) of the Project with the existence of this item;
 VOC_{1b}' – the weighted average operating cost per unit (RMB/vehicle-km) of all vehicle types for the existing associated highways under normal traffic conditions in the absence of this item;
 VOC_{2p}' – the weighted average operating cost per unit (RMB/vehicle-km) of all vehicle types for the Project under the total traffic conditions with the existence of this item;
 L' – the mileage of the existing associated highways (Km);
 L – the mileage of the Project (Km).

(2) *Calculation formula of B_{12}*

$$B_{11} = 0.5 \times L' \times (T_{1p} + T_{2p}) \times (VOC_{1b}' - VOC_{2p}') \times 365$$

- where: T_{1p} – the normal traffic volume (natural numbers, vehicles/day) for the Project with the existence of this item;
- T_{2p} – the total traffic volume (natural numbers, vehicles/day) for the Project with the existence of this item;
- VOC_{1b}' – the weighted average operating cost per unit (RMB/vehicle-km) of all vehicle types for the existing associated highways under normal traffic conditions in the absence of this item;
- VOC_{2p}' – the weighted average operating cost per unit (RMB/vehicle-km) of all vehicle types for the Project under the total traffic conditions with the existence of this item.

(3) *Calculation of automobile transportation costs*

Based on the principle of the same calculation calibre of cost and benefit, the automobile transportation costs in the national economic evaluation should be adjusted accordingly. In the Project, an adjustment is made only to fuel and tyres, which account for a large proportion of transportation costs.

The economic cost of automobile transportation consists of two parts: one is related to the distance travelled by automobiles, including fuel consumption, lubricating oil consumption, tyre consumption, maintenance cost and depreciation cost on the transportation distance of automobiles; and the other is related to the using time, including depreciation cost on the time of automobiles, labour wages and administration expenses.

An adjustment is made to each, with reference to the findings of the PPK Report, and taking into account the impact of different road conditions and traffic conditions on the main factors of automobile transportation costs.

(i) *Adjustment criteria*

With reference to the findings of the PPK report, we determine the basic resources consumption of various vehicle types at a given speed and under a certain road condition, including the underlying data on fuel, lubricating oil, maintenance labour time and consumption of maintenance parts, etc., and then use such data on the resources consumption for the Project in the characteristic year to derive the automobile transportation costs for the Project in the characteristic year based on shadow prices.

(ii) Basic consumption

The table below sets out the basic consumption of each vehicle type for 100-km driving recommended by the PPK report.

Table 30 Basic Consumption per 100 km (V = 50km/hIRI = 2G = 1.5%)

Item/Vehicle type	Unit	Small passenger cars		Coaches	Minivans	Medium trucks	Large trucks	Extra large trucks
		Petrol	Petrol/Diesel			Petrol	Petrol/Diesel	Petrol/Diesel
Fuels	litres	11.3	27		16	23	26	30
Lubricating oils	litres	0.26	0.31		0.28	0.3	0.33	0.35
Quantity of tyres	pieces	4	6		4	6	6	6
Useful distance	Km	40,000	40,000		35,000	40,000	40,000	40,000
Proportion of the cost of servicing materials to the price of automobiles	%	1.5	1		1	1	1	1
Maintenance labour time	RMB	30	100		45	70	90	100
Annual driving mileage	Km	25,000	70,000		40,000	50,000	50,000	50,000
Number of drivers		1	1.7		1.2	1.5	1.5	1.5
Administration expense ratio (%)		5% of all other operating costs for small passenger cars and 15% for other vehicle types						
Labour wages and benefits	RMB/h	Based on the actual local wage level						

Note: V - vehicle speed; IRI - roughness; G - gradient. Some data in the table are sourced from the PPK report.

Based on the above table, and taking into account the vehicle prices, the average wage levels, tyre prices, and the prices of fuels and lubricating oils derived from a physical survey, the general transportation costs of various vehicle types under basic conditions are determined as shown in the table below.

Table 31 General Transportation Costs per 100 km (V = 50km/h IRI = 2G = 1.5%)

Items	Small passenger cars	Coaches	Minivans	Medium trucks	Large trucks	Extra large trucks
Fuels (RMB/100Km)	66.90	159.84	94.72	136.16	155.38	179.28
Lubricating oils (RMB/100Km)	4.56	5.43	4.91	5.26	5.78	6.13
Tyre cost (RMB/100Km)	4.50	18.90	8.23	18.90	30.90	30.90
Servicing materials cost (RMB/100Km)	16.80	30.90	8.90	5.40	25.40	30.00
Maintenance labour cost (RMB/100Km)	2.38	2.83	2.23	2.78	3.57	3.97
Depreciation cost (RMB/100Km)	37.33	36.79	18.54	9.00	42.33	50.00
Wages and benefits (RMB/100Km)	69.44	118.06	104.17	104.17	120.83	120.83
Administration expense (RMB/100Km)	10.10	55.91	36.25	42.25	57.63	63.17
Total (RMB/100Km)	212.01	428.66	277.95	323.91	441.83	484.28

On the basis of the general transportation costs, the transportation costs for each year are derived based on the findings of the PPK report and in view of the actual situation of the Project, taking into account the correction coefficients to transportation costs as a result of the topography and road conditions and various traffic conditions.

(iii) Influence of topography and road conditions

The Project is an expressway, which is a first-class highway. The table below sets out the roughness, gradient and travelling capacity of different classes of roads.

Table 32 Table of Road Technical Conditions

Road class	IRI	G (%)	Travelling capacity (MTE/day)
Highways (four lanes)	2	1.5	35,600
First-class roads	3	1.5	35,600
Second-class roads	4	2.5	13,300
Third-class roads	5	2.5	7,800

The Project uses the speed model formula derived from the PPK report to calculate the speeds under different traffic conditions in the characteristic year. The key factors affecting the economic cost adjustment of each item are shown in the table below, and the formula for correction coefficients to the affecting factors of various vehicle types can be found in the PPK Report.

Table 33 Key Factors Affecting the Economic Cost Adjustment of Items

Items	Affecting factors			
Fuels	Roughness	Gradient	Speed	Congesting degree
Lubricating oils	Roughness		Speed	
Tyres	Roughness		Speed	Congesting degree
Vehicle maintenance	Roughness		Speed	
Maintenance labour	Roughness		Speed	
Depreciation cost	Roughness		Speed	

Calculation formula:

Economic cost of fuels = shadow price of fuels x basic fuel consumption x roughness correction coefficient x gradient correction coefficient x speed correction coefficient x congestion degree correction coefficient;

Economic cost of lubricating oils = shadow price of lubricating oils x basic consumption x roughness correction coefficient x speed correction coefficient;

Economic cost of tyres = basic economic cost of tyres x roughness correction coefficient x speed correction coefficient x congestion degree correction coefficient;

Economic cost of service parts = basic economic cost of service parts x roughness correction coefficient x speed correction coefficient;

Actual depreciation cost = basic economic cost of annual depreciation x roughness correction coefficient x speed correction coefficient;

An adjustment to labour wages is related to driving time and mileage, but not to road conditions.

Administration expenses are charged in a percentage of vehicle operating costs and vary as operating costs change from year to year.

2. *Benefits from time savings for passengers (B2)*

The formula for calculating the benefits from time savings for passengers: $B2 = B21 + B22$;

where: B21 – the benefit arising from time savings for passengers using the Project (RMB/year);
B22 – the benefit arising from time savings for passengers using the existing associated highways (RMB/year).

(3) *Calculation of time value of passenger vehicles*

The calculation of the time value of passenger vehicles for each characteristic year is shown in the table below.

