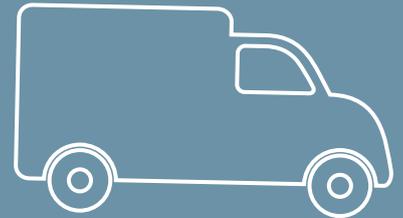
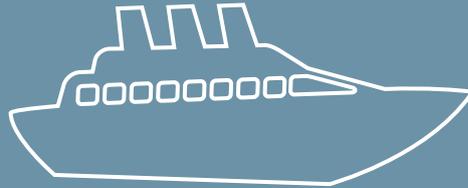
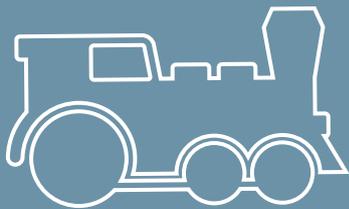
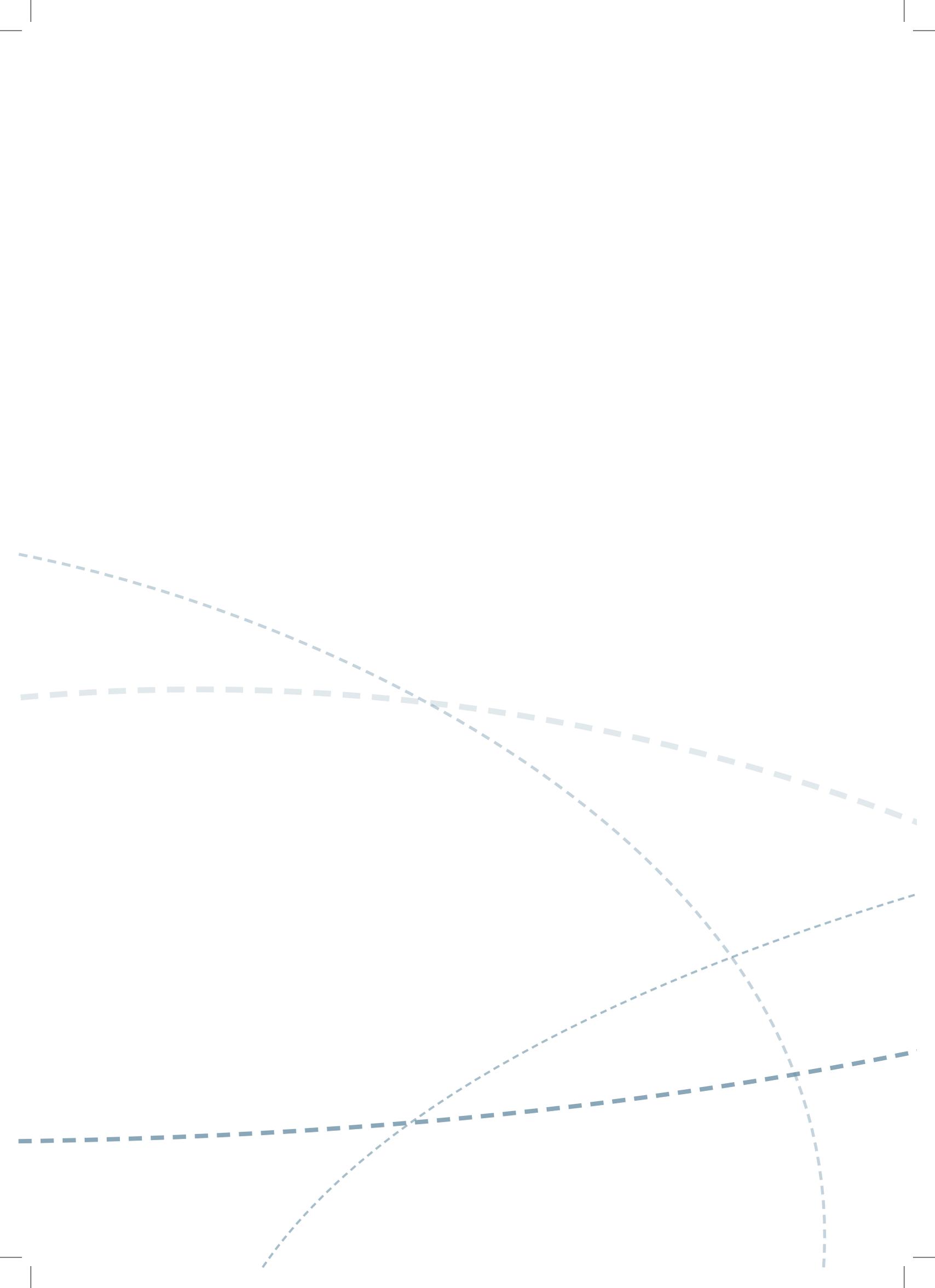


