Regulatory Framework and Prospects for Ports and Railways

SAFIR Course

8th February, 2026 - IIT Kanpur

G Raghuram

Former Professor IIMA and IIMB

Significance of Ports: India

(mt)

Cargo Traffic	2011-12	2014-15	2019-20	2020-21	2021-22	2023-24	2024-25
Total	913.9	1052.3	1318.0	1247.0	1318.9	1542.4	1593.1
Major^	560.2	581.3	705.0	672.0	720.3	819.0	853.6
Non-Major	353.7	470.9	613.0	575.0	598.6	723.4	739.5
Non-Major Share (%)	**38.7**	**44.8**	**46.5**	**46.1**	**45.4**	**46.9**	**46.4**
GMB*	259.0	336.1	412.0	388.0	403.9	449.3	487.7
GMB Share (%)	**28.3**	**31.9**	**31.3**	**31.1**	**30.6**	**29.1**	**30.6**
APSEZ				**299**	**312**	**420**	**450**
APSEZ Share (%)				**24.0**	**23.7**	**27.2**	**28.2**

- *APSEZ handled 339 mt in 2022-23 and 420 mt in 2023-24. It crossed the Government (non-PPP) volume of 410 mt.*
- *PPP share is 73.4% in 2023-24 and over 74% in 2024-25.*

Source:
1. Ministry of Ports, Shipping and Waterways, April 2025 - https://shipmin.gov.in/division/transport-research
2. Gujarat Maritime Board - Company data
3. APSEZ - Company data

Enhance infrastructure in high and transshipment potential clusters

(mTEU)

Top Seven Container Ports					
	India[1]		World[4]		
Rank	**Port**	**2024-25**	**Port**	**2020**	**2021**
1	Gujarat Adani Port Ltd. (Mundra)[2]	6.5	Shanghai	43.5	47.0
2	Jawaharlal Nehru Port Authority (Mumbai)	7.3	Singapore	36.6	37.5
3	Chennai Port Trust	1.6	Ningbo-Zhoushan	28.7	31.1
4	Gujarat Pipavav Port Ltd.[3]	1.4	Shenzhen	26.5	28.8
5	V.O. Chidambaranar Port Authority (Thoothukudi)	0.8	Guangzhou	23.2	24.5
6	Cochin Port Trust	0.7	Qingdao	22.6	23.7
7	Syama Prasad Mookerjee Port Trust (Kolkata)	0.7	Busan	22.0	22.7
	Total of Above	17.4	Total of Above	202.1	215.3
	Total (Major + Non-Major) Ports	**24.3**	**Global Containerized Trade Volume[5]**	**815.6**	

During 2019-20, GAPL (Mundra) overtook JNPA and sustained in 2020-21 and 2021-22. In 2021-22, it reinforced its premier container terminal position in India by handling 6.5 mTEU, a growth of 15% YoY.

Source:
1. India - Indian Ports Association, Major Ports Statistics - http://www.ipa.nic.in/
2. GAPL (Mundra) - India Shipping news, Apr 05, 2022 - https://indiashippingnews.com/apsez-handles-highest-ever-monthly-cargo-in-march-2022/
3. Pipavav - APM Terminals - https://www.apmterminals.com/en/pipavav/about/our-terminal
4. World - World shipping council / top-50-ports, 2020 - https://www.worldshipping.org/top-50-ports
5. Global - UNCTAD RMT 2021 - https://unctad.org/system/files/official-

