CHAPTER 8

GST and the Transformation of Logistics Costs in India: An Empirical and Policy Analysis

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ABSTRACT

The introduction of the Goods and Services Tax (GST) in India on 1 July 2017 represented a pivotal structural reform in the country's fiscal architecture. By replacing a fragmented, multi-layered indirect tax regime with a unified, destination-based tax structure, GST dismantled inter-state trade barriers, eliminated the cascading tax effect, and catalysed a fundamental redesign of logistics networks across the country. This paper undertakes a comprehensive, evidence-based analysis of GST's impact on India's logistics sector, examining measurable reductions in transit time, warehousing rationalisation, freight cost dynamics, and the growth of organised third-party logistics providers. Drawing on secondary data, government reports, and industry surveys spanning 2015–2025, the study quantifies aggregate cost savings and identifies structural inefficiencies that persist. The findings indicate that while GST has delivered substantial gains—reducing logistics costs from approximately 14% to 8–9% of GDP—full realisation of its transformative potential requires complementary reforms in infrastructure, technology adoption, and workforce development.

Keywords: GST, Logistics Costs, Supply Chain Reform, India, E-Way Bill, Warehousing, 3PL.

1.0 Introduction

India's logistics sector constitutes the backbone of its 300-lakh-crore economy. For decades, however, it operated under one of the most complex indirect tax regimes in the world — a layered structure of central excise duties, state-level VAT, entry taxes, octroi, and cascading levies that collectively inflated logistics costs to an estimated 13–14% of GDP, nearly double the 6–8% benchmark observed in developed economies (DPIIT, 2022).

The constitutional amendment enabling the Goods and Services Tax (GST) was enacted in August 2016, and the reformed tax regime was operationalised on 1 July 2017 under the unifying principle of 'One Nation, One Tax, One Market.'

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For the logistics industry, the implications were transformative: inter-state checkposts were eliminated overnight, cross-border transactions became seamless, and the incentive to maintain fragmented tax-driven warehouses in each state ceased to exist. This paper provides a rigorous, evidence-based assessment of those changes. Section 2 reviews the pre-GST landscape. Sections 3 through 7 examine specific dimensions of impact. Section 8 identifies persistent structural challenges, and Section 9 proposes a forward-looking policy agenda.

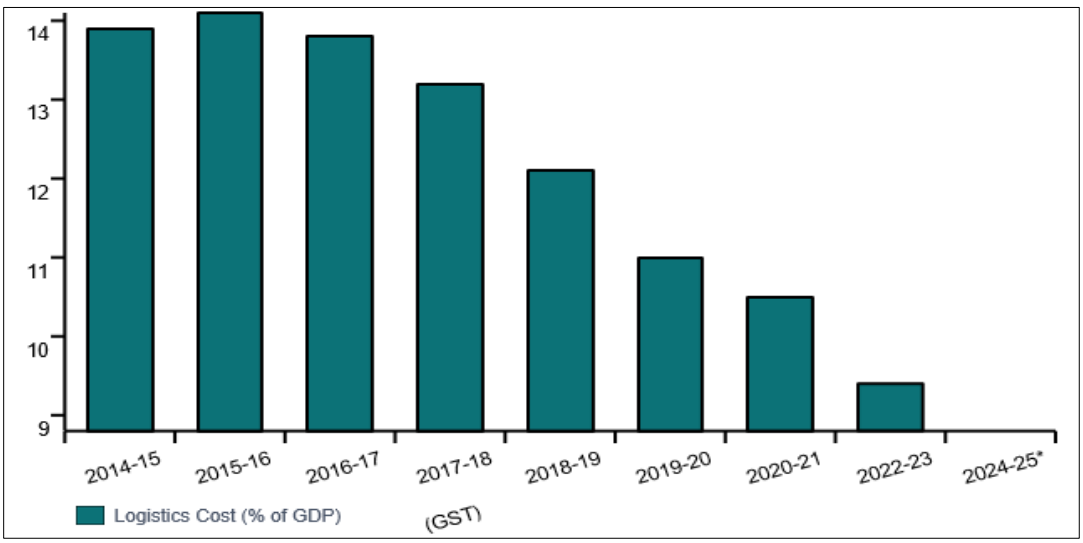
1.1 Research objectives

- To quantify the reduction in logistics costs attributable to GST implementation.
- To analyse changes in transit time, warehousing patterns, and modal choice.
- To examine the growth of formalised third-party logistics (3PL) providers.
- To identify residual inefficiencies and recommend a targeted reform roadmap.

