"A STUDY ON ENHANCING CARGO MOVEMENT THROUGH INDIAN RAILWAYS"

Project report submitted to the School of Maritime Management, Indian Maritime University in partial fulfilment for the requirements for the award of a degree of

MASTER OF BUSINESS ADMINISTRATION

In

INTERNATIONAL TRANSPORTATIONS AND LOGISTICS MANAGEMENT

Submitted by

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DECLARATION

I, **K.B.N.S. YASWANTH, Reg. No.2303305021** student of **School of Maritime Management, Indian Maritime University**, pursuing **MBA in International Transportation And Logistics Management** hereby declare that this submission of this project report titled **"A STUDY ON ENHANCEMENT CARGO MOVEMENT THROUGH INDIAN RAILWAYS" -** has been prepared by me towards the partial fulfilment of the Master of Business Administration in Port shipping Management under the supervision of **Dr .Lekha Ravi** Assistant Professor SMM, Indian Maritime University, Chennai Campus. I also declare that this project report is my original work and has not been copied from any other report previously submitted for the award of any degree, fellowship or other in the similar title.

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CERTIFICATE

This is to certify that this project report entitled **" A STUDY ON ENHANCEMENT CARGO MOVEMENT THROUGH INDIAN RAILWAYS"** submitted to the School of Maritime Management, Indian Maritime University, Chennai Campus in partial fulfilment of the requirement for awarding the degree, MBA in International Transportation And Logistics Management is a genuine work of **K.B.N.C.S. YASWANTH (Reg No. 2303305021).**

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Executive Summary

Indian Railways (IR), one of the largest rail networks globally, has seen a significant decline in its freight transport share—from 85% in 1951 to just 27–28% by 2024. This decline not only impacts the economic competitiveness of IR but also challenges India's environmental goals, particularly its Nationally Determined Contributions (NDCs) under the Paris Agreement. To address this issue, the Government of India has set ambitious targets under the National Rail Plan (NRP), aiming for a 45% share of rail in freight transport by 2030–31 and a near-term goal of 3,000 million tonnes (MT) of freight loading by 2027.

This study examines the key challenges and opportunities for IR to regain its freight dominance. It identifies the core issues—capacity constraints, policy inefficiencies, competitiveness against road transport, and the need for regulatory reform. The study is built around three primary pillars: terminal infrastructure, freight marketing policies, and tariff structures. It draws heavily from secondary data, including government reports and TERI's commodity-specific studies, and uses both qualitative and quantitative methods for analysis.

Key findings highlight the need for infrastructure upgrades such as dedicated freight corridors, improved terminals, and policy reforms to make rail freight more attractive. Additionally, six commodities—automobiles, cement, steel, containers, fly ash, and parcels—are identified as having high potential for modal shift to rail. The study suggests that achieving the desired freight targets will require comprehensive policy enhancements, separation of regulatory functions from operations, and improved coordination among stakeholders.

While offering actionable recommendations, the study also acknowledges limitations such as reliance on secondary data, potential generalization issues with case studies, and the lack of cost-benefit analysis for proposed interventions.

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Abbreviations and Details

Abbreviation	Detail
3PL	Third Party Logistics
AAR	Association of American Railroads
ADB	Asian Development Bank
AFTO	Auto Freight Traffic Operator
CAGR	Compound Annual Growth Rate
CFS	Container Freight Stations
CMA	Cement Manufacturing Association
CO2	Carbon dioxide
CONCOR	Container Corporation
CTO	Container Train Operator
DFC	Dedicated Freight Corridor
DFCCIL	Dedicated Freight Corridor Corporation of India
EDFC	The Eastern Dedicated Freight Corridor
EXIM	Export-Import
FCI	Food Corporation of India
FIEO	The Federation of Indian Export Organisations
FMCG	Fast Moving Customer Goods
FY	Financial Year

GDP	Gross Domestic Product
GVA	Gross Value Added
ICD	Inland Container Depot
INR	Indian Rupees
IT	Information Technology
JNPT	Jawaharlal Nehru Port Trust
Kgs	Kilograms
Km	Kilometre
KMPH	Kilometre Per hour
LTTC	Long Term Tariff Contract
MMLPs	Multi-Modal Logistics Parks
MT	Metric Tonnes
NHAI	National Highways Authority of India
NHs	National Highways
NMG	New Modified Goods
NSSO	National Sample Survey Office
NTKM	Net Tonne Kilometre
OCR	Optical Character Recognition
OECD	The Organisation for Economic Co-operation and Development
OEM	Original Equipment Manufacturer
Pol	Mineral Oil
RDSO	Research Designs and Standards

	Organisation
RFID	Radio Frequency Identification
RO-RO	Roll-on, Roll-off
RTT	Round Trip Traffic
SIAM	Society of Indian Automobile Manufacturers
SUV	Sports Utility Vehicle
TEUs	Twenty Feet Equivalent Units
USD	US Dollar

CARGO ENHANCEMENT IN INDIAN RAILWAYS

CHAPTER 1

INTRODUCTION

CARGO ENHANCEMENT IN INDIAN RAILWAYS

1.1 Introduction

Indian Railways (IR) is the fourth largest rail network in the world with 68,043 route kilometres in 2023– 24. Between 1950–51 and 2023–24, IR has increased running track length by 1.7 times, from 51,315 kilometres to 1,02,831 kilometres (summary sheet 2023–24, IR). However, its continued dominance as the backbone of the economy has been waning over the years, for both passenger and freight operations (Chaudhury, 2005). Rail share in freight transport has declined steadily from 85% in 1951 to 60% in 1991, and in 2024 it accounted for only 27–28% of total freight movement (GoI, 2022). Under its Nationally Determined Contributions (NDCs) target for 2030, India has committed to reducing the emission intensity of GDP by 45% from the 2005 level. The observed modal shift from a more environmentally friendly mode to polluting modes of transport may pose severe challenges to India's net-zero ambition as well as its efforts to decarbonise the transport sector (GoI, 1980). IR has formulated a National Rail Plan (NRP) (GoI, 2020) that envisions achieving a rail share of 45% in freight transport by 2030–31. This requires augmenting its capacity to cater to the future increase in demand for infrastructure. There have been several micro initiatives to attract more passengers to railways by upgrading terminals, introducing premium trains, improving average speed, providing improved passenger amenities, etc. As an interim target towards the NRP goal, IR has envisioned freight loading of 3,000 million tonnes (MT) by 2027 (GoI, 2022). In order to supplement the goal of achieving a 45% share of railways in freight transport, TERI undertook a detailed commodity-specific study, published in 2019. The report identifies the key factors that resulted in the declining railway shares and further identifies six commodities that have the highest potential to shift to railways – automobiles, cement, steel, containers, fly ash, and parcels. The study further suggested short to medium-term strategies to facilitate the transition. Building on the findings of the study, TERI undertook the present study focusing on three key pillars of rail freight business – terminal infrastructure, freight marketing policies, and freight tariff structure. more competitive compared to other modes. It also highlights the importance of separation of the regulating role from the Railway Board to an independent regulator.

1.2 Statement Of the Problem

Indian Railways (IR) is facing a significant decline in its share of freight transport, which poses challenges for both the economy and environmental sustainability. The key issues include:

1. Declining market share: IR's share in freight transport has drastically reduced from 85% in 1951 to only 27-28% in 2024, indicating a substantial loss of dominance in the sector.
2. Modal shift to polluting transport: The observed shift from rail (a more environmentally friendly mode) to more polluting modes of transport threatens India's efforts to decarbonize the transport sector and achieve its net-zero ambitions.
3. Capacity constraints: IR needs to significantly augment its capacity to meet the future increase in demand for infrastructure and achieve its target of 45% share in freight transport by 2030-31.
4. Competitiveness issues: The railway's declining share suggests challenges in remaining competitive compared to other modes of transport, particularly road transport.
5. Regulatory concerns: The current structure, where the Railway Board acts as both operator and regulator, may hinder effective governance and market-responsive policies.
6. Sustainability challenges: The shift away from rail freight contradicts India's commitment to reducing emission intensity and poses obstacles to achieving its Nationally Determined Contributions (NDCs) target for 2030.

1.3 Objectives

This study aims to carry out a multi-dimensional analysis of the issues in rail freight movement, along with providing a few solutions in aiding IR to gain its lost share in domestic freight transport. There are three broad objectives of the study.

1. The main objective of the study is to document the Initiatives taken by the Indian Railways to increase freight movement across the country
2. This includes assessing the potential cost savings, increased efficiency, and overall contribution to national logistics and trade competitiveness.
3. Assess if IR is contributing to a sustainable and efficient transportation network in India.

1.4 Scope Of Study

This study provides a comprehensive analysis of the initiatives undertaken by Indian Railways (IR) to enhance freight movement across India. The scope includes:

- Evaluating infrastructural developments such as dedicated freight corridors, modernization of terminals, and expansion of track capacity.
- Assessing policy reforms, freight marketing strategies, and tariff structures to understand their impact on cost savings and operational efficiency.
- Identifying key commodities with potential for increased rail freight share and analyzing strategies to attract them.
- Examining the role of IR in promoting a sustainable and efficient transportation network by reducing carbon emissions and aligning with India's decarbonization goals.
- Comparing IR's freight movement performance with other modes of transport to understand competitiveness and challenges.

1.5 Research Methodology

The study employs a mixed-method approach, integrating both qualitative and quantitative analyses.

1) Secondary Data Collection

- Review of government reports, policy documents, and official data from Indian Railways.
- Analysis of TERI's commodity-specific study and previous reports on freight movement trends.
- Examination of academic literature and industry publications on rail freight logistics.

