

REPORT

Provincial Logistics Competitiveness Index (LCI) of Vietnam In 2022

A publication celebrating the 30th anniversary of the establishment of the
Vietnam Logistics Services Business Association (1993-2023)

September 2023

Author: Assoc. Prof. Dr. Ho Thi Thu Hoa

Co- Authors:

Mr. Nguyen Duy Minh

MSc. Nguyen Doan Duc Tuan Anh

PhD Candidate, MSc. / Nguyen Thang Loi

MSc. To Thi Hang

Mr. Nguyen Thanh Danh

PREFACE

With a dynamic economy, even when facing global uncertainties, Vietnam's economic growth rate remained consistently stable. However, the logistics system, which plays an important role in the overall foundation of the national economy in Vietnam, still has bottlenecks that need to be cleared. Besides issues such as infrastructure or legal and policy frameworks that take a long time and resources to resolve, there are still other issues that exist but are not properly recognized, creating inconsistencies in the process of building logistics development strategies in Vietnam in general and localities in particular. In particular, logistics is an interconnected and wide-ranging activity, therefore, to develop logistics, it requires inter-sectoral nature and close links between localities with regional connectivity. Aware of responsibility and with the desire to provide a comprehensive picture of the logistics situation of provinces and cities in Vietnam, contributing to creating a foundation to evaluate the effectiveness in building and implementing policies as well as logistics development strategies, the Vietnam Logistics Business Association (VLA) has pioneered in building and implementing the project "Vietnam's Provincial Logistics Competitiveness Index (LCI)". This is a research project with the participation of research units including Vietnam Logistics Research and Development Institute (VLI) and Dream Incubator (DI) and will be evaluated periodically.

The LCI project is also considered a commitment of VLA to implement Tasks 10, 11, 12, 17, 36, 49, 54 and 60 according to Decision 221/QD-TTg dated February 22, 2021 amended Decision 200/QD-TTg dated February 14, 2017 on approving the Action Plan to enhance competitiveness and develop Vietnam's logistics services until 2025 and Resolution 120/ND-CP dated November 17, 2017 of the Government in promoting the spirit of the Resolution of the 13th National Party Congress on Sustainable Development of the Economic Region and Integrated Planning of the Mekong Delta spreading to other Economic Regions.

The Project Research Board also received support, facilitation, and in-depth feedback from agencies and organizations such as the Import-Export Department (Ministry of Industry and Trade), VCCI, and Board IV (Economic Development Research Board of the Administrative Procedure Reform Advisory Council) along with advice from experts such as Professor. Dr. Nguyen Ngoc Tran (former Deputy Chairman of the State Science and Technology Committee, Chairman of the Integrated Basic Investigation Program in the Mekong Delta (1983-1990), National Assembly delegate of the IX, X, XI terms, former Vice Chairman appointed to the National Assembly's Foreign Affairs Committee); Mr. Tran Thanh Hai (Deputy Director, Import-Export Department (Ministry of Industry and Trade).

This first report on LCI scores and rankings in 2022 will prioritize analyzing typical provinces and cities in terms of economic and logistics activities according to 5 pillars including Economy, Logistics Services, Legal Framework and Policy, Logistics Infrastructure and Human Resources. Specifically, the selection of provinces and cities to be included in the sample space is done based on the criteria of GRDP (gross product in the area), volume of goods in circulation and number of logistics enterprises. The items achieved due to compliance with the standards are considered to become official evaluation criteria that will later be the basis for re-evaluation of the LCI.

In the long term, the Steering Committee and Project Research Board believe that the LCI project will have a positive impact on enhancing local logistics capacity and thereby contribute to improving logistics costs, supporting the development of production and exports and attracting foreign investment. In addition, regular LCI reports will play an important role and become a reliable basis for state management agencies as well as the business community to refer to as a basis for building macro and micro strategic plans.

In the first compilation, although many efforts have been made, there may still be shortcomings. We look forward to receiving comments so that we can continue to improve the report in the future.

CONTENTS

CONTENTS	I
LIST OF FIGURES.....	III
LIST OF TABLES.....	IV
LIST OF ABBREVIATIONS.....	V
ACKNOWLEDGMENTS.....	VI
LIST OF PARTICIPANTS IN THE LCI 2022.....	VIII
OPENING STATEMENT	XIII

PART 1: METHODOLOGY FOR RESEARCHING THE PROVINCIAL LOGISTICS COMPETITIVENESS INDEX 15

1.1. METHOD OF SELECTING REPRESENTATIVE PROVINCES	15
1.1.1. Reasons for selecting representative provinces.....	15
1.1.2. Method of selecting representative provinces	15
1.2. METHOD FOR DETERMINING LCI	18
1.2.1. Theoretical basis of the method for determining LCI	18
1.2.2. Overview, meaning and basis for choosing the 5 pillars that constitute LCI.....	19
1.2.3. Overview of measurement methods.....	19
1.2.3.1. <i>Measurement at the research variable level</i>	19
1.2.3.2. <i>Measurement at the pillar level</i>	20
1.2.3.3. <i>Measurement of LCI scores</i>	20
1.2.3.4. <i>Grouping the logistics capacity of provinces according to expert methods</i>	21
1.2.3.5. <i>LCI ranking of provinces/cities</i>	21
1.2.4. Determining the weights.....	21
1.2.4.1. <i>Overview content</i>	21
1.2.4.2. <i>Implementation steps</i>	22
1.3. LIST OF VARIABLES AND SAMPLING METHOD	24
1.3.1. List of variables.....	24
1.3.2. Sample selection method.....	28

PART 2: PROCESS OF IMPLEMENTING RESEARCH ON PROVINCIAL LOGISTICS COMPETITIVENESS INDEX (LCI)..... 30

2.1. PROCESS DESCRIPTION	30
2.1.1. Step 1: Selection of the research sample.....	30
2.1.2. Step 2: Formulation of the pillars.....	31
2.1.3. Step 3: Formulation of a questionnaire	31
2.1.4. Step 4: Determination of the scores for each pillar's criteria.....	31
2.1.5. Step 5: Formulation of the conversion score for the same criterion.....	31
2.1.6. Step 6: Calculation of the score per each pillar.....	32
2.1.7. Step 7: Determination of the LCI score from the survey	32
2.1.8. Step 8: In-depth interviews with experts for grouping	32
2.1.9. Step 9: Combination of LCI scores from the survey and in-depth interviews with experts to determine the final ranking.....	32
2.2. DATA INFORMATION	32

PART 3: RESULTS OF THE PROVINCIAL LOGISTICS COMPETITIVENESS INDEX (LCI) 34

3.1. STATISTICS FOR SURVEY/INTERVIEW SAMPLES	34
3.2. DETERMINATION OF WEIGHTS	35
3.3. ANALYSIS RESULTS BY PROVINCE/CITY	36
3.3.1. Pillar of Economy.....	36
3.3.2. Pillar of Human resources	39
3.3.3. Pillar of Logistics Services	42
3.3.4. Pillar of Legal and Policy Framework.....	47
3.3.5. Pillar of Infrastructure	50
3.3.6. Determination of LCI scores for each locality	53

PART 4: CONCLUSION AND RECOMMENDATIONS 60

APPENDIX..... 66

LIST OF FIGURES

Figure 1. Diagram of AHP	22
Figure 2. Pairwise evaluation of criteria based on priority	22
Figure 3. Describe the process for determining LCI results.....	30
Figure 4. Statistics on the number of businesses based on ownership form.....	34
Figure 5. Vietnam Logistics System.....	61

LIST OF TABLES

Table 1. The province's selection results are based on Economic and Logistics criteria.....	18
Table 2. Random index corresponding to the number of selection criteria.....	24
Table 3. List of proposed observation variables	25
Table 4. Details of the measurement scale for observed variables	27
Table 5. Summary of the sample size that needs to be surveyed by region and provinces/cities	33
Table 6. Statistics of businesses by region	35
Table 7. The Initial matrix.....	35
Table 8. Standardisation matrix.....	36
Table 9. Weights of the pillars	36
Table 10. Criteria to evaluate the "Economy" pillar	36
Table 11. Evaluate the "Economy" pillar for localities according to the proposed criteria.....	37
Table 12. Evaluate the "Economy" pillar for localities after standardization.....	38
Table 13. Criteria to evaluate the "Human Resources" pillar	40
Table 14. Evaluate the Human Resources pillar for localities according to proposed criteria (Not standardization)	40
Table 15. Evaluate the Human Resources pillar for localities after standardization	41
Table 16. Criteria to evaluate the "Logistics services" pillar	42
Table 17. Evaluate the Logistics Services pillar for localities according to the proposed criteria	43
Table 18. Evaluate the Logistics Services pillar for localities after standardization	45
Table 19. Criteria to evaluate the "Legal and policy framework" pillar.....	48
Table 20. Evaluate the Legal and Policy Framework pillar for localities according to the proposed criteria	48
Table 21. Evaluate the legal and policy framework pillar for localities after standardization	49

Table 22. Criteria to evaluate the “Infrastructure” pillar	50
Table 23. Evaluate the Infrastructure pillar for localities according to the proposed criteria	51
Table 24. Evaluate the Infrastructure pillar for localities after standardization	52
Table 25. The Aggregated scores of localities according to each pillar	53
Table 26. LCI scores of localities according to survey results.....	54
Table 27. List of LCI ranks by locality according to experts	55
Table 28. Ranking List of LCI by Locality and Region	56
Table 29. Ranking of Component Indicators Constituting the LCI Score and Specific LCI by Localities	58
Table 30. List of Key Localities for Logistics System Assessment Planned for the Next LCI Evaluation	62

LIST OF ABBREVIATIONS

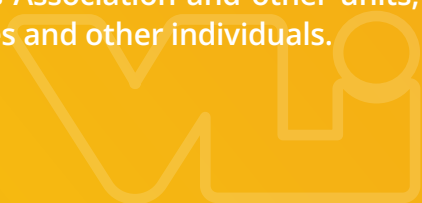
No.	Notations	Meaning
1	AHP	Analytic Hierarchy Process
2	CC	Supply
3	CI	Consistency Index
4	CN	Industry
5	CO	Cargo Owner
6	CR	Consistency Ratio
7	DI	Dream Incubator
8	DV	Service
9	GRDP	Gross Regional Domestic Product
10	VGC	Volume of goods in circulation
11	LCI	Logistics Competitiveness Index
12	LPI	Logistics Performance Index
13	LSP	Logistics Service Provider
14	N/A	Not Available
15	NN	Agriculture
16	PL	Planning
17	RI	Random Index
18	NLB	Number of logistics businesses
19	VLA	Vietnam Logistics Business Association
20	VLI	Vietnam Logistics Research and Development Institute

ACKNOWLEDGMENTS

The Provincial Logistics Competitiveness Index (LCI) project in Vietnam demonstrates the consensus, persistent and persistent striving with high determination from the Vietnam Logistics Business Association (VLA) from 2020 to present with the participation of research units including Vietnam Logistics Research and Development Institute (VLI) and Dream Incubator (DI) with the aim of reflecting the general picture of the Logistics situation in provinces and cities in Vietnam. Vietnam aims to improve capacity, quality of logistics services, regional connectivity and sustainable development of the logistics system together with production and business activities in Vietnam. This is a large-scale project with coverage throughout all regions of Vietnam, requiring the joint efforts of members from the Steering Committee, Professional Advisory Council and members of the Research Committee. We would like to send our sincerest and deepest thanks to all of these wonderful members.

The LCI 2022 Report was initiated and implemented under the direct direction of the VLA Executive Committee. VLI and DI were responsible for formulating and developing the methodology. VLI plays a key role in deciding and directly implementing the survey, processing data, analyzing results inclusive of making recommendations. This report is based on in-depth interview data with experts and leaders of large-scale logistics businesses with the management and coordination of VLI. The process of analyzing survey data from shippers (COs) and logistics services businesses (LSPs) is strictly regulated to ensure quality. The survey work is implemented based on a network of hundreds of VLA and VLI collaborators nationwide under the management and coordination of the VLI Research Board.

The survey implementation process has effective and enthusiastic support from units, organizations and individuals. We would like to express our deepest gratitude to the Department of Import and Export (Ministry of Industry and Trade), Center for Industry and Trade Information (Ministry of Industry and Trade), Department of Industry and Trade of An Giang province, Department of Planning and Investment of Kien Giang province, Office of Vietnam Logistics Business Association (VLA) in Ho Chi Minh City and Hanoi, Hai Phong Logistics Association, Hanoi Logistics Association and other units, organizations and departments in some localities and other individuals.





Besides, we also received professional contributions to help the Project Research Board complete the methodology and valuable opinions to evaluate the current state of logistics in localities as well as general comments about the current status of the logistics system in Vietnam. We would like to express our deepest thanks to the experts with many years of experience in the field of logistics from Transimex Joint Stock Company, Tan Cang Northern Branch - Saigon Tan Cang Corporation, Joint Stock Company Management & Operation of Long An International Port, International Logistics Joint Stock Company - InterLog, T&M Forwarding Company - Hai Phong Branch, Addicon Logistics Management Vietnam, Asiatrans Vietnam Joint Stock Company, Joint Stock Company Quy Nhon Port, AJ Total Vietnam Company Limited, SSIT Port, Ecotruck Company, FM Supply Chain Vietnam Company, Dong A Logistics Joint Stock Company, Delta International JSC, MLC - ITL Logistics, An Giang Port, Company Delta International Joint Stock Company, InDo Trans Logistics Corporation, Maritime Transportation and Services Joint Stock Company, My A Freight Forwarding Joint Stock Company, Tan Cang Logistics Services Center - Saigon Tan Cang Corporation, Kuehne Nagel Vietnam Company, Maersk Vietnam Company, and many other experts from Provinces, Cities, Research Institutes, Associations, and Enterprises that we may not have mentioned enough and listed here. We hope for understanding and sharing from businesses and experts!

To implement the LCI project, we have extremely valuable companionship from sponsors. We would like to express our gratitude to golden sponsors such as International Logistics Joint Stock Company (INTERLOG), Branch of International Logistics Joint Stock Company - WR1, Saigon Newport Corporation, Company Gemadept Joint Stock Company, Southern Logistics Joint Stock Company (SOTRANS), Song Binh Trading and Services Limited Liability Company, Vietnam Air Cargo Services Joint Stock Company; Silver sponsor is LOSCAM Vietnam Limited Liability Company, VINAFCO Joint Stock Company; Co-sponsors include UNIQUE Logistics Vietnam International Limited Liability Company, Gemadept Logistics One Member Limited Liability Company; and co-sponsors ASIATRANS Vietnam Joint Stock Company, Customs and Trade Facilitation Department - VLA, Vietnam Maritime Corporation (VIMC), Vietnam Shipping Agents Joint Stock Company (VOSA), AAAS Forwarding Services Limited Liability Company, Import - Export Logistics Limited Liability Company.

Sincerely thanks!

LIST OF PARTICIPANTS IN THE LCI 2022

THE STEERING COMMITTEE

No.	Full Name	Position
1	Mr. Le Duy Hiep - Chairman of VLA	Head
2	Mr. Nguyen Duy Minh - General Secretary of VLA	Standing Member
3	Mr. Nguyen Thanh Binh - Vice Chairman of VLA	Member
4	Mr. Dao Trong Khoa - Vice Chairman of VLA	Member
5	Dr. Dang Vu Thanh - Vice Chairman of VLA	Member
6	Mr. Do Xuan Quang - Member of VLA Standing Committee	Member
7	Dr. Le Quang Trung - Vice Chairman of VLA	Member

PROFESSIONAL ADVISORY COUNCIL

No.	Full Name	Agency	Position
1	Professor. Ph.D. Nguyen Ngoc Tran	Former member of the National Assembly Foreign Affairs Committee	Former Deputy Chairman of the National Assembly Foreign Affairs Committee, Former Deputy Chairman of the State Science and Technology Committee, Senior Expert of the National Science and Technology Policy Council
2	MSc. Tran Thanh Hai	Ministry of Industry and Trade	Deputy Director of Import-Export Department
3	Mr. Pham Minh Duc	World Bank	Senior Economic Expert
4	Dr. Nguyen Dinh Cung	CIEM	Former Director of the Central Institute for Economic Management (CIEM)
5	Mr. Vu Ngoc Son	Hai An Company	Chairman of the Board

RESEARCH DEPARTMENT

No.	Full Name	Agency	Position
1	Mr. Nguyen Duy Minh	VLA	General secretary
2	Associate Professor. PhD. Ho Thi Thu Hoa	International University VLI	Head of Department of Logistics and Supply Chain Management, International University, Vietnam National University, Ho Chi Minh City - Director of Vietnam Logistics Research and Development Institute (VLI)
3	Mr. Dau Anh Tuan	VCCI	Deputy Secretary General and Head of the VCCI Legal Department
4	MSc. Nguyen Doan Duc Tuan Anh	DI	CEO
5	PhD Can. MSc. Nguyen Thang Loi	FPT University - Can Tho Campus VLI	Lecturer in Biz - Research and Consulting Department Manager
6	MSc. To Thi Hang	Ho Chi Minh City University of Technical Education VLI	Training and Development Cooperation Department Manager
7	Associate Professor. Dr. Nguyen Van Hop	International University	Dean of Faculty of Engineering and Industrial Management, International University, Vietnam National University, Ho Chi Minh City
8	Associate Professor. Dr. Trinh Thi Thu Huong	Foreign Trade University	Deputy Director, Economics and International Business Institute, Foreign Trade University
9	Eng. Nguyen Thanh Danh	VLI	Research specialist
10	PhD Can. MSc. Nguyen Thanh Tuan	VLI	Research specialist
11	Mr. Tran Viet Huy	Trasas	Director of Trasas Maritime Transport and Services Joint Stock Company; Head of Customs and Trade Facilitation Department (VLA)
12	Mr. Bui Thanh Binh	HPLA	General Secretary of Hai Phong Logistics Association
13	Ms. La Uyen Ngoc	SOTRANS Logistics	Deputy Director of Forwarding Division, SOTRANS Logistics Company
14	Mr. Le Kim Cuong	SNPL	Deputy Director of Tan Cang Logistics Services Center
15	Ms. Pham Thi Tinh	InterLOG	Director of Commerce 3PL service, Supply Chain expert
16	Ms. Nguyen Thi Thuy Loan	InterLOG	Director of Commerce for container transport
17	Dr. Nguyen Thi Van Ha	Institute of Logistics and Supply Chain Management - EDINS	Head of Consulting Department in Logistics and Supply Chain Management Institute - EDINS
18	Mr. Pham Ngoc Thach	VCCI	Deputy Head of Department, VCCI Legal Department
19	Ms. Le Thanh Ha	VCCI	Leader, VCCI Legal Department
20	Mr. Truong Duc Trong	VCCI	Data analyst, VCCI Legal Department
21	Ms. Luu Ngoc Anh	VCCI	Research expert, VCCI Legal Department
22	Dr. Nguyen Minh Thao	CIEM	Expert in Customs, Specialized Inspection, and Trade Facilitation