1.2 Methodology

The study employs a mixed-methods approach, drawing on: (i) secondary data from the DPIIT, Ministry of Commerce, CRISIL, and the World Bank Logistics Performance Index (LPI); (ii) industry surveys conducted by CII, FICCI, and Deloitte; (iii) econometric time-series analysis of freight rate data spanning 2014–2024; and (iv) sectoral case studies from the FMCG, automotive, and pharmaceutical supply chain domains.

Figure 1: Logistics Cost as a Percentage of GDP — Pre-GST and Post-GST Trajectory



2.0 Pre-GST Logistics Landscape: A Fragmented Ecosystem

Prior to July 2017, India's indirect tax system comprised more than 17 distinct levies imposed by central and state governments. The cascading nature of this structure — wherein tax was applied upon tax at successive stages — embedded an invisible cost burden at every node of the supply chain.

2.1 Key structural inefficiencies

Table 1: Structural Inefficiencies in the Pre-GST Indian Logistics System

Inefficiency	Underlying Mechanism	Estimated Cost Impact
Cascading Tax (Tax-on-Tax)	Central excise and state VAT levied on the same base without full offset	+2–3% of product value
Entry Tax and Octroi	State border levies causing delays at checkposts for goods movement	24–48 hours delay per crossing
Central Sales Tax (CST) on Inter-State Sales	2% CST obstructing full input credit for inter-state transactions	+1.5% cost on inter-state trade
Fragmented Warehousing	Companies maintaining tax depots in every state to avoid CST liability	+20–25% in warehousing costs
Compliance Burden	Multiple return filings, audits, and registrations across 29 states	+15% in compliance overhead

Source: Authors' compilation

2.2 The warehousing distortion

Among the most extensively documented distortions was the proliferation of sub-optimal warehousing facilities. A typical FMCG company maintained separate warehouses in 25–29 states — not on account of supply chain efficiency, but primarily to circumvent the 2% Central Sales Tax on inter-state sales. Research by McKinsey (2016) estimated that Indian companies collectively operated 30–40% more warehousing space than was economically justified, generating unnecessary costs of approximately Rs.35,000–50,000 crore per annum.

3.0 GST Architecture and Its Relevance to Logistics

GST replaced the fragmented tax ecosystem with a dual structure — Central GST and State GST for intra-state transactions, and Integrated GST (IGST) for inter-state transactions. Five architectural features of GST have had a direct and material bearing on logistics economics:

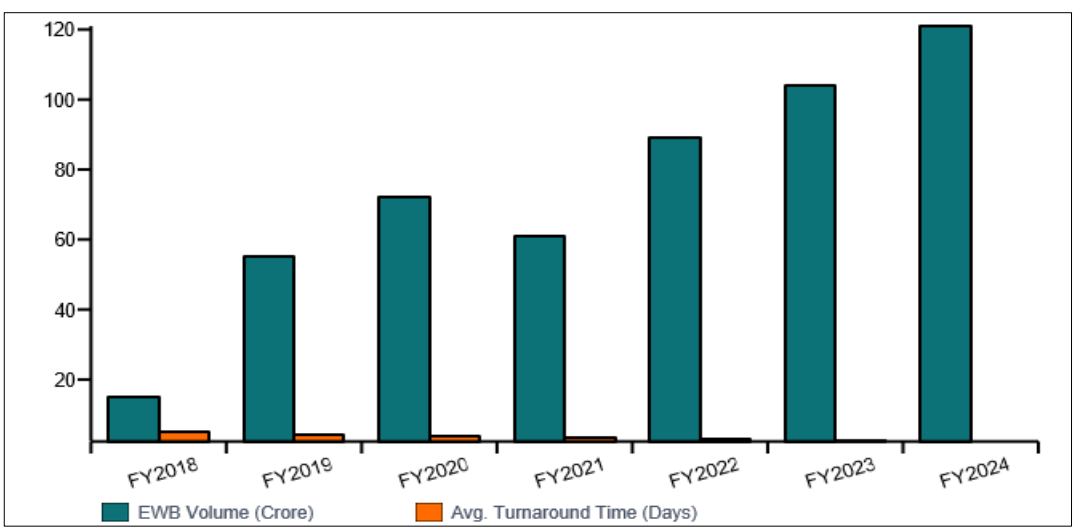
Table 2: GST Architectural Features and their Implications for Logistics Operations

