



# Future Ready Railways for Viksit Bharat





India's railway sector is undergoing a generational transformation. Today, it is being shaped by a strong policy push, rapid technological advancements, and a shared national vision for growth. Railways are no longer viewed only as a mode of transport—they are emerging as a strategic backbone of India's logistics ecosystem. As we move towards the goal of India@2047, the sector will play a defining role in building a network that is efficient, sustainable, and globally competitive.

Initiatives such as the PM GatiShakti National Master Plan, Dedicated Freight Corridors, and continued investments in multimodal infrastructure are delivering tangible progress. We are witnessing a shift towards greater capacity, faster transit, and improved reliability. At the same time, the modernisation of rolling stock, expansion of rail-linked logistics infrastructure, and increasing focus on seamless first- and last-mile connectivity are driving the next phase of growth. From advanced wagon designs and higher axle loads to digital operations and predictive maintenance, the transformation is both visible and impactful.

From an industry standpoint, this transition presents a significant opportunity to strengthen India's wagon manufacturing ecosystem. With the scale and ambition of Indian Railways, there is a clear pathway to develop globally competitive capabilities in freight wagons, critical components, and engineering solutions. The emphasis on efficiency, durability, and sustainability is not only enhancing operational performance but also driving innovation in wagon design and manufacturing. As a company deeply engaged in this space, we see this as a defining moment for Indian industry to contribute meaningfully to modernizing freight mobility while positioning India as a global hub for wagon manufacturing.

ASSOCHAM and I, through the National Council on Railways, remain committed to fostering dialogue, enabling collaboration, and supporting policy interventions that drive long-term growth. This knowledge paper on "Future Ready Railways for Viksit Bharat" captures the direction of this transformation. It brings together perspectives across infrastructure, manufacturing, technology, and policy, offering stakeholders a comprehensive view of the opportunities ahead.

I invite all stakeholders—policymakers, industry leaders, investors, and technology partners—to come together in shaping a modern railway ecosystem. Together, we have the opportunity to build a system that is not only efficient and resilient, but also a key enabler of India's journey towards Viksit Bharat.



**Vivek Lohia**

**Chairman, National Council on Railways, ASSOCHAM**  
Managing Director, Jupiter Wagons Limited



## Foreword



India's railway sector is entering a new phase of growth, driven by the country's expanding industrial base, rising freight demand, and a clear policy focus on building a more efficient logistics ecosystem. Railways today are not just a mode of transport—they are a critical enabler of core sectors such as steel, energy, and infrastructure. As India progresses towards Viksit Bharat @2047, the efficiency and reliability of rail connectivity will play a decisive role in sustaining this growth momentum.

For industries like ours, railways form an essential backbone for the movement of raw materials and finished products at scale. The ongoing push towards capacity expansion, corridor development, and improved terminal infrastructure is therefore a welcome step. Enhanced connectivity, faster turnaround times, and better integration with ports and industrial clusters are already beginning to improve supply chain efficiencies and reduce logistics bottlenecks.

We are also witnessing a gradual but important shift towards modernisation and operational improvement. Greater adoption of technology, focus on asset utilisation, and efforts to streamline processes are contributing to a more dependable and responsive system. At the same time, the emphasis on sustainability—through energy efficiency and lower carbon intensity—further reinforces the role of railways as the preferred mode for bulk freight movement.

ASSOCHAM and the National Council on Railways continue to provide a valuable platform for dialogue between government and industry. The knowledge paper on "Future Ready Railways for Viksit Bharat" reflects the evolving priorities of the sector and brings together perspectives on infrastructure, operations, and policy reforms. It offers a balanced view of both the progress made and the areas that require continued attention.

As India's growth story accelerates, the need for a robust, industry-aligned railway network becomes even more important. I encourage all stakeholders to work together in strengthening this ecosystem, so that railways can continue to support the country's industrial ambitions and emerge as a key driver of sustainable economic development.



**Sushil Nowal**

**Co-Chair, National Council on Railways, ASSOCHAM**  
Executive Vice President, JSW Steel



# Preface



*"India's infrastructure story has rarely moved as decisively as it does today, and Indian Railways sits at the very heart of it. From the commissioning of the Dedicated Freight Corridors to the rollout of Kavach, from the integrated planning vision of PM Gati Shakti to the emergence of multimodal logistics parks across the country, the transformation underway is both structural and generational in its ambition.*

*For a network of this scale and complexity, the progress is significant. Freight corridors that were long-constrained by mixed traffic now have dedicated, high-capacity infrastructure designed for the demands of modern logistics. Industrial clusters, ports, and warehousing hubs are being connected in ways that were simply not possible a decade ago. Technology is beginning to reshape operations - predictive maintenance, real-time monitoring, and advanced signalling are gradually moving Indian Railways from reactive management to intelligent, anticipatory operations.*

*The opportunity ahead is substantial. As India advances toward its Viksit Bharat vision, railways must and increasingly can serve as the backbone of a more efficient, competitive, and sustainable national logistics system. Closing the remaining gaps in last-mile connectivity, sharpening the commercial competitiveness of rail freight, and accelerating private participation in terminals and operations are the next frontier. The foundations have been laid; the priority now is to build decisively on them.*

*This knowledge paper is a contribution to that conversation. It maps the progress made, honestly examines where constraints remain, and charts the priorities that will define a future-ready rail freight network. It is written for practitioners, policymakers, and industry leaders who believe that Indian Railways is not just a public utility, but a strategic asset - one whose full potential is well within reach.*

*The momentum is real. The ambition is right. What lies ahead is the work of translating both into lasting impact."*



**Nivesh Chaudhary**

**Co-Founder and Managing Director**

Head, Strategic Advisory - Mobility and Supply Chain, ASCELA



# Industry Outlook

*"I look forward to the Knowledge Report by ASSOCHAM on Indian Railways. As a student of this Sector, I am acutely aware of the potential of Railways. I have no doubt that Indian Railways will play a pivotal role in Nation building, as the Primary and most environment friendly service provider in the Logistics Sector."*