No.	Full Name	Agency	Position
23	Dr. Huynh Minh Triet	Inha University, Korea	Postdoctoral fellow, Jungseok International Trade and Logistics Research Institute, Inha University, Korea
24	Dr. Phan Thi Song Thuong	Institute of Social Sciences of the Central Region	Deputy Director of the Center for Political and Social Research
25	Eng. Nguyen Xuan Mai Tram	VLI	Research specialist
26	MSc. Nakashoji Kazuhiro	DI	Manager
27	MSc. Chu Hieu Linh	DI	Deputy Head of Strategic Consulting Department
28	MSc. Dao Duc Anh	DI	Senior consultant
29	Mr. Nguyen Xuan Thao	Gemadept Logistics	General Manager
30	Ms. Cao Thi Ngoc Thuy	WR1	Commercial director
31	Mr. Ho Van Duy	ABZ Export Import Company Limited	Manager
32	Mr. Nguyen Quang Thanh	Hoang Ha International logistics	Deputy General Manager
33	Ms. Dang Thi Thuy	WR1	Deputy Head of Sales Department
34	Ms. Le Thi Thu Hanh	WR1	Sales specialist
35	Ms. Dao Thi Oanh	WR1	Sales specialist
36	Ms. Tran Bao Ngoc	WR1	Manager
37	Ms. Ho Thi Thanh Tam	WR1	Business team leader
38	Mr. Nguyen Hoang Cuong	WR1	Expert
39	Mr. Tran Thanh Hoa	InterLog	Commercial Director
40	Mr. Le Thanh Ton	InterLog	Deputy Commercial Director
41	Mr. Du Dinh Nhat	InterLog	Deputy Head of HCM Business Development Department
42	Ms. Nguyen Thi Ngoc Diep	InterLog	Head of HCM Business Development Team
43	Ms. Nguyen Thi Nga	InterLog	Deputy Head of Hanoi Business Development Department
44	Ms. Tran Thanh Trang	InterLog	Head of Hanoi Business Development Team
45	Ms. Vo Thi Ai Nhi	InterLog	Head of Hanoi Business Development Team
46	Ms. Pham Thi Tuyet Mai	InterLog	Head of Hanoi Business Development Team

Furthermore, the project implementation team would also like to thank State management agencies, domestic and international organizations, businesses, institutes, schools, partners and collaborators who were interested and enthusiastically supported us during the implementation process in conjunction with conducting surveys for this project. The silent support of your Organizations, Businesses and Experts makes an enormously important contribution to the results of LCI 2022.

OPENING STATEMENT

Logistics has been and continues to be an important service industry, playing a key role in supporting, connecting and promoting Vietnam's socio-economic development. Logistics services are specified in Article 233 of the 2005 Commercial Law as commercial activities whereby traders organize the performance of one or many jobs including reception, transportation, warehousing, yard storage of cargoes, completion of customs procedures and other formalities and paperwork, provision of consultancy to customers, services of packaging, marking, delivery of goods, or other services related to goods according to agreements with customers in order to enjoy service charges. Accordingly, 17 types of logistics services provided in Vietnam are specifically stated in Decree No. 163/2017/ND-CP "Provision of Logistics Services". In addition, the logistics industry receives great attention, support and priority from the Party - Government and Ministries to move towards the position of a key economic sector, helping to improve competitiveness of the Vietnamese economy.

Although there are still many important problems that need to be resolved to promote the stronger development of logistics activities in Vietnam, we recognize the positive results achieved in the logistics field in recent times. Recognizing the urgent need of a unified basis for assessing the current state of Logistics in provinces and cities, helping localities review the current state of logistics development and evaluate the effectiveness of Logistics development policies which are being applied, the project "Vietnam's Provincial Logistics Competitiveness Index (LCI)" has been initiated by the Logistics Services Business Association (VLA) to implement task No. 60 "Do research, rank and evaluate the competitiveness of logistics sector and of logistics services providers" according to Decision No. 221/QĐ-TTg, approved by Prime Minister on February 22, 2021 and supplements to the Decision Decree No. 200/QĐ-TTg dated February 14, 2017 on approving the action plan for improvement of competitiveness and development of Vietnam's logistics services by 2025.

The project has the participation of research units including Vietnam Logistics Research and Development Institute (VLI) and Dream Incubator (DI) with the important tasks of conducting research to reflect the general picture of the Logistics situations in provinces and cities in Vietnam through computing the LCI. This is a large-scale, long-term project with regular reports being carried out, and in the first report for 2022, 26 provinces and cities were selected on the basis of their outstanding Gross Domestic Product (GRDP), volume of goods circulated and number of logistics businesses. The report results focus on determining LCI scores, ranking orders for localities and directional suggestions for LCI reports in the following years. The 2022 LCI report is expected to bring positive meaning and create a breakthrough in Vietnam's logistics development orientation.

VIETNAM LOGISTICS SERVICES ENTERPRISES ASSOCIATION THANKS SPONSORS

GOLD SPONSOR



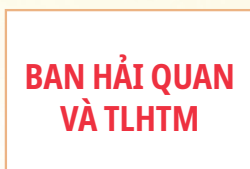
SILVER SPONSOR



BRONZE SPONSOR



CO-SPONSORS



PART 1: METHODOLOGY FOR RESEARCHING THE PROVINCIAL LOGISTICS COMPETITIVENESS INDEX

1.1. METHOD OF SELECTING REPRESENTATIVE PROVINCES

1.1.1. Reasons for selecting representative provinces

The Provincial Logistics Competitiveness Index Report is a regular report that provides a comprehensive logistics overview of all provinces and cities in Vietnam. However, for the first edition in 2022, we did not conduct research and surveys spread across the entire country but instead focused on an in-depth analysis of 26 representative provinces and cities, accounting for more than 1/3 number of provinces and cities in Vietnam. The list of 26 provinces and cities was selected and established on the basis of Economic and Logistics criteria of the entire region. In addition, for provinces and cities that are not included in this LCI report 2022, we plan to continue to complete surveys, research and analysis in regular LCI reports in the coming years.

1.1.2. Method of selecting representative provinces

As mentioned above, this first regular report will prioritize focusing on analyzing outstanding provinces and cities in terms of Economic and Logistics activities. Specifically, the selection of provinces and cities to include in the sample research is based on the criteria of GRDP, volume of goods circulated and number of logistics businesses. All three criteria use data updated in 2021.

Through discussion, we agreed on a plan to select provinces based on these 3 criteria:

▼ The criterion for GRDP:

- * The GRDP criterion was selected as the main criterion thanks to its overview, comprehensiveness in many aspects of the economy (including logistics) and the availability of data.
- * Definition of GRDP (*as defined by the General Statistics Office*)

❖ Concepts

- Gross regional product (GRDP) is a comprehensive economic indicator that reflects the newly added value of goods and services created in the province/city in a certain period of time (6 months, one year). The phrase “goods and final services” is understood that it does not include the value of physical products and services used at the intermediate stages in the production process.
- The calculation of Gross regional product in the area is based on current and comparative prices. In particular, current prices were chosen as the basis for selecting representative provinces in this study because they reflect the market value of goods, services, and assets at the time of transaction, capturing production, circulation, and distribution movements, as well as financial and monetary flows. (*according to the Ministry of Planning & Investment*)

- ❖ **The general content of GRDP is considered from different perspectives:**
 - From the perspective of use (expenditure): GRDP is the gross demand of the provincial and city economy including household final consumption, local Government final consumption, asset accumulation (fixed assets, liquid assets, and rare assets) and the difference between import and export of goods.
 - From a revenue perspective, GRDP includes Labor income, production taxes, depreciation of fixed assets used for production, and production surplus value over the period.
 - From a production perspective: GRDP is calculated as total production value minus intermediate costs.
- * The method of selecting provinces based on GRDP criteria is specifically implemented through the following steps:
 - ❖ **Step 1 - Zoning:**
 - The report not only provides analysis based on the logistics competitiveness of each individual province but also comprehensive research on the scope of logistics capacity and the coordination of the entire socio-economic region. According to the National Master Plan for 2021 - 2030 with vision toward 2050, Vietnam is divided into 6 socio-economic regions and institutionalized in Resolution No. 81/2023/QH15 dated January 9, 2023, of National Assembly.
 - The rationale for adopting the above zoning plan is consisted of (1) comprehensiveness, including all 63 provinces and cities in Vietnam and (2) the purpose of the LCI report which aim to rank, evaluate competitiveness and develop logistics services, which can create an impact on the economic and social development of each locality.
 - ❖ **Step 2 - Classifying provinces on the key industry groups of province and city:**
 - In each region, the top 3 representative provinces for each industry group will be selected (3 provinces with the highest GRDP proportion of Agriculture, Industry/Construction, and Services compared to other provinces in the region)
 - ❖ **Step 3 - Selecting the representing province for each industry group of each region:**
 - Among 3 provinces and cities where each industry group is the dominant one, the province with the highest level of industry-specific development, as measured by GRDP value, is selected as the representative.
- ▼ **The Criterion for the volume of goods in circulation (VGC)**
 - * Besides the criteria for GRDP, criterion for VGC is also applied. The reasons for choosing this criterion are consisted of (1) the project nature is about logistics competitiveness, the list of selected provinces must be truly representative of the logistics capacity of a province/region; (2) this criterion reflects the results of freight transport activities of transport units in correlation with the actual transport distance in the province/city; (3) the results after consulting a number of similar reports in the world (Türkiye, India, LPI World Bank) as well as Circular 12/2021/TT-BKHD on Regulations on the system of logistics and statistical indicators; (4) the feasibility of data collection.

* Definition of VGC (according to the General Statistics Office)

❖ Concepts:

- VGC is the volume of freight transport calculated based on 2 factors: Volume of the transported goods and Actual transport distance. The unit of measurement is Ton-Kilometer (T.Km).

❖ Method of Calculation:

$$VGC (T.Km) = Volume\ of\ the\ transported\ goods\ (T) \times Actual\ transport\ distance\ (Km)$$

In which, the volume of the transported goods refers to the total quantity of goods moved within a specified period, regardless of transportation distance. Calculating the volume of the transported goods is based on the actual weight of the transported goods (including packaging, if any). The volume of the transported goods is only calculated after the completion of the transport, meaning that the goods must have been delivered to the designated location as specified in the transport contract, and all necessary loading and unloading procedures must be completed. For bulky goods transported by road in conditions where it is not possible to directly weigh and measure the volume, it is estimated to be 50% of the vehicle's tonnage or calculated according to the agreement between the vehicle owner and the goods owner to determine the actual volume of goods.

■ **The Criterion for the Number of Logistics Businesses (NLB)**

- * In addition, another additional logistics criterion is also considered in this report, which is the criterion for the number of logistics businesses in the province and city. Regarding the reasons for selection, in addition to the same reasons as for the criterion for VGC such as (1) the project nature is about logistics competitiveness, list of selected provinces must be truly representative of the project logistics capacity of a province/region; (2) the results after studying Circular 12/2021/TT-BKHDT on Regulations on the system of logistics statistical indicators and (3) the level of feasibility in data collection, this criterion also reflects (4) capacity to provide logistics services in each province.

❖ Definition of criterion for NLB (according to Circular No.12/2021/TT-BKHDT on Logistics Statistics Index System - Ministry of Planning and Investment of Vietnam)

- * The number of logistics businesses consisted of the businesses which provide logistics services such as road, rail, aviation, sea transport, inland waterways and multimodal transport, warehousing and distribution businesses, forwarding and customs agents... In which, a business is defined as an organization possesses a legal identity, owns assets, has a registered transaction office, and is established or registered in accordance with legal regulations for business purposes. Data sources are collected by the Economic Census, Business Survey, and Administrative Data of the General Statistics Office in coordination with the Ministry of Finance.
- * After evaluating all 3 criteria, 20 provinces and cities were selected from the criterion for GRDP, 6 provinces and cities from the criterion for VGC and 6 provinces from the criterion for NLB. After eliminating duplicate results, a final total of 26 provinces and cities was obtained (Table 1).

Table 1. The province's selection results are based on Economic and Logistics criteria

Regions	Representative provinces and cities (GRDP)	Representative provinces and cities (VGC)	Representative provinces and cities (NLB)	Representative provinces and cities
Northern midland and mountainous	Tuyen Quang (NN) Bac Giang, Thai Nguyen (CN) Dien Bien, Lang Son (DV)	Phu Tho	Phu Tho	Tuyen Quang Bac Giang Dien Bien Phu Tho Thai Nguyen Lang Son
Red River Delta	Thai Binh (NN) Bac Ninh (CN) Ha Noi (DV)	Hai Phong	Ha Noi	Thai Binh Bac Ninh Ha Noi Hai Phong
North Central Coast and South-Central Coast	Binh Dinh (NN) Thanh Hoa (CN) Da Nang (DV)	Nghe An	Da Nang	Binh Dinh Thanh Hoa Nghe An Da Nang
Highlands	Lam Dong (NN) Gia Lai (CN) Dak Lak (DV)	Gia Lai	Dak Lak	Lam Dong Gia Lai Dak Lak
Southeast	Ba Ria - Vung Tau (NN) Binh Duong, Dong Nai (CN) Ho Chi Minh city (DV)	Ho Chi Minh city	Dak Lak	Ba Ria - Vung Tau Binh Duong Ho Chi Minh city Dong Nai
Mekong River Delta	Kien Giang, Tien Giang (NN) Long An (CN) Can Tho (DV)	An Giang	Can Tho	Kien Giang Long An Can Tho An Giang Tien Giang

1.2. METHOD FOR DETERMINING LCI

1.2.1. Theoretical basis of the method for determining LCI

LCI was formulated with the purpose of reflecting the general picture of the Logistics landscape across provinces and cities in Vietnam. To calculate this index, a combined qualitative and quantitative method is established the combination of the scientific and practical bases and the results which are inherited by relevant reports around the world and comments during the implementation process from a team of logistics experts with over 20 years experiences. The method of determining indicators using a combined qualitative and quantitative method in calculating index sets is widely applied globally. However, the current method will create high subjectivity for the LCI determination process. The Analytical Hierarchy Process (AHP) method which was researched and developed by Professor Thomas L. Saaty (1970), is an

integrated analysis method between quantitative and qualitative methods that will help solve the mentioned limitations. Furthermore, with the support of a team of logistics experts, the results that are collected during the entire research process, are continuously updated and scheduled for regular discussion through dozens of meetings during the process of conducting the LCI study. With improvements based on scientific and practical foundations, the new methodology will meet the requirements for accuracy and objectivity in calculating LCI.

The LCI results demonstrate the close coordination, determination and professional implementation efforts from the Steering Committee, Advisory Council, Research Committee and support forces from organizations, businesses and individuals, domestic and foreign experts.

1.2.2. Overview, meaning and basis for choosing the 5 pillars that constitute LCI

The LCI is calculated based on 5 main pillars including: Economy, Logistics services, Legal and Policy Framework, Infrastructure and Logistics human resources. These pillars are composed of 42 research variables.

Regarding the basis of selection, the 5 pillars of Economy, Logistics Services, Legal and Policy Framework, Infrastructure and Logistics Human Resources are synthesized to form a group of factors that broadly reflects the logistics capacity of a region.

Economic development is a strong motivation for the development of logistics services because the logistics industry is always associated with the task of promoting the flow of economic transactions. Therefore, it is necessary to pay attention to the Economy pillar when calculating the logistics competitiveness index of a region. The Logistics Services pillar directly demonstrates logistics competitiveness in a region through the quality and capacity of service providers. To create conditions for the development of logistics activities, the Legal and Policy Framework of each region plays a key role by expressing the orientation and strategy of authorities at all levels. Finally, elements of Infrastructure, including Hard Infrastructure (e.g. roads, wharves, etc.) and Human Resources, serve as the foundation for the development of logistics. Hard infrastructure helps speed up progress, smooth logistics operations, and limit congestion. Meanwhile, the Human factor plays a decisive role in the competitiveness of the logistics industry because this is the resource that directly operates the relevant activities.

In addition, the selection of pillars is also based on the reference to the relevant reports around the world such as the Logistics Performance Assessment Report of Provinces in Turkey (using the Economic, Infrastructure, and Human Resources pillars), World Bank's Logistics Capacity Index (LPI) Report (Using the Logistics Services Pillar), Logistics Competitiveness Report of Provinces in India (Using the Logistics Services, Legal and Policy Framework, Infrastructure, Human Resources pillars), VCCI's Provincial Competitiveness Index (PCI) Report (using the Legal and Policy Framework pillar).

1.2.3. Overview of measurement methods

1.2.3.1. Measurement at the research variable level

For each research variable, we collect data, including primary and secondary data. Primary data mainly reaches from the surveys of collecting opinions and assessments of parties

involved in the province's logistics value chain such as cargo owners, logistics services providers, Policymaking agencies and leading experts in the field of logistics in Vietnam. For secondary data, we use statistical data from State agencies (Departments, Boards, Sectors) such as the General Statistics Office, Ministry of Industry and Trade, Ministry of Transport, Statistics Departments - Departments of Transport - Department of Industry and Trade, etc. of provinces and cities.

After completing the data collection, we process and standardize the data to a common scale from 0 to 100 points. Specifically, the province with the best rating on a certain logistics criterion will be given 100 points and the province with the worst rating will be given 0 points for the same criterion.

This normalization method is applies to both positive and negative criteria. For positive criterion, that is, the higher the index score, the better the logistics quality, for example, criterion for completeness and punctuality of logistics services implementation, general data standardization formula will be shown in equation (1)

$$\text{Standardized score} = 100 \times \left(\frac{i - \min}{\max - \min} \right) \quad (1)$$

Thus, for the above example, a score of 100 will be given to the province with the highest rating for the completeness and punctuality of logistics services implementation, while a score of 0 will be given to the province with the lowest rating. For the inverse criterion, where a lower index score indicates better logistics performance, such as the criterion Ratio of logistics costs to cost of goods sold of the business, the general data standardization formula will be shown in equation (2)

$$\text{Standardized score} = 100 \times \left(1 - \frac{i - \min}{\max - \min} \right) \quad (2)$$

In this example, a score of 100 will be given to the province with the lowest ratio of logistics costs to the business's cost of goods sold and vice versa, a score of 0 is given to the province with the highest ratio of logistics costs to the business's cost of goods sold.