Significance of Ports: India

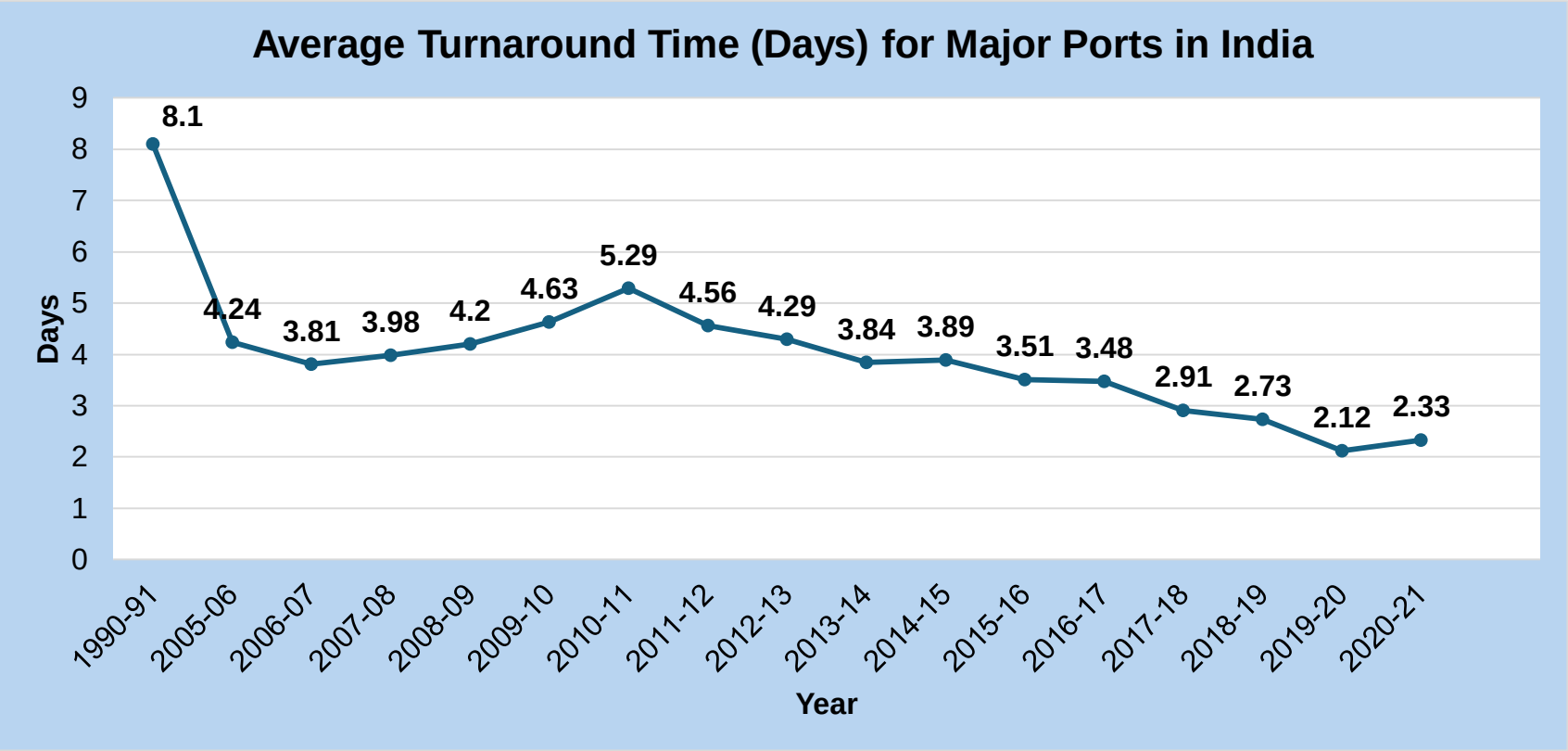
(mt)

Top Seven Ports (Cargo Traffic)				
	India[1]		World[3]	
Rank	**Port**	**2024-25**	**Port**	**2019**
1	Gujarat Adani Port Ltd. (Mundra)[2]	200.7	Ningbo Zhoushan	1120.1
2	Sikka (Jamnagar)	128.0	Shanghai	716.8
3	Deendayal Port Trust (Kandla)	150,2	Tangshan	656.7
4	Paradip Port Trust	150.4	Singapore	626.2
5	Jawaharlal Nehru Port Trust (Mumbai)	92.1	Guangzhou	606.2
6	Visakhapatnam Port Trust	82.6	Qingdao	577.4
7	Mumbai Port Trust	68.6	Suzhou	522.8
	Total of Above	0.6	Total of Above	4826.1
	Total (Major + Non-Major) Ports	**1593.1**	**Global Maritime Port Volume[4]**	**22142.0**

This number is twice the loaded traffic in all the ports in 2019. In 2020, the global maritime port volume declined by 3.8% and dropped to 10648 mt as compared to 2019[4].

Source:
1. India -Ministry of Ports, Shipping and Waterways, 2021-22 - https://shipmin.gov.in/division/transport-research
2. Mundra - India Shipping news, Apr 05, 2022 - https://indiashippingnews.com/apsez-handles-highest-ever-monthly-cargo-in-march-2022/
3. World - http://sisi.gstta.org/uploads/2021/10/291409176464.pdf
4. Global - UNCTAD RMT 2021

Significance of Ports: India



- The container ship turnaround time in Indian ports was 26.5 hours (1.1 days) during 2021-22.*

Source:

1. Ministry of Ports, Shipping and Waterways (India) https://www.statista.com/statistics/693742/average-turnaround-time-at-major-ports-india/
2. FY 2021 – Economic times, Jan 31, 2022 https://infra.economictimes.indiatimes.com/blog/economic-survey-average-ship-turnaround-time-at-major-ports-down-to-55-99-hrs-in-fy21/89244888
3. *FY 2022 – BusinessLine, Mar 25, 2022 https://www.thehindubusinessline.com/economy/logistics/turnaround-time-in-indian-ports-has-improved-to-265-hrs-sarbananda-sonowal/article65259496.ece

- Turnaround times at our Ports which are on the average more than the best-in-class ports, leading to significant avoidable costs in shipping charges.
- With an extra 1.5 days on 30,000 annual port calls, at an average of US$ 25,000 per day, it amounts to an avoidable cost of over US$ one billion pa or INR 90 billion pa.

