



Analysis of Logistics Sector Employees' Perceptions of Türkiye's Strategic Position in International Transportation within the Scope of the New Silk Road

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Abstract

This study explores the perceptions of logistics sector employees regarding Turkey's strategic role in international transportation under the Belt and Road Initiative. The sample includes 402 employees working at border gates, ports, railway terminals, and logistics centers, selected via convenience sampling. Data were analyzed using SPSS 27.0. Results show that Turkey's position between Asia and Europe is considered a major logistical advantage. While road and rail infrastructures are rated positively, port infrastructure is seen as needing improvement. Logistics service quality, digitalization, and customs operations received favorable evaluations. However, border congestion, bureaucratic transit procedures, and regional political instability are perceived as key challenges. Despite these issues, a cautiously optimistic view of future opportunities prevails. Significant differences in perceptions were observed by gender, age, experience, sector, region, and job unit. These findings highlight the importance of designing transportation policies based on sectoral perceptions and expectations.

Keywords: New Silk Road, Logistics Perceptions, Transportation Economics, Non-Parametric Tests.

1. Introduction

In recent years, the transformation in the structure of global trade has reshaped countries' transportation and logistics policies. The increasing trade volume, while deepening economic interactions, has made the transportation and logistics sectors not only a fundamental element of economic growth but also of regional development and competitiveness (Hummels, 2007; Rodrigue, 2020). The development of international trade has made the efficiency of transport corridors and the quality of transportation infrastructure a strategic element. Especially in terms of increasing economic growth and global competitiveness, the effectiveness of transportation and logistics systems plays a critical role.

The World Bank (2023) states that each unit improvement in transportation infrastructure increases exports by 8–10%. This finding clearly demonstrates the

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importance of transportation in economic integration. Turkey, which serves as a natural bridge between Asia and Europe, continues to maintain its historical logistical advantage in this context (Notteboom and Rodrigue, 2005). Thanks to its geopolitical position, Turkey, located at the intersection of east-west and north-south transport corridors, has become an important logistics transit country through the Middle Corridor within the framework of China's Belt and Road Initiative, which was launched in 2013 (OECD, 2018; Erdal, 2021). Within this multimodal transportation network extending from China to Europe, Turkey offers one of the shortest and safest connection routes through the Middle Corridor (Erdal, 2021).

Turkey's position in international transportation networks is becoming more visible within the holistic structure of routes being shaped between Asia and Europe within the scope of the Belt and Road Initiative (BRI). The Northern Corridor, the Central Corridor, and maritime lines extending from China to Europe are restructuring global trade flows with varying costs and transit times. In this context, the Central Corridor is one of the most critical routes strengthening Turkey's geostrategic role. This structure is presented holistically in Figure 1 (Stiftung Wissenschaft und Politik, 2022).

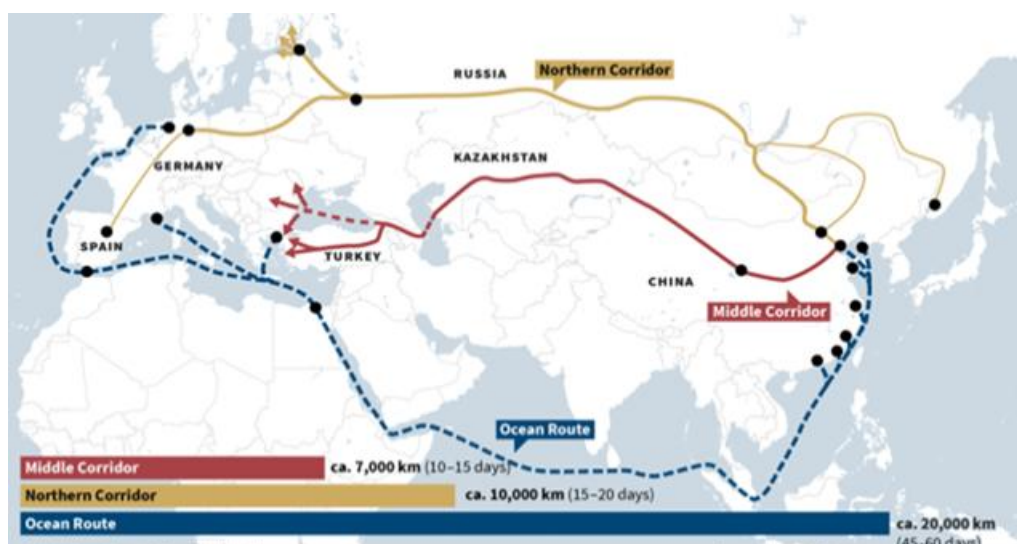


Figure 1: Alternative Transport Routes and the Middle Corridor from China to Europe within the Scope of the Belt and Road Initiative (BRI)

Figure 1 shows the comparative positioning of the three main routes from China to Europe—the Northern Corridor, the Central Corridor, and the maritime route—in terms of distance and transit time. The Central Corridor, which passes through Turkey, stands out as a strategic alternative for Asia-Europe transportation.

Turkey aims to increase its capacity through investments in the Baku-Tbilisi-Kars Line, Marmaray, Yavuz Sultan Selim Bridge, and logistics centers (Ministry of Transport and Infrastructure, 2022). However, in order for Turkey to fully realize its potential leadership role within the framework of the New Silk Road, structural enhancements are needed in certain areas. According to the Turkey Logistics Sector Report published by UTIKAD (2022), factors such as waiting times at border gates, the complexity of customs procedures, and the inadequacy of the level of digitalization in transportation negatively impact logistics efficiency. Similarly, Arvis et al. (2018) state that time loss in transportation not only leads to economic losses but also causes significant damage to the perception of reliability. Additionally, Turkey's score on the World Bank's Logistics

Performance Index as of 2023 indicates that there are still areas for improvement when compared to developed economies (World Bank, 2023).