1.2.3.2. Measurement at the pillar level

After measuring the research variables, the score of each pillar will be determined by averaging the scores of the constituent variables. The assumption of this method is that the variables belongin each pillar have equal weight (Weighted average method). This method is widely applied in similar studies worldwide, typically the Logistics Performance Assessment Report of the Provinces in Turkey, and the World Bank's Logistics Capacity Assessment Report.

1.2.3.3. Measurement of LCI scores

In this step, each variable is weighted using the Analytical Hierarchy Process, referred to as the AHP method.

Theoretically, AHP is a weight calculation method applied to multi-criteria problems, developed by Thomas L. Saaty (1970) and has been expanded and supplemented to date. It has been applied in many different fields such as natural sciences, economics, society, health, etc. Specifically for the logistics field, the AHP method is also widely applied in Logistics capacity scoring reports, typically the Logistics Performance Assessment Report of provinces in Turkey.

Regarding the basis for the reason why the AHP method is chosen, we propose to apply AHP method first because of its high efficiency with economic and logistics data in Vietnam and high feasibility in implementation. Besides, the advantage of the AHP method is the ability to structure complex, multidimensional problems in a simple and easy-to-understand way. AHP entails building a hierarchy with primary and secondary attributes, alternatives, etc. This facilitates the communication of complex problems into smaller components as well as proposed solutions.

1.2.3.4. Grouping the logistics capacity of provinces according to expert methods

The step of ranking logistics capacity based on expert evaluation is conducted at the same time as the step of measuring LCI scores from survey/interview results to always ensure objectivity when combining the results between these steps. Accordingly, logistics capacity in provinces/cities will be divided into 4 groups as follows:

- + Group A: Group of provinces/cities with the best logistics capacity
- + Group B: Group of provinces/cities with good logistics capacity
- + Group C: Group of provinces/cities with average logistics capacity
- + Group D: Group of provinces/cities with the weakest logistics capacity

Logistics experts are invited to participate in the assessment in this step include representatives from organizations, research institutes, logistics services providers and users on a large scale and with a wide area of operation. The final rankings are consolidated based on priority, arranged in descending order from Group A to Group D.

1.2.3.5. LCI ranking of provinces/cities

The LCI results obtained from the calculations will be combined with the grouping results to determine the final rankings of provinces/cities. At this step, the conversion ratio between the survey/interview results and the grouping results from the Experts is applied based on the method used by World Competitiveness Ranking (2023). Accordingly, the statistical indicators obtained from the results of in-depth interviews with experts who have many years of experiences and leaders of large-scale businesses in the field under consideration, account for one-thirds weight in the overall rank. The criteria are drawn from the annual Executive Opinion Survey called survey data, which accounts for two-thirds weight (World Competitiveness Ranking, 2023). By applying this conversion rate, an LCI rank for 26 provinces and cities will be established. The final displayed result represents the definitive ranking outcome.

1.2.4. Determining the weights

1.2.4.1. Overview content

The Analytical Hierarchy Process (AHP) allows for the simultaneous evaluation of multiple sub-criteria within broader groups of criteria, combining both qualitative and quantitative analyses. Based on the principle of pairwise comparison, the AHP method can be described with three main principles, which are analysis, evaluation and synthesis. AHP addresses key decision-making questions, such as “Which option should be chosen?” or “Which option is the most optimal?” by identifying the best option that satisfies the decision maker’s criteria based on comparison of pairs of options and a specific calculation mechanism. The problems of the problem are modeled in Figure 1.

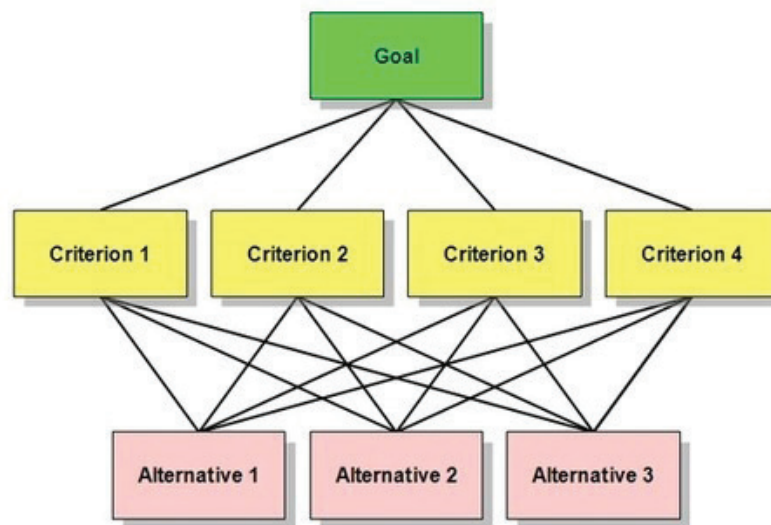


Figure 1. Diagram of AHP

Source: Thomas E Saaty (1970)

Suppose we have a problem that needs to be decided (called a goal), which must be based on many criteria (Criterion C1, Criterion C2, ..., Criterion Cn). The Alternatives, that can be compared, are Alternative A1, Alternative A2, ... Alternative Am.

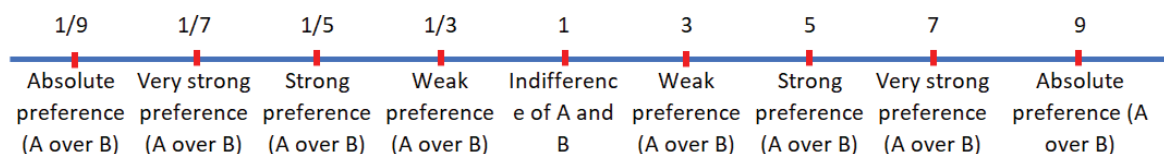
1.2.4.2. Implementation steps

The AHP method was proposed by Thomas E Saaty in 1970, based on how the human brain analysis deals with complex and fuzzy problems (Asgharpour, 2014)¹. The steps of this method are presented as follows:

Step 1: Determine the criteria

In the first step, the authors needs to identify important criteria for making decisions about the target problem.

Step 2. Pairwise comparison of experts



An intermediate numerical values 2, 4, 6, 8 and 1/2, 1/4, 1/6, 1/8 can be used as well

Figure 2. Pairwise evaluation of criteria based on priority

Source: Asgharpour (2014)

Carry out comparisons of criteria in pairs, the level of importance of criteria pairs, we get a square matrix ($n \times n$) as equation (3). Priority levels (b_{ijk} values, with i running in rows, j running in columns and k representing the k th expert participating in the survey) in criteria pairs are determined by the positive integer values from 1 to 9 or the inverse of these

1. Asgharpour, M.J., 2014. Multiple Criteria Decision Making. Tehran University Publication (in Persian).

numbers, are converted to equivalent significance levels as explained in Figure 2.

The coefficients of the matrix are derived from the pairwise comparison scores between components, factors or criteria. Paired comparison values are performed by experts' opinions. The coefficient value of the correlation matrix completely depends on the subjectivity of the researcher in quantifying the weights for the objectives, which is a drawback of this method. Specifically, for the LCI report, logistics experts will be asked to compare the pillars in pairs, based on the degree of correlation of each pillar to the province's logistics capacity..

$$D_k = \begin{bmatrix} b_{11k} & \dots & b_{1nk} \\ \dots & b_{ijk} & \dots \\ b_{n1k} & \dots & b_{nnk} \end{bmatrix} \quad k = 1, \dots, K; i = 1, \dots, n; j = 1, \dots, n \quad (3)$$

Step 3: Calculation of the geometric mean value of expert opinions

$$D = \begin{bmatrix} d_{11} & d_{1n} \\ \dots & \dots \\ d_{n1} & d_{nn} \end{bmatrix} \quad (4)$$

$$d_{ij} = \sqrt[k]{\prod_{k=1}^K b_{ijk}} = 1/d_{ji} \quad \forall i, j \quad (5)$$

Step 4: Standardization

$$r_{ij} = \frac{d_{ij}}{\sqrt{\sum_{i=1}^n d_{ij}^2}} \quad \forall i, j \quad (6)$$

Step 5: Calculation of the weights for the criteria

After completing the matrix, the evaluator will calculate the weights for the criteria following equation (4)

$$w_i = \frac{\sum_{j=1}^n r_{ij}}{\sum_{i=1}^n \sum_{j=1}^n r_{ij}} \quad \forall i \quad (7)$$

However, the weight values () from step 5 are not the final conclusive values, it is necessary to check the consistency in the experts' assessments during the application of this method. Saaty, T.L, (2008) points out that a consistency ratio (CR) less than or equal to 10% is considered acceptable. In other words, there is a 10% probability that the experts answer the questions completely at random. If the CR exceed 10%, the assessment is deemed inconsistent, necessitating reassessment and recalculation (see equation (8)).

$$CR = \frac{CI}{RI} \quad (8)$$

In which, CR: consistency ratio; CI: consistency index; RI: random index
CI will be calculated by the equation (9)

$$CI = \frac{\lambda_{max} - n}{n - 1} \quad (9)$$

where, λ_{max} is the largest eigenvalue of the pair comparison matrix ($n \times n$), the largest eigenvalue λ_{max} is always greater than or equal to the number of rows or columns n . The more consistent the judgment, the calculated value λ_{max} is closer to n (which is the size of the calculated matrix). λ_{max} is determined by equation (10).

$$\lambda_{max} = \frac{\sum_{j=1}^n d_{ij} * w_j}{w_i} \quad \forall i \quad (10)$$

In which, k is the expert index, K is the total number of experts, is the pairwise comparison matrix created by the k th expert and is the level of influence of the i th criterion (factor) on the j th factor according to the opinion of the k th expert. D represents the geometric mean matrix of expert opinions. indicates the standardized matrix entries. represents the weight of the i th criterion. CR denotes the inconsistency coefficient, CI denotes the consistency index, and RI denotes the stability coefficient, n indicates the number of elements and the RI value for n is taken from Table 2.

Table 2. Random index corresponding to the number of selection criteria

n	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
RI	0	0	0.6	0.9	1.1	1.2	1.3	1.4	1.5	1.5	1.5	1.5	1.6	1.6	1.6

Source: Saaty (1995)²

Step 6: Calculation of the points for Alternatives and Choices

This is the final step in the evaluation and solution process. From Step 3, the weight matrix of alternatives for each criterion is synthesized. This matrix is then with the weight matrix of criteria as the result of Step 2 to reach a matrix of m rows (m alternative s) and 1 column (weight values). The resulting matrix will indicate the best alternative which has the highest weight value.

1.3. LIST OF VARIABLES AND SAMPLING METHOD

1.3.1. List of variables

Through the completion process, the list of the official variables includes 42 research variables (Table 3). The basis for formulating a list of variables and measurement methods is based on reference to relevant research around the world such as the Logistics Performance Assessment Report of the Provinces in Turkey, the Logistics Capacity Report of Turkey, and the Logistics Capacity Report of Turkey, World Bank, etc. In addition, we also consulted 20 experts from leading organizations and businesses in logistics to have a basis for formulating

2. Saaty, T. L. (1995). Transport planning with multiple criteria: The analytic hierarchy process applications and progress review. Journal of Advanced Transportation, 29(1), 81-126.

a list of variables, sampling methods and data standardization methods..

Table 3. List of proposed observation variables

No.	List of variables	Sources	Scales*	Scopes
Pillar 1: Economy <i>(Represents the scale of the economy and the level of use of logistics services by sectors in the economy. The scale of the economy creates motivation for logistics development, while the level of use of logistics services reflects the value that the logistics industry creates for the economy)</i>				
1	Ratio of basic components of logistics costs to cost of goods sold - Transportation costs/Cost of goods sold - Handling costs/Cost of goods sold - Warehouse costs/Cost of goods sold - Administrative expenses/Cost of goods sold	CO Survey	Unit: %	Province / City
Pillar 2: Logistics Services <i>(Demonstrates the quality and capacity of businesses providing logistics services)</i>				
1	Level of application of information technology in management and operation of logistics activities - Level of application of information technology and software - Level of implementation of digital transformation applications (IoT, Blockchain, Big data,...) - Level of implementation of automation technology application	LSP Survey	1-5 (Very poor - Very good)	Province / City
2	The level of implementation of green logistics activities of enterprises, specifically reducing the negative impacts of enterprises on the environment (such as reducing environmental pollution, reducing noise pollution, reducing waste, using clean fuels, electric vehicles, using renewable energy, recycled packaging materials, etc.)	LSP Survey	1-5 (No policy - Very good implementation)	Province / City
3	Availability (in terms of quantity and quality) of service providers supporting the logistics industry	LSP Survey	1-5 (Very poor - Very good)	Province / City
4	The effectiveness of integrating transport modes into freight services	LSP Survey	1-5 (Very ineffective - Very effective)	Province / City
5	The level of economic efficiency for using logistics services - The effectiveness of outsourcing - Transportation costs/Cost of goods sold - Handling costs/Cost of goods sold - Warehouse costs/Cost of goods sold - Administrative expenses/Cost of goods sold	LSP Survey	1-5 (Very poor - Very good)	Province / City

No.	List of variables	Sources	Scales*	Scopes
6	Completeness and timeliness of shipments upon arrival at destination compared to the contractual deadline	CO Survey	Unit: %	Province / City
7	Capacity of logistics services providers - Ability to ensure product quality and product security - Ability to track and trace journeys - Warehouse availability - Ability to adapt to customer needs	CO Survey	1-5 (Very poor - Very good)	Province / City
8	Ability to meet customer requirements for logistics services - Ability to respond to customer requests and complaints - Availability of freight vehicles	CO Survey	1-5 (Very slow - Very fast)	Province / City
Pillar 3: Legal and Policy Framework <i>(Demonstrates the planning capacity, policy development capacity, and policy implementation capacity of the government. Legal framework and policies demonstrate the creation of an environment to promote the development of logistics activities)</i>				
1	Capacity to promote digital transformation and facilitate transportation of government agencies in the region	LSP Survey	1-5 (Very poor - Very good)	Region
2	Reasonableness of toll fees in the region	LSP Survey	1-5 (Very unreasonable - Very reasonable)	Region
3	Legal criteria and logistics development policies - The level of dissemination of guidance documents and materials related to regulations and policies in the logistics sector in the region. - The level of clarity and understanding of guidance documents and materials related to the region's logistics development policy - The level of simplification and efficiency of processes, legal procedures, customs procedures in the region to facilitate the movement of goods	LSP Survey	1-5 (Very poor - Very good)	Region
4	Level of corruption in customs procedures in the region	LSP Survey	1-5 (None - Very severe)	Region
5	Smooth and consistent coordination in management and policy implementation in the logistics sector of relevant state management agencies in the region (Ministry of Industry and Trade, Ministry of Transport, General Department of Customs, etc.)	Survey and Interview (CO & LSP)	1-5 (None - Very good)	Region
Pillar 4 - Infrastructure <i>(Demonstrates connectivity & Infrastructure Quality. Infrastructure plays a role in speeding up progress, helping logistics operations run smoothly)</i>				

No.	List of variables	Sources	Scales*	Scopes
1	Quality of infrastructure in the province/city where the business is operating - Road infrastructure - Railway infrastructure - Telecommunication infrastructure and information technology services	LSP Survey	1-5 (Very poor - Very good)	Region
2	Ease of access to infrastructure in the area - Ease of access to seaports - Ease of access to the airport - Ease of access to railway station	LSP Survey	1-5 (Very poor - Very good)	Region
3	Port Infrastructure Quality - Quality of Port Infrastructure - Quality of Airport Infrastructure - Quality of Inland Water Port Infrastructure	LSP Survey	1-5 (Very poor - Very good)	Region
Pillar 5 - Logistics human resources (Represents the quantity and quality of resources operating logistics activities)				
1	The ratio of female employees to the total number of employees in the enterprise	LSP Survey	Unit: %	Province / City
2	Percentage of logistics personnel trained in the correct logistics major/related to the logistics industry	LSP Survey	Unit: %	Province / City
3	Professional capacity of logistics personnel in the enterprise	CO & LSP Survey	1-5 (Very poor - Very good)	Province / City

Notes: Observed variables will be uniformly converted on a scale of 1-5 representing specific characteristics according to their specific nature. Besides, for observed variables with similar characteristics in terms of statistical significance, a scale from 1-5 is also used with the purpose of displaying the level from Very Poor to Very Good. Details of the measurement scale for the variables on the 1-5 scale will be presented in Table 4.

Table 4. Details of the measurement scale for observed variables

No.	Measurement characteristics	Capacity to provide green, sustainable logistics services	Integrated planning (PL) capacity	Transparency in the customs process	The remaining variables
1		Absolutely no policy	Absolutely no integrated PL	The problem of harassment is very serious	Very poor
2		Start with policies	Starting integrated PL policy	The problem of harassment is serious	Poor

No. / Measurement characteristics	Capacity to provide green, sustainable logistics services	Integrated planning (PL) capacity	Transparency in the customs process	The remaining variables
3	Start implementation	Start implementing integrated PL	There is harassment but it is acceptable	Normal
4	Well done	Effective integrated PL	There is very little interference	Good
5	Very well done	Very effective integrated PL	There is absolutely no interference	Very good

1.3.2. Sample selection method

As shown in table 3, LCI is currently being measured by 42 criteria (research variables), which are divided into 2 main groups including (1) a group using available data (secondary) and (2) a group using survey data (primary).

Specifically, for the variable using secondary data, information will be collected from the Government's database, including the agencies of the General Statistics Office, the Ministry of Industry and Trade, the Ministry of Transport, and the Ministry of Planning and Investment. Planning and Investment, General Department of Customs, etc. The data used in this report is from 2022.

For primary variables, data will be collected through two forms: survey and in-depth interview.

▼ With survey method:

* Subjects: Cargo Owners (COs) and logistics experts. In particular, logistics experts include two groups, including (1) reputable businesses in the logistics industry, and (2) representatives individuals from research fields such as research institutes and universities.