Table 34 Time Value of Passenger Vehicles

Year	Vehicle type	Time value RMB/hour	Leisure time value RMB/hour	Average ridership	Work trip	Leisure trip	Time value RMB/unit-hour
2023	Small passenger cars	46.88	9.38	4.5	0.6	0.4	143.4
	Coaches	46.88	9.38	30	0.5	0.5	843.8
2030	Small passenger cars	67.71	16.93	4.5	0.55	0.45	201.9
	Coaches	67.71	16.93	30	0.45	0.55	1,193.4
2040	Small passenger cars	90.41	19.56	4.5	0.55	0.45	268.4
	Coaches	90.41	19.56	30	0.45	0.55	1,346.2

Note: The data in the table is based on the GDP per capita forecasted in the province's plan.

3. *Benefits from reduction of traffic accidents (B3)*

The calculation formula: $B3 = B31 + B32$

Where: B31 – the benefits arising from the reduction of traffic accidents for the Project (RMB/year);
B32 – the benefits arising from the reduction of traffic accidents for the existing associated highways (RMB/year).

According to the findings of the PPK report, the accident rate is calculated in the following formula:

Highways: $R = -40 + 0.005 \times AADT$

First-class roads: $R = 37 + 0.003 \times AADT$

Second-class roads: $R = 133 + 0.007 \times AADT$

Third-class roads: $R = 140 + 0.03 \times AADT$

where: R – number of accidents (times/100 million vehicle-km).
 AADT – annual average daily traffic volume (unit/day, for medium-sized vehicles).

With reference to the PPK Report, the average accident damages for each class of roads are shown in the table below.

Table 35 Average Accident Damages for Roads

Road class	Highways	Firs-class roads	Second-class roads	Third-class roads
Average accident Damages (RMB/accident)	14,000	10,000	6,500	4,500

All economic benefits generated by the Project are calculated by vehicle types by way of the methods set out in the Measures, the results of which are shown in the table below.

Table 36 Economic Benefits Components

Year	Benefit from cost savings (B1) (RMB10,000)	Benefit from time savings for passengers (B2) (RMB10,000)	Benefit from reduction of accidents (B3) (RMB10,000)	Total (RMB10,000)
2023	790	418	12	1,220
2024	862	508	13	1,383
2025	901	456	13	1,370
2026	991	547	14	1,552
2027	1,095	656	15	1,766
2028	1,213	790	15	2,018
2029	1,350	952	16	2,317
2030	1,425	1,084	16	2,525
2031	1,632	1,639	16	3,287
2032	1,897	2,078	17	3,992
2033	1,942	2,316	17	4,275
2034	2,281	2,899	18	5,198
2035	2,520	2,863	18	5,401
2036	2,978	3,901	19	6,898
2037	3,420	4,695	19	8,134
2038	3,968	5,693	19	9,681
2039	4,369	6,476	20	10,865
2040	4,395	6,687	20	11,102
2041	4,601	7,172	20	11,793
2042	4,787	7,236	20	12,043

5.4 Evaluation Indicators and Calculation

1. Evaluation indicators

The statement of national economic benefit-cost flow for the Project is shown in Table 24. When $i=8\%$, the following evaluation indicators are used: Economic Internal Rate of Return (EIRR) of 10.16%, Economic Net Present Value ($I=8\%$, ENPV) of RMB223.05 million, Investment Payback Period (N) (including construction period) of 11.1 years, and Economic Benefit-Cost Ratio (EBCR) of 2.54.

From the above paragraph, it can be found that the EIRR is greater than 8% and the ENPV is above zero, indicating that the Project is feasible from the perspective of national economy.

Table 37 Calculation Table of Economic Cost-Benefit

Unit: RMB10,000

Year	Benefit	Cost	Cash flow	Discount factor	Discounted benefit	Discounted cost	Net present value	Aggregate present value
2023	1,220	14,711	(14,711)	0.9259	1,130	13,622	(12,492)	(13,622)
2024	1,383	39	1,344	0.8573	1,186	33	1,152	(12,469)
2026	1,552	41	1,511	0.7350	1,141	30	1,111	(10,303)
2027	1,766	212	1,554	0.6806	1,202	144	1,058	(9,245)
2028	2,018	44	1,974	0.6302	1,272	28	1,244	(8,001)
2029	2,317	45	2,272	0.5835	1,352	26	1,326	(6,676)
2030	2,525	46	2,479	0.5403	1,364	25	1,339	(5,336)
2031	3,287	48	3,240	0.5002	1,645	24	1,621	(3,716)
2032	3,992	501	3,491	0.4632	1,849	232	1,617	(2,099)
2033	4,275	51	4,224	0.4289	1,833	22	1,812	(287)
2034	5,198	52	5,146	0.3971	2,064	21	2,044	1,756
2035	5,401	54	5,347	0.3677	1,986	20	1,966	3,722
2036	6,898	56	6,843	0.3405	2,349	19	2,330	6,052
2037	8,134	285	7,849	0.3152	2,564	90	2,474	8,526
2038	9,681	59	9,622	0.2919	2,826	17	2,809	11,335
2039	10,865	61	10,805	0.2703	2,937	16	2,920	14,255
2040	11,102	62	11,040	0.2502	2,778	16	2,763	17,018
2041	11,793	64	11,729	0.2317	2,733	15	2,718	19,735
2042	12,043	66	11,977	0.2145	2,584	14	2,570	22,305
2043	0	0	0	0.1987	0	0	0	22,305

EIRR = 10.16% ENPV = RMB223.05 million EBCR = 2.54 N = 11.1 years

2. Sensitivity analysis

Most of the parameters used in the economic evaluation come from estimates and forecast, with some uncertainties, especially traffic volume forecast and investment estimates, which are volatile to some extent and have a significant impact on the national economic benefits. For the purpose of analysing the impact of these uncertainties on the national economic benefits, the uncertainty analysis for the Project mainly considers how the changes of traffic volume and investment affect the key indicators of national economy.