Source: Authors' analysis

LPI International Score and Rank - India

Parameters		2023		2018		2016		2014	
		Rank	Score	Rank	Score	Rank	Score	Rank	Score
	Overall score	38	3.4	44	3.18	35	3.42	54	3.08
1	Customs	47	3	40	2.96	38	3.17	65	2.72
2	Infrastructure	47	3.2	52	2.91	36	3.34	58	2.88
3	International shipments	22	3.5	44	3.21	39	3.36	44	3.20
4	Logistics competence	38	3.5	42	3.13	32	3.39	52	3.03
5	Tracking & tracing	41	3.4	38	3.32	33	3.52	57	3.11
6	Timeliness	35	3.6	52	3.5	42	3.74	51	3.51

Source: Website – The World Bank - https://lpi.worldbank.org/about Visited on 14.08.2024

Maritime: Challenges

- **Continued Increase in Ship Size**
- **Mergers and Alliances of Shipping Companies**
- **Emergence of International Terminal Operators doing their Business at Multiple Ports Globally**
- **Increasing Involvement of Private Sector in Ports**
  - **Privatized services:** handling equipment at container and break bulk terminals, services such as pilotage, stevedoring, towage, ship agents, land transport and other shipping services
  - **Provision** of port services has been **shifting from the public port authority to private sector** for improved efficiency of port operations

Maritime: Challenges

- PPP business model, concession agreements and regulation
- Coastal shipping
- Ease of doing business
- Captive vs common carrier ports – is it really an issue?
- How to make major ports as vibrant as non major ports? (Hand over major ports to the respective states?) Indian Ports Bill?
- Centre-State relations
- Role of TAMP
- Threat of private monopolies

Maritime: Challenges

- Regulation
  - Safety
  - Security
  - Sustainability (Environment)
  - Tariff
  - Service levels
  - Cabotage
- Has Safety been addressed sufficiently?
- Tariffs and service levels can be regulated by the market
- Can ports take on part of the demurrage? Can there be appropriate Service Level Agreements?
- What does it take to do away with cabotage?

Regulatory Framework - Ports

- Licensing - *Ministry of Ports, Shipping and Waterways (MoPSW)*
- Safety - *Directorate General of Shipping (DGS)*
- Security - *Directorate General of Shipping (DGS)*
- Environment - *Ministry of Ports, Shipping and Waterways (MoPSW)/Maritime Boards*
- Pricing - *Tariff Authority for Major Ports (TAMP)/Concession Agreement*
- Service Levels - *Concession Agreement*
- Dispute Resolution - *Concession Agreement*