* Purpose:

- Cargo Owners: quantify variables (see Table 3 for details)
- Logistics experts: quantify variables (see Table 3 for details) & determine weights for the 5 pillars according to the AHP method

* Number of samples:

- Cargo Owners: To ensure representativeness, relied on the stratified random sampling method, the survey sample needs to satisfy the following requirements:
 - » Regarding industry, ensure that at least X% of the sample must belong to the province's main industry group (X is the proportion of the main industry group in the GRDP structure)
 - » Regarding business scale, ensure that at least 5% of the sample are large businesses, which is based on the classification in Article 6 of Decree 39/2018/ND-CP. According

to the General Statistics Office (2021), 5% is also the average ratio of the large business number to the total number of 63 provinces and cities in Vietnam.

- Method of survey distribution: stratified random sampling method

* Logistics experts: based on the list of logistics experts that will be fully updated in the Appendix

▼ **With the in-depth interviews method:**

* Subjects: Cargo Owners (interview with a small group selected from survey results), Logistics experts, State Agency representatives.

* Purpose: collect more detailed information/in-depth opinions about the logistics situation in the province and city/region.

* Sample size: ~ **40 samples**

» Cargo Owners (CO): 1 CO/province or city Businesses satisfy the following criteria: (1) Operate in the industry with the largest GRDP in the province, (2) Prioritize businesses with large revenues among the surveyed businesses, (3) Have a high level of logistics services outsource.

- Logistics expert, including in which

» Logistics services providers (LSP): 1 LSP/province or city. The selected LSPs have to meet the following criteria: (1) there is (are) headquarters/many branches in the surveyed region, (2) revenue in the region is the largest in the LSP's revenue structure.

- Experts from research institutes and universities: 1 expert/region

» Representative of a State Agency (e.g. Deputy Director/Director of Department of Industry and Trade, Department of Transport or related Departments): 1 representative/province and city or region.

PART 2: PROCESS OF IMPLEMENTING RESEARCH ON PROVINCIAL LOGISTICS COMPETITIVENESS INDEX (LCI)

2.1. PROCESS DESCRIPTION

Based on the newly established methodology, the determination process of LCI results will be uniformly implemented by 9 steps. These steps are divided according to task characteristics and goals to be achieved, with the first step being “Selecting research sample” and the last step being “Determining final ranking” (see figure 3). Throughout the process, qualitative and quantitative analyses will be integrated to increase the objectivity of the assessment results while still complying with the requirements of the methodology.

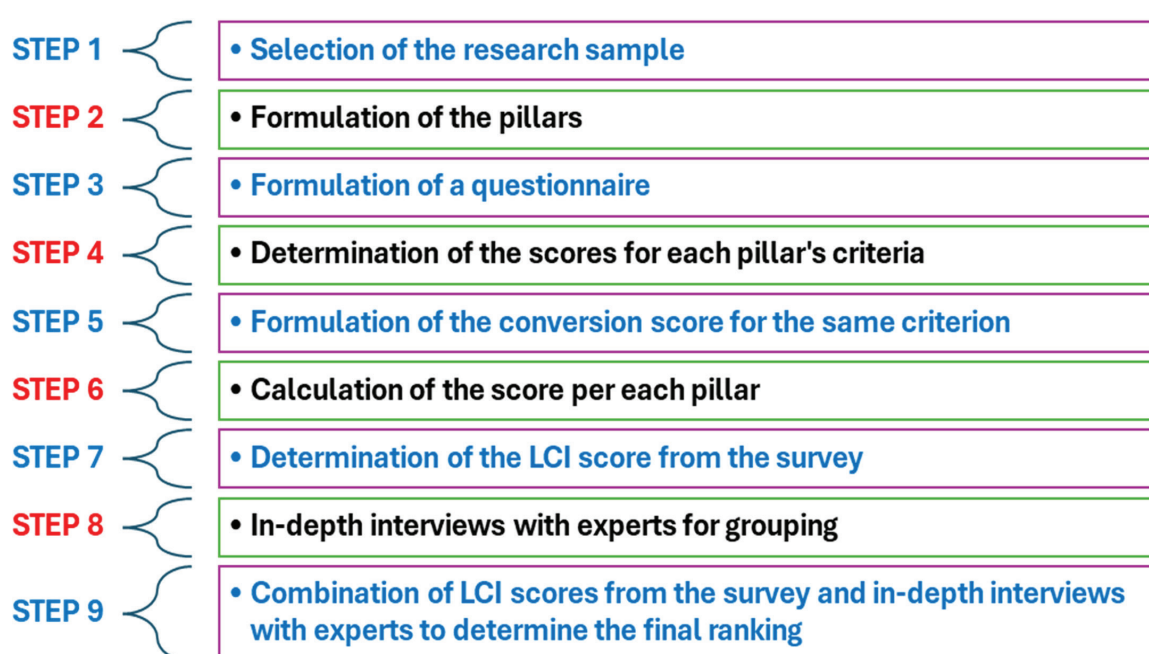


Figure 3. Describe the process for determining LCI results

2.1.1. Step 1: Selection of the research sample

This is not only the first step but also a difficult task even though it has been discussed in the methodology. Specifically, the selection of the in-depth analysis for 26 representative provinces/cities is based on the Economic and Logistics criteria of the entire region in terms of GRDP, volume of goods in circulation and number of logistics services providers (all 3 criteria use the updated data in 2021) which is completely appropriate. However, besides the 26 provinces/cities with outstanding logistics characteristics in each region, other provinces/cities may also have outstanding logistics features and may have potential logistics development but have not been shown in List of 26 provinces/cities for this assessment. For the remaining provinces/cities, the Vietnam Logistics Business Association (VLA) and VLI will continue to complete surveys, research and analysis for the following years. The number of samples to be collected is calculated with a sample size of more than 1,000 logistics services providers (LSPs) and 1,003 cargo owners (COs).

2.1.2. Step 2: Formulation of the pillars

The LCI is calculated based on 5 main pillars including: Economy, Logistics services, Legal and policy framework, Infrastructure and Logistics human resources. These pillars are synthesized by 42 observed variables, selected because of scientific research, relevant reports worldwide and logistics experts. The highest number of observed variables is 19 for the Logistics Services pillar and the lowest number is 3 variables for the Human Resources pillar. Economy pillar includes 4 variables, Legal and Policy framework and Infrastructure are represented by 7 and 9 variables, respectively. The selection of observed variables for all pillars entirely depends on the unique characteristics of each pillar and is not subject to any quantity constraints.

2.1.3. Step 3: Formulation of a questionnaire

Formulation of a questionnaire is based on the pillars to conduct surveys and interviews through two forms: an online survey using Limesurvey software and an offline survey by directly sending to survey units. Units supporting survey connection include the Office of the Vietnam Logistics Business Association (VLA) in Ho Chi Minh City and Hanoi, Hai Phong Logistics Association (HPLA), and the Import-Export Department (Ministry of Industry and Trade), Industry and Trade Information Center (Ministry of Industry and Trade), Department of Industry and Trade, Department of Planning and Investment and Department of Transport in provinces and cities, businesses in the connection network of VLA/VLI, etc. The purpose of the Questionnaire is to determine the score for each pillar while still ensuring a common rule for all pillars. At the same time, a questionnaire based on the Analytical Hierarchy Process (AHP) method was also formulated to determine the weight of each pillar for calculating LCI scores. The main contents of the AHP survey/interview questionnaire focus on comparing the importance levels of each pair of pillars, thus helping to increase objectivity in the calculation process of the pillars' weights. The AHP questionnaire is completely independent in terms of both results and survey/interview participants compared to the previous survey questionnaire.

2.1.4. Step 4: Determination of the scores for each pillar's criteria

Based on the survey results from participating units, after synthesizing and screening to remove inappropriate (incomplete) survey forms, the score of each criterion will be determined. The screening process follows rules that ensure transparency and completeness of information in survey forms. Specifically, for survey forms in localities, the completeness level of key information is always guaranteed at 95-100% which limits the level of bias in the statistical process. The criteria scores are determined by the actual selection results from the Survey Forms. These scores are the initial scores that have not been standardized according to the methodology. However, the score calculation in this step will be based on the conversion results from the ratio of dividing the actual score of the criteria by the highest possible score of the criteria. This ratio is then multiplied by 100 to convert to a 100-score scale.

2.1.5. Step 5: Formulation of the conversion score for the same criterion

After determining the score of each criterion from the survey results, the specific conversion score (presented in the methodology) will range from 0 to 100 and is called the standardized score. Specifically, the standardized score 0 will correspond to the lowest score in the range of scores per each criterion among 26 provinces/cities. Meanwhile, 100-score will correspond to the locality with the highest criterion score in the range of scores according to the same criterion.

2.1.6. Step 6: Calculation of the score per each pillar

Based on the converted scores for each locality's criteria the score per pillar will be determined by the averaging of the criteria for the same pillar. This rule will help eliminate the influence of the criteria that are not evaluated by the survey results. Besides, the method of calculating the average is consistent with the methodology presented earlier and can determine the importance of observed variables according to each pillar more effectively.

2.1.7. Step 7: Determination of the LCI score from the survey

After determining the scores per pillar in provinces and cities, the LCI score from the survey results will be determined by combining the score with the corresponding importance level per each pillar. The scores per pillar for each province and city will be combined with the weighted results from the AHP method to create the LCI scores. The weights from the AHP method will represent the specific impact of each pillar on the LCI scores. However, these results are not yet the final results. Next, we compared the research results with insights from in-depth interviews conducted with leading logistics experts, industry leaders, managers, and scientists with many years of experience in logistics research.

2.1.8. Step 8: In-depth interviews with experts for grouping

To perform step 8, a questionnaire was created with the goal of grouping Logistics Capacity and Ranking of provinces/cities according to the opinions of the experts and the many years of experiences leaders in Logistics businesses. With their abilities and experiences, experts will provide more multi-dimensional and realistic perspectives on logistics capacity in provinces and cities. From there, provinces and cities from best to weakest logistics capacity will be arranged into groups A, B, C, D and the order of provinces and cities in each group according to logistics capacity is also arranged from good to weak level.

2.1.9. Step 9: Combination of LCI scores from the survey and in-depth interviews with experts to determine the final ranking

The final ranking of provinces/cities will be based on the ranking results of LCI scores from the survey combined with the grouping results of experts according to the 2/3 - 1/3 conversion rule (World Competitiveness Ranking, 2023). Specifically, the results from the survey process will account for 2/3 while the evaluation results from experts will account for 1/3 to the final LCI results.

2.2. DATA INFORMATION

Based on the data collection approach, the specific survey sample size is compiled as table 5. With 26 provinces/cities identified in the methodology, the specific CO and LSP sample sizes will be highly detailed with the largest sample size from Hanoi and Ho Chi Minh City with 69 CO samples and 71 LSP samples.

*Table 5. Summary of the sample size that needs to be surveyed by region and provinces/
cities*

No.	REGION	PROVINCE/CITY	CO	LSP
1	Northern Midlands and Mountains	Tuyen Quang	21	16
2	Northern Midlands and Mountains	Dien Bien	20	16
3	Northern Midlands and Mountains	Bac Giang	33	31
4	Northern Midlands and Mountains	Phu Tho	32	31
5	Northern Midlands and Mountains	Thai Nguyen	20	16
6	Northern Midlands and Mountains	Lang Son	17	16
7	Red river delta	Ha Noi	69	71
8	Red river delta	Hai Phong	54	55
9	Red river delta	Thai Binh	33	32
10	Red river delta	Bac Ninh	54	55
11	North Central and Central Coast	Da Nang	55	55
12	North Central and Central Coast	Binh Dinh	38	39
13	North Central and Central Coast	Nghe An	39	39
14	North Central and Central Coast	Thanh Hoa	52	55
15	Highlands	Dak Lak	37	39
16	Highlands	Gia Lai	18	17
17	Highlands	Lam Dong	28	31
18	Southeast	Ho Chi Minh	69	71
19	Southeast	Ba Ria - Vung Tau	39	39
20	Southeast	Binh Duong	54	55
21	Southeast	Dong Nai	54	55
22	Mekong Delta	Kien Giang	35	39
23	Mekong Delta	Can Tho	39	39
24	Mekong Delta	Long An	45	39
25	Mekong Delta	Tien Giang	31	32
26	Mekong Delta	An Giang	17	17
Total			1003	1000

PART 3: RESULTS OF THE PROVINCIAL LOGISTICS COMPETITIVENESS INDEX (LCI)

3.1. STATISTICS FOR SURVEY/INTERVIEW SAMPLES

From the results of the overall analysis and the experts’ opinions, 2 survey forms have been established for 2 groups: Cargo Owners (COs) and logistics services providers (LSPs). The survey results are summarized based on 5 key pillars: Economy, Logistics services, Legal and policy framework, Infrastructure and Logistics human resources.

In parallel with the survey process, interviews were also conducted to gain more in-depth and multi-dimensional insights from experts through both face-to-face and online forms. The results from the interview process serve as a reliable basis for the research team to consider the level of reliability in the process of synthesizing survey questionnaires.

The survey and interview process were also conducted with experts to determine the weights of the main pillars affecting the LCI based on requirements from the AHP method. The number of experts participating in the survey was 20, including representatives from state agencies on logistics, business leaders and leading logistics researchers from universities in Vietnam. The results from the AHP method highlight the importance of the five survey pillars, making a significant contribution to the LCI assessment. Some sample statistical results are presented in Figure 4 and Table 6.

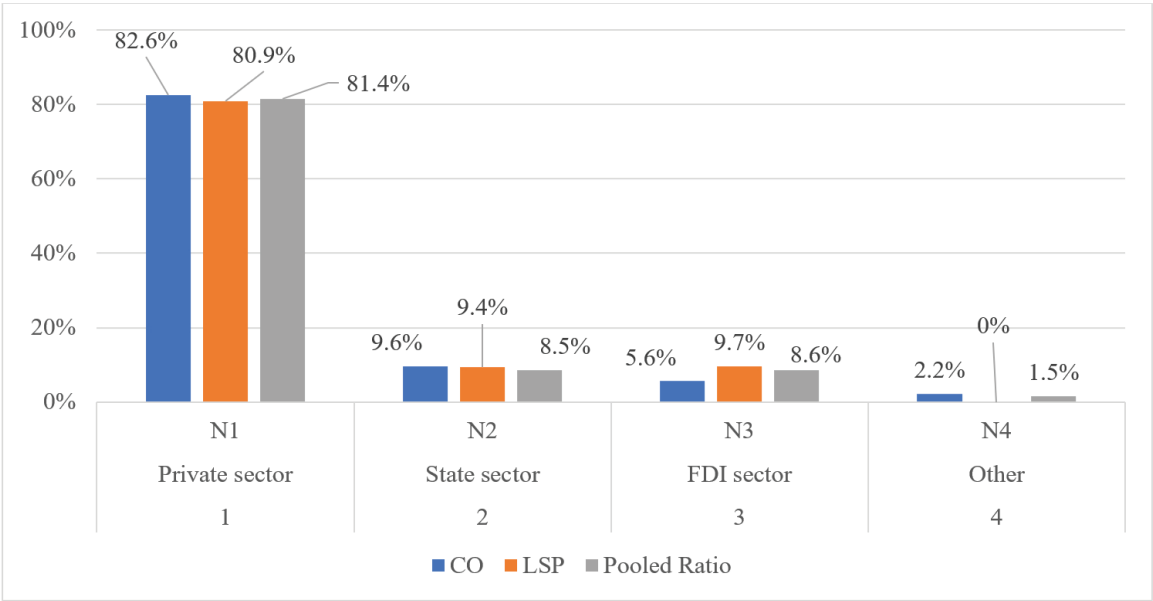


Figure 4. Statistics on the number of businesses based on ownership form

In figure 4, the sample ratio of CO and LSP compared to the total number of CO and LSP samples respectively by each economic sector is shown. The total sample size (combination of CO and LSP) is also shown in Figure 4, which is called Pooled Ratio. In addition, the proportion of CO and LSP samples corresponding to each Geographic region is also displayed in table 6. From this data, a miniature picture of the economy by region will be described specifically.

Table 6. Statistics of businesses by region

Geographic region	Economic sector	Business	Private sector	State sector	FDI sector	Others	Total
Mekong Delta	CO		70.1%	2.3%	1.4%	26.2%	100%
	LSP		84%	7.3%	8.7%	0%	100%
Southeast	CO		93.9%	1.3%	1.8%	3%	100%
	LSP		82.6%	5.6%	11.8%	0%	100%
Northern Midlands and Mountains	CO		94.7%	5.3%	0%	0%	100%
	LSP		85.2%	7.4%	7.4%	0%	100%
Red river delta	CO		96.4%	2.2%	0%	1.4%	100%
	LSP		90.6%	1.6%	7.8%	0%	100%
North Central and Central Coast	CO		87.6%	2.6%	0%	9.8%	100%
	LSP		89.2%	2.7%	8.1%	0%	100%
Highlands	CO		96.6%	2.3%	0%	1.1%	100%
	LSP		92.3%	0%	7.7%	0%	100%

3.2. DETERMINATION OF WEIGHTS

In the process of determining LCI, the AHP method was used with the goal of determining the weights of the main pillars that impact the index as mentioned before, these pillars include Economy, Logistics Services, Legal and Policy Framework, Infrastructure and Logistics Human Resources. The analysis process is based on survey results of 20 logistics experts with in-depth expertise and practical experience, who are leaders of logistics businesses, senior experts in the logistics industry, and scientists with experience in logistics research. The analysis results are presented in the following steps:

Building an initial matrix which was compiled by the expert survey results. The results displayed in the matrix were determined by the geometric average responses from 20 experts using equation (5) (see table 7).

Table 7. The Initial matrix

Pillars	Economy	Logistics Services	Legal and policy framework	Infra-structure	Human Resources
Economy	1	1.25	0.46	0.75	0.78
Logistics Services	0.8	1	0.72	0.58	0.83
Legal and policy framework	2.18	1.38	1	1.15	1.45
Infrastructure	1.34	1.73	0.87	1	1.68
Human Resources	1.28	1.2	0.69	0.59	1

From the matrix results, the standardization value will be determined from equation (6) and the results will be displayed in table 8.