Christopher (2016) argues that the efficiency of transportation systems is directly influenced not only by cost reduction but also by customer satisfaction and supply chain reliability. Delays at border crossings and along transit transportation routes can lead to increased transportation costs, longer delivery times, and a reduction in Turkey's competitive advantage within global supply chains. Therefore, it has become a significant necessity for Turkey to support the physical developments in its transportation infrastructure with the quality of logistics services.

In the literature, the indirect effects of improvements in the transportation and logistics sector on economic growth are frequently emphasized. Limao and Venables (2001) state that poor infrastructure can increase transportation costs by up to 50%, and this situation can directly reduce trade volume. Similarly, an analysis conducted by the Turkish Economic Policy Research Foundation (TEPAV, 2020) revealed that logistics costs in Turkey are still approximately 30% higher than those in developed countries. At this point, it is emphasized that in order for Turkey to enhance its international competitiveness in the logistics sector, not only the improvement of transportation infrastructure but also the increase of efficiency and speed in service processes is necessary (Özdemir and Güngör, 2022). However, research on the support of Turkey's transportation strategy by the perceptions of logistics employees is limited (Tunay, 2021). However, the experiences of these employees are a critical source of information for understanding the sectoral situation and the policy development processes (Christopher, 2016).

This study aims to analyze the perceptions of logistics employees regarding Turkey's strategic position in international transportation within the scope of the New Silk Road; to evaluate these perceptions in the context of transportation infrastructure, service quality, risks, and opportunities. Thus, it is aimed to contribute to the gap in the literature and provide applicable suggestions for sectoral development.

2. Literature Review

The Belt and Road Initiative (BRI) and the Middle Corridor, which emerged within it, have become central to geopolitical and geoeconomic debates in recent years, particularly at the Eurasian level. Hussain (2021) examines the debate over whether the Middle Corridor is an alternative to or a complement to China's Northern Line within a multi-actor framework, emphasizing that the line serves as a strategic diversification of east-west trade via the Caspian Sea. Similarly, Vasa and Barkanyı (2023) demonstrate that the Middle Corridor's connectivity, extending from Central Asia, the Caucasus, and Turkey to Europe, is gaining increasing geoeconomic importance not only in transit transportation but also in energy, supply chain security, and regional cooperation. These debates position Turkey as a multimodal intersection where the BRI routes and the Trans-Caspian Line intersect.

Turkey's function as a "regional logistics hub" and "transfer point" in transportation networks is also highlighted in other studies. Gabrielyan (2022) analyzes Turkey as a "transport and logistics hub" through railway, highway, and port projects connecting the Balkans, the Black Sea, the Caucasus, and the Middle East. He notes that the country's Middle Corridor vision has been materialized through Marmaray, the Baku–Tbilisi–Kars (BTK) line, and port investments. Şenol and Üçışık Erbilin (2022), on the other hand, examine the impact of the Middle Corridor on Turkey within the framework of the KYG,

demonstrating that Turkey has become a critical "transit country" in China–Europe trade thanks to its trans-Caspian railway and highway networks in terms of energy lines and freight transport. Cengiz (2023) also analyzes the reorientations in road and rail freight movements after the Russia–Ukraine war and, using Kars Logistics Center data, reveals that the Middle Corridor has become an increasingly used alternative route even during crisis periods.

The supply chain security and risk management dimension of the Middle Corridor for Turkey has recently become a distinct area of research. Taşkın and Akıncı (2024) examine the Middle Corridor in the context of fragile supply chains, emphasizing that the Trans-Caspian line has emerged as a secure and diversified corridor following the COVID-19 pandemic, the Russia-Ukraine war, and global geopolitical tensions, and that Turkey could play a role as a "regional security provider" on this line. Toprak (2020), on the other hand, examines the transformation of Turkey's Central Asia policy within the framework of the Middle Corridor Initiative, demonstrating that Turkey has positioned itself not only as a transit country but also as a regional policy actor, with transportation and logistics infrastructure becoming a key tool of this policy. While these studies demonstrate Turkey's strategic importance in the context of the Central Corridor and the Middle Corridor, they primarily rely on macropolitical documents, diplomatic discourse, and secondary data.

Empirical studies on logistics performance, infrastructure, and port connections assess Turkey's logistics capacity along the Middle Corridor from a more technical perspective. Kamacı (2025a) measures the logistics performance of Middle Corridor countries using the Logistics Performance Index (LPI) data and ranks countries using the LOPCOW-weighted TOPSIS method. He reveals that Turkey outperforms the regional average in customs procedures and infrastructure, but that there is still room for improvement in logistics service quality and traceability. Kamacı (2025b) examines the role of the Middle Corridor in the context of global supply chains and Turkey's logistics infrastructure through a SWOT analysis, noting that the BTK line, Marmaray, and port investments position Turkey as a potential logistics hub, but that port-railway integration and processing times at border crossings are major weaknesses. Sacar and Özdemir (2022) evaluate Turkey's port connections along the Middle Corridor route using fuzzy AHP and TOPSIS methods, determine the most appropriate port combinations in terms of railway connectivity, hinterland accessibility, cost and service quality criteria, and show that structural deficiencies in port-railway integration limit the effectiveness of combined transport.