2) Quantitative Analysis

- Assessment of freight loading trends, modal share changes, and cost comparisons with road transport.
- Evaluation of projected freight demand and expected infrastructure growth based on available data.

3) Policy and Impact Assessment

- Analysis of the National Rail Plan (NRP) and other strategic initiatives to determine their impact on trade competitiveness and sustainability.
- Recommendations for improving IR's freight share through policy enhancements and operational reforms.

1.6 Limitations:

- Data Availability and Accuracy: The study relies heavily on secondary data from government reports and official sources. The accuracy and completeness of this data could impact the findings.
- Generalizability of Case Studies: Case studies of specific freight corridors or policy interventions might not be fully generalizable to the entire Indian Railways network due to regional variations and specific contexts.
- Subjectivity in Qualitative Analysis: The review of policy documents and strategic initiatives involves qualitative assessment, which may introduce some degree of subjectivity in interpretation.
- Focus on Specific Commodities: While the study identifies key commodities for potential modal shift, it may not comprehensively cover all commodities relevant to rail freight.
- External Factors: The study may not fully account for unforeseen external factors (e.g., economic fluctuations, policy changes, global events) that could impact rail freight movement.
- Limited Primary Data Collection: The methodology primarily relies on secondary data, limiting the depth of insights compared to studies incorporating primary data collection methods like surveys or interviews.
- Cost-Benefit Analysis of Recommendations: While the study recommends policy enhancements and operational reforms, a detailed cost-benefit analysis of these recommendations might be beyond its scope.

CHAPTER 2

LITERATURE REVIEW

LITERATURE REVIEW

A comprehensive literature review is a critical foundation in academic research, providing an organized and analytical summary of existing scholarship relevant to a specific research problem. It synthesizes insights from empirical, theoretical, and conceptual perspectives to contextualize the current study, identify gaps in knowledge, and justify the need for further research (Smith, 2020). Through the integration of findings from peer-reviewed articles, books, and other credible scholarly sources, a literature review not only highlights key developments in a field but also demonstrates an understanding of how past research has evolved. Empirical literature, in particular, contributes significantly by presenting findings derived from observation, experimentation, and data analysis. These studies often employ various quantitative, qualitative, or mixed-method approaches to assess hypotheses, examine relationships among variables, and evaluate outcomes in specific populations or settings (Johnson & Lee, 2019). For instance, recent empirical studies have explored diverse themes such as technological integration in education, public health interventions, and organizational performance, offering valuable data-driven evidence that informs both academic inquiry and practical application (Brown et al., 2021). However, empirical studies are often constrained by limitations such as narrow sample sizes, geographical bias, or context-specific findings that may not be generalizable (Nguyen & Patel, 2018). These limitations highlight the need for broader or comparative research that can validate findings across different environments or populations. Moreover, inconsistencies in methodological approaches, particularly in sampling techniques, measurement tools, and analytical frameworks, may compromise the reliability and comparability of results across studies. Addressing these gaps through rigorous and standardized methodologies is critical to advancing empirical knowledge.

Theoretical literature, on the other hand, provides the conceptual scaffolding necessary to frame research questions, interpret empirical findings, and establish logical connections between observed phenomena. Theories offer a lens through which complex social, behavioural, or scientific processes are understood and analysed. Foundational theories such as the Theory of Planned Behavior (Ajzen, 1991), Social Cognitive Theory (Bandura, 1986), and Maslow's Hierarchy of Needs (Maslow, 1943) have been instrumental in shaping research across disciplines ranging from psychology and education to management and health sciences. These frameworks guide researchers in defining

variables, structuring research models, and making sense of observed relationships. For example, the Theory of Planned Behavior has been widely applied to studies on consumer behavior, health compliance, and technology adoption, providing predictive power through constructs like attitude, subjective norms, and perceived behavioral control (Chen, 2022). Yet, as new social and technological paradigms emerge, traditional theories may require adaptation or reconceptualization to remain relevant. In this context, contemporary theorists have called for hybrid models that integrate classical theory with new constructs that reflect digital behavior, cross-cultural considerations, or dynamic environmental influences (Thompson & Zhao, 2023). Therefore, ongoing theoretical refinement is essential to ensure that conceptual frameworks remain responsive to changing realities and can effectively support modern research inquiries.

In addition to empirical and theoretical literature, conceptual literature plays a vital role in clarifying terminology, defining constructs, and ensuring consistency in how key ideas are operationalized throughout a study. Conceptual clarity is particularly important in multidisciplinary research, where terms such as “sustainability,” “performance,” “motivation,” or “equity” may carry different meanings across fields. Conceptual literature helps align research variables with theoretical frameworks and empirical measures, thus strengthening the internal validity of the research (Lopez & Kim, 2020). For instance, in studies addressing employee performance, it is crucial to distinguish between subjective and objective performance measures, as well as between individual and organizational performance outcomes. Authors such as Miller (2017) have emphasized the importance of precise conceptual definitions to avoid ambiguity and enhance scholarly communication. Furthermore, conceptual literature is instrumental in identifying emerging constructs and themes that may not yet be widely studied empirically but are of growing relevance. With the acceleration of societal changes—such as globalization, digital transformation, and climate change—researchers increasingly rely on conceptual exploration to anticipate new challenges and inform the design of forward-looking studies. These emerging constructs serve as a basis for hypothesis generation and often pave the way for empirical testing in subsequent research phases.

Despite the richness of existing scholarship across empirical, theoretical, and conceptual dimensions, several critical gaps persist that justify the need for continued investigation. One recurring issue is the underrepresentation of certain populations or regions in

mainstream research, which may lead to findings that are not universally applicable (Garcia, 2021). This is particularly evident in global comparative studies, where data from developing countries or marginalized groups are often scarce. Addressing such disparities requires deliberate efforts to conduct inclusive and context-sensitive research. Another significant gap involves the lack of longitudinal studies capable of tracking changes over time and establishing causal relationships. Cross-sectional designs, while informative, are limited in their ability to capture temporal dynamics or long-term effects. Additionally, there is often a disconnect between theoretical advancements and practical implementation, as many studies fail to translate conceptual models into actionable strategies that can be applied in real-world settings (Nguyen & Patel, 2018). Bridging this gap demands more interdisciplinary collaboration and engagement with practitioners, policymakers, and stakeholders. Furthermore, the literature reveals a need for methodological innovation, particularly in adapting research tools to digital and remote environments in response to changes brought about by the COVID-19 pandemic and technological evolution (Smith, 2020). These shifts necessitate new approaches to data collection, participant engagement, and ethical considerations.

Inventory management plays a vital role in operational efficiency and cost control, especially in the automobile sector. Hax and Candea (1979) emphasized the importance of inventory in various operational contexts. Caswell et al. (1993) and Ishizawa et al. (1988) discussed technological advancements like automated systems and control units for effective stock tracking and handling.

Lancioni and Howard (1978) warned that poor inventory control leads to delays and customer dissatisfaction. Michalski (2009) introduced financial risk into inventory strategies using portfolio theory. Buzacott and Zhang (2004) integrated financing with inventory decisions, promoting asset-based models.

Beamon (1998) and Thomas & Griffin (1996) pushed for coordinated supply chain planning. Teunter (2001) and Guide (2000) examined complex systems like remanufacturing and recoverable inventory. Meanwhile, Lin et al. (2001) and Çebi & Kahraman (2010) proposed using Activity-Based Costing and fuzzy logic to improve inventory classification.

Researchers like Raafat (1991) and Padmanabhan & Vrat (1995) addressed perishable goods, while Minner (2003) and Kalchschmidt et al. (2003) explored multi-supplier and multi-echelon inventory models to manage uncertainty and demand fluctuations

CHAPTER 3

History and current status of Cargo movement through IR

3.1 Historical Background of The Indian Railways

The idea of road construction came first in colonial India, followed by railway development. During the British government, Lord William Bentinck launched the construction of public roads, which lasted from 1828 until 1835. The overall length of the road between 1839 and 1849 was 30000 miles (Sanyal, 1930:3). The first railroad idea in India was conceived in the Madras Presidency in 1831-32. The promoters of a corporation led by Sir Macdonald Stephenson made the first plans for building railways in India in 1843- 44 (Bell, 1894:1).

The East India Railways Company was established in 1845 by a deed of settlement under its direction, but the idea was thwarted by the mercantile crisis in England. During the same period, the court also gave its sanction to the first line at Bombay and three years after to Madras and Calcutta. But these lines were merely experimental. Whereas the Calcutta line was 120 miles from Raneegunge, the Bombay line was 34 miles to Callion and Madras line was 50 miles to the western coast, but among these, only the Calcutta line was extended for commercial purposes and the other two were only for experimental railways (Marshman, 1863:397).

Early in 1845, a formally drawn-up prospectus for a company was put before the court of directors of the East India Company. It proposed to raise a capital of one million sterling for the construction of an experimental railway, starting from Calcutta, and extending for 140 miles towards Allahabad the court of directors decided to send out to Indian railways engineer of experience who, after due inquiry, would suggest some scheme of moderate length as a first experiment. Simms arrived from England to India in September 1845. He drew up a memorandum, dated February 6, 1846, in which he made the following suggestions to the term that should be offered to English capitalists. He proposed that rent should be given by the government free of cost for permanent works; and that a company should have complete control over its servants (Tiwari, 1921:205).

The government of India in July 1846 recommended a grant of one million sterling or an annual contribution of 5 lacks of rupees to a railway completed between Calcutta and Delhi. The Court of Directors dissented from the government of India on the subject of guarantee, which they held to be essential for the formation of the company, and recommended 4 percent, on all sums paid into the treasury, on the condition that all profits should be divided between the government and the railway company (ibid).

