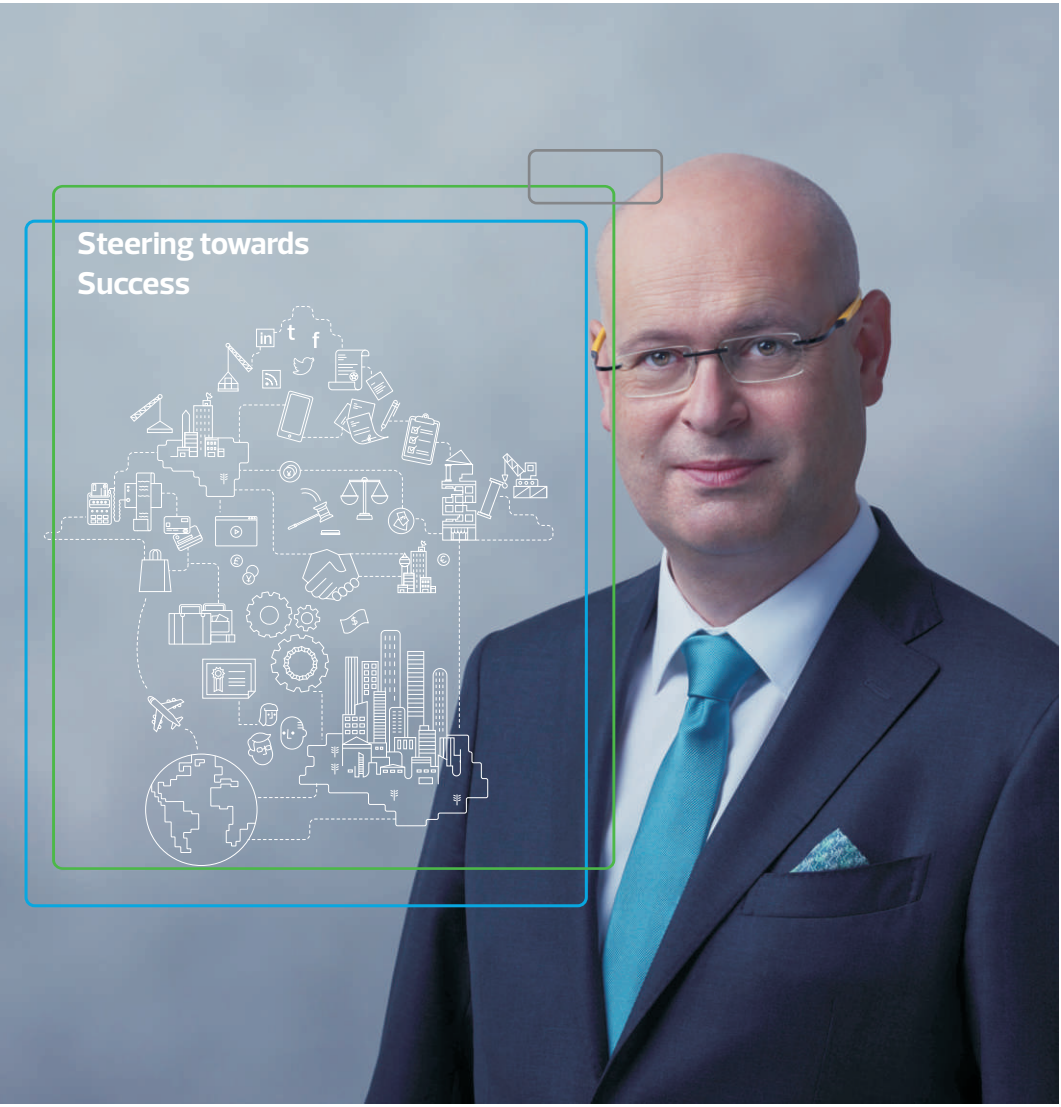

National Logistics Policy

Redefining the Future of Indian Logistics

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National Logistics Policy –
Redefining the Future of Indian Logistics

Highlights:

- Brief overview of the National Logistics Policy
- Integrated Digital Systems & Unified Logistics Interface Platform (ULIP), its impact & Benefits to the Businesses
- The Logistics Navigator – A Compilation of the Logistics Infrastructure in India inclusive of Ports, Inland Container Depots (ICD), Multi-Modal Logistics Parks, Railway Terminals, Dedicated Freight Corridors, Inland Waterways and Commercial Electric Vehicles in India

January 2024

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Preface

India's economic growth over the last few years has resulted in numerous opportunities for citizens and businesses, with supply chain playing a pivotal role. Logistics has been often-ignored linchpin sector for trade & commerce. Some recent developments like assigning the status of infrastructure industry in 2020, and creation of Logistics division under the Department of Commerce in the Ministry of Commerce & Industry are strong positive signs to recognize the sector's mute contribution to the economy over several decades.

The Economic Survey on India conducted in 2021 revealed that Logistics accounts for ~ 13-14% of the country's GDP. As of 2022, the logistics sector employs 2.2 crore individuals. The country managed the movement of an impressive 4.6 billion tonnes of goods annually for last 3 years. This vast array of goods encompasses various domestic industries and products, with ~22 percent being agricultural, ~39 percent related to mining, and another ~39 percent associated with manufacturing.

Road transportation dominates the logistics in India, while railways, coastal & inland waterways, pipelines, and air collectively handle the remainder. Recognizing the sector's crucial role in the nation's future, and the higher cost of logistics, the Government of India (GOI) is actively undertaking measures to enhance logistics performance. This includes the establishment of dedicated rail-based freight corridors, enhancements to coastal and inland water-based shipping capacity and connectivity, and the development of road infrastructure projects like Bharatmala and the Golden Quadrilateral.

In September 2022, the Hon'ble Prime Minister of India unveiled The National Logistics Policy (NLP) to further bolster the logistics sector. The NLP serves as a strategic framework designed to serve as a guiding blueprint for reducing overall costs and benchmarking services within the logistics sector. Key initiative under the NLP is Infrastructure development for mobility of goods, Synergetic use of logistics assets, Standardization of physical assets, process, taxonomy, and advanced usage of technology for enabling convenience in Logistics Operations. The policy also aimed at Integration of various essential e-portals / systems under one common platform.

Chapter 1: National Logistics Policy (NLP)

National Logistics Policy (NLP)

1.1 Vision

"To develop a technologically enabled, integrated, cost-efficient, resilient, sustainable, and trusted logistics ecosystem in the country for accelerated and inclusive growth"

1.2 Pillars of National Logistics Policy

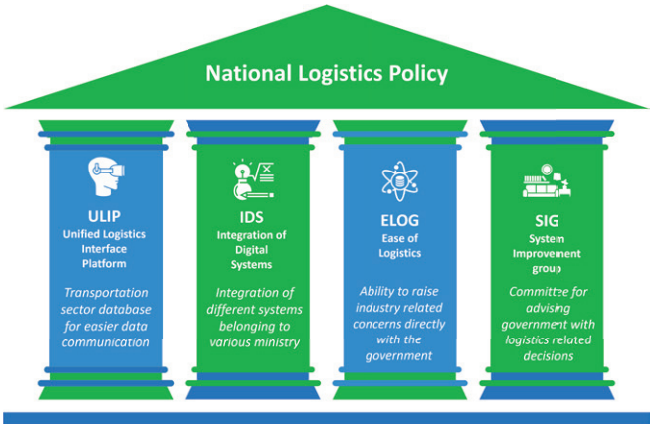


Figure 1: Pillars of NLP

1.3 Targets

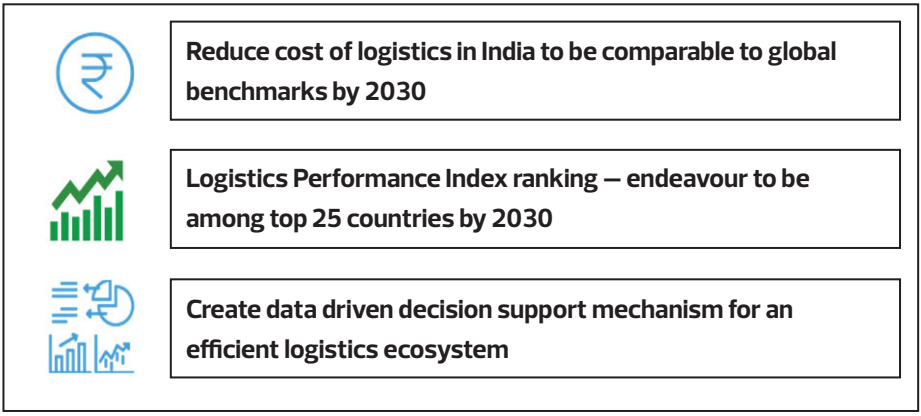


Figure 2: NLP Targets

1.4 Framework for NLP implementation

Baseline framework for NLP implementation	INCREASE THE MODE SHARE OF RAIL TRANSPORT	Increase the rail network capacity	Improve existing network infrastructure
			Build new tracks in the network
		Increase the share of intermodal transportation	Identify and upgrade high potential intermodal network
			Ensure better modal integration
	OPTIMISE TRUCK USE	Improve transportation practices	Improve load matching
			Maximise vehicle productivity through efficient packaging and loading
		Improve warehousing practices	Improve the siting of warehouses
			Improve the quality of warehouses
	PROMOTE EFFICIENT AND ALTERNATIVE FUEL TECHNOLOGIES	Improve fuel economy and reduce ICE vehicles' emissions	Enhance fuel consumption and emissions standards
			Promote collaboration on technology solutions
		Use electric vehicles and cleaner fuel	Implement supportive policies and pilot projects
			Manufacture high quality vehicles and create robust charging infrastructure network

Figure 3: Structure for NLP implementation

1.5 Planned roadmap for NLP execution

	PHASE 1 **Aligning the Quill**	PHASE 2 **Stringing the Bow**	PHASE 3 **Releasing the Shaft**
Government	• Invest in railway infrastructure and multi-modal logistics parks. • Develop strategies to enhance the affordability of cleaner fuels and electric vehicles (EVs).Guarantee adherence to fuel economy standards.	• Establish a dedicated heavy-haul rail corridor. • Streamline the location selection process for intermodal parks. • Formulate regulations to phase out the usage of older internal combustion engine (ICE) vehicles.	• Establish a comprehensive nationwide network of specialized infrastructure. • Construct freight tracks equipped with intermodal and heavy haul capabilities. • Implement mandates promoting the adoption of electric vehicles (EVs) in the trucking industry.
Industry	• Allocate resources to support the manufacturing and integration of larger, more advanced trucks. • Modernize warehouse operations through digitalization practices. • Invest in the standardization of logistics assets for increased efficiency.	• Implement research and development (R&D) as well as manufacturing programs aimed at enhancing the design of electric vehicles (EVs). • Introduce sustainability initiatives throughout the corporate sector, extending across the entire supply chain.	• Produce top-tier electric trucks with cutting-edge features. • Guarantee that warehouses are equipped with state-of-the-art assets and employ best practices.
Multistakeholder collaboration	• Conduct pilot programs to evaluate the viability of alternative fuels, electric vehicles (EVs), and efficient logistics practices. • Streamline the placement of EV infrastructure to enhance efficiency and accessibility.	• Advocate for standardization across various modes of transportation. • Enhance the capabilities of leaders and technical personnel to facilitate the development of an advanced rail network.	Establish and operate multi-stakeholder consortiums aimed at ongoing assessment and enhancement of policymaking and business models to improve efficiency in transportation and warehousing.

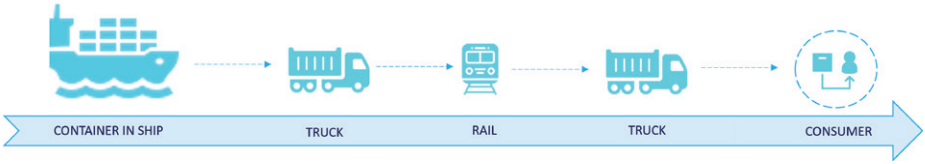
Figure 4: Roadmap for NLP execution

A well-structured supply chain optimization framework can assist organizations to evaluate and optimize the key facets of supply chain viz. – procurement, storage, distribution, and overall supply chain design and leverage technology and tools for this purpose.

In this publication, RSM Astute Consulting's research team has discussed the outline of the framework, the Integration of Digital System (IDS) and Unified Logistics Interface Platform (ULIP) ULIP and IDS can serve as a pivotal component for the implementation of next-generation automation tools. We have also discussed the state of physical infrastructure in the Indian Logistics landscape, encompassing upcoming projects. This compilation serves as a valuable tool for devising strategies related to the utilization of multi-modal transportation, customized to user preferences. Utilizing ports for offshore selling, leveraging National Waterways for quick turnaround times, and tapping into available container depots near ports and rail terminals offer cost-effective and efficient solutions.

The establishment of multi-modal logistics parks (MMLP) can serve as temporary storage and transfer centres, facilitating seamless transitions between highways, waterways, railways, and more. Furthermore, Supply chain team has conducted a

thorough analysis and presentation of data on currently available electric vehicles (EVs), aligning with the commitment to reducing carbon footprint and advocating for sustainable business practices



Chapter 2: RSM Astute Consulting – Supply Chain Optimisation Framework

RSM Supply Chain Consulting team would like to build on the existing capability and deliver more value to our clients in the supply chain domain. RSM is well-positioned to offer its network and outline industry best practices, facilitating the adoption of the latest technology by the existing resources. Additionally, RSM can tailor solutions to engage with service providers, customizing them to meet specific requirements. RSM can undertake regular performance assessments and recommend corrective actions for optimization of Supply Chain Performance.