A significant portion of the international literature on logistics performance and BRI countries relies on survey-based LPI scores, macro trade data, or supply chain indicators; however, these studies do not comprehensively measure the position perceptions of logistics professionals within a given country. In summary, the literature includes empirical studies that (i) discuss the geopolitical/geoeconomic importance of the CPG and the Middle Corridor and Turkey's central role within this framework through conceptual and policy documents; (ii) evaluate Turkey's logistics performance and infrastructure using the LPI, port connections, and multi-criteria decision-making methods. However, studies that directly examine Turkey's strategic position within the CPG/Middle Corridor through a scale-based, multidimensional approach, based on the perceptions of logistics professionals, are extremely limited. Existing research largely focuses on macro indicators, official policy documents, international indices, or the general expectations of company managers; it does not systematically measure the

perceptions of employees working at border crossings, ports, railway terminals, and logistics centers regarding their strategic location, infrastructure, service quality, risks, and future opportunities. This study aims to address this gap by exploring perceptions of Turkey's strategic position in international transportation at a multidimensional level using a unique scale, thus contributing to the literature with practical implications for both theoretical and policymakers.

3. Methodology

3.1 Pattern of the Research

This research is a cross-sectional study aimed at determining the perceptions of logistics sector employees regarding Turkey's strategic transportation position within the scope of the New Silk Road. In the study, the descriptive survey model from quantitative methods was used. This model aims to systematically measure individuals' perceptions of a specific phenomenon through large samples (Cohen et al., 2007; Karakaya, 2012). Participants' perceptions were evaluated in terms of transportation infrastructure, service quality, risks, and future opportunities. The data collection process was carried out simultaneously, and the findings presented objective outputs reflecting the current situation. This design has been preferred in terms of systematically presenting sectoral perceptions and laying the groundwork for strategic inferences.

3.2 The Hypotheses of the Research

Transportation and logistics are one of the fundamental dynamics of international trade and play a critical role in economic growth and global integration. Turkey, as a strategic transit point between Asia and Europe, has significant potential as a logistics hub within the framework of the New Silk Road. The evaluation of this potential is related not only to the physical infrastructure but also to the perceptions of the employees working in the sector. In this context, the perceptions of logistics employees regarding Turkey's strategic transportation position have been addressed in terms of transportation infrastructure, service quality, risks, and opportunities; the effects of individual variables such as age, gender, type of transportation, and duration of experience have been examined. Within the scope of the research, the following hypotheses were tested:

H1–H5: Participants' perceptions of Turkey's strategic location, infrastructure, service quality, risks, and future opportunities are at a positive level.

H6–H12: These perceptions show significant differences based on variables such as age, gender, sector, duration of experience, type of institution, region, and unit.

Through these hypotheses, it is aimed to evaluate Turkey's strategic position in transportation based on sectoral perceptions and to contribute to the strategy development processes with these perceptions.

3.3 Research Population and Sample

The research population was defined using data from UTİKAD, which includes approximately 150,000 employees in the logistics sector in Turkey. Considering the population size, the minimum sample size calculated using the Cochran (1977) formula was 384. Data were collected from a total of 450 participants via online and face-to-face surveys. However, due to missing data, inconsistent response patterns, and extreme

outliers, 48 observations were removed during the data cleaning process. Therefore, analyses were conducted on 402 valid observations. This indicates that the sample was statistically sufficient in size and met the calculated minimum value.

The study employed a convenience sampling method. The sample included individuals working in various modes of transportation (road, rail, sea, and air), various operational units (border crossings, ports, railway terminals, and logistics centers), and across seven geographic regions in Turkey. Thus, the participants comprised individuals from various positions and experience levels working in sea, road, rail, and combined transport. To further illustrate the sample structure, the demographic and occupational characteristics of the participants are presented in Table 2.

3.4 Data Collection Tools

The research data collection tool consists of two parts. The first part includes questions aimed at determining the demographic and professional characteristics of the participants, such as gender, age, sector, length of experience, institution type, duty region, and unit. The second part includes the "Strategic Position Perception Scale," developed to measure employees' perceptions of Turkey's strategic position in international transportation. The scale was developed using studies on the Belt and Road Initiative, the Middle Corridor, logistics performance, transportation infrastructure, service quality, sectoral risks, and future vision in the literature (Christopher, 2016; UTIKAD, 2022; World Bank, 2023). Content validity was ensured in line with the opinions received from academics specialized in logistics and transportation, and the scale items were arranged in accordance with content validity.

The scale consists of five subscales and a total of 28 items: strategic location, transportation infrastructure, logistics service quality, perceived risks, and future opportunities. All items were designed on a 5-point Likert-type structure, ranging from "1 = Strongly Disagree" to "5 = Strongly Agree." The full scale is presented in Appendix 1. The construct validity of the scale was tested using Exploratory Factor Analysis, and reliability analyses revealed acceptable Cronbach's alpha coefficients for all subscales.

3.5 Data Analysis

The research data were analyzed using the SPSS 27.0 program. First, missing data and outliers were checked, and then the distribution of the variables was evaluated using the Kolmogorov-Smirnov test. Non-parametric tests were preferred for variables that did not meet the normality assumption. For binary groups, the Mann-Whitney U test was applied, and for three or more groups, the Kruskal-Wallis H test was used. To test the construct validity of the scale, Exploratory Factor Analysis (EFA) was conducted, and the suitability was evaluated using the Kaiser-Meyer-Olkin (KMO) and Bartlett's Test of Sphericity. Factor loadings were used to assess the validity of the scale, while Cronbach's Alpha coefficients were used as a reliability measure for the sub-dimensions and the overall scale. In all analyses, a significance level of $p < 0.05$ was accepted.