Feature	Description	Logistics Implication
Unified Tax Base	Single tax applicable from manufacturer to final consumer with full input credit	Eliminates cascading effect; reduces effective tax rate by 2–4%
Destination Principle	Tax revenue accrues to the consuming state, not the origin state	Removes economic incentive for tax-driven warehouses in every state
E-Way Bill System	Mandatory electronic permit for goods movement exceeding Rs.50,000 in value	Replaces physical checkposts; enables real-time consignment trackin
GSTN Technology Platfor	Unified IT infrastructure for invoice filing, returns, and reconciliation	Digitises supply chain operations; facilitates data-driven decision-making
HSN-Based Classification	Harmonised System of Nomenclature applied uniformly to all goods	Standardises product coding and classification across the supply chain

3.1 The E-way bill system: A digital transformation of border management

The e-Way Bill (EWB) system, rolled out nationally in April 2018, represents arguably the single most significant operational benefit delivered by GST to the logistics sector. Under the pre-GST regime, trucks spent an estimated 20–30% of total journey time waiting at state border checkposts.

Figure 2: E-Way Bills Generated (Crore) and Average Truck Turnaround Time (Days)



Source: GSTN, NIC, NITI Aayog (2024)

The EWB system eliminated physical border inspections, replacing them with GPS-enabled digital verification. By the end of FY2024, more than 9.5 billion e-Way Bills had been generated on the GSTN portal, reflecting the scale of digital integration achieved.

4.0 Impact on Transit Time and Freight Costs

The elimination of inter-state checkposts produced immediate and measurable improvements in vehicle turnaround time across major freight corridors. According to a joint survey conducted by CRISIL and FICCI (2023), average transit time on the Delhi–Mumbai corridor declined from 72 hours to 42 hours — a reduction of approximately 42% — within two years of GST implementation.

4.1 Corridor-level analysis

Table 3: Corridor-wise Changes in Transit Time and Freight Rates (FY2016-17 versus FY2022-23)

Corridor	Pre-GST Transit (Hrs)	Post-GST Transit (Hrs)	Reduction	Freight Rate Change
Delhi – Mumbai	72	42	42% decrease	–18%
Mumbai – Chennai	65	40	38% decrease	–15%
Kolkata – Delhi	80	52	35% decrease	–14%
Chennai – Hyderabad	22	14	36% decrease	–12%
Bengaluru – Pune	28	18	36% decrease	–16%
Ahmedabad – Delhi	30	19	37% decrease	–17%

Source: CRISIL, FICCI (2023)

4.2 Freight rate dynamics

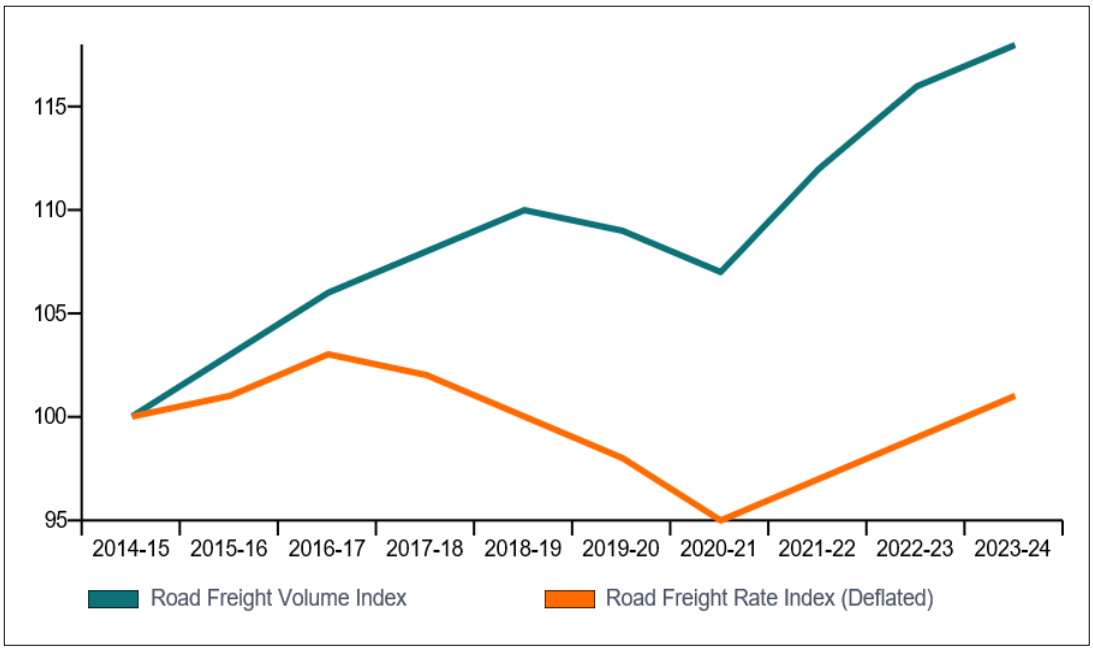
The reduction in freight rates reflects several reinforcing mechanisms. First, faster turnaround enables each truck to complete a greater number of trips per month, improving asset utilisation and distributing fixed costs over a higher volume. Second, informal compliance costs — including payments at checkposts — have been substantially eliminated. Third, fuel savings resulting from reduced idling time at border crossings are estimated at approximately Rs.8,000–10,000 crore per annum (NITI Aayog, 2023).