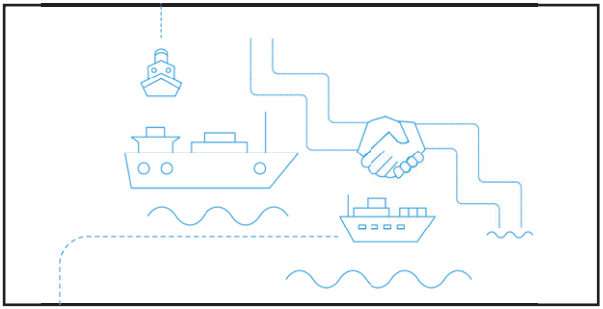
RSM Supply Chain Excellence framework constitutes key aspects of Supply Chain such as Logistics, Warehousing, Procurement, Technology enablers and the overall Supply Chain Design & Processes. Each area is elaborated in terms of optimizing performance using unique levers and tools.

Figure 5: RSM Supply chain optimisation

RSM holistic Supply Chain Optimisation Framework for individual elements of Supply Chain are elaborated in the respective tables.

2.1 Logistics – Domestic Movements

Optimization Areas	Description	Potential Opportunities / Benefits
Logistics Cost	Structured basis for cost reference, apt assumptions, Zero based costing	Scientific basis & strong reference for negotiation
Vehicle Selection, Size	Size selection to optimize cost, market vs dedicated fleet	Potential Cost saving in the range of 2 – 5%
Modes of Transport	Alternative modes – road / rail, inland waterways	Discovery of strategic / tactical options
Turn Around Time (TAT)	In plant, trip turn around	Potential 10–25% reduction in TAT
Vehicle Utilization	Weight / volume capacity utilization of all vehicles	Potential Cost saving in the range of 2 – 5%
Service Providers Base	Share of Business review	Risks, mitigation, Cost saving
Service Provider Contract	Terms & conditions	Techno-commercial risks & mitigation
In Plant & Transit Safety	Logistics safety review	Safety risks and mitigation
Unplanned Costs	Detention, damages, penalty, LD	Reduction Potential ~ 5 – 40%



Logistics Cost

Turnaround time

Tools Used: Zero Based Costing (ZBC), Mode-Mix, Process Mapping, Non-Value Added (NVA) elimination, Stratification, Risk Matrix, Root Cause Analysis

2.2 Logistics – Import / Export

Optimization Areas	Description	Potential Opportunities / Benefits
Partners, Channel Hand-offs	Service providers, scope, share of business, constraints, alternatives	Lead time reduction, Cost reduction, automation / streamlining of process
Mode of Transport	Road, ocean, air, rail, dry port options, alternative ports	Strategic / tactical options for alternative means of logistics
Price Variance	Indexation, variance patterns, Total cost of EXIM	Cost references, transparency, cost reduction
Packing, Transportation, Handling & Storage	LCL to FCL, container size, packaging size, Yard space, Free Trade Warehouse Zone usage	Different options for cost reduction & efficiency improvement
Supplier / Customer Contract Review	Review of inco terms, LD clauses, lead time, other commercial terms	Different options for reduced commercial risks & cost savings
Service Provider Contracts	Terms & conditions	Techno-commercial risks and mitigation
In plant, transit safety	Road, port, ocean safety	Key safety risks & mitigation
Unplanned Costs	Damages, detention, penalty, LD, demurrages, returns	Reduction Potential ~ 5 – 40%

Mode of Transport

Packaging, Transportation Handling and Storage

Tools Used: Correlation, Reverse Auction, Mode-Mix, Share of Business (SOB), Stratification, Risk Matrix, RCA

2.3 Warehousing

Optimization Areas	Description	Potential Opportunities / Benefits
Warehouse Size, Utilization	Floor space, transactions, under / over utilization	Options to for re-organization / restructuring, potential cost saving
Storage Process, Practices	Good storage practices, gross distance travelled per pallet	Improvement in warehouse KPIs, efficiency
Warehousing Cost	Bottoms up costing	Robust & scientific basis for negotiations
Service Provider Selection, Contracting, Evaluation	Selection process, periodic evaluation of service provider	Reduced lead time, reduced potential risks
Turn Around Time (TAT)	Dock in / out, customer TAT, inbound TAT	Potential reduction ~ 10-25%
Warehouse Safety	Infrastructure, operations, processes, practices, preventive / reactive	Key safety risks & mitigation
Unplanned Costs	Damages, penalty, LD	Reduction potential ~ 5 – 40%

Reduce Warehouse Cost

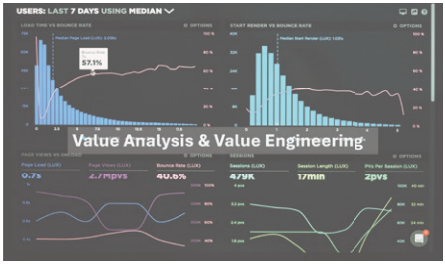
Ensure Warehouse Safety

Tools Used: Warehouse Modelling, String Diagram, ZBC, Process Mapping, NVA elimination, Risk Matrix, RCA

2.4 Procurement – Direct Material

Optimization Areas	Description	Potential Opportunities / Benefits
Vendor Development Process	Technical, commercial criteria	Robust & fool proof process to cover commercial, business risks
Contracting	Terms & conditions	Key risks and mitigation plan
Price Variance	Zero based / Activity based costing, Rate equalization	Robust & scientific basis for negotiations
Consumption Variance	Spec vs actual weight, PO vs actual, process / handling yield	Potential cost saving opportunities ~ 2 – 8% of PO value
Value Engineering / Value Analysis	Alternative material, process, optimum specifications	Potential options for cost saving without hampering value
Volume Consolidation	Share of business, economy of scale, absorption of fixed costs	Potential cost savings, supply risk mitigation, reference for negotiations
Vendor Evaluation	KPI, ratings, performance improvement	Strong basis for quality of supply, vendor selection / termination

Contracting



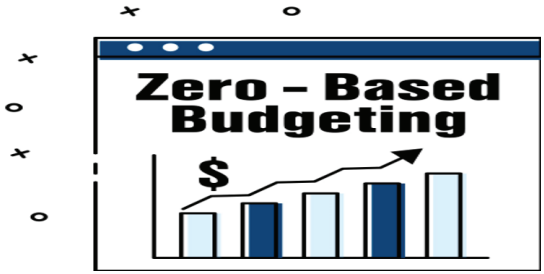
Value Analysis & Value Engineering

Tools Used: Activity Based Coting (ABC), ZBC, Value Engineering (VE), Variance, SOB, Break Even Analysis (BEA), Process Mapping, NVA Elimination, Risk Matrix

2.5 Procurement – Indirect Material

Optimization Areas	Description	Potential Opportunities / Benefits
Budgeting process	Zero based budgeting, assumptions	Cost saving potential ~ 10 – 25%
First principal costing	Zero / activity-based costing	Scientific & robust reference for negotiations
Consumption review	Consumption variance, SKU wise, location wise variance	Cost saving potential ~ 5 – 15%
Volume consolidation	Centralized / decentralized sourcing, share of business	Cost saving, specifications standardization, reduction of number of transactions

Tools Used: Zero Based Budgeting (ZBB), ZBC, ABC, Variance, SOB, Cost Decision Matrix, Risk Matrix



2.6 Technology

Optimization Areas	Description	Potential Opportunities / Benefits
Vehicle tracking	Review of potential technology solutions such as GPS, RFID with their impact on KPIs, benefits	Logistics efficiency improvement, Predictability & transparency
Logistics process automation	Synchronization among departments and people from sale order to material receipt at customer	Zero communication gap, visibility of material / service
Warehousing automation	Review of various technology solutions such as WMS, ASRS, Drones with impact on KPIs	Improvement in warehouse performance, reduction in cost
Negotiation process	Implementation of e-auction, reverse / forward auction tools, and their impact on KPIs, benefits	Cost reduction, lead time reduction
Vendor invoice to payment process	Manual activities in the payment process, overall lead time, and application of technology	Payment led time reduction, supplier satisfaction
Import / Export automation	Installation / utilization of various technology solutions such as Gocomet, ProcureTiger and their impact on KPIs, benefits	Improvement in import / export efficiency, cost savings
Technology Capability	Process, People, infrastructure capability to adapt to technology tools	Identified gaps in capability, and plan to bridge the same

Vehicle Tracking

Warehousing Automation

Tools Used: Application / tools / Software with GPS, RFID, QR codes, Reverse Auction, Process Automation, EXIM Automation Solutions

2.7 Supply Chain Design & Processes

Optimization Areas	Description	Potential Opportunities / Benefits
Distribution Network	Networking model, number, size, location of hubs, synchronization of primary & secondary network	Potential options for network efficiency improvement
Supply Chain Partner Selection	Selection Criteria, evaluation, onboarding process, lead time	Robust & fool proof process to cover commercial, business risks
Sales & Operations Planning Process	KPI's for planning, execution, exception handling, deviation handling	Improvement of SNOP efficiency and other Supply Chain KPIs
Job-Work, Make or Buy	Activity based costing, framework for make vs buy decision	Cost reduction, customer service improvement
Inventory review	End to end inventory – Inbound, outbound, stock outs, ageing	Inventory optimization, reduction of stock outs, adapting good practices

Distribution Network

Job-work optimization

Tools Used: Network Design tools (may need Llama soft), Sales & Operations Planning (SNOP) tools, Customized Framework for Make vs Buy, Min Order Quantity / Safety stock tools

2.8 Leveraging The National Logistics Policy

Review Area	Description	Potential Opportunities / Benefits
Logistics Infrastructure aligned to the NLP	Recently commissioned / upcoming ports, ICD, Warehousing SEZs, Rail, Multi-modal logistics hubs	Long term strategy for efficient and cost effective inbound / outbound logistics
Unified Logistics Interface Platform (ULIP)	Integration of supply chain and logistics processes, leveraging the access to different data / portals through ULIP	Transparency, efficiency in logistics operations using the ULIP
National Logistics law	Single bill of lading across modes, unique identification for service providers, logistics excellence certification	Compliance to the NLL, and leveraging for building efficiency in logistics
Supply Chain Capability	Leveraging the capability building courses / certification programs for teams	Improvement in Supply Chain capabilities, with contemporary tools

Chapter 3: Integrated Digital Systems & Unified Logistics Interface Platform

Comprehensive Logistics Action Plan (CLAP) designed for implementing the NLP addresses the Integration objectives of the NLP. The digital systems and interfaces of various line ministries and departments which used to operate independently in silos are brought together under a common interface, named as Unified Logistics Interface Platform (ULIP). User can access all the relevant systems at one reference point. Additionally, one can now use this Interface for performance monitoring and network planning to harness data from various integrated e-portals by developing digital tools and communicating the ULIP through API requests.

3.1 Key Features of ULIP

3.1.1 Centralized Real-Time Tracking: Offering a centralized dashboard for real-time tracking, encompassing activities like shipment tracking, inventory monitoring, and order management.

3.1.2 Integration of Logistics Stakeholders: Integrate all logistics stakeholders, including suppliers, manufacturers, distributors, and carriers. It supports data and information exchange to enhance coordination and collaboration, ultimately improving efficiency, reducing delays, and minimizing errors.

3.1.3 Streamlined Documentation and Digitization: Automates and streamline the documentation process in logistics. This includes the digital generation and management of crucial documents such as bills of lading and invoices.

3.1.4 Efficient Transportation Network Planning: Offers tools and algorithms to optimize transportation network planning, considering factors like distance, capacity, and cost to determine the most efficient routes and transportation modes.

3.1.5 Collaboration and Communication Tools: Collaborations and communication tools for seamless interaction among logistics stakeholders. These tools can encompass instant messaging, file sharing, and task management capabilities.

3.1.6 Data Analytics and Insights: Function with robust data analytics capabilities, allowing stakeholders to analyse and gain insights from logistics data. It provides

key performance indicators (KPIs), reports, and dashboards to monitor and assess logistics operations' performance.

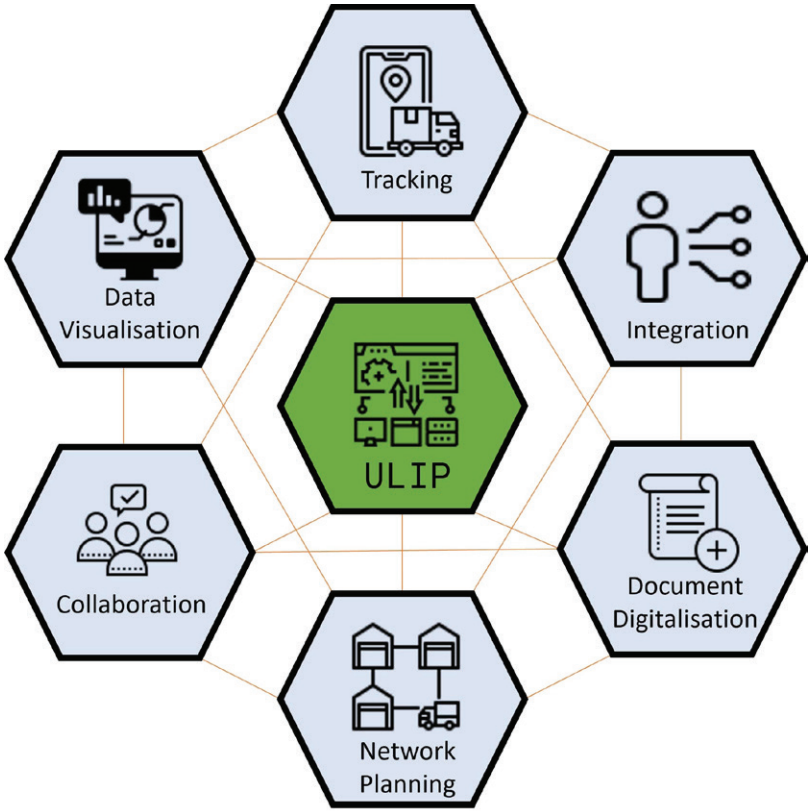


Figure 6: Features of Unified Logistics Interface Platform

ULIP, in its quest to streamline logistics, also has a broader goal of enhancing the industry's efficiency. Through the application of cutting-edge technologies like artificial intelligence, machine learning, and data analytics, the platform empowers precise demand prediction, optimal route selection, and effective resource utilization. This will result in cost reduction, shorter delivery times, and an improved customer experience.