4. Findings

4.1 Findings Regarding the Construct Validity of the Research Scale

To test the construct validity of the scale, Exploratory Factor Analysis (EFA) was applied. EFA is a multivariate analysis method that simplifies the data structure by grouping related variables under a smaller number of independent factors (Büyüköztürk, 2018). The suitability of the dataset for factor analysis was evaluated using the Kaiser-Meyer-Olkin (KMO) test; the KMO coefficient was found to be 0.881, indicating a good level of sample adequacy (Tavşancıl, 2010). Additionally, the result of the Bartlett's Test of Sphericity ($\chi^2=6618.639$; $p<0.001$) indicates a significant relationship between the variables. To determine the factor structure, Principal Component Analysis (PCA) and Varimax Rotation were applied, and the findings are presented in Table 1.

Table 1: EFA Results of the Research Scale

<i>Substances and Dimensions</i>	<i>Factor Loading</i>	<i>Eigenvalue</i>	<i>Variance</i>	<i>Cumulative Variance</i>
<i>Strategic Position Dimension</i>				
Turkey's geopolitical position is advantageous for international transportation.	0.859			
Turkey plays an effective role as a transfer hub in Middle Corridor transportation.	0.855			
Turkey's geographic location provides a competitive advantage in logistics costs.	0.845			
Turkey's ability to connect east-west and north-south corridors is important for international trade.	0.843	4.404	15.727	15.727
Turkey functions as a strategic logistics bridge between Asia and Europe.	0.826			
The New Silk Road initiative has increased Turkey's transportation potential.	0.751			
<i>Transport Infrastructure Dimension</i>				
Port infrastructure in Turkey is sufficient for international transportation.	0.750			
Turkey's railway infrastructure is adequate for international transport.	0.737			
The establishment of logistics villages (centers) enhances Turkey's competitiveness in transportation.	0.680			
The physical infrastructure of border gates in Turkey is sufficient for international transportation.	0.617	4.117	14.702	30.429
Turkey's road networks are of sufficient quality to support international transport.	0.574			
Transportation infrastructure investments in Turkey have increased efficiency in international transport.	0.553			
<i>Logistics Service Quality Dimension</i>				
Customs procedures in Turkey are fast and efficient for international transportation.	0.813			
Transport safety (cargo security, insurance, etc.) in Turkey is adequate for international transportation.	0.808			
Widespread digitalization at border gates has facilitated transportation processes.	0.766	3.412	12.185	42.614
Bureaucratic barriers in transit transport have decreased in Turkey.	0.745			
Turkey continuously improves the quality of its transportation services.	0.716			
Logistics service providers in Turkey deliver services at international standards.	0.715			
<i>Risks and Barriers Dimension</i>				
Turkey's challenges with transit passage documents in international transport hinder logistics flow.	0.874			
Political instability in neighboring countries may pose risks for transport through Turkey.	0.864	3.304	11.801	54.415

Frequent congestion at Turkey's land borders negatively impacts international transport.	0.859			
In Turkey's transport sector, regulatory problems are more prominent than infrastructure issues.	0.786			
One of Turkey's main challenges in international transport is customs waiting times.	0.618			
<i>Opportunities and Future Expectations Dimension</i>				
If Turkey continues infrastructure investments, it is believed to become a leading country in international transport.	0.884			
Turkey's investments in the Middle Corridor will increase transport volume in the future.	0.869			
Turkey could become a logistics hub within the New Silk Road framework.	0.835	2.974	10.621	65.036
Turkey's human resources in transportation and logistics are capable of succeeding in global competition.	0.714			
To become a regional hub in international transport, Turkey must invest more in digitalization.	0.605			

The Kaiser criterion was used to determine the number of factors, and only components with an eigenvalue greater than 1 were included in the analysis (Kaiser, 1974). According to the AFA results, the scale has a five-factor structure: strategic location, transportation infrastructure, logistics service quality, risks and barriers, and opportunities and future expectations. When examining the factor load values; in the strategic position dimension, values ranged from 0.751 to 0.859, in transportation infrastructure from 0.553 to 0.750, in logistics service quality from 0.715 to 0.813, in risks and barriers from 0.618 to 0.874, and in opportunities and future expectations from 0.605 to 0.884, high values were obtained. These findings indicate that the items exhibit strong relationships with the structures they measure and that the scale factor structure is reliable (Büyüköztürk, 2018). The total variance explained by the five factors is 65.036%. This ratio is above the thresholds considered sufficient for valid scale structures in social sciences and confirms the establishment of construct validity. The resulting five-dimensional structure is consistent with the factor patterns reported in the logistics perception and strategic location literature (Acar and Karakaya, 2021; Özdemir and Güngör, 2022).

4.2 Reliability Analysis

The internal consistency of the scale has been evaluated using the Cronbach Alpha (α) coefficient. The overall Cronbach Alpha value of the scale is 0.884, indicating high reliability. The α values for the sub-dimensions are as follows: strategic location: 0.923; transportation infrastructure: 0.795; logistics service quality: 0.884; risks and obstacles: 0.866; opportunities and future expectations: 0.861. According to Tavşancıl (2010), values above 0.80 indicate high reliability, while values between 0.60 and 0.80 indicate good reliability. In this context, the scale is reliable and consistent both at the general level and in its sub-dimensions.