Indian Ports Bill 2025

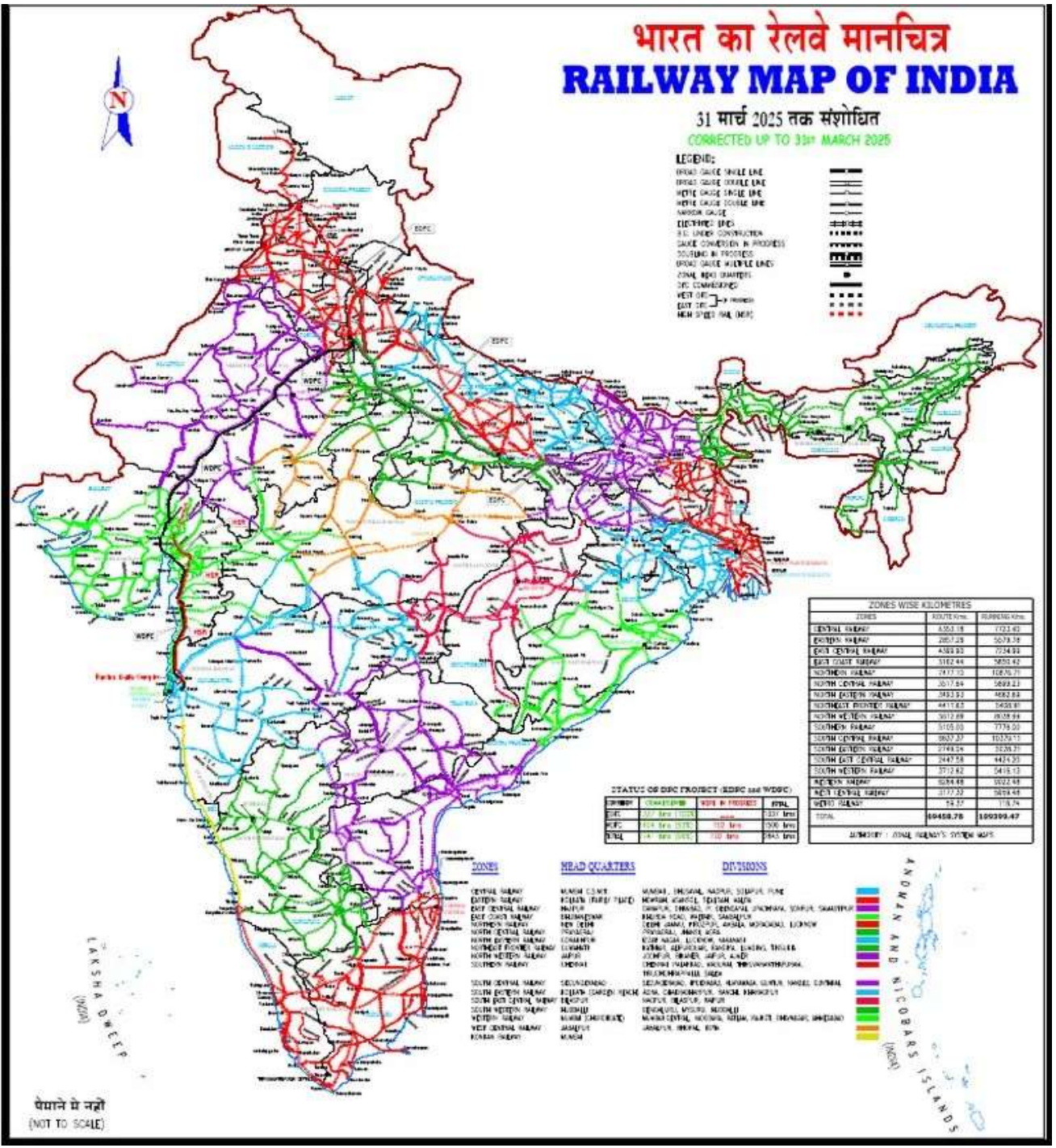
- Consolidate the law relating to ports,
- Promote integrated port development,
- Facilitate ease of doing business and
- Ensure the optimum utilisation of India's coastline;
- *Establish and empower State Maritime Boards for effective management of ports other than major ports;*
- *Establish the Maritime State Development Council for fostering structured growth and development of the port sector;*
- *Provide for the management of pollution, disaster, emergencies, security, safety, navigation, and data at ports;*
- *Ensure compliance with India’s obligations under international instruments to which it is a party;*
- *Take measures for the conservation of ports;*
- *Provide for adjudicatory mechanisms for the redressal of port-related disputes;*
- *And address matters connected therewith or incidental thereto.*

Recent Acts

- The Major Port Authorities Act, 2020
- The Merchant Shipping Act, 2024
- The Postal Shipping Act, 2024
- Carriage of Goods by Sea Act, 2025
- Indian Ports Act, 2025

Indian Railways: Current Facts

- As of October 2025, route length was 69,315 km.
- As of end 2024, route length was 69,181 km (66,820 km was broad gauge), running track length was 109,748 km, and total track length was 135,207 km.
- This is the fourth largest national railway system after USA, China and Russia.



Indian Railways: Current Facts

- Network managed by
  - 19 railway operating zones (latest being South Coast Railway) including KRCL
  - Two railway companies (KRCL and DFCCIL)
- Over 7300 railway stations

Indian Railways: Current Facts

- **India's largest logistics organization**
- **Revenue** for 2024-25 estimated at an all-time high of **Rs 2.79 trillion (t)**

  (The pre covid high was Rs 1.9 t in 2018-19. It was Rs 2.56 t in 2023-24)

  Budgeted for 2025-26: ***Rs 3.02 t***
- **Revenue** Freight:Passenger:Other 62:31:7
- **Capital** investment for 2025-26 to be **Rs 2.65 t** with a budgetary support of Rs **2.52 t**

Sources: IR Year Book, Union Budget documents

Indian Railways: Current Facts

- In 2023–24, it operated 13,198 passenger trains on average daily and carried 6.905 billion passengers (five times India’s population).
- In 2024-25, it operated nearly 12,000 freight trains on average daily and transported 1.6 billion tons of freight, becoming the second largest global rail freight carrier behind China (4 bt in 2024). In ton-kilometres, India is the fourth after China, USA and Russia.
- As of March 2024, Indian Railways' rolling stock consisted of 327,991 freight wagons, and 91,948 passenger coaches (including multiple unit coaches).
- As of November 2025, Indian Railways had 13,294 electric, 4137 diesel and 16 steam locomotives in its inventory.