In December 1846, the board of control communicated its view to the court of directors. They accepted the proposal for constructing railways using companies, modified the terms for ultimate purchase, and objected strongly and entirely to the idea of a guarantee or at least until the directors of the East India company fully satisfied that the money could not be raised without it, and later, only for 15 years. These terms were not acceptable to the promoters, but the board of control would not yield and a long period of delay intervened, during which the chambers of commerce of Manchester represented the need for encouraging the carrying out of railways in India. After further discussions and a further representation in June 1847 from the court of directors, the board of control reluctantly consented given the then condition of the money market, to raise the rate of guaranteed interest from 4 to 5 percent, and for 25 years. These terms were accepted by directors of the Indian railways with a grateful sense of the liberal manner in which they had been treated by the East India Company (ibid: 207).

The first railway opened in India was the G.I.P. Railways; its first section of 20½ miles from Bombay to Thana was opened to traffic on April 18, 1853, followed by its second section of 12.42 miles from Thana to Kalyan, which opened on May 1, 1854. Then the first section on the E. I. Railways, Howrah to Hoogly, 23.28 miles long, was opened on August 15, 1854, followed by its second section of the 14.31miles from Hoogly to Pundooah, which opened on September 1 of the same year (Tiwari, 1921:1). The development of Railways in India dates back to the second decade of the nineteenth century. Consequently, opened in 1853 and by 1900 India, with nearly 24,000 route miles, had Asia's longest and the world's fourth longest railways system (Kerr, 2003:289). Indian railway development is especially interesting because India experienced a similar shift from private to state ownership. Beginning in 1853, the first railway lines were constructed in India by private British companies relying on capital raised in Britain with a 5 percent guarantee backed by the Government of India (Bogart and Chaudhary, 2009).

Indian railways expanded gradually under the influence of Lord Dalhousie's Minute. Promoters like R.M. Stephenson, J. Chapman, and W.P. Andrews were railway enthusiasts who were keen on seeing the spread of railways (Marshman, 1863). The construction and management of the Indian rail network involved private British companies, private Indian companies, and the GOI and Indian native states. Ten private companies incorporated in Britain constructed and managed the early trunk lines. After that eight major railway companies were formed, these are (1) East India Railway, (2) Great Indian Peninsula, (3)

Eastern Bengal, (4) Bombay, Baroda, and Central India, (5) Sind, Punjab, and Delhi, (6) Madras, (7) South Indian, and (8) Oudh and Rohilkhand (Bogart and Chaudhary, 2011:4). These companies constructed the major trunk routes connecting the ports and to the interior on the broad gauge. These were the following major railway companies.

The East Indian Railway Company was the first railway company in the history of railway construction in India. This line was completed from Calcutta to Delhi, with a branch to the collieries at Raneegunge, and another to meet the Bombay line Jabalpur. The whole length was 1,369 mills (Marshman, 1863:399). The introduction of the Great Indian Peninsula Railway Company in India on November 8, 1844. The objective of this line was to connect the western capital and emporium, in one direction with Madras, and the other with Delhi and Calcutta, by a junction with the East India railways to Jabalpur. The total length of this railway line was 1,266 miles (Marshman, 1863:399).

In 1836, A. P. Cotton, a civil engineer of Madras presented a more serious report on a railway line from Madras to Bombay via Bangalore and Poona. After this, the Madras Railway Company was formed in London on July 8, 1845, with the general objective of constructing railroads in the Madras Presidency. One line taking a south-western direction to Beypore, on the Malabar Coast, and the other a north-west direction to Bellary, to join the Bombay line and thus complete the triangulation of India. Two branches strike off from the southwestern line, one to the Nilgherres, 30 miles; the other to Bangalore, 80 miles. The entire length of the line under the management of this company was 850 miles (ibid).

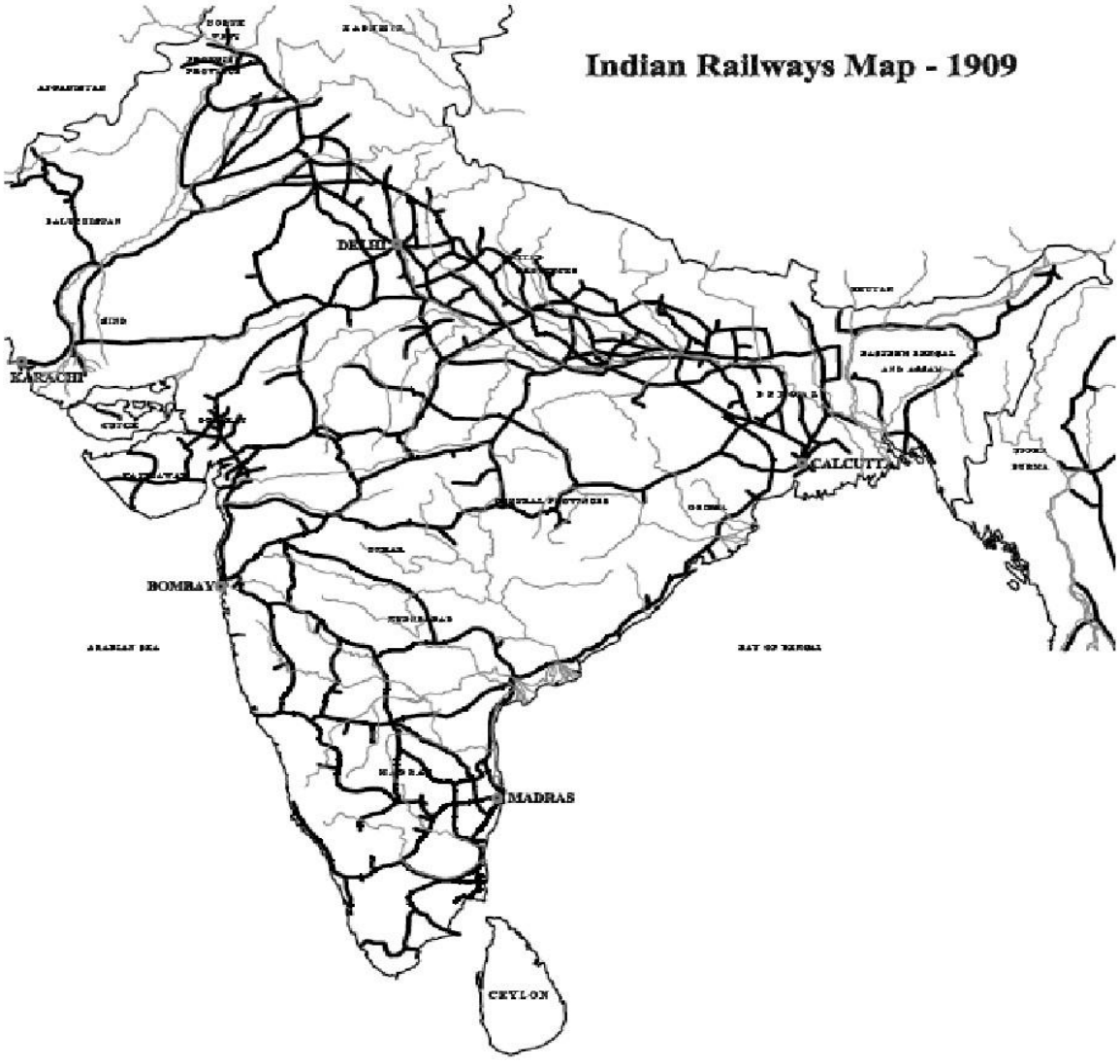
Bombay, Baroda and Central India Railway Company were formed in Britain in 1852. J.P. Kennedy, the ex-consulting Engineer to the government of India had become its consulting Engineer. It adopted the route from Bombay along the sea coast to Surat, Broach, Baroda, Neemuch, and then to Agra. The objective is to connect the extensive cotton district of Surat in direct communication with the port of Bombay (Marshman, 1863:400).

The Sindh railway was to connect the port of Karachi with Kotree, near Hyderabad, on the Indus. The total distance of this line was 114 miles. Then there was the construction of the railway from Multan to Lahore and Amritsar, a distance of 252 miles, and from thence down to Delhi, 300 miles. The entire length of the lines under the management of this company was 666 miles (ibid). The Eastern Bengal Railway was also an important route. This line was intended to rapidly and to afford regular communication between Calcutta

and the districts laying to north and east it so that communication between these cities can be easy and quick.

The Great Southern India rail was constructed in the Madras region. This railway was constructed to give the provinces of the south of Madras, the benefits of railway communication. The first portion of the line, which had been completed, runs from Negapatam, on the Coromandel coast, to Trichinopoly (ibid).[1]

Map-1 Indian Railway Map of 1909, showing railway lines.



Source: https://encrypted-tbn0.gstatic.com/images?q=tbn:ANd9GcRJR6PiywU1qNgp-bCpT1dnW1c7VP03aPSgdg&s

The initiative was taken by the Indian railways

Indian Railways and India Posts have formally launched Rail Post Gati Shakti Express Cargo Service, Joint Parcel Product of Railways and India Post**.** It is an initiative of partnership between Indian Railways and India Posts in providing seamless logistics for the services sector in the country. This is in compliance with the Budget Announcement of FY 2022-23. Today it has been started, on the four sectors -Delhi to Kolkata; Bangalore to Guwahati, Surat to Muzaffarpur and Hyderabad to Hazrat Nizamuddin. However, total 15 sectors(mentioned in Annx-A) have been planned to be covered in the first phase.

The highlights of this service are Total logistic Service: Pick-Up and Delivery at customer premises, Palletization -Transportation through covered and sealed boxes, Semi-mechanized handling, Time tabled service, Insurance at 0.05% of the declared value of the cargo for loss, damage and deterioration, Integrated Parcel Way Bill. Joint Marketing Teams between Posts and Railways have been made to take this initiative forward. Doing away with the slab system of pricing is an innovation herein.