4.3 Demographic Findings

Details regarding the demographic and occupational characteristics of the sample are presented in Table 2.

Table 2: Demographic and Professional Characteristics of Participants

	Demographic Characteristics	Frequency	Percentage		Demographic Characteristics	Frequency	Percentage
Age	18–25	110	27.4	Gender	Male	261	64.9
	26–40	123	30.6		Female	141	35.1
	41–55	118	29.3	Type of Institution	Private Sector	211	52.5
	56 and above	51	12.7		Public Institution	191	47.5
Sector	Road Transportation	172	42.8	Work Unit	Border Gate	135	33.6
	Railway Transportation	121	30.1		Port	80	19.9
	Maritime Transportation	80	19.9		Railway Terminal	119	29.6
	Air Transportation	29	7.2		Road Logistics Center	68	16.9
Region	Marmara	128	31.8	Experience Time	1–5 years	68	16.9
	Aegean	71	17.7		6–10 years	194	48.3
	Central Anatolia	52	12.9		11–15 years	93	23.1
	Mediterranean	41	10.2		16 years and above	47	11.7
	Black Sea	35	8.7				
	Eastern Anatolia	34	8.5				
	Southeastern Anatolia	41	10.2				

The age distribution of the participants was balanced, with the majority between the ages of 26 and 55. The gender distribution shows a predominance of male employees. Sectoral diversity is evident, with road and rail transport having a high representation rate, while maritime and air transport groups were more limited. The regional distribution reflects the true concentrations of the Marmara, Aegean, Central Anatolia, and Mediterranean regions within the sector. These characteristics demonstrate that the sample is representative of the logistics sector's workforce composition.

4.4 Findings on Their Responses to the Statements in the Research Scales

The statistical results regarding the participants' responses to the statements in the research scale are presented in Table 3.

Table 3: Results Regarding Perceptions of Strategic Location

Statements	Strongly Disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly Agree (%)	Mean	Standard Deviation

<i>Strategic Position Dimension</i>							
Turkey functions as a strategic logistics bridge between Asia and Europe.	8.5	8.7	13.2	35.0	34.6	3.78	1.24
Turkey's geopolitical position is advantageous for international transportation.	8.2	6.7	14.4	32.3	38.4	3.85	1.23
The New Silk Road initiative has increased Turkey's transportation potential.	7.2	11.2	11.9	37.9	31.8	3.75	1.21
Turkey's geographic location offers a competitive advantage in logistics costs.	7.5	7.5	15.2	37.7	32.1	3.79	1.18
Turkey's ability to connect east-west and north-south corridors is vital for international trade.	8.7	10.7	15.4	31.8	33.4	3.70	1.27
Turkey acts as an effective transfer hub for Middle Corridor transportation.	8.2	7.5	13.7	37.3	33.3	3.80	1.21
<i>Transport Infrastructure Dimension</i>							
Port infrastructure in Turkey is sufficient for international transportation.	3.5	14.4	16.7	47	18.4	3.62	1.05
Turkey's railway infrastructure is suitable for international transportation.	3.2	7.5	12.7	46.3	30.3	3.93	1.00
Turkey's road network is of a quality that supports international transport.	3.7	5	14.9	42.3	34.1	3.98	1.01
The establishment of logistics villages (centers) increases Turkey's competitiveness in transportation.	3	4.2	11.9	50.3	30.6	4.01	0.93
Turkey's infrastructure investments have improved the efficiency of international transport.	3.5	9.2	12.9	50.3	24.1	3.82	1.01
The physical infrastructure of Turkey's border gates is sufficient for international transport.	4.2	5.7	8	56.5	25.6	3.93	0.97
<i>Logistics Service Quality Dimension</i>							
Customs procedures in Turkey are fast and efficient for international transportation.	2	4.2	11.2	48.3	34.3	4.08	0.89
Bureaucratic barriers in transit transport have been reduced in Turkey.	2	3.5	7.5	46.5	40.5	4.20	0.87
The spread of digitalization at border gates has streamlined transportation processes.	2.5	4.7	9.7	45.5	37.6	4.10	0.93
Logistics service providers in Turkey operate at international standards.	4	6	12.9	44	33.1	3.96	1.02
Transport safety (cargo security, insurance, etc.) in Turkey is adequate for international transport.	2.7	4.5	9.2	49.5	34.1	4.07	0.92
Turkey continuously improves the quality of its transport services.	3.2	2.7	17.7	51	25.4	3.92	0.90
<i>Risks and Barriers Dimension</i>							
One of the main issues Turkey faces in international transport is waiting times at customs.	4.7	18.7	16.7	37.8	22.1	3.53	1.16
Frequent congestion at Turkey's land border gates negatively affects international transport.	2.5	8	15.7	52.2	21.6	3.82	0.94
Political instability in neighboring countries can make transportation through Turkey risky.	2.7	8	15.4	52.8	21.1	3.81	0.94
Turkey's issues with transit permits in international transport hinder the flow of logistics.	3	8.2	16.4	52.3	20.1	3.78	0.95
In Turkey's transport sector, regulatory problems are more significant than infrastructure issues.	2.2	9.7	19.7	45	23.4	3.77	0.98
<i>Opportunities and Future Expectations Dimension</i>							
Turkey's investments in the Middle Corridor will increase transportation volume in the future.	6.2	21.1	18.7	41.1	12.9	3.33	1.13
Within the New Silk Road framework, it is possible for Turkey to become a logistics hub.	7.2	22.9	18.7	37.5	13.7	3.27	1.16