**Amit Kumar**

Director  
Pristine Logistics & Infraprojects Limited



*"The Report on "Future Ready Railways for Vikshit Bharat" prepared by Assocham provides a very insightful analysis on the logistics transformation of Indian Railways. While the US and Russia move about 86% and 46% respectively of the freight through Railways, the figure for India stands at a paltry 27-30%. The logistics cost of India as % of the GDP hinges around 7-9 %, while for highly efficient countries like Japan, it is around 4%. Since the freight cost for rail movement is almost 30-40% cheaper than that of road, it is therefore imperative that Indian Railways shoulder the bulk of freight transportation of the country.*

*This Report identifies the path that Indian Railways could tread, makes a detailed analysis of the key structural gaps that act as impediments in the system, and throws light on the key implementable strategies that Indian Railways could adopt over different time horizons, which could enable them to overcome these hurdles and transform itself into a global behemoth for safe, secure and cost-efficient movement of freight."*



**Ranit Rana**

Associate Vice President, Sales & Distribution  
Jindal Stainless Limited



*"Adani Ports & SEZ (APSEZ) is fully aligned with The Vision of Viksit Bharat@2047. Having handled 500 MT cargo this year, APSEZ aims to scale to 1,000 MT across ports, with rail contributing over 300 MT by FY30. This aligns with the National Rail Vision 2030 of 3,000 MT rail cargo. APSEZ is investing significantly in rail-linked infrastructure, rolling stock, and operations, while partnering with Indian Railways for progressive policy reforms and network capacity enhancements."*

**Shailendra Kumar**

Head Railways  
Adani Ports



*"Rail sector growth strategy is backed by reforms and capital investments. Simultaneously adoption of global best practices for Atmanirbhar Bharat using digital technologies for Innovation is transforming the sector into a sustainable and future-ready resilient railway system.*

*Digital railways is integrating cutting-edge technologies for enhanced safety and efficiency digital technologies like Predictive Maintenance, Digital Twin Infrastructure, Smart Signalling, IoT-Enabled Monitoring. Physical AI strengthens platforms like HMAX, which is gaining momentum in railway. This will enable us to integrate digital services, AI capabilities, and physical infrastructure into cohesive, intelligent solutions that deliver measurable and sustainable value.*

*Hitachi HMAX platform, demonstrate how predictive, analytics and real-time data can improve operational reliability, optimise maintenance, and enhance service as demonstrated on IR rolling stock and fixed infrastructure on Western DFC."*

**Mangal Dev**

Head, Hitachi Rail India & South Asia (Mobility)  
Director, Hitachi India Private Limited



# Industry Outlook

*"India's railways are powering industrial growth by enabling efficient, sustainable logistics. Strengthened connectivity, modern infrastructure, and collaborative policy reforms will be vital in driving Viksit Bharat and future-ready supply chains."*



**Sushil Nowal**

Co-Chair, National Council on Railways, ASSOCHAM  
Executive Vice President, JSW Steel



*"The scale and direction of India's railway modernization present a defining opportunity for domestic manufacturing. By aligning innovation, capacity, and policy support, India can emerge as a global leader in advanced wagon manufacturing and integrated rail logistics solutions."*



**Vivek Lohia**

Chairman, National Council on Railways, ASSOCHAM  
Managing Director, Jupiter Wagons Limited



*"As Indian Railways pursue a higher modal share, the strategic focus must shift to capacity augmentation, segment-specific policy design, and partnerships that extend infrastructure beyond the railhead to sustainably reduce logistics costs."*



**Sanjay Bajpai**

Industry Veteran and Advisor, Railways Council, ASSOCHAM  
Former ED – CONCOR



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## Key Contents of the Report



**Rail at the Core:** Powering India's Logistics Transformation



**Freight Flow Frontiers:** Regional & Commodity Demand Hotspots



**Breaking the Bottlenecks:** Bridging Gaps in High-Density Freight Corridors



**Dedicated Freight Corridors:** Backbone of Modern Rail Logistics



**Seamless Logistics:** Unlocking First & Last Mile Connectivity



**Smart Railways:** Driving Efficiency Through Digital Transformation



**Safe, Secure, Reliable:** The Next Era of Rail Operations



**Reforming the Rails:** Targeting Policy & Commercial Levers



**Strategic Roadmap** for a Future-Ready Rail Freight in India



“

# Crafting India's Rail Power

# 01 Rail at the Core: Powering India's Logistics Transformation

## FUTURE FREIGHT FOCUS



**Mission 3,000 MT**  
Attain a handling capacity of 3,000MT, annually by 2030, driven by a rise in wagon population



**Increasing the Modal Share of Rail**  
Accelerate modal shift from road to rail for freight movement over the next five years



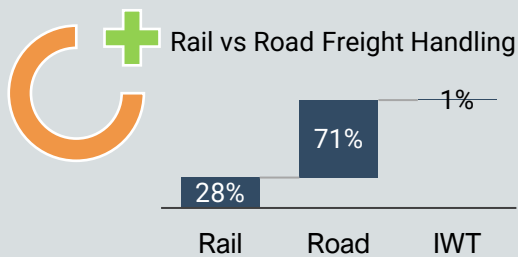
**Net Zero Carbon Freight**  
India targets net-zero emissions by 2070, enabled by 100% electrification and green energy-powered freight



India's logistics future runs on **Rail**.

## DRIVING INDIA'S LOGISTICS TRANSFORMATION

### Modal Share



### Freight Revenue Share

**65%**

Share of revenue from freight operations in total railway revenue (FY25)

### Foreign Investments

**USD 942 Million** \$

Total FDI equity inflows attracted in the railway sector over last 11 years

## NATIONAL RAIL PLAN, 2030



Aimed at building rail capacity and infrastructure by 2030 to meet freight demand up to 2050 and increase rail share.

### KEY GROWTH DRIVERS



#### Dedicated Freight Corridors

With DFCs operational, rail becomes a faster, more efficient alternative, shifting freight from road to rail.