Status

- Over 99% route electrified
- Freight market share dropping – 28%
- Heavily coal transport dependant (50%...)
- Average freight train speed 25 kmph (one third of the maximum)
- Average revenue movement of wagons: 20%
- Passenger market share even lower and dropping – no market research
- Average passenger train speeds 40 kmph to 90 kmph (half to two thirds of the maximum). Overall about 55 kmph
- Average coaching stock utilisation: 400 to 1400 kmpd. Overall about 600 kmpd
- Distortions in timetabling, superfast train concept…
- Safety improving, though occasionally…

Visible Projects/Reforms

- 100% Electrification
- Dedicated Freight Corridors
- Vande Bharath, Increasing Speeds, High Speed Rail
- Station Redevelopment
- Multi-modal Logistics Parks
- Gauge Conversion, New Lines, Multiple Lining
- PM Gati Shakti National Master Plan
- Railway Board Roles

Not so Visible

May be not so successful

- Rake Standardisation
- Special Purpose Wagons (Automobiles)
- Decentralization
- Safety Focus (Kavach)
- Private Involvement
  - Manufacturing
  - Wagon Ownership
  - Container Train Operations
  - *Passenger Train Operations*
- Unified Logistics Interface Platform
- *Zero Based Timetabling*
- *Merging of Cadres*

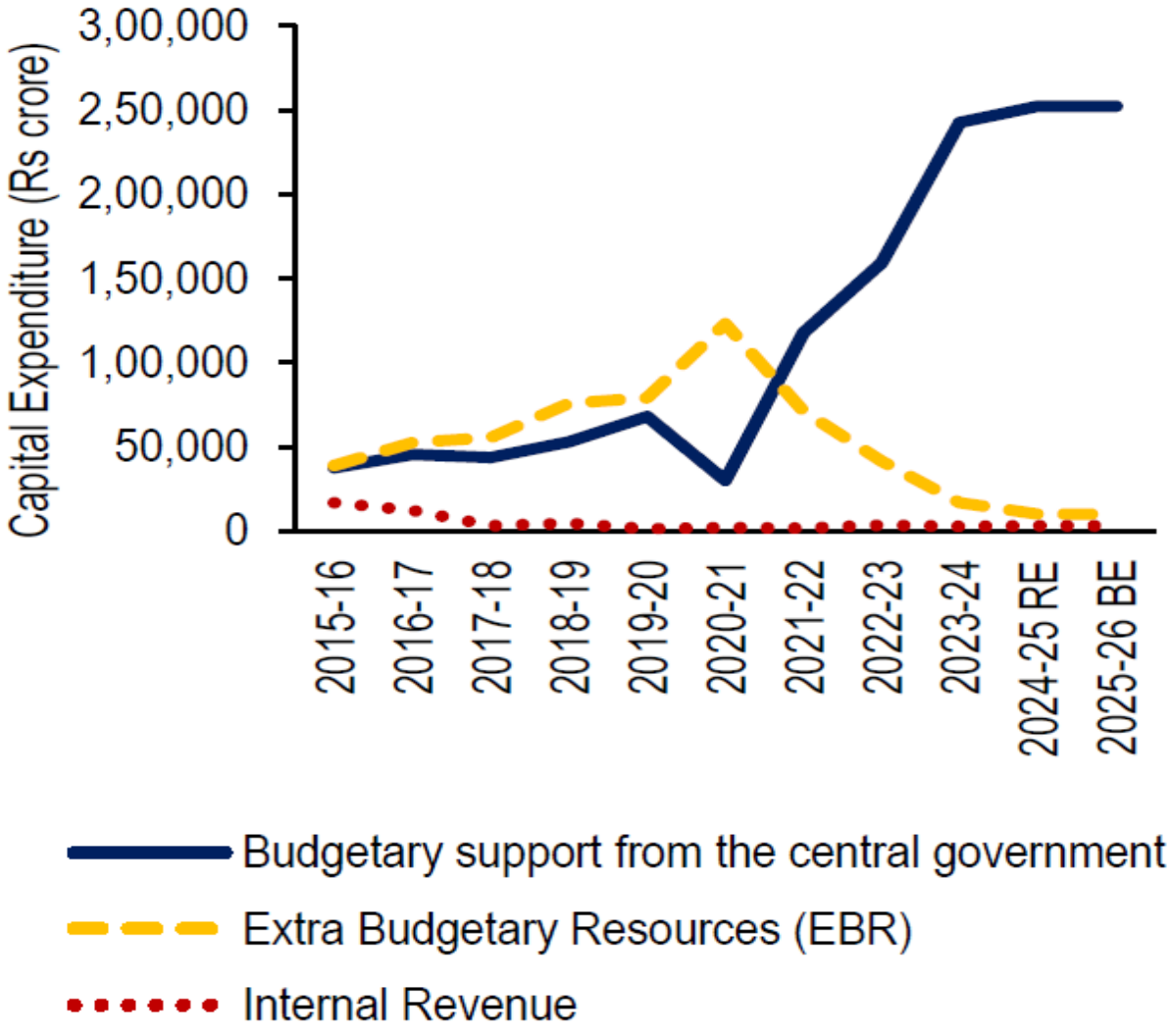
PM GatiShakti National Master Plan (NMP)