Table 8. Standardisation matrix

Pillars	Economy	Logistics Services	Legal and policy framework	Infrastructure	Human Resources
Economy	0.32	0.42	0.27	0.40	0.29
Logistics Services	0.25	0.34	0.42	0.31	0.31
Legal and policy framework	0.70	0.46	0.58	0.61	0.54
Infrastructure	0.43	0.58	0.50	0.53	0.63
Human Resources	0.41	0.40	0.40	0.31	0.37

Standardizing the matrix to determine the weights of the pillars, as shown in Table 9. However, to validate the appropriateness of the weights, a consistency value (CR) requires less than or equal to 10%. The results of the research team satisfy this requirement, with a specific value of 9%. Therefore, the weights are statistically valid..

Table 9. Weights of the pillars

No.	Pillars	Weights W_i
1	Economy	0.16
2	Logistics Services	0.15
3	Legal and policy framework	0.27
4	Infrastructure	0.25
5	Human Resources	0.18

3.3. ANALYSIS RESULTS BY PROVINCE/CITY

3.3.1. Pillar of Economy

“Economy” is considered based on the ratio of basic components of logistics costs to the cost of goods sold in the business. Specifically, there will be 4 criteria representing the “Economy” pillar as shown in Table 10.

Table 10. Criteria to evaluate the “Economy” pillar

No.	Criteria	Notations
1	Ratio of basic components of logistics costs to cost of goods sold of the enterprise [Transportation costs / Cost of goods sold]	KT1

No.	Criteria	Notations
2	Ratio of basic components of logistics costs to cost of goods sold of the enterprise [Handling costs / Cost of goods sold]	KT2
3	Ratio of basic components of logistics costs to cost of goods sold of the enterprise [Warehouse costs / Cost of goods sold]	KT3
4	Ratio of basic components of logistics costs to cost of goods sold of the enterprise [Management costs / Cost of goods sold]	KT4

The criteria then determined the score (on a 100-point scale) from the aggregated results for each locality. This score is compiled from the survey process and is called the Unstandardized Score (see table 11). The scores in table 11 are determined from the ratio between the actual score that is selected from the survey and the maximum possible score of the considered criteria.

Table 11. Evaluate the “Economy” pillar for localities according to the proposed criteria

No.	Provinces/Cities	KT1	KT2	KT3	KT4
1	An Giang	96	93	95	90.3
2	Ba Ria - Vung Tau	96.8	98.2	96.2	94.8
3	Bac Giang	97	96	97	98
4	Bac Ninh	96.5	99.1	96.8	96.8
5	Binh Dinh	95.1	97.4	98.7	95.9
6	Binh Duong	86.7	97.5	94.5	90.4
7	Can Tho	90.5	99.7	99.2	99.5
8	Da Nang	89	97.3	97	94.8
9	Dak Lak	94.3	95.8	94.1	93.1
10	Dien Bien	96	96	92	92
11	Dong Nai	96.5	98.7	99.6	97.4
12	Gia Lai	85.8	95.8	95.3	93.2
13	Ha Noi	96.5	100	100	98.6
14	Hai Phong	100	100	99.8	98.8
15	Kien Giang	88.8	93.9	90.8	88.4
16	Lam Dong	94.3	96.0	96.7	96.3
17	Lang Son	100	100	100	100
18	Long An	87.8	100	99.5	97.5

19	Nghe An	99.8	100	100	100
20	Phu Tho	93	96	97	98
21	Thai Binh	100	100	100	100
22	Thai Nguyen	99.2	100	100	100
23	Thanh Hoa	85.9	100	92	34.6
24	Tien Giang	93.8	98.5	97.7	96.9
25	Ho Chi Minh	99.1	98.9	98.8	98.1
26	Tuyen Quang	95.5	96	97	96

Table 11 displays the scores of localities according to the 4 criteria used to evaluate the “Economy” pillar, specifically for the evaluation of the “Economy” pillar of An Giang province, the criterion “Proportion of members The basic component of logistics costs to the cost of goods sold of the enterprise [Transportation costs / Cost of goods sold] (KT1)” reached 96 scores, “The ratio of basic components of logistics costs to cost of goods sold” reached 96 scores. goods sold of the enterprise [Handling costs / Cost of goods sold] (KT2)” reached 93 scores, “The ratio of basic components of logistics costs to the cost of goods sold of the enterprise [Warehouse costs / Cost of goods sold] (KT3)” reached 95 scores, and “Ratio of basic components of logistics costs to cost of goods sold of the enterprise [Management costs / Cost of goods sold] (KT4) ” reached 90.3 scores. Similarly for Ba Ria - Vung Tau province, criteria KT1 reached 96.8 scores, KT2 reached 98.2 scores, KT3 reached 96.2 scores and KT4 reached 94.8 scores. When directly comparing the criteria of the “Economy” pillar between An Giang and Ba Ria - Vung Tau, the scores of KT1 to KT4 of Ba Ria - Vung Tau province always reach a higher level or economic level of Ba Ria - Vung Tau is rated higher than An Giang province. Similar values will be displayed for other localities.

To evaluate the score of the “Economy” pillar for each specific locality according to a common standard, the values in table 11 will be standardized according to formula (1). The normalized value will be determined according to the rules of considering each column in table 11. With the smallest and highest value in each column, the values in the column will be converted accordingly to create the calculated score value. standardized. Finally, the score value of the “Economy” pillar will be compiled according to the average value of the 4 criteria for each locality and summarized in Table 12.

Table 12. Evaluate the “Economy” pillar for localities after standardization

No.	Provinces/Cities	KT1	KT2	KT3	KT4	Synthetic
1	An Giang	71.9	0	45.7	85.2	50.7
2	Ba Ria - Vung Tau	77.6	74	58.5	92.1	75.6
3	Bac Giang	78.9	42.9	67.4	96.9	71.5
4	Bac Ninh	75.3	87.5	65.7	95.2	80.9
5	Binh Dinh	65.7	63.4	86.1	93.7	77.2

No.	Provinces/Cities	KT1	KT2	KT3	KT4	Synthetic
6	Binh Duong	6.2	63.6	40.3	85.3	48.8
7	Can Tho	33.2	96.3	91.6	99.2	80.1
8	Da Nang	22.6	61.9	67.4	92.1	61
9	Dak Lak	60	40.6	35.9	89.4	56.5
10	Dien Bien	71.9	42.9	13	87.8	53.9
11	Dong Nai	75.5	81.4	95.3	96	87
12	Gia Lai	0	39.8	48.5	89.5	44.5
13	Ha Noi	75.4	100	100	97.9	93.3
14	Hai Phong	100	100	97.9	98.2	99
15	Kien Giang	21.2	12.4	0	82.3	29
16	Lam Dong	60.1	42.9	63.8	94.4	65.3
17	Lang Son	100	100	100	100	N/A
18	Long An	14.2	100	94.9	96.2	76.3
19	Nghe An	98.3	100	100	100	N/A
20	Phu Tho	50.7	42.9	67.4	96.9	64.5
21	Thai Binh	100	100	100	100	N/A
22	Thai Nguyen	94.6	100	100	100	N/A
23	Thanh Hoa	1	100	13.4	0	N/A
24	Tien Giang	56.7	78	74.9	95.3	76.2
25	Ho Chi Minh	93.8	83.6	87.4	97.1	90.5
26	Tuyen Quang	68.5	42.9	67.4	93.9	68.2

3.3.2. Pillar of Human resources

Considering the “Human resources” pillar, the criteria of “Ratio (%) of female in the total number of employees in the enterprise”, “Ratio (%) of logistics personnel trained in the correct logistics field /related to the enterprise’s logistics industry” and “Professional capacity of logistics personnel in the enterprise” will be integrated in the evaluation scale of localities. The criteria will be denoted as in Table 13.

Table 13. Criteria to evaluate the “Human Resources” pillar

No.	Criteria	Notations
1	Ratio (%) of female in the total number of employees in the enterprise	NL1
2	Ratio (%) of logistics personnel trained in the correct logistics field / related to the enterprise’s logistics industry	NL2
3	Professional capacity of logistics personnel in the enterprise	NL3

The criteria will then have been determined their scores (on a 100-score scale) by the aggregated results for each locality and will then be standardized according to the corresponding scores displayed in table 14 - 15. The method of determining conversion scores shown in table 14 will be determined similarly to the “Economy” pillar.

Table 14. Evaluate the Human Resources pillar for localities according to proposed criteria (Not standardization)

No.	Provinces/Cities	NL1	NL2	NL3
1	An Giang	25	63.3	78.3
2	Ba Ria - Vung Tau	46.6	70.1	68.2
3	Bac Giang	54.2	37.5	68
4	Bac Ninh	52.6	24.1	70.2
5	Binh Dinh	46.2	46.2	74.9
6	Binh Duong	44.2	62	76.9
7	Can Tho	35.7	41.7	66.7
8	Da Nang	44.4	44.4	77
9	Dak Lak	38.7	52.7	69.1
10	Dien Bien	34.6	41.1	80
11	Dong Nai	55.1	56.4	75.7
12	Gia Lai	37.5	62	64.6
13	Ha Noi	56.1	63.2	71.3
14	Hai Phong	47	49	73.8
15	Kien Giang	41	44.9	68
16	Lam Dong	36.7	62.2	65
17	Lang Son	N/A	N/A	60
18	Long An	53.9	69	63.1

No.	Provinces/Cities	NL1	NL2	NL3
19	Nghe An	N/A	N/A	60
20	Phu Tho	33.3	83.3	63
21	Thai Binh	N/A	N/A	78.9
22	Thai Nguyen	N/A	N/A	68.5
23	Thanh Hoa	N/A	N/A	79.3
24	Tien Giang	37	48.1	61.5
25	Ho Chi Minh	48.2	77.6	73.2
26	Tuyen Quang	33.3	33.3	74.3

To evaluate the score of the “Human Resources” pillar for each locality, the values in table 14 will be standardized according to equation (1) according to each data column. The standardized results will then be compiled according to the average value of the 3 criteria for each locality and summarized in Table 15.

Table 15. Evaluate the Human Resources pillar for localities after standardization

No.	Provinces/Cities	NL1	NL2	NL3	Synthetic
1	An Giang	0	66.3	91.7	52.6
2	Ba Ria - Vung Tau	69.5	77.6	40.9	62.7
3	Bac Giang	93.9	22.7	40	52.2
4	Bac Ninh	88.8	0	50.9	46.6
5	Binh Dinh	68.4	37.4	74.4	60
6	Binh Duong	61.7	64.0	84.3	70
7	Can Tho	34.5	29.7	33.3	32.5
8	Da Nang	62.6	34.4	85.0	60.7
9	Dak Lak	44	48.3	45.3	45.8
10	Dien Bien	31	28.8	100	53.3
11	Dong Nai	97	54.6	78.3	76.6
12	Gia Lai	40.2	64.0	23.2	42.5
13	Ha Noi	100	65.9	56.3	74.1
14	Hai Phong	70.7	42	69.2	60.7
15	Kien Giang	51.4	35.2	40	42.2

No.	Provinces/Cities	NL1	NL2	NL3	Synthetic
16	Lam Dong	37.6	64.3	25	42.3
17	Lang Son	N/A	N/A	0	N/A
18	Long An	93	75.8	15.6	61.5
19	Nghe An	N/A	N/A	0	N/A
20	Phu Tho	26.8	100	15	47.3
21	Thai Binh	N/A	N/A	94.6	N/A
22	Thai Nguyen	N/A	N/A	42.3	N/A
23	Thanh Hoa	N/A	N/A	96.3	N/A
24	Tien Giang	38.8	40.6	7.7	29
25	Ho Chi Minh	74.6	90.3	65.9	77
26	Tuyen Quang	26.8	15.6	71.4	38

3.3.3. Pillar of Logistics Services

For the “Logistics Services” pillar, the review criteria mainly focus on the ability and efficiency in the process of implementing logistics activities. Specifically, there will be 19 criteria evaluated as shown in Table 16.

Table 16. Criteria to evaluate the “Logistics services” pillar

No.	Criteria	Notations
1	Level of application of information technology and software	DV1
2	Level of implementation of digital transformation applications (IoT, Block-chain, Big data, ...)	DV2
3	Level of implementation of automation technology application	DV3
4	The level of implementation of green logistics activities by businesses, specifically reducing the negative impacts of businesses on the environment (such as reducing environmental pollution, reducing noise pollution, reducing waste, clean fuel, electric vehicles, renewable energy, recycled packaging materials, etc.)?	DV4
5	The level of readiness (in terms of quantity and quality) of service providers supporting the logistics industry in the province where the business is operating. Support services in the logistics industry include: packing and unloading containers with forklifts, loading and unloading; loading and unloading bulk ships at the port; Providing pallets and packaging accessories; etc.	DV5
6	Diversity of logistics services	DV6

No.	Criteria	Notations
7	Level of effectiveness in integrating transport methods in the enterprise's freight service	DV7
8	Level of economic efficiency for using logistics services (Outsourcing rate)	DV8
9	Level of economic efficiency for using logistics services (Transportation costs/Cost of goods sold)	DV9
10	Level of economic efficiency for using logistics services (Handling costs/Cost of goods sold)	DV10
11	Level of economic efficiency for using logistics services (Warehouse costs/Cost of goods sold)	DV11
12	Level of economic efficiency for using logistics services (Management costs/Cost of goods sold)	DV12
13	Completeness and punctuality of the shipments upon arrival at their destination compared to the time limit specified in the contract	DV13
14	Ability to ensure goods quality and goods security issues	DV14
15	Ability to track and trace journeys	DV15
16	Warehouse readiness level	DV16
17	Ability to adapt to customer needs	DV17
18	Ability to respond to customer requests and complaints	DV18
19	The level of readiness of the vehicle to transport goods	DV19

The criteria will then be determined by the score (on a 100-score scale). With a conversion method liked the scoring method of the “Economy” and “Human Resources” pillars, a corresponding conversion score table from the initial survey score will be displayed in table 17 and is also only at the “Unstandardized level”.

Table 17. Evaluate the Logistics Services pillar for localities according to the proposed criteria

No.	Provinces/Cities	DV1	DV2	DV3	DV4	DV5	DV6	DV7	DV8	DV9	DV10
1	An Giang	61.7	60	60	43.3	60	80	65	78.7	75.3	74
2	Ba Ria - Vung Tau	70.7	63.2	63.2	61.8	73	100	87.9	73.6	79.4	66.4
3	Bac Giang	70	64	45	25	75	91	60	61.1	58.3	79.1
4	Bac Ninh	77.9	37.8	37.8	63.8	73.9	100	86.9	78.7	80.1	76.6
5	Binh Dinh	67.7	55.5	55.5	40	72.9	100	65.2	79	71.8	76.9
6	Binh Duong	70.2	63.9	63.9	50.2	69.8	100	72.3	70.2	73.7	72.9

No.	Provinces/Cities	DV1	DV2	DV3	DV4	DV5	DV6	DV7	DV8	DV9	DV10
7	Can Tho	72.9	64.3	64.3	40	75.7	100	72.9	72.3	67.2	72.8
8	Da Nang	63.3	50	50	66.7	73.3	100	86.7	76.3	73	78.3
9	Dak Lak	64	56	56	48	60	80	76	77.9	67.9	70.5
10	Dien Bien	61.6	47.9	57.9	45.3	61.3	71	72.6	81	82	80
11	Dong Nai	66.2	56.9	56.9	56.9	58.5	80	69.2	75.7	72.2	75.7
12	Gia Lai	60	60	60	35	60	80	60	78.9	70.5	75.8
13	Ha Noi	62.7	51.8	51.8	35.5	66.4	100	70.9	71.5	71.5	72.5
14	Hai Phong	66.1	54.5	54.5	40	73.3	100	64.2	77.7	65.8	79.2
15	Kien Giang	68.1	66.4	66.4	51.4	69.2	100	70.6	68.3	68.8	68.5
16	Lam Dong	65	65	65	40	65	60	75	78.7	69.3	73.3
17	Lang Son	N/A	N/A	N/A	N/A	N/A	N/A	N/A	61.2	78.8	78.8
18	Long An	72.1	62.8	62.8	50.2	65.6	100	76.7	76.3	73.8	74.4
19	Nghe An	N/A	N/A	N/A	N/A	N/A	N/A	N/A	64.9	79.5	74.6
20	Phu Tho	80	51	52	38	64	60	90	66.8	67.6	74.1
21	Thai Binh	N/A	N/A	N/A	N/A	N/A	N/A	N/A	73.5	76.2	77.3
22	Thai Nguyen	N/A	N/A	N/A	N/A	N/A	N/A	N/A	66.2	67.7	67.7
23	Thanh Hoa	N/A	N/A	N/A	N/A	N/A	N/A	N/A	80	81.9	79.3
24	Tien Giang	64.4	62.2	62.2	66.7	64.4	100	64.4	75.4	64.6	69.2
25	Ho Chi Minh	70.1	59.4	59.4	46.3	70.1	100	73.7	69	74.2	72.2
26	Tuyen Quang	60	60	60	50	60	60	70	63.8	77.1	71.4

Table 17. Evaluate the Logistics Services pillar for localities according to the proposed criteria

No.	Provinces/Cities	DV 11	DV 12	DV 13	DV 14	DV 15	DV 16	DV 17	DV 18	DV 19
1	An Giang	72	68	93	78.7	72	72.7	74.7	73.3	72
2	Ba Ria - Vung Tau	75	77.5	85.5	79.8	75.1	67.3	70	76.2	75.9
3	Bac Giang	79	77	60.6	79.7	58.3	60	79.3	77.6	76.4
4	Bac Ninh	78.4	79.9	92.5	77	75.2	80.7	81	77.4	77.8
5	Binh Dinh	72.8	65.6	95.4	79.5	75.9	73.3	76.9	75.9	72.3
6	Binh Duong	73.3	60.4	79.4	71	76.1	74.9	74.1	74.1	73.7

No.	Provinces/Cities	DV 11	DV 12	DV 13	DV 14	DV 15	DV 16	DV 17	DV 18	DV 19
7	Can Tho	68.7	61	91.8	72.8	67.2	67.7	72.8	71.8	68.7
8	Da Nang	73.3	80	93.5	77.7	78.3	76	78	73.3	73
9	Dak Lak	70.5	54.7	95.5	78.4	74.2	70	71.1	73.2	71.1
10	Dien Bien	75	61	75	71	72	65	80	69	71
11	Dong Nai	74.8	70.4	78.7	76.5	75.7	73	75.7	72.2	74.8
12	Gia Lai	73.7	38.9	97.9	78.9	75.8	72.6	74.7	74.7	72.6
13	Ha Noi	70	74.8	92.9	73	76.3	72	72.8	70	71.5
14	Hai Phong	66.9	50.8	84.6	N/A	74.2	65.8	79.2	78.1	68.5
15	Kien Giang	66.4	66.9	82.4	68.5	64.8	68	68.3	66.7	68.3
16	Lam Dong	72.7	50	94.7	78.7	72	70	74	75.3	72.7
17	Lang Son	61.2	74.1	99.4	60	78.8	78.8	78.8	60	60
18	Long An	77.5	65.6	96.6	76.6	70.6	73.4	73.4	72.2	77.5
19	Nghe An	60	80.5	98.8	60	80.0	80.0	80.0	60.0	60
20	Phu Tho	78.1	81.3	79.7	71	74	69	67	66	80
21	Thai Binh	78.9	78.4	95.7	78.4	78.4	77.8	78.4	77.3	77.8
22	Thai Nguyen	66.9	67.7	82.3	69.2	71.5	67.7	67.7	69.2	66.9
23	Thanh Hoa	80.7	74.4	97.8	83.3	82.2	81.9	82.6	83	80.4
24	Tien Giang	64.6	72.3	90.8	75.4	63.1	66.2	69.2	66.2	64.6
25	Ho Chi Minh	73.6	64.1	91.5	73.9	72.5	74.5	73.3	71.3	75.9
26	Tuyen Quang	71.4	71.4	97.6	77.1	74.3	77.1	77.1	74.3	75.2

From table 17, the scores are in turn standardized by column while using equation (1). The scores of the “Logistics services” pillar for each specific locality will follow a common standard with the “Economy” and “Human resources” pillars and are fully displayed in table 18 with scores. The final score is the average score of 19 criteria for each locality.