#### Electrification of the Network

With ~99% electrification, rail runs heavier, faster, lower-cost freight, boosting capacity and competitiveness.



#### Digitalisation & Modernisation

ITS, digital control, and GIS mapping have improved visibility and efficiency, driving freight growth.



#### Foreign Direct Investments

Indian Railways has seen steady growth in foreign investment over the last decade, which has helped strengthen infrastructure

# 02 Freight Flow Frontiers: Regional & Commodity Demand Hotspots

## "India's Freight: Concentration, Corridors & Commodity Flows"

Freight demand in India is shifting from dispersed networks to linear, corridor-based systems, driven by DFC alignment and industrial corridor development.

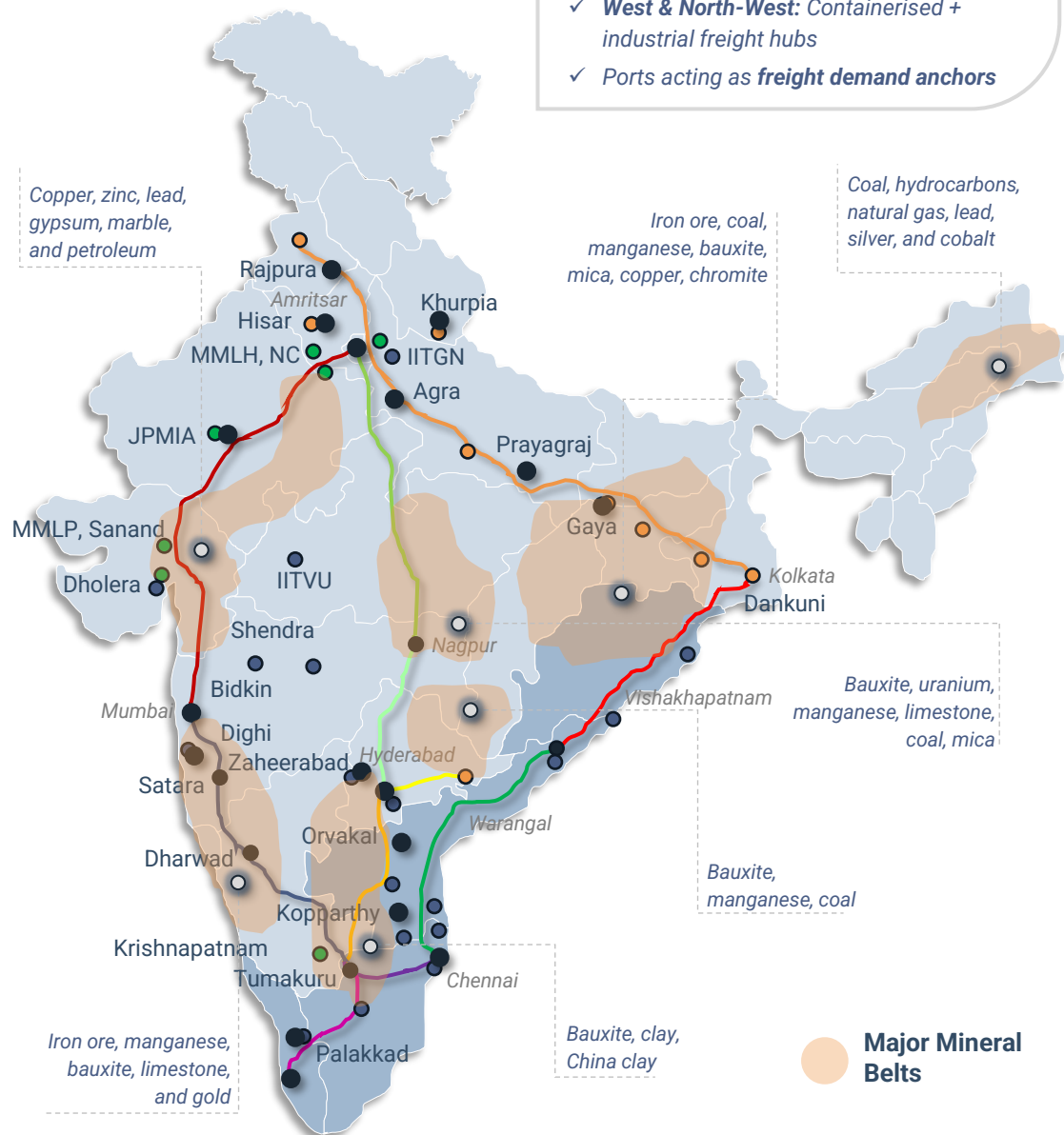
### Challenge Segments:

- ✓ Structural Network Asymmetry
- ✓ Weak Reverse Logistics Flows



### Dominating Regional Concentration:

- ✓ **East-Central India:** Coal & mineral-heavy corridors
- ✓ **West & North-West:** Containerised + industrial freight hubs
- ✓ Ports acting as **freight demand anchors**



### Gati Shakti Cargo Terminals (GCTs)

As of Jan 2026, IR has approved 306 GCTs, with a combined capacity of 192 MTPA; of which 118 are already commissioned to boost investment from industry.

### Dedicated Rare Earth Corridors

Union Budget 2026-27 announced Corridors in Odisha, Kerala, Andhra Pradesh, and Tamil Nadu (mining, processing, research, and manufacturing).

From bulk-dominated, one-directional flows to a balanced, diversified, multimodal, corridor-driven logistics ecosystem with balanced two-way flows.