As of September 2023, about 34 digital systems essential to logistics from various

Ministries and Departments have been brought under ULIP. The platform has seen significant interest, with over 614 industry players registering on ULIP, 106 private companies signing NDAs, and 142 companies submitting 382 use cases for hosting.

3.2 Strategic Benefits of ULIP Implementation

3.2.1 Complete Information for Freight Movements

Below sample illustration is an indicative of ULIP ensuring Operations efficiency

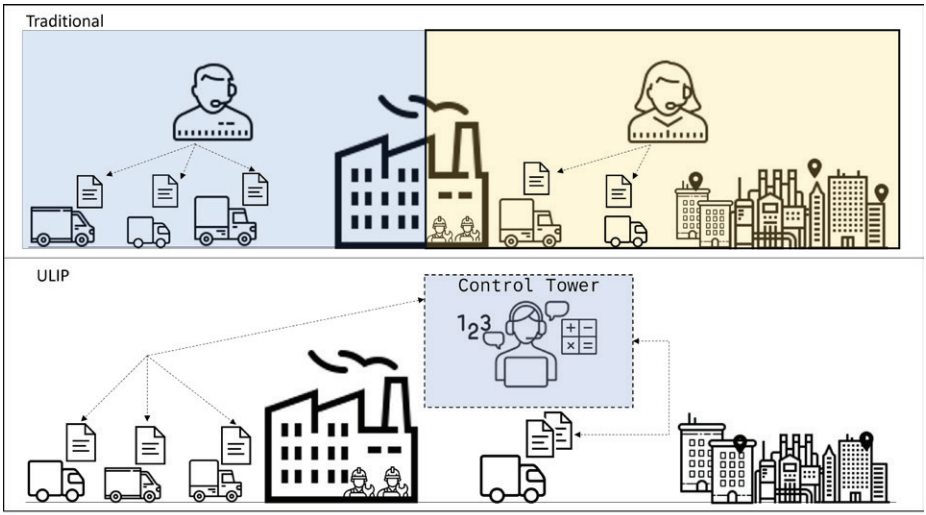


Figure 7: Traditional Vs. synergetic dispatch operations

Usually, team working in silos does not have complete information of incoming & outgoing goods.

The implementation of ULIP has brought about a transformation in the way these logistics operations are handled. With ULIP in place, users can efficiently monitor the movement of all vehicles entering and exiting the facility. This real-time visibility is a game-changer for businesses, allowing them to optimize their logistics processes in several ways.

The logistics team can shift their focus from the day-to-day management of

dispatch schedules to a more strategic emphasis on cost reduction. This shift in focus benefits not only the company but also its customers, as the savings can potentially be passed on to them in the form of lower prices or improved services. Moreover, customers can be pre-emptively informed of any changes or delays in their shipments, enhancing their overall experience and reducing uncertainty.

In addition, the collaboration facilitated by the ULIP allows for the implementation of goods consolidation with Logistics Service Providers (LSPs), optimizing the use of transportation resources. This approach ensures the efficient utilization of cargo space and leads to significant cost savings per transaction volume. It also fosters better cooperation and coordination between the company and its logistics partners, contributing to overall cost efficiency and operational excellence.

3.2.2 Efficient Document Clearance

Compliance with regulatory requirements for the movement of freight necessitates the use of various documents in the transportation of goods. Typically, the consignor collaborates with multiple agencies for clearance, often referring to different portals, which can increase turnaround time and associated cost.

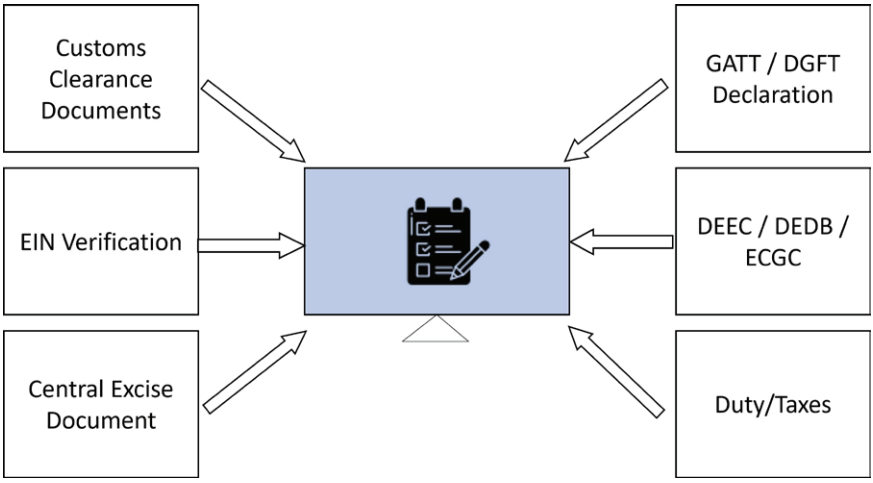


Figure 8: Document checklist for export/import operations

ULIP has improved the document clearance processes, leading to faster transactions and a reduction in overall costs. With ULIP, resources can be allocated more efficiently, and bureaucratic obstacles are minimized. The simplified document clearance not only decreases delays but also lowers administrative expenses. Consequently, logistics operations are streamlined, and resources are directed where they are most needed, rather than being tied up in cumbersome paperwork. This results in a more efficient and cost-effective logistics system.

3.2.3 Enhanced Tracking with FASTAG

FASTag, mandated for all vehicle movements, utilizes RFID technology, offering a unique identifier for each vehicle. When passing through toll plazas, FASTag is scanned, and the vehicle is invoiced accordingly for the journey. These toll plazas collect data on vehicles traveling specific routes.

The utilization of FASTag data for tracking, particularly in areas with limited communication infrastructure, provides shippers with valuable information about their shipments, ensuring reliable and efficient shipment monitoring. This technology not only delivers visibility but also presents a cost-effective and scalable solution for logistics companies operating in regions where traditional communication systems may be less developed.

FASTag system under the Ministry of Road Transport and Highways (MoRTH) is integrated under ULIP. Through ULIP, logistics service providers are enhancing the accuracy of delivery schedules and responding swiftly to changing conditions, ultimately increasing the reliability of their supply chains.

3.2.4 Improved Vehicle Capacity Utilization

By utilizing ULIP, the available cargo is effectively matched with truck capacity through the connection of shippers and carriers. This eliminates situations where vehicles operate below their maximum capacity. ULIPs identify opportunities to consolidate multiple shipments into a single load, reducing the occurrence of partially filled trucks and consequently lowering transportation expenses.

Optimizing the utilization of vehicle capacity results in reduction of the per-ton-

per-kilometre cost. By making efficient use of the available cargo space, logistics companies can transport more goods with fewer resources, ultimately reducing operational costs and boosting profitability.

3.2.5 Minimizing Inventory Costs

The production planning team typically relies on sales forecasts to determine inventory needs. The implementation of ULIP introduces advanced analytics tools that enhance inventory accuracy. The system utilizes user defined algorithms to notify when to increase inventory levels or maintain the status. ULIP also facilitates vendor inventory management through collaboration and streamlining order-to-delivery processes. This optimization results in faster order processing and decreased inventory requirements, which is particularly advantageous for companies dealing with perishable or seasonal products.

Access to data concerning inventory turnover and demand patterns empowers organizations to negotiate more favourable terms with suppliers, including reduced lead times and bulk purchase discounts, leading to cost savings.

By leveraging demand forecasting and aggregate planning techniques on the ULIP, users can minimize inventory costs and enable more efficient resource allocation. Accurate demand predictions and strategic inventory management contribute to reduced holding costs and ensure that resources are allocated effectively, fostering leaner and more cost-effective supply chains.

3.2.6 Resource Allocation with Terminal Operating System (TOS)

The integration of the Terminal Operating System (TOS) platform within the Ministry of Port, Shipping, and Waterways (MoPSW) alongside ULIP has a significant ripple effect. Shippers can now strategize last-mile surface logistics with optimized scheduling for cargo loading and unloading, resulting in reduced detention and demurrage costs. Improved planning of various port operations, such as Yard Management and gate operations, leads to potential savings on port or agency charges.

Efficient resource allocation facilitated by TOS enhances the utilization of port

facilities, minimizes delays, and ensures the efficient handling of cargo. This, in turn, results in swifter and more cost-effective logistics operations, benefiting both LSP and their clientele.

3.2.7 Traffic Management for Congestion Avoidance

ULIP grants access to up-to-the-minute traffic data, allowing for the monitoring and assessment of current traffic conditions. This data facilitates the identification of congestion hotspots and the proactive planning of interventions.

Additionally, ULIP can support route optimizing application, to enable route optimization capabilities, offering real-time alternative route suggestions to drivers, effectively mitigating traffic congestion.

With its comprehensive traffic data and analytics, ULIP empowers users to base their decisions on data regarding vehicle maintenance. By implementing congestion avoidance systems, it becomes feasible to reduce fuel consumption and greenhouse gas emissions, thus fostering environmental sustainability.

3.2.8 Trust-Building with Stakeholders

Transparency and visibility are the cornerstones of contemporary logistics operations. ULIP addresses this fundamental value in trust-building by providing a platform that eliminates uncertainties and promotes open communication. Stakeholders can depend on ULIP for consistent and accurate information sharing, reducing the likelihood of misunderstandings or misinformation. This reliability enhances trust by ensuring that all parties have access to uniform data, effectively eliminating the risk of disputes and discrepancies.

ULIP incorporates robust security measures designed to safeguard sensitive data, offering stakeholders assurance that their information is well-protected. This commitment to security serves to instil trust by significantly reducing the risks associated with data breaches and unauthorized access.

Trust encourages stronger collaborations among logistics service providers, suppliers, and customers, leading to smoother financial transactions and prompt payments. This, in turn, enhances the predictability and stability of cash flows,

enabling logistics companies to allocate resources more efficiently and pursue growth opportunities with confidence.

3.3 Additional benefits of ULIP

3.3.1 Private Investment in ULIP Bonds

ULIP offers a reliable funding source for initiatives focused on developing a resilient logistics infrastructure, ultimately promoting modernization and enhances the efficiency of the supply chain. By merging insurance coverage with investment opportunities, ULIPs provide a financial safety net to safeguard business continuity in the face of supply chain disruptions.

ULIPs empower suppliers by granting them the opportunity to invest and accumulate wealth, thereby promoting the growth of SMEs and MSMEs. These investments inject fresh funds into the logistics infrastructure, facilitating modernization and expansion projects. Moreover, they foster economic growth by promoting private sector involvement in the development and maintenance of logistics infrastructure.

3.3.2 Simplified GST Filing

ULIP streamlines data collection, simplifying the process of gathering and organizing the essential financial information necessary for precise GST filing. With real-time data access, ULIP maintains the accuracy and timeliness of the data used for GST filing, diminishing the potential for errors and penalties.

Additionally, ULIP aids in precise Input Tax Credit (ITC) calculations, allowing businesses to optimize their credit claims and mitigate the risk of underutilizing available credits. Integration with various systems, including Enterprise Resource Planning (ERP) software, further enhances the efficiency of the GST filing process.

Incorporating ULIP into the GST filing process offers businesses a more efficient, accurate, and cost-effective approach to compliance. This implementation reduces administrative burdens, minimizes errors, and empowers businesses to maximize their input tax credits, ultimately contributing to enhanced financial management and regulatory compliance.

3.4 Some Hinderances & Mitigation Plan

3.4.1 Integrating ULIP with existing systems, such as Enterprise Resource Planning (ERP) software, can be complex and may require significant IT resources and expertise. The initial cost of implementing a ULIP, including software licenses, hardware, and IT infrastructure, can be substantial.

3.4.2 Employees and stakeholders may resist changes in their workflows and processes. Adapting to the new system and its requirements can be a cultural and organizational challenge. Training employees to effectively use the ULIP and application designed for ULIP can be time-consuming and costly. Ensuring that the workforce is proficient in using the platform is crucial for its success. Gaining support and buy-in from all relevant stakeholders, including suppliers, customers, and partners, can be challenging, but it's essential for a successful ULIP implementation.

3.4.3 Managing sensitive data within a ULIP requires robust security measures to prevent data breaches and unauthorized access. Ensuring compliance with data protection regulations is essential.

3.4.4 Once implemented, it's crucial to continuously monitor the ULIP's performance and make necessary adjustments to ensure it meets the company's evolving needs.

Overcoming these challenges requires careful planning, collaboration with experienced MSPs, and a commitment to ongoing improvement and adaptation. Despite the obstacles, the strategic advantages, and long-term benefits of a well-implemented ULIP can outweigh the challenges.

In conclusion, ULIP is the disruptive mechanism on which Logistics systems are designed in future. These systems will evolve and endeavours companies coming forward early to make a move for their longer sustainability. The ball is the court of the decision makers to move and harness its potential for gaining a sizable advantage in the competitive business scenario.

https://morth.nic.in/, https://shipmin.gov.in/, https://dpiit.gov.in/logistics-division, Gazette of India by Ministry of Commerce and Industry notification dated 28th September 2022 S.O. 4575(E).