Railways and Department of Posts have collectively upgraded their tools, machinery and handling equipment, storage space for optimum use. Specially designed Fold type box, Envelope box, Mesh type Box, Bubble Guard Box made up of aluminium and light weight material have been developed. Similarly, Parcel Aggregation Centre have been equipped with conveyor system alongwith specially designed rakes for efficient stacking. BTU Deck where palatized material can be easily rolled are provided for effortless movement.

3.2 Salient Features for Customers:

1. **Door step Pick-Up and Delivery:** India Post will pick up the consignment at the doorstep of the customer and transport to the Railway Station (first mile activity) and at the destination railway station, India Post will transport the consignment from the stationto the destination address and deliver the consignment at the doorstep of the addressee (last mile activity).
2. **Flexibility of Quantum of Load:** There is no fixed obligation of loading as party can book small load of 100 kg also.
3. **Time Tabled Service:** Parcel Train operated under JPP Scheme is a time tabled train with scheduled departure and arrival of Train at Originating, intermediate and Destination stations which

4. **Safe Transmission**: Indian Railways will provide intermediate transmission between origin and destination railway stations (middle mile activity), in secured sealed boxes, ensuring safe and secured passage through time tabled trains.
5. **Insurance**: Dept. of Post offers third party insurance facility at an affordable rate of 0.03% of cargo value to the customers availing JPP Service.
6. **Affordable Tariff**: First mile and last service charges at Rs 6/- per kg gives competitive and cost effective solution to the customers in comparison to existing road rates.
7. **Single Point of Contact**: India Post will be the single point of contact for the customer for the despatch of consignment from pick up till delivery.
8. **Mobile Application**: A mobile app is being developed where customers availing JPP service can book the consignment with online payment facility and also can track the status of consignment with live tracking facility.

Earlier, a Pilot weekly service was launched on 31st March 2022 from Surat to Varanasi by attaching a VPU to Tapti Ganga Express. After the Budget announcement in 2022-23, proof of concept has been conducted on the textile segment from Surat and today after conducting 99 trials on single Parcel Van mode and 16 trials on full train load mode, Railways have decided to launch this combined initiative across the network.

Table-1 **Railway projects**

SN	Origin Destination	Origin Area	Stoppages	Destination Area
1	Surat Area – Varanasi-Sonpur-Narayanpur	Surat Area (Surat /Chalthan /Bardoli /Niyol /Gangadhara)	Varanasi	Narayanpur Anant
2	Surat Area– Kanpur-Lucknow-Gorakhpur	Surat Area (Surat /Chalthan /Bardoli /Niyol /Gangadhara)	Kanpur, Lucknow	Gorakhpur Area
3	Bangalore Area - Melpakkam - Delhi Area	Bangalore Area (Bangalore /Yeswantpur)	Jolarpet, Perambur, Gudur, Vijayawada,	Okhla-ICOD

			Warangal, Ballaharshah, Nagpur	
4	Delhi Area – Guwahati	Okhla-ICOD	Kanpur, Lucknow	Aghtori
5	Renigunta – Nizamuddin (Doodh Duronto + JPP)	Renigunta /Kurnool Town /Secunderabad /Kacheguda	Kurnool town, Secunderabad, Kacheguda, Kazipet, Ballaharshah, Nagpur, Bhopal	Okhla-ICOD
6	Secunderabad Area – Guntur – Rajahmundry – Howrah/ Guwahati Area	Secunderabad (Kacheguda /Secunderabad /Vijayawada /Rajmundry)	Guntur, Vijayawada, Tadepalligudem, Rajamundry	Sankrail/ Chitpur /Aghtori
7	Ahmedabad – Udhna – Howrah/Gawhati	Lynch/ Kankaria /Anand /Udhna	Jabalpur (Via Manikpur)	Chitpur/Aghtori
8	Mumbai Area – Vasai/Boisar - Vapi/Umbergaon Area – Sahnewal	Bhivandi /Boisar /Vapi /Umbergaon /Udhna /Vadodara	Karambeli	Okhla/Sahnewal/Rudrapur City
9	Chennai Area – Vijayawada – Tadepalligudem - Howrah Area/Guwahati Area	Chennai Area (Royapuram, Perambur, Tambaram, Korukkupet)	Vijayawada, Rajamundry, Vizianagaram	Sankrail/ Chitpur /Aghtori
10	Delhi Area – Howrah	Okhla-ICOD	Chitpur	Sankrail/ Chitpur /Aghtori
11	Howrah – Guwahati	Sankrail/ Chitpur	Nan	Aghtori

12	Madurai - Dindagul - Trichy - Vijayawada - Howrah	Madurai/ Dindagul /Trichy	Royapuram /Korukkupet; Vijayawada	Sankrail/ Chitpur /Aghtori
13	Ernakulam – Coimbatore - Tiruppur – Erode – Salem - Howrah	Ernakulam /Coimbatore /Tiruppur /Erode /Salem	Renigunta, Gudur	Sankrail/ Chitpur /Aghtori
14	Bhivandi - Boisar - Vapi/Umbergaon-Udhna – Howrah/Gauhati	Bhiwandi /Boisar /Vapi /Umbergaon /Udhna	Jabalpur,(Via Manikpur)	Sankrail/ Chitpur /Aghtori
15	Bangalore Area - Melpakkam - Renigunta-Gudur - Vijayawada – Howrah /Guwahati	Banglaore /SMVB /Yeswantpur	Jolarpet, Perambur, Gudur, Vijayawada	Sankrail/ Chitpur /Aghtori

Source: https://www.pib.gov.in/PressReleasePage.aspx?PRID=1899930#:~:text=Indian%20Railways%20and%20India%20Posts,services%20sector%20in%20the%20country.

3.3 Concession Agreement and Track Access Agreement

DFCCIL is a special purpose vehicle established by the MOR as a Non-Government Railway to implement the Project and operate and maintain the New Railway consistent with the Project Objectives and is a railway administration under the Railway Act, 1989.

The Concession Agreement was signed between the Ministry of Railway (MOR) and DFCCIL on 28/2/2014 after necessary reviews from the Railway Board, duly incorporating the suggestions of DEA and points emanating from joint discussions with the Planning Commission with the approvals from DFCCIL Board of Directors. The Track Access Agreement is a part of the Concession agreement and has been signed as Annexure

A of the Concession agreement itself. The concession Agreement mainly covers the general representations, warranties, undertakings, and obligations by the Concessionaire (DFCCIL) and the Concessioning Authority (MOR) and the areas of services, design, delivery, construction, subcontracting, variation, completion timelines, operation and maintenance, Access arrangements, Blocks, intellectual property, risks, insurance, accounting, reporting, termination, handover, etc.

With the timely signing of this agreement , DFCCIL has now been fully empowered to go ahead with the Project construction, operation & Maintenance in a clear legal and rightful manner defining the obligations of the Concessionaire, DFCCIL, and that of the Concessioning Authority, the Ministry of Railway (MOR) and actions to be taken for the success of the DFCCIL project ahead.

One of the basic conditions under Schedule 1 of the Concession Agreement was the "Condition Precedent" to the Concession agreement which was to be mandatorily fulfilled prior to the execution of this Agreement. The same has been successfully fulfilled on 25.6.2014 to the satisfaction of MOR and with this fulfillment of the "Condition Precedent ", the Concession Agreement is fully operational.

Following are the salient features of the Concession Agreement:

1. MOR grants to DFCCIL for the Concession Period the right to implement the Project. MOR and DFCCIL shall, at the end of each period of 5 years of the Concession Period, review the performance of DFCCIL of its rights and obligations under the Project Documents having regard to the Project Objectives and any other matters as agreed between MOR and DFCCIL.
2. MOR shall grant MOR License in respect of all land required for the Project and associated Railway Infrastructure, as agreed by the MOR and DFCCIL, and at the time required to comply with the Construction Programme.
3. MOR will assist DFCCIL to obtain financing on attractive terms from external credit providers (including multilateral agencies) to facilitate the funding of the Project including obtaining relevant Tax exemptions and waivers.
4. MOR acknowledges and agrees that DFCCIL shall have autonomy and independence from MOR in relation to its management of the implementation of the Project and the performance of its obligations and exercise of its rights under the Project Documents.

5. The MOR accepts certain risks and obligations, including in relation to:

A. A delay in its funding of the MOR Loans and other funding to be made available by it to DFCCIL and any corresponding rise in costs;

B. A delay in giving, or a failure to give, within a reasonable period any Approval required from MOR (subject to DFCCIL having complied with all applicable conditions for the grant of such Approvals);

C. Failure to grant MOR License for all the land required for the Project at the time such land is required to comply with the Construction Programme;

D. Pre-Existing Contamination and MOR Subsequent Contamination;

E. Damage to the New Railway caused by defective trains run by Authorised Rail Users; (the protocol for establishing the cause/cost of damage, etc. shall be unambiguously stated in the disaster management manual or appropriate manual issued by DFCCIL with the approval of MOR);

F. Loss of traffic or inability to carry traffic as a result of corresponding MOR Improvements not being completed as planned.

6. MOR shall utilize the DFCCIL network and in return shall pay Track Access Charge (TAC) as per Track Access Agreement. TAC so paid shall be deposited in an Escrow Account to be opened by DFCCIL. TAC Liability shall be worked out by MOR and provisions shall be made under demand under separate Head.

7. To the extent reasonable and permissible under the Laws, the MOR shall make all Reasonable endeavours to ensure that any third parties in relation to whom it has the authority or a contractual right to request or direct (in connection with the Project), provide reasonable assistance to, cooperate with, and do not unnecessarily or unreasonably prevent, hinder, disrupt, delay or otherwise interfere with DFCCIL and its Associates in undertaking the Project as contemplated by this Agreement. MOR shall ensure that each Zonal Railway with geographical jurisdiction adjacent to with the terms of mutually agreed program.