## Corridor Centric Freight Geography

**Cargo Profile:**  
Coal, iron ore, cement contribute >60% of freight volumes

**DFC-led efficiency gains:** High-capacity corridors enabling faster, longer-haul freight movement

**GCTs:** Decentralised cargo aggregation & private participation

### Bulk Commodity Dominance in Freight Handling

**821.8 MTPA**      **50.89%**

Loading of revenue-earning coal traffic for the year 2025 (January-December 2025)      % Share of Coal Handled by Railways, 2025

### Industrial Corridors

- Delhi-Mumbai
- Amritsar-Kolkata
- Chennai-Bengaluru
- Vizag-Chennai
- Hyderabad-Nagpur
- Hyderabad-Warangal
- Hyderabad Bengaluru
- Odisha Economic Corridor
- Bengaluru-Mumbai
- Extension of CBIC to Kochi via Coimbatore
- Delhi-Nagpur

### Major Hubs

- Major IMC's
- Major Nodes/ Cities
- MMLP/ Logistics Infrastructure
- Major Industrial Areas

### East India (Odisha, Jharkhand, Chhattisgarh):

**Heavy outbound bulk flows; limited return cargo**

Functions as a resource extraction corridor, not a balanced logistics ecosystem.

#### Targeted Strategy

Promote downstream industries near mines; use return legs for container/FMCG aggregation; enable steel/container movement.

### North India (NCR, Punjab, UP):

**High consumption but low rail share in retail/FMCG**

#### Targeted Strategy

Develop rail-based retail distribution corridors; urban logistics hubs; promote night-time freight operations.

### West India (Gujarat, Maharashtra):

**Strong port-led flows but limited hinterland depth**

Risks becoming a port shuttle system rather than a distributed logistics network.

#### Targeted Strategy

Expand inland container penetration; develop Tier-2 ICDs; integrate rail + coastal shipping.

### South India (TN, Karnataka):

**Manufacturing growth constrained by rail capacity/connectivity**

#### Targeted Strategy

Fast-track southern freight corridors; improve port connectivity; promote auto & electronics rail logistics.

# 03 Breaking the Bottlenecks: Bridging Gaps in High-Density Freight Corridors



Indian Railways operates one of the world's largest freight networks, yet its modal share has been declining for decades, while road transport dominates.

## 28%

Modal share of rail in 2024-25, reducing from 36% in 2007-08

## >120%

Utilisation of Golden Quadrilateral and its two diagonals which account for ~15% of IR route length while carrying > 55% of total freight revenue traffic.

### KEY STRUCTURAL GAPS



Limited last-mile connectivity to manufacturing industries



Inadequate numbers of PFTs and GCTs



Maintenance backlog and overaged track lead to derailment risk



### Wagon Unavailability Concerns

India's freight rail network suffers due to inadequate availability of rolling stock, particularly specialised wagons.

#### Related concerns -



#### High Turnaround Time

With average wagon turnaround exceeding 4-5 days on congested corridors.



#### Wagon Type Constraints

Indian Railways witnesses acute shortage of BOXN, BCNA, and BTPN type wagons. The other wagon types which are adequately available may not be effectively handled in modern loading terminals.



#### Loading Point Constraints

Many industrial sidings lack mechanised loading infrastructure. Manual loading extends dwell time at source, compounding the effective shortage.



### Support Infrastructure Constraints

Critical gap between rail freight network and industrial hubs is an impediment leading to lower modal share.

#### Related concerns -



#### Line Capacity Saturation

Existing DFCs are highly saturated, with capacity utilisation in range of 120 - 150%.



#### Industrial Siding Deficit

Significant numbers of Coal, Steel, Cement, and Fertiliser plants are built without dedicated rail sidings. The General-Purpose Wagon Investment Scheme (GPWIS) adoption < 15% of eligible industries.



#### Agri Corridor Connects

Agriculture Mandis and markets lack efficient connectivity via rail. This leads to post-harvest losses with a 48-72-hour transit time versus a 24-hour target.



### Private Investment Risks

Structural and regulatory barriers make rail freight investment relatively less attractive for private capital.

#### Related concerns -



✓ Telescopic freight pricing system, at times, results in substantial increase in freight rate.

✓ Private wagon owners bear empty return costs without backhaul matching.



✓ Lack of digitisation restricts private operators from optimising return loads.

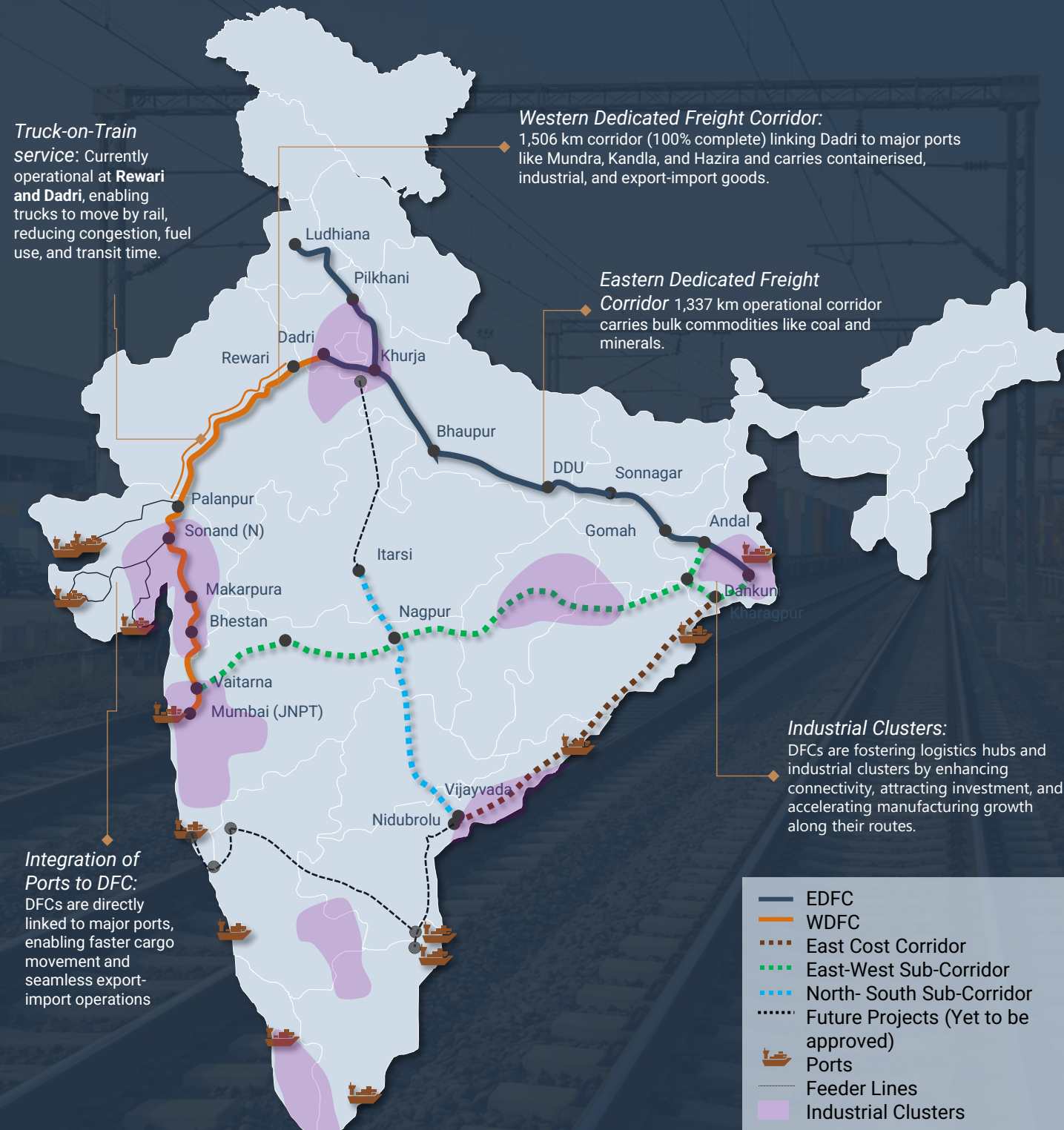
✓ Effective average utilisation of private rakes is < 50%.