Chapter 4: Logistics Infrastructure in India – 2023

Transportation and logistics can be considered a lifeline of the business across the world. It is increasingly getting prominence in India, where the economy is consistently growing over the last three decades. Logistics sector has evolved during the last 70 years. Majority of transportation used to be essential commodities in initial period, through railways (88% of the total transported volume in 1950–51). The scenario in 2021–22 has multiple goods getting transported with share of road transportation being 74% (Ref figure 9). The volumes have grown more than 10 times during the last three decades (Ref figure 9 – from 505 MT in 1990–91 to 5443 MT in 2021–22).

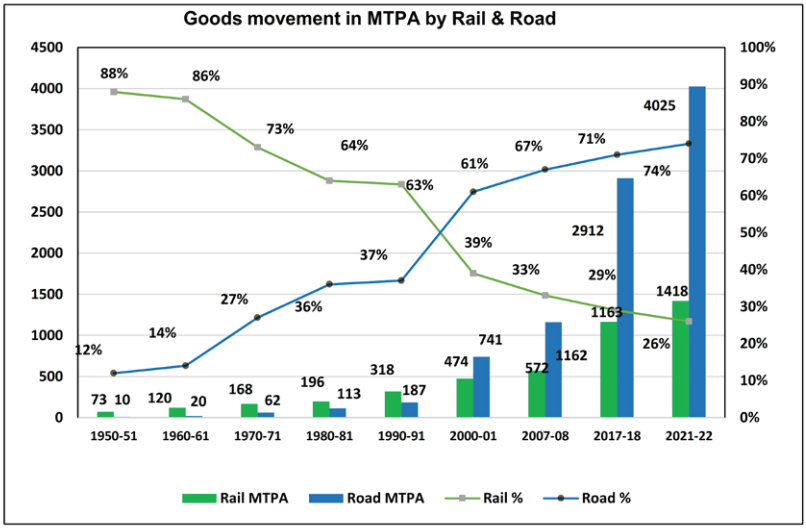


Figure 9: Use of Rail vs Road Transportation in India (1950–51 to 2021–22)

With India's growth story helping it to become 5th largest economy in 2023, it is important to compare India's logistics landscape with other large economies in the world. Road transportation, although the most convenient mode of transporting goods, is 4–5 times costlier than a comparable rail or water mode for similar quantity & distance. When we compare India's logistics footprint as against the world's three other large economies, USA, China, and Japan, it is evident that India has far more distance to cover, in terms of logistics infrastructure, equipment, processes and mindset (Ref figure 10). Road transportation constitutes a whopping 60% in India, in comparison to Japan (10%), China (30%) and USA (37%).

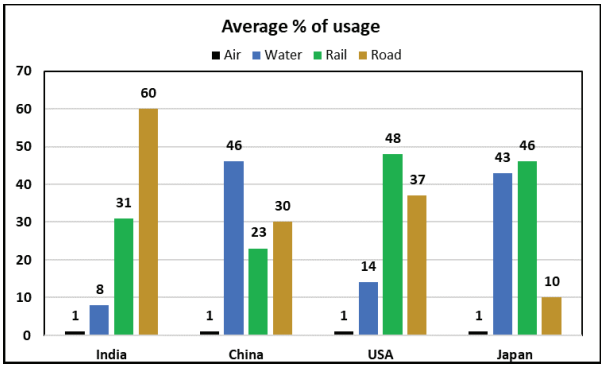


Figure 10: Average % of use of different modes of Transport by Major Economies

RSM India Research team has been carrying our extensive study in logistics infrastructure, equipment, processes, systems, and technological developments, to assist our clients in driving supply chain & logistics performance. This publication focuses on the output of our research team's efforts in compiling the logistics infrastructure. Additional information regarding upcoming infrastructure & facilities, with their tentative completion timelines are also provided where possible. It is designed to act as a navigator for logistics in India and hope to be helpful to the logistics industry professionals working across industry & sectors in domestic as well import exports.

The Navigator has been compiled in the following sections.

(i) Ports – Details about major and non-major ports in India, with their capacity & cargo traffic over the six-year period. The cargo traffic for overseas and coastal (domestic) is separately shared for the benefit of logistics professionals

(ii) Inland Container Depots (ICD) and Container Freight Stations (CFS) – State wise List of ICD's and CFS and upcoming infrastructure in various states

(iii) Multi-Modal Logistics Parks (MMLP) – List of state wise upcoming MMLP's, with specifics of rail, road, port connectivity for key MMLP's

(iv) Railway Logistics Infrastructure – Details of Rail Terminals, Dedicated Freight Corridors (DFC's), link to the Railways portal, High Density & High Usage routes, their traffic (current and projected), upcoming DFC's

(v) Inland Waterways – In addition to the coastal water movements for domestic transportation, the Government of India has been focusing on inland waterways, using large rivers like Ganga, Brahmaputra, Krishna, Godavari, etc. List of existing and upcoming waterways are compiled, with the respective floating terminals, jetties and other infrastructure (available and upcoming)

(vi) Electric Vehicles (EVs) – EV's are going to significantly reduce the cost of road transport, due to their low cost per kilometre. While India's EV landscape is limited to three wheelers, passenger vehicles and city transportation buses, our research team has compiled commercial vehicles (existing and to be launched) by different manufacturers

Note: The data / information compiled in this Navigator is retrieved from various public sources & subscribed websites by the RSM India research team. The research team is credited with the Compilation, analytics and enlisting in the user-friendly format. Reference / source links are given at the end of this document. We have limited this Navigator by not mentioning highway infrastructure & commercial IC engines

Chapter 5: Ports

5.1 Cargo Traffic in Major & Non-Major ports in India over six-year period

Cargo Traffic (million tons)	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
Major Ports	679.47	699.17	704.93	672.68	720.05	784.27
Non-Major Ports	529.09	582.61	615.05	577.19	603.56	650.96

5.2 Cargo Traffic of Coastal (Domestic) and Overseas Cargo:

Years	Major Ports (million tons)		Non-major Ports (million tons)	
	Coastal cargo	Overseas cargo	Coastal cargo	Overseas cargo
2021-22	171.32	548.73	92.35	511.4
2022-23	183.26	601.01	124.89	526.07

5.3 Share of Overseas Cargo Traffic at Major Ports – 2022-23 (million tons)

Location	Ports	Traffic	Share
Kandla, Gujarat	Deendayal Port	123.88	20.60%
Navha Seva, Maharashtra	JNPT	78.78	13.10%
Jagatsinghpur, Odisha	Paradip Port	76.97	12.80%
Visakhapatnam, Andhra Pradesh	Vishakhapatnam Port	54.72	9.10%
Haldia, West Bengal	SMP Haldia Dock	43.90	7.30%
Chennai, Tamil Nadu	Chennai Port	43.30	7.20%
Mumbai, Maharashtra	Mumbai Port	40.89	6.80%
Mangaluru, Karnataka	New Mangalore Port	32.47	5.40%
Chennai, Tamil Nadu	Kamarajar Port	25.86	4.30%
Muttayyapuram, Tamil Nadu	V.O. Chidambaranar Port	25.26	4.20%
Kochi, Kerala	Cochin Port	23.45	3.90%
Kolkata, West Bengal	Kolkata Dock	16.84	2.80%
Mormugao, Goa	Mormugao Port	15.64	2.60%

5.4 Share of Costal Cargo Traffic at Major Ports 2022–23 (million tons)

Ports	Traffic	Share
Paradip Port	58.46	31.90%
Mumbai Port	22.54	12.30%
Vishakhapatnam Port	19.06	10.40%
Kamarajar Port	17.78	9.70%
Deendayal Port	13.74	7.50%
V.O.Chidambaranar Port	12.64	6.90%
Cochin Port	12.10	6.60%
New Mangalore Port	9.16	5.00%
Chennai Port	5.86	3.20%
Haldia Dock	4.95	2.70%
JNPT	4.95	2.70%
Mormugao Port	1.65	0.90%
Kolkata Dock	0.37	0.20%

5.5 Share of Overseas Cargo Traffic at Non-Major Ports 2022–23 (million tons)

Location	Ports	Traffic	Share
Gujarat	Gujarat Maritime Board	369.827	70.30%
Andhra Pradesh	Andhra Pradesh Maritime Board	78.3844	14.90%
Odisha	Directorate of Ports, Odisha	35.2467	6.70%
Maharashtra	Maharashtra Maritime Board	27.3556	5.20%
Tamil Nadu	Tamil Nadu Maritime Board	9.46926	1.80%
Pondicherry	Puducherry	4.20856	0.80%
Karnataka	Karnataka	1.05214	0.20%
Kerala	Kerala	–	–
Andaman & Nicobar Island	A&N Island	–	–
Lakshadweep	Lakshadweep	–	–

5.6 Share of Coastal Cargo Traffic at Non-Major Ports 2022-23 (million tons)

Ports	Traffic	Share
Gujarat Maritime Board	46.33419	37.10%
Maharashtra Maritime Board	43.83639	35.10%
Andhra Pradesh Maritime Board	22.97976	18.40%
Puducherry	5.74494	4.60%
Directorate of Ports, Odisha	3.24714	2.60%
A&N Islands	1.74846	1.40%
Tami Nadu Maritime board	0.62445	0.50%
Kerala Maritime Board	0.24978	0.20%
Karnataka	0.12489	0.10%

5.7 Container Traffic at Major Ports (in thousand tons / TEU's)

Location	Ports	2020-21		2021-22		2022-23	
		Tn	TEU	Tn	TEU	Tn	TEU
Kolkata, West Bengal	SMP Kolkata DS	8237	538	8441	570	8520	569
Haldia, West Bengal	SMP Haldia DC	2927	149	3353	165	2067	107
Jagatsinghpur, Odisha	Paradip Port	279	16	184	10	192	11
Visakhapatnam, Andhra Pradesh	Vishakha-patnam Port	8178	481	8583	512	8460	522
Chennai, Tamil Nadu	Chennai Port	26768	1387	30925	1602	28377	1470
Chennai, Tamil Nadu	Kamarajar Port	3871	198	9269	480	10617	550
Muttayyapuram, Tamil Nadu	V.O. Chid-ambaranar	15023	762	15905	781	14678	734
Kochi, Kerala	Cochin Port	9550	690	10278	736	9986	695
Mangaluru, Kar-nataka	New Man-galore Port	2291	150	2309	152	2369	166
Mormugao, Goa	Mormugao Port	307	22	184	14	28	3

Location	Ports	2020–21		2021–22		2022–23	
		Tn	TEU	Tn	TEU	Tn	TEU
Navha Seva, Maharashtra	JNPT	57746	4677	69092	5685	76194	6190
Mumbai, Maharashtra	Mumbai Port	255	25	238	25	225	21
Kandla, Gujarat	Deendayal Port	8279	515	8620	493	8572	494

5.8 Traffic Handled by Non-Major Ports by Maritime States / UTs (million tons)

Location	2017–18	2018–19	2019–20	2020–21	2021–22	2022–23
Gujarat	370.77	399.20	411.79	387.57	405.39	416.36
Maharashtra	37.91	45.79	43.66	39.84	52.47	71.26
Andhra Pradesh	86.29	103.33	99.91	89.64	87.98	101.45
Goa	0.07	0.02	0.01	0.04	0.03	0.00
Tamil Nadu	1.10	0.96	11.37	7.41	7.84	9.88
Karnataka	0.68	1.04	0.94	0.79	0.79	1.06
A&N	1.42	1.50	1.85	1.43	1.54	1.88
Odisha	22.60	22.19	35.27	43.03	41.54	38.71
Kerala	0.14	0.22	0.16	0.11	0.14	0.24
Puducherry	8.12	8.37	10.10	7.33	5.84	10.12
Lakshadweep	–	–	–	0.12	0.18	–

5.9 Traffic Handled by Major Ports (million tons)

Ports	2017–18	2018–19	2019–20	2020–21	2021–22	2022–23
SMP Kolkata	57.891	63.763	63.983	61.368	58.175	65.66
SMP Kolkata DS	17.39	18.551	17.303	15.9	15.298	17.052
SMP Haldia DC	40.501	45.212	46.68	45.468	42.877	48.608
Paradip	102.028	109.302	112.689	114.549	116.134	135.329
Vizag	63.537	65.301	72.722	69.843	69.03	73.75
Kamarajar	30.446	34.498	31.746	25.889	38.742	43.507

Ports	2017–18	2018–19	2019–20	2020–21	2021–22	2022–23
Chennai	51.881	53.012	46.758	43.553	48.564	48.949
V.O. Chidambaranar	36.583	34.342	36.076	31.79	34.119	38.041
Cochin	29.143	32.021	34.038	31.503	34.551	35.256
New Mangalore	42.059	42.508	39.145	36.5	39.296	41.417
Mormugao	26.897	17.683	16.017	21.988	18.456	17.334
Mumbai	62.902	60.634	60.696	53.324	59.891	63.606
JNPT	66.004	70.706	68.449	64.809	75.996	83.861
Deendayal	110.099	115.401	122.606	117.566	127.1	137.561

