



LEADS
Logistics Ease Across Different States
January 2018



Foreword

Logistics is the fuel that powers a country's International trade. It determines the success of a supply chain and how well businesses can harness it to respond to the demand – through cost-competitiveness. A well organised logistics sector, in fact, can be the crucial differentiator in helping economies gain the competitive edge in exports.

However, infrastructure bottlenecks, complex procedures, and inadequate diversification in our services have held back the Indian logistics Industry from performing optimally.

Indian logistics costs are said to be amongst the highest in the world – i.e in the vicinity of 13% of the GDP. Germany's costs in comparison average just about 8% of its GDP providing its industry a huge competitive edge in the global market. We need to find ways to bring down our logistics cost and time, thereby improving the efficiency of the EXIM trade in India. This is not possible without the interventions of all the stakeholders in the EXIM trade value chain.

On the lines of the World Bank's Logistics Performance Index that ranks countries, we have now taken a sub-national view of the state of logistics with the help of Deloitte. This effort is aimed at establishing a baseline of performance based on the perception of users and stakeholders at the State level. It provides a basis for stakeholder engagement, discussions and evolving action plan by various agencies through a shared vision.

This study should not be assumed as an index of the performance of State Governments, but rather be used to assess the status of logistics efficiency in each State. There are significant variations across States with regards to logistics infrastructure as well as industrial production and supply clusters. Not just that, multiple agencies and processes make up the logistics chain, each constituting a composite part with varying roles and responsibilities. They all play important roles in determining the level of logistics performance.

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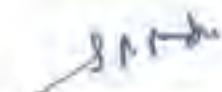
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The State logistics Performance Index is arrived at using a ranking methodology for stakeholder engagement based on a series of meetings and online surveys in the key areas of logistics – Infrastructure, Services, Timelines, Traceability, Competitiveness, Security, Operating Environment and Efficiency of Regulation.

Already, the introduction of GST has brought about a change by abolishing cross border delays and ultimately lowering the cost of our exports. But more needs to be done. Logistics involves a series of activities and services – transportation, handling and storage, custom brokering, forwarding, cold storage and so on. These activities are carried out through a coordinated effort of multiple stakeholders in the chain, and any weak link can vitiate the efficiency of the integrated chain.

As more data is made available and analysed and read with these perception results, there will be greater clarity on action points. Interactions with State Governments shall follow and an action agenda deliberated upon and implemented. However, it needs to be noted that State Governments alone cannot bring about a turnaround. All stakeholders will need to work together to make logistics lean and efficient if exports are to thrive.

This first edition of the report, prepared by Deloitte provides valuable insights into what enables and/or impedes logistics efficiency across the country as perceived by users within the community. It provides a useful starting point for reliable identification of the right problem areas and I look forward to this publication being used widely to work towards focused policy making.


(Suresh Prabhu)
30, December, 2017

Acknowledgement

This report has been prepared by a team of Transportation & Logistics professionals at Deloitte and academics under the guidance of the State Cell, Department of Commerce, the Ministry of Commerce and Industry, Government of India.

The team is thankful to senior officials at the Ministry for their time and inputs on all aspects of the international trade logistics scenario in the country, and the framework developed for LEADS index under this study. Their vision for the holistic development of the sector, the importance placed on this study as a sound starting step, and the sense of urgency inspired the team to undertake this enormous effort under extremely challenging timelines. The result is the first-of-its-kind LEADS index for the country.

The team would like to acknowledge the generous support provided by the Federation of Indian Export Organizations (FIEO), Director General of Foreign Trade (DGFT), and Directorate General of Commercial Intelligence and Statistics (DGCIS) in identifying and facilitating connect with stakeholders for seeking their feedback.

The team is also thankful to officials and nodal officers of various state governments who facilitated the survey and shared their invaluable inputs; representatives of various countrywide Chambers of Commerce and Industry, their state chapters, industry associations, Export Promotion Councils and Associations for goods such as leather, electronics, computer, handloom, pharmaceuticals, tea, plastic, silk, cotton, gems and jewellery, wool, tobacco, and sports goods. Additionally, various Industry boards for products such as tobacco, tea, spices, coconut, and rubber, supported in connecting with appropriate respondents.

This report would not have been possible without the inputs of hundreds of respondents – shippers, logistics service providers, terminal operators and transporters; from all over the country who responded enthusiastically to the survey. Their participation was the foundation of this report, just as their ideas for improvement promise to be core to a strong Indian logistics sector in the years to come. It has been our privilege to interact with many of them across numerous cities and industrial clusters across the country.

Acronyms

APEDA	Agricultural and Processed Food Products Export Development Authority
CAGR	Compounded Annual Growth Rate
CFS	Container Freight Station
DGCIS	Directorate General of Commercial Intelligence and Statistics
DGFT	Directorate General of Foreign Trade
FIEO	Federation of Indian Export Organisations
FSSAI	Food Security
GST	Goods and Service Tax
GVC	Global value Chain
ICD	Inland Container Depot
IPRCL	Indian Port Rail Corporation Ltd.
LSPs	Logistic Service Providers
MoRTH	Ministry of Road Transport and Highways
PCA	Principal Components Analysis
PFT	Private Freight Terminal
SEZ	Special Economic Zone
UT	Union Territory
WTO	World Trade Organisation

Fuel for Growth

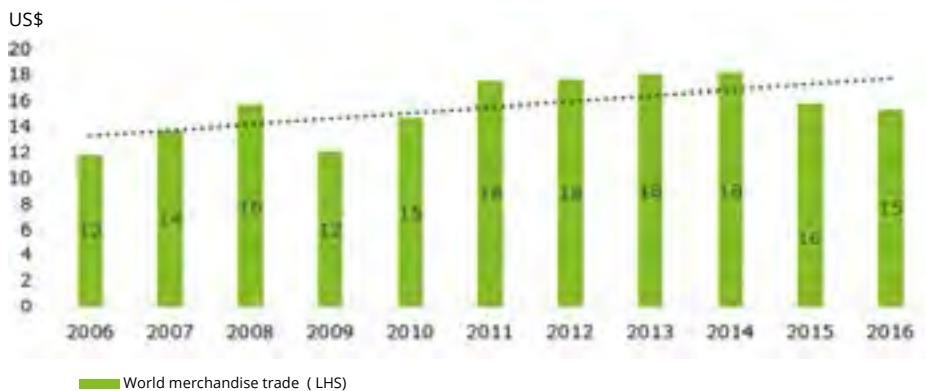
Logistics: Fostering an interconnected and growing economy

The global economy has transformed over the last few decades with increasing trade flows between countries. Global merchandise trade increased from around US\$12 trillion in 2006 to more than US\$15 trillion in 2016 – a 25 percent increase (WTO, 2017).

Increasing trade, as established through academic research, has led to rising incomes and a boost to demand. To fulfil this demand, newer networks are required between businesses to cater to the growing consequent needs of manufacturing and distribution. Companies are able to spread their production geographically by way of

disaggregated supply chains, sourcing material and intermediate inputs and components from locations that are most favourable to the production cycle, in addition to ensuring cost and quality. While this has increasingly led to distributed production networks across geographies, it has also meant more integrated global value chains (GVCs).

Exhibit 1: World Merchandise Trade



Source: WTO (2017)



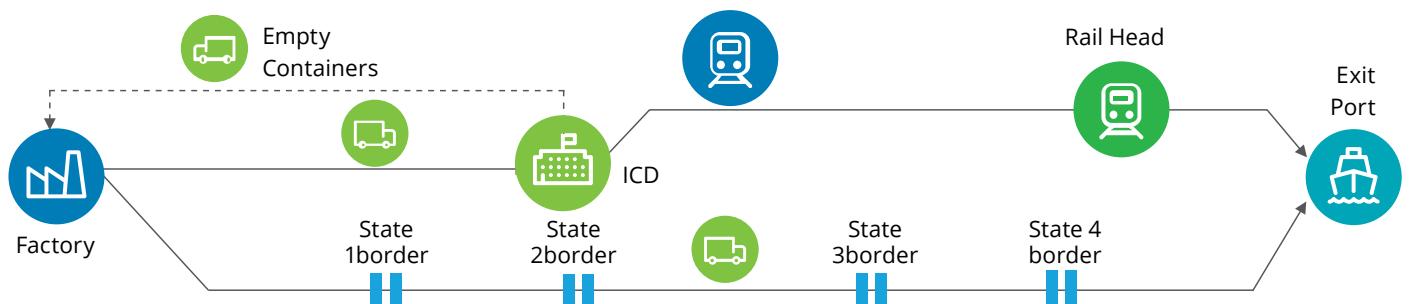
As manufacturers and traders increasingly look at the world as a unified production base and a market, efficient logistics networks can significantly enhance a country's ability to trade globally. In today's interconnected world, there can be little debate that investment in, and improvement of, the complete logistics chain is pivotal in boosting competitiveness and international trade. With right operating conditions and regulatory impetus, this, in turn, contributes to a country's GDP growth.

A well-organized and efficient logistics system is therefore a definite catalyst in an economy's integration with GVCs, buoyancy in external trade, and ultimately in the overall development of economies.

Logistics: What and How

Logistics is the management of the flow of resources — cargo, documents, information and funds — through a range of activities and services between a point of origin and a point of destination.¹

Exhibit 2: The Cycle of Logistics

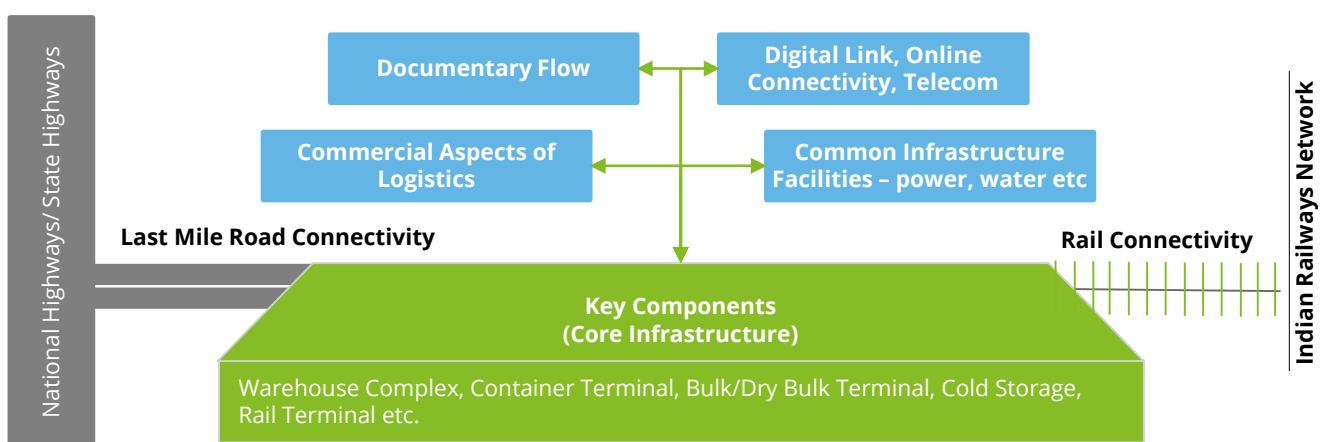


Source: Deloitte research

Logistics has come a long way from being a unidimensional support function it once was. It has morphed into a networked, multidimensional process today, aimed at enhancing operational efficiency and boosting economic activity.

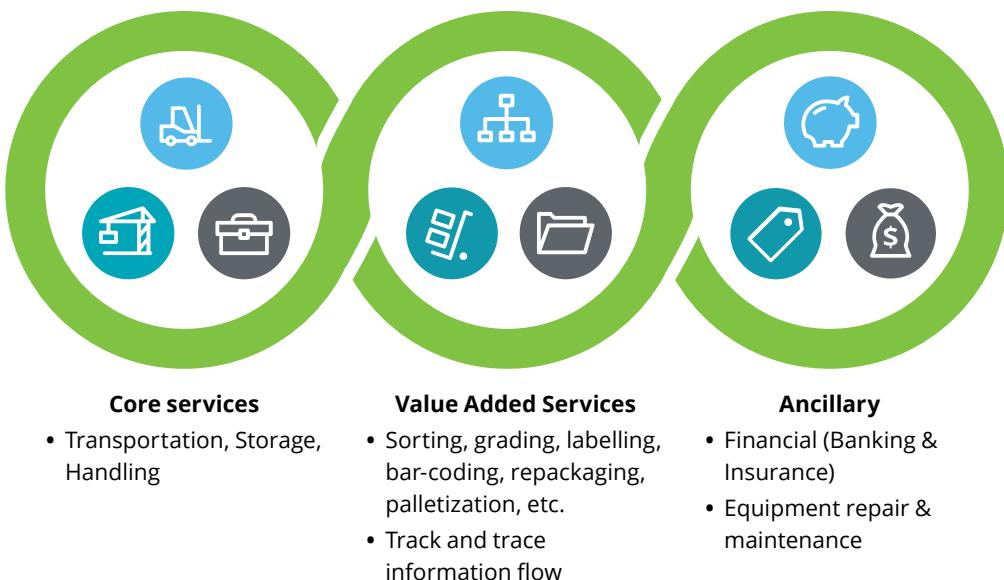
The logistics ecosystem comprises of fixed facilities, moving units or rolling stock, and systems and processes that come together to provide a number of service elements.

Exhibit 3: The Logistics Ecosystem



Source: Deloitte research

¹This is not an attempt to define the term, but instead to indicate the lens with which this study has focused on the subject.