✓ Incentives on carrying bulk cargo using BOXN cargo are not extended to special and private wagons.

# 04 Dedicated Freight Corridors: Backbone of Modern Rail Logistics

## Overview of DFCs and their integration with ports and industrial clusters



### Faster Transit & Higher Capacity

- ✓ DFCs have significantly reduced transit time, with WDFC cutting port-to-NCR travel by nearly half and EDFC improving coal movement.
- ✓ They enable longer, heavier trains and can handle up to **300 trains/day**, increasing freight capacity and efficiency.



### Port Connectivity & Export Boost

- ✓ DFCs enable efficient movement of goods to major gateways like **JN Port and Mundra Port**, with direct connectivity to terminals such as PSA Mumbai.
- ✓ This strengthens export infrastructure, boosting trade volumes and supporting India's overall economic growth and improved supply chain.



### Revenue Growth

- ✓ Improved efficiency and reliability in freight operations have driven strong revenue growth for Indian Railways, with **15% increase in FY 2022-23**.
- ✓ DFCs are key contributors, helping railways regain market share from road transport.



### Cost Saving

- ✓ Faster transit and efficient operations have lowered freight costs, lowering commodity **prices by up to 0.5%**, and supporting industries' competitiveness.
- ✓ Shifting freight from road to rail cuts fuel consumption and road maintenance, making transport more cost-effective and sustainable.



### Employment and Investments

- ✓ DFC development has **created jobs** and attracted investments, contributing to national economic growth.
- ✓ DFC corridors have stimulated growth in corridor states by attracting industries. They promote integration into **global value chains**, boosting local economies



### Environmental Benefits

- ✓ Shifting freight from road to electrified rail significantly **reduces carbon emissions**, supporting cleaner logistics.
- ✓ Reduced road traffic lowers particulate emissions, **improving air quality** in both urban and rural areas.

## Growing Freight Demand

- ❖ Rising due to industrial growth, expanding trade, and shift to efficient logistics.
- ❖ Freight grew 400 million tonnes in 50 years (1950-2000), with the same growth achieved in just 10 years (2001-2010)

## Connectivity Gaps

- ❖ Several industrial clusters and ports are not directly connected to the DFC network
- ❖ These corridors rely on conventional rail or road links instead of high-capacity corridor access

## Need

Growing freight demand and evolving industrial regions require expanded and advanced corridors to enhance capacity, connectivity, and efficiency across the rail network.

# 05 Seamless Logistics: Unlocking First & Last Mile Connectivity

With increasing **congestion**, rising **logistics costs**, and **environmental concerns** across major Indian cities, metro rail systems present a transformative opportunity.

## KEY DEVELOPMENT OPPORTUNITIES



### Off-peak Freight Operations

Utilising metro systems during non-passenger hours



### Multimodal Logistics Hubs at Stations

Developing cargo aggregation and distribution nodes



### Integration with Existing Logistics Ecosystem

Connecting metro freight with logistics, industrial, & transportation clusters

Integration of metro rail systems into urban freight networks represents a **Paradigm Shift in Urban Logistics Planning**

## EVOLUTION OF INDIAN URBAN LOGISTICS

### 01 FREIGHT ECOSYSTEM IN NAMO BHARAT



✓ The World Bank Group is exploring the integration of urban freight movement with the Namo Bharat Rapid Rail Transit System (RRTS) in Delhi/NCR

### 02 CARGO INTEGRATION IN DMRC



✓ Delhi Metro Rail Corporation (DMRC) has partnered with Blue Dart to introduce urban freight services via metro trains

### 03 VANDE BHARAT HIGH-SPEED FREIGHT TRAINS



✓ The Indian Railways is targeting superfast parcel service to capture high-value and time-sensitive cargo presently being moved via road

Positioning India in "City-wise Readiness for Metro-enabled Freight Integration"