Table 38 Calculations of Economic Benefits Sensitivity Analysis

Benefit change	Cost change	20%	15%	10%	5%	0%	-5%	-10%	-15%	-20%
20%	EIRR (%)	10.16%	9.75%	9.34%	8.90%	8.46%	7.99%	7.51%	7.01%	6.48%
	ENPV (RMB10,000)	26,766	24,929	23,091	21,253	19,416	17,578	15,741	13,903	12,066
	EBCR	2.54	2.44	2.33	2.23	2.12	2.01	1.91	1.80	1.70
	N (years)	11.1	11.4	11.8	12.1	12.6	13.0	13.4	13.9	14.4
15%	EIRR (%)	10.57%	10.16%	9.74%	9.30%	8.85%	8.38%	7.89%	7.38%	6.85%
	ENPV (RMB10,000)	27,488	25,651	23,813	21,976	20,138	18,301	16,463	14,626	12,788
	EBCR	2.65	2.54	2.43	2.32	2.21	2.10	1.99	1.88	1.77
	N (years)	10.8	11.1	11.5	11.8	12.2	12.6	13.1	13.6	14.1
10%	EIRR (%)	11.00%	10.59%	10.16%	9.72%	9.26%	8.78%	8.29%	7.78%	7.24%
	ENPV (RMB10,000)	28,211	26,373	24,536	22,698	20,861	19,023	17,185	15,348	13,510
	EBCR	2.78	2.66	2.54	2.43	2.31	2.20	2.08	1.97	1.85
	N (years)	10.5	10.8	11.1	11.5	11.8	12.3	12.7	13.2	13.7
5%	EIRR (%)	11.46%	11.04%	10.61%	10.16%	9.69%	9.21%	8.71%	8.19%	7.65%
	ENPV (RMB10,000)	28,933	27,095	25,258	23,420	21,583	19,745	17,908	16,070	14,233
	EBCR	2.91	2.79	2.67	2.54	2.42	2.30	2.18	2.06	1.94
	N (years)	10.2	10.5	10.8	11.1	11.5	11.9	12.3	12.8	13.3
0%	EIRR (%)	11.95%	11.52%	11.08%	10.63%	10.16%	9.67%	9.16%	8.64%	8.09%
	ENPV (RMB10,000)	29,655	27,818	25,980	24,143	22,305	20,468	18,630	16,792	14,955
	EBCR	3.05	2.93	2.80	2.67	2.54	2.42	2.29	2.16	2.04
	N (years)	9.8	10.1	10.4	10.8	11.1	11.5	11.9	12.4	12.9
-5%	EIRR (%)	12.47%	12.04%	11.59%	11.13%	10.65%	10.16%	9.64%	9.11%	8.55%
	ENPV (RMB10,000)	3,194	3,195	3,196	3,197	3,198	3,199	3,200	3,201	3,202
	EBCR	3.21	3.08	2.95	2.81	2.68	2.54	2.41	2.28	2.14
	N (years)	9.5	9.8	10.1	10.4	10.8	11.1	11.5	12.0	12.5
-10%	EIRR (%)	13.03%	12.59%	12.14%	11.67%	11.18%	10.68%	10.16%	9.62%	9.05%
	ENPV (RMB10,000)	31,100	29,262	27,425	25,587	23,750	21,912	20,075	18,237	16,399
	EBCR	3.39	3.25	3.11	2.97	2.83	2.69	2.54	2.40	2.26
	N (years)	9.1	9.4	9.7	10.0	10.4	10.7	11.1	11.6	12.0
-15%	EIRR (%)	13.63%	13.18%	12.72%	12.24%	11.75%	11.24%	10.71%	10.16%	9.58%
	ENPV (RMB10,000)	31,822	29,985	28,147	26,310	24,472	22,634	20,797	18,959	17,122
	EBCR	3.59	3.44	3.29	3.14	2.99	2.84	2.69	2.54	2.39
	N (years)	8.8	9.0	9.3	9.6	10.0	10.3	10.7	11.1	11.6
-20%	EIRR (%)	14.29%	13.83%	13.35%	12.87%	12.36%	11.84%	11.30%	10.74%	10.16%
	ENPV (RMB10,000)	32,544	30,707	28,869	27,032	25,194	23,357	21,519	19,682	17,844
	EBCR	3.82	3.66	3.50	3.34	3.18	3.02	2.86	2.70	2.54
	N (years)	8.4	8.7	8.9	9.2	9.6	9.9	10.3	10.7	11.1

The sensitivity analysis shows that even under the unfavorable conditions of 10% increase in cost and 10% decrease in benefit, all road sections of the Project have good economic benefits, indicating that the Project has a strong economic capacity.

6. TRAFFIC VOLUME ANALYSIS

6.1 Analysis of Historical Traffic Volume and Revenue of the Project's Highways

6.1.1 Historical Traffic Volume Analysis

Monthly traffic data on the Project's highways from 2018 to June 2022 has been collected from Zhejiang Expressway and through the analysis, it is found that the Project's highways:

- (1) were under closed-off management in March and April 2022 due to the epidemic and in response to the requirements of the anti-epidemic policy, with an incidental significant decrease in traffic volume.
- (2) have the traffic dominated by passenger vehicles, accounting for approximately 63% on average, most of which are passenger vehicle 1, accounting for over 61% on average.
- (3) continue to maintain a relatively fast growth in average daily traffic volume from 2018 to 2021 with a CAGR of 6.77%.

Based on the historical traffic survey data in Zhejiang Province, through the statistical analysis, the annual average daily traffic volume and the vehicle composition of the Shenjiahuhang Expressway from 2018 to June 2022 are shown in the table below.

Table 39 Historical Daily Traffic Volume Statistics of Shenjiahuhang Expressway

Unit: unit/day

Year	Passenger vehicle 1	Passenger vehicle 2	Passenger vehicle 3	Passenger vehicle 4	Truck 1	Truck 2	Truck 3	Truck 4	Truck 5	Truck 6	Truck 7	Total
2018	17,683	230	267	349	2,324	1,506	715	363	4,548	28	357	28,370
2019	19,452	229	257	327	2,654	1,480	816	419	4,626	24	290	30,575
2020	20,544	138	142	201	3,206	1,951	1,130	1,071	402	4,165	-	32,950
2021	21,082	107	124	162	3,480	2,123	780	1,112	753	4,803	-	34,526
2022 ¹	14,879	50	29	58	2,887	1,834	562	968	814	4,162	-	26,242

Table 40 Vehicle Composition Statistics on the Shenjiahuhang Expressway

Unit: %

Year	Passenger	Passenger	Passenger	Passenger	Truck 1	Truck 2	Truck 3	Truck 4	Truck 5	Truck 6	Truck 7	Passenger	
	vehicle 1	vehicle 2	vehicle 3	vehicle 4								vehicles	Trucks
2018	62.33%	0.81%	0.94%	1.23%	8.19%	5.31%	2.52%	1.28%	16.03%	0.10%	1.26%	65.31%	34.69%
2019	63.62%	0.75%	0.84%	1.07%	8.68%	4.84%	2.67%	1.37%	15.13%	0.08%	0.95%	66.28%	33.72%
2020	62.35%	0.42%	0.43%	0.61%	9.73%	5.92%	3.43%	3.25%	1.22%	12.64%	-	63.81%	36.19%
2021	61.06%	0.31%	0.36%	0.47%	10.08%	6.15%	2.26%	3.22%	2.18%	13.91%	-	62.20%	37.80%
2022 ¹	56.70%	0.19%	0.11%	0.22%	11.00%	6.99%	2.14%	3.69%	3.10%	15.86%	-	57.22%	42.78%

¹ January to June 2022

² January to June 2022

From 2018 to June 2022, the epidemic had an impact on the traffic volume of the Project’s highways to a certain extent, especially passenger vehicles, which dominated the road sections. From January to June 2022, the passenger vehicles accounted for approximately 57.22% of the total traffic volume, of which passenger vehicle 1 accounted for the largest proportion of 56.70%, followed by truck 6, which accounted for 15.86%.

The historical cross-section weighted average daily traffic volume for the Project’s highways is shown below.

Historical Cross-section Weighted Average Daily Traffic Volume (unit/day)

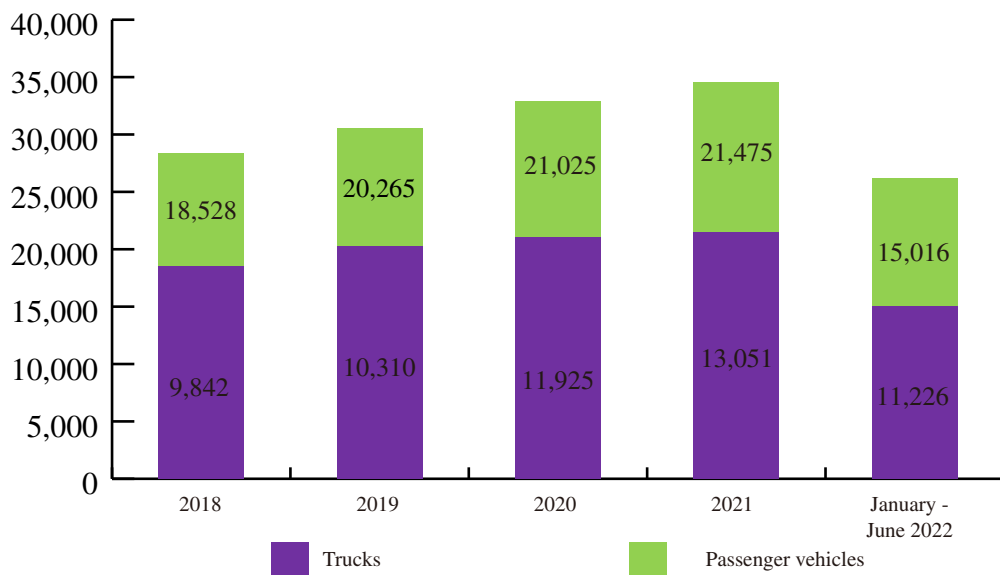


Figure 1 Historical Weighted Average Daily Traffic Flow Cross-section Diagram

Based on the data from Zhejiang Expressway, through the analysis, the vehicle composition of the traffic of all sections and the cross-section weighted average traffic volume for the Project’s highways from January to June 2022 is shown in the figure below. From the distribution of traffic on the Project’s highways, the closer to Hangzhou, the larger the traffic volume, which was followed by the Huzhou-Jiaxing Boundary-Lianshi Junction section after the intersection of the Huzhou section and the Lianhang section.