If Turkey continues its infrastructure investments, it is believed to become a leading country in international transport.	6.2	23.9	18.4	35.6	15.9	3.31	1.17
Turkey needs to invest more in digitalization to become a regional center in international transportation.	4.7	11.4	12.2	46.8	24.9	3.75	1.09
Turkey's human resources in transportation and logistics are competitive at the global level.	4.5	15.9	13.9	42.8	22.9	3.63	1.13

In the strategic location dimension, all items have averages above 3.70, indicating a strong awareness of Turkey's geopolitical advantages among participants. In the transportation infrastructure dimension, relatively lower perceptions of port infrastructure indicate areas for improvement, particularly in maritime transport. The logistics service quality dimension averages reveal a generally positive assessment of service providers, but there is room for improvement in customs procedures. In the risks and obstacles dimension, transit documents, congestion at border crossings, and regional instability stand out as significant problem areas in international transportation. Finally, the high averages in the opportunities and future expectations dimensions reveal cautious optimism that Turkey can gain a more central position in transport corridors in the future; however, the realization of this expectation depends largely on the comprehensiveness of infrastructure investments and the sustainability of cooperation with China.

4.5 Findings Regarding Significance Analyses in Terms of Various Variables

To evaluate the normality of the data, the average scores, coefficient of variation, and Kolmogorov-Smirnov normality test results for the factors were analyzed (Table 4).

Table 4: Factor Scores and Normality Test Results

<i>Factor Groups</i>	<i>N</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>Coefficient of Variation</i>	<i>Skewness</i>	<i>Kurtosis</i>	<i>Kolmogorov-Smirnov Normality Test</i>	
							<i>Test Statistic</i>	<i>p</i>
<i>Strategic Position</i>	402	3.784	1.041	%28	-0.810	0.118	0.157	0.000
<i>Transport Infrastructure</i>	402	3.884	0.701	%18	-1.319	2.970	0.148	0.000
<i>Logistics Service Quality</i>	402	4.004	0.628	%16	-2.157	6.974	0.209	0.000
<i>Risks and Barriers</i>	402	3.748	0.809	%22	-0.874	0.822	0.192	0.000
<i>Opportunities and Future Expectations</i>	402	3.462	0.915	%26	-0.258	-0.405	0.134	0.000

According to Tabachnick and Fidell (2007), for a normal distribution, skewness should be within ± 1 and kurtosis within ± 2 . While the dimensions of strategic location, risks, and opportunities meet these criteria, the dimensions of transportation infrastructure and logistics service quality have been excluded. Additionally, the coefficient of variation for all dimensions was found to be below 33%, which was considered in favor of normality (Oğuz and Karakayacı, 2017). However, according to the results of the Kolmogorov-

Smirnov test ($p < 0.05$), all dimensions do not conform to a normal distribution. Therefore, non-parametric tests were preferred in the analyses: For comparisons between two groups, the Mann-Whitney U test was used, and for three or more groups, the Kruskal-Wallis H test was used.

Table 5: Mann-Whitney U Test Results by Gender

<i>Variables</i>	<i>Gender</i>	<i>n</i>	<i>Mean Rank</i>	<i>Sum of Ranks</i>	<i>U Value</i>	<i>p</i>
<i>Strategic Position</i>	Male	261	193.1	50399.5	16208.5	0.046
	Female	141	217.05	30603.5		

A significant difference was found only in the strategic position dimension by gender. Female employees' perceptions of strategic position were higher than those of males, indicating that women may have a stronger sensitivity to planning and strategy processes.

Table 6: Mann-Whitney U Test Results by the Nature of the Institution

<i>Variables</i>	<i>Institution Type</i>	<i>n</i>	<i>Mean Rank</i>	<i>Sum of Ranks</i>	<i>U Value</i>	<i>p</i>
<i>Strategic Position</i>	Private Sector	211	216.2	45619	17048	0.007
	Public Institution	191	185.26	35384		

In terms of institutional characteristics, a significant difference was found only in terms of strategic location. Private sector employees appear to evaluate Turkey's geopolitical transportation position more positively.

Table 7: Kruskal-Wallis H Test Results by Age

<i>Variables</i>	<i>Age</i>	<i>n</i>	<i>Mean Rank</i>	<i>Degrees of Freedom</i>	<i>Chi-Square (χ^2)</i>	<i>p</i>
<i>Strategic Position</i>	18–25	110	198.03	3	9.077	0.028
	26–40	123	199.12			
	41–55	118	222.63			
	56 and above	51	165.84			
<i>Logistics Service Quality</i>	18–25	110	174.68	3	15.026	0.002
	26–40	123	207.09			
	41–55	118	229.91			
	56 and above	51	180.14			
<i>Opportunities and Future Expectations</i>	18–25	110	180.68	3	8.434	0.038
	26–40	123	196.05			
	41–55	118	223.9			
	56 and above	51	207.72			

Significant differences were found between age groups in the dimensions of strategic location, logistics service quality, opportunities, and future expectations. The 41–55 age group had the highest perception, indicating that industry experience and observations were positively reflected in the evaluations.