Infrastructure Practice



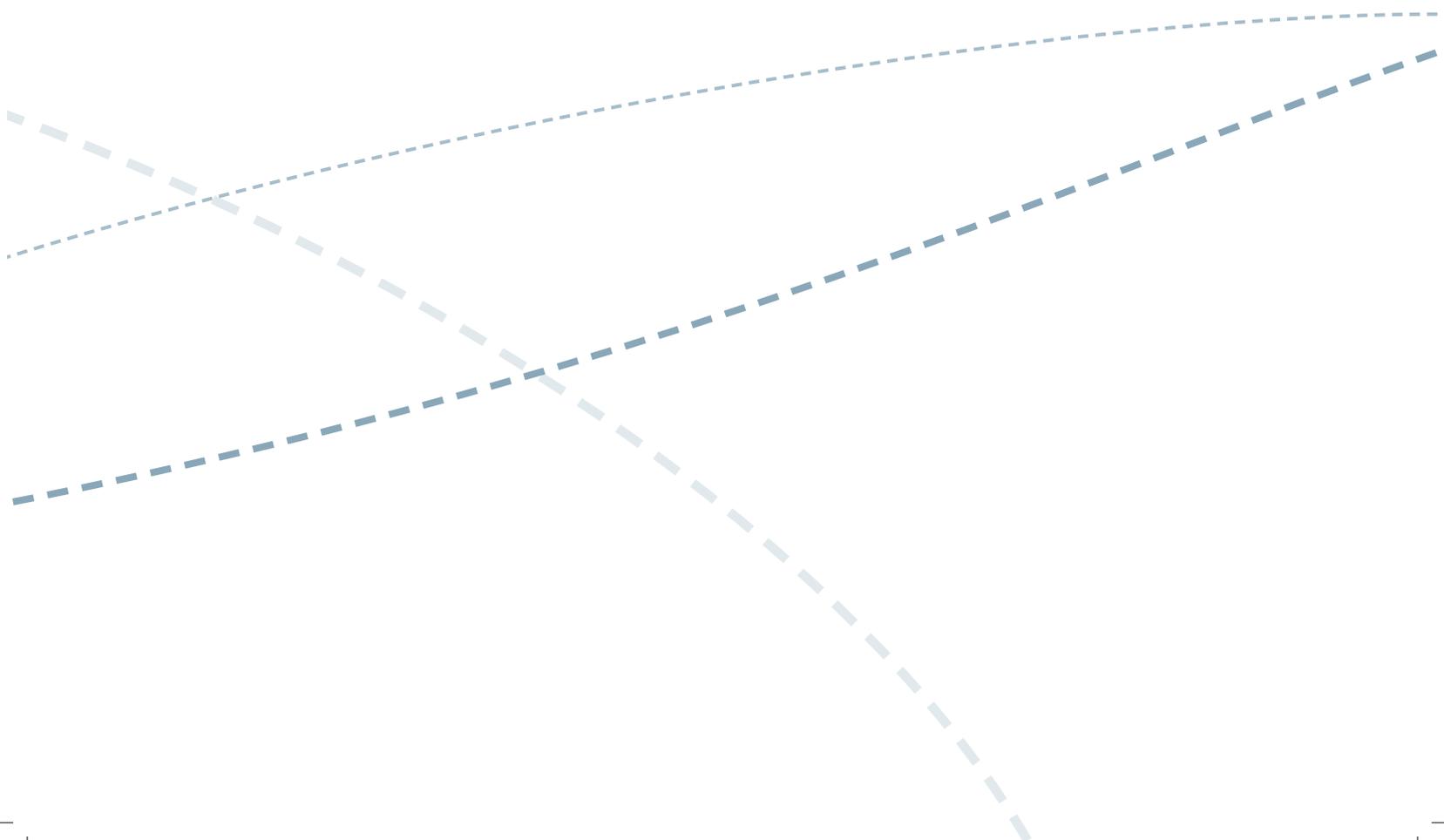
Building India

Transforming the nation's logistics infrastructure

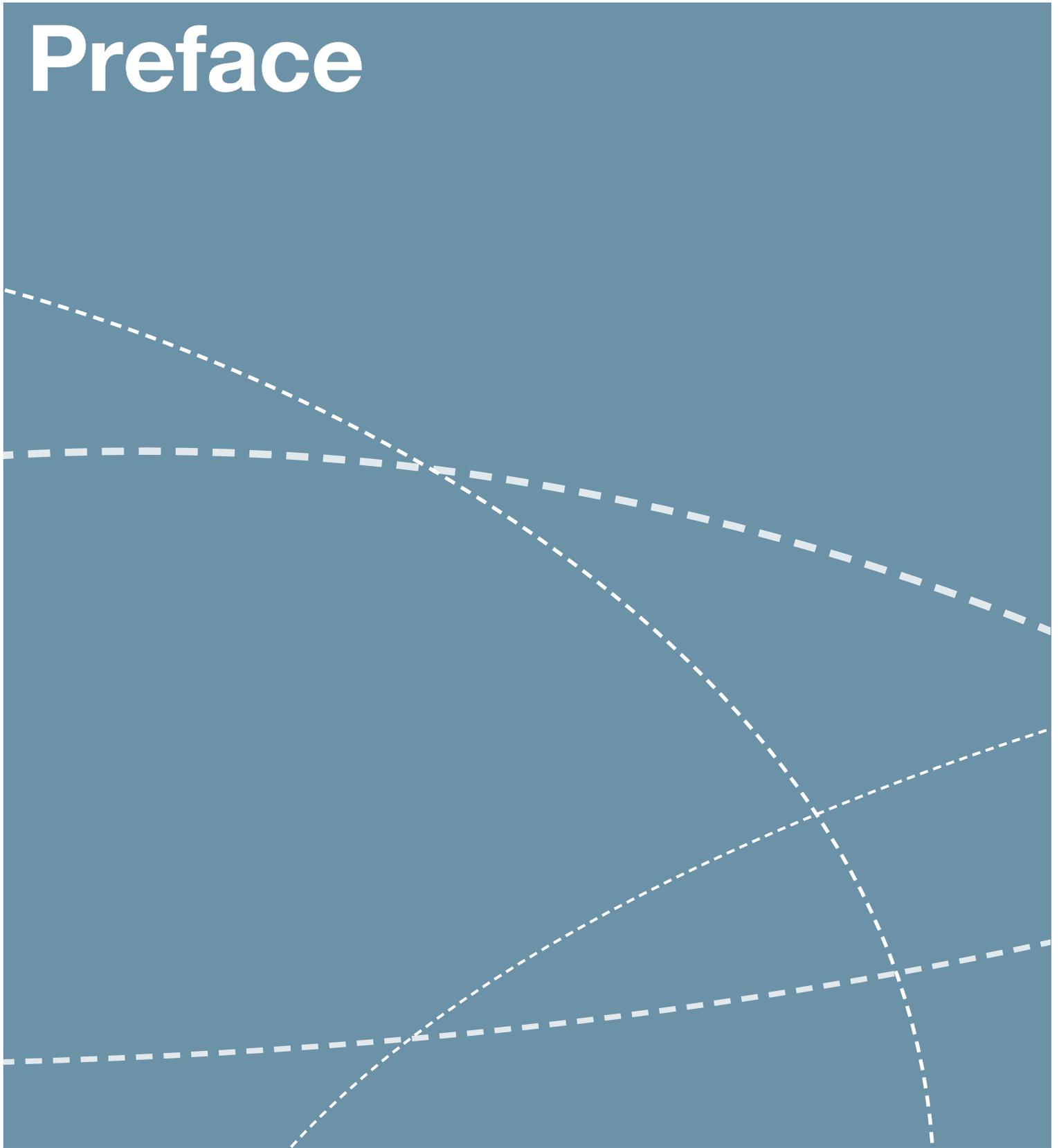


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Preface



Infrastructure development is a critical enabler to economic growth. Logistics infrastructure, covering the road, rail, waterways and air network of a country, is the backbone on which the nation marches ahead. Although the urgency to develop India's logistics infrastructure has been realised in the past decade, the task at hand is daunting. India's logistics infrastructure is insufficient, ill-equipped and ill-designed to support the expected growth rates of 7 to 8 per cent over the next decade. This expected 2.5-fold growth in freight traffic will further increase the pressure on India's infrastructure.

India has the opportunity to address this issue. Over two-thirds of the infrastructure network capacity of the future has not yet been built. Learning from the past and adopting global best practices, India should pursue a logistics infrastructure strategy that minimises investment, maximises cost efficiency, reduces losses for users and is energy efficient. This will need India to build its freight infrastructure in a manner that creates an integrated network across modes and prioritises high-return programmes.