## OPPORTUNITIES AT IDENTIFIED MEGA CLUSTERS



### Transportation Challenges



### Opportunity Mapping



### Likely Commodities

	Delhi/NCR	Mumbai	Pune	Hyderabad	Bengaluru
Transportation Challenges	High dependency on trucks for intra-city freight; Inefficient last-mile connectivity	Linear city structure with limited alternate routes; Heavy congestion	Industrial freight movement heavily via roads; Limited multimodal integration	Growing congestion; High demand for time-sensitive logistics	Chronic traffic congestion; Unpredictable logistics cost & time
Opportunity Mapping	Leverage DMRC and RRTS for off-peak cargo movement; Metro-linked logistics hubs near Ghaziabad, Sahibabad, Mundka	Metro connectivity for port-to-city cargo distribution; Enable high-frequency small parcel movement	Integrate metro network with Chakan, Talegaon, and Pimpri industrial clusters; Support just-in-time logistics for auto sector	Utilise metro for high-value and temperature-sensitive cargo; Integrate with pharma clusters and airport cargo terminal	Use metro network for high-frequency intra-city cargo movement; Develop station-based logistics hubs
Likely Commodities	E-commerce, FMCG, agri commodities	F&V, seafood, textile, and e-commerce	Automobile and engineering goods	Pharma, vaccines, biotech products	Electronics, e-commerce,, IT hardware

# 06 Smart Railways: Driving Efficiency Through Digital Transformation

## Key Performance Highlights and targets

**5.8%**

CAGR of India Digital Railway Market reflects a steady expansion and **increasing adoption of digital rail network.**

**50%**

**reduction in the logistics cost** is expected to lead to a more efficient and reliable network from

**90%**

**on-time performance** in 24 divisions in India via advanced signaling/AI monitoring.



ATO

## Opportunities for Digital Railways in India

- **Kavach (ATP)** has **limited coverage (3%)**, indicating a scaling challenge but strong potential to improve safety.
- **Electronic Interlocking (90% coverage)** provides a solid base with scope for further system integration.
- AI-based predictive maintenance is at pilot stage, reflecting early adoption with high efficiency potential.
- **Video Surveillance Systems (VSS)** cover only **2.8%** of stations, highlighting a gap in monitoring and security.

Indian railway infrastructure needs to scale its advanced systems to unlock full benefits.

## Digitisation measures for Railways adopted Globally

### Advanced Signalling & Traffic Management

European Train Control System (ETCS) – Europe

- Capacity Increase**  
Enhances line capacity for freight through ETCS-enabled optimised speeds.
- Energy Savings**  
Cuts energy use up to 30% through better acceleration phases and avoiding group starts.
- Competitiveness Boost**  
Improves freight reliability with fewer delays and seamless cross-border operations.

### Integrated Command Centres

Deutsche Bahn Integrated Control Centres (Germany)

- Real-Time Monitoring**  
Provides instant oversight for rapid freight disruption responses across networks.
- Scheduling Optimisation**  
Enhances cargo timetables and asset use for higher throughput.
- Punctuality Control**  
Centralizes data to maintain schedule adherence in freight corridors.

### AI/IoT Asset Monitoring & Predictive Maintenance

SNCF Predictive Maintenance (France)

- Early Detection**  
Spots wheelset/brake issues early for scheduled freight wagon maintenance.
- Failure Prevention**  
Reduces unplanned breakdowns through continuous condition monitoring.
- Availability Gains**  
Generates smart work orders to maximize freight equipment uptime.

### Cybersecurity Measures

UK Rail Cybersecurity Strategy (Network Rail)

- System Protection**  
Secures freight control systems against IT/OT spoofing vulnerabilities.
- Data Security**  
Ensures safe information flow in digital freight transport networks.
- Protocol Defense**  
Addresses risks in freight signaling and real-time tracking systems.

# 07 Safe, Secure, Reliable: The Next Era of Rail Operations

Higher safety investments have been accompanied by a sustained reduction in train accidents over time.

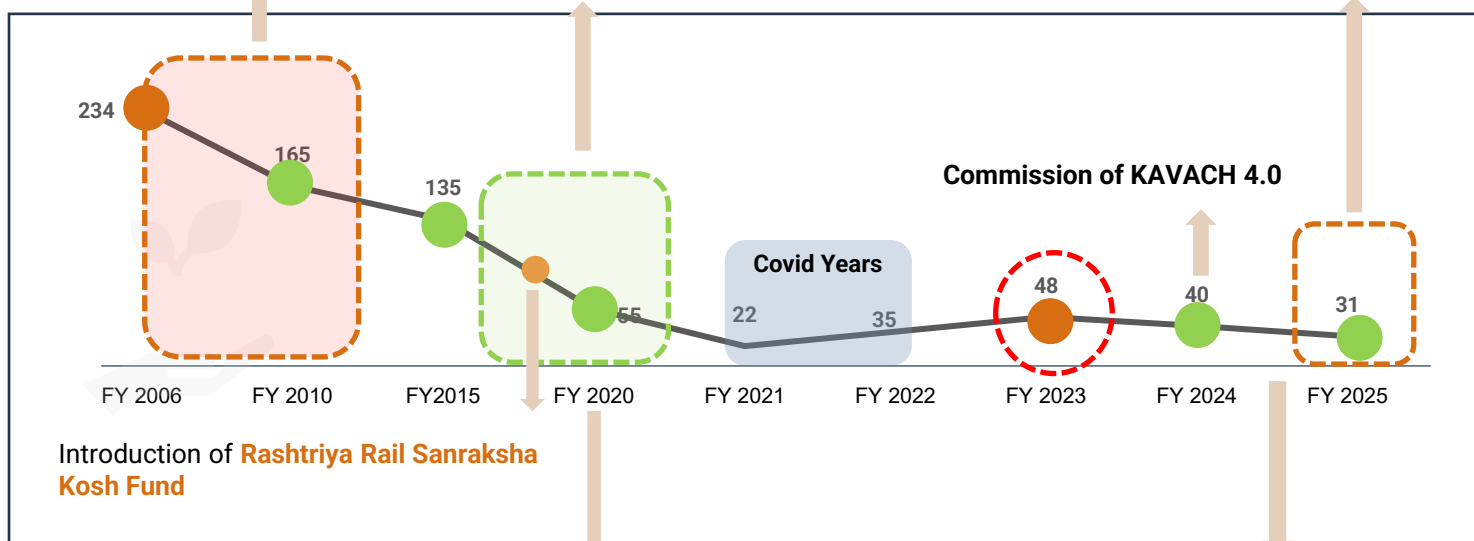
- › Introduction of self-propelled accident relief trains
- › Emphasis on LHB coaches backed by a comprehensive fire and smoke detection system

