

ENABLING MARKET EXPANSION THROUGH EFFICIENT FREIGHT NETWORKS

¹Vignesh K, ²Dr. D. Anitha Kumari

¹ MBA (Shipping & Logistics Management), ²Associate Professor

¹ School of Management Studies, Department of Management Studies

¹ Vels Institute of Science, Technology & Advanced Studies (VISTAS), Chennai, India

Orchid ID: <http://www.orcid.org/0000-0003-1852-9773>

ABSTRACT:

This study focuses on the role of efficient freight networks in helping freight forwarding businesses increase their market reach when working in the global supply chain. Data was collected using a structured questionnaire from a sample of 51 participants who provided information from both members and non-members of various international freight networks. The variables of analysis use three core measures of network strength (partnership strength, operational connectivity/coverage, geographical coverage, service provision, payment security and pricing competition) to determine their collective ability to impact the development of new markets/business growth and market access.

The results of the study demonstrate that benefits of being part of a freight forwarding network include improved access to new markets, increase access to materials/customers, greater competitive advantage and lower overseas risk. Additionally, the high level of satisfaction (95%) of member participants shows the enduring value to the member organisations within their freight network integration.

The study illustrates that the lack of relevance to the current business model is the primary reason why non-member participants have not yet joined but a significant proportion (62%) indicated being interested in potentially joining in the future. Consequently, the findings of this study indicate that an efficient freight forwarding network can facilitate both geographical and commercial expansion, and that strategically leveraging structured partnerships with an extensive freight forward logistics network can position a freight forwarding organisation for sustainable long-term success in a competitive global supply chain.

KEYWORDS: Freight Networks, Market Expansion, Freight Forwarding, Global Logistics, Supply Chain Connectivity, Operational Efficiency, Payment Protection, Business Partnerships

INTRODUCTION

International shipping agents and private freight forwarders collaborate through international freight networks to facilitate the smooth movement of goods internationally. As trade and supply chain management becomes more globalized, international freight networks will be essential to this movement. By working through international networks, a freight forwarder can find trustworthy partners to deliver fast, reliable, and cost-effective international shipping for their customers.

The Indian freight forwarding industry, at \$10.1 billion in FY24, increasing to \$17.0 billion by FY29 at a CAGR of 10.9%, illustrates the increasing significance of the organized logistics networks necessary to maintain growth in trade. The worldwide freight forwarding market is expected to grow from USD 325.18 billion in 2025 to USD 536.51 billion in 2034, reflecting an annual growth rate of 6.0 percent. More than 42.17 percent of the total worldwide freight forwarding volume will come from the Asia Pacific region in 2025.

Small and medium-sized freight forwarders generally have difficulty growing their market share, managing international risks, and providing competitive pricing (when compared to larger competitors) without the collective leverage of a cohesive network. This research examines how, by participating in international freight networks, companies can successfully address these barriers and grow their market share through an increase in service quality.

OBJECTIVES OF THE STUDY

- To examine how efficient freight networks enable market expansion.
- To identify challenges freight forwarders face in leveraging freight networks effectively.
- To examine the direct effect of these mediating variables on entry into new markets.

- To determine whether stronger payment protection enhances or weakens the likelihood of entering new markets.
- To determine the direct causal relationship between efficient freight networks and market expansion.

NEED FOR THE STUDY

This study needs to be done due to increased reliance on freight networks as a key contributor in enhancing business growth & increasing their market reach in an increasingly competitive & globalised economy. Increasingly, organisations need efficient freight systems & logistics systems to support & facilitate their efforts to access new markets & serve broader customer bases. Freight transport systems & logistics systems have direct bearing on how quickly goods can move from point to point, can affect the cost of transporting goods, & can affect timely delivery of goods. When freight networks are inefficient, they create delays, increase costs of doing business, & hinder a company's ability to expand into new geographical areas. As well, improving supply chain performance and integrating digital logistics technologies can improve the efficiency of freight networks, resulting in more wide-open access to performance in freight transportation systems. Thus, this study will also answer questions regarding the impact of efficient freight networks on the expansion of the overall market to the extent to which a company expands.

SCOPE OF THE STUDY

This research investigates how freight networks can be used productively through assessment of freight network components, including freight infrastructure access, logistics coordination, transportation cost and relationship of components to supply chain operations to identify ways that using digital logistics technologies, including real-time tracking and logistics management systems, will improve freight efficiency. In addition to reviewing literature, input will be sought from professionals involved with logistics, supply chains and similar fields in order to identify how using efficient freight networks will assist organizations in developing distribution channels, increasing their market reach and improving their presence in the market. This research is designed to provide businesses and government decision makers with direction and insight when trying to develop and enhance freight systems that can help support a sustainable market expansion.