Exhibit 4: Logistics Service Elements

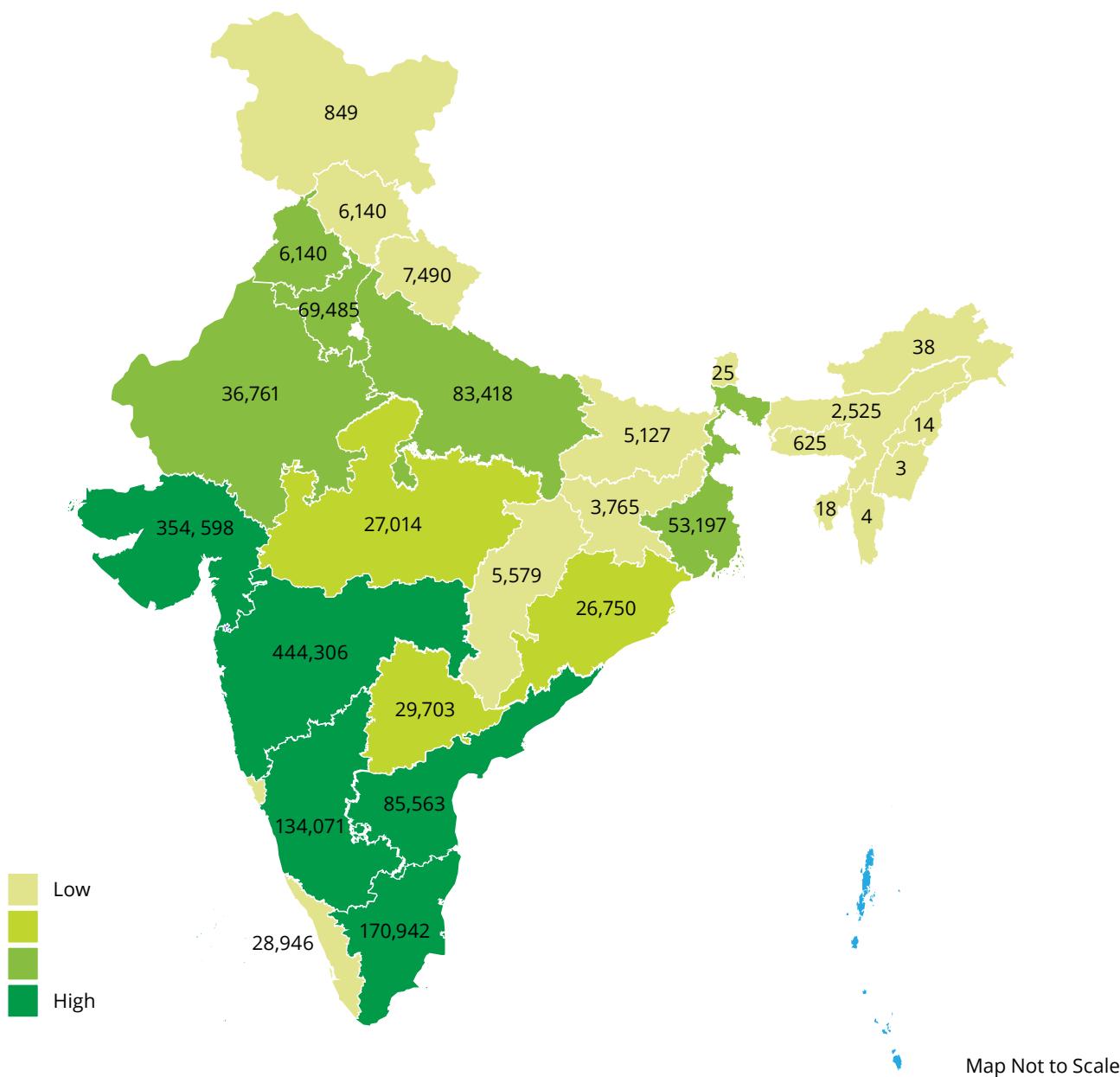
The sector brings together a range of public sector agencies and private sector players who coordinate to provide logistics services to users. The users perceive the outcomes of these services in terms of parameters like time, cost, and quality (a multi-dimensional concept involving aspects like visibility, timeliness, safety, and integrity of the shipment). The performance of the logistics sector in turn is influenced by various factors such as policy and regulations, cross-border protocols, infrastructure availability, service delivery, changing technology, and importantly, evolving consumer requirements and preferences.

International Trade Logistics in India
Recent economic reforms, enhanced trade cooperation, increasing infrastructure investment, stronger focus on manufacturing through initiatives like 'Make in India', and deeper e-commerce penetration have opened up several growth opportunities for the logistics

sector in India. Various industry estimates put the size of Indian Logistics market at around US\$ 100-125 bn growing at about 5% per annum

The Indian economy grew at a CAGR of 6.89 percent between FY 2011 and FY 2017 (Reserve Bank of India, 2017). Significantly, the country's economy is increasingly integrating with international markets. For instance, India's foreign value-added content of exports² increased from 9.4 percent in 1995 to 24.1 percent in 2011, indicating an increased integration into GVCs.

Over the last three years (FY 2014-15 to FY 2016-17), 15 states/UTs have, on average, accounted for 90 percent of total exports by value. These 15 states/UTs also contribute a large share (75 to 100 percent) of exports of those key commodities, which account for nearly 80 percent of the country's exports by value. Refer Exhibit 5:

Exhibit 5: State Exports by Value (in INR Crores)

Note: Average of exports for year 2014-15 & 2016-17

Source: DGCIS

Expectedly, these states/UTs also account for a substantial share of infrastructure facilities — 85 percent of the total road network in India, 83 percent of the railway route-kilometres in the country, and 90 percent of total international

air freight handled at Indian airports. While information on the presence or availability of service providers is limited, it is believed that these states/UTs are also the ones where majority of service providers operate.

²It reflects the extent of value add, produced outside the domestic economy, in the exports of a country. (OECD, 2016) (http://www.oecd-ilibrary.org/economics/oecd-factbook-2015-2016/trade-in-value-added_factbook-2015-28-en)

Exhibit 6: Top 15 Exporting States and their key export commodities

S.No	State	Key Commodities Exported	S.No	State	Key Commodities Exported
1	Maharashtra	<ul style="list-style-type: none"> • Pearls, Precious and Semiprecious Stones • Drug Formulations and Biologicals • Jewellery of Gold and Other Precious Metals • Ships, Boats and Floating Structures • Iron and Steel 	9	West Bengal	<ul style="list-style-type: none"> • Iron and steel • Jewellery of gold and other precious metals • Leather goods • Products of iron and steel • Marine products
2	Gujarat	<ul style="list-style-type: none"> • Petroleum Products • Jewellery of Gold and Other Precious Metals • Drug Formulation and Biologicals • Organic Chemicals • Cotton Fabrics, Madeups, etc. 	10	Punjab	<ul style="list-style-type: none"> • Rice -basmoti • Cotton yarn • Products of iron and steel • RMG manmade fibres • Cotton fabrics, madeups etc.
3	Tamil Nadu	<ul style="list-style-type: none"> • Motor Vehicles/Cars • RMG Cotton include Accessories • Auto components/parts • Cotton fabrics, madeups etc. • Footwear of leather 	11	Rajasthan	<ul style="list-style-type: none"> • Pearls, precious and semiprecious stones • Manmade yarn,fabrics,madeups • Plywood and allied products • Zinc and products made of zinc • Jewellery of gold and other precious metals
4	Karnataka	<ul style="list-style-type: none"> • Gold • Petroleum products • Iron and steel • RMG cotton incl accessories • Organic CHEMICALS 	12	Telangana	<ul style="list-style-type: none"> • Drug formulations and biologicals • Residual chemicals and allied products • Bulk drugs and drug intermediates • Organic chemicals • Jewellery of gold and other precious metals
5	Andhra Pradesh	<ul style="list-style-type: none"> • Marine products • Jewellery of gold and other precious metals • Ships, boats and floating structures • Drug formulations and biologicals • Spices 	13	Kerala	<ul style="list-style-type: none"> • Jewellery of gold and other precious metals • Marine products • Spices • Cashew • Petroleum products
6	Uttar Pradesh	<ul style="list-style-type: none"> • Buffalo meat • Jewellery of gold and other precious metals • Footwear of leather • Carpet(excl. Silk) handmade • RMG manmade fibres 	14	Madhya Pradesh	<ul style="list-style-type: none"> • Drug formulations and biologicals • Cotton yarn • Oil meals • Cotton fabrics, madeups etc. • Aluminium and products made of aluminium
7	Haryana	<ul style="list-style-type: none"> • Rice -basmoti • Motor vehicle/cars • Electric machinery and equipment • RMG cotton incl accessories • RMG manmade fibres 	15	Orissa	<ul style="list-style-type: none"> • Iron and steel • Aluminium and products made of aluminium • Iron ore • Petroleum products • Processed minerals
8	Delhi	<ul style="list-style-type: none"> • RMG manmade fibres • RMG cotton incl accessories • RMG of othr textile matrl • Buffalo meat • Gold 			

Source: DGCIS

Moving Logistics in India Forward

Since 2007, the World Bank Group has been publishing a “Connecting to Compete” series featuring logistics performance of international supply chains across countries. Serving as a global benchmarking reference, the report has contributed to efforts by a number of countries to undertake further in-depth country diagnostic studies. The 2016 version of the report notes the complex, intertwined, and evolving nature of logistics, which makes improvement in performance an ongoing activity.

India has undertaken number of positive steps on this agenda in recent years. Our world ranking has moved up from 54 in 2014 to 35 in 2016 — a significant change in our score in the World Bank’s Logistics Performance Index (LPI) in just two years.

Further progress in this direction would need concerted focus on the complex, cross-cutting nature of logistics industry that is presently fragmented. The role of multiple actors across states and regional boundaries would need to be streamlined.

Box 1: World Bank LPI: A useful starting point for diagnosis and policy making

Countries have made use of WB LPI assessments to understand focus areas for policy initiatives, coordinating and channelizing investment to improve their logistics performance. For instance, Panama improved its score from 2.92 to 3.34 from 2012 to 2016, an upgrade in the overall ranking from 61 to 40 amongst 160 countries.

This was in contrast with declining scores / performance of countries in the same group as Panama, whether on regional basis (Latin American countries) or on economic basis (upper middle income group of countries).

Panama - on analysing its indicator scores (which LPI comprised), faced the challenge of shifting its policy focus from infrastructure, commerce and services driven development to transport and logistics based growth. It focused on both hard and soft aspects of logistics.

Panama first developed place based policies for SEZ (such as Colón Free Trade Zone) to attract foreign firms. Development of manufacturing hubs in mixed use zones were geared for value additions in export products and services. Panama launched a logistics portal in 2015 in collaboration with Georgia Institute of Technology. It also looked at key infrastructure projects - Panama Canal expansion project (doubling the handling capacity of total cargo volume), Tocumen airport, port and road infrastructure reaping rewards in terms of growth in overall Net Tonne Kilometres.

Panama concurrently focused on soft solutions, which are critical to logistics chain, like aligning custom clearances and ICT for improved international connectivity.

Source, multiple: <https://lpi.worldbank.org/>; Deloitte, 2014, Competitiveness: Catching the next wave: Panama; IMF Working Paper, Western Hemisphere Department, Panama's Growth Prospects: Determinants and Sectoral Perspectives, Kimberly Beaton and Metodij Hadzi-Vaskov (Authorized for distribution by Valerie Cerra, July 2017)



As a start, the Ministry of Commerce and Industry undertook this study to understand the perception of industry players and stakeholders across India, about international trade logistics. It is critical to note that while measuring performance is fundamental to analysing, monitoring and planning improvement, inter se benchmarking of countries, regions or states would not be enough, given the varying operating circumstances, resource availabilities, geographical factors, among other things. This study should be an input to further deliberations, identification of potential focus areas, and setting priorities for strategic plans.

This study therefore presents the perception of users and stakeholders about logistics performance across states and regions. It finds it to be an enmeshed integrated play of actors, including agencies of the central government, state governments, and private sector players, including shippers, exporters and importers.

"High logistics costs can be seen as an implicit tax that biases the economy away from exports" [Kunaka, C and Rizwan, N (2016)]. Only coordinated planning and follow-through with actions on the part of all the agencies involved would help bring the necessary focus to international trade logistics performance in India — from the ground up!



Measuring Logistics Performance

International trade logistics is an enmeshed integrated play of multiple actors – agencies of central and state governments, logistics service provider, and shippers. What makes it more complex is that users perceive outcomes of logistics services in terms of multiple parameters – including ones that service providers might consider inconsequential – all of which influence provision of these services.

For that reason, measuring performance of international trade logistics is not an easy task. Many indicators could inform performance across parameters but none alone comprehensively.

The *Connecting to Compete* 2016 report by the World Bank analyses countries across six components, which, the report says, have been chosen based on theoretical and empirical research as well as practical experience of logistics professionals and have been aggregated into a single indicator using standard statistical techniques.

This study similarly focused on creating a ‘composite indicator’ so that performance of international trade logistics across India could be measured in a manner that provides a meaningful basis for identifying focus areas and setting strategic plans over time.

The study intended to formulate an Index relevant to India’s context based on industry practices for developing composite indices and combined observations and knowledge for designing a framework for India’s requirements.

Box 2: Composite Indicators

Composite indicators, which compare and benchmark performance across geographies, have emerged as a useful tool in initiating discussions for policy design and analysis. There are several reasons for their use in differing contexts across the globe. Firstly, their ability to summarize complex or multi-dimensional issues in a simplistic manner aids easy interpretation, as stakeholders might find it challenging to rely on a set of multiple indicators for drawing inferences. Secondly, quantifying a concept helps to assess progress regularly, and brings to light instances where interventions are needed. Finally, updating quantitative ratings periodically helps facilitate two-way communication with stakeholders, which is at the core of public policy making (Saisana and Tarantola, 2002).

Nevertheless, one needs to exercise caution while interpreting composite indicators to avoid misunderstanding the problem area leading to inappropriate policy making. In addition, critics such as Sharpe (2004) have raised concerns over the manner of selecting indicators and weights. However, undertaking an in-depth literature review for identifying indicators that are capable of assessing various performance dimensions and validating them can address this problem.