### Key MoUs Signed by Indian Railway

- › For AI enabled **Wayside Machine Vision-based Inspection System** for detecting anomalies in moving trains with DFCCIL
- › **Automatic Wheel Measurement System** for noncontact real-time wheel geometry measurement with DMRC

**2 times ↑**  
Expenditure for asset renewal

- › Track renewal programmes undertaken
- › Elimination of all unmanned level crossing



**KAVACH** adopted as **National Automatic Train Protection (ATP) system** after successful trials from 2016 onwards

- › Developed AI enabled **Intrusion Detection System** to detect the presence of wild animals on the track
- › **Online Monitoring of Rolling Stock System** and **Wheel Impact Load Detectors** adopted for early detection of rolling stock

Source: PIB



## Key Investment Opportunities

▲ High Investment Attractiveness

▲ Moderate Investment Attractiveness

▲ High Safety Impact

▲ Moderate Safety Impact

**Investment Opportunity**

**Revenue Streams**

**Why Attractive**

### KAVACH Contract

Large-scale rollout across 20,000+ route km Including

- ✓ Hardware (track and onboard), Telecom, Software integration

EPC Contracts

Annual maintenance contracts

High entry barriers due to certification and safety standards

### Safety-led Asset Renewal

Continuous demand for:

- ✓ Track renewal, Bridge strengthening, Signalling upgrades

EPC Contracts

Long term maintenance contracts

Backed by dedicated funding mechanisms (like RRSK)

### Telecom & Digital Infra

Nation-wide rollout of optical fibre network

- ✓ Backbone for all safety systems

Leasing telecom capacity

Data services

Development of dual use asset through commercial telecom monetisation for railways

### Predictive Maintenance

Development of asset monitoring platforms and failure prediction tools:

- ✓ Potential for SaaS

Subscription based analytics

Data monetisation

Low CAPEX and high scalability – replicable across railways, metro etc.

### Smart Wagon Monitoring

Deployment of train integrity monitoring systems and

- ✓ Smart wagons with IoT sensors
- ✓ Wayside detection systems

Equipment supply and O&M

Subscription-based analytics

### Key Expenditure Components

- ✓ Maintenance of the permanent way and works
- ✓ Maintenance of motive power and rolling stock
- ✓ Track renewals

INR  
**1.16**  
Lakh Crore  
B.E. FY 2026

With global benchmarks such as the UK's signal-less railway advancing safety standards, India's increased budgetary outlay for railway safety reinforces its **commitment to safer rail operations.**

# 08 Reforming the Rails: Targeting Policy & Commercial Levers

**1 billion Milestone**  
Cumulative tonnes of freight loading till FY 2025–26

With a target to nearly double rail freight over the next five years, Indian Railways is well-positioned to undertake and implement a new wave of policy reforms.

Key recent policy reforms in 2025 & 2026 are outlined below.

**~1600**

Million Tonnes

Current Annual freight loading with daily loading touching 4.4 million tonnes in late 2025.

**3000**

Million Tonnes

Targeted Annual freight loading by 2029-30

Category	Key highlights of Recent Reform	Primary Beneficiary	Major Impact	Key Execution Risks
Regulatory, Governance	<b>Railways (Amendment) Act, 2025</b> <ul style="list-style-type: none"> <li>Consolidates the 1905 Railway Board Act into the Railways Act, 1989, reducing legal ambiguity</li> <li>Decentralises the system by empowering zonal GMs to independently sanction freight projects up to INR 1,000 crore</li> <li>Reduces terminal and siding approvals time from ~18 months to 3 months</li> </ul>	Private freight terminal developers 3PL / logistics companies bidding on siding projects	<ul style="list-style-type: none"> <li>India has a ~200 freight terminal deficit (World Bank); this reform accelerates capacity creation.</li> </ul>	<ul style="list-style-type: none"> <li>Land acquisition still remains a delay factor</li> <li>The Act creates the framework, but investor confidence depends on consistent implementation at the Zonal level</li> </ul>
Commercial, Regulatory	<b>New Public-Private-Partnership (“PPP”) Policy, 2025</b> <ul style="list-style-type: none"> <li>Brings up the concession period from 30 years to 50 years, letting private players recover large capital investments</li> <li>Land Acquisition cost and acquisition process responsibility to shift to the Railways</li> <li>7 projects valued at INR 16,362 crore are currently under implementation</li> <li>Focus on coal and port connectivity</li> </ul>	Private Developers Mining Players GCT Operators Port Operators	<ul style="list-style-type: none"> <li>Improves project viability for high-capex rail project</li> <li>Enhances investor confidence</li> <li>Enables long-term revenue recovery for private players</li> </ul>	<ul style="list-style-type: none"> <li>Demand risk over long tenure</li> <li>Delays in land acquisition</li> </ul>
Commercial, Operational	<b>Integrated Logistics Hubs and New Freight Services</b> <ul style="list-style-type: none"> <li>Door-to-door freight and parcel services to strengthen integrated logistics</li> <li>Assured transit container rail service between Delhi and Kolkata</li> <li>Door-to-door parcel service on the Mumbai–Kolkata route</li> </ul>	End Consumers MSMEs & Small Businesses	<ul style="list-style-type: none"> <li>Lower dependency on roads</li> <li>Integrated hubs act as collection, distribution, and transshipment nodes for parcel freight</li> </ul>	<ul style="list-style-type: none"> <li>Adoption barriers</li> <li>First and last-mile coordination complexity</li> </ul>

**Key progress for Freight Traffic Under “52 Reforms in 52 Weeks” Initiative as of March 2026**

“**One reform for every week of 2026**”



**Extended Contract Tenures for GCTs**

The Indian Railways has extended the contract tenure for Gati Shakti Cargo Terminals (GCTs) and related cargo facilities from 35 to 50 years