The composition of various vehicle types of the Project’s highways cross section from January to June 2022 is shown below.

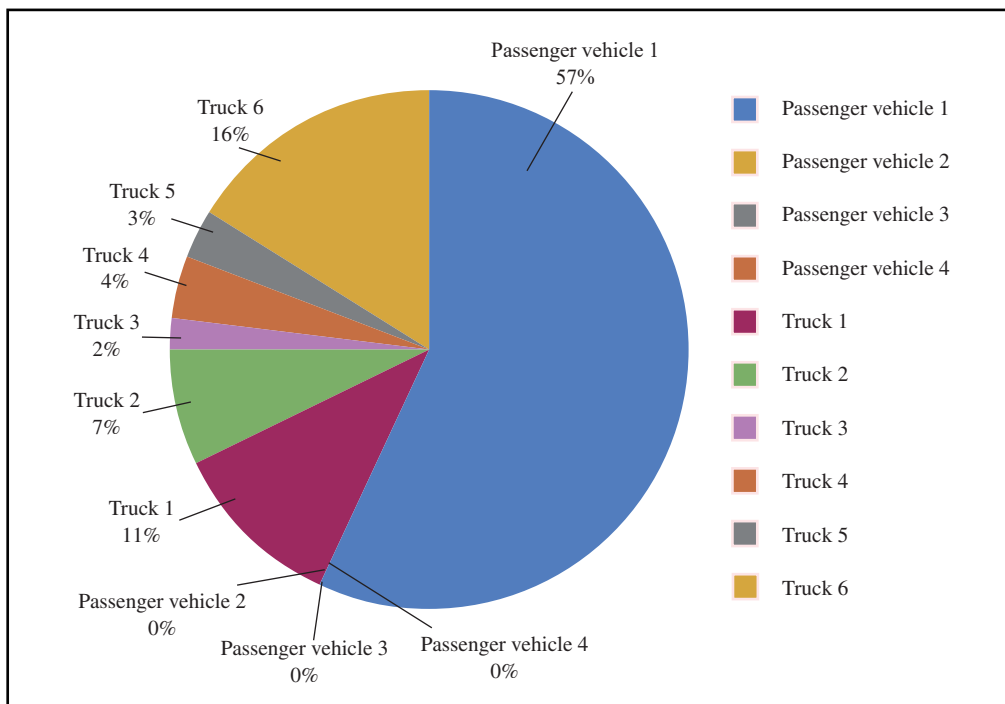


Figure 2 Vehicle Composition of the Project’s Highways Cross-section

6.1.2 Historical Revenue Analysis

1. Average rates by vehicle type

According to the Reply Letter of the General Office of the People’s Government of Zhejiang Province on Tolling for the Jiaxing Section and Huzhou Section of the Shenjiahuhang Expressway (Zhezhenban letter [2007] No. 62) and the Reply Letter of the General Office of the People’s Government of Zhejiang Province on Tolling for the Lianhang Section of the Shenjiahuhang Expressway (Zhezhenban letter [2010] No. 10), the toll rates for the Huzhou section and Lianhang section of the Project’s highways can be found, which are shown in the table below for details.

Table 41 Toll Rates for the Huzhou and Lianhang Sections of the Project's Highways (RMB/km)

Vehicle classification standards	Entrance fee	Mileage fee
Passenger vehicles with 20 seats or less; Trucks under 2 tonnes (inclusive)	5	0.40
Passenger vehicles with more than 20 seats and less than 40 seats (inclusive); Trucks over 2 tonnes and under 40 seats (inclusive)	10	0.8
Passenger vehicles with more than 40 seats (including sleeping cars with more than 32 seats); Trucks over 5 tonnes and under 10 tonnes (inclusive)	15	1.2
Trucks over 10 tonnes and under 15 tonnes (inclusive)	15	1.4
Trucks over 15 tonnes	20	1.6

Toll = Entrance fee + Mileage x Mileage fee for trucks + Tunnel superimposed toll. A tunnel with superimposed toll refers to an independent tunnel equipped with ventilation and monitoring devices, and is classified into 3 categories according to its length: 1,000-2,500m, 2,500-4,000m and over 4,000m, superimposing RMB1/vehicle/trip, RMB2/vehicle/trip and RMB5/vehicle/trip, respectively.

The Project's highways adopted the above-mentioned toll rates from 2018 to 2021, and the rates as specified in Zhezhengbanfa [2021] No. 77 from January to June 2022. The specific toll rates are set out in 7.2.1.

2. Historical toll revenue

Toll revenue from the Project's highways has grown steadily since 2018, with a CAGR of approximately 3.74% from 2018 to 2021 and a CAGR of 9.83% over the past ten years.

In 2020, toll revenue declined significantly by 20.03% year-on-year due to the epidemic, and also declined significantly by 19.3% year-on-year from January to June 2022 due to the epidemic prevention and control in the Yangtze River Delta.