Handbook on Constructing Composite Indicators (Organisation for Economic Co-operation and Development, JRC European Commission, 2008) notes the use of composite indicators as a useful tool in analysis and communication of public policies.

The study considered development of the composite indicator at the level of states and union territories (UTs) as these can be discrete units for:

- overall analysis of logistics performance in a given context;
- deliberations with stakeholders on findings and potential focus areas; and
- coordination of strategic planning across different players with defined ownership.

In view of the enmeshed integrated play of actors that international trade logistics presents itself as, it is important to note that the composite indicator would accordingly reflect performance 'across' these units (states and union territories) rather than performance 'of' these units themselves.

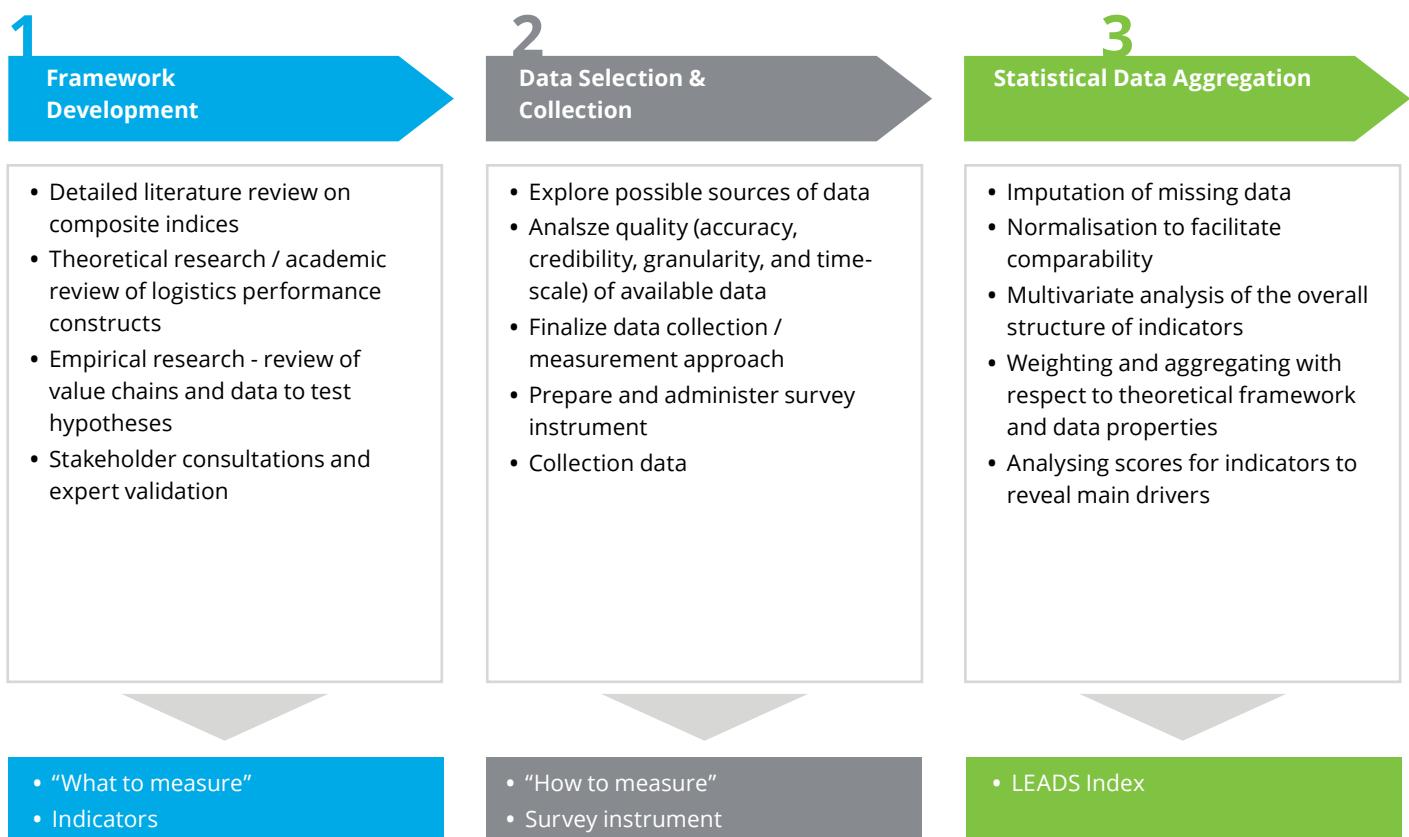
This study also does not provide for direct comparison of international trade logistics performance across states with that of India or other countries on the World Bank's LPI. That is because the construct of this study is not fully equivalenced. However, if all the relevant agencies focus on improving logistics performance across states collectively, it will lead to definitive improvement of the country's international trade logistics performance.

The LEADS Index Architecture

Among the many proposed methodologies for developing composite indicators, there are some that are relatively more established than others. The following exhibit illustrates the approach taken for developing a composite indicator to assess international trade logistics across states and UTs. The study terms it "Logistics Ease Across Different States" (LEADS) Index.

As is the case with many important international studies³, it is expected that the methodology for the LEADS Index will evolve and get refined with the availability of more data in future.

Exhibit 7: Approach for developing the LEADS Index



Source: Deloitte Research

³ "This year's report introduces important changes in the methodology for the indicators. These changes are aimed at increasing the economic and policy relevance of the indicators, improving the consistency and replicability of the data and clarifying the context in which the data should be interpreted as well as the caveats that should be kept in mind."; Doing Business 2016: Trading Across Borders

Parameters of Logistics Performance – “What to Measure”

The study envisions initiating further deliberations, identification of potential focus areas, and setting priorities for strategic plans of various agencies to improve performance of international trade logistics across India.

Accordingly, the study considered certain key objectives for identifying relevant indicators of logistics performance to make up the composite indicator:

- The indicator should convey an output measure of activity(ies) / service(s) that are an important part of international trade logistics chain in the country – as experienced either by end users or other stakeholders in the chain (given the multiplicity of users / stakeholders in the multi-dimensional phenomena);
- Since the study is focusing on understanding and baselining international trade logistics performance across the country, the indicators should be differentiable across different trade lanes / value chains within the country; and

- The indicators should be validated by stakeholders as being meaningful to assess international trade logistics performance across the country.

The study had the following boundary conditions:

- International trade logistics chain was considered within the country – from production centre(s) to exit gateway(s) for exports, and vice versa for imports, i.e. excluding part of the chain beyond India's borders; and
- While part of the international trade logistics chain that operates within the country is covered under the ambit of this study, it was not used for identification of indicators as well as stakeholders.

With this framework, the study identified and finalized eight (8) indicators to form part of the composite LEADS Index through theoretical and empirical research, and with active involvement of stakeholders and experts (to account for varied viewpoints and experiences). See Box 3 for more details on Framework Development.



Exhibit 8: Indicators of LEADS Index

Indicator	Definition	Coverage
Quality of Transport & Logistics Infrastructure	Capacity in relation to demand, operating conditions of infrastructure, efficiency of operations	<ul style="list-style-type: none"> Road Network Rail Network Ports and Airports CFS/ICDs <ul style="list-style-type: none"> Logistics Parks/ freight terminals Warehouses Cold Storage Units
Quality of services offered by Logistics Service Providers	Availability, competence, efficiency of services and ease of access to service providers	<ul style="list-style-type: none"> Haulage by different modes Handling & storage of cargo and containers <ul style="list-style-type: none"> Freight forwarding Customs broking Value added logistics activities
Efficiency of regulatory processes	Speed, simplicity, transparency in processing, ease of documentation	<ul style="list-style-type: none"> Customs Health Sanitary and phytosanitary Quarantine <ul style="list-style-type: none"> Drug controller FSSAI Inter-state border crossing agencies
Favourability of operating environment	Low incidences of law and order issues, strikes, impact of trade/ transporter unions etc.	<ul style="list-style-type: none"> Law and order by State Government agencies <ul style="list-style-type: none"> Trade/ transporter / labour unions
Ease of arranging logistics at competitive rates	Shipment prices to/from chosen state compared to price expectations, assessment of costs, prices elsewhere	<ul style="list-style-type: none"> Transportation Handling Storage <ul style="list-style-type: none"> Value added Services Informal Charges
Timeliness of cargo delivery	High Frequency of delivery within scheduled or expected delivery time with minimum time delays	<ul style="list-style-type: none"> Unscheduled stoppages Average detention at border crossings <ul style="list-style-type: none"> Documentary compliance check time
Safety/Security of cargo movement	Frequent delivery without or with minimum damage/ deterioration/ pilferage of cargo due to logistics inefficiencies, accidents or thefts	<ul style="list-style-type: none"> Frequency of loss / damage to cargo <ul style="list-style-type: none"> Unscheduled stoppages
Ease of Track & Trace	Ability to obtain frequent, consistent & accurate information regarding movement and condition of cargo	<ul style="list-style-type: none"> Information availability Information source <ul style="list-style-type: none"> Real time information availability Accuracy

Source: Deloitte Research

Box 3: Framework Development

To construct the LEADS Index, the starting point was developing a sound theoretical framework. The study used an iterative process for identifying and finalizing indicators using the components illustrated in the adjoining Exhibit.

Theoretical Research

The study reviewed a wide range of academic literature pertaining to logistics performance constructs as also a number of internationally accepted performance / competitiveness benchmarking studies relevant to trade, transport and logistics.

- Studies / indices pertaining to **logistics assessment** were relevant to the scope of this study. So the framework development considered indicators considered in such studies
- Some studies / indices pertaining to **competitiveness** had considered logistics as a component. The framework considered indicators pertaining to logistics performance from such studies.
- Studies / indices pertaining to **trade facilitation or enablement** also considered logistics as an important enabler and had some relevant indicators of logistics performance.
- Studies / indices pertaining to **Doing Business** analysed policy-level factors. The study considered these to assess their impact on logistics performance of relevant stakeholders – for instance, to incentivize creation of logistics infrastructure, to facilitate efficiency in regular business operations.

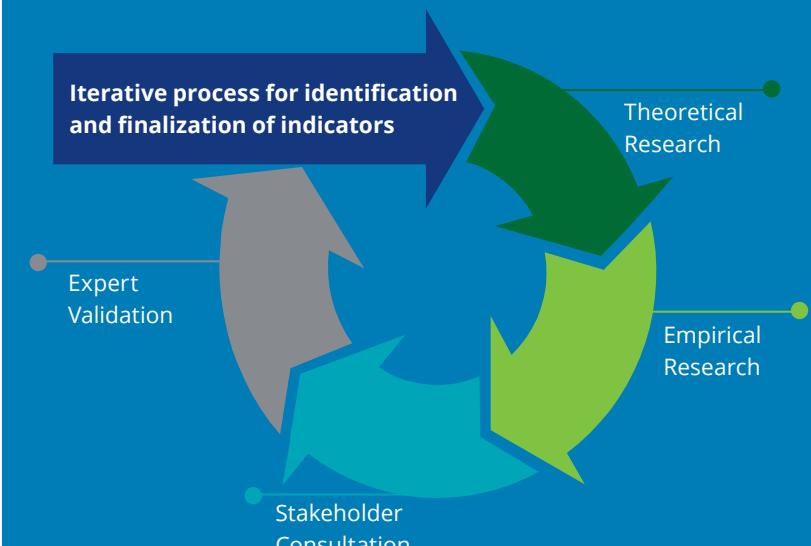
Empirical Research

The study considered international trade logistics chains for a number of commodities – covering various geographies within the country as well as modes of transport, focusing on key outcomes that matter to stakeholders. Extensive interactions with them helped bring forth relevant observations. Finally, through an analysis of the logistics chains, stakeholder interactions and consequent observations, the study identified the most pertinent indicators.

Stakeholder / Expert Consultation

The study team consulted a wide variety of stakeholders, comprising shippers, road transporters, container train operators, freight forwarders, multimodal transport operators, air cargo agents, shipping lines, ICD/CFS operators, among others. These consultations were intended to identify as well as validate and finalize the final set of indicators. Additionally, an Expert Workshop was organized with logistics sector representatives having extensive operational experience across multiple activities and services to deliberate and validate the set of indicators.

Exhibit 9: Framework Development – An iterative process



Source: Deloitte Research

Box 4: World Bank's Logistics Performance Index (LPI) – based on extensive research and practical work

The World Bank's LPI has been developed to measure how effective trade logistics is across countries. The LPI index helps to assess a country's overall performance on all aspects of international trade logistics, and to appraise how well connected it is with global trade.

Both theoretical and empirical research went into developing the LPI framework. It also leveraged hands-on experience of logistics professionals involved in international freight forwarding. The World Bank emphasizes that the extensive practical work of its professional and academic partners helped to make it robust.

It is understood that the methodology evolved from its first version in 1993 in various stages to focus on specific characteristics capturing the logistics performance. Subsequently pilot surveys, carried out in 2000 and 2004 by Prof Ojala at Turku School of Economics, contributed towards the final shape of the LPI framework launched in 2007.

Source: The World Bank, Connecting to Compete 2007; The World Bank, Connecting to Compete 2012

Data collection – “How to Measure”

Industry practice suggests that the data to be used for developing such composite index should be relevant to the underlying measures, be measurable, and be consistent across units being assessed.

The study examined if relevant quantitative data was easily available for assessing logistics performance across the identified indicators. After an extensive data collection exercise and analysis, the key findings were:

- **Extremely limited availability of quantitative data** – Quantitative data is only available with respect to infrastructure under the purview of central government and its agencies. This is data such as length of highways, railway route-length, port capacities, and so on.)

- **Quality data not consistently available across states** – Across states, different departments or agencies are responsible for collating data relevant to indicators identified for this study. Also the availability, granularity, and time-scale of whatever data is available for states from public sources varied widely – not allowing any meaningful analysis and collation for the purpose of creating an indicator.

- **Credible quantitative data not available for key indicators** – Given the fragmented nature of the Indian logistics sector, quantitative data is not available across states to allow any analysis of key indicators of logistics performance like time, cost, among others.