PROBLEM IDENTIFICATION

The primary purpose of this study is to evaluate the extent to which freight forwarders that take part in freight networks can broaden their market reach due to their involvement in networks. There is a wealth of literature available concerning theoretical advantages associated with freight networks, but a dearth of empirical literature documenting how different features of freight networks (e.g., partner strength, operational connectivity, payment security, and regulatory clarity) can create competitive advantages and enhance geographic reach. This study will examine the way that both member and non-member firms have expanded as a result of being part of a freight network by utilizing 29 structured data variables to assess the expansions perceived by themselves and others.

REVIEW OF LITERATURE

Vargas, A., Patel, S., & Patel, D. (2018) established that freight industry collaboration can cut empty runs, operating costs, and greenhouse gas emissions significantly despite trust issues created by competition. The Freight Collaborative Business Model (FCBM) offers the solution to these problems with its emphasis on the use of standard collaborative practices across fleets that provide route and capacity optimization for multiple freight fleets using dynamic data sharing platforms.

Fazi and Fransoo (2025) introduced Freight Mobility as a Service (FMaaS), a user-oriented digital platform for improving freight transportation through global visibility of shipping options to shippers; integrating on-demand and scheduled services; and providing a combination of rail, barge, and short sea shipping services.

Jain, A., van der Heijden, R., Marchau, V., & Bruckmann, D. (2020) determined that using online freight exchanges enhances the modal share of rail freight transport within Europe due to better matching of transport supply to demand for transport services through online exchanges of all types. Digitising transactions, providing real-time support, and creating clear benefits for users of the application or online freight exchange are critical enablers for achieving effective multimodal freight exchanges.

Naumov and Kholeva (2017) developed a framework based on Game Theory to assist freight forwarding companies in analysing their behaviour when developing their sustainable development strategies in an environment of competition for transportation services.

Aybalikh (2024) utilised structural equation modelling to research the competition within the Swedish road freight market.