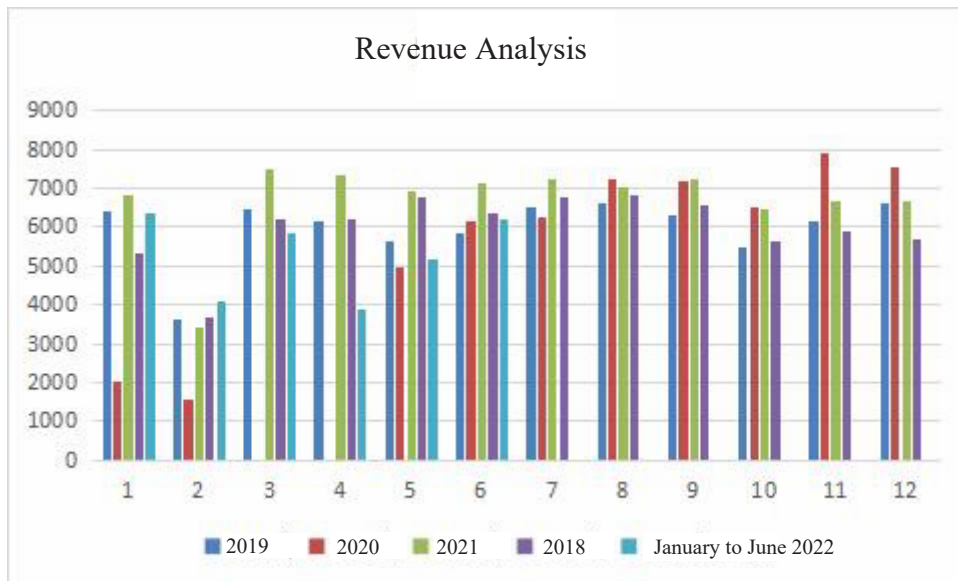


Figure 4 Chart of Monthly Revenue Analysis for 2018 to June 2022

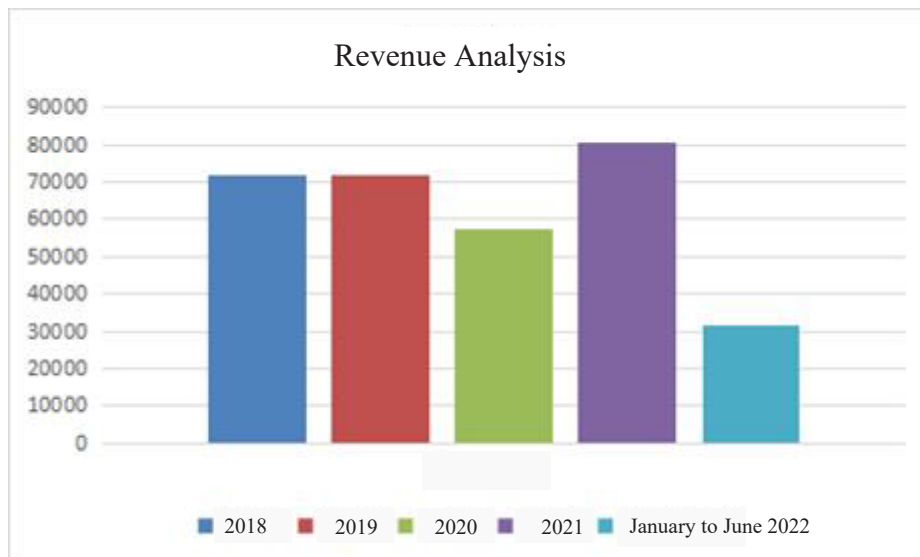


Figure 5 Chart of Annual Revenue Analysis for 2018 to June 2022

6.2 Forecast and Analysis of Future Traffic Volumes on the Project's Highways

6.2.1 Road Network Assumptions in Future Years

For the purpose of analysing the impact of future changes in the road network on the traffic flow of the Project's highways (induced increment or diversion), with reference to the 14th Five-Year Plan of Zhejiang Province, and by collecting the information on recent construction plans of the expressways around the Project's highways as set out in the 14th Five-Year Plan for Comprehensive Transport Development of Zhejiang Province, we have reviewed the progress of the highways under construction and concluded the future changes in the road network around the Project's highways.

Table 42 Table of Road Network Construction in Future Years

No.	Name of highways	Year of opening	Length (km)	Number of lanes	Designed speed (km/h)
1	Hangzhou-Shaoxing-Ningbo Expressway	End of 2023	137	6	120 or above
2	Opening of the Ningguo Section of Ningxuanhang Expressway	End of 2023	36	6	120
3	Sutai Expressway Project	2025	40	6	100
4	Widening of Lianshi Junction to Lushan Junction of Shenjiahu Expressway	End of 2023	36	4	120
5	Husuhu Railway	Early 2023	64.6	Two lines	200-350
6	Opening of the Eastern Section of the Ring Expressway Parallel Line	2025	36	4	100
7	Xinzhi Line	2025	44	6	120

6.2.2 Traffic Capacity Forecast

The factors affecting the traffic capacity of expressways are mainly, among others, design standards (designed speed), composition and traffic volume time distribution (peak hour coefficient). For the Project’s highways with designed speed of 120 km/h, according to the technical standards of highway engineering (JTG B01-214), the traffic capacity of cross sections with the service level III is 1,650 (units/lane/hour) respectively, and the peak hour coefficient of the Project’s highways is 6.35%, which is likely to decrease in the future with the increasing congestion. The evaluation conversion factor for small cars is 1.627 (units/veh) (calculated with reference of historical traffic data), which is likely to decrease in the future as small cars increase more rapidly than other vehicles. The traffic capacity of the Project’s highways is calculated as follows:

1,650 (units/lane/hour) x 4 (lanes) ÷ 1.627 (units/veh) ÷ 6.35% = 63,883 (units/day)

Table 43 Relationship between Service Level and Maximum Servicing Traffic Volume of Expressways

Service level	V/C value	Designed speed		
		120	100	80
		Maximum servicing traffic volume	Maximum servicing traffic volume	Maximum servicing traffic volume
I	V/C ≤0.35	750	730	700
II	0.35 <V/C ≤0.55	1,200	1,150	1,100
III	0.55 <V/C≤0.75	1,650	1,600	1,500
IV	0.75 <V/C≤0.90	1,980	1,850	1,800
V	0.90 <V/C≤1.00	2,200	2,100	2,000
VI	V/C <1.00	0-2,200	0-2,100	0-2,000

Note: Technical Standards for Highway Engineering (JTG B01-2014)

6.2.3 Explanation of Plan Assumptions

Based on the previous study and analysis, the year 2021 was used as the base year, and the forecast period was from 2022 to 2035, with the toll period for the Huzhou Section being up to January 27, 2033, and for the Lianhang Section up to February 5, 2035. Traffic volumes for subsequent years are based on data for the base year, and the forecast of future annual average daily traffic volume is calculated by a computerised traffic assignment model. The forecast of toll revenue is based on the current toll rates.

Table 44 Assumptions of Each Plan

Plan	Year	Assumptions
Basic plans	End of 2023	Opening of the Hangzhou-Shaoxing-Ningbo Expressway
	End of 2023	Opening of the Ningguo Section of Ningxuanhang Expressway
	Early 2025	Opening of the Sutai Expressway
	End of 2023	Completion of the widening of Lianshi Junction to Lushan Junction of Shenjiahu Expressway
	Early 2023	Opening of the Husuhu Railway
	2023	Lifting of trailer ban on West Line of Hangzhou Ring Expressway and thus increasing the number of trailers on the Lianhang Expressway
	2025	Completion of the Eastern Section of Ring Expressway Parallel Line
	2025	Opening of the Xinzhi Line

6.2.4 Traffic Impacts of the New Highways

According to the model analysis, the coming years that would have greater impacts on the Shenjiahuang Expressway are 2023 and 2025. The impacts of the new highways on the Shenjiahuang Expressway in these years are shown in the table below.

Table 45 Traffic Impacts of the New Highways

Schedule	Highway	Diversion/Inducement impacts on Shenjiahuang Expressway	Magnitude of impacts on the Shenjiahuang Expressway
End of 2023	Hangzhou-Shaoxing-Ningbo Expressway	The expressway will be located in the southeast of the Project's highways, connecting Hangzhou and Ningbo. It is relatively far from the Project's highways and impacts are expected to be minimal	

Schedule	Highway	Diversion/Inducement impacts on Shenjiahuhang Expressway	Magnitude of impacts on the Shenjiahuhang Expressway
2023	Lifting of trailer ban on West Line of Hangzhou Ring Expressway	After the ban on trailers is lifted, the number of trailers on the Lianhang section of the Project's highways will increase and the overall traffic flow is expected to increase	Traffic impacts: +0.5%; Revenue impacts: +0.4%
End of 2023	Ningguo Section of Ningxuanhang Expressway	After opening, it will be connected with Shenjiahu Expressway in the Bogushan Tunnel, thus opening up the inter-provincial "dead end road" and inducing an increase in traffic from southern Anhui to Shanghai, Hangzhou and Ningbo	Traffic impacts: +2.2%; Revenue impacts: +2.0%
2025	Sutai Expressway	After opening, Sutai Expressway will be connected to the Project's highways at the Lianshi Junction. The northern section will be connected to the cargo distribution areas in the peripheral areas of Suzhou, thereby shortening the distance between Suzhou and Hangzhou for cargo traffic and inducing more truck traffic; while the southern section will be connected to Shaoxing and Ningbo, parallel to the G25 Changshen Expressway, which will divert part of its inter-provincial traffic flow	Traffic impacts: +2.5%; Revenue impacts: +2.1%
End of 2023	Widening of Lianshi Junction to Lushan Junction of Shenjiahu Expressway	Room for two more lanes has already been reserved for future widening during the design process of the Project's highways, and the bridge construction has been implemented according to the standard of six lanes. Therefore, the widening works can be implemented without road closure and traffic control, so the impact on overall traffic flow is expected to be minimal	–