Being mindful of all these limitations, this study used data from a perception based survey instrument – prepared

and administered across the country over a 6-week period. See Box 5 for a review of literature on use of perception-based data for such studies. In future,

the LEADS Index can incorporate relevant quantitative data as it becomes consistently available for various states on the same time-scale.

Box 5: Use of perception based data

The study reviewed numerous (international) index studies and the nature of data used to develop them. Of the 11 studies, nine rely on perception-based data with available objective data only used to supplement or inform the perception-based data results. Only two index studies – US Chamber of Commerce's Transportation Performance Index, and Trade and Development Index by UNCTAD, are based on objective data. Even here, the report on Transportation Performance Index by US Chamber of Commerce (2010) notes the extensive challenge of gathering necessary data impacting use of certain ideal indicators.

Handbook on Constructing Composite Indicators (Organisation for Economic Co-operation and Development, JRC European Commission, 2008) notes the scarcity of comparable quantitative data leading to use of survey-based data in many cases.

Validity of perception-based studies

Literature review indicates that there is debate around choice of indicators in developing composite indices. There are two categories of indicators: (1) actionable indicators, based on direct measurement of institutions and their outcomes, and (2) perception indicators based on assessments by surveys⁴.

While actionable indicators are potentially more responsive to changes in underlying conditions, directly measuring norms and practices for complex phenomena can be a challenging exercise. Thus, perception measures are used, which allow researchers to assess nuances and issues that hard data may not cover adequately.

In fact, perception-based assessments by users and stakeholders – who work in the logistics space and take business decisions based on its performance – are a more accurate measure of ground realities of the state of logistics.

The perception-based survey instrument had two main parts:

01. Assessing logistics performance across eight key indicators for up to five states / UTs where respondents' had operations / experience pertaining to international trade logistics; and
02. Assessing logistics performance in more detail for one state / UT where

a respondent had more experience pertaining to international trade logistics.

Being the first industry-level exercise after GST roll-out, the questionnaire also asked respondents for their perspective on GST. Finally, the questionnaire had an optional part for capturing more granular (time / cost) details for certain types of logistics chains.

2,885 responses in 6 weeks helped to cover 27 states and 5 UTs in the first LEADS Index⁵. See Box 6 for more details on preparation and administration of the questionnaire.

⁴Methodology of Indices of Social Development – Foa and Tanner

⁵Due to insufficient number of responses, Sikkim, Arunachal Pradesh, Nagaland, Manipur, Mizoram, Tripura and Meghalaya had to be excluded from LEADS Index scoring. However, given the similarity in their geographical and export value contexts, LEADS score was assessed for them as one geographical cluster (Hilly East). Given the difference in administrative and size context of UTs, they were assessed separately (barring 2 for which there were insufficient number of responses).

Box 6: Preparing and administering the questionnaire

Since it was the first instance of preparation of the LEADS Index in the country, a draft survey questionnaire was designed to capture the perception of logistics users and stakeholders on the identified indicators. All perception assessment questions used a standard 5-point Likert scale.

The draft survey was pilot-tested with a variety of stakeholders, including road transporters, container train operators, freight forwarders, multimodal transport operators, air cargo agents, shipping lines, ICD/CFS operators as well as shippers across multiple geographies.

The focus of the pilot testing was to:

- Examine the ease of comprehension of questions in terms of language, context, and so on;
- Identify any recurrent instances of poor or no responses;
- Assess the time required to fill the questionnaire and respondent fatigue thresholds; and
- Ascertain respondents' views on the questionnaire.

Stakeholders indicated that the questionnaire was comprehensive and covered all logistics performance areas relevant to them. Post-assessment discussions provided some useful feedback on making some questions sharper.

Alongside, data for qualitative assessment was also collected through a web-enabled survey and one-on-one interviews. To offset a low response rate to the web-enabled survey because of a short survey window, the study team visited ~40 cities, including key industrial clusters and state capitals, for interacting with users, stakeholders, associations, as well as state government officials.

Sampling

All stakeholders were classified under four respondent categories –

- shippers including exporters / importers;
- transport service providers including road hauliers, rail operators, container train operators, airlines and shipping lines;
- terminal service providers including surface transport based terminal operators (CFS/ICD/PFT/AFS), warehouse operators / cold storages, port terminal operators, air cargo terminal operators; and
- logistics service providers including freight forwarders, express carriers, customs brokers, multimodal transport operators, and air cargo agents

To ensure adequate representation of all categories across various states, stratified random sampling was used.

Among those who provided support in preparing an appropriate sample frame were FIEO, DGFT, APEDA, Industry Chambers, national and regional Industry Associations, Federation of Freight Forwarders' Association of India, Air Cargo Agents Association of India, Exporter Associations, and Export Promotion Councils.

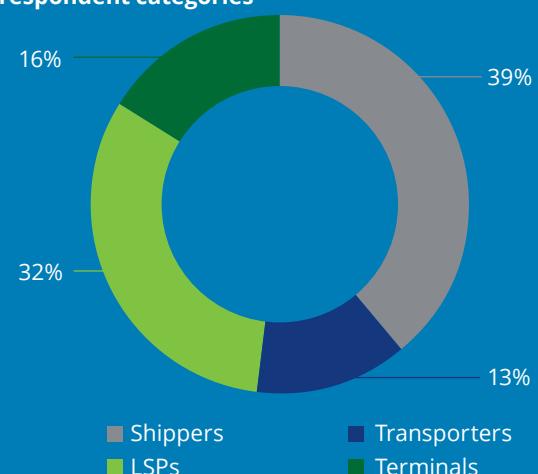
The survey was administered to a sample of respondents selected with an assumption of 80% confidence interval and a margin of error of 0.10.

2885 responses from around 1000 respondents, located across 36 states and UTs, were received through online mode as well as in-person during visits to various states and UTs.

Adequate number of responses were received for most states and UTs – 27 states and 5 UTs, to allow for meaningful statistical analyses. Exceptions were UTs of Andaman & Nicobar Islands and Lakshadweep Islands, and states of Arunachal Pradesh and Sikkim. LEADS scores were accordingly not computed for these states and UTs.

Around 70% of responses were from shippers and logistics service providers with the rest being from terminal service providers & transporters. This sample is in line with the population sizes of these individual categories. Among the respondents, 66% were from senior management level within their organizations. The proportion rises to 89% if senior and middle management levels are considered together.

Exhibit 10: Distribution of survey responses by respondent categories



Source: Deloitte Analyses

Statistical Data Aggregation – LEADS Index

Standard statistical techniques were used to analyse and aggregate perception-based data into the LEADS Index. Essentially, approaches were considered

for imputing missing data, analysing the overall structure of the data to identify choices for weighing and aggregating indicators into the composite LEADS Index. See Box 7 for description of how the Index is calculated.

Box 7: Calculating the LEADS Index

Imputation of missing data

The overall data structure was analysed using suitable tests (viz. Little's MCAR test) to suitably address the issue of missing data within the responses received. The missing data was not found to be 'Missing Completely At Random (MCAR)'. Accordingly, 'maximum likelihood estimation method' was used to impute values in the data set.

Normalization

A variety of standard normalization techniques were applied to the data set and the Z-score standardization method was found to be most appropriate. Data was normalized based on the respondent category group.

Multivariate analysis, weighting and aggregating

Multivariate analysis is essentially to assess the structure of the index and to test whether the defined indicator set is sufficiently balanced. Cronbach Coefficient Alpha method was used to check internal consistency in the set of individual indicators. The resulting scale reliability coefficient is 0.83 – indicating that the eight indicators are explaining the underlying index construct i.e. LEADS Index.

Additionally, principal components analysis (PCA) was used to analyse the association between different indicators. The output from PCA is a single LEAD Score for each state - a weighted average of the scores on eight indicators with weights chosen to maximize the percentage of variation that is accounted for by one summary indicator i.e. the LEADS Index.

While, the weights derived for various indicators are similar across states and UTs, statistical analyses indicated different weights for certain states in the eastern part of the country – broadly categorized as part of a Hilly-East cluster. Number of responses received for these states were also low resulting in wider statistical spread between the upper and lower bound of their scores.

PCA results for states and UTs in three relevant categories are presented below.

Exhibit 11: Principal Component Analysis Results for states

Component	Eigenvalue	Difference	Proportion	Cumulative
1	4.06	3.06	0.50	0.50
2	1.00	0.30	0.12	0.63
3	0.69	0.12	0.08	0.72
4	0.57	0.06	0.07	0.79
5	0.51	0.06	0.06	0.85
6	0.45	0.06	0.05	0.91
7	0.39	0.09	0.04	0.96
8	0.29		0.03	1.00

Source: Deloitte Research

Exhibit 12: Principal Component Analysis Results for UTs

Component	Eigenvalue	Difference	Proportion	Cumulative
1	4.08	3.06	0.51	0.51
2	1.01	0.31	0.12	0.63
3	0.70	0.16	0.09	0.72
4	0.53	0.01	0.06	0.79
5	0.52	0.10	0.06	0.85
6	0.41	0.01	0.05	0.91
7	0.40	0.08	0.05	0.96
8	0.31		0.03	1.00

Source: Deloitte Research

Exhibit 13: Principal Component Analysis Results for Hilly-East cluster of states

Component	Eigenvalue	Difference	Proportion	Cumulative
1	3.19	1.11	0.39	0.39
2	2.07	1.02	0.26	0.65
3	1.05	0.43	0.13	0.79
4	0.62	0.29	0.07	0.86
5	0.32	0.03	0.04	0.91
6	0.29	0.05	0.03	0.94
7	0.24	0.06	0.03	0.97
8	0.17		0.02	1.00

Source: Deloitte Research

Based on the Kayser's Rule of Thumb and Scree Plot criteria, two principle components with eigen values greater than 1 were retained in case of computations of scores for the first two groups of states and UTs. Three principle components were identified for computation of scores for the states categorized as part of a Hilly-East cluster.

Loadings for corresponding components are varimax rotated to enhance the interpretability of the results within these principle components keeping the components uncorrelated or orthogonal. It results into final set of component loadings (two sets for states & UTs and three sets for states in Hilly East).

These have been converted into a single set of component loadings (weights) for respective cluster of states/UTs through share of overall variance explained by each component, and share of variance explained by each indicator in respective components. The resultant indicator weights are presented in below.

Exhibit 14: Indicator Weights for computation of composite LEADS scores

Indicators	States	UTs	States in Hilly-East cluster
Infrastructure	0.13	0.12	0.14
Services	0.14	0.14	0.11
Timeliness	0.13	0.12	0.13
Tracking/Tracing of cargo	0.11	0.11	0.13
Competitive Pricing Shipments	0.20	0.19	0.06
Safety/Security of Cargo	0.09	0.10	0.16
Operating Environment	0.10	0.10	0.12
Regulatory Processes	0.11	0.12	0.15

Source: Deloitte Analyses

Sensitivity Analysis

While constructing the LEADS Index, several statistical techniques, were investigated at each step of the analyses e.g. missing data imputation, data normalization, as well as weights and aggregation. Industry practice recommends sensitivity analysis to check the robustness of the scores derived using the selected methods.

On the missing data imputation method, two additional methods were investigated – single imputation method using mean and multiple imputation method. PCA conducted on the data set imputed using both these methods separately does not affect the final scores for states and their respective rank ordering.

LEADS scores were also computed for different normalization techniques including standardization, normalization (a scale of 1-5 using min-max formula), and using raw scores. Scores of states remain largely unaffected with maximum variation in scores being less than 3% (Scores range from 2.49 to 3.36 in one technique and range from 2.40 – 3.32 in the other).

The sensitivity analyses help in confirming the robustness of scores vis-à-vis the statistical techniques finally used in constructing the LEADS Index.

What the Index is and what it is not

LEADS makes a perception-based assessment of international trade logistics across Indian states and UTs – focusing on users and stakeholders. Alongwith an overall composite assessment of logistics performance across states, LEADS also provides indicator-level assessments of performance on specific dimensions.

Its construct considers, and uses appropriate normalization, to account for any potential biases with respect to respondents' role in the logistics chain, commodities or modes of transport dealt with, and landlocked/coastal/hilly nature of states.

Local operating contexts, varying levels of expectations or needs of different stakeholders, or geographical / economic conditions can all influence perceptions. The fragmented and largely unorganized nature of the Indian logistics industry can also lead to different experiences for users in difference instances leading to varying perceptions, as firms can have varying levels of service standards.

LEADS does not assign higher or lower weightage to states with more or less evolved logistics ecosystem. More importantly, it does not identify / establish "frontiers of logistics performance" for states / UTs, nor does it attempt to diagnose pain points in each. Instead, LEADS provides a basis for

states / UTs to look at other states / UTs operating in similar operating contexts / other relevant conditions to study / compare performance and identify focus areas for planning and improving logistics performance.

The scores

Exhibits below present LEADS scores for states and UTs. Since the number of responses for some states and UTs were inadequate for meaningful statistical analyses, scores were not computed for such states and UTs.

To account for sampling error, LEADS scores are presented with 80 percent confidence intervals. Higher sample size implies a more robust scoring with narrower margin between its (upper and lower) bounds. The (upper and lower) bounds / intervals for LEADS scores are larger for states with fewer respondents. As the number of respondents increase, bounds for the LEADS scores are narrower.

Confidence Intervals

For each state, the upper and lower bounds for LEADS scores are calculated using the following formula:

$$\text{LEADS Score} \pm \frac{t(0.1,N-1)*S}{\sqrt{n}} \times \frac{\sqrt{N-n}}{\sqrt{n}}$$

Where:

LEADS score is the state's score,

N denotes population size of respondents for a state as part of the sample frame,
n denotes the number of survey responses for a state,

S denotes estimated standard error of each state's score average across all the respondents for a state, and

t denotes the two tailed t-distribution score with degrees of freedom N-1 and level of significance, $\alpha = 0.20$

These intervals can be used to check if there is a significant difference between scores for two states. If the score for a state is lower/higher than the lower/

upper bound of the confidence interval of another state, it means that the difference between the two scores is statistically significant.