**Cargo Plus Processing Concept at GCTs**

Food grain processing, stuffing and destuffing, and other value addition activities can now occur within terminal premises



**Boost of Logistics Capacity**

Expansion of the Gati Shakti Cargo Terminals to over 500 hubs to boost logistics capacity across Indian Railways

# 09 Strategic Roadmap for a Future-Ready Rail Freight in India

Integrated, Corridor-Led, Multimodal & Market-Responsive Transformation



Strategic Pillars:

Key Challenges:

**01**  
NETWORK PERFORMANCE & FLOW EFFICIENCY

- HDN congestion
- High transit time
- Empty backhaul
- Rake/wagon inefficiencies
- Crew & loco constraints

**02**  
MARKET EXPANSION, MULTIMODAL INTEGRATION & CARGO DIVERSIFICATION

- Low rail share
- Poor first/last-mile
- Limited non-bulk cargo
- Weak multimodal integration
- Urban logistics gap

**03**  
COMMERCIAL, POLICY, DIGITAL & SUSTAINABLE TRANSFORMATION

- Non-competitive pricing
- Policy rigidities
- Low reliability
- Manual processes
- Sustainability pressure

Efficiency

Operational Efficiency & Market Activation



Path Rationalisation & Throughput Unlock

Unlock Efficiency

- › AI-based dynamic train path allocation.
- › Freight priority windows on HDN routes (time-segregated ops)
- › Network-wide real-time rake reallocation
- › Standardised rake configuration policy (uniform payload + faster loading cycles)



Demand Capture & Aggregation Layer

Traffic Aggregation

- › Cluster-based freight mapping (origin-destination demand pairing)
- › Open digital marketplace for rail freight booking (Uberisation of rake access)
- › Urban rail-linked consolidation hubs (at suburban/metro interchanges)
- › Standardised containerisation for agri, FMCG and parcel cargo



Pricing Reform & Service Competitiveness

Pricing Strategy

- › Transition to linear distance-based pricing
- › Backhaul incentive pricing models (discounted reverse haul tariffs)
- › Abolition of distance inflation on critical routes (cost rationalisation)
- › Time-guaranteed freight products (assured transit SLAs)

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Short-term Strategies



Expansion

Capacity Expansion & Multimodal Integration



Corridor Decongestion & Asset Productivity

Operational Optimisation

- › Dedicated freight bypass links at congestion nodes (junction de-bottlenecking)
- › Develop modern signalling and train control systems
- › High-speed freight corridors
- › Integrated loco-crew pooling platforms and advanced yard automation and smart marshalling systems



Integrated Multimodal Freight Grid

Integrated Operational Systems

- › Rail integration with MMLPs, ICDs & port terminals via unified operating protocols
- › Dedicated first-mile rail spurs to mines and industrial clusters
- › Expansion of double-stack & specialised rolling stock
- › Rail-enabled urban logistics corridors (night-time freight movement via suburban rail)



Policy Liberalisation & Asset Modernisation

Policy Initiatives

- › Private participation in wagon O&M (performance-based contracts)
- › Standardised national framework for land licensing & terminal approvals
- › Rake and wagon design standardisation (modular, forklift-compatible wagons)
- › Incentivisation of specialised wagons (liquid, fly ash, hazardous safe transport)

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Medium-term Strategies



Transformation

Network Transformation & Intelligent Ecosystem



Autonomous Heavy Haul Network

Autonomous Operations

- › Heavy haul mineral corridors with distributed power systems
- › Autonomous freight operations
- › Dynamic digital twin-based network optimisation (real-time rerouting)
- › End-to-end freight-passenger network decoupling (multi-corridor grid)



High-Frequency Rail Logistics Ecosystem

Modal Competitive Strengthening

- › Scheduled high-frequency freight corridors competing with road (hub-to-hub express freight)
- › End-to-end Rail Logistics Service Providers (integrated 3PL/4PL rail offerings) (Privatisation of Operations)
- › Strategic commodity corridors
- › Fully synchronised multimodal network under the National Logistics Grid



Intelligent, Green & Autonomous Ecosystem

Digital Support Ecosystem

- › Rail-as-a-Service (RaaS) platform (end-to-end digital logistics marketplace)
- › Blockchain-based freight contracts & documentation
- › Hydrogen/electric hybrid freight corridors
- › Carbon credit monetisation linked to rail modal shift

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Long-term Strategies

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# Contributors



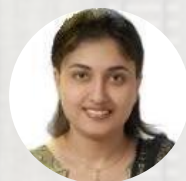
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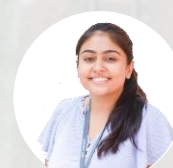
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# About ASSOCHAM

The Associated Chambers of Commerce & Industry of India (ASSOCHAM) is the country's apex national chamber since 1920. It advocates actionable policy suggestions to strengthen the Indian economy by leveraging its extensive membership reach of over 450,000 companies, comprising of large corporates and SMEs. With over 70 Sector and State Councils, ASSOCHAM effectively represents diverse segments of Indian industry and focusses on aligning industry priorities with the nation's growth aspirations.

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## About **ASCELA**

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ASCELA is a professional service company providing advisory services to organisations to help them enhance efficiency by analysing market potential, competitive landscape, and operational, financial, economic, technical, and strategic challenges into Infrastructure and build environments.

### About ASCELA Strategic Advisory – Mobility and Supply Chain

ASCELA's Strategic Advisory – Mobility and Supply Chain practice helps clients develop and leverage core competencies to deliver sustainable and tangible returns. We define strategies that help clients gain market share, enter new markets, regions, and products, improve the bottom line and reconfigure organisational/ operational structures.

ASCELA is well placed to provide strategic inputs and analysis for assessing potential development opportunities in Infrastructure design and development space. Our in-depth knowledge of our focus transportation sectors, backed by intensive research and analysis of our client's specific contexts, helps define superior strategies, frameworks, and implementable action plans.

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