

Envisioning the future of Indian logistics@2047

April 2023



Bombay Chamber
of Commerce & Industry

The EY logo, consisting of the letters 'EY' in a bold, white, sans-serif font, with a yellow and white chevron shape above the 'Y'.

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Neville M. Dumasia
India Leader
Advanced Manufacturing,
Mobility and Infrastructure
EY India

EY projects that India will continue its strong economic performance and become a US\$26t economy by FY48. This will create a significant opportunity for India's transportation and logistics sector, which is poised to grow at ~4.5% CAGR (from 2022 to 2050) to 15.6 trillion-ton km by 2050.

To realize the full potential that exists in the sector, it is imperative for stakeholders including, service providers, customers and GOI (government of India) to collaborate and compliment each other. Although GOI has launched several initiatives, such as GatiShakti and National Logistics Policy, there are numerous challenges related to implementation, infrastructure development, digital readiness and supply chain transparency, which need to be addressed.

In this thought leadership, EY and BCCI have come together to analyze key challenges in India's logistics sector and recommend strategies to address them.

First is the adoption of advanced technologies and new business models. Although new digital platforms, such as ICEGATE (e-Sanchit), E-Logs, are playing a pivotal role in streamlining processes and rooting out inefficiencies, a considerable effort is required to ensure end-to-end monitoring and supply chain visibility in the logistics sector.

Second is fast tracking infrastructure development, which is being addressed by initiatives such as Bharatmala, Dedicated freight corridor (DFC) and Sagarmala, among others. However, numerous policy measures need to be adopted to alleviate delays in land acquisition and clearances and stimulate infrastructure development ecosystem further.

Third, infrastructure financing is complex and therefore stakeholders should develop and build on their infrastructure asset strategy and adopt a collaborative approach to design a risk sharing protocol. The GOI should formulate a uniform and simplified tax and regulatory landscape and adopt policies to facilitate greater participation of the private sector.

Fourth, adoption of sustainable practices is critical, to keep up with stringent domestic and international regulatory customers and investors requirements. However, EY's supply chain sustainability survey 2022 indicates that 33% companies lack a strong business case for sustainable supply chain. Thus, stakeholders need to identify and prioritize focus areas for decarbonization, including climate financing for emerging markets. Moreover, they should consider additional drivers, such as higher revenues, market share, as a result of their focus on sustainability.

To help set a context for discussion among stakeholders participating in the conference, the thought leadership highlights implementation related challenges and recommendations. It aims to facilitate development of a roadmap to ensure that India's ports, shipping and logistics sector leapfrogs and can benefit from the multi-fold GDP growth projected for the Indian economy.





Rajiv Jalota
*Chairman, Mumbai Port Trust
and Additional Charge, DG,
Directorate General of Shipping*

As the Indian economy continues to grow and evolve, the importance of efficient and effective movement of goods cannot be unnoticed. In today's interconnected world, shipping and logistics stand at the heart of the economy, serving as crucial gateways for international trade and commerce.

Indian logistics sector comprises the entire inbound and outbound segments of the manufacturing and service supply chains. Of late, the shipping and logistics infrastructure has received a lot of attention both from business and industry as well as policy makers – posing tremendous opportunities for development across different avenues.

The logistics management regimen has the capability of overcoming the disadvantages of the infrastructure in the short run while providing cutting-edge competitiveness in the long term. It is here that exist several challenges as well as opportunities for the Indian economy.

With increasing complexity in logistics and supply chain management, it has become imperative to adopt innovative approaches and groundbreaking technology to ensure that goods are delivered on time and in good condition, as it is the need of the hour. Physical transporters who run their business process in manual and offline model, can utilize different technologies such as AI, Big data, IoT, to increase their service and compete with an international market by providing real time and end-to-end connectivity.

While we move ahead, sustainability is no longer an option today but an essential aspect to consider by all stakeholders in all future endeavors. While the government has been launching several initiatives to support this, we must work together to ensure that the sector can continue to grow and contribute to the economy while also mitigating its impact on the environment.

In view of this, the Bombay Chamber of Commerce and Industry (BCCI) in association with EY as the Knowledge Partner, presents to you this Thought Leadership paper.

It aims to provide a comprehensive overview of the current state of the ports, shipping, and logistics industry. Through extensive research and analysis, we explore the latest trends, challenges, and opportunities shaping this dynamic sector. We examine key issues such as the impact of COVID-19 on the industry, emerging technologies and new business models, infrastructure development and investment need, regulatory developments, and sustainability initiatives.

Our goal is to provide valuable insights that will help businesses, policymakers, and industry stakeholders navigate the rapidly evolving landscape of ports, shipping, and logistics in India. We hope that this report will serve as a useful resource and contribute to informed decision-making and strategic planning for the sector's growth and development.



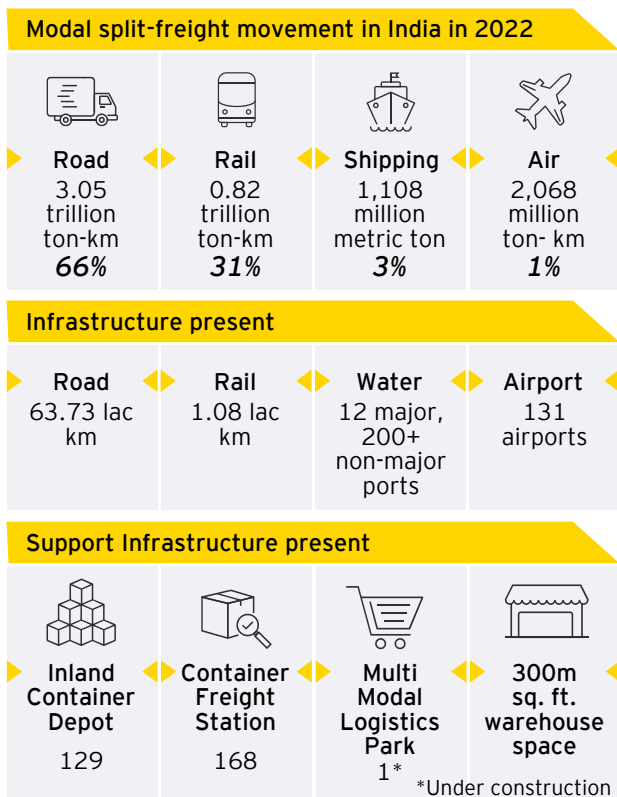
Executive summary



India's projected GDP growth to US\$26t by FY48 (US\$6t by FY2030) and the impetus to accelerate merchandise exports to US\$1t by 2030 are key drivers which will increase demand for India's logistics sector.

As of FY22, India's exports grew by 44.6% to US\$422b and imports grew by 55.4% to US\$613b. This growth has propelled the Indian transportation and logistics sector, which has grown between ~US\$160 and US\$200b (INR13- 16 Lakh cr.) in 2022.

India's transportation and logistics landscape



Source- PBI, Ministry of shipping, Ministry of civil aviation, Niti Aayog

India's Transportation and Logistics sector acts as the backbone to support the fast-paced growth which it is poised to achieve in the next 25 years.

India's freight movement is heavily skewed toward road transportation, which moves 66% of cargo (in ton-km). This is followed by rail (31%), shipping (3%) and air (1%). To aid this cargo movement, India has an extensive network of support infrastructure comprising 129+ In-land container depots, 168+ container freight station, and ~300 m sq. ft. of warehousing space.

GOI acknowledges the issue of high dependence on road transportation and is exploring options to move freight optimally with a focus on reducing logistics costs and bringing it at par with the global standards.

This uneven distribution of modes of transportation has led to low operational efficiency; prompting the GOI to undertake multiple logistics specific initiatives, such as GatiShakti, National Logistics Policy and others. These programs aim to streamline India's logistics sector by making it more green, agile, transparent and integrated.

India aims to reduce logistics cost from 13% to 14% of GDP, to 8% to 10% of GDP, by 2030. It is estimated that a 10% reduction in indirect logistics cost will result in 5% to 8% rise in exports.

The transportation and logistics sector, and in particular the ports and shipping sector is grappling with several structural challenges:

- ▶ The inter-state movement of goods takes a long time due to complex regulations, delayed clearances and involves a significant amount of paperwork.
- ▶ As the industry is fragmented, there are several intermediaries in the ecosystem leading to multiple cargo exchanges, thereby increasing costs and operational inefficiencies.
- ▶ Lack of end-to-end supply chain visibility and ability to track and trace the cargo remains a challenge for the service providers and customers.

These issues have a significant bearing on the cost of operations for stakeholders and may directly or indirectly hinder their green ambition.

Executive summary

To address some of these challenges, there has been a recent spurt in development of associated infrastructure, which is in line with the changing business environment. The sector is witnessing a rapid development of infrastructure, greater thrust in digitalization, and enhanced focus on sustainable logistics.

Launch of multiple start-ups and GOI's digital initiatives such as "Make in India", Unified Logistics Platform (ULIP) etc. are helping to bring greater transparency in the logistics sector. Digitization of work processes to facilitate paperless processing of documents and clearances and enhanced tracking of shipment helps to increase the speed of movement of goods and reduce logistics cost.

There has been an enhanced focus on infrastructure development, which is playing a significant role in increasing the pace of movement of goods. India's road network has grown from 62.15 lakh km in FY21 to 63.73 lakh km until Jan 2023. As part of Dedicated Freight Corridor (DFC) India has pledged ~US\$38b (INR 3 lakh cr.) to develop exclusive rail tracks and associated infrastructure for movement of goods train.

In the ambit of Maritime India Vision (MIV), GOI has pledged US\$38b to US\$44b (INR 3-3.5 lakh cr.) across ports, shipping, and in-land waterways, which will help unlock US\$2.5b (INR 20,000+ cr.) worth of potential annual revenue for Indian ports.

MIV targets to reduce the average vessel turnaround time (for containers) from ~22 hours in 2021 to <20 hours by 2030.

The proposed growth in the logistics sector requires major private and foreign investment to alleviate the load on GOI's finances. Initiatives such as National Infrastructure Pipeline, is one such lever which is expected to raise ~US\$650b (INR 50 lakh cr.) worth of investment. Additionally, GOI has rolled out multiple policies to facilitate PPP in ports, rail and road sector.

To fulfill India's commitment to the Net Zero emissions by 2070, the logistics sector's contribution to decarbonization is essential. Several initiatives, such as adoption of alternate fuel vehicles, increasing share of renewable energy in ports, providing shore power to dock ships and others, are being incorporated. Maritime India Vision indicates specific targets for Indian ports to promote sustainability in the maritime sector.

Although the above-mentioned initiatives are likely to transform and improve efficiency in the logistics sector, some challenges continue to persist, which may limit its growth. A collaborative effort of industry and GOI may be required to resolve them. Thus, EY and BCCI suggest following strategies to accelerate India's competitiveness in global ports, shipping and logistics sector.

1 Adopt advanced technologies and explore new business models

2 Fast-track infrastructure development

3 Attract investment and investor interest

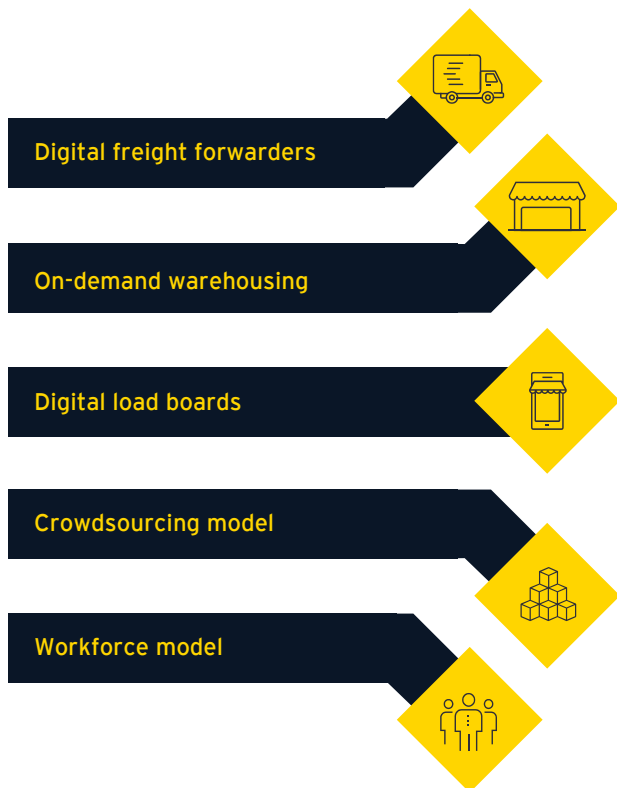
4 Focus on sustainable logistics

Adopt advanced technologies and explore new business models

Recent supply chain disruptions and amplified focus on sustainability have led to increased adoption of technology-enabled solutions. As a result, blockchain, big data, cloud computing, digital twins and others are seeing widespread adoption, globally. Although the level of adoption is relatively low in India, the renewed interest of the GOI has resulted in the launch of several digital solutions, such as ICEGATE and E-Logs. These solutions have helped to reduce inefficiencies, improve transparency and increase the speed of movement of goods.

While digital technologies have been pivotal in increasing the efficiency and speed of freight movement, there is a need for greater transparency and end-to-end visibility across the supply chain.

Technological advancements and global supply chain constraints have resulted in the development of new business models



This has paved the way for multiple start-ups which are offering innovative solutions by either working independently or partnering with traditional players.

However, a coordinated effort by all stakeholders is required to boost the adoption of digital technologies. Special focus is required to implement a comprehensive digital tool which offers end-to-end cargo tracking and acts as an inclusive digital marketplace. This requires a complete transition from port community to cargo community system. Additionally, NLP- Marine should be agile enough to offer transactional rates and allow users to bid on them to make it an inclusive marketplace platform.

A better collaboration between start-ups and industry would be crucial to paving the way for an integrated and transparent logistics ecosystem.

Recommendation

Service providers and customers need to carefully consider the adoption of digital technologies and upgrade their legacy systems. Seamless implementation of digital technologies is required across multiple government bodies to avoid siloed communication.

Fast-track infrastructure development

Recently, the GOI has launched several programs with a focus on building new roads, railways, ports infrastructure, etc.

The average speed of road development has increased from 20.79 km/day in FY22 to 22.23 km/day till Jan-23.

This is complimented with measures to attract private capital and implement administrative reforms to streamline processes for planning and executing infrastructure investments. GatiShakti is a critical component of this strategy, which aims to integrate planning and implementation of infrastructure projects.

As a result, programs such as Bharatmala, Dedicated freight corridor and Sagarmala were developed. Several Multi Modal Logistics Parks (MMLPs) are being developed to connect multiple modes of transport. MMLPs also help to improve utilization and performance of inland container depots and container freight stations. Development of maritime clusters, container terminals and warehouses are other key initiatives being undertaken.

Executive summary

These will help increase competitiveness of India's logistics sector globally, boost MSME (medium and small manufacturing enterprise) growth and reduce ship turnaround time.

However, delayed land acquisition and clearances are key challenges which need to be addressed. It has a significant impact on project timelines and profitability. A complete roll out of Nationwide single window clearance system by government will go a long way to resolve this.

India will need to speed up dedicated freight infrastructure connecting four major metros. So far, only around 1,724 km out of planned 2,843 km direct freight corridor got commissioned as of Jan 2023. DFC is an important part of National Rail Plan 2030, which aims to increase the rail share from 26% to 45% over the next 10 years. Higher rail share will result in significant logistics cost savings for manufacturing companies. In addition, new rail infrastructure can boost industrial townships along the freight corridor.

Attract investment and investor interest

Traditionally, GOI has been the main proponent and financier for the development of infrastructure. However, it is increasingly adopting new policies to attract private and foreign investment as levers to fast-track infrastructure development.

This includes 100% Income Tax exemption in any consecutive 10-year period out of 20 years of operations for road construction projects, volume-based rebate scheme of up to 100% on rail tariff for movement of empty containers from ports to hinterland for its utilization in exports as offered by CONCOR, among others.

In total, the investors have opportunity to invest in ~6,000 projects worth INR 52 lakh crore (~US\$650b), which can aid the transportation and logistics sector.

Although 100% FDI has been permitted in most transport infrastructure development initiatives, the sector requires establishment of processes to accelerate clearances, simplification of regulations to promote higher FDI inflows.

100% FDI allowed in

- ▶ Air transport (including air freight)
- ▶ Port and harbor's construction and maintenance
- ▶ Railways: under automatic route for construction, operation and maintenance of suburban corridor projects through PPP

Additionally, GOI is aggressively pushing Public Private Partnerships to increase investments and has met with a significant success in the maritime sector.

Proposed MMLPs will need an investment of over US\$6.25b (INR50,000 cr.) from the private sector. The projects will include warehouses, specialized cold chain facilities, freight/container terminals, and bulk/break-bulk cargo terminals and will help in achieving better modal mix in favor of rail. Interest from private sector is subdued so far due to the large investment size and uncertainty in demand.

Stakeholders need to develop and build expertise in Infrastructure asset strategy, project financing, infrastructure M&A and deal structuring; and adopt a collaborative approach to design an optimal risk-sharing protocol that can enhance bankability of large infrastructure projects.

Focus on sustainable logistics

India’s shipping and logistics sector is poised to embrace sustainable practices to comply with domestic and global regulatory policies. This includes complying with key regulations and initiatives, such as Energy Efficiency existing ship Index, Carbon intensity rating and Emissions Trading System.

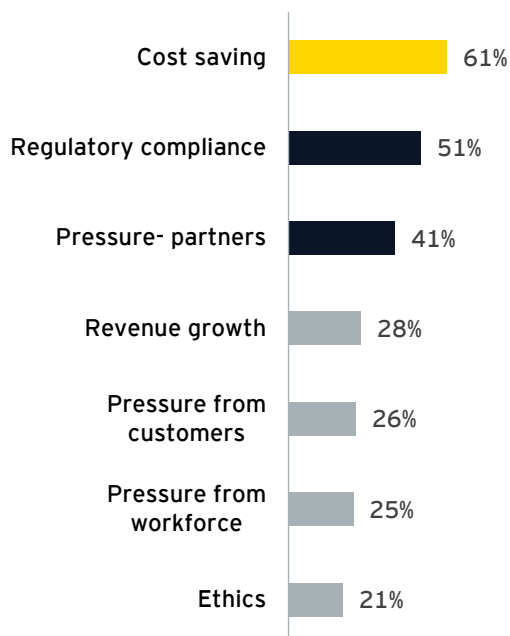
To meet emission related regulations, several initiatives are being adopted globally such as- issuance of green bonds for raising capital, adoption of low/ zero-emission fuels, improved availability of shore power, development of intermodal transport within port, usage of eco- friendly packaging materials, and others.

India’s maritime vision aims to inculcate practices to reduce cargo emissions per ton. Moreover, development of institutes such as the National Centre of Excellence for Green Port & Shipping will act as a technological arm and will help develop data driven policies to foster carbon neutrality and circular economy in the shipping sector. The institute will also carry out education, applied research and technology transfer in maritime transportation at the local, regional, national and International levels. It will focus in the area of energy management, emission management and sustainable maritime operations.

India has committed to implement IMO’s energy efficiency requirements for existing ships and carbon intensity requirements for all vessels. Indian Ports are expected to adhere to all the targets which are in line with nine UN Sustainable development goals. These include obligations on safety, efficiency and sustainability. Also, India has been selected as the first country under the IMO’s Green Voyage 2050 project to conduct a pilot related to green shipping.

EY view- Global supply chain executives on ESG.