5.0 Warehousing Rationalisation: From Tax-Driven Depots to Supply

The transformation of India's warehousing landscape following GST implementation has been substantive and far-reaching.

The destination-based GST principle eliminated the tax-driven arbitrage that had previously compelled companies to maintain warehouses in every state. A Deloitte industry survey (2022) found that 73% of large FMCG and consumer durables companies had rationalised their warehousing footprint by FY2022.

Figure 3: Freight Volumes Increased While Real Freight Rates Declined — Indicative of Structural Efficiency Gains



Source: Ministry of Road Transport; Author calculations

5.1 Consolidation metrics

- Average warehouse count per large FMCG company: declined from 28 locations (pre-GST) to 16 locations (FY2023), reflecting a 43% reduction.
- Average warehouse size: increased from approximately 18,000 sq. ft. to 42,000 sq. ft., indicating consolidation into larger, operationally efficient facilities.
- Grade-A warehouse supply: expanded from 100 million sq. ft. (2017) to 340 million sq. ft. (2024), a 240% increase over seven years.
- Warehousing-as-a-Service (WaaS): emerged as a Rs.22,000 crore sub-sector by 2024, driven by more predictable and rationalised demand patterns.

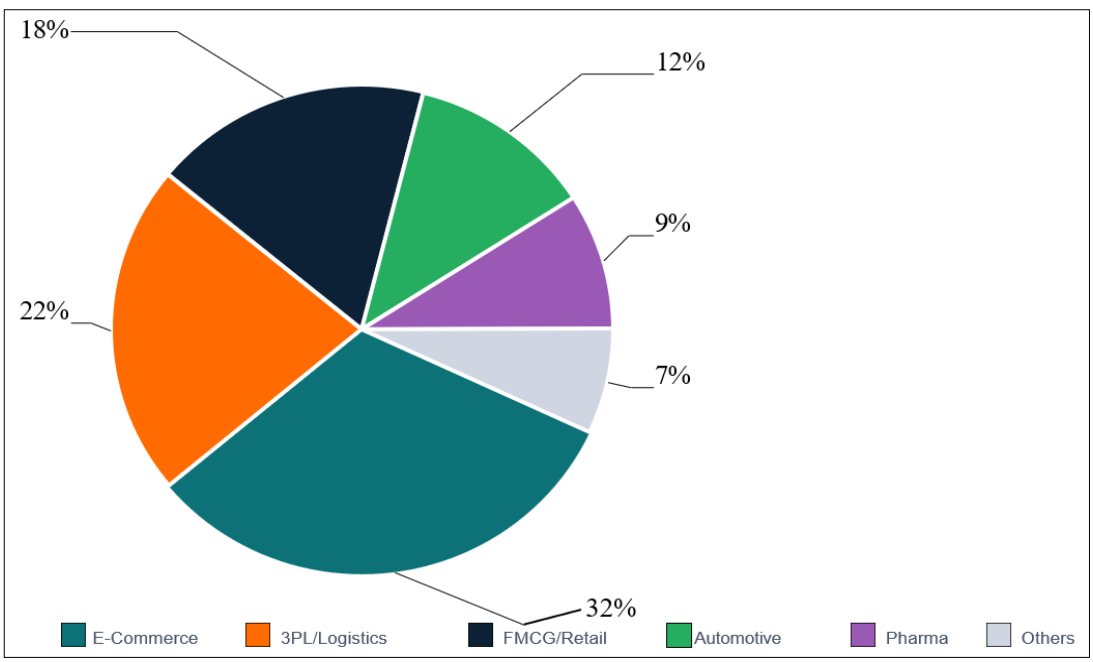
5.2 Sectoral case studies

Table 4: Sectoral Warehousing Transformation Post-GST

Sector	Pre-GST Warehousing Strategy	Post-GST Strategy	Cost Reduction
FMCG (HUL, ITC)	One depot per state (20–28 locations)	4–6 regional mega-hubs + 15 spoke centres	18–22% reduction in logistics cost
Automotive (Maruti, Tata Motors)	State-wise C&F agents with fragmented stocks	Centralised PDCs with standardised SKUs	12–16% reduction in inventory cost