This report, "Building India—Transforming the Nation's Logistics Infrastructure"¹ provides a perspective on how India's logistics network should evolve to meet future freight needs in 2020 and beyond. It discusses how India's current logistics infrastructure is inadequate to meet its growth aspirations and estimates the current and future concentration of freight traffic flows in the country in order to define logistics requirements and financial implications. It proposes a balanced modal strategy as the best way forward and lays out the elements of a National Integrated Logistics Policy to move from strategy to implementation. It argues that the time is right for all stakeholders—policy makers, regulators, public and private providers, resource holders, equipment providers, financiers and end users—to act in concert to build the country's future.

We hope this report will contribute to the ongoing discussions and policy developments related to the development of India's logistics infrastructure—an imperative for economic development.

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¹ McKinsey & Company has conducted proprietary research in the areas of infrastructure financing, infrastructure implementation and logistics infrastructure strategy. This report is part of the Building India series of reports that attempt to provide a comprehensive perspective on infrastructure development in the country.

Acknowledgements

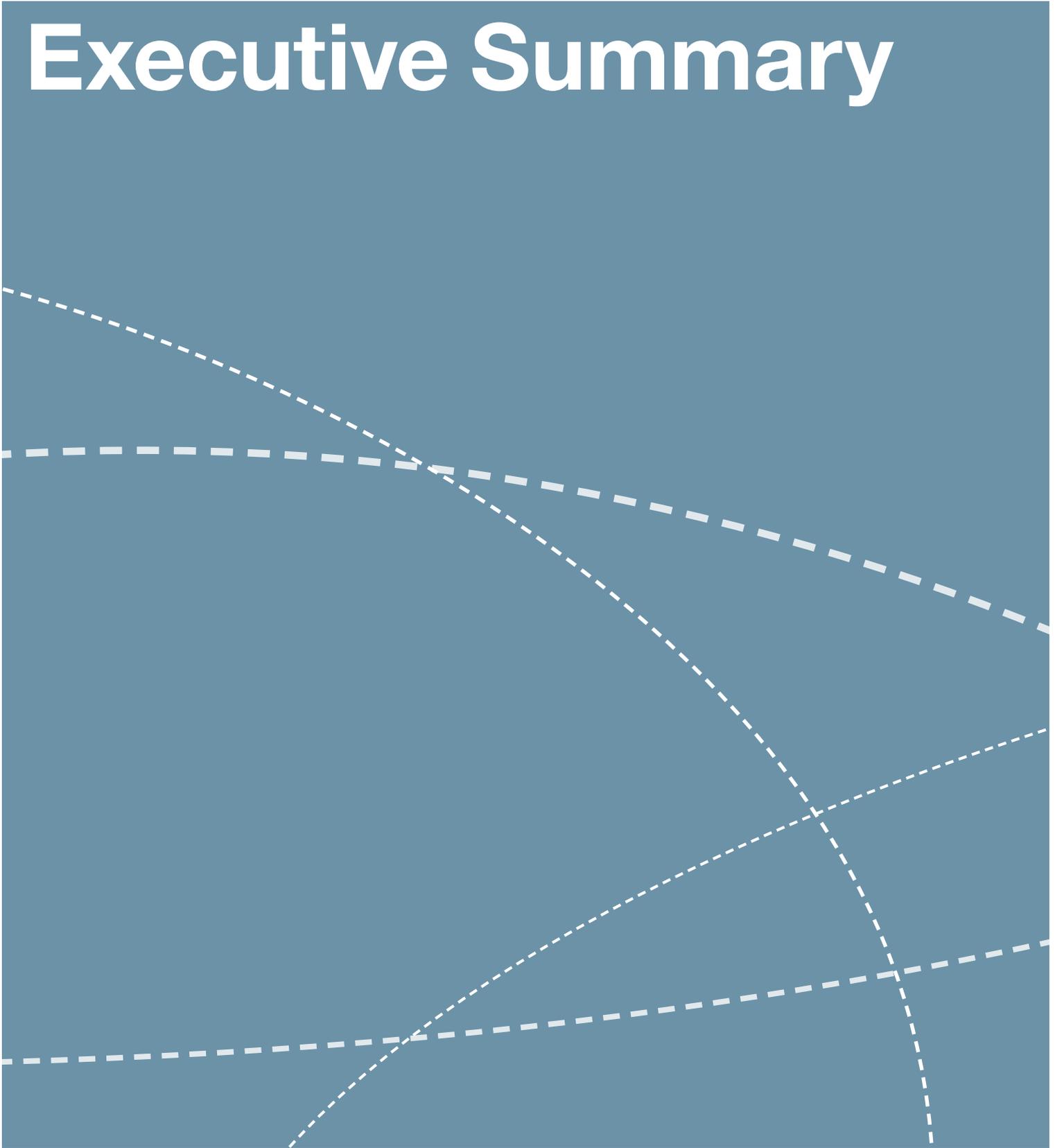
“Building India – Transforming the Nation’s Logistics Infrastructure” is the result of proprietary research conducted by McKinsey’s Infrastructure Practice. We would like to thank all the people and organisations who supported us in the creation of this report.

This study has benefited enormously from the valuable inputs provided by key stakeholders, policy makers and government officials in various ministries in the central government and several others across state governments, including Coal India Limited, CONCOR, DFCCIL, DG Shipping, Indian Railways, NHAI, The Planning Commission, and the PMO. We are grateful to all of them for sharing with us their experiences and insights. In addition, perspectives and comments received from various industry leaders and practitioners across the logistics infrastructure value chain have enriched this effort.

This effort would not have been possible without the commitment and efforts of the working team comprising Achint Setia, Ankit Misra, Sanjeev Sujana, Pallavi Sharma, Khushboo Vaish, Anubhav Kaul and Ravi Shah. We would like to specially thank our project manager—Hemang Mehta for leading this effort. The working team benefited from the help provided by colleagues in the McKinsey Knowledge Centre and Research and Information services. We are thankful to them for their efforts.

Finally, we would like to thank our external communications colleagues Fatema Nulwala, Manasi Apte, Nandita Surendran and Sunali Rohra for their communications and external relations support; our visual aids specialists J. Sathya Kumar, and Gurpreet Singh Bhatia for their much-appreciated design support; and Deepa Malik and Tessie D’Silva for their invaluable administrative support.

Executive Summary



Logistics infrastructure is a critical enabler of India's economic development. Recognising this pivotal role, logistics infrastructure spend has been tripled from around USD 10 billion in 2003 to a planned amount of around USD 30 billion in 2010. Despite this increase, the country's network of roads, rail and waterways will be insufficient as freight movement increases about 3 fold in the coming decade. This shortfall in logistics infrastructure will put India's growth at risk.