Table 18. Evaluate the Logistics Services pillar for localities after standardization

No.	Provinces/Cities	DV1	DV2	DV3	DV4	DV5	DV6	DV7	DV8	DV9	DV10
1	An Giang	8.3	77.7	77.7	44	8.9	50	16.7	88.2	71.9	56
2	Ba Ria - Vung Tau	53.6	88.8	88.8	88.4	84.3	100	93	62.9	88.9	0
3	Bac Giang	50	91.7	25.2	0	95.9	77.5	0	0	0	93.7
4	Bac Ninh	89.4	0	0	93.1	89.4	100	89.6	88.3	91.9	75.3

No.	Provinces/Cities	DV1	DV2	DV3	DV4	DV5	DV6	DV7	DV8	DV9	DV10
5	Binh Dinh	38.7	61.9	61.9	36	83.7	100	17.2	89.8	57	77.4
6	Binh Duong	50.9	91.2	91.2	60.4	65.9	100	40.9	45.6	65.1	48.2
7	Can Tho	64.3	92.6	92.6	36	100	100	42.9	56.2	37.5	47.4
8	Da Nang	16.7	42.7	42.7	100	86.2	100	88.9	76.5	62	87.8
9	Dak Lak	20	63.7	63.7	55.2	8.9	50	53.3	84.4	40.5	30.5
10	Dien Bien	7.9	35.4	70.3	48.6	16.5	27.5	42.1	100	100	100
11	Dong Nai	30.8	66.9	66.9	76.6	0	50	30.8	73.1	58.6	68.1
12	Gia Lai	0	77.7	77.7	24	8.9	50	0	89.7	51.6	69.1
13	Ha Noi	13.6	49.1	49.1	25.1	45.8	100	36.4	52.2	55.7	45
14	Hai Phong	30.3	58.6	58.6	36	86.2	100	14.1	83.3	31.6	94.4
15	Kien Giang	40.3	100	100	63.3	62	100	35.2	35.9	44.3	15.9
16	Lam Dong	25	95.1	95.1	36	37.9	0	50	88.2	46.6	51.1
17	Lang Son	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.2	86.6	91.4
18	Long An	60.5	87.4	87.4	60.6	41.3	100	55.8	76.1	65.2	58.8
19	Nghe An	N/A	N/A	N/A	N/A	N/A	N/A	N/A	18.8	89.5	60.7
20	Phu Tho	100	46.2	49.7	31.2	32.1	0	100	28.2	39.4	56.9
21	Thai Binh	N/A	N/A	N/A	N/A	N/A	N/A	N/A	62.3	75.6	80.2
22	Thai Nguyen	N/A	N/A	N/A	N/A	N/A	N/A	N/A	25.2	39.7	9.7
23	Thanh Hoa	N/A	N/A	N/A	N/A	N/A	N/A	N/A	95	99.4	94.6
24	Tien Giang	22.2	85.4	85.4	100	34.7	100	14.8	71.7	26.7	21
25	Ho Chi Minh	50.5	75.6	75.6	51	67.5	100	45.8	39.5	67.1	42.6
26	Tuyen Quang	0	77.7	77.7	60	8.9	0	33.3	13.4	79.5	37.1

Table 18. Evaluate the Logistics Services pillar for localities after standardization

No.	Provinces/Cities	DV11	DV12	DV13	DV14	DV15	DV16	DV17	DV18	DV19	Syn- thetic
1	An Giang	57.9	68.7	83.5	80	57.3	58	49.2	58.1	58.9	56.4
2	Ba Ria - Vung Tau	72.3	91	64.1	84.9	70.2	33.3	19.2	70.5	78.1	70.1
3	Bac Giang	91.6	90	0	84.5	0	0	78.8	76.5	80.6	49.3
4	Bac Ninh	88.8	96.8	82.3	73	70.6	94.8	89.7	75.9	87.2	77.7
5	Binh Dinh	61.8	63.1	89.6	83.5	73.6	61	63.6	69.2	60.4	65.8

No.	Provinces/Cities	DV11	DV12	DV13	DV14	DV15	DV16	DV17	DV18	DV19	Syn- thetic
6	Binh Duong	64.3	50.7	48.5	47.1	74.3	68.2	45.6	61.5	67.4	62.5
7	Can Tho	42	52.2	80.4	54.9	37.2	35.2	37.3	51.4	42.8	58.0
8	Da Nang	64.3	97	84.8	75.7	83.8	73.2	70.5	58.1	63.8	72.4
9	Dak Lak	50.8	37.3	90	78.9	66.5	45.8	26	57.3	54.3	51.4
10	Dien Bien	72.3	52.1	37.1	47.1	57.3	22.9	83.4	39.2	54	53.4
11	Dong Nai	71.3	74.4	46.7	70.8	72.6	59.7	55.5	53	72.6	57.8
12	Gia Lai	66	0	96.1	81.2	73.1	57.8	49.6	64.2	62	52.6
13	Ha Noi	48.2	84.6	83.2	55.7	75	54.9	36.9	43.5	56.5	53.2
14	Hai Phong	33.4	27.9	61.9	N/A	66.6	26.4	78.4	78.7	41.5	56.0
15	Kien Giang	30.9	66.2	56.2	36.6	27.2	36.6	8.1	29	40.6	48.9
16	Lam Dong	61.1	26.1	87.8	80	57.3	45.8	44.9	66.8	62.2	55.6
17	Lang Son	5.7	83.1	100	0	85.8	86.1	75.8	0	0	N/A
18	Long An	84.4	63.1	92.7	71	51.6	61.5	41.3	53.1	85.9	68.3
19	Nghe An	0	98.2	98.4	0	90.7	91.5	83.4	0	0	N/A
20	Phu Tho	87.4	100	49.2	47.1	65.6	41.2	0	26.1	98.2	52.6
21	Thai Binh	91.2	93.2	90.4	78.8	83.9	81.6	73	75.3	87.6	N/A
22	Thai Nguyen	33.4	68	56	39.6	55.4	35.2	4.4	40.2	34	N/A
23	Thanh Hoa	100	83.9	95.8	100	100	100	100	100	100	N/A
24	Tien Giang	22.3	78.9	77.7	65.9	20	28.2	14.3	26.8	22.7	48.4
25	Ho Chi Minh	65.7	59.4	79.6	59.6	59.2	66.3	40.6	49.2	78.3	61.7
26	Tuyen Quang	55.1	76.8	95.4	73.5	66.8	78.5	65	62.2	74.8	54.5

3.3.4. Pillar of Legal and Policy Framework

Regarding this pillar, there are 6 criteria including: “Capacity to promote digital transformation and facilitate transportation of regional government agencies”, “ Reasonable level of road tolls in the region”, “The level of popularity of guiding documents and documents related to relevant regulations and policies in the field of logistics in the region”, “The level of clarity and ease of understanding of guiding documents, documents related to the region’s logistics development policy”, “The level of simplification and effectiveness of processes, legal procedures, and customs procedures in the region to facilitate the movement of goods”, “Level of harassment in customs procedures in the region”, and “Level of smooth and consistent coordination of Relevant state management agencies in the region (Ministry of Industry and Trade, Ministry of Transport, General Department of Customs, etc.) in management issues and policy implementation in the logistics field” will be considered in evaluating the scoring scale for each locality. For convenience of presentation, the criteria will be denoted as Table 19.

Table 19. Criteria to evaluate the “Legal and policy framework” pillar

TT	Criteria	Notations
1	Capacity to promote digital transformation and facilitate transportation of regional government agencies	PL1
2	Reasonable level of road tolls in the region	PL2
3	The level of popularity of guiding documents and documents related to relevant regulations and policies in the field of logistics in the region	PL3
4	The level of clarity and ease of understanding of guiding documents, documents related to the region's logistics development policy	PL4
5	The level of simplification and effectiveness of processes, legal procedures, and customs procedures in the region to facilitate the movement of goods.	PL5
6	Level of harassment in customs procedures in the region	PL6
7	Level of smooth and consistent coordination of Relevant state management agencies in the region (Ministry of Industry and Trade, Ministry of Transport, General Department of Customs, etc.) in management issues and policy implementation in the logistics field.	PL7

The converted score from the results of evaluating the criteria from the survey will then also be determined (on a 100-score scale) like the pillars of “Economy”, “Human Resources” and “Logistics Services”, compiled by each locality as shown in Table 20.

Table 20. Evaluate the Legal and Policy Framework pillar for localities according to the proposed criteria

No.	Provinces/Cities	PL1	PL2	PL3	PL4	PL5	PL6	PL7
1	An Giang	60	50	58.3	58.3	56.7	68.3	65
2	Ba Ria - Vung Tau	65.5	59.5	62.3	60.9	60.9	65	60.9
3	Bac Giang	65	60	65	70	65	40	55
4	Bac Ninh	62.2	40	71.1	62.2	71.1	51.1	71.1
5	Binh Dinh	63.9	58.1	63.2	60.6	63.9	59.4	67.3
6	Binh Duong	67.9	60.7	63.6	62.9	62.1	69.6	65
7	Can Tho	78.5	60	72.9	70	68.6	84.3	67.1
8	Da Nang	63.3	57.3	71.3	69.3	62.3	68.3	53.3
9	Dak Lak	68	64	56	60	56	60	68
10	Dien Bien	63.2	54.7	62.1	61.1	58.9	63.2	64.2
11	Dong Nai	61.5	56.9	58.5	58.5	63.1	61.5	64.6
12	Gia Lai	65	60	65	60	60	65	65
13	Ha Noi	64.5	55.5	58.2	57.3	58.2	55.5	67.3

14	Hai Phong	63.6	57.6	62.4	60	63.6	59.4	65
15	Kien Giang	51.8	69.9	58.4	72.5	56.2	56.9	72.8
16	Lam Dong	65	65	65	65	65	65	65
17	Lang Son	N/A	N/A	N/A	N/A	N/A	N/A	N/A
18	Long An	63.3	57.2	67.9	64.6	57.7	58.6	59.1
19	Nghe An	N/A	N/A	N/A	N/A	N/A	N/A	N/A
20	Phu Tho	58	60	60	59	60	60	60
21	Thai Binh	N/A	N/A	N/A	N/A	N/A	N/A	N/A
22	Thai Nguyen	N/A	N/A	N/A	N/A	N/A	N/A	N/A
23	Thanh Hoa	N/A	N/A	N/A	N/A	N/A	N/A	N/A
24	Tien Giang	64.4	66.7	60	60	57.8	60	68.9
25	Ho Chi Minh	64	54.9	64.2	61.4	59.6	62.8	65.7
26	Tuyen Quang	40	50	50	50	50	83	72

To evaluate the score of the “ Legal and policy framework “ pillar for each specific locality according to a common standard, the remaining pillars “Logistics services”, “Economy”, “Human resources” and “Infrastructure”, the values in table 20 will be standardized according to equation (1) in each corresponding column. The standardized results will be arranged corresponding to the order in table 20 “Not standardization” to produce the results in table 21. The score value of the “Legal and policy framework” pillar will be synthesized according to the average value of 7 criteria for each locality.

Table 21. Evaluate the legal and policy framework pillar for localities after standardization

No.	Provinces/Cities	PL1	PL2	PL3	PL4	PL5	PL6	PL7	Synthetic
1	An Giang	52	33.5	36.5	37	31.6	64	60	44.9
2	Ba Ria - Vung Tau	66.2	65.5	53.7	48.5	51.7	56.5	39.1	54.4
3	Bac Giang	65	67	65.6	88.9	71.1	0	8.6	52.3
4	Bac Ninh	57.8	0	92.4	54.3	100	25.1	91.4	60.1
5	Binh Dinh	62.1	60.5	57.9	47.3	65.7	43.7	72	58.4
6	Binh Duong	72.4	69.4	59.4	57.1	57.5	66.9	60	63.3
7	Can Tho	100	67	100	88.9	88	100	71	87.8
8	Da Nang	60.7	58.1	93.3	85.9	58.4	64.0	0	60.1
9	Dak Lak	72.8	80.4	26.3	44.4	28.4	45.2	75.4	53.3
10	Dien Bien	60.2	49.4	53	49.1	42.4	52.3	55.9	51.8
11	Dong Nai	56	56.7	37	37.6	61.9	48.6	58	50.8

12	Gia Lai	65	67	65.6	44.4	47.4	56.5	60	58
13	Ha Noi	63.8	51.8	35.8	32.3	38.8	34.9	71.7	47
14	Hai Phong	61.5	58.9	54.4	44.4	64.6	43.8	60	55.4
15	Kien Giang	30.8	100	36.7	100	29.2	38.1	100	62.1
16	Lam Dong	65	83.7	65.6	66.7	71.1	56.5	60	66.9
17	Lang Son	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
18	Long An	60.5	57.6	78.2	64.7	36.5	42	29.5	52.7
19	Nghe An	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
20	Phu Tho	46.8	67	43.8	40	47.4	45.2	34.3	46.3
21	Thai Binh	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
22	Thai Nguyen	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
23	Thanh Hoa	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
24	Tien Giang	63.6	89.3	43.8	44.4	36.8	45.2	80	57.6
25	Ho Chi Minh	62.5	50.1	62.3	50.7	45.5	51.5	63.4	55.1
26	Tuyen Quang	0	33.5	0	0	0	97.1	96	32.4

3.3.5. Pillar of Infrastructure

The final pillar for evaluating the LCI is “Infrastructure”. There are 9 criteria that will be developed as the basis for the assessment, including infrastructure serving road, rail, inland waterway, sea and air transport. The criteria will be listed in Table 22

Table 22. Criteria to evaluate the “Infrastructure” pillar

No.	Criteria	Notations
1	Road infrastructure	HT1
2	Railway infrastructure	HT2
3	Telecommunications infrastructure and information technology services	HT3
4	Ease of access to seaports	HT4
5	Ease of access to the airport	HT5
6	Ease of access to railway station	HT6
7	Quality of Seaport Infrastructure	HT7
8	Quality of Airport Infrastructure	HT8
9	Quality of Inland Waterway Port Infrastructure	HT9

The criteria will then be coded according to the value displayed on the survey form and then assigned a score (on a 100-score scale) according to rules liked the process of determining scores for the “Logistics Services”, “Economy”, “Human resources” and “Legal and policy framework” pillars. These scores are compiled and arranged in order as shown in Table 23.

Table 23. Evaluate the Infrastructure pillar for localities according to the proposed criteria

No	Provinces/Cities	HT1	HT2	HT3	HT4	HT5	HT6	HT7	HT8	HT9
1	An Giang	51.7	N/A	55	70.7	50	48.3	N/A	N/A	84.7
2	Ba Ria - Vung Tau	73.2	N/A	64.1	77.3	73.6	59.1	84.1	N/A	85.9
3	Bac Giang	65	40	65	75	55	75	N/A	N/A	80
4	Bac Ninh	68.9	51.1	60	80	71.1	62.2	N/A	N/A	71.1
5	Binh Dinh	68.4	52.3	67.7	78.7	76.1	61.9	71	69	68.4
6	Binh Duong	75.3	76.1	75.7	71.4	75.4	73.2	N/A	N/A	72.1
7	Can Tho	74.3	N/A	65.7	71.4	64.3	60	N/A	60	62.9
8	Da Nang	68	56.7	80	70	70	66.7	73	75	70
9	Dak Lak	64	N/A	64	76	68	52	N/A	72	N/A
10	Dien Bien	65.3	N/A	60	71.6	67.4	57.9	N/A	75.8	55.8
11	Dong Nai	70.8	53.8	75	71.5	69	70.3	N/A	N/A	76.9
12	Gia Lai	65	N/A	60	65	65	65	N/A	70	N/A
13	Ha Noi	69.3	74.7	76.4	68.2	67.3	74.1	N/A	73.5	60.9
14	Hai Phong	69.7	72.9	75.5	77	74.5	73.6	76.7	72.1	81.1
15	Kien Giang	68.6	N/A	68.1	68.3	70.8	53.1	74.4	73.3	75.8
16	Lam Dong	55	N/A	65	70	65	60	N/A	75	N/A
17	Lang Son	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
18	Long An	66.5	N/A	78.5	78.5	74.2	53.9	72.1	N/A	75.8
19	Nghe An	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
20	Phu Tho	65	50	70	55	50	70	N/A	N/A	N/A
21	Thai Binh	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
22	Thai Nguyen	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
23	Thanh Hoa	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
24	Tien Giang	57.8	N/A	62.2	64.4	55.6	55.6	N/A	N/A	66.7
25	Ho Chi Minh	73.6	74.3	79.4	79.3	75.4	74.2	77.7	74.9	84.1
26	Tuyen Quang	60	N/A	60	50	50	70	N/A	N/A	80

To evaluate the score of “Infrastructure” for each locality according to consistency with the pillars of “Economy”, “Logistics services”, “Human resources” and “Legal and policy framework”, the score value in table 23 will be standardized corresponding to each column according to equation (1). The standardized results will be displayed specifically in table 24. Also in table 24, the score value of the “Infrastructure” pillar will be compiled according to the average value of 9 criteria for each locality.