5.10 State wise Capacity and Utilization of Major & Non-Major Ports (million tons)

State	(all figures in million tons)	2017–18	2018–19	2019–20	2020–21	2021–22	2022–23
Gujarat: Non-Major Port	Capacity	523	543	543	545	552	552
	Cargo Handled	370.77	399.2	411.79	387.57	405.39	416.36
	% Utilization	71%	74%	76%	71%	73%	75%
Maharashtra	Major Port	128.91	131.34	129.15	118.13	135.89	147.47
	Non-Major Port	37.91	45.79	43.66	39.84	52.47	71.26
Goa	Major Port	26.9	17.68	16.02	21.99	18.46	17.33
	Non-Major Port	0.07	0.02	0.01	0.04	0.03	0
Karnataka	Major Port	42.06	42.51	39.15	36.5	39.3	41.42
	Non-Major Port	0.68	1.04	0.94	0.79	0.79	1.06
Kerala	Major Port	29.14	32.02	34.04	31.5	34.55	35.26
	Non-Major Port	0.14	0.22	0.16	0.11	0.14	0.24

State	(all figures in million tons)	2017–18	2018–19	2019–20	2020–21	2021–22	2022–23
Tamil Nadu	Major Port	118.91	121.85	114.58	101.23	121.43	130.5
	Non-Major Port	1.1	0.96	11.37	7.41	7.84	9.88
Andhra Pradesh	Major Ports	63.54	65.3	72.72	69.84	69.03	73.75
	Non-Major Ports	86.29	103.33	99.91	89.64	87.98	101.45
Odisha	Major Ports	102.03	109.3	112.69	114.55	116.13	135.33
	Non-Major Ports	22.6	22.19	35.27	43.03	41.54	38.71
West Bengal	Major Ports	57.89	63.76	63.98	61.37	58.18	65.66
	Non-Major Ports	57.89	63.76	63.98	61.37	58.18	65.66

5.11 Major Port-wise Capacity Utilization during 2022–23

Ports	Capacity	Traffic	Capacity Utilization (%)
Paradip Port Authority	289.75	135.33	46.7
Deendayal Port Authority	267.1	137.56	51.5
Jawaharlal Nehru Port Authority	141.37	83.86	59.3
Chennai Port Authority	135	48.95	36.3
Visakhapatnam Port Authority	134.18	73.75	55
V.O.Chidambaranar Port Authority	111.46	38.04	34.1
New Mangalore Port Authority	108.96	41.42	38
Kolkata Port of Authority	92.77	65.66	70.8
Kamarajar Ports Limited	91	43.51	47.8
Mumbai Port Authority	84	63.61	75.7
Cochin Port Authority	78.6	35.26	44.9
Mormugao Port Authority	63.4	17.33	27.3

5.12 Non-Major Port-wise Capacity Utilization during 2022-23

Ports	Capacity	Traffic	Capacity Utilization (%)
Gujarat	552	416.36	75.4
Andhra Pradesh	207	101.45	49
Maharashtra	127.75	71.26	55.8
Odisha	65	38.71	59.6
Goa	25.05	0	0
Puducherry	17.95	10.12	56.4
Tamil Nadu	9	9.88	109.7
Lakshadweep	5.82	0	0
Karnataka	5	1.06	21.1
Andaman & Nicobar Islands	4.11	1.88	45.8
Kerala	1.07	0.241	22.5

Source: https://shipmin.gov.in, https://www.cochinport.gov.in

5.13 Upcoming Ports in India as of 2023

Vadhavan Container Port

- Status: Construction in progress
- Capacity: 254 million tonnes of cargo
- The location is about 10 Km from the National Railway grid and about 35-40 Km from NH8

Figure 11: Distance from middle East

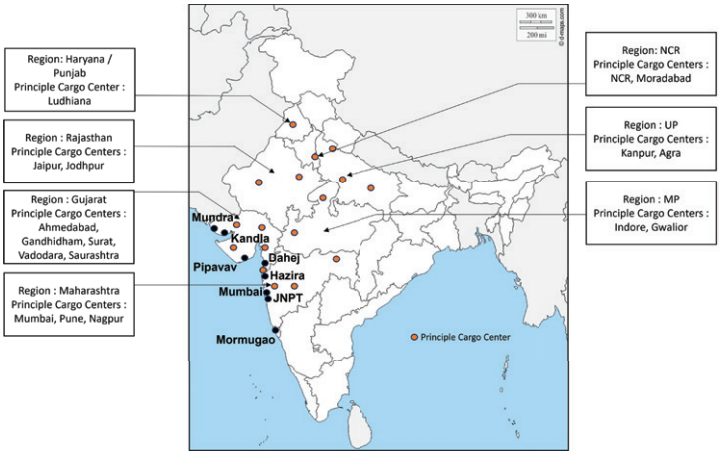


Figure 12: Outreach of Major ports from principal Cargo Centres

5.14 Trans-shipment Port in India 2023

Port	State	Capacity	Status
Vizhinjam International Seaport	Kerala	1 million TEU	Operational by 2024
International container transhipment port (ICTP)	Galathea Bay in the Great Nicobar Island	4 million containers	DPR in progress
Vallarpadam International Container Transhipment Terminal (ICTT)	Cochin	1 million TEU – Operational	Operational

Vizhinjam International Seaport	
Capacity	
Phase 1	1 million TEUs (by 2023)
Phase 2	2.5 million TEUs
Phase 3	3.3 million TEUs
Terminal Area (Phase 1)	80 hectares
Quay Length (Phase 1)	800 meters
Connectivity	
Road	4 lane NH-66
Rail	Proposed dedicated freight corridor
Air	16 kms from Trivandrum International Airport

Source: https://vizhinjamport.in

Chapter 6: Inland Container Depots (ICD) and Container Freight Stations (CFS)

6.1 Operational & Central/State Operated ICD and CFS

States	CFS	ICD
Andhra Pradesh	3	–
Chandigarh	–	1
Chhattisgarh	–	1
Goa	1	–
Gujarat	11	4
Himachal Pradesh	–	1
Haryana	2	4
Jammu & Kashmir	–	1
Jharkhand	–	1
Karnataka	5	–
Kerala	6	2
Maharashtra	19	5
Madhya Pradesh	–	5
Odisha	–	1
Punjab	2	–
Rajasthan	2	7
Tamil Nadu	11	5
Uttar Pradesh	4	6
Uttarakhand	–	2
West Bengal	5	1
Telangana	1	1

6.2 Under Implementation & Central / State Operated ICD, CFS

States	CFS	ICD
Andhra Pradesh	3	1
Chhattisgarh	–	1
Gujarat	–	1
Haryana	–	2

States	CFS	ICD
Jammu & Kashmir	–	1
Karnataka	–	1
Kerala	2	–
Maharashtra	1	2
Odisha	–	1
Punjab	–	1
Rajasthan	–	1
Tamil Nadu	4	1
Uttar Pradesh	–	2
West Bengal	2	–
Telangana	1	–

6.3 Operational and Privately Operated ICD, CFS

States	CFS	ICD
Andhra Pradesh	3	2
Gujarat	13	3
Haryana	–	3
Karnataka	2	–
Kerala	4	–
Maharashtra	22	4
Madhya Pradesh	–	2
Odisha	–	1
Pondicherry	2	–
Punjab	3	2
Tamil Nadu	37	4
Uttar Pradesh	5	2
West Bengal	6	–
Telangana	1	–

6.4 Under Implementation & Privately Operated ICD, CFS

States	AFS	CFS	ICD
Andhra Pradesh	–	4	–
Bihar	–	–	1
Delhi	1	4	–
Gujarat	–	–	2
Haryana	–	–	1
Karnataka	1	1	–
Maharashtra	–	–	1
Punjab	–	2	1
Tamil Nadu	–	–	–
Telangana	–	–	1

6.5 Some Major ICDs

S. No.	State	Name of ICD	Location
State wise Rail ICDs with CFS			
1	Andhra Pradesh	Sanathnagar(SNF)	Hyderabad
2	Andhra Pradesh	Anarpati	East Godavari (AP)
3	Andhra Pradesh	Guntur	Guntur
4	Andhra Pradesh	Chirala	Dist Guntur (AP)
5	Assam	Amingaon	Guwahati
6	Gujarat	Sabarmati	Ahmedabad
7	Haryana	Tughlakabad(TKD)	New Delhi
8	Haryana	Riwari	Haryana
9	Haryana	Dadri(Greater Noida)	Delhi
10	Karnataka	Whitefield	Bangalore
11	Madhya Pradesh	Raipur	Khapa
12	Maharashtra	Nagpur	Nagpur
13	Maharashtra	New Mulund(E)	Mumbai
14	Maharashtra	Daulatabad	Aurangabad
15	Maharashtra	Miraje	Miraje

S. No.	State	Name of ICD	Location
16	Maharashtra	Bhusawal	Bhusawal
17	Orissa	Balasore	Balasore
18	Punjab	Dhandarikalan	Ludhiana
19	Rajasthan	Jodhpur	Jodhpur
20	Rajasthan	Kanakpura	Jaipur
21	Tamil Nadu	Coimbatore	Coimbatore
22	Tamil Nadu	Tondiarpet	Chennai
23	Tamil Nadu	Madurai	Madurai
24	Tamil Nadu	Tirupur	Tirupur
25	Uttar Pradesh	Agra	Belanganj
26	Uttar Pradesh	Moradabad	Moradabad
27	Uttar Pradesh	Kanpur	Kanpur
28	West Bengal	Cossipore	Kolkata
State wise Road ICDs with CFS			
29	Haryana	Babarpur	Panipat
30	Madhya Pradesh	Pithampur	Indore
31	Madhya Pradesh	Malanpur	Gwailior
32	Maharashtra	Mulund(W)	Mumbai
33	Tamil Nadu	Tuticorin	Milavittan
34	Tamil Nadu	Pondicherry	Pondicherry
State wise ICD without CFS			
35	Gujarat	Vadodara	Vadorara
36	Jharkhand	Jamshedpur	Tatanagar
37	Kerala	Kochi	Kochi
38	Maharashtra	Chincwad	Pune
39	Maharashtra	Wadi Bunder	Mumbai
40	Maharashtra	D'Node	Navi Mumbai
State wise Port Side Container Terminals			
41	Andhra Pradesh	Vizag(Visakhapatnam)	Vizag (Visakhapatnam)

S. No.	State	Name of ICD	Location
42	Gujarat	Kandla	Kandla
43	Tamil Nadu	Harbour of Madras	Chennai
44	West Bengal	Haldia	Kolkata
45	West Bengal	Shalimar	Kolkata
Rail Linked Empty Park			
46	Uttar Pradesh	Ballabhgarh	Uttar Pradesh

6.6 Upcoming-ICD-/-CFS-/-AFS (Air Freight Stations)

Source: https://www.icegate.gov.in

Location	AFS	CFS	ICD
Anuppampattu Village		1	
Attible, Anekal Taluk, Bangalore			1
Ayyanadaippu,Tuticorin (Private)		1	
Bayyavaram, Visakhapatnam Distt (Private)		1	
Bhamboli, Pune (Private)			1
Butibori, Nagpur			1
Central Warehousing Corporation, Pune		1	
Devanahalli Village & Taluka, Bangalore (Private)	1		
GroMh Centre Bawal Distt. Rewari (Private)			1
Hazira, Surat (Private)		1	
Hindaun			1
Hyderabad		1	
Hyderabad (Private)			1
Jharsuguda			1
Kakinada, East Godavari Distt (Private)		1	
Kalamassery, Kochi		1	
Kapashera (Private)	1		
Kattupalli Village, Thiruvallur, Chennai		1	
Khidirpur, Kolkata		1	
Kila Raipur, Ludhiana (Private)			1
Krishnapatnam Port		1	

Location	AFS	CFS	ICD
Loni (Ghaziabad)			1
Ludhiana			1
Madurai (Private)			1
Meelavattan village, Tuticorin		1	
Mihan Area of District Nagpur			1
Modi Nagar, U.P.			1
Moje Suvali, Taluka, Choryasi, Dist. Surat. (Private)		1	
Naya Raipur			1
Paiki, Village Motakapaya, Mundra (Private)		1	
Patna, Bihar (Private)			1
Ponneri Taluka, Thiruvallur (Private)		1	
Rajkot (Private)			1
Rangreth			1
South –24 Pargana, Solapur, Kolkata		1	
Surareddy palem, Praksam At Kikinada, Andhra Pradesh			1
Trivallur, Chennai		1	
Vallarpadam, Kochi		1	
Village Bhingar, Panvel Taluk, Dist Raigad, (Private)		1	
Village Janoli and Bhagola, Palwal, Distt.Faridabad			1
Village Jattipur, Samalkha, Panipat			1
Village Sachana, Taluka Viramgam, Ahmedabad (Private)			1
Village Zarpara, Mundra Taluka (Private)		1	
Viramgam, Ahmedabad			1
Visakhapatanam		1	
Visakhapatnam		1	
Visakhapatnam (Private)		2	

Chapter 7: Multi Modal Logistics Parks (MMLP)

7.1 List of Proposed Multi Modal Logistics Park Locations in India

Sr. No.	Location
1	Delhi–NCR (Delhi, Gurgaon, Ghaziabad, Faridabad, Noida)
2	Mumbai (Mumbai, Mumbai Suburbs, JNPT, Mumbai Port, Raigad District)
3	North Gujarat (Ahmedabad and Vadodara)
4	Hyderabad
5	South Gujarat (Surat and Bharuch)
6	South Punjab (Ludhiana, Sangrur, Patiala)
7	North Punjab (Amritsar, Jalandhar, Gurudaspur)
8	Jaipur
9	Bangalore
10	Pune
11	Vijayawada
12	Chennai
13	Nagpur
14	Kandla
15	Cochin
16	Indore
17	Patna
18	Kolkata
19	Ambala
20	Valsad
21	Coimbatore
22	Jagatsinghpur
23	Nasik
24	Guwahati