Table 8: Kruskal-Wallis H Test Results by Sector

<i>Variables</i>	<i>Sector</i>	<i>n</i>	<i>Mean Rank</i>	<i>Degrees of Freedom</i>	<i>Chi-Square (χ^2)</i>	<i>p</i>
<i>Transport Infrastructure</i>	Road Transportation	172	185.65	3	8.919	0.030
	Railway Transportation	121	200.75			
	Maritime Transportation	80	224.08			
	Air Transportation	29	236.33			
<i>Logistics Service Quality</i>	Road Transportation	172	173.93	3	19.178	0.000
	Railway Transportation	121	215.14			
	Maritime Transportation	80	237.22			
	Air Transportation	29	209.59			
<i>Opportunities and Future Expectations</i>	Road Transportation	172	177.75	3	15.541	0.001
	Railway Transportation	121	209.76			
	Maritime Transportation	80	236.79			
	Air Transportation	29	210.52			

Significant differences were found in the dimensions of transportation infrastructure, service quality, opportunities, and future expectations by sector type. The higher perceptions of maritime and airline employees may be related to these sectors' operational structures and digitalization capacity, which are close to international standards.

Table 9: Results of the Kruskal-Wallis H Test by Length of Experience in the Industry

<i>Variables</i>	<i>Years of Experience in the Sector</i>	<i>n</i>	<i>Mean Rank</i>	<i>Degrees of Freedom</i>	<i>Chi-Square (χ^2)</i>	<i>p</i>
<i>Logistics Service Quality</i>	1–5 years	68	165.58	3	10.709	0.013
	6–10 years	194	217.48			
	11–15 years	93	200.24			
	16 years and above	47	190.01			

A significant difference was found only in the logistics service quality dimension according to experience length, and it was observed that employees in the medium experience group evaluated the service processes more positively.

Table 10: Kruskal-Wallis H Test Results According to the Unit Participants Work In

<i>Variables</i>	<i>Work Unit</i>	<i>n</i>	<i>Mean Rank</i>	<i>Degrees of Freedom</i>	<i>Chi-Square (χ^2)</i>	<i>p</i>
<i>Transport Infrastructure</i>	Border Gate	135	198.29	3	22.111	0.000
	Port	80	152.48			
	Railway Terminal	119	223.47			
	Road Logistics Center	68	227.08			
<i>Logistics Service Quality</i>	Border Gate	135	206.1	3	31.692	0.001
	Port	80	138.7			
	Railway Terminal	119	222.01			
	Road Logistics Center	68	230.35			
<i>Opportunities and Future Expectations</i>	Border Gate	135	209.81	3	11.599	0.009
	Port	80	162.49			
	Railway Terminal	119	214.82			
	Road Logistics Center	68	207.59			

Significant differences were also found in three dimensions based on the unit employed. The higher perceptions of railway terminal and highway logistics center employees may be related to the more systematic and digitalized operational processes in these units.

Table 11: Kruskal-Wallis H Test Results by Region

<i>Variables</i>	<i>Region</i>	<i>n</i>	<i>Mean Rank</i>	<i>Degrees of Freedom</i>	<i>Chi-Square (χ^2)</i>	<i>p</i>
<i>Logistics Service Quality</i>	Marmara	128	184.16	6	12.829	0.046
	Aegean	71	235.63			
	Central Anatolia	52	213.3			
	Mediterranean	41	180.37			
	Black Sea	35	205.87			
	Eastern Anatolia	34	219.97			
	Southeastern Anatolia	41	183.67			
<i>Opportunities and Future Expectations</i>	Marmara	128	205.64	6	25.972	0.000
	Aegean	71	180.77			
	Central Anatolia	52	226.61			
	Mediterranean	41	164.26			
	Black Sea	35	199.59			
	Eastern Anatolia	34	275.15			
	Southeastern Anatolia	41	170.45			

Regional comparisons show that the perception of logistics service quality is particularly high in the Aegean and Eastern Anatolia regions, while it remains lower in the Mediterranean and Marmara regions. The prominence of Eastern and Central Anatolia regions in terms of opportunities and future expectations suggests stronger optimism about the sector's development in these regions.

5. Conclusion and Evaluation

This research examined the perceptions of logistics sector employees regarding Turkey's strategic position in international transportation within the context of the Belt and Road Initiative (BRI) and revealed a general awareness of Turkey's geopolitical advantages. The high means observed in the strategic location dimension indicate that the perception of Turkey as a natural logistics bridge on the East-West axis is strongly internalized within the sector. This finding is consistent with the literature emphasizing Turkey's structural advantage in Asia-Europe trade flows (Acar and Karakaya, 2021; Yıldız and Doğan, 2020).

While road and rail transport infrastructure assessments are perceived relatively positively, it is noteworthy that satisfaction with port infrastructure remains low. Despite the relatively high evaluations of logistics service quality by maritime transport professionals, the perceived inadequacy of port infrastructure demonstrates that port modernization in Turkey needs to be integrated within a holistic planning framework. Similarly, Karagöz and Demirtaş (2019) note that port infrastructure has made progress regionally, but there is a lack of strategic integration. This suggests that the road-rail-port integration required by the Middle Corridor's multimodal transportation structure has not yet reached the desired level.

In terms of logistics service quality, improvements in digitalization, customs modernization, and transaction speed have been perceived positively. This demonstrates that the digital applications and customs process reforms implemented in recent years are resonating within the sector (Çiçek and Sürmeneli, 2022). However, in terms of risks and

obstacles, congestion at border crossings, bureaucratic burdens in transit procedures, and political instability in neighboring countries stand out. This finding reveals that Turkey is vulnerable to external vulnerabilities in the transportation geopolitics (Özkan and Turan, 2020).