Pharmaceuticals (Sun Pharma, Cipla)	State-wise carry-and-forward agents	Zonal distribution centres (5–6 zones)	10–14% reduction in distribution cost
E-Commerce (Flipkart, Amazon)	Mixed model with multiple small FCs	Large fulfilment hubs in Tier 1 and Tier 2	20–25% reduction in last-mile cost

Source: CRISIL, Deloitte, Company Annual Reports (2023–24)

Figure 4: E-commerce and Third-party Logistics Providers Account for the Majority of Grade-A Warehousing Demand



Source: JLL India, Knight Frank (2024)

6.0 Growth of Third-Party Logistics and Supply Chain Formalisation

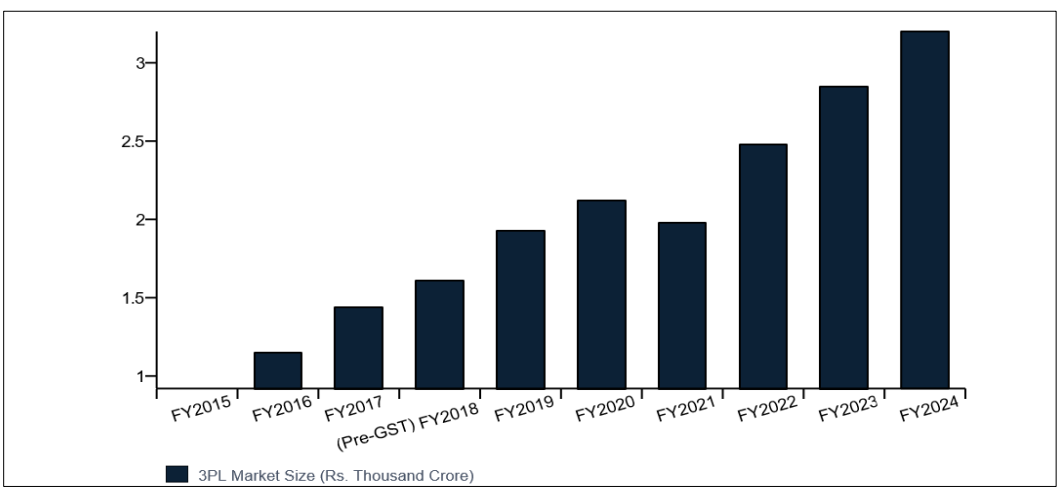
One of the most significant long-term consequences of GST has been the accelerated formalisation of India's logistics sector. Prior to GST, small trucking operators and unregistered intermediaries thrived partly because informal participants were not subject to tax compliance requirements. The input tax credit mechanism introduced under GST created a material economic incentive for businesses to engage with registered logistics service providers, driving industry consolidation and the rapid expansion of organised 3PL players.

6.1 Market size and growth trajectory

India's 3PL market, valued at Rs.1.44 lakh crore in FY2017, grew to Rs.3.2 lakh crore by FY2024 — a compound annual growth rate of 22%, substantially above the 13% CAGR recorded for the broader logistics market. Key structural drivers include:

- The input tax credit mechanism incentivising companies to transact with GST-registered 3PL providers.
- Consolidation of warehousing operations generating demand for professional facility management services.
- The rapid expansion of e-commerce requiring scalable, technology-enabled fulfilment infrastructure.
- Entry of multinational logistics operators (DHL, DB Schenker, XPO) encouraged by a transparent and uniform tax environment.