Motivators for improving supply chain sustainability



According to EY’s sustainable supply chain survey- 2022, although companies are emphasizing on adoption of ESG initiatives, they lack a viable business case to commit and pursue sustainable practices. To solve this, organizations need to offer innovative solutions to enhance the inherent willingness of stakeholders to pay a premium for carbon-neutral shipping.

Cost saving, regulatory compliance, and pressure from partners are top motivators for supply chain executives to improve supply chain sustainability.

Ports, shipping and logistics in India:

current scenario and outlook

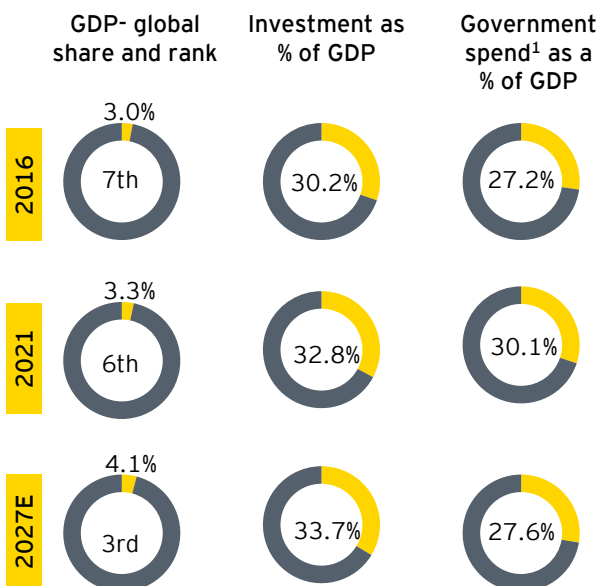


By FY48, India's GDP is expected to grow to US\$26t, with freight being the major driver in achieving and sustaining this growth.

From 2023, India is expected to be a part of a select group of three countries whose yearly GDP growth exceeds US\$300b.

In 2022, the US pipped China to register the highest GDP growth in absolute terms. However, China is expected to reclaim this position in 2024. Between 2022- 2027, India's contribution to global GDP growth is projected to average ~6.4% with the highest being 7.6% in 2023.

India's financial performance and global standing

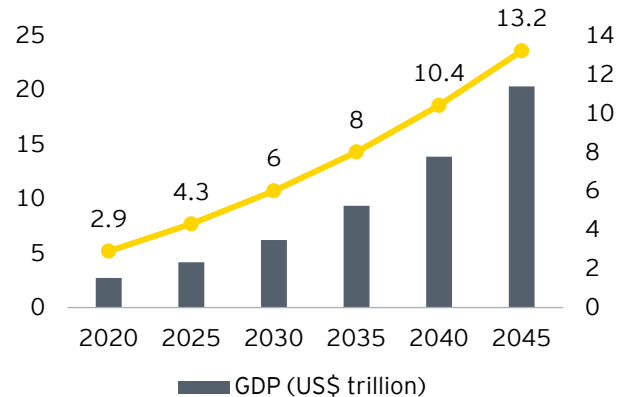


Source- IMF
Government spend¹- General government expenditure

India's GDP growth has traditionally outgrown growth in freight activity. Same trend is expected to continue in the future.

From 2015 to 2020, GDP grew by 32% but freight activity increased by 28% only. EY estimates that India's GDP is projected to grow to US\$26t by FY48. However, despite a higher base, GDP is projected to grow at a CAGR of ~11.3% from 2020 to 2025, and freight activity is only expected to grow by 8.2% CAGR.

India- GDP and freight projections

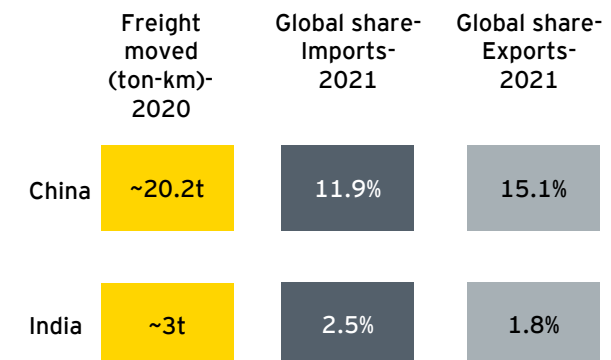


Source: EY @100, Niti Aayog
GDP projections as per "most favoured case"

On the contrary, China's contribution to global GDP growth averages ~24% with the highest being 30.9%. However, India's projected growth of "Investment percentage of GDP" at 33.7% in 2027, reflects India's position as a strong investment hub.

India's "Investment as a percentage of GDP" averages ~31.9% from 2016 to 2027E, which surpasses the global average of ~24%.

India- merchandise trade performance versus peers



Source- WTO, Niti Aayog
Countries in order of freight moved (ton-km)

Ports, shipping and logistics in India: current scenario and outlook

India's target to have US\$1t merchandise export by 2030 will be a significant driver to push trade, thereby increasing freight movement.

In 2021, commercial activities generated about 4.6b tons of freight annually, which resulted in ~3 trillion ton-km of transportation demand. This demand was driven by rising income levels, higher exports, rapidly growing e-commerce sector and a growing retail sales market.

GDP outgrows freight

Continuing with the past trends, India's GDP growth of 8.4% CAGR is expected to be higher than that of freight (6.3% CAGR).

15.6t ton- km

Expected goods movement by 2050. This growth is expected to be boosted by higher exports.

Source: EY analysis, Niti Aayog

India's high logistics cost as a share of GDP presents a unique opportunity to optimize freight movement via efficient modes.

India's logistics sector grew by ~45% since 2020 and is currently valued at ~US\$160b to US\$200b (INR 13- 16 lakh cr.)

India's transportation and logistics sector acts as the backbone to support the fast-paced growth, which the country is poised to achieve in the next 25 years. The sector comprises four different modes- Road, Rail, Shipping and Air.

India's freight movement is heavily skewed toward road transportation, which moves 66% of cargo (in ton-km). This is followed by rail (31%), shipping (3%) and air (1%).

To aid this cargo movement, India has an extensive network of support infrastructure comprising 129+ in-land container depots, 168+ container freight station, and ~300 m sq. ft. of warehousing space.

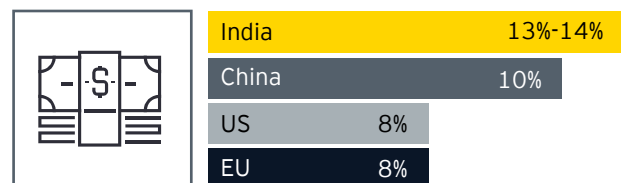
The sector handles ~10,000 commodities and employs ~22m people. It is one of the highly fragmented sectors, with only 10% of the sector operated by organized players.

GOI acknowledges the issue of high dependence on road transportation and is exploring options to move freight optimally with a focus on reducing logistics costs and bringing it at par with the global standards.

The EU and the US have invested heavily in increasing logistics efficiency by optimizing mode share.

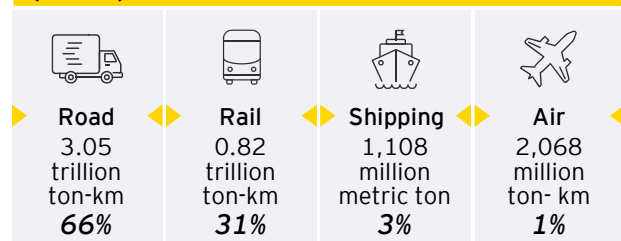
Currently, 62% of logistics cost in India is attributed to transportation and 34% to inventory management. India needs to adopt inventory management best practices to improve supply chain management and design.

India- logistics service performance comparison Logistics cost as a share of GDP



India's transportation and logistics landscape

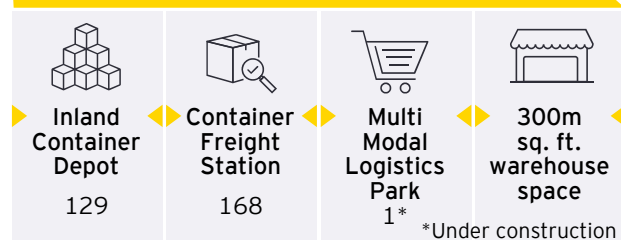
Modal split- freight movement in India in 2022 (ton-km)



Infrastructure present



Support Infrastructure present



Source- PBI, Ministry of shipping, Ministry of civil aviation, Niti Aayog

India's high average lead freight distance (500 km) indicates a strategic misalignment of manufacturing centers and consumption areas

Despite having one-third the geographical area, compared to the US, India has 37.5% more lead freight distance. This significantly increases India's manufacturing cost and reduces the export potential.

India plans to reduce its logistics cost as a share of GDP between 8% and 10%, by 2030. This will be at par with international standards.

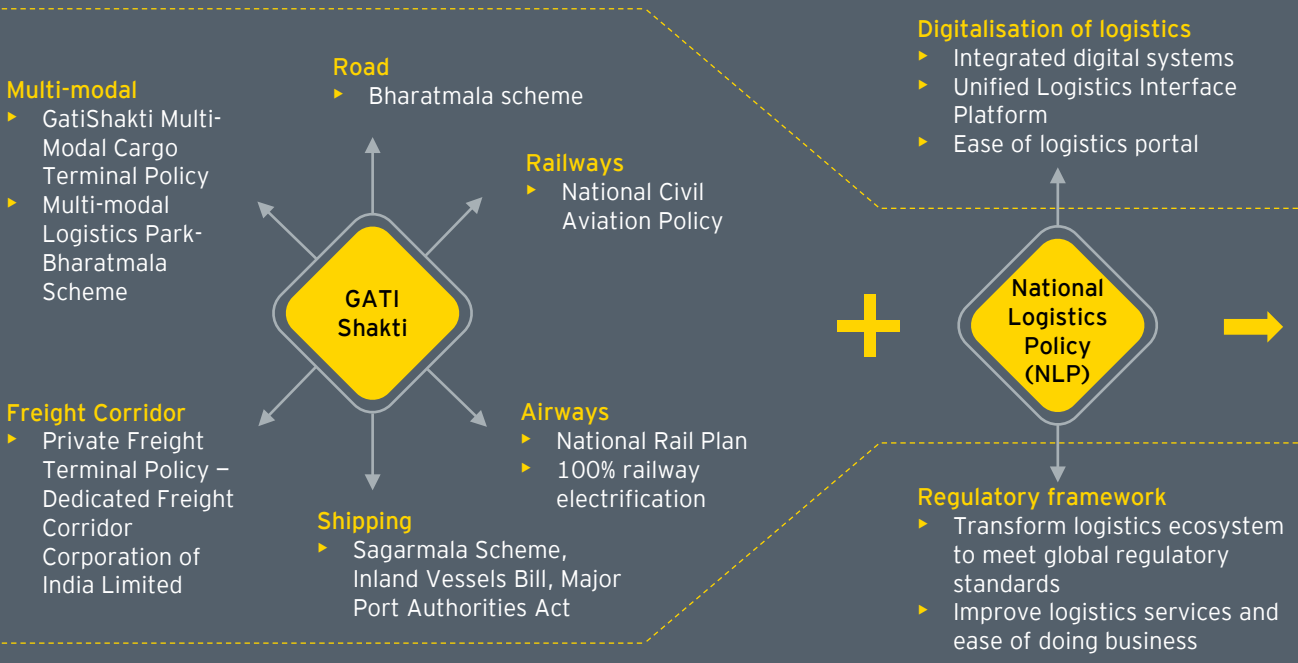
Sources: Business Standard, The Hindu

Vision@ 2047 is a guiding principle which is being supported by multiple regulatory and government initiatives to revamp India's logistics sector

Vision@ 2047 and its relevance in the logistics sector

<p>Vision@2047 aims to set specific targets for 10 sectors to transition India into a developed nation by 2047.</p>	<p>Road Logistics infrastructure</p> <ul style="list-style-type: none"> ▶ Build 32,000 km of expressway and access-controlled highways ▶ Invest US\$6t (INR 480-490 lakh cr.) for urban infrastructure development 	<p>Maritime infrastructure</p> <ul style="list-style-type: none"> ▶ Increase port capacity by four times to 10,000 MTPA
	<p>Rail infrastructure development</p> <ul style="list-style-type: none"> ▶ Invest ~US\$1.7t (INR 135-145 lakh cr.) over the next 25 years ▶ Target 40% to 45% railway share in freight transport by 2030 ▶ Develop seven hyperloop lines, including two for cargo 	<p>Air infrastructure development</p> <ul style="list-style-type: none"> ▶ Develop 20 new airports on aerotropolis approach
		<p>Multi-modal and logistics hub</p> <ul style="list-style-type: none"> ▶ Reduce logistics costs by augmenting cargo speed by two to three times (current average speed of intercity transport ~24 kmph) ▶ Build more than 70 multi-modal logistics park

Regulatory levers which are expected to help achieve Vision@ 2047



Ports, shipping and logistics in India: current scenario and outlook

The Government of India plans to invest ~US\$1.2t (INR 100 lakh cr.) in building a holistic infrastructure through GATISHakti.

GATI Shakti aims to strengthen local manufacturing, push exports, and raise possibilities of new futuristic economic zones, thereby making India a hub for world-class logistics infrastructure. Furthermore, the multi-modal connectivity plan aims to increase cargo handling capacity and reduce the turnaround time across all the transport modes.

NLP aims to develop a technology enabled, cost-efficient, resilient and sustainable logistics ecosystem

Initiatives taken under NLP include- automating EXIM processes for paperless clearances (eSanchit- e-Storage and Computerized Handling of Indirect Tax documents), building complimentary infrastructure related projects under Gati Shakti and reforming rail sector. NLP also focuses on improving seaport quality, engaging with private and MSME sectors to boost exports (for toys, textiles, chemicals) and facilitating modal shift in first and last mile logistics.

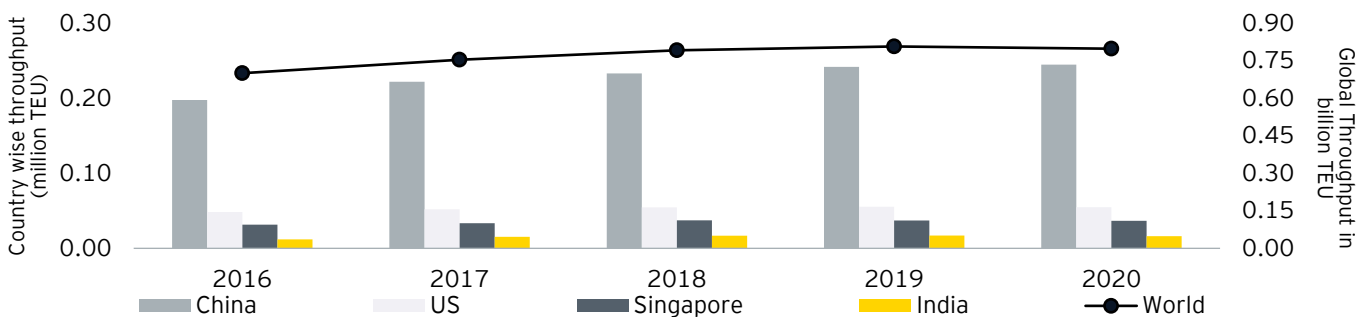
India's share of global "container port throughput" increased from 1.7% in 2016 to 2% in 2020. In contrast, China's share exceeded 30% in 2020

India's rank in "container throughput" improved from 16 to 11 in 2016 and has since remained constant.

Although "container throughput" reduced by ~1% (in 2020) globally, for India, it reduced by ~4%.

Also, India's share of global "container throughput" shrunk from 2.1% in 2019 to 2.04% in 2020. Though international maritime trade grew by ~3.2% in 2021, Indian shipments grew by 5.9% (in FY22).

Container throughput: Top three countries and India- 2020

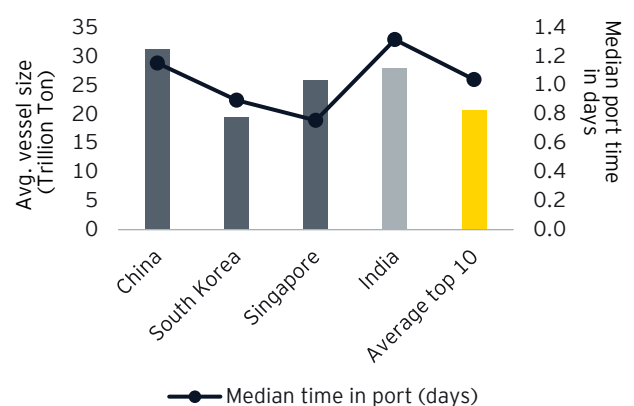


Sources: UNCTAD

Despite the relatively smaller size of vessels at Indian ports, their median time at port is much higher.

China's average vessel size is 1.12 times that of India's. Its median time in port is ~11% less. This is likely due to superior systems, process and enhanced level of digitization in Chinese ports.

Average vessel size and median time in port-2021

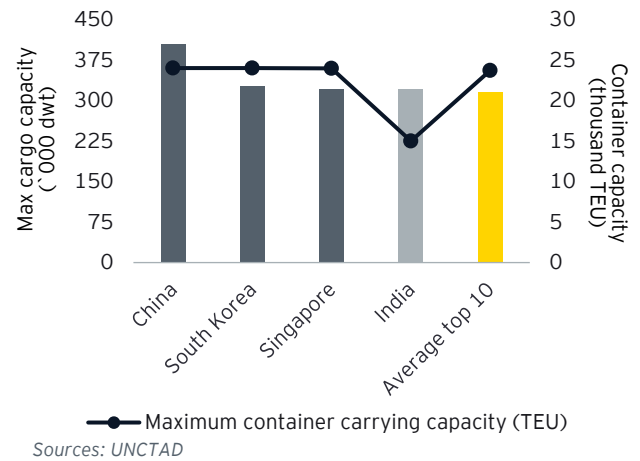


Sources: UNCTAD

India ranks 20th in “Max cargo carrying capacity for ship” and 40th in “Max container carrying capacity for ship”

For ports to handle container vessels above 16,000 TEU, a draft of 18 m to 20 m is essential. Not many Indian ports have sufficient draft to accommodate them. The lack of deep draft ports result in shipping lines bypassing India, thereby reducing transshipment opportunities.

Maximum cargo/container carrying capacity-2021

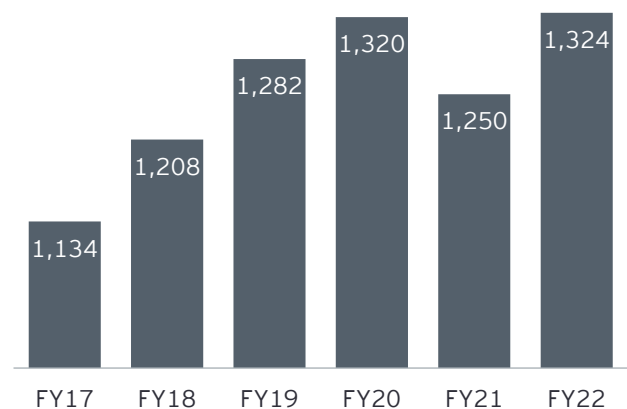


Cargo moved by Indian ports increased by 5.5% in FY22, and has already exceeded the pre-COVID-19 levels

Cargo moved via maritime transport is projected to increase by ~63.5% from FY22 to FY30

As of FY22, Kandla is the biggest Indian port handling 127.1 m ton cargo, followed by Paradip 116.1 million ton. POL (Petroleum oil and lubricants) was the most handled commodity by top Indian ports.