Since a large part of India's future logistics network is still to be built, the country has a chance to build infrastructure optimally, to meet the growing demand. Doing so requires an integrated and coordinated approach in which the development of each mode—railways, waterways and roads—is matched to the needs and existing assets are better utilised.

In particular, India needs to increase its use of rail, and realise the potential of its waterways. For example, in the normal course, India's rail share in freight would decline to 25 per cent from the current 36 per cent. This is relative to almost 50 per cent rail share in China and the US, similar continental sized nations. The concerted approach suggested in this report can increase India's rail share to 46 per cent.

If India fails to achieve this, waste caused by poor logistics infrastructure will increase from the current USD 45 billion¹ equivalent to 4.3 per cent of today's GDP, to USD 140 billion or more than 5 per cent of the GDP in 2020. If tackled in an integrated and coordinated manner, this can be reduced by half and India's transport fuel requirement reduced by 15 to 20 per cent.

Achieving this will require four major shifts:

- **Building the right network and ensuring flows on the right mode**, comprising an integrated mesh of seven high-density long-distance corridors (rail and coastal waterways), 150 medium-distance rail and road connectors and about 700 last mile links
- **Creating enablers to maximise the efficient use of the network**, which includes developing 15 to 20 logistics parks, providing standards for containers and pallets and upgrading the skilled workforce
- **Extracting more from existing assets**, for example, by increasing the share of toll plazas with electronic tolling, using stainless steel wagons with higher load carrying capacity, and increasing spend on maintenance of roads
- **Allocating more investment to rail and reallocating within roads and rail**, Based on current trends, USD 500 billion is estimated to be spent on logistics infrastructure in the next decade, with roads accounting for more than 50 per cent of the spend and rail for 40 per cent. However, this investment will need to be re-apportioned to support the changes required. The allocation to railways, for instance, needs to increase to more than 50 per cent with large sums spent on building high-density traffic corridors, connectors and last mile links

¹ Losses are estimated by benchmarking costs against countries with more efficient logistics networks such as the US. See Appendix B for details.

If these shifts are implemented, India's waste in logistics in 2020 at about USD 100 billion would be almost one-third lower. This amount can be reduced further to about USD 70 billion (3 per cent of expected GDP) if the investment can be increased to about USD 700 billion. In addition, these shifts would reduce India's commercial energy consumption by over 1 per cent.

To implement these four major shifts, India will require a National Integrated Logistics Policy (NILP). Such a policy should target a greater share of rail, reduce economic waste and improve energy efficiency. The policy will need to establish and implement 10 targeted national programmes including for dedicated rail freight corridors, coastal freight corridors, national expressways, last-mile roads, last-mile rail, multi-modal logistics parks, road maintenance, technology adoption, skills development and equipment and service standards.

Implementing a new logistics infrastructure strategy is a complex task given the multiple stakeholders within the central and the state governments. An empowered cross-ministerial group will be needed to drive this effort, define programmes, allocate budgets, monitor implementation, and ensure continual coordination across ministries. The High Level National Transport Policy Development Committee recently set up by the government to develop policy recommendations is the first step in this direction.

This report expands on these perspectives and is organised in the following three sections:

- India's current logistics infrastructure: Inadequate to meet growth aspirations
- Required logistics infrastructure strategy going forward: Shift to a balanced modal network
- Moving from strategy to implementation: National Integrated Logistics Policy (NILP).

INDIA'S CURRENT LOGISTICS INFRASTRUCTURE PLAN: INADEQUATE TO MEET GROWTH ASPIRATIONS

The country's road, rail and waterways network is a legacy of colonial rule, historically developed to transport troops, agricultural products and raw materials. As a result, India's logistics infrastructure is not adequately equipped to meet rapidly rising freight traffic, changing consumption patterns and increasing numbers of production centres. Over the last 60 years, limited planning and investments in freight transport have resulted in numerous inefficiencies. Further, India's economic growth will only put greater pressure on an already stretched network. The four aspects outlined below characterise India's logistics network.

The logistics flows are highly concentrated

Three components of India's logistics network account for over two-thirds of total freight traffic flow in the country (Exhibit 1).

Component 1 – Seven long-haul corridors² that connect 15 high-growth clusters form the backbone of India's logistics network

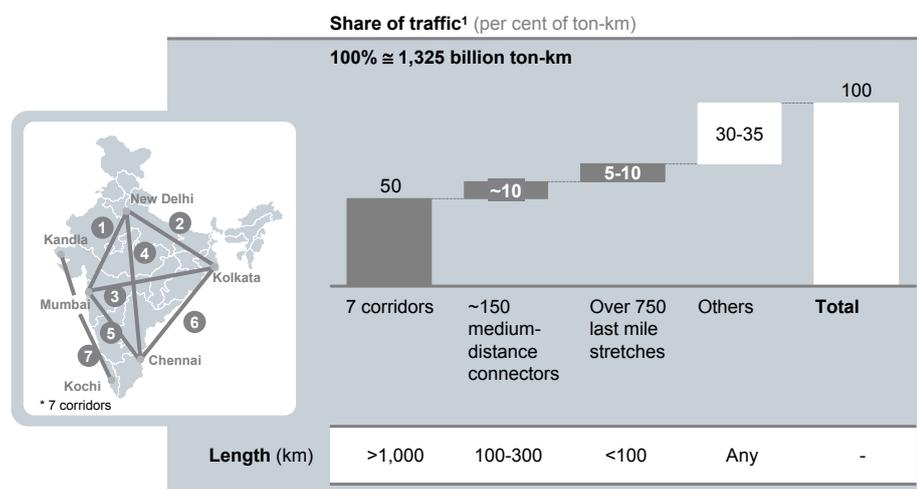
The seven corridors account for about half of the total freight traffic in 2007. Consequently, freight routes through these corridors witness the highest traffic volumes in the country

² These corridors are the Delhi-Mumbai, Delhi-Kolkata, Mumbai-Kolkata, Delhi-Chennai, Mumbai-Chennai, Kolkata-Chennai, Kandla-Kochi.

Exhibit 1

Three key components of the logistics network account for over two-thirds of total freight traffic in the country

■ Key elements



and will continue to do so.³ National highways along these corridors handle 40 per cent of road freight traffic even though they are less than 0.5 per cent of the Indian road network. Similarly, rail links on the corridors account for 27 per cent of the Indian rail network but handle over 50 per cent of rail freight traffic in the country.