- Innovative use of technology to break silos.
- GIS based digital platform for multimodal connectivity to various economic zones.
- Decision support system.
- Integrated Project Monitoring.
- Institutional Arrangement at Centre and State Level.

PM GatiShakti National Master Plan (NMP)

- 40 Railway specific data layers have been uploaded on the NMP portal.
- 209 + 127 Railway Projects Mapped on National Master Plan Portal.
- 100 Cargo Terminal to be developed as per Gati Shakti Cargo Policy are mapped on NMP.
- Access to portal for Ministerial, Zonal and Divisional functionaries.

Capital Expenditure over the Years



Sources: Expenditure Profile, Railway Statements, Union budget documents, 2015-16 to 2025-26; PRS.

Rail Share Commodity-wise (National Rail Plan 2021)

	Commodity	2021 (%)	2051 (%)	Increase (%)
1	POL	18	48	30
2	Container	24	48	24
3	Pig Iron	49	70	21
4	BoG	4	22	18
5	Iron Ore Export	65	82	17
6	Food Grains	16	32	16
7	Cement	37	51	14
8	Coal	65	74	9
9	Steel RM	56	60	4
10	Fertilizer	87	90	3
	Overall	**28**	**44**	**16**

Prepare for 4 to 5 fold increase in Rail Transportation by 2050?

Opportunities and Realities

Opportunities:

1. Markets
2. Technologies
3. Investments
4. Optimization

Realties:

1. Road Infrastructure Development
2. EV Technology
3. Pipeline, Inland Waterways and Coastal
4. Developments in Aviation

Markets

Customers who want:

- Carbon Credits (about six times less energy)
- Cost Reduction
- Controlled Conditions
  - Safer
  - Less Losses
  - Rail as Door to Door
- Continuous Movement: Faster, Streamlined Multimodal

Drivers for Improvement

- Customer Orientation
  - Service delivery effectiveness
  - Efficiency
- Climate Impact
- Capacity
  - Asset creation efficiency
  - Asset management efficiency