Sr. No.	Location
25	Kota
26	Panaji
27	Hisar
28	Visakhapatnam
29	Bhopal
30	Sundargarh
31	Bhatinda
32	Solan
33	Rajkot
34	Raipur
35	Jammu

7.2 MMLP location wise Land Requirement

Upcoming Multi Modal Logistics Park (MMLP)		
State	Location	Land requirement (acre)
Andhra Pradesh	Vijayawada	203
Delhi	Delhi–NCR	856
Gujarat	North Gujarat	488
Gujarat	South Gujarat	279
Gujarat	Kandla	305
Karnataka	Bangalore	400
Kerala	Cochin	264
Madhya Pradesh	Indore	255
Maharashtra	Mumbai	813
Maharashtra	Pune	171
Maharashtra	Nagpur	230
Punjab	South Punjab	226
Punjab	North Punjab	267
Rajasthan	Jaipur	197
Tamil Nadu	Chennai	184
Telangana	Hyderabad	295

7.3 MMLP Status as of December 2023

Source: https://morth.nic.in, http://nhlm.in/mmlp.html

MMLP	Road connectivity	Rail connectivity	Sea connectivity
Vardha – Nagpur	NH-361 & Maha Samruddhi Mahamarg (MSMM)	Sindi Railway Station	JNPT
Mappedu – Chennai	SH-50B	Kadambattur Railway station	Chennai Port
Muddalinganahalli – Bengaluru	NH-648	Muddalinganahalli Railway station	Mangalore Port, Karwar Port
Machal – Indore	NH-47	Tihi Railway station, ICD Dhannad	Hazira Port
KRIL Hazira– Surat	NH-53	Surat Railway station	Hazira Port
Bhiwandi – Mumbai	NH-160, NH-48	Bhiwandi Railway station	Mumbai Port & JNPT
Hyderabad	DPR in progress	–	–
Coimbature	DPR in progress	–	–

Chapter 8: Railway Terminals & Corridors

Indian Railway have 2965 loading station and 3602 unloading station catering various goods / commodities that can be transferred in and out. Indian Railways moved around 1500 million tonnes of goods in 2022–23. Commodities such as COAL, IRON ORE, RMSP, IRON& STEEL, POL, FERTILISER, CEMENT, FOOD GRAIN contributed for 89% of the total traffic for IR. Container traffic tentatively lingered around 4–5%.

As per the Indian Railways classification of the network, a total of 7 High–Density Network (HDN) routes and 11 Highly Utilized Network (HUN) routes have been classified based on the passenger and freight volumes carried by these corridors. HDN network comprise of 16% (11,000 Km) of total Indian Railway Network and transports 41% of total traffic. HUN comprise of 35% (24,230 Km) of the total railway network and transports 40% of the total traffic moving on Indian Railway network. Combined HDN+HUN account for almost 50% (34,214 Km) of the total network and carries around 80% of the total volume of traffic moving on Indian Railways.

Indian Railways portal helps users with a dashboard, to plan the transportation of goods. The link is given https://www.fois.indianrail.gov.in/RailSAHAY/pages/TrmlDashboard.jsp

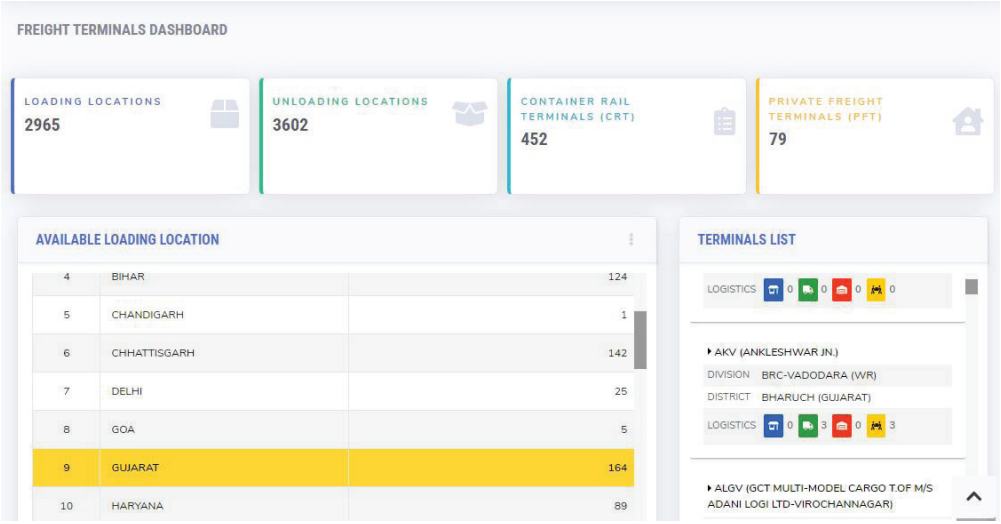


Figure 13.a: Indian Railway portal Dashboard

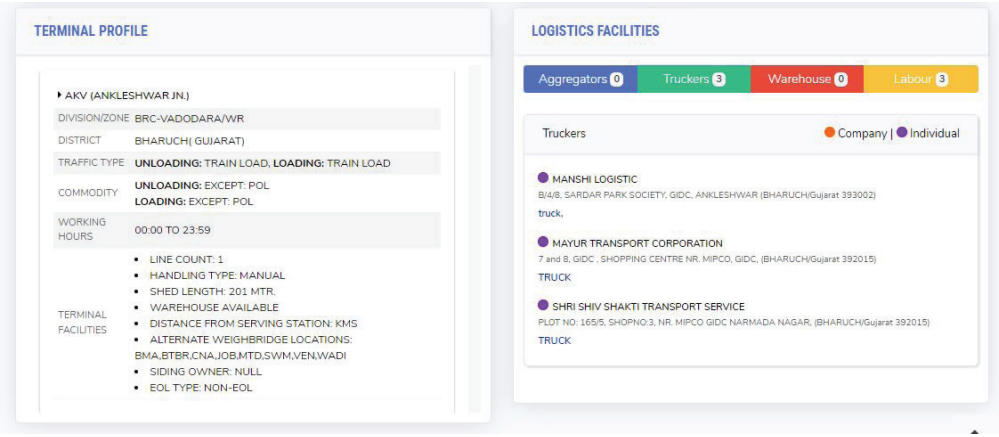


Figure 13. b: Indian Railway portal Dashboard

8.1 Indian Railway HDN Routes

HDN No	Routes	Length (km)
HDN1	Delhi Howrah Main Route via ALD MGS Gaya	1451
HDN2	Howrah – Mumbai main route via Jalgaon, Nagpur, Bilaspur	1963
HDN3	Delhi–Mumbai Main Route via Kota Ratlam	1386
HDN4	Delhi–Guwahati via Rosa–Gorakhpur–Kumedpur	1845
HDN5	Delhi–Chennai Main Route via BPL–NGP–BPQ–BZA–Gudur	2175
HDN6	Howrah Chennai Main Route	1661
HDN7	Mumbai–Chennai main route	1281
	Total	**11,762**

8.2 Indian Railway HUN Routes

S.NO	HUN Routes	Length (Km)
HUN 1	Amrit Sagar Sampark Corridor	3,049
HUN 2	Bengal Arab Sagar Sampark Corridor	3035
HUN 3	Kathiawar Shivalik Sampark Corridor	1685
HUN 4	Sagar Sutlej Sampark Corridor	1,529

S.NO	HUN Routes	Length (Km)
HUN 5	Bundelkhand Tarai Sampark Corridor	2,151
HUN 6	Sagar Purvodaya Sampark Corridor	1,490
HUN 7	Sagar Chambal Sampark Corridor	2,737
HUN 8	Purv Paschim Deccan Sampark Corridor	1,501
HUN 9	Aravali Dakshin Sampark Corridor	2,803
HUN 10	Satpura Coromandel Sampark Corridor	2,232
HUN 11	Konkan Malabar Sampark Corridor	1,134
	Total	**23,346**

8.3 Capacity Utilization for HDN & HUN Routes

Utilization	HDN Network KM	Share
0%–70%	189	2%
70%–100%	2,003	18%
100%–150%	6,326	58%
>150%	2,450	22%
Total	**10,969**	**100**
Utilization	**HUN Network KM**	**Share**
0%–70%	5896	24%
70%–100%	6,887	28%
100%–150%	8,361	34%
>150%	3,121	12%
Total	**24,266**	**100%**

8.4 Rake km for Key Routes

Route	Rake Km 2018	Rake Km 2026	Rake Km 2031	Rake Km 2041	Rake Km 2051
Delhi – Mumbai via Kota – Ratlam	1,42,646	1,28,116	1,28,065	2,53,709	6,07,395
Mumbai – Howrah via Nagpur – Jharsuguda	1,53,322	1,91,886	2,84,575	3,02,143	5,56,427

Route	Rake Km 2018	Rake Km 2026	Rake Km 2031	Rake Km 2041	Rake Km 2051
Delhi – Chennai via Jhansi – Bhopal	1,15,208	1,94,157	1,91,792	3,29,236	5,14,105
Amritsar – Andal via Mughal Sarai – Patna	88,587	1,18,788	1,85,734	2,37,116	4,36,096
Kharagpur – Udhna via Bhusawal	1,27,437	1,09,995	1,89,481	1,89,481	4,11,105
Vasco – Machilipatnam via Dharwad – Vijayawada	39,373	37,102	52,356	1,31,095	3,97,948
Vizianagaram/ Paradeep – Kota	1,44,061	2,01,973	2,78,433	3,71,369	3,80,241
Delhi – Guwahati via Moradabad – Chhapra – Katihar	64,102	2,13,776	2,60,253	3,77,942	3,42,465
Delhi – Howrah via Kanpur – Gaya	1,25,474	72,888	1,74,326	2,04,722	3,41,716
Kolkata – Vijayawada via Jharsuguda – Sambalpur	65,425	1,43,314	2,01,958	2,65,061	2,98,949
Bandel – Dibrugarh via Azimganj – Barsoi	32,330	77,377	88,269	1,44,652	2,74,620
Ajmer – Dindigul via Nanded	27,163	21,154	37,437	1,28,934	2,68,808
Chandigarh – Rajkot Via Panipat – Rewari	74,797	71,354	1,44,795	1,78,936	2,25,608
Jhansi – Muzaffarpur – Katni	43,542	72,708	1,12,270	1,90,810	2,15,763
Manmad – Kanyakumari via Hubli – Birur	37,650	42,495	67,090	1,13,590	1,87,530

Route	Rake Km 2018	Rake Km 2026	Rake Km 2031	Rake Km 2041	Rake Km 2051
Mumbai – Chennai via Guntakal – Hospet	39,624	32,510	47,117	1,07,025	1,74,203
Firozpur – Mundra Port via Bhatinda–Jakhal	53,199	50,325	93,634	1,13,955	1,70,565
Mangalore – Kanyakumari via Shoranu	17,076	17,111	27,900	40,100	58,892

8.5 Dedicated Freight Corridors

Considering the substantial volume of freight circulating within the network, identification of key freight corridors where the proportion of freight traffic exceeds 50%. These corridors are prioritized for the advancement of Dedicated Freight Corridors (DFCs).

These are listed below:

- Kharagpur– Vishakapatnam– Vijayawada– Guntakal
- Delhi– Agra– Bhopal– Nagpur– Vijayawada– Chennai
- Agra– Mughalsarai– Gaya– Dhanbad– Kolkata
- Mumbai– Nashik– Nagpur– Raipur– Bilaspur– Jharsuguda– Jamshedpur– Kharagpur
- Mumbai– Pune– Guntakal– Chennai
- Delhi– Kota– Surat– Mumbai
- Delhi– Ajmer– Ahmedabad

8.5.1 Proposed Phasing of DFC Network

Phasing	2026	2031	2041	2051
Length (Km)	2,807	3,278	1,206	751
New DFC Corridors	Eastern DFC, 1,324 Km	East Coast DFC, 1,265 Km (Kharagpur to Vijayawada)	North South DFC, 1,206 Km (Itarsi to Chennai via	North South DFC, 751 Km (Palwal to Itarsi)

			Nagpur and Vijayawada)	
	Western DFC 1,483 Km	East West DFC, 2,013 Km (Palghar to Dankuni and EDFC Connectors) Eastern DFC, 515 Km (Sonnagar to Dankuni)		