Component 2 – Over 150 medium-distance connectors that link the corridors are key for India's logistics network

They are 100 to 300 km in length, typically branch out from the corridors, and carry 10 per cent of freight in ton-km.⁴ More importantly, close to 30 per cent of freight volumes pass through these connectors at some point. These connectors include rail links and state and national highways—as well as major district roads that account for a disproportionate share of intra-state traffic.

Component 3 – Over 750 last mile links⁵ of up to 100 km form a critical component of India's logistics network

These links connect key production, consumption and transit points such as ports, mines and industry clusters to the corridors and connectors. They have not typically been the focus of efforts to build the country's logistics infrastructure. Nevertheless, the poor quality

3 Traffic estimates are based on a bottom-up assessment of freight flows along key highways, rail links and coastal corridors (along the East and West coast) and have been adjusted for future changes in freight flows of key commodities such as coal. See Appendix A for details.

4 Freight flows and critical connectors are estimated through a bottom-up analysis of 8 major states and extrapolated to the rest of the country. Freight flows on connectors are estimated on the basis of the GDP of the districts they connect. See Appendix A for details.

5 Last mile links are estimated based on a bottom-up study of over close to 400 industry clusters, 200 ports (including major and non-major) and 200 mines and their proximity to national and state highway networks. See Appendix A for details.

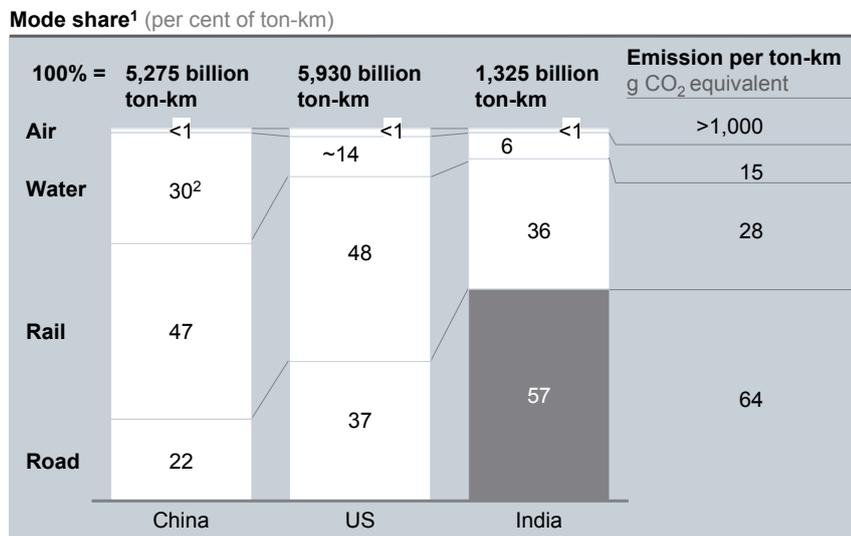
of these links or their absence altogether is often the cause of bottlenecks and poor service levels.

India’s freight transport relies excessively on roads

India’s roads account for a higher share of freight traffic compared to other continental sized countries like the US and China (Exhibit 2). India’s reliance on roads is more than three times that of China.⁶ This is despite the fact that a large part of India’s freight traffic comprises bulk material and moves over long distances that can be more economically served by rail and waterways.⁷

Exhibit 2

Freight transport in India is dominated by roads



¹ Share estimated for 2007, excluding pipelines
² Two-thirds of this is from coastal shipping and one-third of this is on inland waterways mainly the Yangtze river
 SOURCE: World Economic Forum; China Statistic Yearbook; Planning Commission India; NHAI; Indian Railways; DG Shipping; Bureau of Transportation Statistics US; McKinsey

Further, the higher dependence on road transport is adverse for the environment as emissions from road transport are higher than emissions from rail and waterways. Road transport emits 84g of CO² equivalent per ton-km compared to 28g for railways and 15g for waterways. Yet, India continues to transport a majority of its goods via roads including bulk materials like steel, cement and coal. A moderate shift from road to rail can help India save close to 0.7 per cent of its total commercial energy consumption.

⁶ The low share of roads in China’s freight flows can be attributed to the greater utilisation of waterways along the East Coast and the Yangtze river system and use of railways for long-distance movements across the hinterland.

⁷ Around 80 per cent of freight movements (in ton-km) are over 400 km.

Around USD 45 billion is lost each year due to inefficiencies in India's logistics network⁸

While in absolute terms, industry spend on logistics in India is low—the relative spend is high. India spends 13 per cent of GDP on logistics which is more than what the US (9.5 per cent) and Germany (8 per cent) spend.

The purchasing power parity (PPP) adjusted benchmark of transportation costs by mode with the US demonstrates that India's logistics infrastructure is inefficient. For instance, rail and coastal shipping costs in India are approximately 70 per cent higher than those in the US. Likewise, road costs in India are higher by about 30 per cent. This not only results in higher prices and lower competitiveness, but also hampers economic growth. Our analysis suggests that poor logistics infrastructure costs the economy an extra USD 45 billion or 4.3 per cent of GDP each year. Two-thirds of these costs are hidden i.e., not generally regarded as logistics costs. These hidden costs include theft and damage, higher inventory holding costs, facilitation and transaction costs.

A 2.5 times increase in freight traffic in the next decade will put further pressure on India's logistics infrastructure

India's current infrastructure is already over-stretched. For example, most of the national highway network and rail links along the Golden Quadrilateral and North-South and East-West corridors are congested. Many large ports are already operating at very high utilisation rates.

Further, even at a conservative annual growth rate of 7.5 per cent, India's freight traffic is likely to more than double from current levels by 2020. Finally, investments in the current network design will only lead to increased inefficiencies and in losses as established earlier.

Recognising these challenges, the Eleventh Five-Year Plan proposed a large increase in logistics infrastructure spend from USD 65 billion or 1.5 per cent of GDP in the Tenth Plan period to USD 160 billion or 2.3 per cent of GDP. This is even more than India plans to spend on power during the same period. Despite the large increase, the planned spend is insufficient. It would at best result in a 15 to 20 per cent increase in road and rail network capacity.⁹ The growth in freight traffic will outdo this increased capacity.

The current trajectory suggests that the total investment in logistics infrastructure would be over USD 500 billion by 2020. Despite this increased investment, our analysis suggests that service levels, absolute transit times and transit time variations will only worsen given the growth in freight traffic. As a result, economic losses, which are about USD 45 billion today could rise to around USD 140 billion in 2020.

Inadequacies in India's logistics infrastructure could constrain India's growth by adversely impacting user industries. India's exports for example, could be rendered less competitive on account of higher transit times and lower reliability.

⁸ Losses have been estimated by conducting a detailed analysis of the flows of three commodities (coal, auto components and agricultural goods) that represent key sectors in India, and have been extrapolated to all sectors of the economy to arrive at total losses. See Appendix B for details

⁹ Includes 140,000 lane-km of new national highways, state highways and major district roads and 18,400 track-km of additional rail tracks including doubling, gauge conversion and new lines.