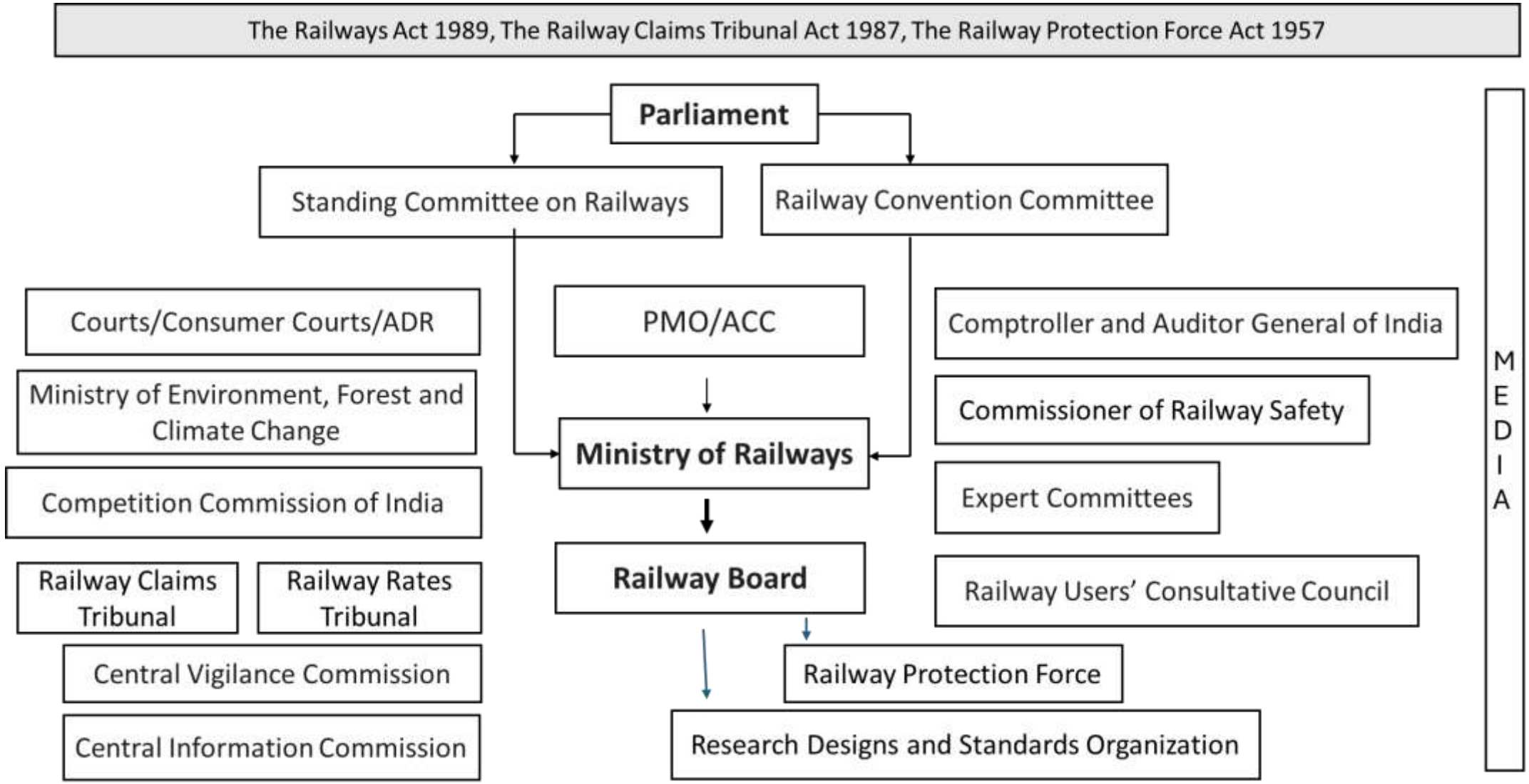
Regulatory Framework

- Licensing - *Ministry of Railways*
- Safety - *Commissioner for Railway Safety*
- Security - *Ministry of Railways*
- Environment - *Ministry of Railways*
- Pricing - *Ministry of Railways*
- Service Levels - *Ministry of Railways*
- Dispute Resolution - *Ministry of Railways*

Conclusions: PPPs in Railways

- In the transport sector, in general the ‘service’ side of infrastructure moves into privatisation earlier than the ‘hardware’ (roads, airports, ports) side of infrastructure.
- This is because entry costs are lower and often can accommodate multiple players which brings in competition in the services. Subsequently, the hardware side can also be considered for privatisation.
- However, there could be still be scope for market failures in licensing, environmental impact, safety, security, pricing, service levels, and dispute resolution (Gangwar and Raghuram, 2015).
- To address this, the need for an independent regulator becomes critical to protect the interests of all stakeholders (OECD, 2005, ECMT, 2005).

Regulatory Ecosystem of IR



Independent Regulation

- Idea has been around for a while since the 1980 Rail Tariff Enquiry Committee
- Rakesh Mohan Committee iterated in 2001
- MoR proposes Rail Tariff Authority in 2014 (to get leeway to increase tariff?)
- MoR modifies the idea to Rail Development Authority in 2016

Guiding Principles of RDA

- Protection of consumer interests
- Promotion of competition
- Encouraging market development
- Ensuring adequate investments
- Benchmarking against international standards
- Promoting non-discriminatory open access to the infrastructure
- Promoting equity of access

There will be an Appellate Authority

Scope of RDA

Includes

- Tariff determination
- Ensuring fair play and a level playing field for private investments in railways
- Ensuring efficiency and performance standards
- dissemination of information