Cargo moved by Indian ports in million ton: FY17- FY22

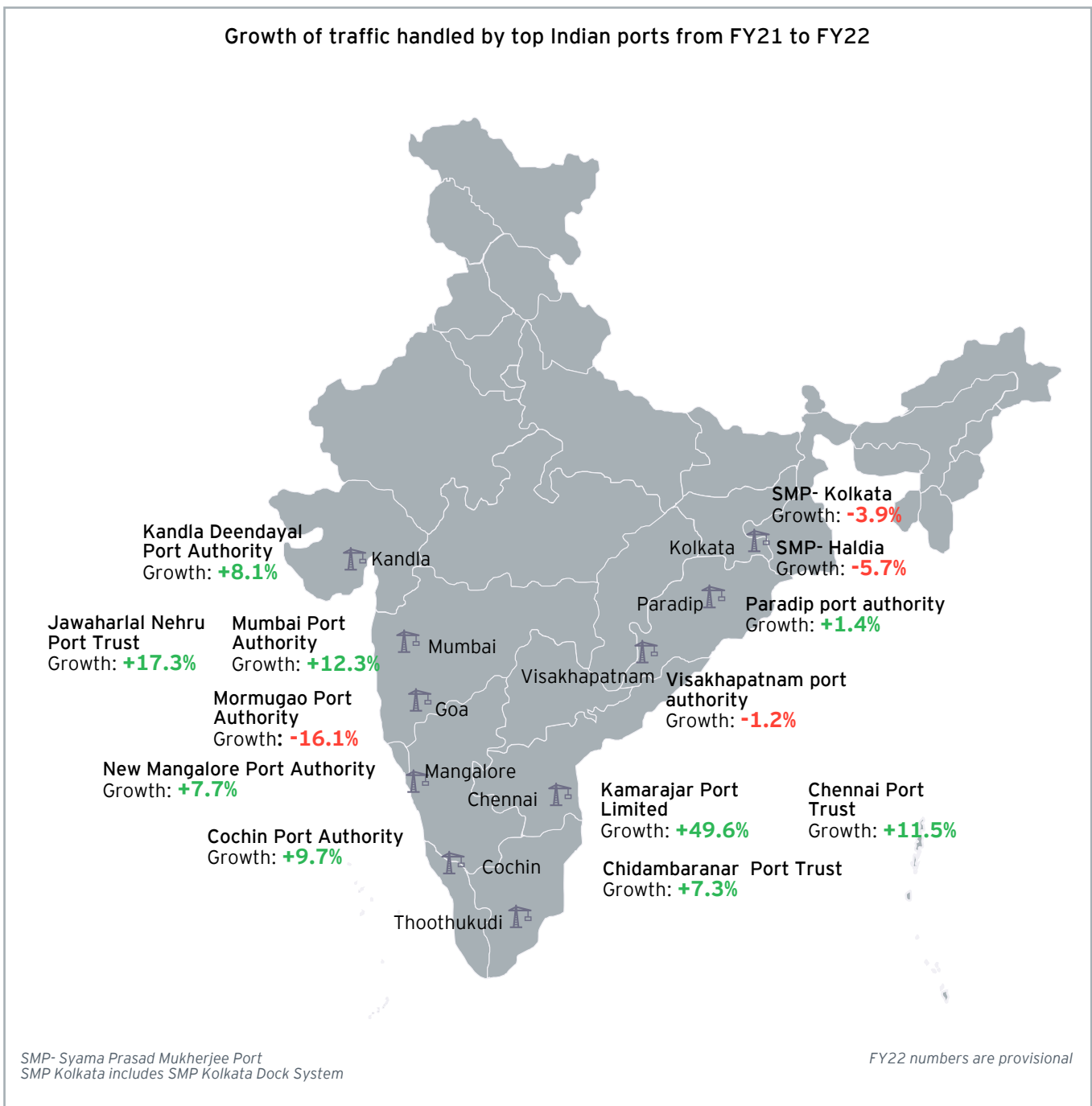


Source: Ministry of Shipping- India
FY22 numbers are provisional

Share of cargo handled for “Top ports” which average ~45% pre-COVID-19 has increased to 54.4% in FY22

Ports, shipping and logistics in India:

current scenario and outlook



Observation

The total cargo handled by top Indian ports increased by ~7% from 673 million ton in FY21 to 720 million ton in FY22. However, the share of total overseas cargo handled by these ports decreased from 78% in FY21 to 76% in FY22.

Observation

As of FY22, Kandla Deendayal port (267.1 million ton) followed by Paradip (249 million ton) are the biggest ports in India in terms of port capacity.

There is an opportunity to improve port capacity utilization, which remains underutilized due to mismatch in the growth of cargo and port capacity expansion

Top Indian ports performance- FY22

Port Location	Port Name (In order of capacity utilization)	Capacity Utilization %	Avg. output per ship berth- day (Ton)	Avg. turnaround time (days)
Mumbai	Mumbai Port Authority	75.8%	20,053	2.38
Kolkata	SMP Kolkata	70.5%	7,393	2.57
	SMP Haldia		14,589	2.13
Mumbai	Jawaharlal Nehru Port Trust	54.7%	29,418	1.15
Visakhapatnam	Visakhapatnam Port Authority	51.4%	16,069	3.08
Kandla	Kandla Deendayal Port Authority	47.6%	18,975	2.50
Paradip	Paradip Port Authority	46.6%	56,767	2.21
Cochin	Cochin Port Authority	44.0%	31,513	1.44
Chennai	Kamarajar Port Limited	42.6%	27,482	1.93
Mangalore	New Mangalore Port Authority	37.5%	19,627	2.00
Chennai	Chennai Port Trust	36.0%	20,152	2.22
Thoothukudi	V.O Chidambaranar Port Trust	30.6%	19,994	2.02
Goa	Mormugao Port Authority	29.1%	52,921	2.66

Source- Ministry of Shipping | FY22- provisional | List may not be exhaustive

Top state maritime board- capacity utilization for other ports- FY22

State Maritime Board (In order of capacity utilization)	Capacity Utilization %	Port Capacity (million ton)	Cargo handled (million ton)
Gujarat	73.4%	552.00	405.39
Odisha	59.3%	70.00	41.54
Andhra Pradesh	45.5%	193.40	88.00
Maharashtra	42.0%	125.00	52.47
Andaman and Nicobar	37.5%	4.11	1.54
Puducherry	34.4%	16.96	5.84
Tamil Nadu	31.3%	25.05	7.84
Kerala	29.9%	1.07	0.320
Karnataka	15.8%	5.00	0.79
Lakshwadeep	3.2%	5.82	0.18
Goa	0.3%	9.00	0.027

Source- Ministry of Shipping | FY22- provisional | List may not be exhaustive

As per international standards, ports should have an ideal surplus capacity of 30% for proper functioning. However, Indian ports have a surplus capacity of 53.1% for top ports (total cargo capacity- 1535 million tons) and 40.1% for other ports (total cargo capacity- 1007 million tons). The surplus capacity is due to the plan of augmenting India's port handling capacity and be ready for the upcoming potential growth in the sector.

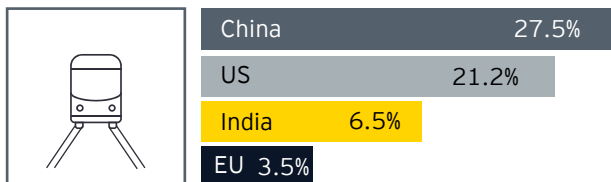
Ports, shipping and logistics in India: current scenario and outlook

India's rail, road and air freight sector is witnessing improvement. However, it needs regulatory and technological interventions to match global standards

In 2022, cargo moved by Indian railways increased by ~7.5% YoY to 1,497 million tons.

Currently, the share of Indian railways in total cargo moved is ~31% and GOI aims to increase this to 44% by 2051. To achieve this growth, challenges such as low level of containerization, higher cost for movement of lighter cargo and insufficient first and last mile connectivity need to be addressed.

Rail freight performance-India and peers (2020) Share- global rail freight (ton-km)



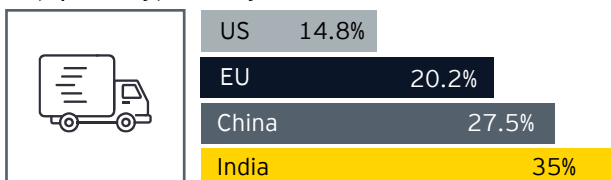
Average goods train speed in India increased by 83.5% to 43.2 kmph from FY20 to FY21. However, this pales in comparison to the high-speed freight train (350kmph) running in China.

Source: National Rail Plan

Congestion due to poor road conditions and absence of city bypass network has significantly impacted the average speed of trucks in India

Indian trucks cover an average daily distance of 250 km to 400 km, which is very less compared to 700 km to 800 km covered for trucks in the EU and the US. Moreover, India's fleet is skewed toward smaller 16 ton to 25 ton trucks which tends to be less cost-effective. This coupled with high empty running percentage increases the total cost of ownership, thereby increasing the cost of transportation drastically.

Road freight performance- India and peers- 2020 Empty running percentage



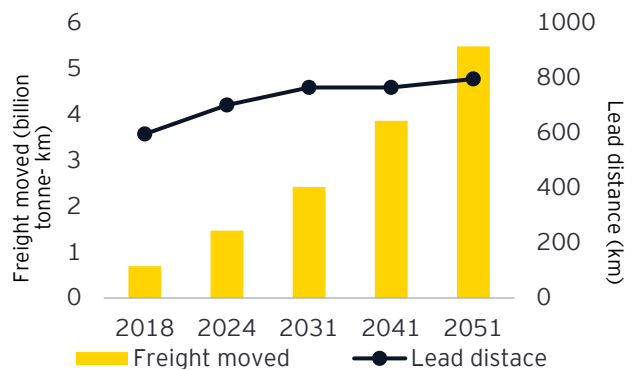
Trucks with a higher payload (which have a lower share in India) are more fuel efficient. For example: Freight cost (per ton-km) for 9T truck is ~US\$0.04 (INR 3.56) which is 2.5x that for a 40T truck.

Source: Niti Aayog, Ministry of Road Transport, Eurostat, Mahindra rise, ICCT

Rail share in traffic having lead distance of 300 km reduced from 51.5% in FY2008 to 32.4% in FY2019.

Development of new infrastructure and launch of super freight trains like 3.5 km long Super Vasuki is a welcome step for improving rail freight efficiency.

Rail- Cargo moved and projection (billion ton-km)



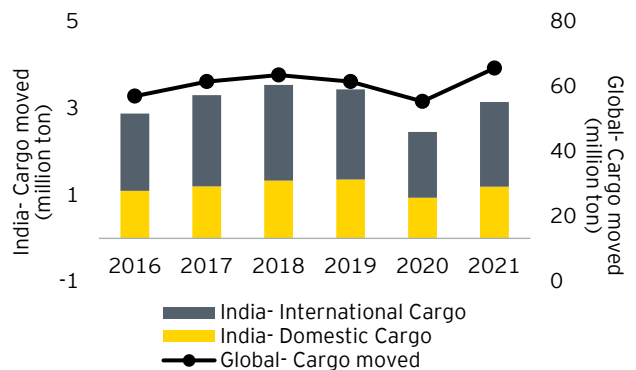
Source: National Rail Plan

With ~131 airports, India accounts for only ~0.3% of the global air cargo. ~62% of Indian cargo was international

Airlines transported ~35% of global cargo (by value) but less than 1% of world trade by volume. Average cargo load factor increased from 54% to 56% in 2021. The highest load factor (76%) was for Asia- Europe route in 2021. But, global freight in ton-km is projected to reduce from 272 billion ton-km in 2021 to 240 billion ton-km in 2023.

Federal airlines leads the list of top 15 airlines/logistics services, by moving most cargo (20.6 ton-km) globally in 2021. No Indian origin airlines/logistics service figures in this list.

Air- Cargo moved- India and the world



Source: Ministry of Civil Aviation, IATA, AAI, FAA

Stakeholders in shipping and logistics sector to revisit, elevate and resolve challenges and fast-track growth

Opportunity areas for India's shipping and logistics sector

Policy

- ▶ Lack of time bound land acquisition (coupled with diverse land acquisition regulations) and clearances resulted in a delay of ~850 government run projects (till Dec 2022).
- ▶ Lack of dedicated skill enhancement policy for logistics sector employees is a major impediment
- ▶ Effective implementation of National Logistics Policy requires a close coordination between central and state government. Effective execution of NLP requires establishment of ground level systems and processes for efficient implementation.

Business

- ▶ Involvement of multiple players and intermediaries results in several cargo exchanges, leading to cost escalation and inefficiency
- ▶ Unorganized players choose labor over technology because it is cheaper compared to investing in a forklift or hand-held computers
- ▶ Diverse export and import commodities result in a general mismatch between type of containers used (40ft for import and 20ft for export). This results in operational and financial challenges.

Manufacturing

- ▶ Due to dependence on imports, container availability is delayed hindering freight movement and results in loss of revenue
- ▶ Lack of shipping container manufacturing ecosystem in India creates a huge dependency for containers on global container leasing companies and Non-Vessel Owning Common Carriers (NVOCCs)

Infrastructure

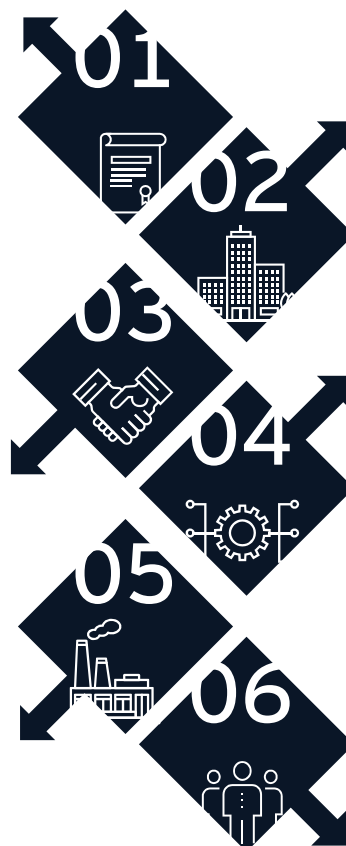
- ▶ Captive logistics infrastructure is a deterrent to inter-connect them with nationwide logistics infrastructure.
- ▶ Transition to hub and spoke model requires development of logistics parks, which are capital intensive.
- ▶ Arrival of bigger vessels at ports is limited by lower draft in Indian ports.
- ▶ Lack of modern equipment and processes increases vessel turnaround time.
- ▶ Uneven utilization of different modes of transportation for freight movement is a challenge.

Digital

- ▶ Absence of a database to map goods moved by road makes it difficult to have a data-based policymaking
- ▶ Existing government backed digital solutions have not been fully effective in offering end to end logistics visibility
- ▶ Lack of adoption of digital technologies results in inefficient route selection, manual processes and uninformed decisions, which increase cost of transportation

Manpower

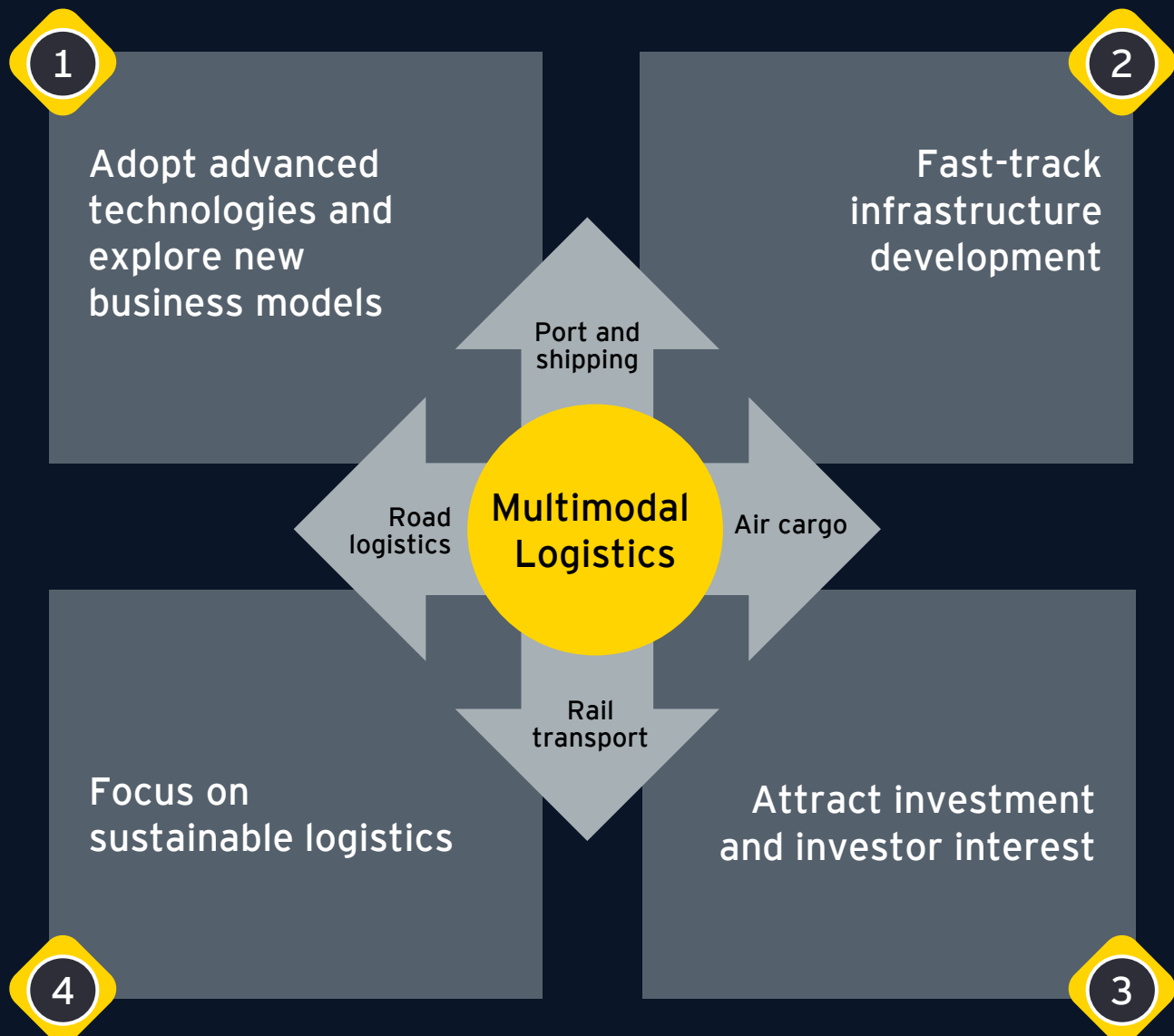
- ▶ Frequent labor unrests and unionization can impede the smooth functioning and infrastructure development
- ▶ Lack of attractiveness of sector fails to attract skilled personnel



Measures required to accelerate India's competitiveness in global ports, shipping and logistics sector



In order to address these challenges, EY and BCCI have developed the following strategies to enable the logistics sector and provide suitable solutions:



1

Adopt advanced technologies and explore new business models

COVID-19 pandemic, recent supply chain disruptions and increased focus on sustainability have led to increased adoption of technology-enabled solutions.

Drivers/triggers promoting digital adoption

Internal/operational	Logistics/inventory cost	Demand uncertainty	Labor shortages
	Increase-operational cost	Cyber-security	Nearshore, offshore decision
External	Muti-modal transportation	Government regulations/Mandates	Advanced technology
	Increasing focus on ESG	Transition to remote management	
Macro economic	Covid-19 pandemic	Conflicts/Wars	Inflation
	Geo-political challenges	Trade barriers	Climate driven disruptions

Shift in logistics priorities- adoption of digital technologies

End-to-end visibility and traceability

Manage data in real-time to generate strategic insights and improve productivity and process accuracy.