8. MOR and DFCCIL acknowledge and agree that at present it is intended that DFCCIL shall not own any rolling stock for the purpose of the implementation of the Project and that all such rolling stock used on the New Railway shall be owned or leased by the Authorised

Rail Users (with the exception of rolling stock used for construction or maintenance or restoration related purposes).

9. For developing the business and strengthening the relation between DFCCIL and MOR, Addendum to Concession Agreement has been proposed.

Western Corridor

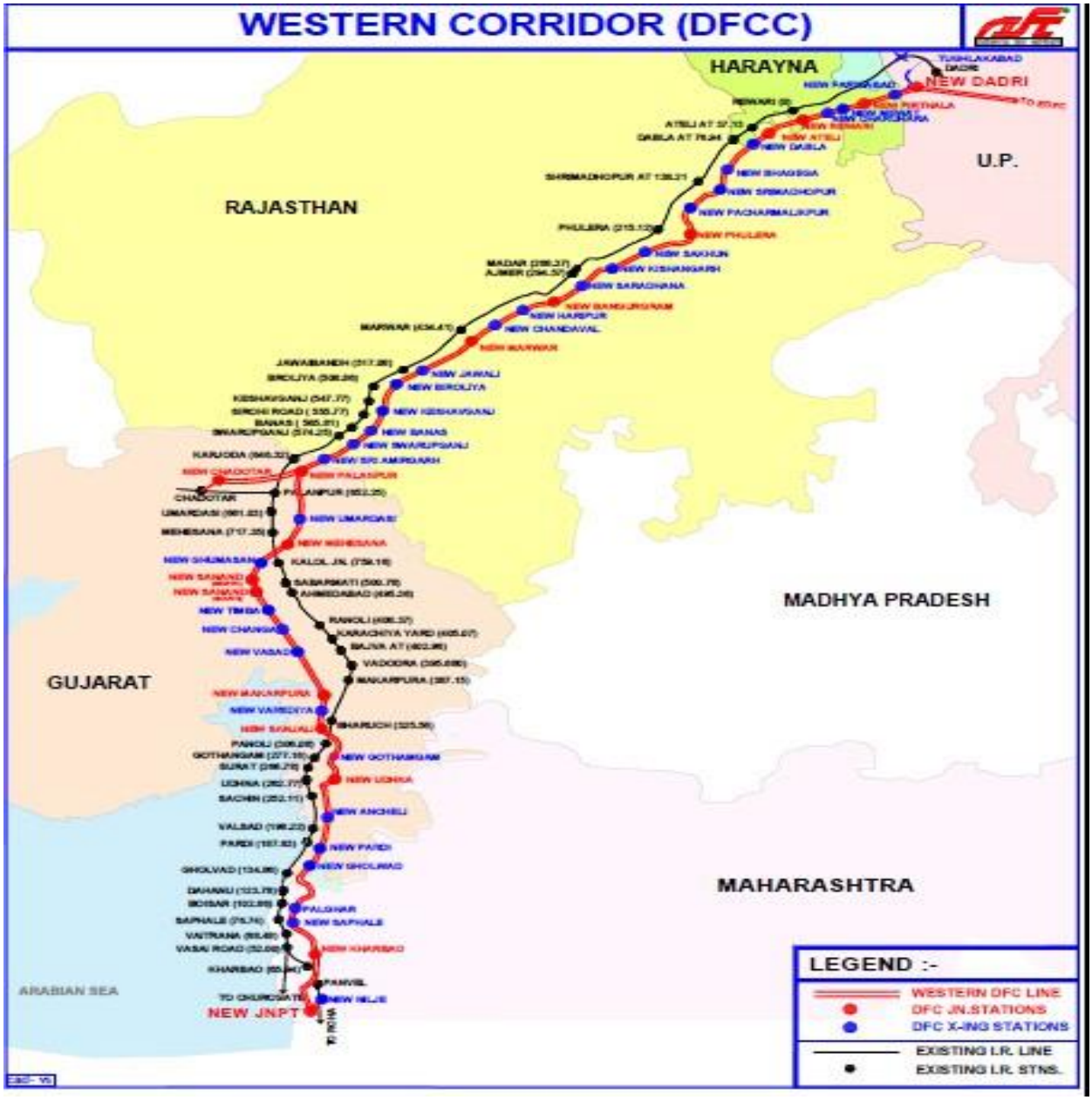
Western Corridor comprising of 1504 km of a double line electrified track from JNPT to Dadri via Vadodara-Sanand-Palanpur-Phulera-Rewari. Alignment has been generally kept parallel to existing lines except provision of detours and entirely on a new alignment from Rewari to Dadri and also from Sanand to Vadodara. This new line portion of DFC is designed to connect with the existing New Delhi - Mathura line at Asaoti railway station from Pirthala station of DFC. Moreover, the Western DFC is proposed to join the Eastern Corridor near Dadri.

Table 2

Western DFC (1504 KMs)	
Haryana	191
Rajasthan	561
Gujarat	552
Maharashtra	183
Uttar Pradesh	17
Total	1504

The traffic on the Western Corridor mainly comprises of ISO containers from JNPT and Mumbai Port in Maharashtra and ports of Pipavav, Mundra and Kandla in Gujarat destined for ICDs located in northern India, especially at Tughlakabad, Dadri and Dandharikalan. Besides Containers, other commodities moving on the Western DFC are POL, Fertilizers, Food grains, Salt, Coal, Iron & Steel and Cement. Further, owing to its faster growth as compared to other commodities, the share of container traffic is expected to progressively increase and reach a level of about 70.5 million tonne in 2023-24. The maximum number of trains in the section is projected as 230 trains (both in UP and DN) in the Ajmer-Palanpur section in the year 2024..

The network diagram of the Western Corridor is given below: -



Eastern Corridor

The Eastern Corridor with a route length of **1861**km, consist of the following distinct segments:

i. An electrified single line segment of 401 km between Ludhiana and Khurja.

ii. An electrified double line segment of 46km between Khurja and Dadri.

iii. An electrified double line segment of 351km between Khurja and Kanpur

iv. An electrified double line segment of 402 km between Kanpur and Mughalsarai

v. An electrified double line segment of 126 km between Mughalsarai and Sonnagar.

vi. An electrified double line segment of 535km between Sonnagar to Dankuni.

Due to non-availability of space along the existing corridor particularly near important city centres and industrial townships, the alignment of the corridor will take detour at several locations. Since the origin and destination of sizable volume of traffic do not necessarily fall on the DFC, a number of junction arrangements have been planned to transfer traffic from the existing Indian Railway corridor to the DFC and vice versa. The junctions on the Eastern Corridor are planned at Chawapail, Sirhind, Sambhu, Kalanaur, Pilkhani, Boraki, Khurja, Dadri(E), Daudkhan, Tundla, Bhaupur, Bhimsen, Kanpur, Karchchna, Ahraura Road, Mughalsarai, Ganjkhwaja, Sonnagar, Chiraillapatu, Gomoh, Andal(W), Andal, Andal(E), Khana and Dankuni. For phase-I opening of the section,temporary junctions are planned at Karwandiya, Sasaram and Durgawati.