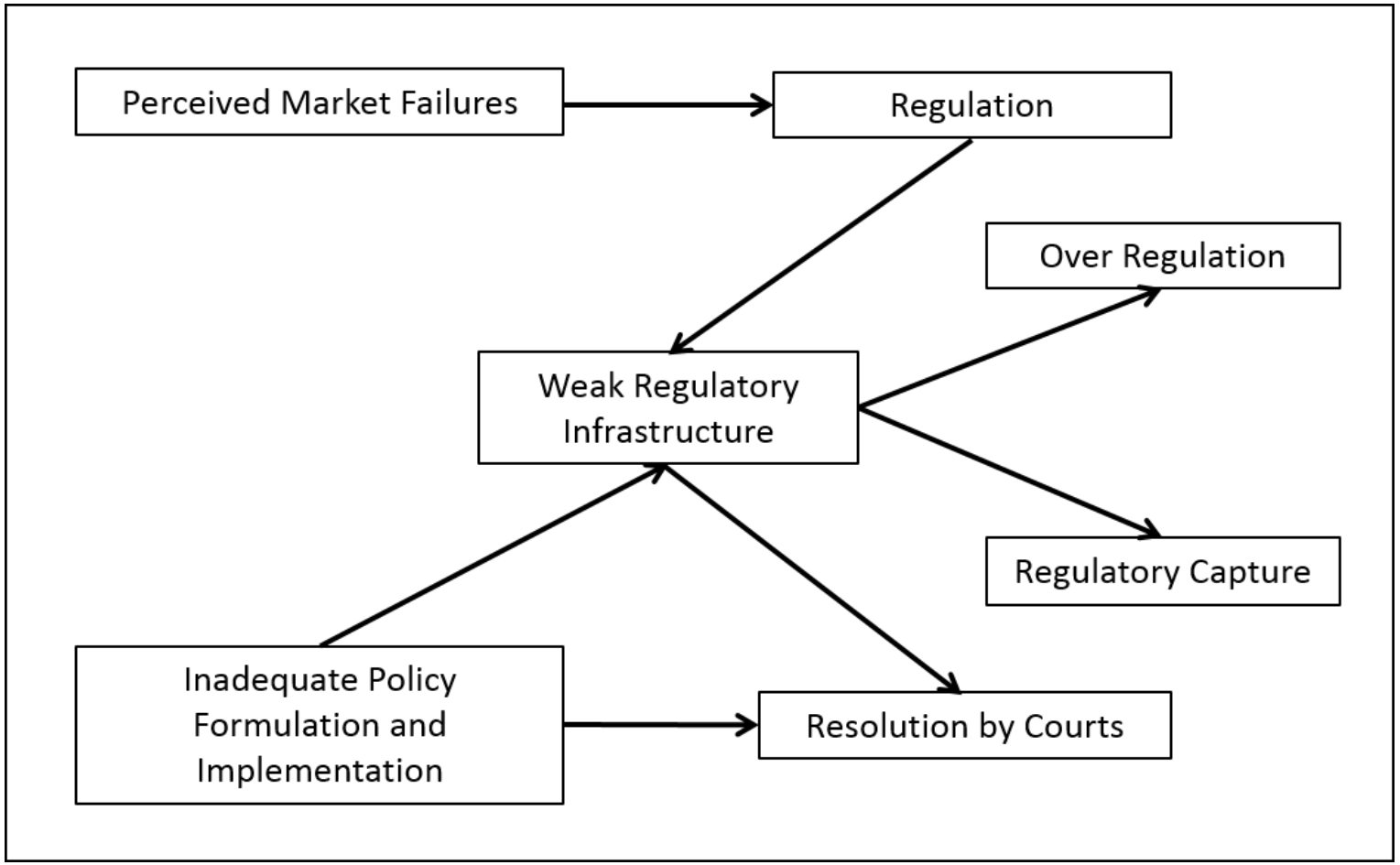
Does not Include

- Policy making
- Expenditure management
- Setting technical standards (RDSO to continue)
- Compliance of safety standards and practices (IR for standards and CRS for compliance to continue)

Conclusions

- Greater direct control on IR by the government, without regulatory intervention
- IR navigates through the complex web of pressure points, many of which have no enforcement powers
- Such navigation and lack of a competitive environment slows down innovation and improvement, both in terms of technology and customer orientation
- Improvements and accountability driven top down rather than bottom up
- No movement on independent regulation (concept papers on Rail Tariff Authority (2014) and Rail Development Authority (2016))

Conclusions: Crystallization



Raghuram, G, and Prashanth D Udayakumar. 2015. "Effect of Tariff Regulation in Major Port Container Terminals: The Case of Jawaharlal Nehru Port Trust." Ahmedabad, December. http://www.iimahd.ernet.in/assets/snippets/workingpaperpdf/6337555852015-12-04.pdf.

Conclusions: Way Forward

Implication of Commercialization of Infrastructure

- Project structuring
- Risk assessment
- Project financing
- Tendering and bidding
- **Agreements**
- Project management
- Financial restructuring
- **Dispute resolution**
- **Regulatory and institutional framework**

Conclusions

- A regulator is required. Scope and methodology of regulation needs clarity.
- Policy framework and statements by government needs to be carefully thought out.
- Else, legal recourse becomes the way out, affecting the very purpose of effectiveness and efficiency in infrastructure.

Thank you