Networked supply chain

Transition from a linear, rigid supply chain to an integrated network, to increase agility and resilience

Automation and operational efficiencies

Improve productivity and decision making to increase speed to market

Compliance and sustainability

Driven by demanding stakeholder expectations, customers

COVID-19 pandemic and supply chain disruptions prompted logistics companies to monitor and gain visibility into their supply chains minutely. As a result, logistics companies have accelerated the pace of adoption of digital technologies across various modes of transportation and applications.



Measures required to accelerate India's competitiveness in global ports, shipping and logistics sector

Key technologies and their applications in various modes of transportation

	Blockchain	Big Data	Cloud logistics	Autonomous	Drones	Digital twins
Maritime	<ul style="list-style-type: none"> ▸ Smart contract ▸ Automated payment ▸ Smart bills of lading ▸ Certificate of origin ▸ EXIM license 	<ul style="list-style-type: none"> ▸ Port traffic management ▸ Vessel maintenance and performance analysis ▸ Spatial imagery analysis 	<ul style="list-style-type: none"> ▸ Ship/cargo monitoring solution ▸ Digital freight forwarding 	<ul style="list-style-type: none"> ▸ Autonomous vehicles for yard management ▸ Autonomous ships 	<ul style="list-style-type: none"> ▸ Security and surveillance ▸ Maritime search and rescue 	<ul style="list-style-type: none"> ▸ Port and terminal operation management ▸ Fleet optimization-virtual transition of ship control system
Road	<ul style="list-style-type: none"> ▸ Real-time tracking ▸ Claims management ▸ Route optimization ▸ Labor management 	<ul style="list-style-type: none"> ▸ On-board diagnostics ▸ E-logs ▸ Vehicle navigation ▸ Smart sensors for safety 	<ul style="list-style-type: none"> ▸ Transport management system ▸ On-demand truck transportation portal ▸ Real-time pricing 	<ul style="list-style-type: none"> ▸ Autonomous trucks 	<ul style="list-style-type: none"> ▸ Optimize middle, last-mile delivery ▸ In-transit vehicle inspection ▸ Emergency deliveries 	<ul style="list-style-type: none"> ▸ Route planning ▸ Identification of constraints
Air	<ul style="list-style-type: none"> ▸ Optimize airport resource usage ▸ Develop air cargo network ▸ Information exchange 	<ul style="list-style-type: none"> ▸ Weather updates ▸ Safety reports ▸ Ground operation automation ▸ Dynamic pricing 	<ul style="list-style-type: none"> ▸ Cargo and asset management 	<ul style="list-style-type: none"> ▸ Autonomous vehicles for airport management 	<ul style="list-style-type: none"> ▸ UAV transport 	<ul style="list-style-type: none"> ▸ Optimization of air traffic systems
Rail	<ul style="list-style-type: none"> ▸ Network optimization ▸ Cargo tracking ▸ Monitor track condition 	<ul style="list-style-type: none"> ▸ Demand planning ▸ Intermodal monitoring system 	<ul style="list-style-type: none"> ▸ Real time tracking ▸ Delivery updates 	<ul style="list-style-type: none"> ▸ Autonomous trains 	<ul style="list-style-type: none"> ▸ Rail track surveillance ▸ Railroad Infrastructure inspection 	<ul style="list-style-type: none"> ▸ Predictive maintenance of rail tracks
Ware-house	<ul style="list-style-type: none"> ▸ Demand forecast ▸ Inventory management ▸ Anti-theft solutions ▸ Labour Management 	<ul style="list-style-type: none"> ▸ Network performance analysis ▸ Dispatch management ▸ Multi-channel order fulfillment 	<ul style="list-style-type: none"> ▸ Order management ▸ Warehouse management ▸ Multi-channel platforms 	<ul style="list-style-type: none"> ▸ Robotic application for order management 	<ul style="list-style-type: none"> ▸ Inventory management ▸ Order scanning and collection 	<ul style="list-style-type: none"> ▸ Warehouse simulations



Measures required to accelerate India's competitiveness in global ports, shipping and logistics sector

Adoption of blockchain, big data and cloud computing is transforming the operational efficiency for logistics companies

Blockchain - focus areas

Automation and efficiency
Physical and digital security
Visibility and resilience
Enhanced customer experience

Globally, the adoption rate of blockchain technology is higher in shipping and transportation industry. In India, blockchain adoption is gradually increasing, especially as part of multiple government initiatives such as the Electronic Cargo Tracking System.

Big Data Analytics - focus areas

Automation and efficiency
Environmental Sustainability
Visibility and Resilience
Enhance Customer Experience

The adoption of this technology globally is significantly higher across all functions of logistics. In India, the emergence of logistics start-ups backing this technology is gradually transforming the unorganized transportation sector.

Cloud logistics – focus areas

Transportation and warehouse systems
Operational Efficiency
Physical & Digital Security
Visibility and resilience

Compared to other technologies, affordability of onboarding this technology is the primary reason behind its high adoption in the logistics industry. Numerous start-ups are implementing these solutions to support heavy operational processes at a relatively low price.

Blockchain is being used by logistics companies and ports globally to improve operations and reduce unwanted costs

One such example is Maersk, which collaborated with Dutch customs and the US Department of Homeland Security to track cargo movement using blockchain. Blockchain helps with digital documentation and smart contracts and is being actively used in the ports of Antwerp, Rotterdam, and Singapore. Rotterdam port is using blockchain to make administrative and financial streams paperless.

The Ministry of Finance, India, has piloted E- Cargo Tracking System (ECTS) for secure documentation and GPS-tracking of containers

Test run of ECTS was carried out at the Inland Container Depot of the Tughlakabad Import Commissionerate. Post successful completion of the pilot, the initiative may be launched across India after an assessment of cost, time, and compliance. Also, the launch of Open Network for Digital Commerce by the Indian government in 2022 may lead the way for increased adoption of blockchain in digital commerce.

Measures required to accelerate India's competitiveness in global ports, shipping and logistics sector

Big data-based solutions help to optimize operations, renew port assets while ensuring optimum cyber security

In Singapore and Malaysia, ports utilize big data analytics to create advanced inspection systems to assess the history and cargo type of importers. Port of Cartagena uses multiple solutions for IoT analytics which help forecast equipment failures. To implement big data analytics, shipbuilders and shipping companies have been entering into partnerships with leading technology suppliers and universities.

Cloud-based solutions streamline logistics through fleet management, inventory management and cargo tracking

Hamburg Port uses cloud-based data analytics tool "SmartPort Logistics" to regulate vessel operations. Global logistics company DHL integrates logistics marketplaces using cloud-based technologies for transparent shipping options, shipment tracking, and last-mile delivery.

Several Indian start-ups are using predictive data to enhance operational efficiency

Additionally, they are using big data technology extensively for on-demand freight booking, increasing fuel efficiency, pooling truck drivers, route optimization, etc. A report by NASSCOM (National Association of Software and Services) anticipates that India's big data analytics market will reach US\$16b by 2025, which places it among the world's top 10 big data analytics market.

Indian Ports Association leveraged ERP to connect major ports to decrease turnaround time, and increase ease of doing business

Another major initiative taken by the Indian Ports Association is the introduction of NLP- Marine. It aims to be a centralized hub for the electronic flow of trade related information for all ports and ports related entities. It is being replaced by NLP- Marine.

“

Everything comes around the cost involved with the digitization. Once this factor is addressed, digitization in international trade will happen very rapidly.



Ravindra Rajwade,
*Shipping & International
Logistics Professional*

Measures required to accelerate India's competitiveness in global ports, shipping and logistics sector

Autonomous vehicles and drones are expected to play a pivotal role in middle and last mile logistics while digital twins help to pre-empt disruption in supply chain

Autonomous vehicles - focus areas

Sustainability

Safety

Cost-efficient

Automation

Based on infrastructure development, penetration of autonomous trucks is expected to increase in the logistics market in the next 5 to 10 years. Adoption of this technology has already begun in the US, China, and the Europe under controlled environment like port terminals, yards, warehouses, airports, etc.

Drones - focus areas

Middle and last-mile deliveries

Security and surveillance

Increase logistics efficiency

Enhanced customer experience

Drones are currently deployed in case of emergencies when medical and relief packages are required to be transported to remote areas. However, different regulations across countries and regions delay drones' mass adoption and deployment in logistics.

Digital twins- focus areas

Freight handling

Efficiency at warehouses, yards, etc.

Customer experience

Protection to shipments

Digital twins use simulations to build resilience against natural disasters, cyberattacks and others. By using satellite and navigation systems, they help assess the entire journey of shipments. Virtual layouts help companies redesign warehouses to enhance productivity without impacting operations.

Not only are autonomous vehicles being tested/introduced in road and maritime logistics, but also in port operations

With autonomous technology in its initial stage, Volvo Autonomous Solutions and its commercial partners are collecting data with a sensor-equipped truck in the Gothenburg, Sweden, port area. But start-ups, such as TuSimple, have already completed the testing of fully autonomous semi-trucks on public roads in July 2021. Also, Orca AI partnered with NYK line, to trial the first autonomous commercial cargo ship in the congested waters of Tokyo Bay successfully. This was a landmark moment in the application of autonomous ships.

Although usage of autonomous vehicles has not yet started in India, Indian shipyards are developing autonomous ships

Cochin shipyard is manufacturing two autonomous, zero-emission electric ferries for Norway-based company ASKO Maritime AS. These vessels will be used to transport trailers across Oslo Fjord between two of ASKO's distribution centers.

Measures required to accelerate India's competitiveness in global ports, shipping and logistics sector

Logistics companies are partnering with drone manufacturers to assess the feasibility of delivery by drone

FedEx Express is testing middle-mile autonomous drone delivery through a partnership with Elroy Air to improve operational efficiency and safety. Drone can autonomously carry 300 500 pounds of cargo up to a distance of 300 to 500 miles. In Europe, DHL has partnered with Dronomics to use drone for middle-mile, cross-border, and inter-city transportation.

Globally, digital twins help to identify potential weaknesses from production to delivery

Ericsson and the port of Livorno in Italy are working to create a digital twin to remove the inefficiencies in freight handling and loading and unloading of shipments. This is being achieved by creating a real-time digital replica of the port area using a 5G network, smart sensors, LiDAR and advanced cameras.

In India, the usage of drones for commercial transportation is low, but recent government initiatives are expected to change that.

The demand is expected to be spearheaded by pharmaceutical and e-commerce industry. A typical case of this is the delivery of vaccines in the Northeast by Health Ministry as part of Drone Response and Outreach (i-Drone). Also, the passage of "Drone Rules 2022" is a welcome step as it legalizes operation of drones (up to 2 kg) for non-commercial purposes. In addition, budget FY2022, as part of 'Drone Shakti', aims to support drone start-ups.

Indian companies do not have adequate data sets to utilize digital twins to the fullest.

While these new-age tools can help companies, they need historical and newer data to predict irregularities. However, with the rapid adoption of Warehouse Management Systems or Transport Management Systems, and Supply Chain Visibility Tools, the adoption of a digital twin is set to increase.

“

Technological advancements and global regulations will impact the international shipping and logistics industry. India needs transparency in the logistics process and GOI needs to focus on the integration of the e-way bill and tollgates with the GST. This will align all the three major stakeholders, which are shippers, consignee, and carriers.



Mr. Dharmendra Gangrade,
*Head of Logistics Management
Center, L&T Ltd.*

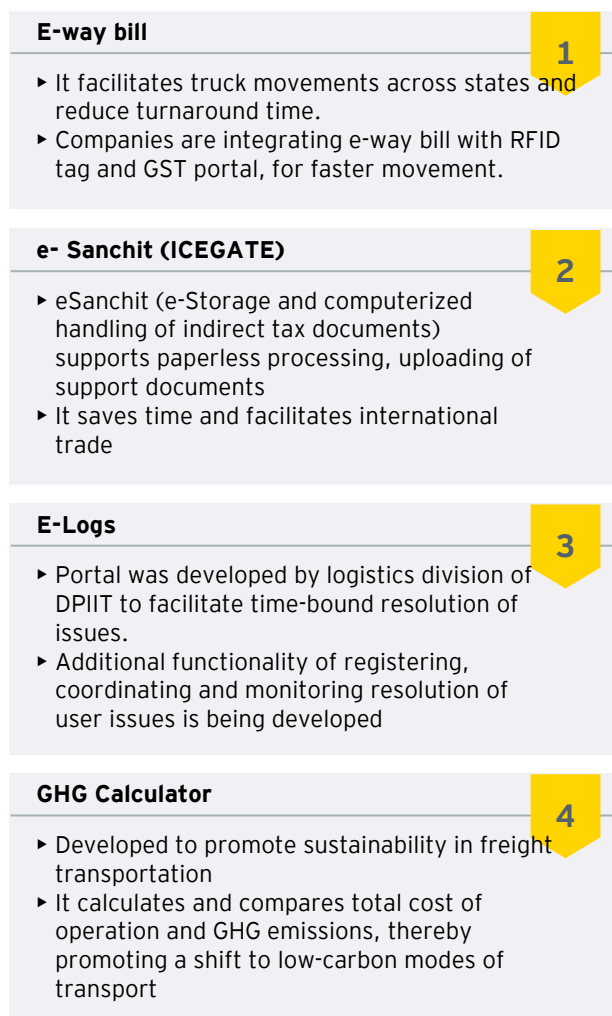
Measures required to accelerate India's competitiveness in global ports, shipping and logistics sector

Existing digital technologies have increased speed of movement of goods, and GOI is putting significant efforts to ensure end-to-end supply chain visibility

Enablers of digital adoption in India

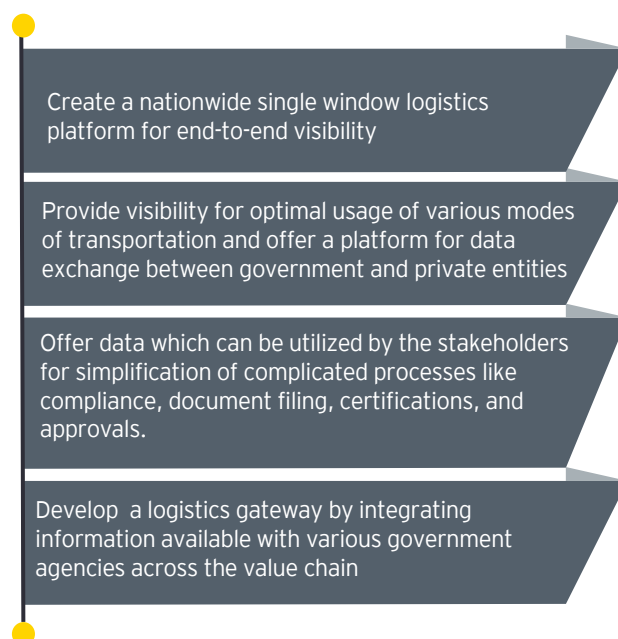


Indian government's digital solutions

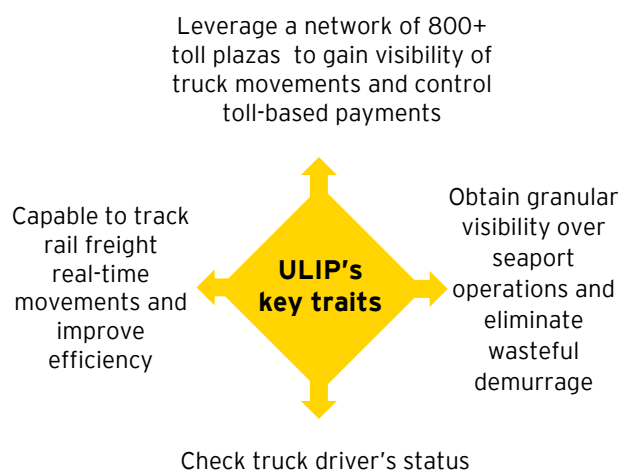


Unified Logistics Interface Platform (ULIP)

In order to provide real-time information to all stakeholders in the logistics value chain, GOI has developed ULIP. It is positioned to be a unified platform that offers information related to logistics-related services such as cargo/ shipment visibility, authorizations, and certifications seamlessly.



ULIP integrates 24 systems, 78 APIs and 1,454 fields across waterways, ports, shipping, civil aviation, railways, DGFT and customs and road transport and highway



Measures required to accelerate India's competitiveness in global ports, shipping and logistics sector

To build a state-of-the-art port ecosystem, a collaborative approach for digital transformation is being conceptualized

Digital transformation involves the adoption of port-based Enterprise Business System (EBS) to improve work processes

As part of detailed business process reengineering, implementation of EBS aims to standardize processes across all ports and build an all-inclusive connected port eco-system for maritime trade.

This is a major step toward port modernization and automation, which aims to foster growth and development of major public sector ports.

Vision for port-based EBS

To build a world-class port ecosystem which:

Promotes ease of doing business

Driven by transparent, simple and error-free business processes

Uses technology to achieve strategic business objectives

Integrates seamlessly with prevalent systems and devices

NLP aims to be a one-stop platform to connect all stakeholders to improve efficiency and transparency

NLP plans to cover all trade processes of the logistics sector across all modes of transportation. This is complimented with an E- marketplace, thereby providing end-to-end coverage for EXIM Trade.

Implementation of NLP has been initiated with the development of NLP Marine in the first phase. NLP-Marine can integrate with- Port Operating Systems/ Terminal Operating Systems, ICEGATE, multiple regulatory agencies, among others. It aims to reduce regulatory complexities and enhance ease of doing business.

Some of the modules available for NLP- Marine are: Common Application Form (CAF) module, e-VGM (as latch-on with service providers), Booking (as latch-on with service providers), Transport Module, E-SEAL Module, Finance Platform, Insurance Platform, Documents Exchange Module

Benefits for traders

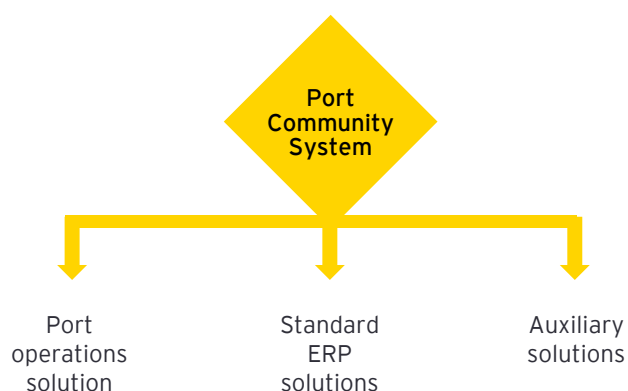
Increases visibility and access to logistics service providers across India

Offers access to competitive rates for various logistics services

Assists in EXIM certification through NLP single window certification system

Gives access to useful statistics and dashboard for efficient business planning

EBS involves integration of core solution components with Port Community System



Benefits envisaged from the system

Improves operational efficiency through common standardized business processes and operating model

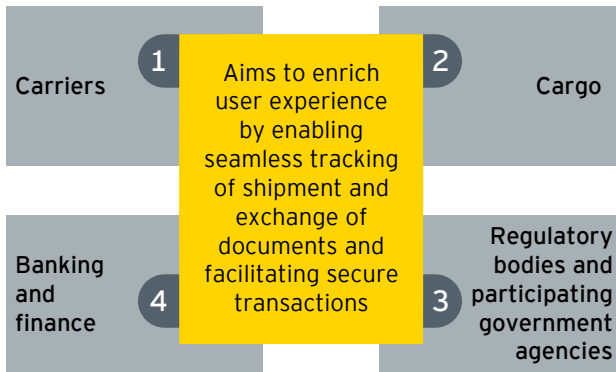
Enables faster request processing in delivery of services with better turnaround time

Reduces manual intervention/documentation

Improves transparency and accessibility of information with integrated processing of application and service request

Measures required to accelerate India's competitiveness in global ports, shipping and logistics sector

Activities of NLP Marine are categorized into four distinct verticals:



Benefit for Logistics Service Provider (LSP)

Gives pan India visibility of services and access to prospective users

Offers an opportunity to increase business volume and capacity utilization

Improves collaboration between LSPs for providing end-to-end solutions to users

Reduces time and effort for obtaining regulatory clearances

Technological advancements and global supply chain disruptions have resulted in the development of new business models

Factors driving new business models

Internal/operational	Labor shortages	Utilization of fixed assets	Labor shortages
	Business expansion plans	Shrinking market share	Sustainability goals
External	Increased competition	Emergence- new tech. start-ups	Customer preferences
	Market penetration of e-commerce industry		Supply chain constraints
Macro economic	Government initiatives to reduce carbon emissions		Post- pandemic trends

Key shifts in logistics priorities for new business models

Emergence of digital technology-based marketplaces

Collaborative logistics model

Circularity-based model

Changing customer preferences and the evolution of disruptive technologies have led to the introduction of new business models. In addition, emergence of digital start-ups is also transforming the traditional logistics companies. They are developing in-house digital solutions and/or are collaborating with logistics companies to form new business models.