8.5.2 Current Status of DFC Network

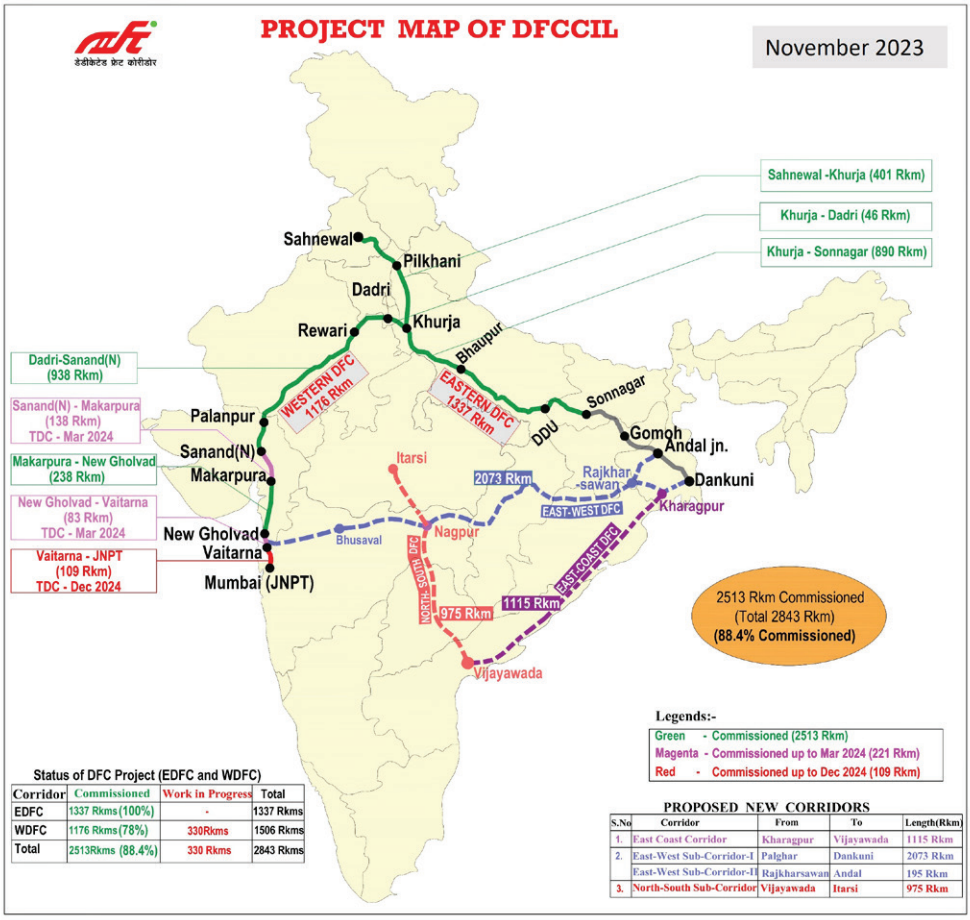


Figure 14: Project map of DFCCIL

8.5.3 Status of Eastern & Western DFC's as of November 2023

a. Total length of Eastern & Western DFC	2843 Km (except Sonnagar – Dankuni section)	Commissioned
(Eastern – 1337 kms, Western – 1506 kms)		Commissioning up to March 2024
b. Target	December 2024	Commissioning up to December 2024
b. Financial Progress (Works)	88%	

8.5.4 Detailed status of DFC's as of November 2023

Section/ Package	Length (km)	Commissioning	Remarks	Financial Progress
WDFC – Western Dedicated Freight Corridor				
Dadri – Rewari	127	Commissioned	Dadri–Rewari (127 Km) section is commissioned.	88%
Rewari – Madar	306	Commissioned	Hon'ble Prime Minister Sh. Narendra Modi inaugurated Rewari – Madar section (306 Km) of WDFC on 07.01.2021.	88%
Madar – Palanpur	353	Commissioned	Hon'ble Prime Minister Sh. Narendra Modi inaugurated Madar–Palanpur (353 Km) of WDFC on 18.06.2022.	88%
Palanpur – Makarpura	290	31-March 2024	New Palanpur– New Sanand (152 Km) section is Commissioned. Hon'ble Prime Minister Sh. Narendra Modi inaugurated New Palanpur–New Mahesana (75 Km) of WDFC on 30.09.2022 and New Bhandu–New Sanand North (77 Km) on 30.10.2023	88%
Sachin – Vaitarna	186	31-March 2024	Sachin–Sanjan (103 Km) section is commissioned.	88%
Vaitarna – JNPT	109	31-December 2024		88%

Section/ Package	Length (km)	Commissioning	Remarks	Financial Progress
EDFC – Eastern Dedicated Freight Corridor				
Sahnewal – Pilkhani	179	Commissioned	Sahnewal–Shambhu (179 Km) section is commissioned.	92%
Pilkhani – Khurja	222	Commissioned	Khurja–Khatauli (222 Km) section is commissioned.	92%
Khurja – Dadri	46	Commissioned	Khurja–Dadri (46 Km) section is commissioned.	92%
Khurja – Bhaupur	351	Commissioned	Hon'ble Prime Minister Sh. Narendra Modi inaugurated Khurja – Bhaupur (351 Km) section of EDFC on 29.12.2020.	92%
Bhaupur – DDU	402	Commissioned	New Bhaupur–New DDU (402 Km) section is commissioned.	92%
DDU – Sonnagar	137	Commissioned	DDU–Sonnagar (137 Km) section is commissioned.	–

8.6 Roll on–Roll off (RORO) Operations

Indian Railways issued a circular dated 06/07/2022, highlighting notifications for operating Roll-on–Roll-off (RO–RO) services across Indian Railways, including DFCCIL, based on wagon rates. The RO–RO service was initially introduced on the Konkan Railway in 1999 and has been consistently operational on diesel routes. However, its implementation on electrified routes has faced operational challenges due to the presence of Overhead Equipment (OHE). Despite these challenges, trial runs of the RO–RO service have been conducted recently on various routes:

- Across the Ganga River in Bihar, connecting Bihta and Turki over the East Central Railway.
- Between Bhanga and Churaibari in Northeast Frontier Railway, specifically for transporting loaded or empty petrol tankers.
- From Nagothane to Boisar on the Western Railway route.

Source: https://www.fois.indianrail.gov.in, https://indianrailways.gov.in, https://concorindia.co.in, https://railministry.com, https://irfca.org/faq/faq-stock2.html, https://dfccil.com

Chapter 9: Inland Waterways

9.1 Major National Waterways (NW) in India

National Waterway	Water Body	Between	Length (km)	Remarks
NW–1	Ganga – Bhagi–rathi–Hooghly River	Haldia (Sagar) and Allahabad	1620	
NW–2	River Brahmaputra	Bangladesh Bor–der and Sadiya	891	
NW–3	West coast canal	Kottapuram – Kollam	168	
NW–3	Udyogmandal canal	Kochi Pathalam bridge	23	
NW–3	Champakara canal	Kochi – Ambala–mugal	14	
NW–4	1. Kakina–da–Puducherry stretch of Canals 2. Integrated Bhadra–chalam – Rajahmun–dry stretch of River Godavari 3. Wazira Vijayawa–da stretch of River Krishna		1078	
NW–4	Krishna River	Muktyala to Vijay–awada	82	
NW–4	Krishna River	Vijayawada – Ka–kinada	233	
NW–4	Krishna River	Rajahmundry to Polavaram		
***NW–4**	River Krishna	Wazirabad to Galagali	628	*DPR underway
***NW–4**	River Godavari	Bhadrachalam to Nasik	1184	
NW–5	Brahmani river & Ma–hanadi delta system & East cost canal	Talcher– Dhamra, Geonkhali– Char–batia, Charbatia–Dhamra, Mangal–gadi–Paradip	623	Construction underway

9.2 Details of Terminals in Haldia – Rajmahal stretch of NW–1

A. Floating Terminals

Name of terminal with chainage (In km)	Land area (in Sq. m)	Size of berth, water front (In mtr.)	No. of Pontoon Barge & Gangway	Storage area	Link approach road	Remarks
Haldia (Ch. 35.0)	10930	70 m berth & 200 m WF	04 Pontoons 01 Gangway	One Godown of size 12 x 30 m and Open space 1630 m2	3.5 km via HDC	Land taken from Haldia Dock Complex (HDC) on lease basis.
Botanical Garden Jetty (Ch. 134.5)	996	35 m berth & 50 m WF	01 Pontoon 01 Steel Gangway	To be stored on Pontoon	150 m	Land belongs to KoPT being used by IWAI.
BISN Jetty & G.R. Jetty–1 (Ch. 135.0)	30409.64	70 m berth & 100 WF	03 Pontoons 01 Steel Gangway	Open Space area 6000 m2	1 km	Land taken from KoPT on lease basis
Tribeni (Ch. 196.0)	–	35 m berth	01 Pontoon 01 Bamboo Gangway	To be stored on Pontoon	Along the road	Land not available pontoon placed on water front
Shantipur (Ch. 241.0)	8000	35 m berth & 100 WF	01 Pontoon 06 Modular Pontoons Gangway	To be stored on Pontoon and open space of IWAI's land 2000 Sq. m	3 km	Land belongs to State Govt. of W.B. being used by IWAI.
Swaroopganj (Ch. 280)	2337	35 m berth	01 Pontoon 01 Bamboo Gangway	One Godown of size 4.5 x 5 m and Open space 290 m2	500 m	Land taken from KoPT on lease basis

Name of terminal with chainage (In km)	Land area (in Sq. m)	Size of berth, water front (In mtr.)	No. of Pontoon Barge & Gangway	Storage area	Link approach road	Remarks
Katwa (Ch. 334.50)	–	35 m berth	01 Pontoon 01 Bamboo Gangway	To be stored on Pontoon.	1.5 km	Land not available pontoon placed on water front
Hazardwari (Ch. 439.0)	–	35 m berth	01 Pontoon 01 Bamboo Gangway	To be stored on Pontoon.	100 m	Land not available pontoon placed on water front
D/s Farakka (Ch. 542.0)	–	35 m berth	01 Pontoon 01 Bamboo Gangway	To be stored on Pontoon.	Along the road	Land not available pontoon placed on water front
U/s Farakka (Ch. 545.0)	4800	35 m berth	01 Pontoon 01 Bamboo Gangway	To be stored on Pontoon & land of FBP	100 m	Land belongs to FBP being used by IWAI.

B. Fixed RCC Jetties

Name of terminal with chainage (In km)	Land area (in Sq. m)	Size of berth, water front (In mtr.)	No of Pontoon Barge & Gangway	Storage area	Link approach road	Remarks
G.R.Jetty-2 (Ch. 134.5)	14,557	70 m berth	–	One Transit shed of size 25 x 46 m and Open space 4000 m2	500 m.	Land taken from KoPT on long term lease basis. RCC Jetty

Name of terminal with chainage (In km)	Land area (in Sq. m)	Size of berth, water front (In mtr.)	No of Pontoon Barge & Gangway	Storage area	Link approach road	Remarks
						completed and being operational since Nov., 2013.
Farakka RCC Jetty (Ch. 542 km)	–	115 m berth	–	–	Along the road	Owned by FBP this can be used by the common users.
Pakur RCC Jetty (Ch. 522 km)	–	60 m berth	–	–	1 km	Owned by FBP this can be used by the common users.

9.3 Details of Terminals in Rajmahal – Allahabad stretch of NW–1

A. Floating Terminals

Name of terminal with Chainage	Land area	Size of berth, waterfront	Storage area	Link approach road	Remarks
Manglahat (Rajmahal) (Ch. 588Km.)	–	35 m berth	To be stored on Pontoon. Private land could be made available if required	Kachcha Rasta 100m and connected with NH 80	Generator could be provided for lighting whenever required
Samdaghat (Sahebganj) (Ch.617Km.)	–	35 m berth	To be stored on Pontoon. Private land could be made available if required	Kachcha Rasta 300m and Pucca road 1km connected with NH 80	Generator could be provided for lighting whenever required

Bateshwarsthan (Ch. 683Km.)	–	35 m berth	To be stored on Pontoon.	Kachcha Rasta 200m and Pucca road 5km connected with NH 80	Generator could be provided for lighting whenever required
Bhagalpur (Ch715Km.)	3.86 Acre Land	35 m berth	To be stored on Pontoon and open space of IWAI's land 1000 Sq. m	Pucca Rasta 300 m and metalled road 2 km connected with NH 80	DGPS Station is operational and being utilized since 2010.
Munger (Ch.793Km.)	3.40 Acre Land	35 m berth	To be stored on Pontoon and open space of IWAI's land 1000 Sq. m	Pucca Rasta 100 m and metalled road 5 km connected with NH 80	Generator could be provided for lighting whenever required
Semaria (Ch. 850 Km)	–	35 m berth	To be stored on Pontoon. Private land could be made available if required	Kachcha Rasta 200m and Pucca road 300 m connected with NH 31	
Buxar (Ch. 1124 Km)	–	35 m berth	To be stored on Pontoon. Private land could be made available if required	Kachcha Rasta 100m and Pucca road 400 m connected with NH 84	
Ghazipur (Ch. 1177 Km) / Rajghat (Varanasi)	–	35 m berth	To be stored on Pontoon. Private land could be made available if required	Kachcha Rasta 100m and Pucca road 100 m connected with NH 19	Generator could be provided for lighting if required

Ramnagar (Varanasi) (Ch. 1315)	5.586 Hectare Land	35 m berth & 300 WF	To be stored on Pontoon and open space of IWAI's land 2000 Sq. m	Land acquisition in process for approach road of about 700m connecting with NH 07	
Allahabad (Ch. 1535)	8.759 Hectare Land	35 m berth & 300 WF	To be stored on Pontoon and open space of IWAI's land 5000 Sq. m	Pucca Rasta 500 m and metalled road 2 km connected with NH 76	Generator could be provided for lighting if required

B. Fixed RCC Jetty

Name of terminal with Chainage	Land area	Size of berth, waterfront	Storage area	Link approach road	Remarks
Patna (Gaighat) (Ch. 955Km.)	2.93 Acre	46.0 m berth 100 m WF	45m x 14m Transit shed and open space of IWAI's land 1000 Sq. m	Pucca Rasta 500 m and metalled road 2 km connected with NH 30	Permanent High-level Jetty and DGPS Station is operational and being utilized since 2012.