One of the striking findings of the study is the regional differences in perception. The higher scores of participants working in the Eastern and Central Anatolia regions on the "opportunities and future expectations" dimension indicate optimism generated by the investment potential and new transportation projects in these regions. In contrast, lower perceptions were observed in the Marmara and Mediterranean regions. This difference can be explained by factors such as current density, capacity pressure, fiercer competition, and approaching infrastructure limits in these regions. Therefore, the importance of investments that will reduce regional imbalances in Turkey's logistics policies emerges. In the opportunities dimension, participants appear cautiously optimistic that Turkey will become an effective player in logistics. This tendency is also supported in the literature, emphasizing Turkey's vision of becoming a logistics hub (Güngör and Yavuz, 2021).

Demographic analyses revealed varying perception levels based on age, gender, industry experience, transportation type, location, and geographic location. For example, participants aged 41–55 expressed more positive assessments of the strategic location and logistics service quality dimensions, while participants aged 18–25 had a more cautious approach to these issues. This result suggests that experience influences perception. A significant difference was observed only in the strategic location dimension by gender, with female participants having higher perceptions than males. Private sector employees expressed a higher level of strategic location perception than public sector employees, while perceptions of logistics service quality and infrastructure varied by transportation sector (e.g., maritime and rail) and the logistics unit they worked in. The fact that private sector employees have higher levels of strategic awareness than public employees also shows that sectoral culture and goals are effective in these perceptions.

Cooperation with China within the context of the Belt and Road Initiative requires a combined assessment of the study's findings and macro-level strategic dynamics. Participants' cautious optimism about Turkey's future points to the potential opportunities of Chinese-financed infrastructure projects, including increased capacity, new market connections, and increased transit revenues. However, frequently discussed in the literature, debt risk, foreign policy dependencies, and competitive pressures on domestic businesses are also factors that decision-makers should consider. Therefore, it is crucial for Türkiye to implement its BRI-related collaborations with a multi-scenario strategic planning approach.

Various policy and implementation recommendations have been developed based on the findings.

(1) Multimodal transport integration should be strengthened, and port-rail-road lines should be planned in line with the Middle Corridor strategy.

(2) Regional modernization programs for port infrastructure should be aligned with the perception of high service quality in maritime transport.

(3) The expansion of digitalization applications across all logistics units will reduce time losses, particularly in customs processes.

(4) A multi-scenario national transportation strategy should be developed that includes alternative routes, taking geopolitical uncertainties into account.

(5) To reduce regional perception differences, it is important to encourage new investments in Eastern and Central Anatolia, and to implement optimization policies to alleviate capacity pressure in the Marmara and Mediterranean regions.

(6) Training and vision development programs can be implemented to spread the high strategic awareness of female employees and the private sector throughout the sector.

Overall, the research results indicate that Türkiye has a significant strategic advantage in international transportation, but holistic planning, infrastructure integration and risk management perspectives need to be strengthened in order to fully utilize this advantage.

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ANNEX 1. Strategic Position Perception Scale

The following statements are designed to determine your perceptions of Turkey's strategic position in international transportation. Please read each statement carefully and select the option that best suits you. 1 = Strongly Disagree, 2 = Disagree, 3 = Neither Agree nor Disagree, 4 = Agree, 5 = Strongly Agree	1	2	3	4	5
Strategic Position Dimension					
Turkey functions as a strategic logistics bridge between Asia and Europe.					
Turkey's geopolitical position is advantageous for international transportation.					
The New Silk Road initiative has increased Turkey's transportation potential.					
Turkey's geographic location offers a competitive advantage in logistics costs.					
Turkey's ability to connect east-west and north-south corridors is vital for international trade.					
Turkey acts as an effective transfer hub for Middle Corridor transportation.					
Transport Infrastructure Dimension					
Port infrastructure in Turkey is sufficient for international transportation.					
Turkey's railway infrastructure is suitable for international transportation.					
Turkey's road network is of a quality that supports international transport.					
The establishment of logistics villages (centers) increases Turkey's competitiveness in transportation.					
Turkey's infrastructure investments have improved the efficiency of international transport.					
The physical infrastructure of Turkey's border gates is sufficient for international transport.					
Logistics Service Quality Dimension					
Customs procedures in Turkey are fast and efficient for international transportation.					
Bureaucratic barriers in transit transport have been reduced in Turkey.					
The spread of digitalization at border gates has streamlined transportation processes.					
Logistics service providers in Turkey operate at international standards.					
Transport safety (cargo security, insurance, etc.) in Turkey is adequate for international transport.					
Turkey continuously improves the quality of its transport services.					
Risks and Barriers Dimension					
One of the main issues Turkey faces in international transport is waiting times at customs.					
Frequent congestion at Turkey's land border gates negatively affects international transport.					
Political instability in neighboring countries can make transportation through Turkey risky.					
Turkey's issues with transit permits in international transport hinder the flow of logistics.					
In Turkey's transport sector, regulatory problems are more significant than infrastructure issues.					
Opportunities and Future Expectations Dimension					
Turkey's investments in the Middle Corridor will increase transportation volume in the future.					

Within the New Silk Road framework, it is possible for Turkey to become a logistics hub.					
If Turkey continues its infrastructure investments, it is believed to become a leading country in international transport.					
Turkey needs to invest more in digitalization to become a regional center in international transportation.					
Turkey's human resources in transportation and logistics are competitive at the global level.					