SHIFT TO A BALANCED MODAL NETWORK

Based on the profile and quantum of India's freight flows, a systematic and efficient development of logistics infrastructure calls for a major shift along four important dimensions – concentrating flows along the right mode, building enablers, increasing asset efficiency and re-allocating investments (Exhibit 3).

Exhibit 3

An efficient logistics infrastructure strategy requires a shift along four key dimensions by 2020

			SHIFT		
			From current trajectory to balanced modal mix	
1	Network structure	Network components and mode	Corridors (rail and water)	~4 ¹	7
			Connectors (expressways)	5-7 ²	20-30
			Last mile links (road & rail)	N A ³	~750
2	Enablers	Illustrative enabler to support network	Logistics parks	N A	15-20
3	Asset efficiency	Illustrative shift	Per cent of toll booths with electronic tolling	<50% ⁴	>90%
4	Investment allocation	Share of spend (per cent ⁵)	Water	~10	~10
			Rail	~40	50
			Road	50	~40

1 No focused last mile programme in current plans

2 Expressways only

3 Two rail Dedicated Freight Corridors (DFCs) planned, plus coastal corridors

4 Assuming all current manual toll booths not upgraded, whereas all new toll booths created have electronic tolling lanes

5 100% = ~USD 500 billion over the next decade

SOURCE: McKinsey

The shifts towards a balanced network design could enable the railways to recapture a share of more than 45 per cent of freight traffic by 2020, relative to the current trajectory, under which its share will reduce to 25 per cent (Exhibit 4). This balanced network will also reduce losses to 4 per cent of the GDP, in comparison to an increase to over 5 per cent of the GDP if the current trajectory is pursued. Finally, if investments in logistics infrastructure are increased to USD 700 billion from the current level of USD 500 billion, losses could further decrease to under 3 per cent of the GDP.

Building the right network and ensuring flows along the right mode

Road has become the dominant mode of transport for India's freight traffic. Current plans earmark half of the planned investment for roads even as capacity on rail and waterways (including last-mile connections) remains inadequate. However, to meet the demands of growing freight traffic, a shift to more economically as well as environmentally suitable modes i.e., waterways and rail is vital. In addition to a greater emphasis on rail and waterways, the right mode of transport has to be used. Ideally, rail and waterways should be prioritised for long distances,¹⁰ rail for medium distances¹¹ and roads including expressways, for shorter stretches. Such a balanced modal approach would lower transportation costs, achieve greater efficiency and be more environment-friendly.

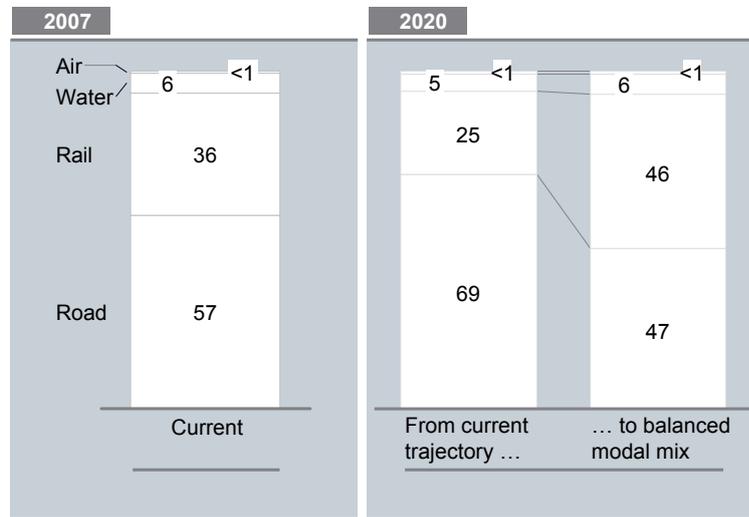
¹⁰ Distances over 700 kilometres.

¹¹ Distances between 400 and 700 kilometres.

Exhibit 4

The proposed shift will lead to a very different modal mix

Per cent



SOURCE: McKinsey

An efficient network will have five rail dedicated freight corridors (DFCs) namely, Delhi-Mumbai, Delhi-Kolkata, Mumbai-Chennai, Delhi-Chennai, Mumbai-Kolkata and two coastal corridors namely, Kandla-Kochi and Kolkata-Chennai. These corridors will need to be supported by 20 to 30 expressways, road and rail links across the 150 connectors and 700 last mile links.

In effect, a considered network design is vital to develop effective and efficient logistics infrastructure, particularly if the funds are limited and freight flows are concentrated. Investments need to be targeted and initiatives focused in connecting growth clusters.

Creating enablers to maximise network efficiency

This shift predominantly refers to improving interfaces. It includes constructing last-mile links and 15 to 20 logistics parks to ensure interconnection between modes. Additional initiatives include standardising equipment, containers and pallets and upgrading skills.

Extracting more from existing assets

Our work posits that India needs to use its existing logistics infrastructure and equipment better. Measures to this effect include better maintenance of roads, rail tracks and rolling stock; unlocking the capacity of the rail network by accelerating the implementation of automatic block signalling, moving to lower tare load wagons,¹² improving the efficiency of scheduled rake maintenance operations; and enhancing road efficiency through electronic tolling systems on highways. These measures could unlock 5 to 10 per cent of freight capacity with much lower investments than is needed for new infrastructure creation.

¹² Lighter wagons, capable of carrying higher loads.

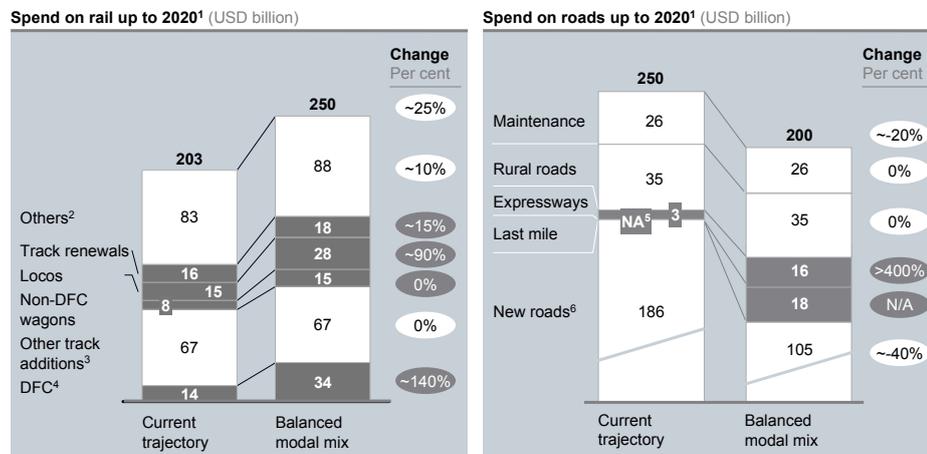
Allocating more investment to rail and reallocating within road and rail

According to the current trajectory, over USD 500 billion is likely to be spent on developing logistics infrastructure in the next decade. Current trends suggest that about half of this will be spent on roads, around 40 per cent on rail and the rest on waterways, mainly for ports to facilitate trade. To support the changes described earlier, two simultaneous actions are required for India to build economical and environment-friendly logistics infrastructure. First, more funds need to be apportioned to rail. Second, funds within rail and road need to be spent differently (Exhibit 5).