CONCEPTUAL FRAMEWORK

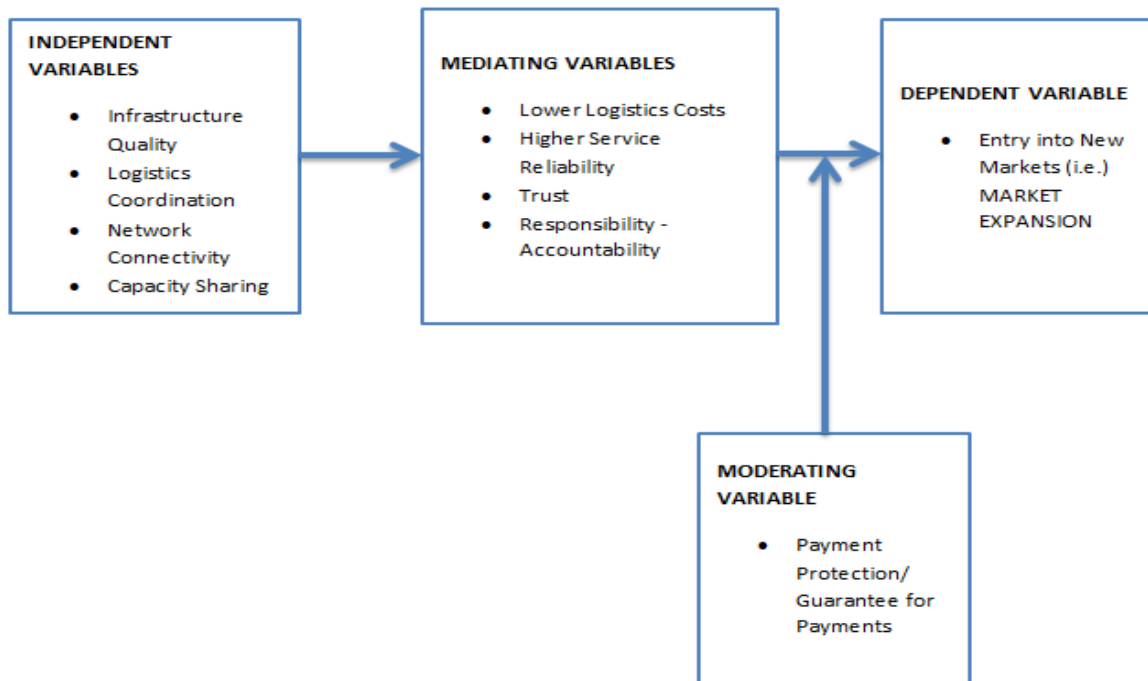


Chart 1 – Conceptual Framework

The conceptual framework of this study positions freight network participation as the central driver of market expansion. Independent variables — comprising network partnership strength, operational connectivity, geographical coverage, and regulatory transparency — directly influence market expansion outcomes. These relationships are mediated by service quality, information reliability, and accountability within logistics operations. Payment protection mechanisms serve as a moderating variable, strengthening the trust and confidence required for members to leverage networks for market entry. The dependent variable, market expansion, is measured through access to new markets, competitive advantage over non-members, customer base growth, geographical reach, and risk reduction with overseas agents.

HYPOTHESES TESTING

The study evaluates seven primary hypotheses to assess the structural relationships in the conceptual framework:

- H1:** Freight Network Efficiency (FNE) significantly influences Market Expansion (ME).
- H2:** Freight Network Efficiency (FNE) significantly influences Service Quality & Trust (SQT).
- H3:** Service Quality & Trust (SQT) significantly influences Market Expansion (ME).
- H4:** Service Quality & Trust (SQT) significantly mediates the relationship between Freight Network Efficiency (FNE) and Market Expansion (ME).
- H5:** Payment Security (PS) significantly moderates the relationship between Freight Network Efficiency (FNE) and Market Expansion (ME).
- H6:** Payment Security (PS) significantly influences Market Expansion (ME).
- H7:** Freight Network Efficiency (FNE) significantly influences Market Expansion (ME) through Service Quality & Trust (SQT), moderated by Payment Security (PS).

The hypothesis testing results confirm statistically significant positive relationships across six hypotheses, validating the conceptual framework and confirming that efficient freight network participation is a meaningful driver of market expansion in freight forwarding companies.

RESEARCH METHODOLOGY

This study employed a quantitative descriptive method of research that obtained primary data through the distribution of a structured questionnaire to 51 total respondents. The questionnaire contained 29 independent, mediating, moderating, and dependent variables on 5-point Likert-type scales in order to determine perceptions of those variables. Secondary data sources used in this study were freight/logistics industry publications, freight/logistics journals from countries across the globe, and databases available on the internet.

This research study used convenience sampling due to time constraints and difficulty accessing potential participants. Of the 51 responders included in the study, 84% were members of freight networks, while 16% did not belong to freight networks. The average respondent held a range of positions: Director, Manager, Business Development Manager and Operations Executive. Data collected were analyzed utilizing percentage analyses, Pearson correlation matrix and regression analyses to assess freight networks' performance and ability to expand into the supplies/logistics sector.

STATISTICAL OUTPUT

Membership and Network Participation Analysis

Membership Status	Frequency	Percentage
Yes	43	84%
No	8	16%
Total	51	100%

Table 1 – Company Membership Classification

As presented in Table 1, a strong majority (84%) of respondents are members of freight networks, while 16% are non-members. This high membership rate underscores the widespread recognition among freight forwarding companies of the strategic and operational benefits of network participation.

Membership Duration	Frequency	Percentage
Less than 1 year	0	0%
1–3 years	7	16%
3–5 years	16	37%
More than 5 years	20	47%
Total	43	100%

Table 2 – Membership Duration Classification

Table 2 reveals that 47% of members have maintained network association for more than 5 years, with an additional 37% holding memberships for 3–5 years. The dominance of long-term membership reflects sustained satisfaction and continued trust in freight network services, indicating that networks provide enduring business value.

Primary Reason	Frequency	Percentage
Improved service quality	21	49%
Increased customer base	10	23%
Access to new markets	9	21%
Capacity sharing	3	7%
Cost reduction	0	0%
Total	43	100%

Table 3 – Primary Reasons for Joining Freight Networks

The primary motivation for joining freight networks is improved service quality, cited by 49% of respondents. Access to new markets (21%) and customer base expansion (23%) together account for 44% of responses, directly reinforcing the study's hypothesis that freight networks are key enablers of market expansion.