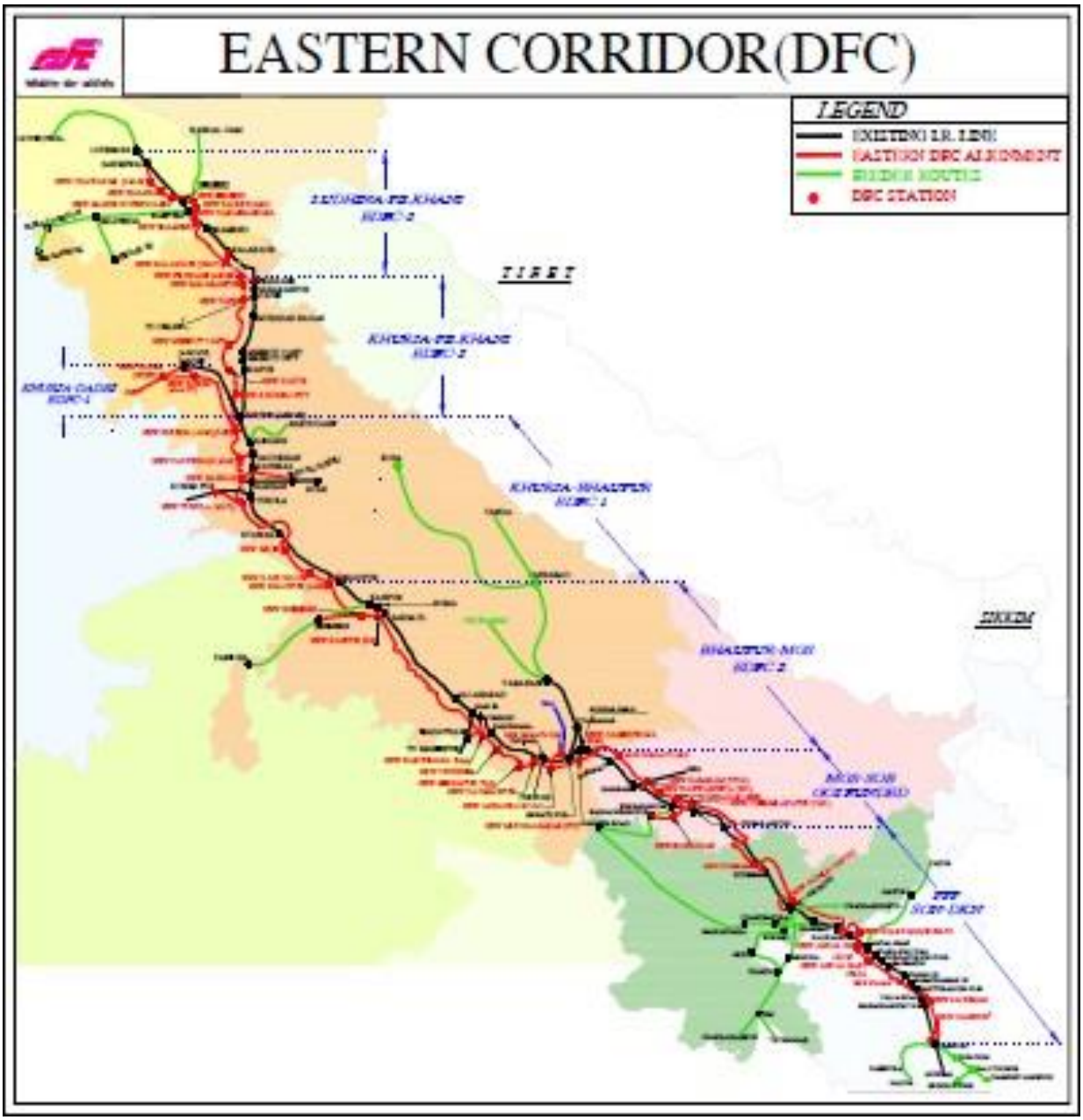
Table 3

Eastern DFC (1861 KMs)	
States	KMs
Punjab	**88**
Haryana	**72**
Uttar Pradesh	**1063**
Bihar	**239**
Jharkhand	**196**
West Bengal	**203**
Total	**1861**

The traffic on the Eastern Corridor mainly comprises of coal for the power plants in the northern region of U.P, Delhi, Haryana, Punjab and parts of Rajasthan from the coal fields situated in Eastern part of the country, finished steel, food grains, cement, fertilizers, lime stone to steel plants and general goods. The total traffic in UP direction& DN direction is projected to go up to224 million tonnes in 2023-24. The number of trains with 25 tonne axle load works out to a maximum of about 163 trains in both UP and DN direction in

Sonnagar-Mughalsarai section of the Eastern Corridor.

Network diagram of Eastern Corridor is given below: -



3.4 FUTURE DEDICATED FREIGHT CORRIDOR

Hon'ble MR has announced in his speech Budget in 2016 to take over the three new Dedicated Freight Corridors. These are: -

1. East –West Corridor (Kolkata – Mumbai) approx. **2328 Km.**
2. North – South Corridor (Delhi – Chennai) approx. **2327Km.**
3. East Coast Corridor (Kharagpur – Vijayawada) approx. **1114 Km**

4. Southern Corridor(Madgaon - Ankola-Rinigunta)approx.**893**

Preliminary Engineering cum Traffic Survey of these Dedicated Freight Corridors have been done by M/s RITES. These reports were submitted for approval to Railway Board.

Vide Letter No.2019/Infra/6/2 dated 15.11.2019 Railway Board conveyed the administrative approval for undertaking and preparing DPR for East-West corridor and North-South corridor to DFCCIL. Details are as under: -

Corridor

i) East Coast Corridor: KHARAGPUR –VIJAYWADA-1115 km

ii) East-West Corridor:

a) Sub Corridor: BHUSAWAL-WARDHA-NAGPUR-RAJKHARSAWAN-KHARAGPUR- ULUBERIA-DANKUNI-1673

b) RAJKHARSAWAN-KALIPAHARI-ANDAL-195

(i) North-South Corridor:
Sub Corridor VIJAYWADA-NAGPUR-ITARSI-972 km.

A detailed Business Plan for DFCCIL was prepared through consultant taking into consideration the Concession agreement and financial arrangement between DFCCIL and Ministry of Railways. The Business Plan has been formulated keeping the following factors in mind.

i. The relationship between Indian Railways and DFCCIL will be that of a concessioner and concessionaire respectively and will be governed by a Concession Agreement between the two parties for a period of thirty years commencing from the date of operations.

ii. Indian Railways is the sole owner and, for the present, only customer of DFCCIL.

iii. DFCCIL has been entrusted with the responsibility of constructing, maintaining and operating two corridors – Eastern Corridor from Ludhiana to Dankuni and Western Corridor from Dadri to Jawaharlal Nehru Port - along with all attendant

infrastructures, to enable Indian Railways to run freight trains on them. DFCCIL's role will primarily be that of the infrastructure provider with responsibility of construction, operation and maintenance.

iv. The DFCCIL will accept freight trains on its system operate them on the DFC and then hand them back to Indian Railways and other qualified operators at the other end. DFCCIL will not own any rolling stock.

v. DFCCIL will receive from Indian Railways a user charge called Track Access Charge (TAC) in return for its services. However, since Indian Railways is the single buyer, TAC is sought to be fixed in a manner that all costs of DFCCIL get covered. At the same time the structure of TAC will be such so as to incentivize DFCCIL towards better performance.

vi. Project phasing has been assumed based on loan sanctions, fund availability and estimated progress of construction during the construction period.

vii. The project is being financed through loan from External bilateral/multilateral funds received via Ministry of Railways and equity contribution from Ministry of Railways. Loan from external funding agencies consist of loans from World Bank and Japanese International Co-operation Agency (JICA). These loans received by Ministry of Finance in the first instance is extended on back-to back basis to the MoR as General Budgetary Support.

viii. Indian Railways will provide Equity to the extent of shortfall between the Project Cost and loan from World Bank & JICA.

ix. In respect of Equity from Indian Railways, dividend payment will be decided by the Board of Directors of DFCCIL from time to time.

x. Since DFCCIL is a corporation registered under the Companies Act, 2013, depreciation has been provided in accordance with Schedule II of the Companies Act. Both depreciation and renewals have not been taken on Sonnagar-Dankuni section as it is proposed to be awarded on Public Private Partnership (PPP) basis. In calculating the financial returns, the cost of Sonnagar-Dankuni section has not been taken.

xi. All traffic moving over two or more consecutive junctions on the existing route

will be assigned to the Dedicated Freight Corridor known as Two Junction Principle.

xii. Sonnagar-Dankuni section is proposed to be done on Public Private Partnership (PPP) basis and TAC does not include payments to be made to the private operator. A separate payment mechanism would be worked out for the same for example: sharing of freight traffic with Indian Railways.

Freight Train projections: Eastern and Western Corridors

The total traffic which can move on the Eastern DFC is estimated to grow at CAGR of4.5% on EDFC. It is expected that 178054 million NTKM traffic will be available on EDFC by 2022 while on the Western DFC it is expected to grow at CAGR 7.7% on expected to be 128064 million NTKM in 2022.

Traffic Flows on Eastern Corridor and Western Corridor

The DFCCIL has carried out detailed, section-wise, traffic assignment exercise to estimate potential traffic expected to move on the DFC routes up to 2021-22. The forecasted number of trains on Eastern and Western DFC corridors in the different reference years is presented below. Traffic in both up and down direction for all reference years in respect of Eastern DFC is given in terms of 25 tonnes axle load wagons. On Western DFC containerized traffic has been estimated considering 25t axle load wagons and partial double stack container train operations.

M/s CDM Smith India Private Limited, in their traffic study, projected traffic in terms of Million Tonne Per Annum (MTPA) for E-DFC and W-DFC are given as under: -

Eastern Corridor Table 4

(In MTPA)

Commodity	**2022**	**2023**	**2024**
Container	8.49	9.20	9.98
Coal	119.50	124.28	128.26
Food Grains	15.37	15.80	16.26
Fertilizer	6.10	6.34	6.60

Cement	12.58	13.56	14.64
Steel	15.92	17.16	18.53
POL	4.41	4.50	4.59
MISC	23.97	24.69	25.43
Total	**206.34**	**215.53**	**224.30**
Modal Shift form Road	13.24	13.90	14.60
AKIC Traffic	0	1.16	1.53
Grand Total	**219.57**	**230.59**	**240.42**

Western corridor Table 5

(In MTPA)

Commodity	**2022**	**2023**	**2024**
Container	64.6	70.5	76.4
Coal	25.2	26.2	27.0
Food Grains	9.1	9.3	9.6
Fertilizer	13.4	13.9	14.5
Cement	8.5	9.2	9.9
Steel	2.2	2.3	2.5
POL	7.3	7.5	7.6
MISC	7.4	7.7	7.9
Total	**137.7**	**146.6**	**155.5**
Modal Shift form Road	15.4	16.2	17.0
DMIC Traffic	14.0	18.5	19.0
Grand Total	**167.1**	**181.3**	**191.5**

IR has been successful in increasing freight loading on its network. In 2022–23 it crossed the milestone of 1,500 MT annual freight loading, registering a growth of 7% over the previous year

(reaching 1,512 MT). However, the average lead has been declining as seen from Figure 5, particularly in last decade. Historically, with increasing industrialization, manufacturing and consumption centers started moving closer to each other causing a decline in lead. Further, economic liberalization and withdrawal of the uniform pricing system in cement and steel also changed freight movement patterns.