Exhibit 5

Reallocate budget across and within modes to improve capacity and service level

■ Categories with major spend increase



¹ Spend between 2008 and 2020
² E.g., coaches, locomotives, signalling, electrification, track renewals, bridge works, computerisation, passenger and other user amenities, workshops and production units
³ New tracks (excluding DFCs), rail doubling and gauge conversion. Over half of this spend is for developmental reasons, not the most economically viable locations. Change for the economically viable locations is more significant
⁴ Including wagons
⁵ No focused programme for last mile
⁶ Includes state highways/major district roads, excludes expressways and roads built as a part of focused last mile programme

SOURCE: McKinsey

- **Reallocate spend within railways:** The increased investment in railways needs to be used to create rail capacity on high-density corridors and to support the movement of a greater volume of traffic on existing track infrastructure. This means more spend on DFCs, rolling stock and other additions such as new tracks, rail line doubling and gauge conversions. While current plans are to complete two DFCs by 2020, five are needed.¹³ To fulfill this aspiration, spend on DFCs in the overall allocation to railways should be doubled from around 7 per cent to close to 15 per cent.¹⁴ This increase in investment, needs to be supplemented with the development of logistics parks and last-mile road and rail links which can facilitate better integration across modes.
- **Redirect investments within roads:** Targeted deployment of the USD 200 billion investment in roads on the high-density traffic stretches could increase the road length of national highways by 60 per cent, and state and major district roads including expressways by 15 per cent by 2020. In particular, there are two areas in which higher spends are recommended. One, an increase in the number of planned expressways from about six to about 30 by 2020 will improve service quality and fuel efficiency.

¹³ Mumbai, Mumbai-Chennai, Delhi-Kolkata, Mumbai-Kolkata, and Delhi-Chennai.

¹⁴ This includes the investment in wagons used for plying on the DFC network.

This will require an increase in spend from USD 3 billion to USD 16 billion by 2020. Second, the spend on last mile stretches should be increased substantially to around 10 per cent of the total spend on roads. At present, there is no focused programme and measurement of last-mile links. As an unfortunate consequence of this reallocation, a smaller proportion of the spend within roads will be on national and state highways that do not fall along corridors, connectors and last-mile stretches.

In addition to re-allocating investment to the extent possible, an increase in funds available to the logistics infrastructure sector would be beneficial. Our analysis suggests that if investments are increased from USD 500 billion to around USD 700 billion by 2020, the losses in the system would decline from over 4 per cent to under 3 per cent of GDP in 2020.

MOVING FROM STRATEGY TO IMPLEMENTATION: THE NATIONAL INTEGRATED LOGISTICS POLICY

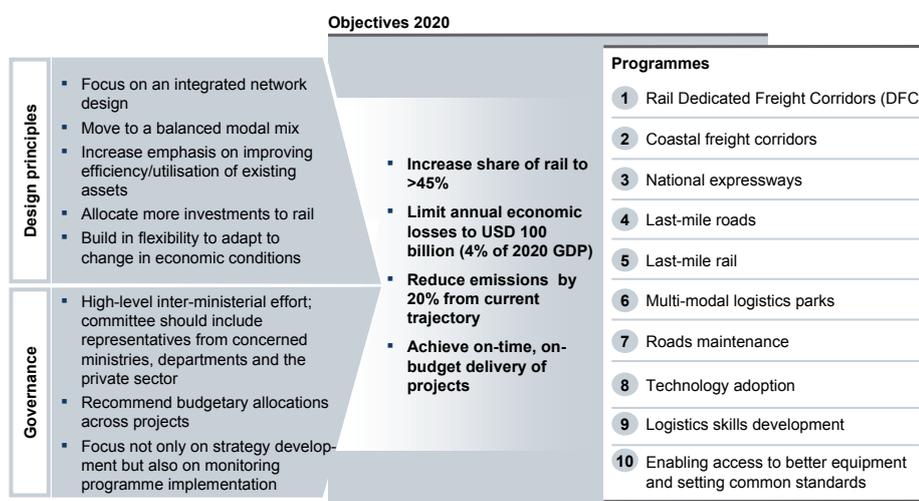
Achieving the four major shifts outlined above will require a concerted effort by multiple stakeholders and pose many challenges. An integrated policy defining a new vision, launching 10 priority programmes and governance that spans across ministries will improve India's ability to achieve its economic growth aspirations, while reducing energy consumption.

National Integrated Logistics Policy – a new vision for India's logistics infrastructure

A National Integrated Logistics Policy (NILP) that shapes a vision for India's logistics infrastructure in 2020 and beyond would be a critical enabler for such efforts (Exhibit 6). The NILP could help the government reduce recurring losses to the economy and improve capital efficiency in the following three ways. First, it could define the blueprint for the most effective and efficient logistics infrastructure to support a balanced modal mix, based on the anticipated increase in freight flows by 2020. Second, it can ensure better coordination

Exhibit 6

National Integrated Logistics Policy (NILP) is needed to move from strategy to implementation



between multiple national and state-level bodies responsible for developing logistics infrastructure. Third, it can facilitate easier access to and optimal allocation of scarce resources such as investments, equipment and people.

Such a policy should: 1) have tangible objectives to build logistics infrastructure that keeps pace with India's economic growth, 2) define a set of programmes that can help realise these goals; and 3) ensure a governance structure that enables efficient and timely execution.

The NILP objectives could include:

- Implementing a balanced modal mix by increasing the share of rail in freight carriage to more than 45 per cent
- Limiting the economic losses attributed to logistics to less than 4 per cent of GDP (USD 100 billion)
- Reducing energy consumption by 10 MTOE in 2020 (around 1 per cent of total commercial energy consumption) and hence freight related greenhouse gas emissions by around 20 per cent from expected levels under the current trajectory¹⁵
- Achieving on-time and on-budget delivery of infrastructure projects, which requires an improvement in project implementation relative to current performance.¹⁶

The NILP should also set clear long-term targets based on rigorous analysis of future flows of freight traffic. These can then be cascaded into near-term targets for the various bodies involved in building India's logistics infrastructure.