Table 24. Evaluate the Infrastructure pillar for localities after standardization

No.	Provinces/Cities	HT1	HT2	HT3	HT4	HT5	HT6	HT7	HT8	HT9	Syn- thetic
1	An Giang	0	N/A	0	68.9	0	0	N/A	N/A	95.9	27.5
2	Ba Ria - Vung Tau	91.2	N/A	36.4	90.9	90.5	40.3	100	N/A	100	78.5
3	Bac Giang	56.5	0	40	83.3	19.1	100	N/A	N/A	80.4	54.2
4	Bac Ninh	73	30.7	20	100	80.8	52.1	N/A	N/A	50.9	58.2
5	Binh Dinh	70.9	33.9	51	95.7	100	51	0	57.2	41.8	55.7
6	Binh Duong	100	100	82.7	71.4	97.3	93.3	N/A	N/A	54.3	85.6
7	Can Tho	95.9	N/A	42.9	71.4	54.7	43.8	N/A	0	23.5	47.4
8	Da Nang	69.2	46.1	100	66.7	76.5	68.8	15.5	95	47.2	65.0
9	Dak Lak	52.3	N/A	36	86.7	68.9	13.8	N/A	76	N/A	55.6
10	Dien Bien	57.6	N/A	20	71.9	66.5	35.9	N/A	100	0	50.3
11	Dong Nai	81	38.3	80	71.8	72.7	82.4	N/A	N/A	70.2	70.9
12	Gia Lai	56.5	N/A	20	50	57.4	62.5	N/A	63.3	N/A	51.6
13	Ha Noi	74.6	96.1	85.5	60.6	66.1	96.6	N/A	85.2	17	72.7
14	Hai Phong	76.4	91.1	81.9	89.9	93.9	94.8	43.7	76.8	83.9	81.4
15	Kien Giang	71.8	N/A	52.2	61.1	79.7	17.7	26.5	84.4	66.5	57.5
16	Lam Dong	14.1	N/A	40	66.7	57.4	43.8	N/A	95	N/A	52.8
17	Lang Son	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
18	Long An	62.9	N/A	93.9	95	92.6	20.7	8.6	N/A	66.5	62.9
19	Nghe An	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
20	Phu Tho	56.5	27.7	60	16.7	0	81.3	N/A	N/A	N/A	40.3
21	Thai Binh	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
22	Thai Nguyen	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
23	Thanh Hoa	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
24	Tien Giang	25.9	N/A	28.9	48.1	21.3	27.1	N/A	N/A	36.1	31.2

No.	Provinces/Cities	HT1	HT2	HT3	HT4	HT5	HT6	HT7	HT8	HT9	Syn- thetic
25	Ho Chi Minh	93.1	94.9	97.8	97.6	97.3	96.9	51.5	94.2	94	90.8
26	Tuyen Quang	35.3	N/A	20	0	0	81.3	N/A	N/A	80.4	36.2

3.3.6. Determination of LCI scores for each locality

From the results of the scores after standardization according to the pillars, the scores of provinces and cities will be summarized as in table 25.

Table 25. The Aggregated scores of localities according to each pillar

No.	Provinces/Cities	Economy	Logistics Services	Legal and Policy Framework	The infrastructure	Human Resources
1	An Giang	50.7	56.4	44.9	27.5	52.6
2	Ba Ria - Vung Tau	75.6	70.1	54.4	78.5	62.7
3	Bac Giang	71.5	49.3	52.3	54.2	52.2
4	Bac Ninh	80.9	77.7	60.1	58.2	46.6
5	Binh Dinh	77.2	65.8	58.4	55.7	60
6	Binh Duong	48.8	62.5	63.3	85.6	70
7	Can Tho	80.1	58.0	87.8	47.4	32.5
8	Da Nang	61	72.4	60.1	65.0	60.7
9	Dak Lak	56.5	51.4	53.3	55.6	45.8
10	Dien Bien	53.9	53.4	51.8	50.3	53.3
11	Dong Nai	87	57.8	50.8	70.9	76.6
12	Gia Lai	44.5	52.6	58	51.6	42.5
13	Ha Noi	93.3	53.2	47	72.7	74.1
14	Hai Phong	99	56.0	55.4	81.4	60.7
15	Kien Giang	29	48.9	62.1	57.5	42.2
16	Lam Dong	65.3	55.6	66.9	52.8	42.3
17	Lang Son	N/A	N/A	N/A	N/A	N/A
18	Long An	76.3	68.3	52.7	62.9	61.5
19	Nghe An	N/A	N/A	N/A	N/A	N/A
20	Phu Tho	64.5	52.6	46.3	40.3	47.3
21	Thai Binh	N/A	N/A	N/A	N/A	N/A

No.	Provinces/Cities	Economy	Logistics Services	Legal and Policy Framework	The infrastructure	Human Resources
22	Thai Nguyen	N/A	N/A	N/A	N/A	N/A
23	Thanh Hoa	N/A	N/A	N/A	N/A	N/A
24	Tien Giang	76.2	48.4	57.6	31.2	29
25	Ho Chi Minh	90.5	61.7	55.1	90.8	77
26	Tuyen Quang	68.2	54.5	32.4	36.2	38

From table 25, Thai Nguyen; Lang Son; Hoa Binh; Nghe An and Thanh Hoa did not receive the full survey results from LSP. Therefore, these localities will temporarily not be ranked or evaluated for LCI. To determine the final score for localities, the weight of each pillar will be multiplied by the standardized score for each corresponding pillar by locality in table 25. LCI scores and rankings are based on the scores calculated from the survey results will be displayed in table 26.

Table 26. LCI scores of localities according to survey results

No.	Provinces/Cities	Scores	Ranks (Intention)	Notes
1	Ho Chi Minh	74.3	1	
2	Hai Phong	69.7	2	
3	Binh Duong	67.6	3	
4	Ba Ria - Vung Tau	67.5	4	
5	Dong Nai	67.1	5	
6	Ha Noi	66.3	6	
7	Da Nang	63.4	7	
8	Bac Ninh	63.2	8	
9	Long An	62.8	9	
10	Can Tho	62.3	10	
11	Binh Dinh	62.1	11	
12	Lam Dong	57.1	12	
13	Bac Giang	55.3	13	
14	Dak Lak	52.8	14	
15	Dien Bien	52.3	15	
16	Gia Lai	50.7	16	
17	Kien Giang	50.3	17	
18	Phu Tho	48.8	18	

No.	Provinces/Cities	Scores	Ranks (Intention)	Notes
19	Tien Giang	47.6	19	
20	An Giang	44.6	20	
21	Tuyen Quang	43.3	21	
22	Lang Son	N/A	N/A	Not rated
23	Thai Nguyen	N/A	N/A	Not rated
24	Nghe An	N/A	N/A	Not rated
25	Thanh Hoa	N/A	N/A	Not rated
26	Thai Binh	N/A	N/A	Not rated

Determining LCI based on survey results is still a part of the proposed methodology. The remainder will be determined by the experts and leaders of large logistics businesses, with over 20 years of experience (**) in the logistics field. The experts' evaluation results will focus on grouping logistics capacity "A, B, C, D" and ranking the localities within the same group. Since, the aggregated ranking results will be deducted and the aggregated results from the expert evaluation results will be displayed in table 27.

Table 27. List of LCI ranks by locality according to experts

No.	Provinces/Cities	Groups	Ranks in Groups	Ranks on Provinces and Cities
1	Ho Chi Minh	A	1	1
2	Hai Phong	A	2	2
3	Ha Noi	A	3	3
4	Binh Duong	A	4	4
5	Da Nang	A	5	5
6	Dong Nai	A	6	6
7	Ba Ria - Vung Tau	A	7	7
8	Bac Ninh	B	1	8
9	Can Tho	B	2	9
10	Bac Giang	B	3	10
11	Long An	B	4	11
12	Lang Son	B	5	12
13	Thai Nguyen	B	6	13
14	Nghe An	B	7	14
15	Binh Dinh	B	8	15

No.	Provinces/Cities	Groups	Ranks in Groups	Ranks on Provinces and Cities
16	Thanh Hoa	C	1	16
17	Thai Binh	C	2	17
18	Phu Tho	C	3	18
19	Tien Giang	C	4	19
20	Kien Giang	C	5	20
21	An Giang	C	6	21
22	Gia Lai	D	1	22
23	Dien Bien	D	2	23
24	Tuyen Quang	D	3	24
25	Dak Lak	D	4	25
26	Lam Dong	D	5	26

To determine the LCI score and final ranking of localities according to logistics capacity, the results obtained from tables 26 and 27 will be aggregated according to the 2/3 - 1/3 rule as mentioned in Methodology. Of which, 1/3 comes from experts' evaluation results (from table 27) and survey results (from table 26) will account for 2/3. The final ranking results will then be compiled in the order shown in table 28.

Table 28. Ranking List of LCI by Locality and Region

No.	Regions	Province / City	LCI ranking according to survey	LCI ranking according to experts	Ag-gregate ranking	Notes
1	Southeast	Ho Chi Minh City	1	1	1	
2	Red River Delta	Hai Phong City	2	2	2	
3	Southeast	Binh Duong	3	4	3	
4	Southeast	Ba Ria - Vung Tau	4	7	4	
5	Red River Delta	Ha Noi City	6	3	4	
6	Southeast	Dong Nai	5	6	6	
7	North Central Coast and South-Central Coast	Da Nang City	7	5	7	
8	Red River Delta	Bac Ninh	8	8	8	
9	Mekong Delta	Long An	9	11	9	

No.	Regions	Province / City	LCI ranking according to survey	LCI ranking according to experts	Ag-gregate ranking	Notes
10	Mekong Delta	Can Tho City	10	9	9	
11	Northern midland and mountainous	Bac Giang	13	10	11	
12	North Central Coast and South-Central Coast	Binh Dinh	11	15	12	
13	Central Highlands	Lam Dong	12	26	13	
14	Central Highlands	Dak Lak	14	25	14	
15	Northern midland and mountainous	Dien Bien	15	23	14	
16	Central Highlands	Gia Lai	16	22	16	
17	Mekong Delta	Kien Giang	17	20	16	
18	Northern midland and mountainous	Phu Tho	18	18	16	
19	Mekong Delta	Tien Giang	19	19	19	
20	Mekong Delta	An Giang	20	21	20	
21	Northern midland and mountainous	Tuyen Quang	21	24	21	
22	Northern midland and mountainous	Lang Son	N/A	12	N/A	Not Ranked
23	Northern midland and mountainous	Thai Nguyen	N/A	13	N/A	Not Ranked
24	North Central Coast and South-Central Coast	Nghe An	N/A	14	N/A	Not Ranked
25	North Central Coast and South-Central Coast	Thanh Hoa	N/A	16	N/A	Not Ranked
26	Red River Delta	Thai Binh	N/A	17	N/A	Not Ranked

Source: Vietnam Logistics Business Association (VLA) and Vietnam Logistics Research and Development Institute (VLI), 2023

From the results in table 28, the 10 localities with the top LCI rankings in the 2022 assessment are Ho Chi Minh City, Hai Phong, Binh Duong, Ba Ria - Vung Tau, Hanoi, Dong Nai, Da Nang, Bac Ninh, Long An and Can Tho in order from 1 to 10. Combined with the scores shown in table 26, the lowest score achieved by the top 10 provinces is 62.3 points for Can Tho and the highest is Ho Chi Minh City with 74.3 points. In addition, localities rated above

50 points but not in the top 10 provinces such as Binh Dinh (62.1 points), Lam Dong (57.1 points), Bac Giang (55.3 points), Dak Lak (52.8 points), Dien Bien (52.3 points), Gia Lai (50.7 points) and Kien Giang (50.3 points). Although assessed at the same rank as Gia Lai and Kien Giang provinces, Phu Tho province's LCI score (48.8 points) is lower and 50 points lower. The provinces and cities ranked in the lowest rankings belong to Tien Giang (47.6 points), An Giang (44.6 points) and Tuyen Quang (43.3 points). The score values associated with specific rankings will be summarized in table 29. Also in table 29, specific rankings for the factors that make up the LCI score will also be determined for further clarity. about the strengths and weaknesses that localities need to pay attention to in the process of planning strategies for developing local logistics systems.

Table 29. Ranking of Component Indicators Constituting the LCI Score and Specific LCI by Localities

No.	Province / City	Economy	Logistics Services	Legal and Policy Framework	Infrastructure	Human resources	LCI Scores	Aggregate ranking	Notes
1	Ho Chi Minh	3	7	11	1	1	74.3	1	
2	Hai Phong	1	11	10	3	7	69.7	2	
3	Binh Duong	19	6	3	2	4	67.6	3	
4	Ba Ria - Vung Tau	10	3	12	4	5	67.5	4	
5	Ha Noi	2	15	18	5	3	66.3	4	
6	Dong Nai	4	9	17	6	2	67.1	6	
7	Da Nang	15	2	5	7	7	63.4	7	
8	Bac Ninh	5	1	5	9	14	63.2	8	
9	Long An	8	4	14	8	6	62.8	9	
10	Can Tho	6	8	1	17	20	62.3	9	
11	Bac Giang	11	19	15	13	12	55.3	11	
12	Binh Dinh	7	5	7	11	9	62.1	12	
13	Lam Dong	13	12	2	14	17	57.1	13	
14	Dak Lak	16	18	13	12	15	52.8	14	
15	Dien Bien	17	14	16	16	10	52.3	14	
16	Gia Lai	20	16	8	15	16	50.7	16	

No.	Province / City	Economy	Logistics Services	Legal and Policy Framework	Infrastructure	Human resources	LCI Scores	Aggregate ranking	Notes
17	Kien Giang	21	20	4	10	18	50.3	16	
18	Phu Tho	14	16	19	18	13	48.8	16	
19	Tien Giang	9	21	9	20	21	47.6	19	
20	An Giang	18	10	20	21	11	44.6	20	
21	Tuyen Quang	12	13	21	19	19	43.3	21	
22	Lang Son	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Not Ranked
23	Thai Nguyen	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Not Ranked
24	Nghe An	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Not Ranked
25	Thanh Hoa	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Not Ranked
26	Thai Binh	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Not Ranked

With 5 pillars constituting the LCI scores of localities, although it may not be the locality that occupies the leading position in all pillars, specifically only the 2 pillars of Infrastructure and Human Resources, Ho Chi Minh City still occupies the first position in the LCI ranking. However, the Legal and Policy Framework pillar and the Logistics Services pillar need more attention to maintain and promote their current position. Leading localities in the remaining pillars include Economy; Legal and Policy Framework; and Logistics services listed in order are Hai Phong city; Can Tho and Bac Ninh province. Above are the leading localities in terms of LCI score rankings based on each pillar. Interested provinces and cities can learn from these localities' experiences to improve their local rankings in LCI scores in the near future. Furthermore, localities have different specific strengths, so it is difficult to accurately assess aspects that are not really suitable in the process of building a local logistics strategy. The LCI ranking will lay the foundation for the emergence of more objective arguments in evaluation work and become a highly convincing scientific basis for localities in the process of developing the system. logistics system of each locality.

PART 4: CONCLUSION AND RECOMMENDATIONS

The 2022 Vietnam Provincial Logistics Competitiveness Index (LCI) report was conducted for the first time in Vietnam with an implementation period of more than 1 year from August 11, 2022 to November 2023.

Over the past year, experts in the research team have conducted surveys with a large sample size (approximately 2000) and conducted in-depth interviews with hundreds of hours of interviews and dozens of reporting meetings. Update progress as well as periodically consult with state management agencies, Organizations, Enterprises and Research Units.

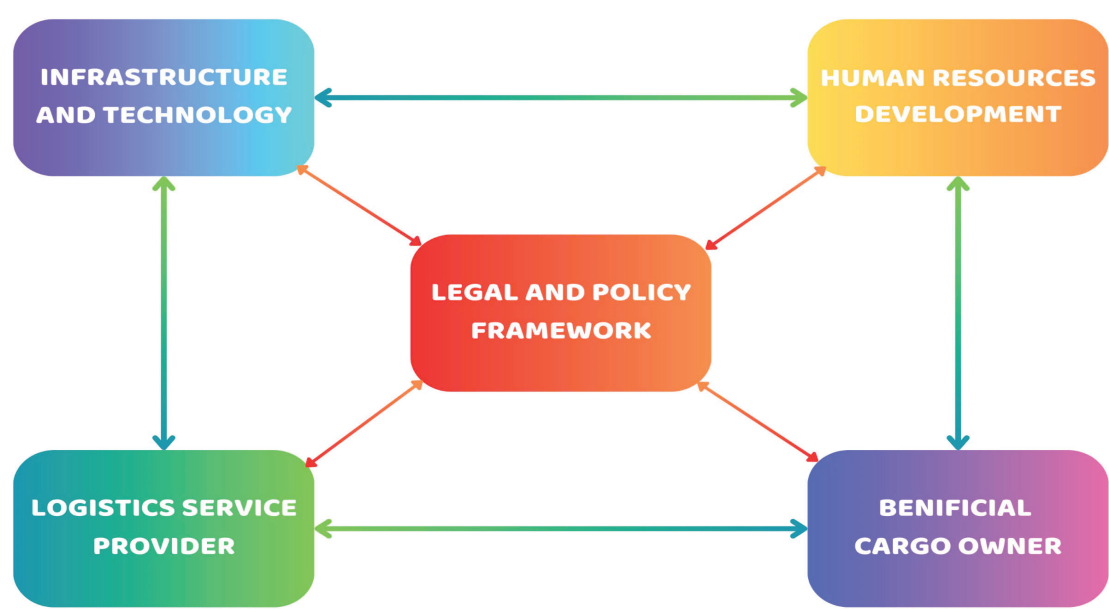
With the spirit of urgency and determination of the team of researchers under the close and active direction of the Steering Committee and in-depth input from the Advisory Board, as well as efforts to overcome many difficulties of the LCI Research Board, such as approaching and conducting surveys of businesses in remote provinces to ensure a sufficient survey sample size with the goal of ensuring reliability, inviting experts to give opinions comments..., up to now we are extremely proud that the project has been completed and Vietnam's Provincial Logistics Competitiveness Index (LCI) Report for 2022 was officially announced on the occasion of the 30th anniversary. Established Vietnam Logistics Business Association (VLA).