Measures required to accelerate India's competitiveness in global ports, shipping and logistics sector

Digital marketplaces- focus areas and types of business models

Freight matching

On-demand service to customers

Optimization of vehicle fleet capacity

Agility and flexibility

Adoption in the logistics industry



High

Medium

Low



High

Medium

Low

Global



Digital freight forwarders

- ▶ Uses digital tools that help in communication and get quick status updates regarding a shipment
- ▶ Digital freight forwarder employs a transparent system that provides a comparison of various carriers to customers

Global

Flexe



Indian



On-demand warehousing

- ▶ Gives logistics providers access to shared warehouse and logistics services on pay-per-use basis
- ▶ Industries that benefit range from hospitality to FMCG and industrial manufacturing.

Global



Indian



Digital load boards

- ▶ Known as a freight matching service, the digital load boards help connect shippers and carriers.
- ▶ It is an online marketplace where truck owner-operators, shippers, and freight brokers can post the load they have available as well as find available loads.

Global



Crowdsourcing model

- ▶ It is a fulfillment method that allows owner-operators and individuals to use their assets to transport products
- ▶ Model applies to last, middle, or first-mile transportation and offers companies an opportunity to cut costs and maximize supply chain efficiency.

Global



Workforce marketplace

- ▶ Provides a platform that connects logistics providers with available workforce like truck drivers
- ▶ It helps optimize personnel resources and address the volatility of workforce demands.

70% to 80% of the logistics companies have built or are planning to build or purchase the marketplace models to increase customer base and efficiency in their services

Measures required to accelerate India's competitiveness in global ports, shipping and logistics sector

Collaborative logistics facilitates companies to have a platform to share assets. Circularity is expected to grow with an increased focus on sustainability.

Collaborative logistics/Asset sharing model- focus area and use cases

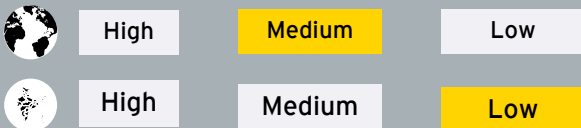
Combined usage of assets

New sources of revenue

Capacity utilization

Cost efficiency

Adoption in the logistics industry



Global companies explore ways to utilize their distribution center fully, by providing storage, fulfillment services to others

"Fulfillment by Amazon" is one such example of shared services or supply chain as-a service in retail distribution. Many parcel delivery companies, such as DHL and UPS, have developed joint parcel stores to reduce warehouse cost. This is also helping companies, such as DB Schenker, who have partnered with online freight exchange provider uShip to map truck drivers and shipments efficiently.

Although the usage of collaborative logistics model is low in India, the GOI is launching multiple initiatives to promote it

One such initiative is ULIP, which is a technological platform, currently in the testing stage. It collaborates with ministries, trade bodies, and logistics companies to offer a common data platform that enables optimum use of logistics modes, thereby saving cost and time.

Circularity Model- Focus area and use cases

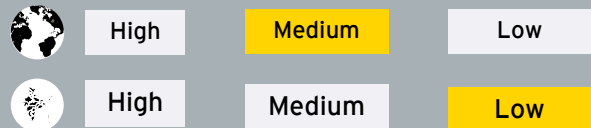
Sustainability

Customer experience

Net zero emissions

Cost efficiency

Adoption in the logistics industry



Re-commerce returns shipment to in-country recycle and resell channels reduces the original retailer's freight and storage cost

UPS enabled a circular economy through smart and sustainable logistics by integrating circular economic principles into its business model. This helps customers reclaim or refurbish products and materials for subsequent use. Also, FedEx introduced reusable packaging designed for shipments up to 2.5 kg. These shipments are resealable and facilitate product return without the additional waste.

Globally, policymakers and regulators have identified circularity as focus area and remain a significant initiative

To reduce wastage, the EU mandated that by 2025, textiles will have to be collected separately from household waste. Moreover, to promote sustainability, the UK government has launched a joint initiative with the private sector to offer funding of ~US\$200 million for research on new forms of packaging from plants, wood chippings, and food waste.

“

In line with India's COP22 commitment to global climate change, it is time to think differently and review our strategy, identify sector-specific industrial clusters from the current model of need to promote and facilitate industrial zones/clusters with complementary industries and contribute to a circular economy model, where one industry's input is the output of the other, thereby reducing carbon footprint.



Capt. Ram Iyer,
Sr. VP, Seahorse Ship
Agencies Pvt. Ltd.

Measures required to accelerate India's competitiveness in global ports, shipping and logistics sector

Adoption of digital technologies in India's logistics sector is in a nascent stage and will need significant intervention by industry and GOI for higher effectiveness

Challenge	Opportunity areas	Recommendations
Absence of a comprehensive digital tool for end-to-end cargo tracking and an inclusive digital marketplace	<ul style="list-style-type: none"> ▶ To address this, GOI launched NLP-marine, which is positioned as an inclusive digital marketplace ▶ As a result, the port community system, which provided limited cargo visibility, is being phased out ▶ However, NLP-Marine only offers tariff rates and customers cannot make any transactions 	<ul style="list-style-type: none"> ▶ Complete transition from port community to cargo community system ▶ NLP- Marine should also offer transactional rates and allow users to bid on them ▶ Need for IT supported block handling system, which can increase efficiency ▶ Indian research institutions can be roped in to develop a comprehensive digital solution and ensure neutrality of application
Legacy systems and manual processes limit insights and productivity	<ul style="list-style-type: none"> ▶ Lack of digitization leads to manual intervention which affects productivity ▶ For e.g., manual review of purchase order before sending it to the vendor ▶ In 2020, GOI announced plans to implement Enterprise Business Systems in Mumbai, Chennai, Deendayal, Paradip and Kolkata ports at a cost of ~US\$40m (INR 320 cr.) 	<ul style="list-style-type: none"> ▶ Service providers and customers need to carefully consider adoption of digital technologies and upgrade their legacy systems ▶ GOI should fast-track deployment of enterprise business software for faster digital adoption ▶ Seamless implementation is required across multiple government bodies to avoid siloed communication
Reduced interoperability between systems and subsystems results in siloed implementation of digital solutions	<ul style="list-style-type: none"> ▶ Stakeholders may digitize operations at different pace and intervals. Each may use a different solution and integration of multiple solutions may be challenging ▶ Diverse regulations for data storage, protection and management may result in siloed collection and processing of information 	<ul style="list-style-type: none"> ▶ Participation by all logistics stakeholders in global initiatives, such as ICC- DSI (Digital Standards Initiative), may help facilitate seamless exchange of data ▶ Stakeholders need to have a robust understanding of complex regulations of data protection and privacy
Effectiveness of integrated end-to-end logistics solutions remains challenging	<ul style="list-style-type: none"> ▶ Companies offering end-to-end integrated logistics solutions are still dependent on intermediaries for services across the supply chain ▶ Resultant multiple cargo exchanges increase inefficiency ▶ Intermediaries charge higher margins, thus increasing the cost of operation significantly 	<ul style="list-style-type: none"> ▶ Offering "risk liability ownership" with integrated logistics solutions can help improve effectiveness ▶ Consolidation of some operations handled by intermediaries can help reduce cargo exchanges and drive efficiency

2 Fast-track infrastructure development

Major infrastructure initiatives undertaken by the Government of India

Recognizing the importance of improving and building new roads, railways, ports infrastructure, etc., the government has increased its budgetary allocations. Simultaneously, GOI is also undertaking measures to attract private capital and implement administrative reforms to make the process for planning and executing infrastructure investments efficient.

GatiShakti National Master Plan – a holistic approach for optimal utilization of infrastructure and predictive decision making for seamless intermodal logistics movement



Below are key project investments undertaken by ministries across various modes of transportation and logistics.

Dedicated Freight Corridor (DFC)

In line with the GOI's initiatives to improve efficiency of logistics in India, Indian Railways have taken a major step toward providing better freight transportation. Indian railways through Dedicated Freight Corridor Corporation of India Ltd. have set up two DFCs which are high speed and high-capacity railway corridors that are exclusively meant for transportation of freight.

Total budget allocation	US\$37.5b (INR 3 Lakh cr.)
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The Western DFC is 1,504 km long and runs from Dadri near Delhi to Jawaharlal Nehru Port, near Mumbai. It is designed for speeds up to 100kmph and has reduced the traveling time from three days to one day. It is being developed in collaboration with the Japan International Cooperation Agency (JICA). Eastern DFC is 1856 km long, running from Ludhiana in Punjab to Dankuni near Kolkata.

Major objectives of DFC

70%	Total railway freight to be moved to DFCs
180%	Improvement in freight movement speed.
40%	Reduction in O&M cost.
30%	Reduction in transportation cost.

India will need to speed up dedicated freight infrastructure connecting four major metros. So far, only around 1,724 km out of planned 2,843 km direct freight corridor got commissioned as of Jan 2023. DFC is an important part of National Rail Plan 2030, which aims to increase the rail share from 26% to 45% over the next 10 years. Higher rail share will result in significant logistics cost savings for manufacturing companies. In addition, new rail infrastructure can boost industrial townships along the freight corridor.

Measures required to accelerate India's competitiveness in global ports, shipping and logistics sector

Bharatmala

The Government of India launched "Bharatmala Pariyojana" in 2017, a new umbrella program for the highways sector that focuses on optimizing the efficiency of road traffic movement across the country by bridging critical infrastructure gaps. The project covering a whopping 34,800 km of the road would be completed in a phased manner.

- ▶ Under the Bharatmala Phase-I, a total of 34,800 kms of highway is to be constructed (24,800 km through Bharatmala and 10,000 km through National highways development project (NHDP))
- ▶ The first phase was scheduled from 2017 to 2022 and work on phase 2 was to be completed by 2028.

Targets envisaged for Bharatmala

Key Performance Indicator	From	To
Highway corridors	6	50
Freight percent on National Highway	40%	70-80%
Number of districts connected with four-lane highway	300	~550

Sagarmala

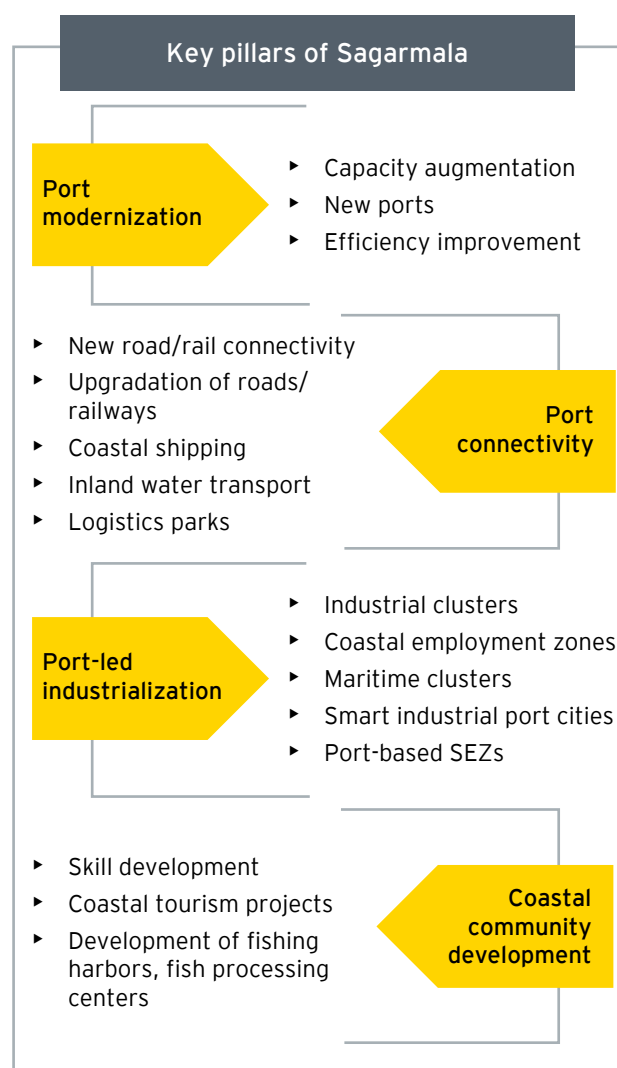
Sagarmala Programme for port-led development comprises 1,537 projects and the capital expenditure outlay of US\$81b (INR 6.5 Lac cr.) by GOI. The program will modernize existing ports, set up new mega ports, and establish Coastal Economic Zones and Units. The prime objective of the Sagarmala project is to promote port-led direct and indirect development and to provide infrastructure to transport goods to and from ports quickly, efficiently and cost-effective.

Sagarmala Project Vision

To reduce logistics cost for both domestic and EXIM cargo with optimized infrastructure investment. Sagarmala aspires to reduce logistics costs for EXIM and domestic cargo leading to overall cost savings of ~US\$5b (INR 35,000 to 40,000 cr.) per annum.

How can the Sagarmala program enhance logistics performance?

The Sagarmala program has improved the performance of India's logistics sector by leveraging the country's waterways and coastlines. It was launched with the goal of cutting logistical costs and reduce carbon emissions by 12.5 metric ton per year through transportation.



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India occupies ~2% of global trade, where major players are the US and China. To compete with these, India needs to become a manufacturing hub for the world by increasing the export volume. Investors are ready to invest in Indian terminals, but major challenge is access to consolidated land.



Mr. Manish Puri,
President, ACTO

Measures required to accelerate India's competitiveness in global ports, shipping and logistics sector

MMLPs bring together road and rail: the two most important transport modes comprising ~90% of the country's cargo movement

National Highways Logistics Management Limited under the Ministry of Road Transport and Highways (MoRTH) and the National Highways Authority of India (NHA) are leading the development of Multi-Modal Logistics Parks (MMLP) in a hub-and-spoke concept to strengthen the nation's freight logistics sector.

MoRTH is currently implementing 37 MMLPs that will be developed through Public Private Partnership (PPP) in the Design, Build, Finance, Operate, and Transfer (DBFOT) mode with a capital allocation of US\$6.25b (INR 50,000 cr.). MoRTH minister Nitin Gadkari laid the foundation stone of India's first multi-modal logistics park at Jogighopa, Assam in October 2020.

Success factors for MMLPs	
Success factor	Description
Connectivity to adjacent nodes	▶ Ability to cater to demands of adjacent nodes will improve business viability of logistics parks
Non-competing infrastructure	▶ Strong coordination is essential across multiple government entities developing similar infrastructure so that competition can be avoided
Competent service providers	▶ Ability to attract world-class 3PL service providers for developing and operating the logistics parks at a high service level will be critical to ensure the success of the logistics parks.
Complementary policies	▶ A comprehensive policy governing multi-modal freight transportation for domestic freight movement needs to be developed.
Early involvement of all stakeholders	▶ Early involvement and alignment of all relevant stakeholders will be critical to ensure faster development of logistics parks.
Adopting digital solutions	▶ Use of technologies like demand forecasting, warehouse management systems, and other digital enablers is essential

Key benefits of MMLP

MMLPs improve the utilization and performance of inland container depots (ICDs) and container freight stations where they exist.

Reduced Transportation Costs

- ▶ Logistics parks would provide a 10% reduction in transportation costs for the top 15 nodes
- ▶ It will improve the inter-fleet mix by enabling freight movement on higher sized trucks and rails

Reduction in CO2 emissions

- ▶ Increased freight movement by larger sized trucks and rail will enable ~12% reduction in CO2 emissions for top 15 nodes
- ▶ Freight movement by rail has 65% less CO2 emission compared to road freight on a per ton per km basis

Congestion reduction

- ▶ Increased freight movement on higher sized trucks and rails will result in ~20% reduction in freight vehicles catering to the demands of the top 15 nodes

Proposed MMLPs will need an investment of over US\$6.25(INR50,000 cr.) from the private sector. The projects will include warehouses, specialized cold chain facilities, freight/container terminals, and bulk/break-bulk cargo terminals and will help in achieving better modal mix in favor of rail. Interest from private sector is subdued so far due to the large investment size and uncertainty in demand. For this to take off, the government will need to bring in demand enablers through preferential shifting of rail cargo handling to designated MMLPs.

Other infrastructure expansion opportunities

India has a vast layout of infrastructure, handling 4.6b tons of goods each year, amounting to a total annual cost of ~US\$119b (INR 9.5 lakh cr.). Recognizing the critical role of logistics and transportation, it is imperative to enhance the logistics infrastructure to support this fast-paced growth.

Fast-paced growth

India has recently emerged as the fifth largest economy in the world and with the fast pace of economic growth, it is projected to grow and become the fourth largest economy by overtaking Germany in 2025 and the third largest in 2027 by overtaking Japan. On the basis of an adjusted purchasing power parity, India is only behind the US and China.

Below are some key avenues for infrastructure improvement and greater investment opportunity.

Modernization/expansion of existing ports infrastructure

India's ports offer potential for investment opportunities with infrastructure.

Infrastructure

- ▶ Upgrades to handle larger cargo volumes and ships.
- ▶ Dredging deeper channels, building new terminals, improving connectivity, and implementing advanced technologies

Streamlining processes

- ▶ Shift from paper-based processes to digital and automated systems, thereby reducing bottlenecks and increasing efficiency in cargo clearance and handling

Port terminal

Indian maritime sector has grown significantly over the past decade. By FY30, cargo handled by Indian ports is projected to grow to 2570 million ton which presents a unique opportunity to the Indian maritime sector. However, issues such as high turnaround time, lack of connectivity, congestion and others plague the Indian shipping and ports sector. Following are the critical areas of development for container terminals in India which can improve their functioning.

Infrastructure: Upgrading infrastructure such as berths, cranes, and handling equipment to increase capacity and efficiency.

Technology: Implementing advanced technologies, such as automation, digitalization, and data analytics, to improve terminal operations and reduce turnaround times.

Connectivity: Improving road and rail connectivity to and from the terminals to reduce congestion and facilitate faster cargo movement.

Maritime clusters

Maritime cluster is a high potential area, which includes a geographic concentration of maritime-related businesses, institutions, and infrastructure that interact and collaborate with one another to enhance competitiveness and innovation.

Benefits

- ▶ Fosters collaboration and knowledge exchange to promote innovation and entrepreneurship
- ▶ Increasing the competitiveness and productivity of the cluster
- ▶ Improves the efficiency and sustainability of operations through the development and adoption of new technologies, best practices, and standards.
- ▶ Enhances reputation and global competitiveness of the region by building a strong maritime brand image

There is potential for the development in Gujarat particularly in the Gulf of Kutch and Gulf of Khambhat areas. These areas have strategic locations and natural deep-water ports that could attract maritime-related businesses and investments.