Different commodities exhibit different growth trajectories. There is a considerable variation in average lead and NTKM of different bulk commodities, as shown in Figure 6. For instance, during 2007–08 and 2021–22, average leads for coal, containers, and bulk other goods (BOG) have declined at -2% CAGR, but on an average coal constitutes 47% of total loading, while the latter two contribute 12%. Average leads for food grains and fertilizers have increased. While cement and mineral oils show stable lead, coal shows the most prominent decline in lead during 2007–08 and 2021–22. The declining trend observed (for all the commodities combined, in Figure 5) in the last two decades is mainly due to the declining lead observed for coal, accounting for 33–48% and 42–50% of NTKM and tonnage, respectively. It is concerning that despite the steady increase in its loading, coal exhibits

3.5 Increasing In Freight Transportation In Last 10 Years

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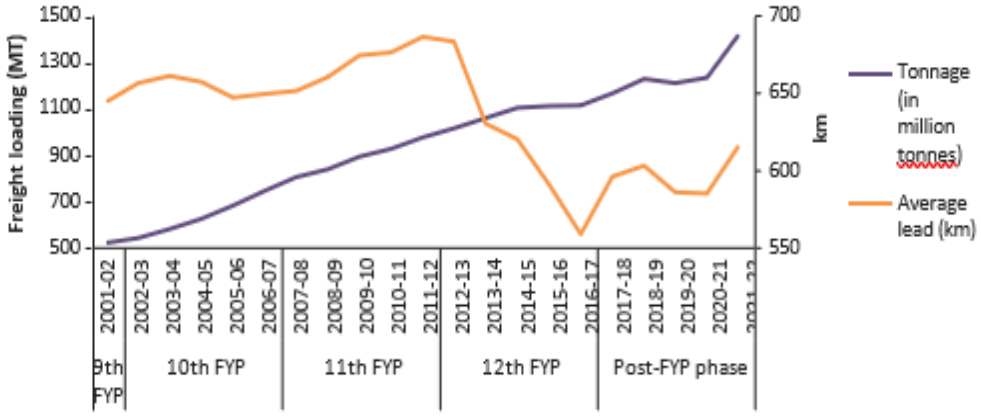

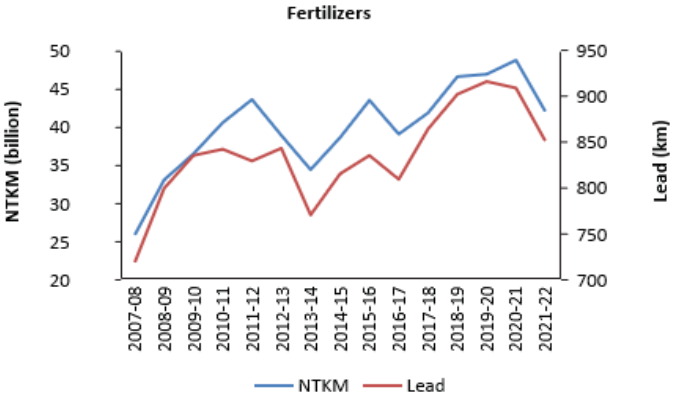

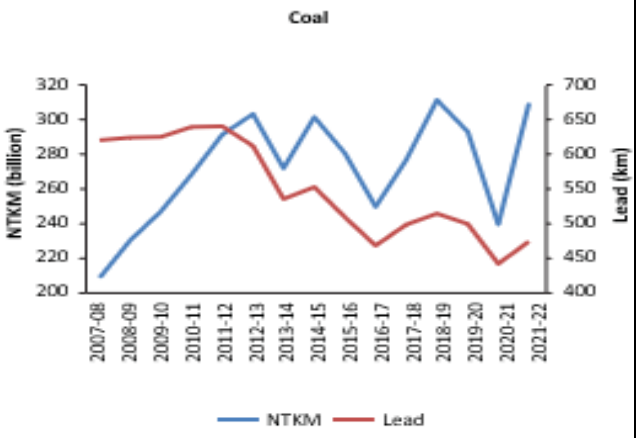

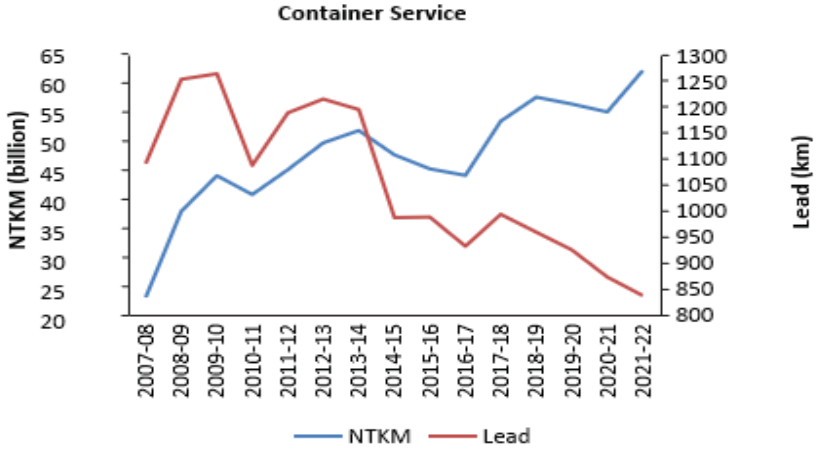

CHAPTER 4

PERFORMANCE OF IR AND CHALLENGES FACED

4.1 ASSESSMENT- REVENUE GENERATION BY INDIAN RAILWAYS FROM FREIGHT

Indian Railways (IR) has generated a cumulative revenue of Rs 2.7 trillion in the financial year (FY) 2024-25. This includes freight revenue of Rs 1.75 trillion and passenger revenue of Rs 755 billion. Further, IR registered a passenger footfall of 7.35 billion during this period, marking a six per cent increase over the previous year. Furthermore, IR transported 817 million tonnes (mt) of coal, which is 4.60 per cent more than the 781 mt transported in 2023-24. Revenue-earning freight in FY24 achieved a growth of 5.2 per cent. Indian Railways, the backbone of India's freight movement, has once again proved its critical role in supporting the country's industrial and economic engine. In the fiscal year 2024-25, the national transporter achieved a significant milestone by recording approximately 1617.38 million tonnes (MT) of originating freight loading, surpassing the 1590.68 MT loaded in FY 2023-24. This marks an incremental growth of 26.70 MT, translating to a 1.68% year-on-year increase.

4.2 Category-Wise Freight Performance Highlights

In FY 2024-25, the loading of various commodities reflected the dynamic growth in specific sectors:

- Domestic Coal loading saw a robust growth of 7.4%, driven by increased demand for thermal power generation.
- Domestic Container loading surged by a remarkable 19.72%, reflecting the rise in fast-moving consumer goods (FMCG), e-commerce, and manufacturing activity.
- Fertilizers registered a modest but steady growth of 1.25%, aligning with agricultural demand cycles.
- POL (Petroleum, Oil, and Lubricants) recorded a 0.61% increase in loading, indicating stable industrial fuel consumption.

4.3 Regional Performance by Zonal Railway

Freight loading growth across Zonal Railways underlines the regional strengths and strategic positioning of Indian Railways:

- Eastern Railway led the growth chart with a phenomenal 16.11% increase in freight loading.
- South East Central Railway (SECR) followed with 7.28% growth, reflecting its pivotal role in coal and mineral transportation.
- Northeast Frontier Railway recorded 4.21% growth, showcasing expanding logistics connectivity in the North-East region.
- Northern Railway grew by 3.89%, supported by strong performance in industrial belts.
- East Central Railway, South Central Railway, and East Coast Railway posted growth rates of 2.82%, 2.14%, and 1.19% respectively.
- Southern Railway and South Eastern Railway registered 0.80% and 0.36% growth, indicating steady performance in southern freight corridors.

4.4 SURPLUS EARNED BY LAST 5 YEARS

India Railways Financial Performance (FY 2020–21 to 2024–25)

Financial Year	Revenue Receipts (₹ crore)	Total Expenditure (₹ crore)	Surplus/Deficit (₹ crore)	Operating Ratio (%)
2020–21	140000	190000	-50000	>100
2021–22	191367	206392	-15025	107.39
2022–23	239892	237375	2517	98.14
2023–24	240000	226000	14000	94.17
2024–25	270000	250000	20000	92.59

- **2020–21**: The COVID-19 pandemic severely impacted revenues, leading to a significant deficit.
- **2021–22**: Despite a rebound in revenue, high expenditures resulted in a deficit of ₹15,025 crore.
- **2022–23**: Marked a turnaround with a surplus of ₹2,517 crore, attributed to increased revenues and controlled expenditures.
- **2023–24**: Continued growth led to a higher surplus of ₹14,000 crore, with an improved operating ratio.
- **2024–25**: Preliminary estimates suggest a surplus of ₹20,000 crore, reflecting ongoing financial strengthening.

4.5 All 12 major ports in India are directly connected to the Indian Railways network

1. **Kolkata (including Haldia Dock Complex)**
   Features an internal railway system linked to the Panskura-Haldia line, facilitating cargo movement to key industrial clients like SAIL and NTPC.
2. **Paradip**
   Connected to Indian Railways, with recent projects approved to enhance cargo movement and connectivity.
3. **Visakhapatnam**
   Directly linked to the Chennai-Howrah main line via its own railway yard, with approximately 186 km of track within the port area.
4. **Kamarajar (Ennore)**
   Equipped with rail connectivity to support cargo operations.
5. **Chennai**
   Integrated with the railway network to handle substantial cargo volumes.
6. **V.O. Chidambaranar (Tuticorin)**
   Connected to the rail network, facilitating cargo movement to and from the port.
7. **Cochin (Kochi)**
   Linked to the railway system, supporting both cargo and passenger services.
8. **New Mangalore**
   Rail connectivity enables efficient cargo handling and distribution.

9. **Mormugao**

   Integrated with the railway network to support port operations.

10. **Mumbai**

    Connected to the extensive railway system, facilitating cargo and passenger movement.

11. **Jawaharlal Nehru Port Trust (JNPT)**

    Features robust rail connectivity to manage significant cargo throughput.

12. **Deendayal Port (Kandla)**

    Linked to the railway network, supporting its status as a major cargo hub.