In the future, the next evaluation of Vietnam's provincial Logistics Competitiveness Index (LCI) will integrate updated results from secondary data to officially evaluate the scores of the provinces. localities and is the basis for demonstrating the logistics capacity of localities (for example, through



actual data on transportation infrastructure, logistics centers, warehouses, etc.) with cross-checking of 3 data sources. Data are surveys, secondary data and expert assessments through which localities have more bases in orienting the development of local logistics resources.

The special point that VLA and the LCI research team proposed as an important result drawn from the research process is to confirm that the necessary Logistics System model includes 5 elements: Infrastructure and Logistics Technology (demonstrating the role of technology rather than just Infrastructure); Human resource development (new element instead of previously being expressed as soft infrastructure in the Infrastructure component); Logistics services provider; Boss; Legal and policy framework (a replacement factor for Organizational Structure to demonstrate the important role of state management and law enforcement in logistics activities, has a dominant impact on the remaining 4 factors). re) instead of using the previous model with only four factors (Banomyong, 2008). Specifically, the application of information technology, modern and smart technology towards digital transformation is an urgent requirement and plays an important role in the logistics industry, helping to improve the efficiency of storage and transportation of goods. and increase the competitive advantage of the economy. Besides, with the strong growth rate and more advanced technology applications appearing in the logistics field, it will create a “hole” in the logistics services industry when most of them are currently working. Mainly, they are trained by the company after being hired. In the current and predicted future context, human resource development plays a key role, requiring serious attention and an appropriate planning strategy to cope with a comprehensive shortage of the logistics human resources (see figure 5).



VIET NAM LOGISTICS SYSTEM

SOURCE: VLA-VLI (2023); ADAPTED FROM BANOMYONG (2008)

Figure 5. Vietnam Logistics System

Source: Vietnam Logistics Business Association (VLA) and Vietnam Logistics Research and Development Institute (VLI), 2023; adapted from Banomyong, 2008.

Besides, in this initial assessment of the Vietnam Provincial Logistics Competitiveness Index (LCI), there are several provinces with a focus on developing the logistics center system and the diversifying transportation methods. Additionally, these localities have begun to receive policy-oriented attention and initiated logistics projects, showcasing significant potential for local logistics development. However, these localities were not included in the evaluation list of this first report due to certain objective factors, such as GRDP data, cargo circulation volume, and the number of logistics enterprises. Outstanding characteristics of the localities will be displayed in table 30. It is expected that in the next assessment, these localities will be proposed to be included in the list of provinces that need to carry out LCI assessments.

Table 30. List of Key Localities for Logistics System Assessment Planned for the Next LCI Evaluation

No.	Province / City	Outstanding Features
1	Vinh Phuc	ICD Vinh Phuc Logistics Center
2	Quang Ninh	Six Planned Logistics Centers: Ha Long, Van Don, Quang Yen, Mong Cai, Hai Ha, Binh Lieu
3	Hung Yen	Thang Long Logistics Center
4	Thua Thien - Hue	Chan May Port
5	Quang Nam	Thaco's Port and Logistics Center
6	Khanh Hoa	Van Phong Port, Cam Ranh Port

Vietnam's Provincial Logistics Competitiveness Index (LCI) Report in 2022 demonstrates the commitment of the Vietnam Logistics Business Association, the Vietnam Logistics Research and Development Institute, and partners in providing an objective assessment and ranking result of logistics competitiveness between localities. This serves as an important reference base for central and local Government agencies in planning and implementation. Implement logistics development policies at the macro and micro levels to improve local logistics capacity. For provinces and cities with high LCI rankings, there are also grounds to continue to maintain and strongly deploy policies to promote competitive advantage. For provinces with poor LCI rankings, there is also motivation to improve limitations and promote advantages to improve logistics capacity.

Corresponding to the characteristics of each locality, proposed tasks that need to be improved in the future with the goal of improving the LCI have been proposed, specifically:

- Ho Chi Minh City leads the LCI but the actual score is 74.3/100 points. Despite this, there is still a considerable distance to the maximum score. Therefore, in addition to the strengths in Human Resources, Infrastructure and Economy that need to continue to be promoted, the city needs to focus on considering and reviewing policies to solve and promote the development of the logistics industry. Furthermore, it is essential to advance the logistics industry development plan, approved by the People's Committee of Ho Chi Minh City in December 2020, which includes the development of seven logistics centers across the city. Thereby, Ho Chi Minh City can enhance the city's logistics brand, contributing to the improvement of logistics services scores in the area.

- As neighboring localities and in the same Southeast region, the provinces of Binh Duong (LCI ranked 3rd), Ba Ria - Vung Tau (LCI ranked 4th) and Dong Nai (ranked 6th) can share Strengths in Infrastructure and Human Resources with Ho Chi Minh City in developing the logistics system. By

prioritizing regional connectivity and strengthening collaboration with Ho Chi Minh City, these localities have the potential to enhance their LCI scores and rankings.

- Hai Phong city (LCI ranked 2nd) holds the adjacent position behind Ho Chi Minh City with nearly 5 points lower. Although the seaport system, road and railway systems are well-developed, currently the source of goods through the city mainly comes from other localities. To maintain the 2nd position in LCI or strive to surpass Ho Chi Minh City, the city should focus on improving the quality and diversity of seaport and logistics services while enhancing the seaport brand. Hai Phong aims to develop the seaport logistics services ecosystem in addition to creating more diverse sources of goods.

- Ranked 4th with Ba Ria - Vung Tau province, but Hanoi Capital excels in the Economy and Logistics Human Resources pillars. Besides, Hanoi's LCI score still has many opportunities to improve when the scores for the Legal and Policy Framework and Logistics Services pillars show that they are not commensurate with the capabilities that Hanoi currently holds. To address this, Hanoi should develop a long-term logistics strategy until 2030, with a vision to 2050, to improve its LCI score and serve as a logistics development model for the Northern region.

- Da Nang City (LCI ranked 7th), which has the highest score in the Logistics Services pillar, has all other pillars scoring above the average of 50/100 and at nearly similar levels. Therefore, in order to improve its position on the LCI rankings, Da Nang needs to research and reassess the current state of the logistics system to have a basis in building a strategy to develop logistics services as well as focus on developing logistics systems. Developing human resources to improve capacity and ability to provide a variety of services.

- Bac Ninh province (LCI ranked 8th) has a dynamic economy and outstanding growth rate in Vietnam. However, its Infrastructure and Human Resources pillars have not been able to reach the same level of value as other pillars, especially the Economy pillar. In the coming time, Bac Ninh should prioritize improving infrastructure and human resources logistics, especially focusing on regional connectivity.

- Long An province and Can Tho city (both ranked 9th) should adopt tailored development strategies based on their individual pillar results.

- + Specifically, Long An province needs to consider reviewing logistics policies in addition to evaluating and building a synchronous development strategy to enhance the remaining 4 pillars, especially human resources. In addition, the province should leverage its strategic position to strengthen inland waterway transport connections between the Mekong Delta with Long An international seaport - Ho Chi Minh City regional port and Cai Mep - Thi Vai port cluster.

- + For Can Tho city, Logistics human resources has a low score but can be completely improved with the role of universities and colleges providing logistics training. Similarly, its logistics infrastructure in Can Tho also has a low rating. Therefore, this is a pillar that needs investment attention in the coming time. In particular, Can Tho needs to focus on developing a regional logistics center according to Decision No. 287/QĐ-TTg of the Prime Minister, approving the Mekong Delta region planning for the period 2021 - 2030, with a vision to 2050, specifically "The general focal point center in Can Tho city with the main functions of trade, logistics, research and development, training and technology transfer, deep processing industry, high technology application to add value to agricultural products, especially rice and seafood; Developing logistics services in Hau

Giang province to support Can Tho city in fulfilling its role as a logistics center of the Mekong Delta.” Additionally, cold-chain logistics for agriculture, alongside seaport and airport logistics, will facilitate direct exports from the Mekong Delta to international markets.

- For Bac Giang (ranked 11th) performs well in the Economy pillar but scores low in the Logistics Services pillar. Therefore, its primary focus should be on developing logistics infrastructure and human resources to enhance logistics services.

- Binh Dinh province (LCI ranked 12th) has a long coastline, making it ideal for seaport developmentsystem in the area. In fact, the logistics infrastructure system in Binh Dinh is remains underdeveloped, especially the connection between the seaport system and the source of goods to industrial parks and businesses in the area. In addition, the issue of Legal and Policy Framework should also be focused on improving to promote the implementation of logistics development policies.

- With the characteristics of most of the area being mountainous in the Central Highlands, Lam Dong province (LCI ranked 13th), Dak Lak (LCI ranked 14th), Gia Lai (LCI ranked 16th) have many difficulties in planning and developing logistics infrastructure. For now, these provinces should focus on economic growth, improving logistics services, and strengthening legal and policy frameworks while attracting high-quality logistics human resources to create foundation for logistics industry development.

- Dien Bien province share the same rank of 14th and similar topographical characteristics with Dak Lak. However, the scores of the pillars all revolve around the average. Therefore, Dien Bien province needs a comprehensive strategic solution to help develop all pillars synchronously. In particular, with a long border bordering Yunnan province (China), Dien Bien has many outstanding advantages and potential to develop a unique logistics system that is cross-border commercial logistics.

- Kien Giang province (LCI ranked 16th) is rated as the lowest LCI among the group of provinces/cities adjacent to the sea. Economic challenges remain a major barrier to improving its LCI ranking in the future. Therefore, Kien Giang needs to build a separate strategy to both focus on economic development while maintaining and improving the scores of the remaining pillars. In particular, Kien Giang considers prioritizing the development of logistics to serve tourism and seafood.

- Phu Tho Province with scores of Legal and Policy Framework, Infrastructure and Human Resources are all below the average of 50/100. In these pillars, Phu Tho province can proactively consider solutions to help improve assessment scores for Legal and Policy Framework and Infrastructure, and at the same time cooperate with businesses in attracting Human resources from localities with strengths in training such as Hai Phong and Hanoi. In particular, localities can consider integrating the implementation of projects/projects to build local logistics development strategies into annual development tasks.

- For Tien Giang Province, Infrastructure and Human Resources are evaluated with very low scores. Therefore, localities should develop solutions and mobilize resources to invest in logistics infrastructure in general and, in the immediate future, connecting transport infrastructure. Regarding human resources, Tien Giang can completely attract talent from Ho Chi Minh City if there is a suitable support plan or focus on attracting human resources in the context of regional integration.

- An Giang province has a huge weakness in infrastructure. However, with projects currently under construction investment, this pillar's score will improve significantly in the future. Therefore, An Giang needs to focus on building a logistics development project and logistics infrastructure planning as well as the potential for developing logistics to serve cross-border trade and logistics to serve focal centers associated with ecological regions. freshwater (freshwater seafood, fruit, rice).

- Tuyen Quang province with low scores belongs to Legal and Policy Framework, Infrastructure and Human Resources. Similar to Phu Tho province, Tuyen Quang province needs to consider integrating logistics development orientation into the province's socio-economic development orientation to create parallel development thereby promoting the development of the logistics industry.

- For provinces lacking sufficient data to determine LCI scores in 2022, such as Lang Son, Thai Nguyen, Nghe An and Thanh Hoa, please make suggestions to the authorities and logistics services businesses in the locality. method to support the research team in the next evaluation period so that sufficient data is collected to serve effective evaluation work. In addition, through the ranking results from experts, Lang Son (LCI ranked 12th), Thai Nguyen (LCI ranked 13th), Nghe An (LCI ranked 14th), Thanh Hoa (LCI ranked 16th), Thai Binh (LCI ranked 17th) is in the middle group of the LCI rankings. This result shows that the current context and the very positive logistics development potential of localities and it is expected that the rankings will improve significantly if localities pay attention to the evaluation and design of logistics systems. through provincial-level schemes and projects.

It can be seen that, in addition to the positive impact, it creates a basis for localities to have effective logistics development policies and guidelines. LCI results are also an important basis for organizations and businesses in orienting business strategies and making investment decisions to increase their competitive advantages. In particular, LCI results will be an important reference source that contributes to promoting logistics development towards regional connectivity and promoting Vietnam's logistics development.

Through reality collected in localities, it can be seen that with 26 provinces and cities in this year's LCI assessment table as well as other provinces and cities in Vietnam, these localities have had approved logistics development projects and is being implemented, there are many advantages in implementing logistics development solutions and the ranking is quite good. Therefore, the Research Board recommends that these provinces should focus on promoting the implementation of logistics projects. The Research Board also recommends that localities that do not have logistics projects should consider conducting research on local logistics development projects to conduct thorough and in-depth research to assess the specific situation and identify solution groups. Key measures to effectively improve local logistics competitiveness.

APPENDIX

**** List of experts participating in the interview**

TT	Full Name	Positions	Working units	Years of experience
1	Le Duy Hiep	General Director, Chairman of VLA	Transimex Joint Stock Company	33
2	Nguyen Duy Minh	General Director, General Secretary of VLA	Interlog International Logistics Joint Stock Company - Interlog	27
3	Tran Duc Nghia	General Director, Chairman of Hanoi Logistics Association	Delta International Joint Stock Company	29
4	Bui Thanh Binh	Head of national forwarding department, General Secretary of Hai Phong Logistics Association	T&M Forwarding Company - Hai Phong Branch	20
5	Tran Viet Huy	CEO	Maritime Transportation and Services Joint Stock Company	25
6	Vo Thi Phuong Lan	General Manager	My A Freight Forwarding Joint Stock Company	25
7	Duong Tien Lam	CEO	Asiatrans Vietnam Joint Stock Company	25
8	Le Kim Cuong	Vice President	Tan Cang Logistics Services Center - Saigon Tan Cang Corporation	10
9	Phan Hoang Vu	Vice President	SSIT Port	23
10	Ho Lien Nam	Deputy General Manager	Quy Nhon Port Joint Stock Company	25
11	Nguyen Thi Thu Hien	Director	Delta International Jsc	15
12	Bui Van Kieu	CEO	Addicon Logistics Management Vietnam	19
13	Tran Huu Trung Tin	Director of National Cold Chain Operations	InDo Trans Logistics Corporation	29
14	Le Minh Phung	Business Manager	AJ Total Vietnam Company Limited	23
15	Nguyen Tuan Nam	Senior Operations Director	FM Supply Chain Vietnam Company	21
16	Tran Vu Doanh Huy	Business Development Director	Long An International Port Management & Exploitation Joint Stock Company	11
17	Pham Cong Tac	Head of Planning Department	An Giang Port	15
18	Ngo Thi Kim Lien	Deputy Head of Logistics Department	Tan Cang Northern Branch - Saigon Newport Corporation	15
19	Be Van Hoang Viet	Nationwide logistics management	Kuehne Nagel Vietnam Company	15
20	Nguyen Ngoc Trung Hieu	Head of national sales department	Ecotruck Company	12
21	Le Thi Doan Minh Nguyet	Customer Service & Logistics Manager	SSIT Port	15
22	Ngo Qui Hoang Trang	Warehouse Management	Maersk Vietnam Company	24
23	Nguyen Quoc Tri	Operations Manager	FM Supply Chain Vietnam	16
24	Phan Minh Tri	Development Department Specialist	MLC - ITL Logistics	9
25	Nguyen Thi Ha Trang	Specialist	Dong A Logistics Joint Stock Company	4



VIETNAM LOGISTICS RESEARCH AND DEVELOPMENT INSTITUTE

The Vietnam Logistics Research and Development Institute (VLI) is the first Science and Technology organization in the field of Logistics and Supply Chain Management in Vietnam. VLI has been operating as a training and research unit under the Vietnam Logistics Business Association (VLA). VLI was established on November 1, 2010, under Decision No. 21/QĐ-VIFFAS and holds an operating registration certificate: 242/ĐK-KHCN. The current Director is Assoc. Prof. Dr. Hồ Thị Thu Hòa.

Notably, VLI is the only organization in Vietnam authorized by VLA to manage and provide training for the FIATA international certification, offering two programs:

- 1. FIATA Diploma in International Freight Forwarding FD.**
- 2. FIATA Higher Diploma in Supply Chain Management - FHD.**

SERVICES:

- Training on Logistics and Supply Chain: Domestic and international certifications, as well as customized corporate training programs.
- Consulting on assessment, improvement, innovation, digital transformation and business development.
- Researching, designing and developing orientation of Logistics and Supply Chain industry.

For detailed consultation and discussions on research and training support, please contact:

VIET NAM LOGISTICS RESEARCH AND DEVELOPMENT INSTITUTE (VLI)

Address: 5th Floor, Saigon Port Building, No. 3 Nguyen Tat Thanh Street, Xom Chieu Ward, Ho Chi Minh City, Vietnam

Email: Research@vli.edu.vn * Hotline: +84 28 7301 8689

Website: www.vli.edu.vn



FACEBOOK



WEBSITE

TRANSPORT PUBLISHING HOUSE

Address: No. 8 Tang Bat Ho Street, Pham Dinh Ho Ward, Hai Ba Trung District, Hanoi, Vietnam

Tel: 024. 39423346/39424620 * Fax: 024. 38224784

Website: www.nxbgtvt.vn * Email: nxbgtvt@fpt.vn

PROVINCIAL LOGISTICS COMPETITIVENESS INDEX (LCI) OF VIETNAM IN 2022

*A publication celebrating the 30th anniversary of the establishment of the Vietnam
Logistics Services Business Association Viet Nam (1993-2023)
September 2023*

SUPERVISING AUTHORITY:

Executive Committee of the Vietnam Logistics Business Association (VLA)

IMPLEMENTATION: Assoc. Prof. Dr. Ho Thi Thu Hoa; Mr. Nguyen Duy Minh

.....

RESPONSIBLE FOR PUBLICATION AND CONTENT:

Director – Editor-in-Chief: Mr. Nguyen Minh Nhat

Editor: Ms. Ngo Thi Bich Diep

Layout & Design: DEKYM Co., Ltd

CO-PUBLISHING PARTNER:

DEKYM Co., Ltd. | Email: dekym01@gmail.com

Printed in 100 copies, A4 size, by Tin Long Printing Co., Ltd.

Address: No. 279/2 Huynh Van Banh Street, Phu Nhuan Ward, Ho Chi Minh City, Vietnam.

Certificate of Publishing Registration: No. 7960/XN-CXBIPH/

International Standard Book Number (ISBN): 978-604-76-3207-7

Decision on Publication: No. 63 LK/QĐ-XBGT dated 17 September 2025

Completed printing and legal deposit in 2025.