Inland waterways transport (IWT) and coastal shipping (CS)

IWT and CS hold significant untapped potential as they offer high levels of sustainability, have low running cost and are critical in optimizing the existing logistics modal mix. Thus, GOI has launched several initiatives to promote their adoption.

Measures required to accelerate India's competitiveness in global ports, shipping and logistics sector

To promote IWT, GOI has pledged an investment of ~US\$4.3b (INR 35,000 cr.) by 2047 to create a network of waterways. GOI has already initiated development on 14 inland waterways and 26 viable routes for cargo movement have been identified. To improve connectivity, GOI is also developing associated infrastructure such as multi-modal terminals (one terminal was recently inaugurated in Haldia).

To aid CS, GOI had reduced tariffs, given priority berthing to coastal vessels and made green channels for faster cargo clearance. Recently GOI has also announced PPP schemes for enhanced participation of private sector.

However, challenges such as limited cargo availability due to insufficient connectivity with production and warehouse hubs, seasonality of Indian rivers and others may require urgent action to ensure successful adoption.

Improving warehousing

Another important cornerstone of the overall logistics sector in India is the warehousing industry. While the warehousing sector in India has shown remarkable growth, there are opportunities for improvement in areas such as infrastructure development, technology adoption, and skill development to enhance the sector's potential for even greater success. To achieve this, both GOI and industry need to work collectively to ensure that the Indian warehouses become more productive and become important levers for the growth of India's logistics sector.

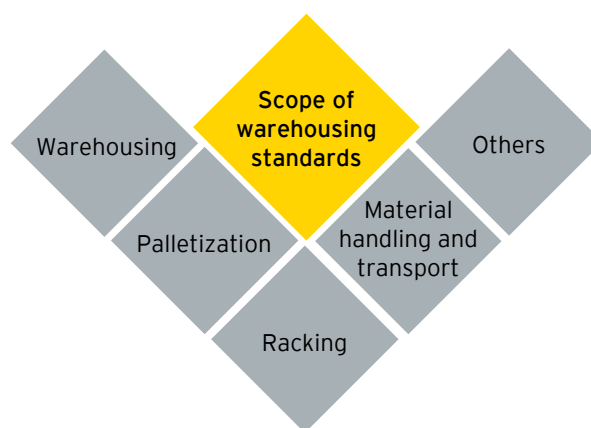
Focus areas to improve performance of Indian warehouses

- 1 Infrastructure
- 2 Technology adoption
- 3 Skilled personnel
- 4 Simplified regulations

Thus, to facilitate seamless and efficient logistics, GOI has launched new warehouse standards. These aim to promote standardisation in warehousing and other related assets.

These include several standards related to design and construction, labour, safety, digital solutions and others. Standardisation of pallet size is another key focus area which focuses on economies of space and facilitation of automation. A special focus is on the development of standards for racking to promote efficient storage. Elements of transportation and material handling have also been incorporated to have end-to-end coverage.

Warehouse standards try to cover all the components associated with warehousing holistically.



The thrust on infrastructure needs to continue for several reasons

Increased competitiveness in International markets

According to an Assocham-Resurgent India study, reducing expenses from 14% to 9% of GDP could save India ~US\$4b (INR 32,500 cr.). Thereby, making the Indian goods more competitive in international markets.

Reduction in ships' Turn Around Time (TAT)

Reducing the turnaround time for ships saves the port time, which translates into savings in port infrastructure expenditure for ports, ship capital costs for carriers and inventory holding outlays for shippers.

Boosting growth in MSMEs

It would also drive growth in the employment-intensive MSME sector, where better transportation and logistics and reliable power are key ingredients for improved competitiveness, especially in sectors like apparel, footwear, furniture, and food processing.

Reduction in crop wastage

Every year, agriculture goods worth ~US\$11.6b (INR 92,651 cr.) are lost in India due to a lack of storage facilities and a poor transportation network. The government's recent directive to establish Inland Container Depots (ICD), cold chain, and warehousing facilities across the country, on the other hand, is expected to attract private investment. The logistics sector would be upgraded as a result of the capital infusion, reducing industrial-scale food waste.

Measures required to accelerate India's competitiveness in global ports, shipping and logistics sector

GOI aims to increase speed, agility and efficiency of freight movement in India with new infrastructure development. However, several concerns limit its growth

Challenge	Opportunity areas	Recommendations
<p>Delayed land acquisition and clearances impact project timelines and profitability</p>	<ul style="list-style-type: none"> ▶ Lack of a nationwide single clearance system significantly affects ease of doing business ▶ Due to lack of digitisation, records are mapped by several authorities, thus, accessing land records is a cumbersome task ▶ Inefficient maintenance of land records results in ownership-related legal challenges 	<ul style="list-style-type: none"> ▶ GOI and state governments should ensure a smooth roll out of nationwide single window clearance system for hassle free approvals ▶ GOI should secure land and other clearances before issuing the tender ▶ Improve project planning and implementation efficiency to reduce cost and time overrun ▶ De-risk infrastructure projects - land acquisition and environment clearances
<p>Sub par performance of SEZs and limited connectivity of industrial complexes</p>	<ul style="list-style-type: none"> ▶ Trends show that establishment of SEZs decreased average productivity growth of firms by ~15.4% ▶ ~18% SEZs are located inland which increases the traveling miles and reduces export potential ▶ Space constraints in existing ports limit development of integrated industrial corridors 	<ul style="list-style-type: none"> ▶ Switch to “comprehensive industrial clusters” instead of individual parks such as chemical clusters, PCPIR (Petroleum, Chemical and Petrochemical Investment Region) ▶ Blueprint for development of new port infrastructure should include construction of integrated industrial and last mile road and rail connectivity
<p>Draft restriction in line with changing scenario and higher distance from maritime (East- west) trade lanes makes them unattractive</p>	<ul style="list-style-type: none"> ▶ 40% of the ships on order will require >16m draft. Not many Indian ports support this ▶ Vessels have to take a detour of at least 5-6 hours to reach nearest key Indian ports. This reduces transshipment opportunities 	<ul style="list-style-type: none"> ▶ Fast track development of Vizhinjam, Kanyakumari and Campbell Bay ports which can offer higher draft ▶ To attract transshipment traffic GOI, should consider offering benefits to shipping liners to invest capital and shift operations from existing ports
<p>Absence of indigenous container manufacturing ecosystem</p>	<ul style="list-style-type: none"> ▶ Manufacturing containers in India is 50% more expensive than China, due to higher price of Corten steel ▶ Limited manufacturing capacity of Corten steel ▶ Existing glut in container market for EXIM trade may derail India's plans to attract investment in container manufacturing space 	<ul style="list-style-type: none"> ▶ GOI's projected requirement of 350K containers/ year and plan to develop associated manufacturing capability may need to be re looked ▶ This may require reworking of, the proposed Production Linked Incentive scheme for container manufacturing. GOI may need to give assurance/ guaranteed orders to promote investment ▶ Corten steel manufacturing should be an inclusive part of the policy

Measures required to accelerate India's competitiveness in global ports, shipping and logistics sector

3 Attract investment and investor interest

For the development of the logistics sector, GOI is investing in ~100 infrastructure projects for first and last mile connectivity with ports for coal, steel, fertilizer.

In FY24 budget, ~US\$125b (INR 10 lakh cr.) has been allocated toward capital expenditure, which will benefit the logistics sector.

Apart from the 50 new airports and heliports, 100 critical transportation infrastructure projects worth ~US\$9b (INR 75,000 cr.) (including private investment) will be crucial in improving first and last mile connectivity for ports, coal, steel, fertilizer, and food grains. In addition to this, more than 39,000 compliances have been reduced and more than 3,400 legal provisions have been decriminalized to improve ease of doing business.

~US\$34b (INR 2.7 Lakh cr.)

Planned investment- road infrastructure development- FY24

~US\$30b (INR 2.4 Lakh cr.)

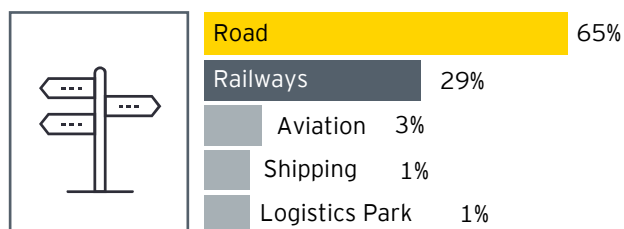
Planned investment- rail infrastructure development- FY24

Source: PIB

~US\$650b (INR 52 Lakh cr.) worth of infrastructure investments are currently on offer in the National Infrastructure Pipeline (NIP), with the highest being for road.

NIP aims to showcase investment opportunities in India's infrastructure sector. NIP aims to capture key greenfield and brownfield projects for investments across all economic and social infrastructure sub-sectors on a best-effort basis.

NIP- Infrastructure opportunities on offer (Value)



Key assets to be monetized

Road Length- 26.7K km	DFC Track- 673km 400 railway stations
31 projects - 9 major ports	25 airports 21 MT warehouse capacity

Source: NIP, Niti Aayog

In total, the investors have an opportunity to invest in ~6,000 projects worth INR 52 lakh crore (~US\$650b), which can aid the transportation and logistics sector. Road sector accounts for the majority share (~82%) of these projects.

Source: NIP | Note: Some investment may be common to passenger and freight transport | Note: Investment does not include "common infrastructure for industrial parks"

With 100% FDI permitted in most transport infrastructure; the sector has not witnessed the expected momentum

FDI in the air transport sector was only US\$3.61b (~INR 29,000 cr.) from April 2000- September 2022. Similarly, FDI in ports for the same period was only US\$1.63b (~INR 13,000 cr.). Following a similar trend, FDI in railways was US\$1.2b (~INR 9,600 cr.) for the same period. Road also followed a similar trajectory and did not register any major FDI, as of December 2021.

100% FDI allowed in

- ▶ Air transport (including air freight)
- ▶ Port and harbor's construction and maintenance
- ▶ Railways: under automatic route for construction, operation and maintenance of suburban corridor projects through PPP

Measures required to accelerate India's competitiveness in global ports, shipping and logistics sector

Government is offering various tax incentives and financial support to boost private and foreign investment



Government offers the following subsidies:

- ▶ Duty-free import of high capacity and modern road construction equipment
- ▶ 100% tax exemption in any consecutive 10 years out of 20 years after commissioning of the project
- ▶ Subsidy up to 40 % of the project cost to make project viable

Government will cover the following costs:

- ▶ Environment clearance, cutting of trees and shifting of utilities
- ▶ Land for the right of way and wayside amenities
- ▶ Project Feasibility Study



Indian Railway Finance Corporation Ltd is a PSU which mobilizes market borrowings to finance capital expenditure in railways. The funds are invested in rolling stock and projects leased by the IRFC to the Ministry of Railways.



CONCOR (Container corporation of India) announced a volume-based rebate scheme of up to 100% on rail tariff for movement of empty containers from Ports to hinterland for its utilization in exports. This helped to resolve the issue of shortage of containers at the port.

Government is aggressively pushing Public Private Partnerships (PPP) to increase investments and all modes of freight movement have seen a healthy response.

PPP is being adopted in the Indian transport infrastructure development sector and helps infuse capital.

Port management under Public Private partnership is being actively pursued. Until July 2022, 86 projects worth ~US\$6.9b (INR 55,000 cr.) have been granted approval under PPP. In 2020, 51% of cargo in major ports was handled via the PPP, Maritime India Vision-2030 targets to increase this to >75% by 2030.

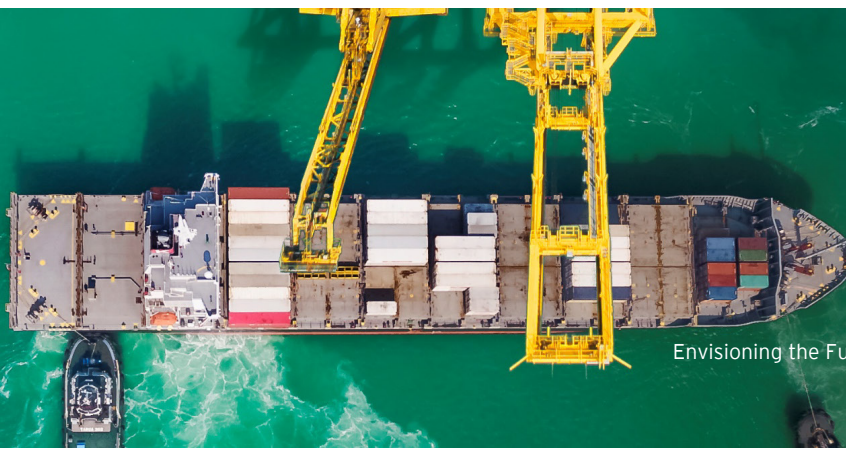
As per GOI, Indian Railways will need a capital investment of around ~US\$625b (INR 50 lakh cr.) until 2030 for network expansion and capacity enhancement.

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As of now, India is a growing nation in terms of its economy. Enquiries are coming from a lot of economists, especially from the US, where there is a distinct shift toward getting into partnership with India.



Durgesh Buxy,
AVP, Crompton Greaves Consumer
Electricals Ltd.



Measures required to accelerate India's competitiveness in global ports, shipping and logistics sector



58 projects worth ~US\$5b (INR 40,000 cr.) are in various stages of implementation. Of these, 33 projects worth ~ US\$3.4b (INR 27,000 cr.) are operational, whereas 25 projects worth over US\$1.6b (INR 13,000 cr.) are under implementation. 19 such projects with a total investment of ~US\$1.1b (INR 8,862 cr.) have been completed in 2021 alone.



Number of PPP airports is likely to increase from 5 in 2014 to 25 in 2025. AAI has formed JVs in seven airports. Recently, AAI has awarded 6 airports – Ahmedabad, Jaipur, Lucknow, Guwahati, Thiruvananthapuram, Mangalore – for operations, management and development under PPP for a period of 50 years.

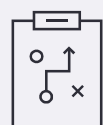


Government is reworking the terms of the PPP model, which will include a hybrid model in which the government makes upfront payment of 40% of project cost to the developer under build operate transfer mechanism.

Railways have invited private sector participation for GatiShakti Terminals. At present, the railways are using the PPP route for modernization of 16 stations, including Anand Vihar and Vijayawada, which is estimated to cost ~US\$1.25b (INR 10,000 cr.).



India has a well-developed framework for Public-Private-Partnerships (PPP) in the highway sector. Asian Development Bank has ranked India as the first spot in PPP operational maturity and has designated India as a developed market for PPPs. NHAI continues to exploit a variety of contractual structures in moving toward the PPP.



Government had planned to offer contracts for development of Multi Modal Logistics Parks (MMLP) at four different locations through PPP mode in 2022-23. Reliance Industries Ltd. has been awarded the project to build India's first MMLP in Chennai at the cost of ~US\$180m (INR 1424 cr.).

Exports from SEZs dip to ~US\$95b (INR 2.51 lakh cr.) in FY21- SEZs may not be having desired impact on Indian exports.

One of the main reasons is the waning competitive advantage of Indian SEZs as other ASEAN countries are adopting policies to boost investment. Moreover, withdrawal of tax concessions and ineffective implementation of single window clearances are major impediments. Additionally, 100% import duty is levied during a domestic sale of goods made in SEZ units. This makes SEZ goods unattractive in the domestic market.

Proposed DESH bill government suggests moving away from the original idea of export-oriented production and intends to allow business units in SEZs to sell in domestic markets more easily and boost domestic manufacturing.

JNPT is one of the first "Multi- purpose SEZs" in India and is a key cog in the Ministry of Shipping's Sagarmala vision.

JNPT offers access to upcoming multi-modal infrastructure projects including New Mumbai airport, DFC rail corridor and trans-harbor road link. This aims to slash cost and facilitate easy movement of goods to and from ports quickly and efficiently. Moreover, formation of the SEZ enables industrialization of JNPT's hinterlands, which is prompting an economic transformation.

JNPT-SEZ is expected to generate ~US\$500m (INR 4,000 cr.) investments and create 72,600 direct jobs. In total, it is expected to generate total employment of 150,000. It aims to set a new benchmark for port led industrialization.

Measures required to accelerate India's competitiveness in global ports, shipping and logistics sector

Governments across the world are using multiple financial routes, such as sovereign wealth funds, PPP models, to boost infrastructure development

Egypt is facilitating investment by deployment of sovereign wealth fund as a go-to partner for foreign investors.

The Sovereign Fund of Egypt (TSFE) which was established to attract private investments, is in talks with AD Ports Group (subsidiary- Abu Dhabi sovereign investor ADQ) over development and operation of Suez Port, known as Port Tawfiq. The contract would be the third signed by AD Ports to operate ports in Egypt.

1 Suez Canal Zone (SCZone) signed a US\$3b agreement to produce ~3,50,000 tons per annum of green energy for fueling ships in Ain Sokhna with EDF Renewables and TSFE.

2 Dubai's DP World signed an agreement to build a US\$80m port-centric logistics services zone at Ain Sokhna Port. The facility will cater to logistics, trading, distribution, value-added, and light industrial activities.

AP Moller-Maersk signed a contract worth US\$500b with Suez Canal Economic Zone to expand East Port Said's port terminal capacity by almost 40%

Vietnam needs ~US\$13.7b to develop modern ports until 2030. Major funding is expected from non-budget sources.

Seaports are experiencing high levels of FDI inflows. Introduction of Investment Law and Enterprise Law is one of the key reason as it reduces administrative investment procedures. Free trade agreements such as EU-Vietnam FTA and Comprehensive and Progressive Agreement for Trans-Pacific Partnership are having a substantial impact on bolstering maritime freight volumes.

1 Mediterranean Shipping Company has partnered with Vietnam National Shipping Lines and Saigon Port to build a "mega" port, worth US\$6b. With an annual capacity of 10-15 mil TEUs, the port will be able to receive container ships of up to 24,000 TEUs capacity.

2 Gemadep Corporation plans to launch two deep water port worth US\$264 mil in 2023. They will have a capacity of 9,00,000 TEUs and 5,00,000 TEUs per year, respectively.

In Vietnam ~US\$8.8b was invested in seaports from 2011-2020, out of which 86% was from non-state budget capital

JNPT has become the first 100% Landlord Major Port of India and heralds India's entry into the PPP model.

Currently, five container terminals are operated at JNPT. Under the latest agreement, two berths of JNPT will be handed over under the PPP contract. Minimum Guaranteed Cargo (MGC) will help guarantee private port operators' investment and is expected to increase from 0.4 mil TEUs in the first year to 0.9 million TEUs, starting 10th year until the end of the 30-year contract.

1 Out of the five berths in JNPT- DP World operates two terminals, APM Terminals and PSA operate one each and the remaining one will be operated by a Joint Venture between JM Baxi Ports and Logistics Ltd., and CMA Terminals

2 JNPT charges a revenue share of around 30% of the business. However, the Major Port Authorities Act and model concession agreement allows terminal operators to fix market determined tariff rates.

Port received the highest royalty price bid of ~US\$56.5 per TEU against minimum reserve price of ~US\$22.5, by JV of JM Baxi and CMA Terminals.

GOI has brought in market pricing for major ports. This is much needed to bring a level playing field between various terminals. However, Indian port tariffs are too high to compete with Colombo and Singapore. Port developers will need to identify measures such as operational efficiencies, larger scale, better land monetization and achieve lower tariffs. Government may also need to step in with incentives to bring Indian ports at par with Global major ports.