Exhibit 15: LEADS scores for 22 states

States	Infrastructure	Services	Timeliness	Track & Trace	Competitiveness of Pricing	Safety of Cargo
Gujarat	3.70	3.62	3.55	3.38	2.73	3.45
Punjab	3.40	3.47	3.31	3.47	2.60	3.53
Andhra Pradesh	3.36	3.35	3.41	3.37	2.71	3.33
Karnataka	3.34	3.40	3.36	3.25	2.71	3.39
Maharashtra	3.44	3.53	3.36	3.31	2.63	3.28
Haryana	3.32	3.38	3.30	3.34	2.66	3.41
Rajasthan	3.26	3.23	3.23	3.30	2.74	3.33
Tamil Nadu	3.27	3.38	3.27	3.17	2.59	3.29
Telangana	3.15	3.15	3.15	3.29	2.62	3.30
Chhattisgarh	3.04	3.11	3.07	3.32	2.64	3.40
Odisha	2.95	3.00	3.33	3.26	2.55	3.12
Kerala	3.15	3.25	3.31	2.96	2.48	3.38
Uttar Pradesh	3.08	3.15	3.11	3.23	2.55	3.20
Madhya Pradesh	2.98	3.10	2.90	3.15	2.68	3.17
Uttarakhand	2.95	3.16	3.11	3.11	1.94	3.25
Goa	2.76	2.92	3.04	3.16	2.51	3.08
Himachal Pradesh	2.62	3.00	2.95	3.24	2.52	3.25
Jharkhand	2.75	2.94	3.00	2.25	2.98	2.78
West Bengal	2.57	2.88	2.73	2.78	2.71	3.00
Assam	2.81	2.68	2.79	2.65	2.49	2.84
Bihar	2.17	2.42	2.38	2.50	2.67	2.90
Jammu & Kashmir	2.18	2.35	2.18	2.29	2.80	2.47

Source: Deloitte analyses of perception-based data

Operating Environment	Regulatory Process	LEADS Index	Lower bound	Upper Bound	States
3.46	3.21	3.34	3.31	3.37	Gujarat
3.30	3.15	3.22	3.14	3.31	Punjab
3.29	3.16	3.21	3.15	3.26	Andhra Pradesh
3.28	3.12	3.19	3.14	3.24	Karnataka
3.18	3.11	3.19	3.15	3.23	Maharashtra
3.32	3.15	3.19	3.12	3.25	Haryana
3.32	3.05	3.14	3.08	3.20	Rajasthan
3.22	3.01	3.11	3.07	3.15	Tamil Nadu
3.24	3.10	3.08	2.97	3.19	Telangana
3.09	2.98	3.04	2.88	3.19	Chhattisgarh
3.28	3.03	3.02	2.91	3.12	Odisha
2.80	3.01	3.00	2.95	3.06	Kerala
3.02	2.95	3.00	2.94	3.06	Uttar Pradesh
3.01	2.97	2.97	2.87	3.06	Madhya Pradesh
3.20	3.25	2.90	2.69	3.12	Uttarakhand
3.10	2.89	2.89	2.74	3.04	Goa
2.69	2.98	2.87	2.71	3.03	Himachal Pradesh
2.65	3.02	2.82	2.67	2.97	Jharkhand
2.71	2.68	2.75	2.70	2.80	West Bengal
2.56	2.70	2.68	2.53	2.82	Assam
2.66	2.56	2.52	2.36	2.69	Bihar
2.17	2.42	2.39	2.23	2.55	Jammu & Kashmir

Exhibit 16: LEADS scores for UTs

States	Infrastructure	Services	Timeliness	Tracking	Pricing	Safety
Daman & Diu	3.35	3.35	3.43	3.43	2.83	3.48
Delhi	3.28	3.43	3.26	3.37	2.61	3.29
Chandigarh	2.93	3.11	3.07	3.36	2.63	3.46
Puducherry	2.17	2.58	2.75	3.17	2.92	3.11
Dadra & Nagar Haveli	2.38	2.63	3.00	3.13	2.50	2.88

Note: Scores have not been computed for Andaman & Nicobar Islands and Lakshadweep due to inadequate number of user / stakeholder responses
Source: Deloitte analysis of perception-based data

The exhibit below presents LEADS scores for states categorized as part of the Hilly-East cluster.

Exhibit 17: LEADS scores for States in Hilly East

States	Infrastructure	Services	Timeliness	Tracking	Pricing	Safety
Tripura	2.40	2.57	2.25	2.40	2.15	2.98
Mizoram	2.00	2.74	2.28	2.14	2.86	2.43
Meghalaya	2.22	2.17	2.51	2.11	2.35	2.57
Nagaland	1.67	2.23	2.05	2.11	1.95	2.38
Manipur	1.63	1.81	1.68	1.88	2.02	2.28

Note: Scores have not been computed for Sikkim and Arunachal Pradesh due to inadequate number of user / stakeholder responses
Source: Deloitte analyses of perception-based data

Operating	Regulatory	LEADS Index	Lower bound	Upper Bound	States
3.26	3.17	3.25	3.08	3.42	Daman & Diu
3.23	3.10	3.15	3.12	3.19	Delhi
3.00	3.08	3.04	2.88	3.19	Chandigarh
2.75	3.06	2.80	2.66	2.95	Puducherry
3.13	2.88	2.78	2.32	3.23	Dadra & Nagar Haveli

Operating	Regulatory	LEADS Index	Lower bound	Upper Bound	States
2.52	2.68	2.53	2.26	2.81	Tripura
2.29	2.54	2.37	2.27	2.47	Mizoram
2.45	2.42	2.36	2.00	2.72	Meghalaya
2.08	2.56	2.15	1.85	2.45	Nagaland
1.80	2.53	1.97	1.82	2.12	Manipur

Logistics Performance: 'Tracing Key Tracks'

Key findings

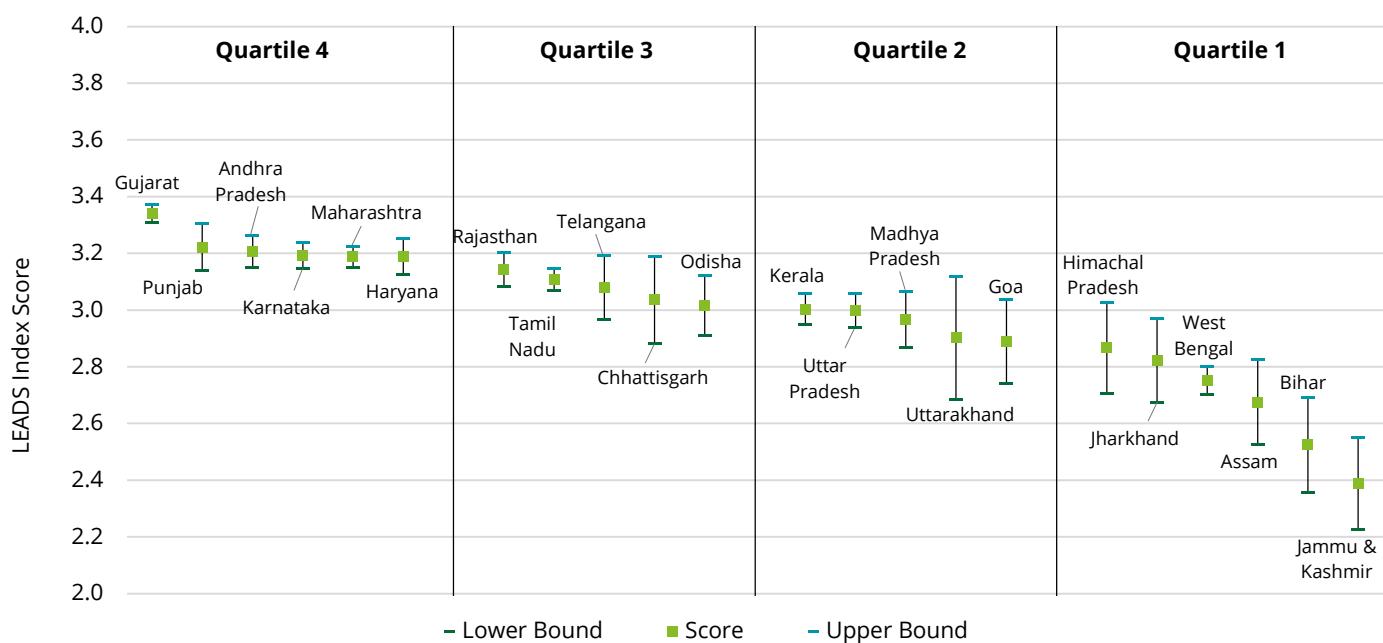
LEADS (Logistics Ease Across Different States) Index 2017 has provided useful insights into how stakeholders perceive international trade logistics performance across the states and UTs.

At one level, it reaffirms what stakeholders have believed and voiced in different contexts about the general state of logistics in India – it has remained sub-par – for a host of reasons. Supply chain efficiencies and economies of scale are yet to be unlocked. Logistics services are still generally seen as a cost to business rather than being a quality driver. Clearly, the Indian logistics market is yet to mature.

Going further, the study has helped identify first hand from stakeholders what they believe are the enablers as well as impediments to an efficient logistics system across the country. Typically, users perceive logistics as being associated with transportation and logistics infrastructure alone, and in general, accord less importance to aspects relating to service quality, documentation, and information exchange. Results from the index also reveal that logistics infrastructure is a significant differentiator across states.

The index scores for 22 states (excluding the states in the Hilly-East cluster) arranged in descending order, divided into quartiles, along with upper and lower bounds are presented below.

Exhibit 18: LEADS Scores for 22 states



Source: Deloitte Analysis

The survey findings have assumed a confidence interval of 80 percent to account for sampling error. For a more informed interpretation, the performance of a state should be viewed in the context of its respective score band rather than limiting inference only to its index score.

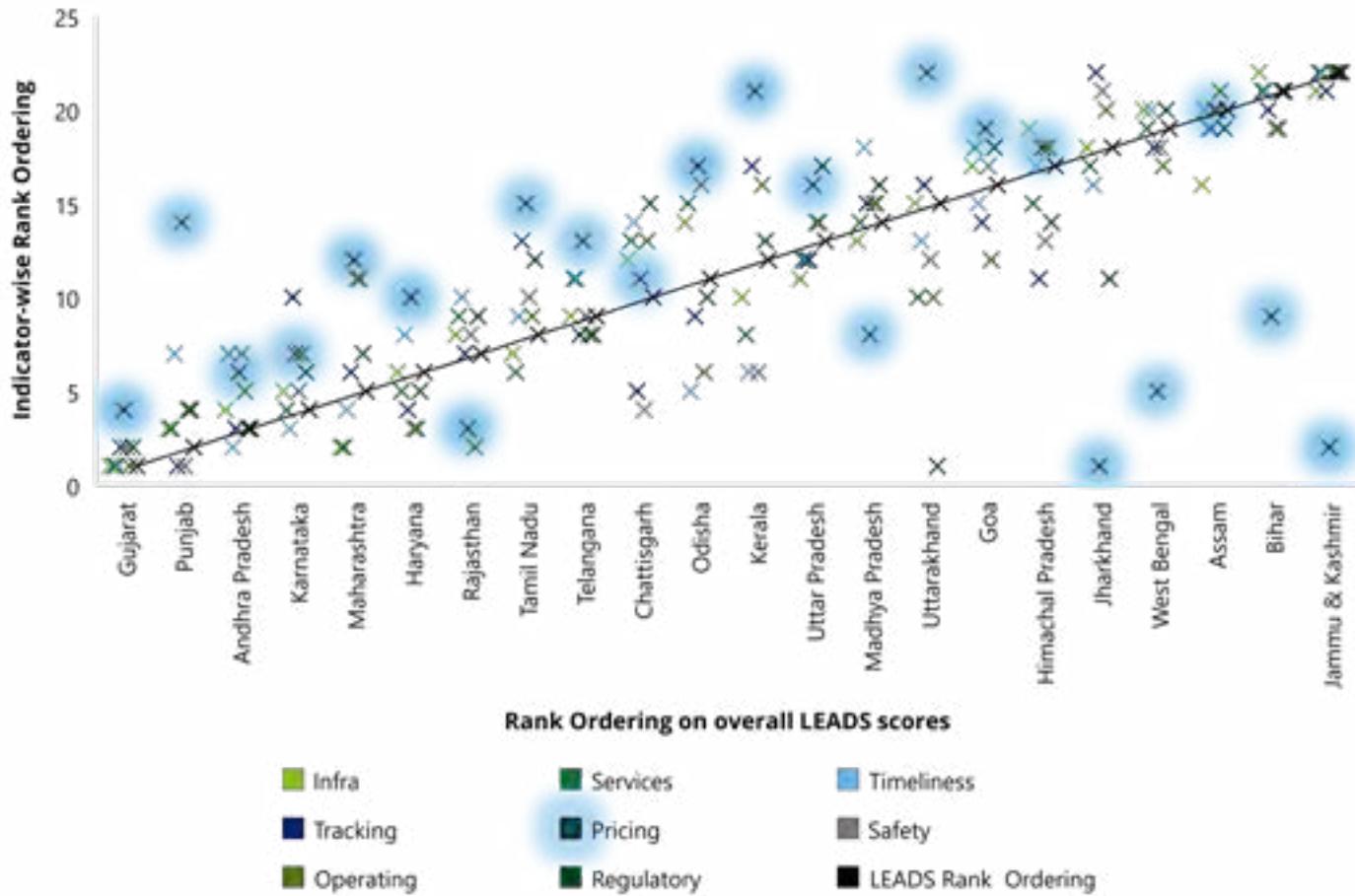
While comparing logistics performance across two states, performance across one with a higher index score can be considered significantly better than the other only if the lower bound of the score is higher than the upper bound of the index score for the other state. In the fourth quartile, for instance, the lower bound for Gujarat's LEADS score is higher than the upper bounds of other states' scores within the quartile, making a clear distinction in logistics performance across Gujarat vis-à-vis other states. On the other hand, such a clear distinction in performance can't be made in the case of a majority of states in the third quartile. It is therefore important to not place much emphasis on the rank-ordering of states on LEADS scores. Instead, analyses and action plans should focus on understanding (1) what the stakeholders' perceptions are indicating about

performance features of states, along with other states with scores similar to theirs as well as (2) what the more detailed assessments / responses by stakeholders to the other part of the survey reveal.