Schedule	Highway	Diversion/Inducement impacts on Shenjiahuhang Expressway	Magnitude of impacts on the Shenjiahuhang Expressway
Early 2023	Husuhu Railway	Husuhu Railway will be the main connection line for high-speed rail passenger transport in the Yangtze River Delta region, and the impact on freight is expected to be minimal. In terms of passenger transport, the routes between Huzhou, Suzhou and Shanghai in the Huzhou region are relatively short, and the routes generally will overlap more with the G50 Shensuzhewan Expressway, so the overall impact is expected to be minimal	
2025	Eastern section of Ring Expressway Parallel Line	The eastern section of the Hangzhou Ring Expressway Parallel Line will be parallel to the Huzhou section of the Project's highways and connected to the Xinshi Junction of the Lianhang section. Its opening is expected to divert part of the traffic from the Xinshi Junction to the Chongxian Junction of the Lianhang Expressway	Traffic impacts: -2.0%; Revenue impacts: -2.2%
2025	Xinzhi Line	The Xinzhi Line will be partly parallel to the Lianhang section of the Project's highways. Its opening is expected to divert some of the traffic between Nanxun and Leidian to the Xinzhi Line	Traffic impacts: -4.1%; Revenue impacts: -3.9%

7. REVENUE FORECAST AND ANALYSIS

The revenue of the Project is calculated based on the projected increase in traffic and toll rates.

7.1 Traffic Forecast

Based on the historical GDP growth rate of the locations of the Project, Chapter 4 of this report and the historical traffic growth of the Project, the project traffic forecast is as follows:

Table 46 Project Traffic Forecast Results

Vehicle type Year	Vehicle 1 (units)	Vehicle 2 (units)	Vehicle 3 (units)	Vehicle 4 (units)	Truck 1 (units)	Truck 2 (units)	Truck 3 (units)	Truck 4 (units)	Truck 5 (units)	Truck 6 (units)	Total (units)	Annual growth rate
2022	20,496	223	259	306	2,511	2,313	679	426	457	4,717	32,387	(6.19%)
2023	23,531	298	291	389	2,726	2,683	949	572	508	6,066	38,013	17.37%
2024	24,914	300	312	402	3,003	3,709	990	602	533	6,374	41,139	8.22%
2025	25,182	346	366	375	3,218	4,366	1,049	638	563	6,759	42,862	4.19%
2026	27,159	387	397	396	3,495	4,480	1,182	658	586	6,863	45,603	6.39%
2027	28,366	429	459	469	4,272	4,830	1,236	691	614	7,205	48,571	6.51%
2028	29,146	531	461	501	4,637	5,374	1,384	720	641	7,497	50,892	4.78%
2029	30,238	633	563	603	5,098	5,616	1,429	746	664	7,570	53,160	4.46%
2030	31,474	654	565	646	5,359	5,957	1,574	772	685	7,642	55,328	4.08%
2031	32,847	636	567	618	5,416	6,197	1,717	797	699	8,094	57,588	4.08%
2032	34,416	658	589	640	5,472	6,235	1,859	822	717	8,144	59,552	3.41%
2033	35,855	667	596	645	5,528	6,274	1,861	847	730	8,172	61,175	2.73%
2034	35,855	668	599	650	5,530	6,284	1,900	865	735	8,185	61,271	0.16%
2035	35,860	670	600	645	5,460	545	1,906	866	736	8,187	55,475	(9.46%)

Notes to the analysis:

- (1) Traffic volume includes general toll-free vehicles, excluding toll free vehicles during the major festive holidays;
- (2) Traffic flow is expected to drop significantly in 2022 due to the COVID-19 epidemic, with a traffic growth rate of -6.19%;
- (3) In 2023, it is expected that the epidemic situation will gradually improve and the economy will recover. Traffic flow will increase rapidly with a high growth rate of 17.37% in 2023;

- (4) Hangzhou-Shaoxing-Ningbo Expressway will be opened by the end of 2023. Hangzhou-Shaoxing-Ningbo Expressway is located in the southeast of the Project's highways, connecting Hangzhou and Ningbo, which is far away from the Project's highways, so the impact is expected to be minimal;
- (5) In 2023, the ban on trailers will be lifted on the West Line of Hangzhou Ring Expressway. After the ban on trailers is lifted, the number of trailers on the Lianhang section of the Project's highways will increase and the overall traffic flow is expected to increase slightly;
- (6) The Ningguo Section of Ningxuanhang Expressway will be opened by the end of 2023, which will be connected with Shenjiahu Expressway in the Bogushan Tunnel, thus opening up the inter-provincial "dead end road" and inducing an increase in traffic from southern Anhui to Shanghai, Hangzhou and Ningbo with a growth rate of 8.22%;
- (7) Sutai Expressway will be opened in 2025, which will be connected to the Project's highways at the Lianshi Junction. The northern section will be connected to the cargo distribution areas in the peripheral areas of Suzhou, thereby shortening the distance between Suzhou and Hangzhou for cargo traffic and inducing more truck traffic; while the southern section will be connected to Shaoxing and Ningbo, parallel to the G25 Changshen Expressway, which will divert part of its inter-provincial traffic flow;
- (8) The widening of Lianshi Junction to Lushan Junction of Shenjiahu Expressway will be completed by the end of 2023. According to the construction period data, room for two more lanes has already been reserved for future widening during the design process of the Project's highways, and the bridge construction has been implemented according to the standard of six lanes. Therefore, the widening works can be implemented without road closure and traffic control, so the impact on overall traffic flow is expected to be minimal;
- (9) Husuhu Railway will be opened in 2023, which will be the main connection line for high-speed rail passenger transport in the Yangtze River Delta region, and the impact on freight is expected to be minimal. In terms of passenger transport, the routes between Huzhou, Suzhou and Shanghai in the Huzhou region are relatively short, and the routes generally will overlap more with the G50 Shensuzhewan Expressway, so the overall impact is expected to be minimal;
- (10) The Eastern Section of the Hangzhou Ring Expressway Parallel Line will be opened in 2025, which will be parallel to the Huzhou section of the Project's highways and connected to the Xinshi Junction of the Lianhang section. Its opening is expected to divert part of the traffic from the Xinshi Junction to the Chongxian Junction of the Lianhang Expressway;
- (11) The Xinzhi Line will be opened in 2025, which will be partly parallel to the Lianhang section of the Project's highways. Its opening is expected to divert some of the traffic between Nanxun and Leidian to the Xinzhi Line.

7.2 Revenue Forecast

7.2.1 Toll Rates

According to the Notice of the General Office of the People's Government of Zhejiang Province on the Continued Implementation of the Toll Policy for All Toll Roads in the Province (Zhezhengbanfa [2021] No. 77), the toll rates of the Project's highways were implemented on January 1, 2022.

(1) Classification of and toll rates for passenger cars

Tolls for passenger cars = vehicle rate + vehicle kilometres rate x actual mileage travel distance + extra tunnel (bridge) fee.

Table 47 Classification of and Toll Rates for Passenger Cars

Type	Vehicle classification	Vehicle kilometre rate (RMB/vehicle km)	Vehicle rate (RMB/vehicle)
Type 1	≤9 seats (and the vehicle length is less than 6 meters)	0.40	5
Type 2	10-19 seats (and the vehicle length is less than 6 meters)	0.40	5
Type 3	Passenger car trailer ≤39 seats (and the vehicle length is not less than 6 meters)	0.80	10
Type 4	≥40 seats (and the vehicle length is not less than 6 meters)	1.20	15

(2) Classification of and toll rates for trucks and special operations vehicles

Tolls for trucks and special operation vehicles = vehicle kilometer rate x actual travel distance + extra tunnel (bridge) fee.