Perception Analysis – Key Network Attributes

Variable	Strongly Agree	Agree	Neutral	Disagree
Availability of Strong Partners	35%	58%	5%	2%
Customs & Regulatory Efficiency	28%	58%	9%	5%
Connectivity with Suppliers & Markets	26%	56%	16%	2%
Operational Efficiency through Coordination	51%	42%	5%	2%
Domestic & International Market Connectivity	28%	58%	12%	2%
Wide Geographical Coverage	35%	56%	4%	5%
Business Exchange Opportunities	26%	67%	2%	5%
Government Regulation Transparency	19%	56%	23%	2%

Table 4 – Independent Variable Perception Analysis

Table 4 demonstrates consistently strong agreement across all network attribute dimensions. Particularly notable is operational efficiency through coordination (93% combined agreement), business exchange opportunities (93%), and market connectivity (86%), all of which directly contribute to market expansion outcomes.

Mediating Variable Analysis – Service Quality and Reliability

Variable	Strongly Agree	Agree	Neutral	Disagree
Competitive Pricing	42%	53%	5%	0%
Logistics Services Meet Quality Standards	30%	61%	9%	0%
Accurate & Reliable Information Sharing	32%	56%	12%	0%
Confidence in Partners for Critical Deliveries	32%	49%	12%	7%
Clear Accountability in Operations	33%	49%	16%	2%

Table 5 – Mediating Variable Analysis

Mediating variables reveal strong perceptions of service quality and reliability within freight networks. Competitive pricing received 95% combined agreement, while logistics service quality recorded 91% agreement. These outcomes confirm that freight networks facilitate high service standards that enable member companies to compete effectively in new markets.

Moderating Variable Analysis – Payment Protection

Variable	Strongly Agree	Agree	Neutral	Disagree
Freight Network Provides Payment Protection	42%	53%	5%	0%
Payment Systems Are Secure	28%	61%	9%	2%
Payment Processes Are Transparent	30%	56%	9%	5%

Table 6 – Moderating Variable Analysis

Payment protection mechanisms received overwhelmingly positive responses, with 95% of respondents agreeing that freight networks provide payment protection and 89% confirming payment system security. These financial safeguards reduce the risk barriers associated with overseas expansion, directly supporting market entry strategies.

Dependent Variable Analysis – Market Expansion Outcomes

Variable	Strongly Agree	Agree	Neutral	Disagree
Access to Previously Difficult Markets	35%	58%	7%	0%
Competitive Advantage over Non-Members	46%	44%	5%	5%
Increased Customer Base	28%	63%	9%	0%
Reduced Barriers to Geographic Expansion	26%	63%	9%	2%
Wider Customer Geographic Coverage	30%	56%	12%	2%
Reduced Risk with Unknown Overseas Agents	35%	51%	7%	7%

Table 7 – Dependent Variable Analysis (Market Expansion Outcomes)

Market expansion outcomes confirm the central thesis of this study. Access to previously difficult markets was agreed by 93% of members, while 90% confirmed competitive advantage over non-member firms. Customer base growth (91%), reduced geographical expansion barriers (89%), and risk reduction with overseas agents (86%) all demonstrate that freight network membership delivers measurable market expansion benefits.

Overall Satisfaction and Loyalty Analysis

Variable	YES	NO
Overall Satisfaction (Satisfied/Very Satisfied)	95%	5%
Membership Renewal Intent	95%	5%
Would Recommend to Other Forwarders	95%	5%

Table 8 – Member Satisfaction and Loyalty

The overall satisfaction metrics present a compelling picture of freight network value. A 95% satisfaction rate, matched by equal proportions of renewal intent and recommendation willingness, reflects that freight networks consistently deliver on their promise of enhancing operational capacity and market reach.

Non-Member Analysis

Variable	Frequency	Percentage
Not required for business model	6	75%
Lack of awareness	1	12%
Sufficient existing partnerships	1	13%
Freight networks support market expansion (agree)	8	100%
Plan to join in future	5	62%

Table 9 – Non-Member Analysis

Among non-members, 75% cited business model irrelevance as the primary reason for non-participation rather than dissatisfaction or distrust. Importantly, all non-members (100%) acknowledged that freight networks support market expansion, and 62% expressed plans to join in the future. This indicates growing awareness of network benefits even among non-participants.