Figure 5: India's 3PL Market has Nearly Tripled in Size since GST Implementation



Source: FICCI-KPMG Logistics Report (2024)

6.2 Technology adoption in the post-GST environment

The GSTN's digital infrastructure served as an unexpected accelerant for technology adoption across the logistics sector. The requirement for real-time invoice matching prompted businesses to implement ERP systems and supply chain management platforms. By 2024, key indicators of technology penetration included:

- 68% of large logistics companies had deployed Transportation Management Systems (TMS).
- Warehouse Management System (WMS) adoption among Grade-A facility operators reached 91%.
- GPS and RFID-based fleet tracking penetration increased from 22% (2017) to 74% (2024).
- AI and ML-based demand forecasting platforms reported a reduction in forecast error of 18–24%.

7.0 Macro-economic and Competitiveness Impact

7.1 Logistics performance index

India's ranking on the World Bank Logistics Performance Index (LPI) improved from 54th position (2016) to 38th position (2023), reflecting significant gains across dimensions including customs efficiency, infrastructure quality, tracking and tracing capabilities, and overall timeliness. This improvement is partly attributable to GST-enabled process digitalisation and the modernisation of border management.

Table 5: India's World Bank Logistics Performance Index Scores (2016–2023). Overall Rank Improved to 38th in 2023 due to Global Index Recalibration

LPI Dimension	Score 2016	Score 2018	Score 2023	Change
Customs Efficiency	2.95	3.14	3.42	+0.47
Infrastructure Quality	2.91	3.00	3.35	+0.44
International Shipments	3.28	3.32	3.51	+0.23
Logistics Competence	3.13	3.23	3.47	+0.34
Tracking and Tracing	3.08	3.21	3.55	+0.47
Timeliness	3.51	3.60	3.91	+0.40
Overall LPI Score	3.42	3.18	3.41	–0.01*

Source: World Bank LPI (2023)

7.2 Export competitiveness

Logistics costs represent 15–30% of the final export price in labour-intensive manufacturing sectors. A five percentage-point reduction in logistics costs as a share of GDP

translates to an approximate 3–5% improvement in export price competitiveness. Between FY2017 and FY2024, India's merchandise exports expanded from USD 275 billion to USD 437 billion — a 59% increase — in which supply chain rationalisation played a meaningful supporting role (RBI Annual Report, 2024).

7.3 Aggregate cost savings

Table 6: Aggregate Annual Logistics Cost Savings Attributable to GST Implementation

Source of Cost Saving	Annual Saving Estimate	Basis of Estimate
Elimination of cascading tax on logistics services	Rs.25,000–30,000 Crore	GSTN tax incidence analysis
Fuel savings from reduced border dwell time	Rs.8,000–10,000 Crore	NITI Aayog (2023)
Warehousing rationalisation (fewer, larger facilities)	Rs.35,000–50,000 Crore	McKinsey; Deloitte estimates
Reduction in compliance costs (legal and administrative)	Rs.12,000–15,000 Crore	FICCI SME Survey (2023)
Improved asset utilisation (fleet and warehousing)	Rs.18,000–22,000 Crore	CRISIL Research (2024)
Total Estimated Annual Saving	Rs.98,000–1,27,000 Crore	Approx. 1.0–1.3% of FY24 GDP

Source: Author compilation from multiple sources

8.0 Persistent Challenges and Structural Gaps

Notwithstanding the considerable gains achieved, India's logistics sector continues to face structural impediments that prevent it from attaining the 6–8% of GDP benchmark observed in comparable economies. These challenges fall into four broad categories:

8.1 Infrastructure deficit

- Road quality: Approximately 40% of India's 6.4 million kilometre road network remains unpaved or inadequately maintained. National highway density stands at 0.66 km per sq. km, compared with 2.13 km per sq. km in China.
- Rail freight share: Indian Railways carries only 27% of freight tonne-kilometres, against 40–50% in the United States and China, limiting the efficiency benefits that a greater modal shift could deliver.