Quartile 4 comprises some of the country's strong manufacturing states – Gujarat, Maharashtra, Karnataka, and Andhra Pradesh – where some of the major ports centres are also located. Also in this quartile are the well-connected agricultural and industrial corridor states of Punjab and Haryana. Quartile 3 include states – Rajasthan, Tamil Nadu, Telangana, Chhattisgarh, and Odisha.

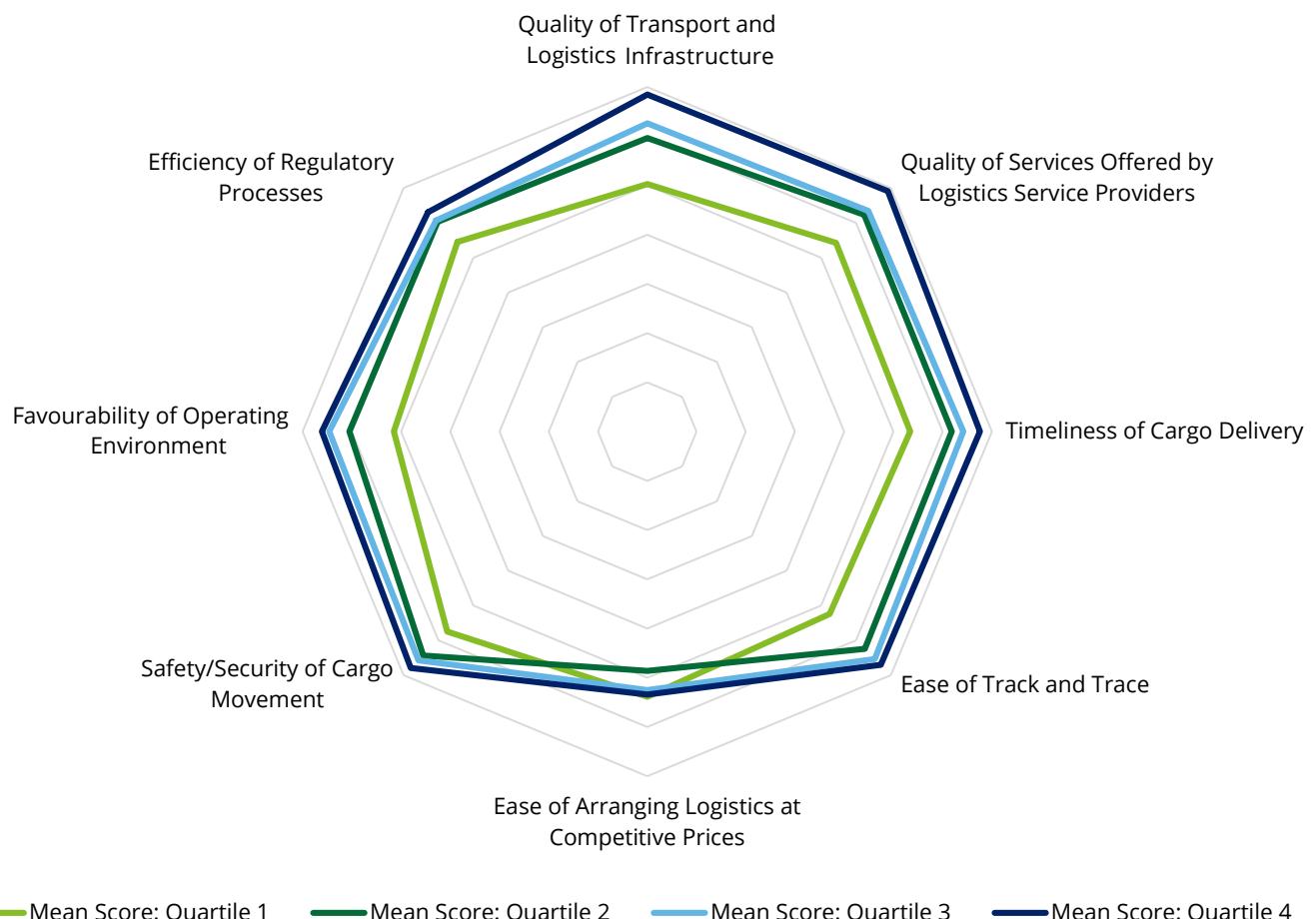
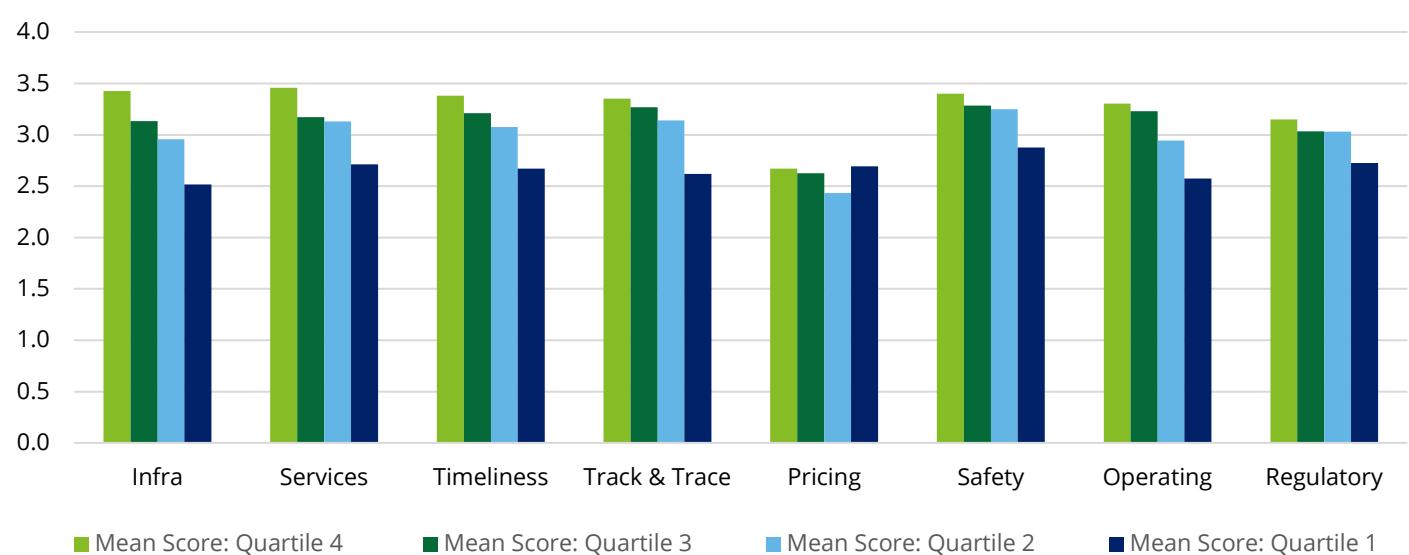
The states of Kerala, Uttar Pradesh, Madhya Pradesh, Uttarakhand and Goa make up Quartile 2. At the end of the quartet are the states of Himachal Pradesh, Jharkhand, West Bengal, Assam, Bihar and Jammu & Kashmir forming Quartile 1.

As mentioned earlier, one standout difference perceived by respondents that sets apart states in quartiles 3 and 4 from those in quartiles 1 and 2 is, the quality of logistics infrastructure.

Exhibit 19: Cross-plot of states' indicator-wise rank ordering and rank ordering on LEADS

Source: Deloitte Analyses

A cross-plot of states' indicator-wise rank orders against their overall LEADS score based rank-order reveals that there is broad consistency in perceptions of stakeholders on states' performance across indicators (more so if ranking with respect to perceptions on the indicator pertaining to 'ease of arranging logistics at competitive rates' – shaded differently in the Exhibit above, is not considered). States across quartiles have similar relative positions across all indicators. This could indicate the synergistic impact of better / improvement in logistics performance across some indicators on logistics performance across other indicators as well.

Logistics performance for 22 states across LEADS quartiles**Exhibit 20: Indicator-wise comparison of quartile mean scores****Exhibit 21: Average of indicator-wise scores for the four quartiles**

Source: Deloitte Analysis

Comparison of indicator-wise mean scores for the four quartiles shows that there is a marked difference in logistics performance across the first and fourth quartiles. The difference in logistics performance across the second and third quartiles is not stark.

The study found that performances on six of the eight indicators – quality of transport & logistics infrastructure, quality of services offered by LSPs, timeliness of cargo delivery, ease of track-and-trace, favourability of operating environment and safety/security of cargo movement – are perceived to be the key differentiators of logistics performance across states. Performances across the remaining two indicators - ease of arranging logistics at competitive rates and efficiency of regulatory processes, are not perceived to be significantly differentiated across states. Also, interestingly, mean scores on these two indicators for quartiles 4 and 3 were the lowest in these quartiles across all indicator mean scores.

Infrastructure and Services

As mentioned earlier, performance on 'quality of transport & logistics infrastructure' indicator is a significant differentiator across states / quartiles. For quartile 1, the mean score for this indicator is lowest, compared to the mean scores for other indicators. This implies that quality of transport & logistics infrastructure is perceived to be low by the stakeholders thereby impacting logistics performance across states in this quartile in general. In stark contrast, the mean score for this indicator is the second highest

compared to the mean scores for other indicators for quartile 4 – implying that positive performance on this aspect can contribute to a positive perception of the users, on logistics performance.

It is interesting to note that for quartile 4, the highest mean score across indicators is on 'quality of services offered by logistics service providers'. There is a close linkage between the coverage of these two indicators in terms of modal infrastructure, service providers interfacing with them and helping provide logistics solutions to users. Hence, perception of distinctly high logistics performance across states in this quartile across both these indicators could be responsible for the higher perception scores for this quartile as a whole.

In fact, a high quality of services offered by logistics service providers could be the most important lever to improve user perception of logistics performance in general, given the important interfacing role LSPs can play with respect to a number of other aspects like coordination with other stakeholders, provision of information, etc.

A clear distinction in perceptions of stakeholders can't be made with respect to performance on these indicators across quartile 2 and quartile 3 states even as the perception is evidently different for states in quartile 4 as well as quartile 1 on two ends. Among the third quartile states, scores on these two indicators for Chhattisgarh and Odisha are even lower than second quartile states like Kerala and Uttar Pradesh.

Detailed assessments / responses by stakeholders reveal that perception of quality of inspection/testing facilities is generally poor across quartiles. This is especially significant in the case of the first and second quartile states where over 50 percent of detailed responses rate the quality of such facilities as very low or low.

Similarly, 30-45% of the detailed responses rate quality of services being provided by inspection agencies as very low or low across all quartiles.

Timeliness, Safety/security of cargo and Ease of track and trace

With respect to the 'timeliness of cargo delivery' pertaining to frequent delivery of cargo within scheduled or expected delivery time and minimum time delays, perception scores for quartile 1 states are substantially different from the perception scores for quartile 4 states. This could broadly reflect the difference in lengths and complexity of the logistics chains for these states. In this context, the difference is not a function of physical nearness to nearest points of exit or entry but instead to 'logistics' nearness. This is borne out by the high perception of logistics performance for the states of Punjab and Haryana – which are landlocked and at a substantial distance to ports but have access to connecting infrastructure and services with high capacity, quality and frequency to 'efficient' points of exit or entry.