Table 48 Classification of and Toll Rates for Trucks and Special Operations Vehicles

Type	Vehicle classification	Vehicle kilometre rate (RMB/vehicle km)
Type 1	2 axles (the vehicle length is less than 6 meters and the maximum allowable total mass is less than 4500 kg)	0.45
Type 2	2 axles (the vehicle length is not less than 6 meters and the maximum allowable total mass is not less than 4500 kg)	0.841
Type 3	3 axles	1.321
Type 4	4 axles	1.639
Type 5	5 axles	1.675
Type 6	≥6	1.747

Note: The total number of axles includes suspension axles.

(3) *Extra tunnel fee*

The toll rates for the extra fee for road tunnels on expressways are shown in the table below.

Table 49 Toll Rates for Extra Fee for Road Tunnels on Expressways

No.	Length (m)	Extra fee rate (RMB/vehicle)
1	1,000≤length≤2,500	1
2	2,500<length≤4,000	2
3	4,000<length≤5,500	5
4	5,500<length≤7,000	8
5	7,000<length≤8,500	10
6	8,500<length≤10,000	12
7	10,000 or more	15

7.2.2 Revenue Forecast

The traffic and revenue forecasts from 2022 to 2035 based on traffic survey, the toll rates in 2021 and the actual traffic throughput of Shenjiahuhang Expressway from 2017 to June 2022 are as follows.

Table 50 Project Revenue Forecast

Year	Average daily revenue (RMB 10,000)	Daily growth rate	Annual revenue (RMB 10,000)	Annual growth rate
2021	220.285	–	80,404.12	–
2022 ³	206.640	(6.19%)	75,423.42	(6.19%)
2023	242.536	17.37%	88,525.73	17.37%
2024	261.764	7.93%	95,805.48	8.22%
2025	273.476	4.47%	99,818.56	4.19%
2026	290.966	6.40%	106,202.51	6.40%
2027	309.905	6.51%	113,115.41	6.51%
2028	323.828	4.49%	118,521.15	4.78%
2029	339.185	4.74%	123,802.55	4.46%
2030	353.015	4.08%	128,850.61	4.08%
2031	367.436	4.08%	134,114.12	4.08%
2032	378.931	3.13%	138,688.85	3.41%
2033	223.299	(41.07%)	81,504.08	(41.23%)
2034	212.781	(4.71%)	77,665.19	(4.71%)
2035	214.594	0.85%	7,725.38	(90.05%)
Total			1,389,763.04	

³ Represents the sum of actual toll revenue from January to June and forecast toll revenue from July to December for 2022

Notes to the analysis:

- (1) Toll revenue forecast was based on the current price;
- (2) Toll revenue forecast excluded currently toll free vehicles;
- (3) The forecast results took into account that there would be free passage of vehicles with 7 seats or less in national public holidays, such as Spring Festival, Qingming Festival, Labor Day and National Day;
- (4) The tolling period of the Huzhou section of the Project's highways will end on January 28, 2033;
- (5) The tolling period of all Project's highways will end on February 6, 2035;
- (6) The forecast excludes revenue from the 79-day extension of toll period.

According to the above traffic analysis and revenue forecast, it can be seen that the continuous and stable traffic of the Project's highways could greatly relieve the pressure of traffic congestion, and the interconnection of the expressways could induce an increase in traffic flow and thus toll revenue from expressways. With the development of economy, the expressway tolls will also increase year by year.

8. MAIN CONCLUSION

This traffic and toll revenue forecasts are for the years 2022 to 2035 and the forecasts are based on data collected and combined with data of the expressways recorded during its actual years of operation. However, as the forecasts cannot fully capture all possible changes, there will certainly be discrepancies between the forecasts and the actual results and involve uncertainties. In addition, the traffic and revenue forecasts presented in this forecast report are primarily intended to reflect the overall long-term trends, and the forecasts and actual results in any specific year may differ due to other factors. Therefore, although every effort is made to ensure the technicality of the information provided in the forecasts, the complete accuracy or reliability of the data provided in the forecasts cannot be guaranteed and no liability is accepted for any losses or damages arising from the forecast information.

The traffic forecast and revenue forecast for the years 2022 to 2035 are summarised as follows:

- (1) **The traffic volume of the Project's highways will increase from an average of 32,387 vehicles per day in 2022 to an average of 55,475 vehicles per day in 2035.**
- (2) **The revenue of the Project's highways will grow from RMB0.754 billion in 2022 to RMB1.387 billion in 2032. Total revenue between 2022 and 2035 is forecast to reach to RMB13.898 billion.**

Since the Huzhou section will cease toll collection in 2033, the total revenue is estimated to decrease in 2033, 2034 and 2035. Starting from 6 February 2035, all the Project's highways will cease toll collection. Traffic volume is expected to gradually reach saturation, but will still maintain a slow growth trend with the development of economy and increased car ownership.

Annex: Revenue Forecast for the 79-day Extension of Toll Period

Taking into account the impact of the toll exemption during the COVID-19 epidemic in 2020, this section only provides the forecast for toll revenue for the 79-day extension of the toll period of the Project's highways. Except as discussed in this section, the toll revenue forecast in the body of the report do not include the revenue during the 79-day toll extension period.

The date of cessation of toll collection for the Huzhou Section of the Project's highways is expected to be extended from January 28, 2033 to April 12, 2033; the date of cessation of toll collection for the Lianhang Section of the Project's highways is expected to be extended from February 6, 2035 to April 26, 2035, after which all the Project's highways will cease to be tolled.

The revenue forecast for the extension period is calculated as detailed in the table below.

Table 51 Forecast for the 79-day Extension of Toll Period for the Project

Year	Huzhou Section (days)	Lianhang Section (days)	Revenue (RMB 10,000)
2033	79	–	8,554.20
2035	–	79	<u>16,494.73</u>
Total			<u><u>25,048.93</u></u>

REPORT FROM DELOITTE**INDEPENDENT ASSURANCE REPORT ON THE CALCULATIONS OF
DISCOUNTED FUTURE ESTIMATED CASH FLOWS IN CONNECTION WITH
THE VALUATION OF THE ENTIRE EQUITY INTEREST IN ZHEJIANG
SHENJIAHUHANG EXPRESSWAY CO., LTD. (“SHENJIAHUHANG CO”)****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 1 September 2022 of the entire equity interest in Shenjiahuhang Co as at 30 June 2022 (the “Valuation”) is based. Shenjiahuhang Co is a company incorporated in the People’s Republic of China which is principally engaged in the operation and management of toll collection rights of Huzhou Section and Lianhang Section of the Shenjiahuhang Expressway. The Valuation 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 19 September 2022 to be issued by the Company in connection with major transaction in relation to the proposed issuance of the ABS and the Equity Transfer Agreement (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 the “Principal assumptions for the income approach adopted for the Valuation Report” section of the Announcement (the “Assumptions”). This responsibility includes carrying out appropriate procedures relevant to the preparation of the discounted future estimated cash flows for the Valuation 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 on which the Valuation 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 all material respects, in accordance with the Assumptions. 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 Shenjiahuhang Co.

Because the Valuation relates to discounted future estimated cash flows, no accounting policies of the Company have been adopted in its preparation. The Assumptions 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 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 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.