9.4 Details of Terminals in stretch of NW-2

Terminals at 12 locations are being maintained on NW-2 for handling cargo vessels and passenger ferries as per the details given below:

Location	Type of terminal (Fixed/Floating)	Purpose	Status
Hatsingimari	Temporary Ro- Ro terminal with a steel crane pontoon is provided.	For providing Ro-Ro service between Dhubri and Hatsingimari	Ro- Ro service is operational
Dhubri	RCC Ro- Ro terminal with a crane pontoon is provided.	For completion of customs and immigration both for incoming and outgoing vessels on Protocol route in addition to handling of Ro -Ro vessel, cargo vessels and passenger ferries.	(i) Ro- Ro Terminal is operational. (ii) A DGPS station is also established at this location.
Jogighopa	Floating terminal with a crane pontoon.	For transportation of Meghalaya coal/import of coal for NTPC power plant at Bongaigaon.	(i) The terminal is proposed to be developed as Multi model logistic hub. (ii) DGPS station has been established at this terminal.
Pandu	Fixed/permanent terminal with two godowns and RCC jetties	Pandu is the major location on NW-2 as an entry point to NE States.	A low level jetty is operational for berthing of vessels.along with a high level jetty. 2 shore cranes of 20-ton capacity, one container crane of 75 ton capacity and ones floating crane are placed at terminal for handling of cargo. One B.G. siding is also constructed and notified for operation
Tejpur	Floating terminal with a steel pontoon.	For handling of cargo vessels, local ferry service.	A steel pontoon is placed at this terminal.

Location	Type of terminal (Fixed/Floating)	Purpose	Status
Biswnath Ghat	Floating Terminal	Projected for handling of PDs cargo by FCI and ODC movement.	A DGPS station is also established at this location
Silghat	Floating terminal with a steel pontoon.	For handling of cargo vessels, local ferry service.	It is a port of call in Indo-Bangladesh Protocol Route.
Neamati	Floating terminal with a steel pontoon	For handling of cargo vessels, local ferry service.	Ro- Ro terminal is proposed and being developed.
Bogibil	Floating terminal with steel pontoon.	For handling of FCI cargo.	Food gain has already been transported and experienced.
Dibrugarh	Floating terminal with a steel pontoon	For handling of cargo vessels, local ferry service. ODC cargo is also expected at this terminal in view of upcoming hydro power project.	A DGPS station is established.
Sengajan/ Panbari	Floating terminal with a crane pontoon	Considered in view of regular movement of Indian army IWT fleet.	At this location floating terminal is being maintained in view of movement of Indian Army vessels between Arunachal and Assam.
Oriumghat	Floating steel pontoon	To facilitate passengers connected to Arunachal /Assam, BSF / Army, and link to southern bank like Dibrugarh. ODC and project cargo.	(i) Land acquisition completed. (ii) Other developmental activities are planned.

9.5 Details of Terminal Facilities in NW – 3 as of June 2018

Terminal Location	Area acquired (in Hectare)	Length & Type of Jetty	Storage Facilities	Remarks
Kottapuram	0.5823	30 m Long Berth (RCC Jetty)	300 sqm covered godown & 800 sqm open storage.	The Terminal building is leased out to Kerala State Warehousing Corporation w.e. from June 2018
Aluva	1.331	30 m Long Berth (RCC Jetty)	300 sqm covered godown & 1500 sqm open storage.	–
CEPZ (Kakkanadu)	1.2234	10 m wide RCC temporary Jetty	only land available	–
Maradu	2.0268	30 m Long Berth (RCC Jetty)	300 sqm covered godown & 2000 sqm office area.	–
Vaikkom	0.5184	30 m Long Berth (RCC Jetty)	300 sqm covered godown & 1200 sqm open storage.	Under consideration for handing over to KSWC.
Thannermukkom	0.917	30 m Long Berth (RCC Jetty)	300 sqm covered godown & 1800 sqm open storage.	–

Terminal Location	Area acquired (in Hectare)	Length & Type of Jetty	Storage Facilities	Remarks
Alappuzha	2.255	30 m Long Berth (RCC Jetty)	300 sqm covered godown & 2500 sqm open storage.	–
Thrikunnappuzha	0.5057	30 m Long Berth (RCC Jetty)	300 sqm covered godown & 800 sqm open storage.	–
Kayamkulam (Ayiramthengu)	1.6304	30 m Long Berth (RCC Jetty)	300 sqm covered godown & 1600 sqm open storage.	–
Chavara	0.8061	Land only	–	–
Kollam	0.6208	30 m Long Berth (RCC Jetty)	270 sqm covered godown & 3500 sqm open storage.	The Terminal godown is leased out to Kerala State Warehousing Corporation from April 2018
Bolgatty Island (CoPT land–on lease)	–	Container terminal	Nil	–
Willingdon Island (CoPT land–on lease)	–	Container terminal	Nil	–

Source: https://logistics.gov.in, https://ieefa.org, https://pib.gov.in, https://niti.gov.in, https://loksabhadocs.nic.in, https://cag.gov.in, https://www.business-standard.com

Chapter 10: Commercial EV in India

10.1 Top selling Model in 2023

(Passenger vehicles & e-buses are exempted from consideration)

Body Type	Model	Price
3W – Auto	Mahindra Treo	₹2.92 – ₹3.02 Lakh
Mini truck	Tata Ace EV	From ₹9.21 Lakh
3W – Auto	Piaggio Ape E City	₹1.95 – ₹2.84 Lakh
3W – Auto	Mahindra Treo Yaari	₹1.79 – ₹2.04 Lakh
3W – Auto	Mahindra Treo Zor	₹3.13 – ₹3.48 Lakh
3W	Mahindra Zor Grand	₹3.50 – ₹3.80 Lakh
3W – Auto	Montra Electric Super Auto	₹3.02 – ₹3.50 Lakh
3W – Auto	YC Electric Yatri Super	From ₹1.69 Lakh
Mini-truck	Piaggio Ape E Xtra FX	From ₹3.12 Lakh
3W – Auto	Mini Metro E Rickshaw	From ₹1.10 Lakh

10.2 eMaaS

In the automobile sector, electric vehicle (EV) manufacturers have made positive strides, but electrification in India encounters two main challenges:

a. **High Upfront Costs:** Despite being cost-effective in the Total Cost of Ownership (TCO) over time, EVs still come with a significant upfront expense.

b. **Need for Comprehensive Support Ecosystem:** EVs demand a robust support infrastructure, especially for charging stations. Additionally, in the initial stages, support is needed for financing, servicing, and overall operations.

Both these hurdles directly impact the widespread adoption of electric vehicles among consumers. To address these challenges, there's a growing emphasis on mobility-as-a-service in the EV sector, often termed as eMaaS. Leveraging technology, innovative business models, and increasing investor interest in the EV market, numerous startups globally have entered the eMaaS domain. The Indian

market is also witnessing the emergence of several compelling eMaaS solutions tailored to tackle these challenges and promote the adoption of electric vehicles.

Emerging business models in eMaaS

- Vehicle -as-a-Service (VaaS)
- Battery-as-a-Service (BaaS)

Manufacturer	Category	Sub-category	Funds raised till December 2023 (USD mn)
Ohm (Ashok Leyland)	VaaS, BaaS	GCC, Fixed battery subscription	NA
EVonGo (Euler)	VaaS	Monthly subscription of vehicles along with vehicle management	22
Log9 Mobility (Log9)	VaaS, BaaS	Monthly subscription of vehicles, Subscription for fixed battery	18
Omega Seiki	VaaS	Monthly subscription of vehicles along with vehicle management	1

10.3 Total Cost of Ownership (TCO) comparison for TATA 4W Cargo – Sample

Particulars	EV with Subsidy	EV w/o subsidy	ICE
Type of vehicle	4W Cargo (1T)	4W Cargo (1T)	4W Cargo (1T)
Model	TATA Ace EV	TATA Ace EV	TATA Ace Gold
Battery capacity in KWH (For EV)	21.4	21.4	NA
Ex-showroom cost	11,38,300	11,38,300	5,99,000
FAME-2 subsidy	2,13,000	-	-
State subsidy	-	-	-
Cost Less Subsidy	9,25,300	11,38,300	5,99,000
Road Tax + Registration Cost	230	230	35,940

Particulars	EV with Subsidy	EV w/o subsidy	ICE
Down Payment of Vehicle	1,38,795	1,70,745	89,850
Financing Cost	10,14,304	12,47,791	6,64,209
Insurance Cost	45,500	45,500	71,400
Battery Cost	1,98,819	1,98,819	–
Energy Cost	4,82,422	4,82,422	23,64,830
Maintenance Cost	69,300	69,300	1,66,320
Salvage Value	1,95,738	1,95,738	1,19,800
Total Cost of Ownership (TCO)	17,53,631	17,53,631	32,72,749

Inputs considered

Source: https://trucks.cardekho.com

Inputs			
Financing			
Financing Cost	₹ 10,14,303.61	₹ 12,47,791.85	₹ 6,64,209.28
Interest Rate	10.50%	10.50%	11.00%
EMI	₹ -16,905.06	₹ -20,796.53	₹ -11,070.15
Annual Insurance Premium	6,500	6,500	6,500
Financing Period (yrs.)	5	5	5
Usage			
Daily Usage (km)	150	150	150
Active Days in yrs	330	330	330
Period (yrs.)	7	7	7
Total usage (km)	3,46,500	3,46,500	3,46,500
Maintenance Cost per km (Rs./km)	0.2	0.2	0.48
Energy Cost			
Energy Cost per km (Rs./km)	1.34	1.34	6.83

10.4 List of current & upcoming commercial EV in India

Body type	Brand	Model	Charging time (hrs.)	Battery (kWh)	Max. speed	Range (km)	GVW (kgs.)	Payload (kgs.)	Tyres (nos.)
Truck	Ashok Leyland	Boss 1218 HB	1	230	80	300	11990	5000	6
Truck	Ashok Leyland	Boss 1219	1	187	80	300	11990	6000	6
Truck	Eicher	Pro 2049	1–1.5	64	80	174	4900	3500	4
Truck	Eicher	Pro 2055	4	75	100	200	7490	4086	6
Mini-Truck	Eka Mobility	K1.5	8	32	70	180	2510	1500	4
Tipper	Eka Mobility	K1.5 Electric Garbage Tipper	8	32	80	180	2510	1500	4
Mini-Truck	E-Trio Logistics	E-Trio Logistics	6	20	60	115–120	NA	750	4
Truck	Evage Motors	FR8	0.2	NA	NA	100	NA	907	4
Pickup	Jupiter	Jem Tez	2	28	80	200	2200	1000	4
Pickup	Jupiter	EV Star CC	2	118	80	150	7000	4095	6
Tipper	Olectra	Olectra 6x4	2	180	80	70–110	28000	NA	10
Truck	OSM	M1KA 1.0	38.7	38.7	80	150	1320	1000	4
Truck	OSM	M1KA 3.0	2	96.77	90	180	5500	3000	6
Mini-Truck	Switch Mobility	IeV4	8	32.2	80	120	3490	1700	4
Mini-Truck	Switch Mobility	IeV3	6	25.6	70	120	2590	1200	4
Truck	Tata Motors	ULTRA T.7	2	62.5	80	100	7490 – 8750	3642 – 4935	6
Truck	Tata Motors	Ultra E.9	1.5–2	110	70	120–150	9000	4050	6
Mini-Truck	Tata Motors	Tata Ace EV	7	17.2	80	154	1840	600	4
Tipper	Tata Motors	Prima E.28k	3	453	80	150–200	28000	17500	10
Truck	Tresa Motors	V0.1	80% in 0.2	300	80	600	18000	11000	6
Truck	Triton	EV Semi Truck	NA	300	100	480–800	NA	NA	6

Chapter 11: Conclusion

With the swift advancement of infrastructure, India is embarking on a transformative journey, shifting from a consumer-oriented economy to a production-oriented one. The integration of emerging commercial electric vehicles, along with the construction of high-quality highways to lower the last-mile transport costs, opens limitless possibilities for industries.

Likewise, instead of heavily depending on a single mode of transportation, embracing a variety of multimodal options such as inland waterways, sea routes, railway networks, Inland Container Depots (ICDs), and Container Freight Stations (CFSs), along with their potential combinations, presents a pathway to cost-effective delivery solutions.

Continuous monitoring of the rapidly evolving network infrastructure landscape is essential to identify the appropriate strategic pivots needed to leverage developmental advantages. Decision-makers are now equipped to assess the logistics landscape for the next 3-5 years, navigating the path with the anticipation of a seamless journey ahead.

The once optimistic goal of reducing transportation costs from 14% to 8% of the GDP now appears to be a tangible and imminent reality. India's logistics landscape is undergoing a course correction, and it is crucial to stay abreast of these developments during this transitional phase.

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Bibliography

AFS	Air Freight Stations
ALD-MGS	Allahabad Mughal Sarai
BaaS	Battery as a Service
BPL	Bhopal Junction
BPQ	Balharshah Junction
BZA	Vijayawada Junction
CFS	Container Freight Stations
COPT	Cochin Port Trust
DFC	Dedicated Freight Corridors
DFCCIL	Dedicated Freight Corridor Corporation of India Limited
DGPS	Differential Global Positioning System
EDFC	Eastern Dedicated Freight Corridor
eMaas	Electrical Mobility as a Service
EV	Electric Vehicle
FCI	Food Corporation of India
HDN	High Density Network
HUN	High Utilized Network
ICD	Inland Container Deport
ICTT	International Container Transhipment Terminal
IWT	Inland Water Transportation
JNPT	Jawaharlal Nehru Port Trust
KSWC	Kerala State Warehousing Corporation
KWH	Killo Watt Hour
MMLP	Multi Modal Logistics Parks
MTPA	Metric Tons Per Annum
NGP	Nagpur Junction
NTPC	National thermal Power Corporation
NW	National Waterways
ODC	Over Dimensional Cargo
OHE	Over Head Equipment
RCC	Reinforced Cement Concrete
RORO	Roll On Roll Off
TCO	Total Cost of Ownership
TEU	Twenty-foot Equivalent Unit
VaaS	Vehicle as a Service
WDFC	Western Dedicated Freight Corridor

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