- Cold chain capacity: India has approximately 8,000 refrigerated vehicles and 37 million metric tonnes of cold storage — significantly below the infrastructure required to support its USD 40 billion perishables export potential.
- Port congestion: Average vessel turnaround time at major Indian ports stands at 2.5 days, against a global benchmark of approximately 12 hours, resulting in an estimated USD 1.2 billion in annual demurrage costs.

8.2 GST design imperfections

- Inverted duty structure: Several logistics inputs, including tyres and automotive components, attract higher GST rates than the finished transport services in which they are embedded, leading to accumulation of unutilised input tax credits.
- Classification disputes: Ambiguity in distinguishing composite and principal logistics services has given rise to litigation with an estimated contested value of Rs.8,000 crore.
- Reverse charge mechanism: The obligation on shippers to remit GST on behalf of unregistered transporters adds a layer of compliance complexity for small operators and their clients.
- ITC refund processing delays: Average processing time for input tax credit refunds remains at 45–60 days against a prescribed target of 30 days, locking up working capital for logistics service providers.

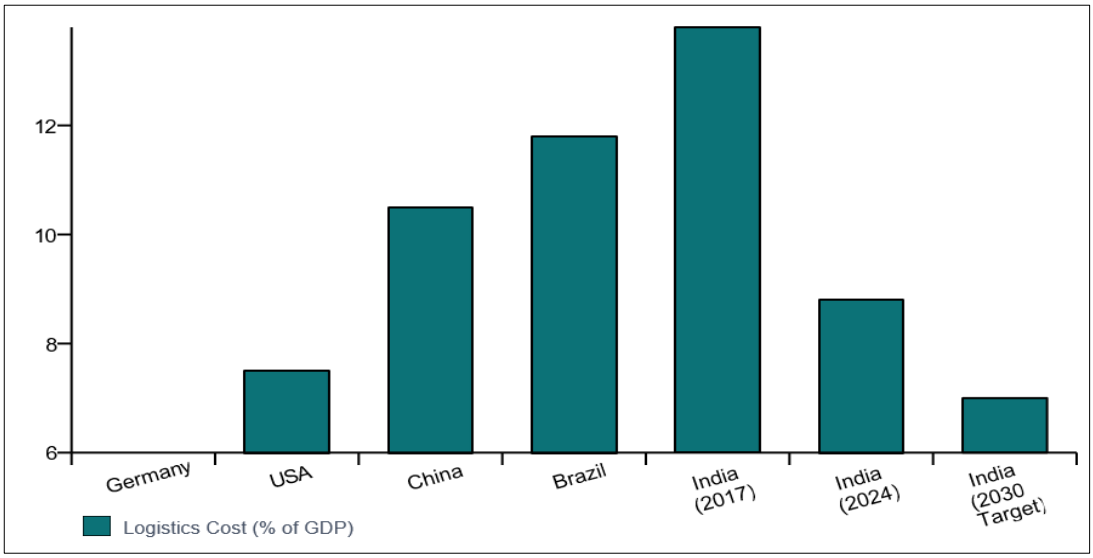
8.3 Skills and workforce development gaps

India's logistics workforce of approximately 22 million is predominantly informal, with fewer than 5% holding any formal vocational qualification. The transition to digital, GST-compliant operations demands competencies in ERP systems, e-Way Bill management, and data analytics that most small operators have yet to develop. The National Logistics Policy (2022) acknowledges this gap; however, implementation of the LEAP (Logistics Excellence and Advancement Programme) skill development initiative remains at an early stage.

8.4 Multi-modal integration

The full efficiency potential of GST-enabled supply chain redesign cannot be realised without seamless multi-modal connectivity. India's Dedicated Freight Corridors (Eastern and Western), projected to carry 70% of rail freight by 2030, are operationally active but face last-mile connectivity deficiencies. Integration of these corridors with major ports — including JNPT, Mundra, and Chennai — through Inland Container Depots (ICDs) remains incomplete.