4.6 Select Non-Major Ports with Railway Connectivity

Several non-major ports have established rail links, often developed through public-private partnerships:

- **Mundra:** Features rail connectivity to facilitate cargo movement.
- **Dahej:** Connected to the railway network, supporting industrial operations.
- **Pipavav:** Integrated with the rail system to handle container and bulk cargo.
- **Dhamra:** Linked to Indian Railways, with ongoing enhancements to improve connectivity.
- **Krishnapatnam:** Equipped with rail connectivity to support port activities

4.7 DIFFERENT METHODS TO IMPROVE INDIAN RAILWAYS

The Indian Railways transports over 23 million passengers and 3 million tonnes of freight daily. Despite its vast network, challenges remain in operational efficiency, frequency of service, regional connectivity, and outdated infrastructure. Furthermore, the privatization and modernization of assets have gained traction as essential reforms. This paper discusses strategies under five key dimensions to drive comprehensive improvements in the Indian Railways.

Enhancing Efficiency

To improve efficiency, Indian Railways must focus on technological upgrades and operational streamlining.

- **Electrification** of major routes reduces dependence on fossil fuels and enhances speed.

- **Dedicated Freight Corridors (DFCs)** help separate freight from passenger traffic, reducing delays.
- **Modern signaling systems** such as ETCS Level-2 improve train control and reduce human error.
- **AI-based predictive maintenance** ensures better reliability and minimizes breakdowns.

Increasing Frequency

More trains can be run with better infrastructure and planning.

- **Double or triple tracking** in high-density areas allows for more frequent services.
- **Improved scheduling systems** using data analytics help reduce idle train time.
- **Rake sharing** enables the same coaches to serve multiple routes efficiently.
- **Faster turnaround times** at stations allow quicker departures and arrivals.

Expanding Connectivity

A well-connected network supports both economic and social development.

- **New lines in rural and remote areas** bridge the connectivity gap, especially in the Northeast and tribal belts.
- **High-speed corridors**, such as the Mumbai-Ahmedabad bullet train, aim to connect major metros faster.
- **Suburban rail systems** in cities like Bengaluru improve daily commute options.
- **Multimodal integration** with buses, metros, and taxis ensures seamless last-mile connectivity.

Encouraging Privatization

Privatization can bring innovation, investment, and improved service quality.

- **Public-Private Partnerships (PPPs)** are being used to modernize stations and run premium trains.
- **Private operators** like IRCTC with Tejas Express provide better onboard services and punctuality.

- **Asset monetization**, including land and freight corridors, attracts private funding without selling core infrastructure.

4.8 Replacing Outdated Infrastructure

Modern infrastructure ensures safety, comfort, and future-readiness.

- **LHB coaches** are replacing older ICF models, offering better safety and ride quality.
- **Vande Bharat trains** represent a new era of semi-high-speed travel.
- **Smart stations** equipped with digital displays, clean platforms, and automated systems improve passenger experience.
- **Bridge and tunnel upgrades** using modern engineering techniques ensure structural safety and longevity.

CHAPTER 5

5.1 Summary:

Indian Railways (IR), once dominating India's freight transport with an 85% share in 1951, has seen a steady decline to just 27–28% by 2024[2]. This trend poses serious challenges for India's economic efficiency and environmental sustainability, as railways are a less polluting mode of transport compared to roadways. To address this, Indian Railways has introduced major reforms through the National Rail Plan (NRP) aiming to achieve a 45% rail share in freight transport by 2030–31[3]. Several key initiatives include the development of Dedicated Freight Corridors (DFC), modernization of terminal infrastructure, introduction of new cargo services like the Rail Post Gati Shakti Express Cargo Service, and improvements in freight marketing policies and tariff structures. Efforts like the creation of special-purpose vehicle DFCCIL for freight corridors and partnerships with ports have strengthened cargo handling capabilities. Despite the decline in share, Indian Railways has improved freight loading volumes, crossing 1,500 million tonnes (MT) in 2022–23, and financial performance has turned positive post-pandemic, with surpluses recorded for consecutive years. New services now offer door-to-door deliveries, insurance options, and competitive pricing, making railways more attractive for industries like coal, cement, containers, steel, fertilizers, and parcels.

Looking ahead, IR's strategy focuses on five pillars: enhancing operational efficiency, increasing service frequency, expanding regional connectivity, promoting privatization and public-private partnerships, and replacing outdated infrastructure with modern technologies. Electrification of routes, AI-driven predictive maintenance, new high-speed and suburban corridors, and asset monetization are central to these goals. Indian Railways' integration with all 12 major ports and several private ports further boosts its strategic position. Freight corridors like the Western DFC and Eastern DFC are specifically designed to handle containerized cargo, coal, and bulk goods, helping reduce congestion and improving speed and reliability. Future plans include three new DFCs: East-West, North-South, and East Coast corridors. Financially, IR projects strong growth, supported by increased freight movement of coal, domestic containers, and fertilizers, and better cost control. Despite challenges like data limitations and regional disparities, the combined modernization efforts aim to transform Indian Railways into a more sustainable,

competitive, and customer-friendly logistics giant, contributing significantly to India's decarbonization and economic ambitions.

Key Points:

- Freight share fell from 85% (1951) to 27–28% (2024).
- National Rail Plan targets 45% freight share by 2030–31.
- Major initiatives:

a) Dedicated Freight Corridors (Eastern & Western DFC).
b) Rail Post Gati Shakti Express Cargo Service.
c) New tariff structures and terminal upgrades.

- Financial turnaround:

a) Surplus of ₹20,000 crore expected in 2024–25.
b) Freight loading crossed 1,500 MT in 2022–23.

- Focus commodities: Coal, cement, steel, containers, fertilizers and parcels.
- 12 major ports and several non-major ports connected to Indian Railways.
- Future DFCs: East-West, North-South, East Coast corridors.
- Strategic focus:

a) Efficiency through electrification and AI maintenance.
b) Expanding connectivity with new lines.
c) Privatization and asset monetization initiatives.
d) Replacement of old coaches and modernization of stations.

5.2 Based on the secondary research, these are the main findings from existing research that has been analysed

1. Indian Railways' freight share has declined from 85% in 1951 to around 27–28% in 2024. The reason was
2. Modal shift from rail to more polluting modes challenges India’s decarbonization goals.
3. The National Rail Plan (NRP) targets a 45% freight share by 2030–31.
4. The interim target for freight loading is set at 3,000 million tonnes (MT) by 2027.
5. TERI identified six high-potential commodities for rail freight: automobiles, cement, steel, containers, fly ash, and parcels.
6. The Joint Parcel Product (JPP) with India Post launched for seamless first-mile and last-mile delivery.

7. JPP service offers doorstep pickup/delivery, low insurance rates, and online tracking via a mobile app.
8. Indian Railways crossed 1,500 MT in freight loading in 2022–23, growing by 7% over the previous year.
9. Coal remains the highest contributor, averaging 47% of freight loading.
10. Dedicated Freight Corridors (DFCs) are key projects: Eastern (1,861 km) and Western (1,504 km).
11. Eastern DFC focuses on coal movement; Western DFC primarily handles container traffic.
12. Projected freight on Eastern DFC by 2024 is 240.42 MTPA; Western DFC is 191.5 MTPA.
13. DFCs are expected to reduce congestion and improve transit times significantly.
14. DFCCIL operates as a special purpose vehicle with autonomy from the Ministry of Railways.
15. The Track Access Agreement outlines mutual responsibilities between DFCCIL and MoR.
16. Three new DFCs are proposed: East-West, North-South, and East Coast Corridors.
17. Freight leads (distance carried per ton) are declining due to closer industrial clustering.
18. Coal leads declined at -2% CAGR between 2007–08 and 2021–22.
19. In 2024–25, IR reported Rs 2.7 trillion in revenue; freight contributed Rs 1.75 trillion.
20. Freight loading of coal grew by 4.6% in 2024–25 to 817 MT.
21. Domestic container traffic grew by 19.72% in FY 2024–25, reflecting rising e-commerce activity.
22. Eastern Railway led zonal freight growth with 16.11% increase in FY 2024–25.
23. IR posted a surplus of ₹20,000 crore in FY 2024–25 with a 92.59% operating ratio.
24. All 12 major Indian ports are connected to the railway network, enhancing intermodal logistics.
25. Several non-major ports (e.g., Mundra, Pipavav) also have rail connectivity through PPPs.
26. AI-based predictive maintenance and modern signaling are improving operational efficiency.
27. Electrification and infrastructure upgrades support sustainability and efficiency goals.
28. Rail Post Gati Shakti service was rolled out across 15 sectors for cargo integration.
29. Policy and pricing reforms aim to make rail freight more competitive against road transport.
30. The privatization of operations and asset monetization are part of broader modernization ef

5.3 Conclusion

Indian Railways has played a big role in India's economy, but over the years, its share in freight transport has dropped sharply—from 85% in 1951 to just 27–28% today. This shift towards more road transport is not only reducing the Railways' importance but also hurting India's efforts to reduce pollution and become more environmentally friendly.

To fix this, Indian Railways has started many new projects. These include building **Dedicated Freight Corridors (DFCs)** to carry goods faster and more efficiently, working with **India Post** on parcel services, and modernizing infrastructure with better technology and planning. The government also wants to increase the railway share in freight transport to **45% by 2030**.

Despite some challenges like declining average transport distances (leads) and competition from road transport, Indian Railways is making progress. Freight traffic and revenue are growing, new policies are being introduced, and ports are being better connected by rail. Financially, Indian Railways has improved too, with increasing surpluses in the last few years.

If Indian Railways continues improving its services, infrastructure, and policies, it can become a more competitive, greener, and more efficient choice for transporting goods across India.

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