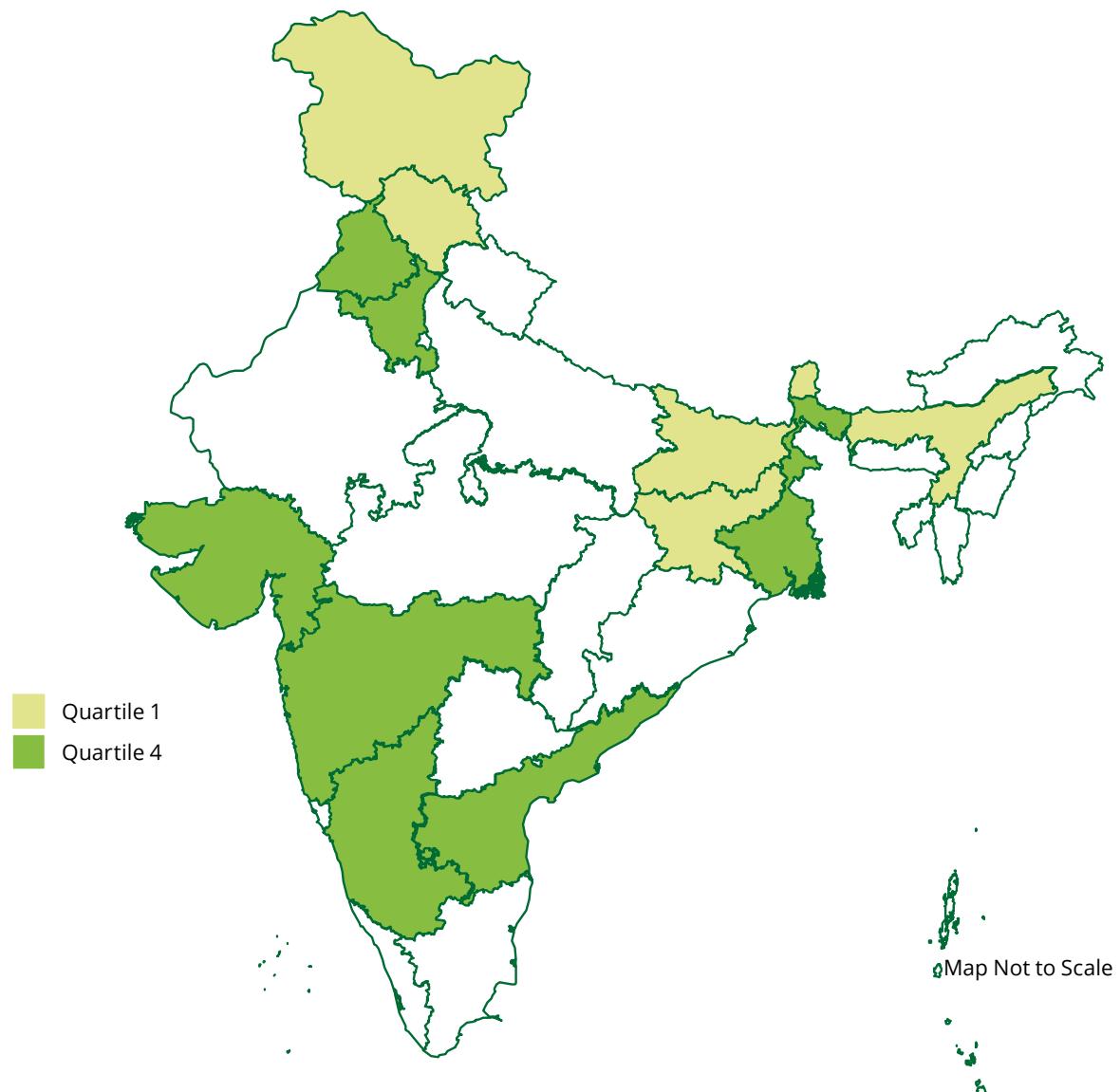
Exhibit 22: States with LEADS Index scores in quartiles 4 and 1

Exhibit 23: Railway Route Km and Route Km Density (km/ 000' sq. km)

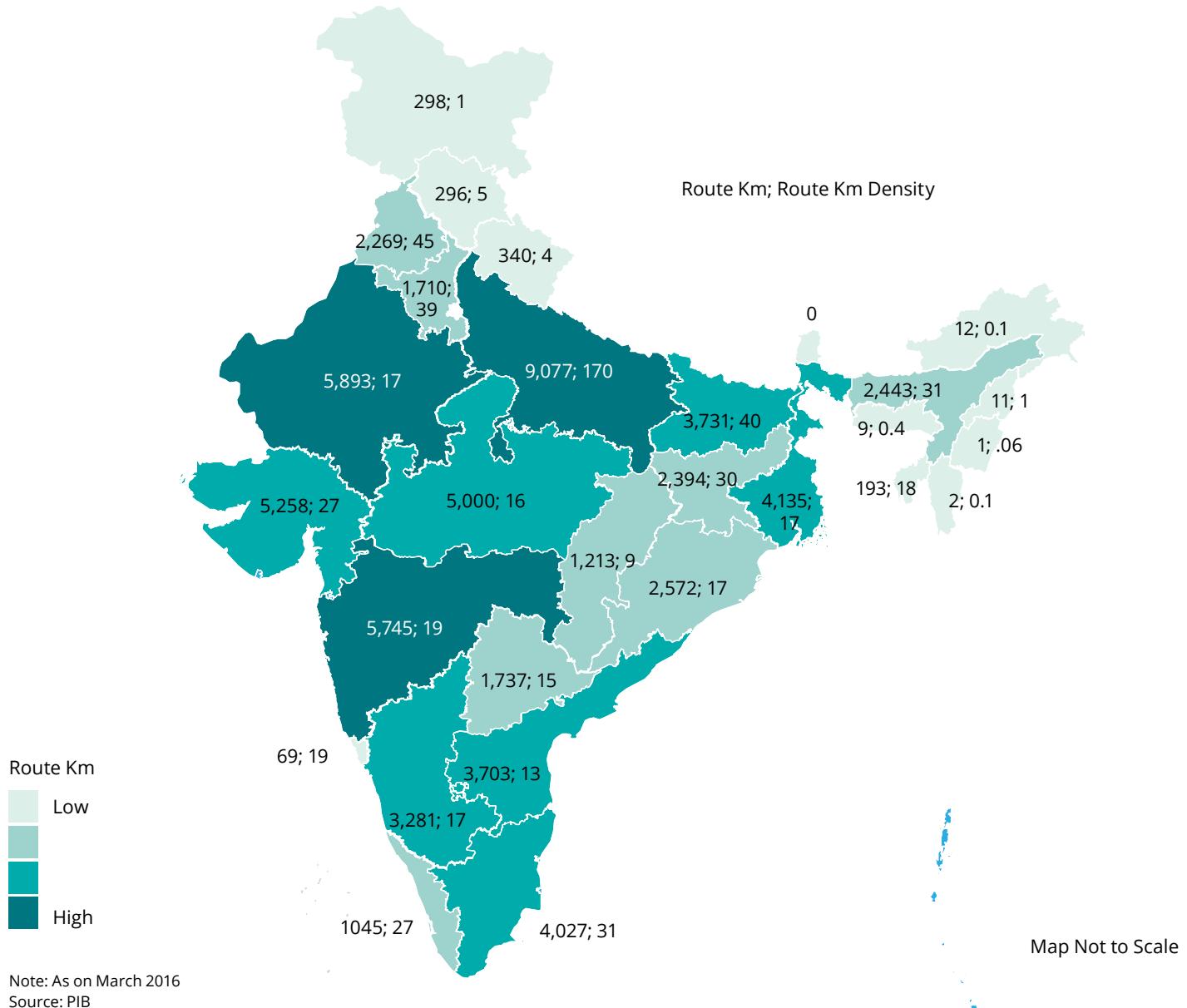
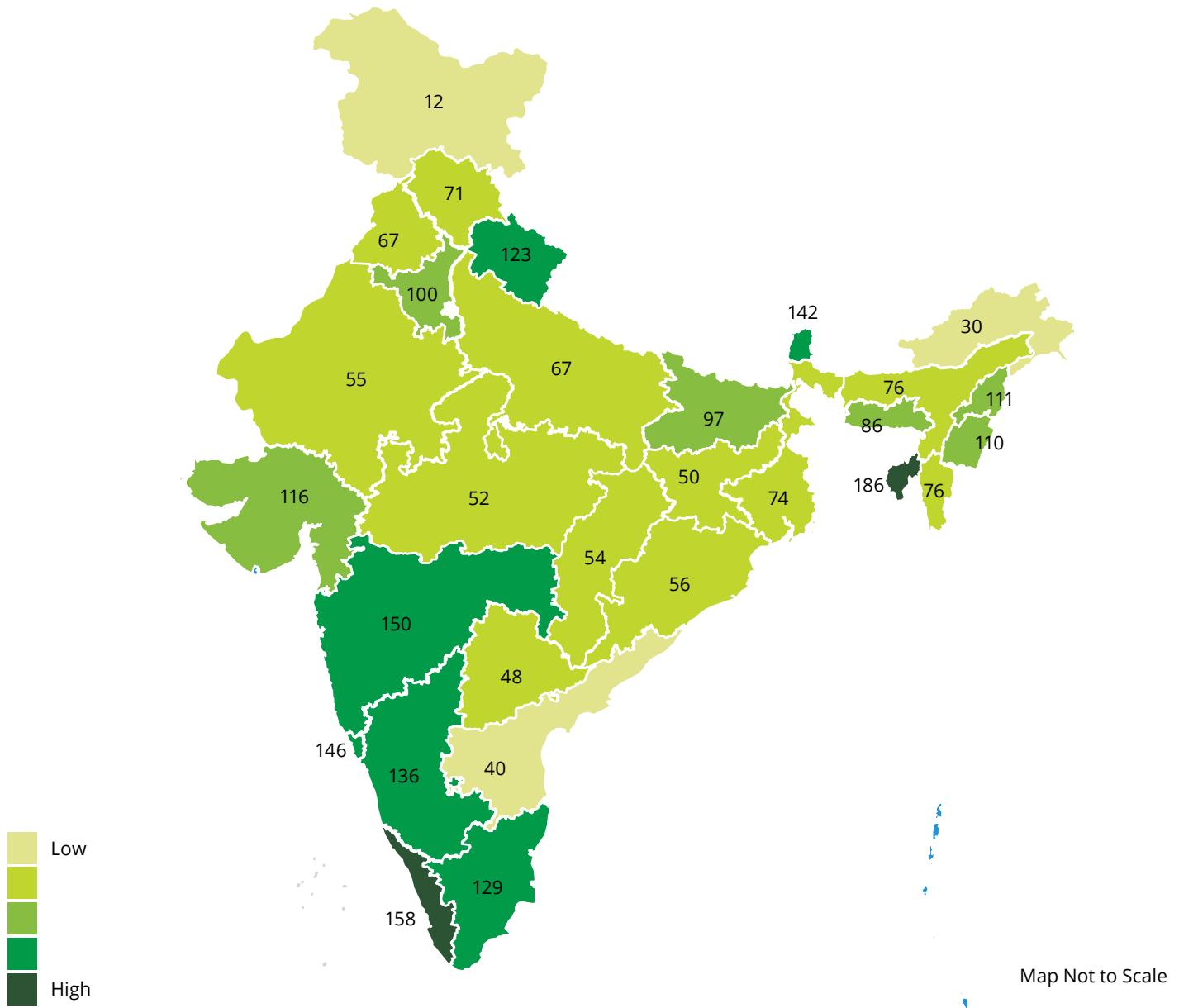
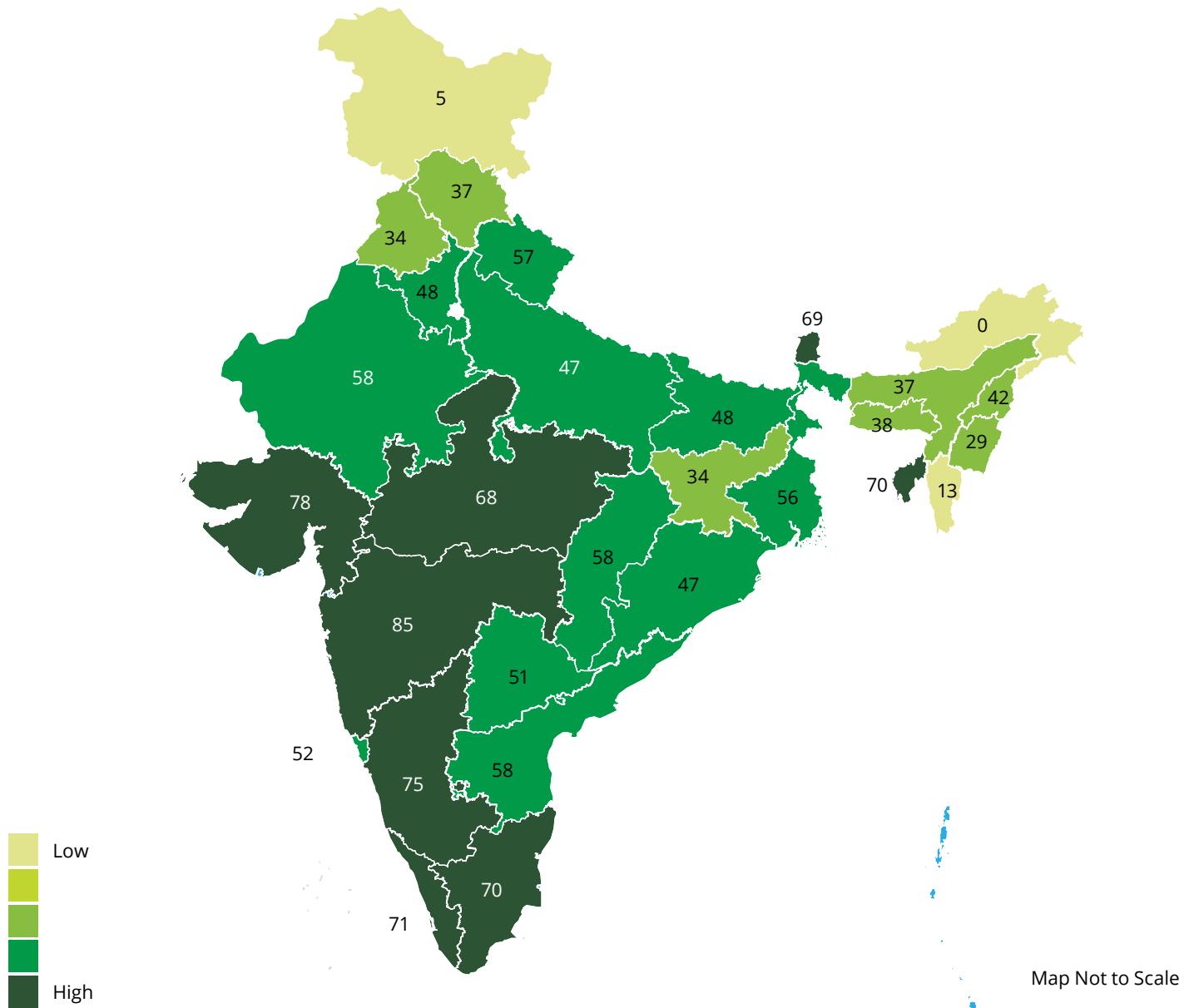


Exhibit 24: Lane (National and State Highways) Kilometer Density (km/000' sq.km)