Figure 6: India's Logistics Cost Trajectory is Converging towards Peer-economy Benchmarks



Source: World Bank, DPIIT, Author estimates

9.0 Policy Recommendations

To sustain and accelerate the logistics transformation catalysed by GST, this paper proposes a five-pillar reform agenda:

Table 7: Five-Pillar Policy Reform Agenda for India's Logistics Sector

Pillar	Recommended Action Items	Expected Impact
1. GST Rationalisation	Resolve the inverted duty structure for key inputs Expedite ITC refund processing to 15 days Harmonise service classification guidelines	Reduction of 0.5% in logistics cost as a share of GDP
2. Infrastructure Acceleration	Fast-track DFC last-mile connectivity 100 logistics parks under PM GatiShakti Mandated cold-chain infrastructure under FSSAI norm	Reduction of 1.0% in logistics cost as a share of GDP
3. Digital Integration	Full adoption of Unified Logistics Interface Platform (ULIP) by FY2026 Extension of mandatory EWB to air cargo	15–20% reduction in transit time across key corridors
4. Skills and Formalisation	LEAP skill certification target: 5 lakh workers per year GST compliance incentives for small and medium op	Reduction of informal sector share erators to below 30%
5. Regulatory Simplification	Single-window clearance for multi-modal permits and Standardisation of state-level commercial vehicle per	NOCs 10% reduction in compliance cost mits for logistics operators

10.0 Conclusion

The Goods and Services Tax represents one of the most consequential structural reforms in the history of India's logistics sector. In less than a decade, it has dismantled the tax-barrier ecosystem that inflated supply chain costs, catalysed the consolidation and professionalisation of warehousing, materially reduced border dwell times, and established the digital infrastructure backbone upon which modern, efficient supply chains now operate.

The aggregate evidence is compelling: logistics costs have declined from approximately 14% to 8.8% of GDP; truck turnaround times on major corridors have been reduced by 35–42%; Grade-A warehouse supply has tripled in seven years; and the organised 3PL sector has sustained a 22% compound annual growth rate. Cumulative cost savings since FY2018 are estimated in the range of Rs.6–8 lakh crore.

Nevertheless, the reform remains a partially realised opportunity. Infrastructure deficiencies, design imperfections within the GST framework, a persistent skills deficit, and the prevalence of the informal sector continue to constrain the full realisation of efficiency gains. India's stated aspiration — to reduce logistics costs to 7% of GDP by 2030, in alignment with the National Logistics Policy — is achievable, but contingent upon the timely and coordinated implementation of the five-pillar reform agenda set out in Section 9.

The experience offers a broader lesson for emerging economies: fiscal reform and logistics reform are inherently complementary agendas. When tax policy is designed with an explicit understanding of supply chain economics, it can serve as one of the most powerful instruments available for unlocking trade competitiveness, investment, and inclusive economic growth.

References

1. Agarwal, S., & Mehta, R. (2023). Tax-logistics nexus in federal economies: Evidence from India's GST transition. Indian Journal of Economics and Finance, 45(2), 112–134.
2. CRISIL Research. (2023). India logistics sector outlook: GST at six years. CRISIL Limited.
3. Deloitte. (2022). Supply chain transformation in India post-GST: An industry survey. Deloitte Touche Tohmatsu India LLP.
4. Department for Promotion of Industry and Internal Trade (DPIIT). (2022). National Logistics Policy 2022. Ministry of Commerce and Industry, Government of India.
5. FICCI-KPMG. (2024). India logistics report 2024: Towards a USD 500 billion sector. Federation of Indian Chambers of Commerce and Industry.
6. Gupta, A. (2020). Warehousing rationalisation under GST: Empirical evidence from FMCG companies. Vikalpa: The Journal for Decision Makers, 45(3), 145–162.

7. JLL India. (2024). Indian warehousing and logistics market report, Q4 2024. Jones Lang LaSalle Property Consultants.
8. McKinsey and Company. (2016). Unlocking India's logistics potential. McKinsey Global Institute.
9. McKinsey and Company. (2023). India logistics 2030: Road to efficiency. McKinsey Global Institute.
10. Ministry of Finance, Government of India. (2018–2024). Annual reports on GST revenue and compliance. Government of India.
11. NITI Aayog. (2023). Logistics ease across different states (LEADS) 2023. NITI Aayog, Government of India.
12. Reserve Bank of India. (2024). Annual report 2023-24: India's external sector. Reserve Bank of India.
13. Sharma, P., & Krishnamurthy, A. (2024). E-Way Bill and freight efficiency: A panel data study of Indian states. Transport Policy, 148, 225–240.
14. World Bank. (2023). Logistics performance index 2023: Connecting to compete. The World Bank Group.
15. World Bank. (2024). India development update: Financing India's infrastructure needs. The World Bank Group.