Measures required to accelerate India's competitiveness in global ports, shipping and logistics sector

The Indian transportation and logistic sector has witnessed the emergence of several start-ups which are being supported by GOI initiatives

Key government initiatives to support start-ups

GOI through Sagarmala project is supporting start-ups in the maritime sector through various means, such as setting up incubation centers, providing seed funding, creating networking opportunities, and offering regulatory support. These initiatives are helping start-ups develop their products, invest in technology, hire staff, and scale their businesses.

- ▶ Jawaharlal Nehru Port Authority has established an incubation center to support start-ups and entrepreneurs in the logistics sector. The center provides infrastructure, mentorship, and other support to early-stage start-ups, with a focus on developing innovative solutions for the industry.
- ▶ JNPT partnered with Invest India to establish a dedicated start-up portal that provides information and resources for start-ups in the logistics industry.
- ▶ Sagarmala Start-up and Innovation Initiative (S2I2) – providing financial, institutional, infrastructure support, mentorship and new market access to start-ups to create a Maritime Innovation Hub.

Select initiatives across the world to support the start-up ecosystem

Govt. support

Provide financial, regulatory support to start-ups, such as tax incentive, streamlined regulatory processes.

Accreditation@SGD program - provides government funding and support in Singapore

Incubation programs

Rotterdam Port Authority has set up an incubation program called PortXL, which provides mentorship, funding, and networking opportunities.

Technology partnerships

Port of Los Angeles partnered with General Electric Transportation to develop a digital platform that optimizes cargo movement and reduces congestion.

Annual Start-up challenges

Provide opportunity to get market access, grants, in specific areas – smart ports, smart ships, green tech.

Smart Port Challenge - Singapore.

Ashdod port's technology incubator - Israel

In 2021, the port of Ashdod established an incubator to support early-stage start-ups in the maritime and logistics industry, providing them with access to resources, mentorship, and funding to help them grow and succeed.

Objective

Enable entrepreneurs understand the needs of the international port market.

Provide them with the expertise of professionals with extensive knowledge.

Position itself (Ashdod port) among the investors and owners of the start-ups.

The Port's Technology Incubator aims to help start-ups from the earliest stages of development to grow and scale their products. It provides an ideal environment and infrastructure for start-ups to develop and refine their ideas, allowing them to turn their concepts into scalable products. By providing a range of resources and support services, the incubator helps start-ups to accelerate their growth and achieve their business goals.

The incubator offered a 12-month program for selected start-ups, providing them with office space, access to mentors and industry experts, and funding of up to US\$4,50,000.

Success so far...

Since its launch, the incubator has supported over 20 start-ups, with a focus on developing innovative solutions for the shipping industry, such as AI-powered cargo tracking systems, blockchain-based logistics platforms, etc.

Key success factors

Industry focus	Mentorship and support services	Funding
The incubator program focuses on supporting start-ups in the maritime and logistics industry, only ensuring targeted solutions to the specific sector challenges	Office space, funding, access to industry experts, enabling them to refine their ideas, products, and grow businesses.	Adequate funding at early stages of product development

Measures required to accelerate India's competitiveness in global ports, shipping and logistics sector

Simplification of regulatory policies, faster clearances and attractive infrastructure financing schemes are key to promote investment

Challenge	Opportunity areas	Recommendations
Infrastructure financing is complex and involves multiple parties with varying priorities	<ul style="list-style-type: none"> ▶ Infrastructure funding involves multiple contracts that require agreements and clearances from all project participants. Negotiations can be extremely difficult and expensive to carry out. ▶ Infrastructure/ corporate bonds may not be getting the desired traction due to regulations limiting investments by pension funds/ insurance companies 	<ul style="list-style-type: none"> ▶ Develop and build expertise in Infrastructure asset strategy, Project finance, infrastructure M&A and deal structuring ▶ Collaborative approach to design an optimal risk-sharing protocol can enhance bankability of large infrastructure projects.
Lack of coordination, delay in clearances/approvals and other inter-departmental issues	<ul style="list-style-type: none"> ▶ Land acquisition, delayed payments to contractors and poor planning of utilities delay infrastructure projects and impact profitability ▶ Higher risk and long project overruns deter investors from investing in greenfield projects 	<ul style="list-style-type: none"> ▶ Set clear objectives for all stakeholders and decisions makers prior to formal decision making and developing blueprint. ▶ GOI, along with key stakeholders, needs to set up accountability matrix and time bound dispute settlement mechanism
Complex regulatory landscape	<ul style="list-style-type: none"> ▶ Ever-changing tax and regulatory landscape, requiring stakeholders to navigate and maintain compliance effectively, especially across different jurisdictions. 	<ul style="list-style-type: none"> ▶ Uniform and simplified tax and regulatory landscape can enable stakeholders to navigate infrastructure development challenges. ▶ Stakeholders need to develop robust systems and resilient processes to decode and address complex regulations

“

The importance of India in global trade is increasing, and the country is becoming a more attractive investment opportunity for foreign companies. The recent focus on infrastructure must continue, as it is the key element to reduce the overall logistic costs together with cargo visibility across the supply chain. Presently, it is practically impossible for manufactures to make a reliable production plan, as the cargo visibility within India is inadequate. By embracing technology, innovation and remaining attentive to simplifying regulatory processes, India will be able to reduce logistics costs and enhance the ease of doing business in the country.



Mr. Lars Sorensen,
MD, Hapag Lloyd India

4

Focus on sustainable logistics

India's shipping and logistics sector is poised to embrace sustainable practices and is relying on policies and measures mandated by regulatory bodies for compliance

Freight transportation has one of the highest reliance on fossil fuels of any sector and accounted for 21% of CO2 emissions in 2020. While it was one of the sectors most affected by the COVID-19 pandemic, emissions resumed rising as demands increased and the uptake of alternative fuels remains limited.

Global shipping spews out 3% of worldwide Green House Gases (GHG). With the maritime industry responsible for transporting no less than 90% of world commerce, there is increasing pressure on the sector to reduce its carbon footprint swiftly.

In India, the transportation sector accounts for ~14% of GHG emissions and freight transport accounts for over 40% of final energy use in the transport sector.

To manage transport and logistics related emissions, global regulatory and government bodies have launched multiple initiatives

In order to achieve net zero target by 2050, it is estimated that emissions related to freight movement have to be reduced from 6.6 MtCO2 in 2020 to 5.1 MtCO2 by 2030. Maritime sector is one of the few modes in which an international coordinated effort is being undertaken by global bodies such as International Maritime Organization (IMO) to have a systematic reduction of emissions, globally. For this, they have made several regulations and have taken several initiatives.

~30% reduction in freight movement related emissions is required by 2030 (from 2020 levels) to achieve net zero target in 2050

International Convention for Prevention of Pollution from ships

*IMO - International Maritime Organization

Note- emission related to transport includes emissions light-duty vehicles and heavy-duty trucks, rail, shipping and aviation. May include some passenger vehicles.

Maritime emissions- International targets

International shipping has pledged to half its GHG emissions by 2050 (from 2008 levels), with many stakeholders pushing for 100% decarbonization by that time.

Transport sector emissions- India's target

GHG emissions from freight transport are growing at an alarming rate and urgent action is needed to achieve net zero emissions by 2070.

Globally, regulatory bodies have developed rating mechanisms to track and benchmark sustainable practices

Energy Efficiency existing ship Index (EEXI)

- ▶ EEXI is a measure introduced by the International Maritime Organization to reduce GHG emissions of ships. It relates to the technical design of a ship and ships must attain EEXI approval once in a lifetime, by the first periodical survey in 2023 at the latest
- ▶ EEXI value is determined by ship's type, capacity and propulsion

Carbon Intensity rating (CII)

- ▶ Operational energy efficiency performance rating is assigned to each ship to which regulation 28 of MARPOL* Annex VI applies. This rating is based on the operational carbon intensity indicator
- ▶ For easy assignment of ratings four boundaries have been defined- superior boundary, lower boundary, upper boundary and inferior boundary
- ▶ Thus, a rating is assigned by comparing the attained annual operational CII of a ship with the boundary values

Emissions Trading System (ETS) - EU

- ▶ ETS aims to reduce GHG emissions cost-effectively. It works on 'cap and trade' principle. Cap limits total GHG that can be emitted by installations. Gradually, the cap is lowered to reduce emissions.
- ▶ Installations can buy or receive emission allowances, which are limited. An installation must surrender allowances for its emissions or face penalties.
- ▶ This helps promote investment in innovative, low-carbon technologies

Measures required to accelerate India's competitiveness in global ports, shipping and logistics sector

Global shipping-related sustainability trends

Green/ Sustainable Bonds

- ▶ Green or sustainable bonds can be issued to boost sustainability.
- ▶ They differ from the conventional bonds as, issuer provides a set of sustainable criteria for them
- ▶ Capital raised via the sale of sustainable bonds is used to meet that criteria.
- ▶ Green bonds grew by 49% from 2016 to 2021. It is expected that green bond market issuance could exceed the US\$1t mark by 2023.

Increased LNG adoption

- ▶ Usage of LNG blended fuel (with fossil fuels) is an upcoming segment
- ▶ LNG is suitable for operations which require an extended range or demand high performance output.
- ▶ India is preparing a roadmap for setting up floating storage facilities for LNG at all major ports.
- ▶ Liner- CMA CGM SA plans to develop an LNG fleet to reduce emissions
- ▶ Hapag- Lloyd AG has started a pilot to use LNG on "Brussels Express"
- ▶ Mitsui OSK took delivery of a dual-fuel methanol carrier

Electric Ship

- ▶ South Korea's Ministry of Oceans and Fisheries announced plans to build an electric ferry powered by renewable energy.
- ▶ Chowgule Shipyard- Goa and Cochin Shipyard, held a keel-laying ceremony for two autonomous E- ferries being built for Norway-based company- ASKO Maritime AS.
- ▶ Mitsui OSK lines joined FMC, which commits to use zero-emission fuels for at least 5% of deep-sea vessels by 2030

Multiple initiatives are being undertaken by the private sector firms and governments to meet net zero targets and other regulatory obligations.

Global ports-related sustainability trends



1

Low and zero-emission fuel

Adoption of hydrogen is expected to start with cargo-handling equipment and, in the future, move to powering hydrogen-powered vessels. Dubai port piloted a Box Bay system, which works on solar energy. Port of Singapore is buying 200 LNG trucks (15% fleet) to reduce emissions.



2

Shore power

It allows docking vessels to 'plug-in' to power units within the port complex. It reduces CO2 emissions by 60 metric tons during a 10-hour stay in port. Recently, Europe opened its largest shore power plant in Warnemünde-Germany. It can supply electricity to two cruise ships simultaneously.



3

Intermodal

Transporting goods by rail is a low-carbon alternative compared to fossil fuel-powered trucks in terminal yards. Due to this, the port of Valencia is investing heavily in intermodal transport and cut its carbon emissions by 30% between 2008 and 2019 despite continuing to grow cargo throughput.

Global logistics-related sustainability trends

Adoption of alternate fuel vehicles

- ▶ Although many alternate powertrains are being considered (LPG, Ammonia, Hydrogen, Biofuels) electric has the highest adoption
- ▶ Light- duty last mile application is amongst the first to adopt electrification as it uses a 'hub and spoke' model, which is well suited, considering the shorter duty cycle
- ▶ Amazon has ordered 100,000 Rivian electric delivery vans, which is a key to achieve its net-zero carbon target by 2030

Incorporation of eco- friendly packing materials

- ▶ Companies are increasingly using recyclable, reusable and chemical free packaging materials
- ▶ BMW is using 25% recycled content in its expanded polypropylene (EPP) packaging, which saves 280T- CO2 annually. It plans to increase the recycled share to 100% by 2024
- ▶ Sealed Air uses automated boxing systems to produce shipping boxes to match the size of the shipped items. This reduces waste and offers weight and space savings

Usage of digital tools to boost sustainability

- ▶ Multiple digital tools are being adopted to monitor and minimize transportation and storage related emissions
- ▶ DHL's Go green is a carbon transparency tool which helps optimize green logistics and improve carbon efficiency
- ▶ UPS's "Warehouse execution systems" defines specific customer requirements and increases productivity by up to 50%. This makes distribution centers more energy efficient

Measures required to accelerate India's competitiveness in global ports, shipping and logistics sector

Responsible sourcing of packaging material

- ▶ Companies are conscious of the origin of packaging material. They consider that sustainable practices should be employed to manufacture it.
- ▶ Brambles a company specializing in unit load, pallet and container logistics uses 100% of timber from certified sources. It has been recognized by Carbon Disclosure Project (CDP) as one of the six companies worldwide doing the most to reduce deforestation in supply chains.

(Alternate) blended fuels emit 99% less SOx and 92% less NOx, compared to traditional fuels. This is well within the guidelines of existing regulations.

Developing eco-friendly facilities

- ▶ Companies use novel construction techniques and install high-tech heat and light systems to save power.
- ▶ Automatic handling equipment is being used in dark warehouses (lights out mode), to reduce carbon footprint.
- ▶ Maersk and Saudi Ports Authority are developing an MMLP which will be fully powered by solar energy. Higher storage density and mechanized pallet-in-out solutions is expected to improve productivity by ~50%

India plans to manufacture bio aviation fuel which is expected to reduce emissions and cost of operation for the aviation industry.

Several global initiatives are being undertaken by the governments to promote sustainability

Several initiatives are being adopted to boost sustainability in the shipping industry.

Vessels need to meet specific criteria outlined by organizations or standards such as the Climate Bonds Initiative, EU Taxonomy or Green Shipping Programme. This requires the Annual efficiency ratio or Energy Efficiency Operational Index to be below the defined decarbonization trajectories. EU Taxonomy also allows use of Energy efficiency design index and defines requirements for vessel retrofitting.

In addition to the technical criteria for the vessel, the shipowner must prepare a green finance framework that meets requirements of relevant bodies, such as LMA, for loans and ICMA, for bonds.

ESG indicators can often be considered as 'non-financial', but they may have major financial consequences.

Capital invested in companies that meet ESG criteria grew by 170% from 2015 to 2021. In the same period, capital invested in euro green bonds grew seven times. Valuation of green bonds increased by 8x in 2020 alone and grew to US\$287b in 1Q21, which is twice as much in the same period last year. Banks aim to meet ESG criteria for their investment and financing decisions, as climate risk will soon be integrated by European central bank into prudential supervision, to reduce risk posed by non-sustainable investments.

Integration of ESG criteria to comply with banking and financial institutions' requirements helps shipping companies get easier access to capital

*LMA - Loan Market Association

** ICMA- international Capital Market Association

Measures required to accelerate India's competitiveness in global ports, shipping and logistics sector

India's commitment to sustainability is backed by country's decarbonization goals and the GOI is undertaking several initiatives to achieve them

India's goalposts: COP26- Glasgow and FY23 capital allocation to achieve it

2030 1b tons of CO2 emissions reduced

2070 India @ net zero

To achieve Net Zero target, FY-23 budget has a planned outlay of ~US\$4.4b (INR 35,000+ cr.) for green initiatives

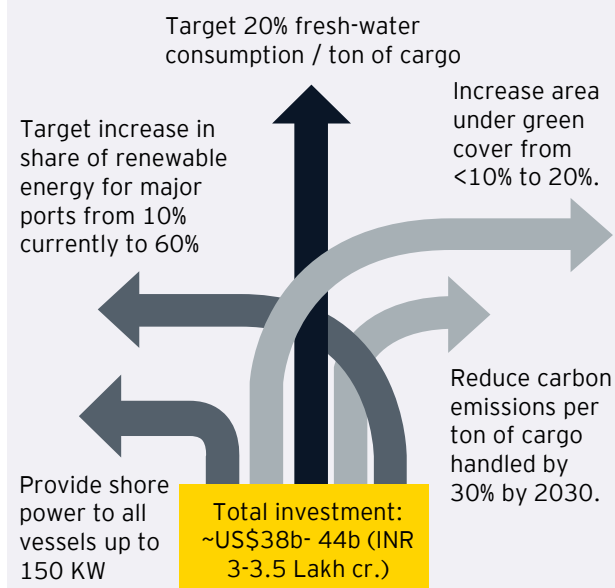
India has submitted two commitments as part of National determined contributions (NDC).

As part of NDC, which is at the heart of Paris agreement, India has committed to reduce the emission intensity of its GDP by 45% by 2030 from 2005 level. For the same period, India aims to have about 40% electric power installed capacity from non-fossil fuel-based energy resources. This will be supported with low-cost international finance and transfer of technology.

India is undertaking multiple projects with IMO to achieve IMO's GHG reduction targets.

As part of a major push, India has committed to implement IMO's energy efficiency requirements for existing ships and carbon intensity requirements for all vessels. Moreover, Indian ports are expected to adhere to all the targets which are in line with nine UN Sustainable development goals. These include obligations on safety, efficiency and sustainability. Also, India has been selected as the first country under the IMO's Green Voyage 2050 project to conduct a pilot related to green shipping. From a regulatory standpoint, India has partnered with the Marine Environmental Protection Committee, IMO, to devise acceptable regulatory requirements and ensure GHG emission reduction as per IMO's GHG initial strategy.

Maritime India Vision- to revitalize the Indian maritime sector



National Centre of Excellence for Green Port & Shipping will act as a technological arm for the Ministry of Ports, India

The center will provide policy and research support on sustainable goals for ports, DG Shipping, and other institutions. The center will also run courses in the field of maritime transportation at the local, regional, and international levels.

“

ESG will play a very vital role and will eventually be implemented, irrespective of whether it is cost-effective. If the customers have a carbon reduction roadmap, they will prefer to on-board logistics partners who understand and can help achieve that goal. Sustainable practices in logistics is going to be the future

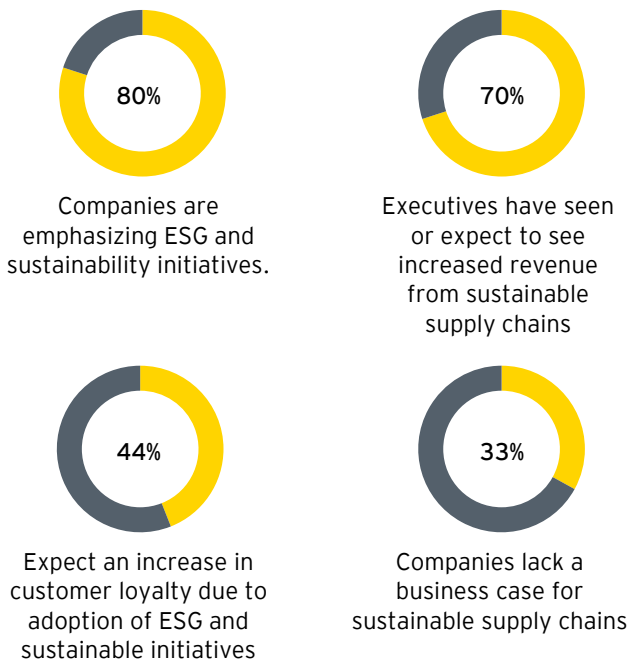


Mr. Anil Radhakrishnan
Director, Accex Supply Chain & Warehousing Pvt. Ltd.

Measures required to accelerate India's competitiveness in global ports, shipping and logistics sector

Companies are emphasizing on adoption of ESG initiatives. However, some of them seem to lack a strong business case for green technologies adoption.

EY view- "Global supply chain executives" on ESG.