Deloitte Touche Tohmatsu
Certified Public Accountants
Hong Kong

19 September 2022

LETTER FROM THE BOARD IN RELATION TO THE PROFIT FORECAST

Hong Kong Exchanges and Clearing Limited
12/F, Two Exchange Square,
8 Connaught Place, Central,
Hong Kong

September 19, 2022

Dear Sirs,

**MAJOR TRANSACTION IN RELATION TO THE PROPOSED ISSUANCE OF THE ABS AND
THE EQUITY TRANSFER AGREEMENT (“SHENJIAHUHANG CO”)**

We refer to the announcement of Zhejiang Expressway Cp., Ltd. (the “**Company**”) dated September 19, 2022 (the “**Announcement**”) in relation to the caption matter and the valuation report dated September 1, 2022 (the “**Valuation Report**”) prepared by Jones Lang LaSalle Corporate Appraisal and Advisory Limited (“**Jones Lang LaSalle**”) in relation to the valuation of the entire equity interests in Shenjiahuhang Co.

We understand that Jones Lang LaSalle prepared the Valuation Report based on the discounted cash flow method, and 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 “**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 the entire equity interest of Shenjiahuhang Co has been made with Jones Lang LaSalle, and reviewed the valuation for which Jones Lang LaSalle is responsible.

We have also considered the report from Deloitte Touche Tohmatsu dated September 19, 2022 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 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 Valuation Report and the valuation therein prepared by Jones Lang LaSalle has been made after due and careful enquiry.

This letter is for the sole purpose of Rule 14.62(3) of the 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.
YUAN Yingjie
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 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:

Name of substantial shareholder	Capacity	Number of Shares	Percentage of the issued share capital of the Company (domestic shares)
Communications Group	Beneficial owner	2,909,260,000	100%
Name of substantial shareholder	Capacity	Number of Shares	Percentage of the issued share capital of the Company (H Shares)
China Merchants Expressway Network & Technology Holdings Co., Ltd.	Beneficial owner approved lending agent	258,132,000 (L)	18.00%
Citigroup Inc.	Interest of controlled corporations and approved lending agent	117,244,386 (L)	8.17%
		20,567,176 (S)	1.43%
		96,054,938 (P)	6.69%
JPMorgan Chase & Co.	Interest of controlled corporations, investment manager, person having a security interest in shares and approved lending agent	121,053,079 (L)	8.44%
		28,315,209 (S)	1.97%
		56,189,005 (P)	3.91%
BlackRock, Inc.	Interest of controlled corporations	104,431,277 (L)	7.28%
		4,128,000 (S)	0.29%

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, no other persons had any interests or short positions in the Shares or underlying Shares of the Company that were required to be recorded pursuant to Section 336 of the SFO, or as otherwise notified the Company and the Stock Exchange. Other than Mr. Yu Zhihong, Mr. Jin Chaoyang, Mr. Fan Ye and Mr. Huang Jianzhang who are currently also employed by the Communications Group, no Director is a director or employee of a company which has an interest or short position in the shares and underlying shares of the issuer which would fall to be disclosed to the issuer under the provisions of Divisions 2 and 3 of Part XV of the SFO.

3. OTHER INTERESTS OF DIRECTORS

As at the Latest Practicable Date,

(a) Interests in service contracts

Each of the Directors and Supervisors had entered into a service agreement with the Company, which is effective from July 1, 2021 to June 30, 2024.

Save as disclosed above, none of the Directors or Supervisors 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 or Supervisors had any direct or indirect interest in any assets which had been acquired or disposed of by, or leased to, or which were proposed to be acquired or disposed of by, or leased to, any member of the Group since December 31, 2021, being the date to which the latest published audited financial statements of the Group were made up.

(c) Interests in contracts or arrangements

None of the Directors or Supervisors was materially interested in any contract or arrangement entered into by the Company or any of its subsidiaries which was subsisting and significant in relation to the business of the Group taken as a whole.

4. DIRECTORS' COMPETING INTERESTS

As at the Latest Practicable Date, 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 was known to the Directors to be pending or threatened against any member of the Group.

6. EXPERTS AND CONSENTS

The following are the qualifications of the experts (the “**Experts**”) who have provided their opinions or advice, which are contained in this Circular:

Name	Qualification
Deloitte	certified public accountants
Jones Lang LaSalle	valuer
Baicheng	traffic consultant

As at the Latest Practicable Date, to the best knowledge of the Company, each of the Experts had no 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 is a third party independent of the Company and its connected persons.

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 or report in the form and context in which it is included.

Each of the Experts has not, or has not 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, 2021, the date to which the latest published audited accounts of the Group was made up.

7. MATERIAL ADVERSE CHANGES

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, 2021, being the date to which the latest published audited financial statements of the Group were made up.

8. MATERIAL CONTRACTS

The following contracts (not being contracts entered into in the ordinary course of business) have been entered into by the members of the Group within two years immediately preceding the issue of this Circular are material:

- (a) the equity purchase agreement dated November 10, 2020 entered into between the Company and Communications Group in relation to the acquisition of 30% equity interest in Zhejiang HangNing Expressway Co., Ltd.* (浙江杭寧高速公路有限責任公司) at the consideration of RMB2,685,000,000 payable by the Company;
- (b) the equity purchase agreement dated November 10, 2020 entered into between the Company and Communications Group in relation to the acquisition of the entire equity interest in Zhejiang LongLiLiLong Expressway Co., Ltd.* (浙江龍麗麗龍高速公路有限公司) at the consideration of RMB238,140,000 payable by the Company;

- (c) the equity transfer agreement dated May 7, 2021 entered into between the Company and Mr. Zhou Minghai and Mr. Shi Guoliang in relation to the acquisition of 55% equity interest in Jiaxing Zhajiasu Expressway Co., Ltd.* (嘉興市乍嘉蘇高速公路有限責任公司) at the consideration of RMB771,650,000 payable by the Company at the consideration of RMB771,650,000 payable by the Company; and
- (d) the financial services agreement dated March 25, 2022 entered into between the Company and Zhejiang Communications Investment Group Finance Co., Ltd. in relation to the provision of deposit services, loan services, clearing services and other financial services to the Group by Zhejiang Communications Investment Group Finance Co., Ltd..

9. MISCELLANEOUS

- (a) The registered office of the Company is at 12/F, Block A, Dragon Century Plaza 1 Hangda Road Hangzhou City, Zhejiang Province, PRC 310007 and its principal place of business is at 5/F., No. 2, Mingzhu International Business Center, 199 Wuxing Road, Hangzhou City, Zhejiang Province, PRC 310020. Its representative office in Hong Kong is at Room 1710B, Office Tower, Convention Plaza, 1 Harbour Road, Wan Chai, Hong Kong.
- (b) The H share registrar and transfer office of the Company in Hong Kong is Hong Kong Registrars Limited at Room 1712-1716, 17/F, Hopewell Centre, 183 Queen's Road East, Hong Kong.
- (c) The company secretary of the Company is Mr. Tony H. Zheng. Mr. Zheng is also the Deputy General Manager of the Company. He graduated from University of California at Berkeley in 1995 with a BS degree in Civil Engineering.
- (d) This Circular has been printed in English and Chinese, in the event of inconsistency, the English version shall prevail.

10. DOCUMENTS ON DISPLAY

The following documents are available on the website of the Stock Exchange (www.hkexnews.hk) and the website of the Company (www.zjec.com.cn) for a period of not less than 14 days commencing from the date of this Circular:

- (a) the Valuation Report;
- (b) the Traffic Study Report from Baicheng;
- (c) the letter from Deloitte in relation to the Valuation report, the text of which is set out in Appendix IV to this Circular;
- (d) the letter from the Board in relation to the profit forecast, the text of which is set out in Appendix IV to this Circular; and
- (e) the written consents from the Experts referred to in the paragraph head “6. EXPERTS AND CONSENTS” in this Appendix.