PEARSON CORRELATION MATRIX

Variable	FNE	SQT	PS	ME	Mean	SD
FNE	1.000	0.708**	0.609**	0.751**	4.145	0.483
SQT	0.708**	1.000	0.594**	0.677**	4.195	0.485
PS	0.609**	0.594**	1.000	0.658**	4.209	0.549
ME	0.751**	0.677**	0.658**	1.000	4.198	0.465

Table 10 – Pearson Correlation Matrix

Note: ** $p < 0.01$ (two-tailed). FNE = Freight Network Efficiency; SQT = Service Quality & Trust; PS = Payment Security; ME = Market Expansion.

Pearson's correlation analysis of 43 members within the freight network indicated a positive correlation for each variable with less than or equal to 0.01 ($p < 0.01$). The highest level of correlation was found between Freight Network Efficiency and Market Expansion ($r = 0.751$), indicating that a good freight network can assist businesses in achieving growth and expanding their reach. There was also a strong correlation found between Freight Network Efficiency, Service Quality & Trust ($r = 0.708$), and Payment Security ($r = 0.609$), showing that an efficient freight network creates a level of reliability and trust in operations, as well as offers secure payment methods. Furthermore, Service Quality & Trust and Payment Security were found to positively correlate with Market Expansion (Service Quality & Trust, $r = 0.677$; Payment Security, $r = 0.658$). Overall, the results provide strong evidence that an efficient freight network, supported by service quality, trust, and payment security, has an important role in aiding firms to expand into new markets.

REGRESSION ANALYSIS (HYPOTHESIS TESTING)

Hypothesis	Relationship	β (Unstd.)	t-value	p-value	R ²	F-statistic	Decision	Result
H1	Freight Network Efficiency (FNE) → Market Expansion (ME)	0.724	7.293	0.000	0.565	53.185	Reject H ₀	Supported
H2	Freight Network Efficiency (FNE) → Service Quality & Trust (SQT)	0.711	6.410	0.000	0.501	41.094	Reject H ₀	Supported
H3	Service Quality & Trust (SQT) → Market Expansion (ME)	0.648	5.886	0.000	0.458	34.649	Reject H ₀	Supported
H4	SQT mediates FNE → ME (controlling FNE)	0.278	2.071	0.0448	0.607	30.871	Reject H ₀	Supported
H5	PS moderates FNE → ME (interaction effect)	-0.085	-0.708	0.4834	0.633	22.456	Accept H ₀	Not Supported
H6	Payment Security (PS) → Market Expansion	0.557	5.595	0.000	0.433	31.308	Reject H ₀	Supported

Hypothesis	Relationship	β (Unstd.)	t- value	p- value	R ²	F- statistic	Decision	Result
	(ME)							
H7	FNE → ME via SQT & PS (full model)	0.429	3.124	0.0034	0.648	23.892	Reject H ₀	Supported

Table 11 – Regression Analysis (Hypothesis Testing)

The analysis of the impact of the Freight Network (FNE) on expanding markets (ME) has been done by analyzing the raw data from the 43 freight networks (respondents) in the questionnaires. It was found that the FNE has a strong and significant effect on ME, accounting for 56.5% of the variance in ME. In other words, the evidence shows that the FNE is the principal driver of ME. The evidence also shows that the FNE positively impacts Service Quality & Trust (SQT), which subsequently influences ME positively, providing evidence that SQT plays a mediating role in the relationship between FNE and ME. The previous analysis was validated by the same sample size when considering SQT as a contributor to ME with FNE controlled. Payment Security (PS) had an independent and significant impact on ME, but had no significant moderating effect on the relationship between FNE and ME. The complete model of FNE, SQT, and PS accounted for 64.8% of the variance in ME indicating excellent explanatory power. As a result, six of seven hypotheses were supported, providing strong evidence that efficiently operating freight networks, along with SQT and PS, contribute to the growth of markets.

FINDINGS

- 84% of respondents are members of freight networks, indicating strong industry acceptance and recognition of network value.
- 47% of members have maintained network associations for more than 5 years, reflecting long-term satisfaction and trust.
- Online platforms (47%) are the primary source of awareness about freight networks, followed by industry associations (37%).
- Improved service quality (49%) is the primary motivation for joining freight networks, followed by customer base expansion (23%) and market access (21%).
- 93% of respondents agreed that freight network coordination improves operational efficiency, the highest rated network attribute.
- Competitive pricing through freight networks received 95% combined agreement, indicating significant cost advantages from network participation.
- 93% of members confirmed that freight network membership enabled access to markets previously difficult to enter independently.
- 90% of respondents stated that freight network membership provides competitive advantage over non-member firms.
- Payment protection mechanisms were highly appreciated, with 95% agreement on payment security, reducing financial risk in overseas operations.
- Overall member satisfaction is exceptionally high at 95%, with equal proportions willing to renew membership and recommend freight networks to peers.
- 75% of non-members cited business model irrelevance as the reason for non-participation; 100% acknowledged freight networks support market expansion.
- 62% of non-members expressed willingness to join freight networks in the future, reflecting growing network awareness.