According to EY's supply chain sustainability report-2022, 50% companies report basic KPIs on supply chain sustainability and risks

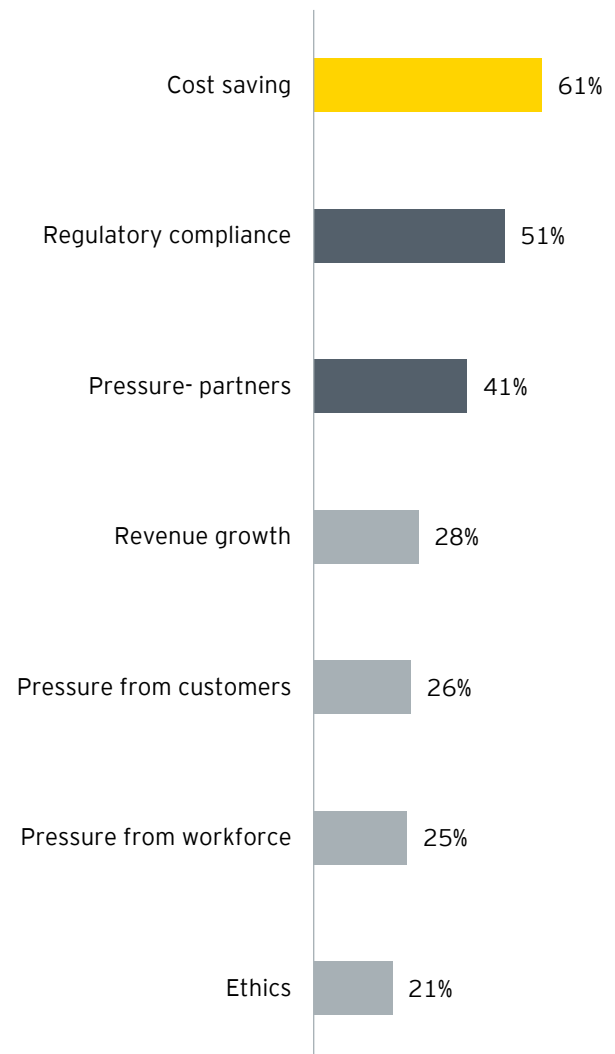
63% of companies are accelerating the use of technologies for sustainability tracking and measurement, including cloud-based platforms (80%), IoT (63%), machine learning and artificial intelligence (62%) and robotic process automation (42%).

3D printing/ additive manufacturing (52%), digital twins (48%), drones (44%) are some of the technologies which the executives are not planning to use as of now.

47% of organizations have spent most of their supply chain sustainability efforts on procurement.

In the next two years, 27% of the companies will look to delivery/ logistics to make the most progress in sustainability

Motivators for improving supply chain sustainability



Cost saving, regulatory compliance, and pressure from partners are top motivators for supply chain executives to improve supply chain sustainability

Measures required to accelerate India's competitiveness in global ports, shipping and logistics sector

Sustainability and "green skills" have become a top priority for corporations, nations and individuals across the world

By 2026

Green talent demand will surpass supply

39%

YoY growth rate between 2015 and 2022 for green knowledge or skills needed in the workforce to support environmental sustainability now and in the future

Indian private sector is committed to accelerate decarbonization

1000

Corporates will be mandatorily required to submit their Sustainability Performance from FY23

100+

Corporates have already stated Net Zero Goals (2035-2050)

500+

Investor engagement on ESG Performance

“

The whole world is focused on ESG and cutting carbon credits by moving commodities and shipments in minimum time & efficiency. These can be achieved by improving the infrastructure in various sectors.



Mr. Miheer Ghotikar,
Director, HD Fire Protect Pvt. Ltd.

Using EY ESG Compass platform, EY has developed an ESG performance analysis (including third-party data) for global companies

Using EY ESG Compass, Indian logistics companies were compared with the global counterparts in multiple ESG-related parameters.

A sub sector level analysis highlighted that cargo ground transportation is an area where Indian companies can improve on ESG parameters and communications

Favorable ESG performance in marine ports and services suggest that Indian companies may already be adopting multiple ESG-related practices and initiatives

Companies in the marine transportation sub sector seem to be behind their global counterparts in ESG implementation. There is a need to improve performance and communications on parameters of Environment, Social and Governance.

Indian rail transportation-related companies are almost at par with their global counterparts.

Measures required to accelerate India's competitiveness in global ports, shipping and logistics sector

ESG performance analysis (Index out of 100)

Sector level: ESG performance- Ports, Shipping and Logistics sector

India / ROW	ESG	Environment	Social	Governance
Total	47	40	49	52
India	39	27	41	50
ROW	47	41	49	52

ROW- Rest of world

ESG performance: ■ Low ■ Medium ■ High

Sector level: ESG performance- Ports, Shipping and Logistics sector

India / RoW	ESG	Environment	Social	Governance
Air Freight & Logistics	45	37	48	52
India	36	20	32	60
Rest of the World	46	39	50	51
Cargo Ground Transportation	38	21	42	52
India	13	6	14	21
Rest of the World	38	21	43	53
Marine Ports & Services	45	40	46	51
India	55	55	64	43
Rest of the World	45	39	45	51
Marine Transportation	47	39	50	54
India	24	12	37	22
Rest of the World	48	39	50	55
Rail Transportation	47	46	48	47
India	46	42	73	16
Rest of the World	47	46	47	47

ROW- Rest of world

ESG performance: ■ Low ■ Medium ■ High

Sustainability and ESG data model: emerging and evolving sectorization and future forward looking insights

Enterprise vs. societal | Sectorization | Data-led performance

ESG performance scope	Comprehensive	Sector focused
	<ul style="list-style-type: none"> IFRS/ ISSB /sector metrics (77 sectors) ESG performance IQ Climate action WEF IBC framework (~55 kpis) Transition pathway initiative 	<ul style="list-style-type: none"> SEBI BRSR (140 parameters / ~400+ data points) mandatory for 1,000 listed companies ESG board matters/ governance India central bank (RBI) - climate risk and sustainable finance EU CSRD 50,000 companies Transition plan taskforce
	<ul style="list-style-type: none"> Sbti (scope 1, 2 & 3) - net zero CDP (carbon disclosure project) Task force on nature related financial disclosures (TNFD) Deforestation supply chain Water circularity packaging Financed emissions 	<ul style="list-style-type: none"> Task force on climate-related financial disclosures (TCFD) Sector framework: CPG, aluminum, energy EU taxonomy/ ETS/ CBAM US SEC: proposed climate disclosure Supply chain due diligence mandates Human capital human rights Opportunities and risk management green skilling

Commercial/ Supply chain performance

Type of specifications

ESG Benchmarks ■ Medium ■ Medium

Measures required to accelerate India's competitiveness in global ports, shipping and logistics sector

Addressing challenges such as, lack of business case, perception of high costs and infrastructure limitations can fast-track the adoption of sustainable practices

Challenge	Opportunity areas	Recommendations
Perception that adoption of sustainable practices increases cost and hits profitability	<ul style="list-style-type: none"> ▶ Stakeholders may have the tendency to equate investment in sustainable practices to that being counterproductive to efforts taken to reduce logistics cost ▶ Adoption of green technologies across the value chain is tough, considering supply chains are spread across continents and have diverse stakeholders 	<ul style="list-style-type: none"> ▶ Adoption of sustainable practices may give an advantage to service providers in contracts that mandate ESG obligations ▶ GOI should develop a framework to measure emissions across supply chain and reward conformance ▶ Technology companies have an opportunity to develop solutions/platforms to monitor and analyze emissions across supply chain
Companies lack a business case for sustainable logistics supply chains.	<ul style="list-style-type: none"> ▶ A number of logistics companies are inclined to start their sustainable logistics journey but are unsure of where to begin. ▶ Some do not have an articulated and defined business case for sustainability in logistics. 	<ul style="list-style-type: none"> ▶ Stakeholders in transportation and logistics sector should work to identify and prioritize focus areas for decarbonization and meet net zero emission target ▶ While cost reduction will remain the prime motivator, companies should consider additional drivers, such as higher revenues, market share, as a result of their focus on sustainability ▶ Create a strong business case for sustainability that can enhance the inherent willingness of stakeholders to pay a premium for carbon-neutral shipping
Companies struggle to measure tangible sustainability progress	<ul style="list-style-type: none"> ▶ Without the appropriate technology in place to collect and analyze data from multiple sources, performance metrics tend to be less advanced and based on qualitative and not quantitative data 	<ul style="list-style-type: none"> ▶ Companies need to increase their digital connections throughout the logistics supply chain and collaborate among stakeholders. ▶ Stakeholders also need to invest in digital tools, data analytics and information sharing to capture quantitative data, KPIs and develop sustainability scorecards.
Infrastructure limitations	<ul style="list-style-type: none"> ▶ Lower draft and length of port terminal limits berthing of bigger vessels for LNG refueling ▶ Dredging increases the content of organic matter, contaminants and heavy metal, which impacts water quality and aquatic life 	<ul style="list-style-type: none"> ▶ Bunker companies can deploy bunker barges to allow refueling outside the berth ▶ GOI should adopt a sustainable dredging disposal mechanism including study (chemical and physical) and identification of suitable disposal location

Key considerations



Key considerations for stakeholders in the ports, shipping and logistics sector

Key themes	Government	Industry
Adopt advanced technologies and explore new business models	<ul style="list-style-type: none"> ▶ Ensure complete transition to digital solutions which offer visibility across the complete supply chain on a single platform ▶ Offer a comprehensive marketplace solution shows transactional rates, and allows users to bid on them ▶ Fast-track deployment of enterprise business software with seamless implementation across multiple government bodies to avoid siloed communication 	<ul style="list-style-type: none"> ▶ Consider the adoption of modern digital technologies and upgrade their legacy systems to support them ▶ Have a robust understanding of complex regulations of data protection and privacy ▶ Offer "risk liability ownership" with integrated logistics solutions, to help improve effectiveness ▶ Try and consolidate some operations handled by intermediaries to reduce cargo exchanges and drive efficiency
Fast-track infrastructure development	<ul style="list-style-type: none"> ▶ Facilitate a complete roll out of nationwide single window clearance system and secure land and other clearances before issuing the tender to avoid delays ▶ Switch to "comprehensive industrial clusters" instead of individual parks such as chemical clusters to streamline logistics and connectivity challenges ▶ Fast-track port development with draft considering the changing scenarios and develop an ecosystem for container manufacturing 	<ul style="list-style-type: none"> ▶ Improve project planning and implementation efficiency to reduce cost and time overrun ▶ De-risk infrastructure projects to minimize losses due to delay in land acquisition, environment clearance, etc.
Attract investment and investor interest	<ul style="list-style-type: none"> ▶ Set clear objectives for all decisions makers prior to formal decision making to avoid delays ▶ Formulate a time bound dispute settlement mechanism ▶ Develop a uniform and simplified tax and regulatory landscape 	<ul style="list-style-type: none"> ▶ Build expertise in infrastructure asset strategy, project finance, infrastructure M&A and deal structuring ▶ Collaborate to design an optimal risk-sharing protocol to enhance the bankability of large infrastructure projects ▶ Develop robust systems and resilient processes to decode and address complex regulations
Focus on sustainable logistics	<ul style="list-style-type: none"> ▶ Should develop a framework to measure emissions across supply chain and reward conformance ▶ Adopt a sustainable dredging disposal mechanism, including study (chemical and physical) and identification of suitable disposal location 	<ul style="list-style-type: none"> ▶ Identify and prioritize focus areas for decarbonization and meet the net zero emission target ▶ Focus on creating a strong business case for sustainability that can enhance the inherent willingness of stakeholders to pay a premium for carbon-neutral shipping ▶ Technology companies have an opportunity to develop solutions/ platforms to monitor and analyse emissions across supply chain

Abbreviations and Notes

AI- Artificial intelligence	IWT- Inland waterways transport
ASEAN- Association of Southeast Asian Nations	JNPT- Jawaharlal Nehru Port Trust
CAGR- Compound annual growth rate	LNG- Liquid natural gas
CII- Carbon intensity rating	LSP- Logistics service provider
CS- Coastal Shipping	MIV- Maritime India Vision
DBFOT- Design, Build, Finance, Operate, and Transfer	ML- Machine learning
DESH- Development of enterprise and service hubs	MMLP- Multi modal logistics park
DFC- Dedicated freight corridor	MoRTH- Ministry of Road Transport and Highways
DG shipping- Directorate general of shipping	MSME- Medium and small duty medium enterprises
DHL- Dalsey, Hillblom and Lynn	NDC- National determined contributions
ECTS- Electronic Cargo Tracking System	NHAI- National Highways Authority of India
EEXI- Energy Efficiency existing ship Index	NHDP- National Highways Development Project
E-GOS- Empowered Group of Secretaries	NIP- National infrastructure pipeline
E-Logs- Ease of logistics Services	NLP- National Logistics Policy
E-Logs- Ease of logistics services	NMP- National master plan
ERP- Enterprise resource planning	NYK- Nippon Yusen Kaisha
eSanchit- e-Storage and Computerized Handling of Indirect Tax documents	PE funded- Private equity funded
ESG- Environment sustainability and governance	PIB- Press information bureau
ETS- Emissions Trading System	PPP- Public private partnership
EU- European union	PSU- Public sector undertaking
e-way bill- Electronic waybill	SEZ- Special Economic Zone
EXIM- Export, Import	UAV- Unmanned aerial vehicle
FDI- Foreign direct investment	ULIP- Unified logistics interface platform
FDI- Foreign direct investment	UNCTAD- United nations conference on trade and development
FY- Financial Year (April- March)	UPS- United Parcel Service
GDP- Gross Domestic Product	US- United States
GHG- Green house gas	WTO- World Trade Organization
GOI- Government of India	
ICD- inland container depots	
ICEGATE- Indian Customs EDI Gateway	
i-Drone- ICMR's Drone Response and Outreach for North East	

Note: Magnitudes in INR terms (except for EY Projections) have been converted to US\$ terms using a common exchange rate of INR80/US\$

Research methodology and EY approach

This thought leadership has been prepared jointly by EY and Bombay Chamber of Commerce and Industry (BCCI) by conducting primary research, focused group discussions, one-on-one interviews with industry leaders and subject matter experts in the transportation and logistics industry, backed by secondary research from government sources, press releases, research papers and statements from industry stalwarts.



Neville M. Dumasia
India Leader - Advanced Manufacturing, Mobility and Infrastructure
EY India
neville.dumasia@in.ey.com



Kiran Malla
Partner, Strategy Leader for Energy Transition, Infrastructure & Logistics, EY-Parthenon India
kiran.malla@parthenon.ey.com



Vivek Ogra
Partner- Transport consulting
EY India
vivek.ogra@in.ey.com



Mihir G. Shah
Partner- Strategy & Transactions
EY India
mihir3.shah@in.ey.com



Nitesh Mehrotra
Partner- Consulting (Sustainability & ESG)
EY India
nitesh.mehrotra@in.ey.com



Pratik Shah
Director- Business Consulting
EY India
pratik.s@in.ey.com



Akhil Khanna
Director- Business Consulting
EY India
akhil.khanna@in.ey.com



Avinash Sagar
Assistant Director- Global Advanced Manufacturing and Mobility
EY- Knowledge
avinash.sagar@gds.ey.com

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- Parag Parmar, *Manager, Business Consulting, EY India*
- Tashi Singh, *Manager, Business Consulting, EY India*
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Advisory Board Members



Shri. Rajiv Jalota, IAS

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Mr. Ritesh Ramakrishnan

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Transworld Group*



Mr. Suresh Kumar Ramiah

CEO-India, Allcargo Logistics Ltd.



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Capt. Avinash Batra

*Chairman, Seahorse Ship
Agencies Pvt. Ltd.*



Mr. S Hajara

Ex CMD, Shipping Corporation of India



Mr. Anil Radhakrishnan

Director, Accex Supply Chain Pvt. Ltd.



Capt. Ram Iyer

Sr. VP, Seahorse Ship Agencies Pvt. Ltd.



Mr. CR Nambiar

CEO, Seahorse Ship Agencies Pvt. Ltd.



Mr. Sandeep Khosla

*Director General,
Bombay Chamber of Commerce
and Industry*

Team members



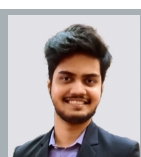
Mr. Pravin Rane

*Joint Director, Bombay Chamber of
Commerce and Industry*



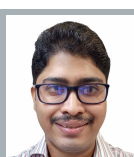
Ms. Minal Khadilkar

*India Business Accelerator Facilitator,
Bombay Chamber of Commerce and Industry*



Mr. Siddhesh Pawar

*International Trade and Investment Team,
Bombay Chamber of Commerce and Industry*



Mr. Pranit Mali

*International Trade and Investment Team,
Bombay Chamber of Commerce and Industry*



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Registered office

Mackinnon Mackenzie Building,
4, Shoorji Vallabhdas Marg,
Ballard Estate,
Mumbai - 400001

Maharashtra, India

Phone No. : +91-22 - 49100200 / 49100213

Email : bcci@bombaychamber.com

Administrative Office

The Ruby, 4th floor,
29, Senapati Bapat Marg,

Dadar (W), Mumbai - 400028

Phone No. : +91-22 - 61200200/ 61200213

Email : bcci@bombaychamber.com

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Our offices

Ahmedabad

22nd Floor, B Wing, Privilon
Ambli BRT Road, Behind Iskcon
Temple, Off SG Highway
Ahmedabad - 380 059
Tel: + 91 79 6608 3800

Bengaluru

12th & 13th floor
"UB City", Canberra Block
No. 24, Vittal Mallya Road
Bengaluru - 560 001
Tel: + 91 80 6727 5000

Ground Floor, 'A' wing
Divyasree Chambers
11, Langford Gardens
Bengaluru - 560 025
Tel: + 91 80 6727 5000

Chandigarh

Elante offices, Unit No. B-613 & 614
6th Floor, Plot No- 178-178A
Industrial & Business Park, Phase-I
Chandigarh - 160 002
Tel: + 91 172 6717800

Chennai

Tidel Park, 6th & 7th Floor
A Block, No.4, Rajiv Gandhi Salai
Taramani, Chennai - 600 113
Tel: + 91 44 6654 8100

Delhi NCR

Golf View Corporate Tower B
Sector 42, Sector Road
Gurugram - 122 002
Tel: + 91 124 443 4000

3rd & 6th Floor, Worldmark-1
IGI Airport Hospitality District
Aerocity, New Delhi - 110 037
Tel: + 91 11 4731 8000

4th & 5th Floor, Plot No 2B
Tower 2, Sector 126
Gautam Budh Nagar, U.P.
Noida - 201 304
Tel: + 91 120 671 7000

Hyderabad

THE SKYVIEW 10
18th Floor, "SOUTH LOBBY"
Survey No 83/1, Raidurgam
Hyderabad - 500 032
Tel: + 91 40 6736 2000

Jamshedpur

1st Floor, Shantiniketan
Building, Holding No. 1
SB Shop Area, Bistupur
Jamshedpur - 831 001
Tel: + 91 657 663 1000

Kochi

9th Floor, ABAD Nucleus
NH-49, Maradu PO
Kochi - 682 304
Tel: + 91 484 433 4000

Kolkata

22 Camac Street
3rd Floor, Block 'C'
Kolkata - 700 016
Tel: + 91 33 6615 3400

Mumbai

14th Floor, The Ruby
29 Senapati Bapat Marg
Dadar (W), Mumbai - 400 028
Tel: + 91 22 6192 0000

5th Floor, Block B-2
Nirlon Knowledge Park
Off. Western Express Highway
Goregaon (E)
Mumbai - 400 063
Tel: + 91 22 6192 0000

Pune

C-401, 4th floor
Panchshil Tech Park, Yerwada
(Near Don Bosco School)
Pune - 411 006
Tel: + 91 20 4912 6000

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