Ten targeted programmes should be the bedrock of the National Integrated Logistics Policy

The NILP should propose and result in the launch of 10 targeted programmes outlined below which would ensure that the objectives are met:

- **Rail dedicated freight corridors:** This programme should have a dual focus. First, accelerating the special purpose vehicles (SPVs) for the two planned DFCs—Delhi-Kolkata, Delhi-Mumbai—and simultaneously incorporating SPVs for three additional DFCs. These are on the Kolkata-Mumbai, Delhi-Chennai, Mumbai-Chennai corridors.
- **Coastal freight corridors:** The objective of this programme must be to strengthen the West i.e., Kandla to Kochi and East i.e., Kolkata to Chennai coastal freight corridors through integrated projects that include last-mile rail and road programmes, trans-shipment hubs, proactive marketing and accelerated port development.
- **National expressways:** This includes constructing expressways of 100 to 300 km stretches that factor in expected increases in traffic by 2020. While currently 5 to 7 expressways are likely to be built by 2020, ideally, the number of expressways should be increased to over 20 by 2020. Expressways should include high-traffic routes such as Nasik-Shirpur and Ghaziabad-Bareilly.

¹⁵ From around 180 million tons of CO2 equivalent in 2020 under the current trajectory to around 150 million.

¹⁶ Current project implementation track record shows on average a cost and time overrun of 20 to 25 per cent for infrastructure projects. For details see McKinsey report on "Building India: Accelerating Infrastructure Projects"

- **Last-mile roads:** Creating a dedicated last mile programme with over 750 last-mile links to connect in particular port and railway terminals to production and distribution centres.
- **Last-mile rail:** This should ensure last mile rail infrastructure in many of the last 750 mile links. It will include developing track and rail head infrastructure to support 8 to 10 critical coal corridors in mineral rich states such as Jharkhand, Chattisgarh and Orissa.
- **Multi-modal logistics parks:** This programme will predominantly focus on demarcating land for logistics parks at 15 to 20 key points where different modes overlap, near major cities, or along proposed DFC routes. Designed as concessions, these should be equipped with the necessary infrastructure to ensure the seamless movement of freight across modes.
- **Roads maintenance:** This comprises creating long (e.g. 10 years) annuity-based maintenance contracts for 400 km to 500 km stretches. The current practice has been to issue contracts for shorter distances of 50 km to 100 km. Clear commitment to maintenance could also encourage the participation of more private providers. Extending both the duration of contracts and increasing the road stretches to be maintained could act as an incentive to providers to achieve scale and invest in better technology, thereby reducing costs.
- **Technology adoption like national electronic tolling:** This entails standardising technology for nationwide electronic toll collection (ETC) in future contracts and establishing a nationwide clearing house with set norms and service standards to facilitate transactions, thereby reducing waiting time and improving service levels.
- **Logistics skills development:** Adopting a balanced modal approach will increase demand for requisite skills. In particular, demand for four types of personnel will grow—warehouse managers, logistics managers, coastal seafarers and truck drivers. This in turn will require upgrading the training infrastructure and collaborating with institutes of technology, engineering colleges, marine training institutes and driver training institutes to help meet growing demand.
- **Enabling access to better equipment and setting common standards:** This refers to acquiring access to better equipment such as larger trucks and higher tare load railway wagons and developing common standards to aid inter-modal transport that ensures consistency in containers, pallets and cranes. Further, supporting research institutions like Road Research Institute could help develop better quality road construction material to bolster construction while simultaneously reducing costs.

Governance changes needed at the highest levels to develop the policy and ensure implementation

Developing and implementing various initiatives as part of the balanced modal approach will require an integrated approach across multiple stakeholders at the central and state level. The level of coordination required is monumental, as developing India's logistics infrastructure is the responsibility of a number of state and central government units and infrastructure development agencies.

The policy itself can be developed in a manner similar to the Integrated Energy Policy i.e., through an appropriate committee. Such a committee should include representatives from the concerned ministries and departments (e.g., NHAI, Indian Railways, Waterways Authority), stakeholders across ministries (e.g., Ministry of Roads, Ports, Railways, Finance, Aviation) and from the private sector (e.g., user industries, developers and

logistics providers). The government has recently set up the High Level National Transport Development Policy Committee that could fulfil this role.

Adopting and implementing an integrated logistics policy will need an empowered Group of Ministers, the Cabinet Committee on Infrastructure, the Prime Minister's Office or an equivalent central body at the highest level to take charge. While the policy execution will be carried out by ministries in the centre and states, such a body should ensure an integrated, coordinated, timely and flexible approach to infrastructure development.

Separately, to ensure speedy implementation, well-functioning infrastructure implementation "war rooms" should be set up for high-priority projects at various levels to provide common information, debottleneck and accelerate implementation of projects, under nodal and executing agencies like NHAI, as well as at the centre with the Cabinet Committee on Infrastructure.

PRIVATE SECTOR OPPORTUNITIES

Building logistics infrastructure capable of handling rising freight traffic more efficiently and in an environmental-friendly manner will open up large new opportunities for industry.

First and foremost, user industries will need to rethink their logistics strategy under two scenarios: a scenario where the logistics situation worsens as well as in a scenario that a new more efficient balanced modal logistics network gets created that opens up new opportunities. Companies that rethink their strategy for modal mix, use of containers, network planning and so on will benefit the most.

New opportunities will also surface for infrastructure developers and construction companies, technology and equipment providers. The size and scale of opportunities will increase. For example, capital and operational expenditure spending on road development till 2020 could be as much as USD 200 billion. Similarly, expenditure on rail tracks including DFCs could be close to USD 90 billion. The investment in ports could be as much as USD 50 billion. Increased demand for rail wagons will benefit equipment providers. Technology providers would also benefit through greater demand for warehouse management software and a common ETC platform across tolling centres.

Simultaneously, logistics providers also stand to benefit on multiple fronts with the implementation of the new vision for India's infrastructure. Benefits include greater demand for Third-Party Logistics (3PL services) such as warehouse management, end-to-end transportation management; and more opportunities for coastal operators to create charter and liner services in commodity bulk materials like coal, cement, iron ore, transport, and increasingly, in container transport.



India stands to gain economically and environmentally from implementing an effective and efficient balanced modal logistics infrastructure system. Economic gains encompass capital savings and reduced waste, both in the freight system and in the user industries. Environmental gains like reduction in emissions and reduced energy consumption are also likely. Implementing this is imperative but by no means easy. It calls for strong leadership to facilitate political alignment across the centre and states, rigorous implementation and programme management.