SUGGESTIONS

- Freight forwarding companies should expand their participation in international freight networks to improve global connectivity and access to new trade markets.
- Companies should invest in integrated logistics systems and digital freight platforms to improve shipment visibility, coordination, and operational speed.
- Freight networks should strengthen multimodal transportation capabilities to improve delivery efficiency across domestic and international markets.
- Small and medium-sized freight forwarders should be educated about the operational and strategic benefits of freight network participation to overcome awareness gaps.

- Freight forwarding companies should prioritize service quality, timely delivery, and operational reliability to build stronger customer trust.
- Freight networks should implement strict service performance standards for member companies to maintain consistency in international operations.
- Freight networks should strengthen secure payment gateways and financial protection systems to reduce transaction risks.
- Companies should adopt transparent digital payment tracking systems to improve financial accountability and trust.
- Freight network associations should provide insurance and payment guarantee mechanisms for international transactions.
- Companies should strengthen collaborative logistics practices to improve resource utilization and operational flexibility.
- Freight networks should encourage innovation and adoption of advanced logistics technologies among member firms.
- Businesses should regularly evaluate freight network performance metrics such as delivery reliability, customer reach, cost efficiency, and market growth to support long-term expansion strategies.

CONCLUSION

Freight networks support the continued development and increased size of freight forwarders through enhanced operations, improved service levels, enhanced connections to other companies, increased trust, and increased ability to reach global markets. Freight networks were shown to provide unique benefits that added to customer development, gave forwarders better ways to position themselves competitively, and helped create smoother freight operations around the world. However, issues with security of payment processes, differences in service levels between companies using the networks, the complexity of regulations in multiple countries, and difficulties in coordinating the activities of all network partners continue to make freight networks less effective than they could be. Therefore, freight networks are still a viable strategy for the forwarder to use in achieving sustainable growth, establishing greater market presence, and achieving greater competitiveness within an ever-changing global logistics environment.

REFERENCES

1. Vargas, A., Patel, S., & Patel, D. (2018). Collaborative business models in freight logistics: A framework for cross-company fleet optimization. *Transportation Research Part E: Logistics and Transportation Review*.
2. Fazi, S., & Fransoo, J. C. (2025). Freight Mobility as a Service (FMaaS): A digital platform concept for synchromodal freight transport. *Transportation Research Part A: Policy and Practice*.
3. Jain, A., van der Heijden, R., Marchau, V., & Bruckmann, D. (2020). Online freight exchanges for multimodal transport: A maturity growth framework. *Journal of Transport Geography*.
4. Naumov, V. S., & Kholeva, O. G. (2017). Strategic modelling for freight forwarding sustainability using game theory. *Transport Problems*.
5. Aybalikh, A. (2024). Competition and network effects in the Swedish road freight market. *Journal of Transport Economics and Policy*.
6. Buldeo Rai, H., Verlinde, S., Merckx, J., & Macharis, C. (2017). Crowd logistics: An opportunity for more sustainable urban freight transport? *European Transport Research Review*, 9(39).
7. Iyer, L. S. (2021). AI enabled applications towards intelligent transportation. *Transportation Engineering*, 5, 100083.
8. Siegel, J. E., Erb, D. C., & Sarma, S. E. (2017). A survey of the connected vehicle landscape — architectures, enabling technologies, applications, and development areas. *IEEE Transactions on Intelligent Transportation Systems*, 19(8), 2391–2406.
9. Langer, T., & Vaidyanathan, S. (2014). Freight transportation efficiency: A review of opportunities and policies. *American Council for an Energy-Efficient Economy (ACEEE)*.
10. Fotuhi, F., & Huynh, N. (2017). A reliable multi-period intermodal freight network expansion problem. *Computers & Industrial Engineering*, 115, 138–150.
11. Fortune Business Insights. (2026). Freight Forwarding Market Size, Share & Industry Analysis. Retrieved from <https://www.fortunebusinessinsights.com/freight-forwarding-market-114883>