Note: As on March 2015

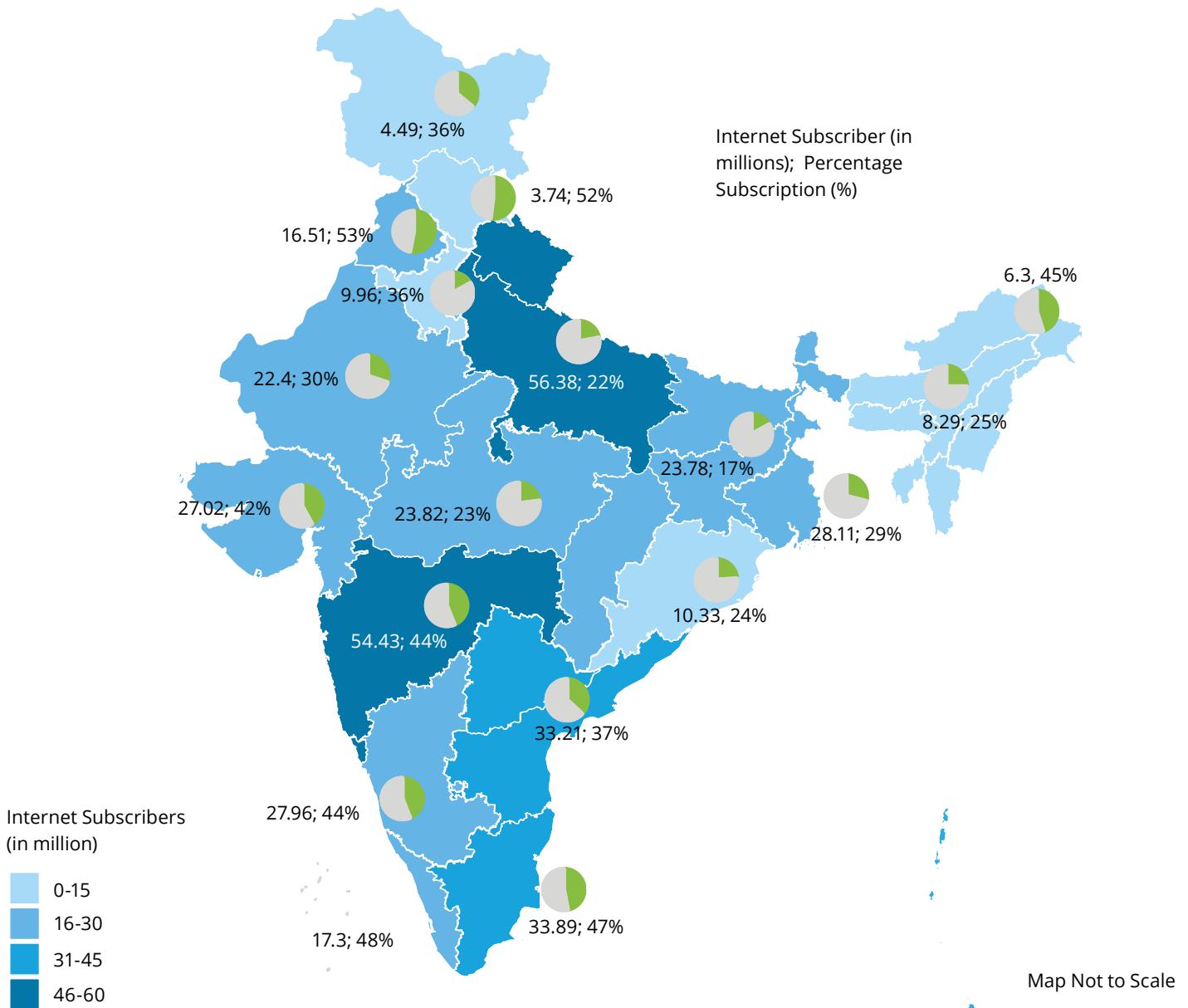
Source: MoRTH

Exhibit 25: Percentage of State Highway in Primary Network (NH+SH)



Note: As on March 2015

Source: MoRTH

Exhibit 26: Internet Subscribers (in million) and Percentage Subscription (%)

Note: As on June, 2017

Source: TRAI, Census (2011)

Notes: 1. No. of total internet subscribers per 100 population is derived from the subscriber data provided by the operators and the population projections of the country, published by the Office of the Registrar General & Census Commissioner, India.

2. Data/information for Andhra Pradesh includes Telengana, Madhya Pradesh includes Chhattisgarh, Bihar includes Jharkhand, Maharashtra includes Goa, Uttar Pradesh includes Uttarakhand, West Bengal includes Sikkim and North-East includes Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland & Tripura states.

Exhibit 27: Number of ICDs, CFSs and PFTs across states

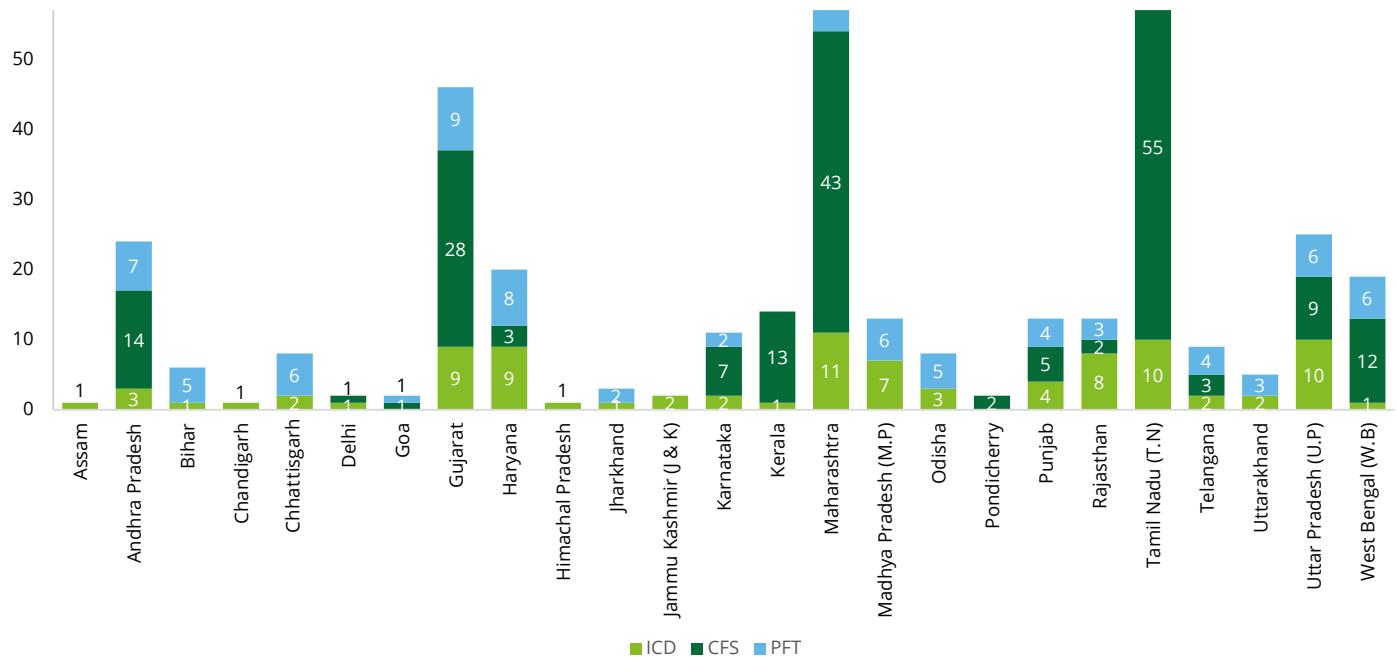
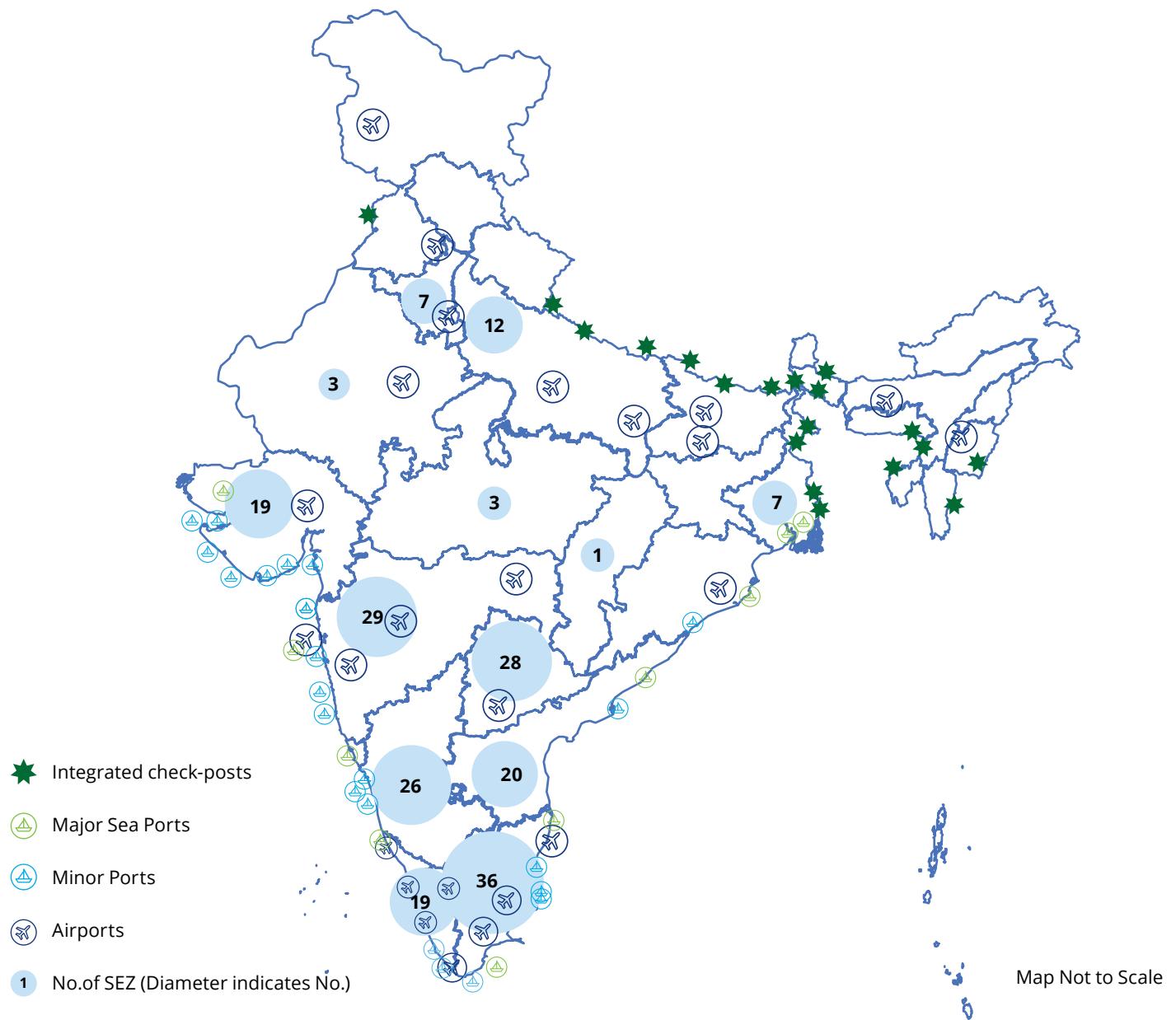


Exhibit 28: SEZs with respect to International EXIM Gateways


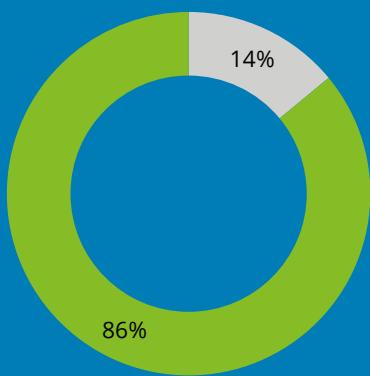
Source: Ministry of Shipping, Land Ports Authority of India, Ministry of Commerce, Ministry of Civil Aviation

Box 8: Implementation of Goods and Services Tax

In the context of timely and reliable cargo movement, stoppages (especially unscheduled) and detentions at border crossings can have a key bearing. Majority of the detailed assessments / responses indicated that the implementation of the Goods & Services Tax (GST) had already contributed to reduction in procedural requirements and stoppages. Further, responses also had a positive view on further reduction in procedural requirements in future.

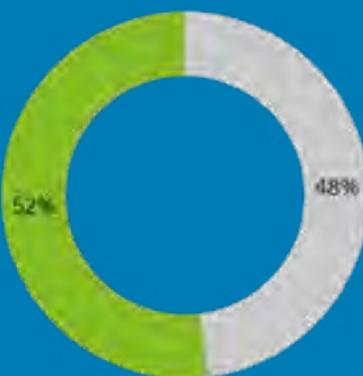
User Perception on Impact of Implementation of GST

Perceived impact on stoppages due to documentary compliance



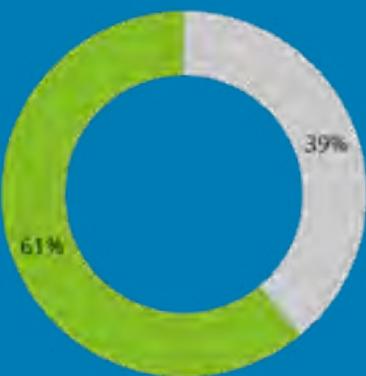
- Greater than Average Stoppages
- Less than Average Stoppages

Perceived impact on stoppages due to documentary compliance



- GST has not reduced
- GST has reduced

Perceived impact on stoppages due to documentary compliance



- Will Not Reduce
- Will Reduce

Source: Deloitte Analysis

User perception on ease of track and trace was consistently high for states in quartiles 4 and 3 (with the exception of Tamil Nadu).

User perception on this indicator for states in the first quartile was generally low (with the exception of Himachal Pradesh) as compared to states in the other three quartiles.

While majority of the detailed assessments / responses indicated that extent of digitization vis-à-vis services of logistics service providers and financial services providers is perceived to be very high across all four quartiles, the extent of digitization and frequency of online payments is perceived to be poor vis-à-vis road sector – the pre-eminent mode of transport across all quartiles.

Favourability of operating environment and efficiency of regulatory processes

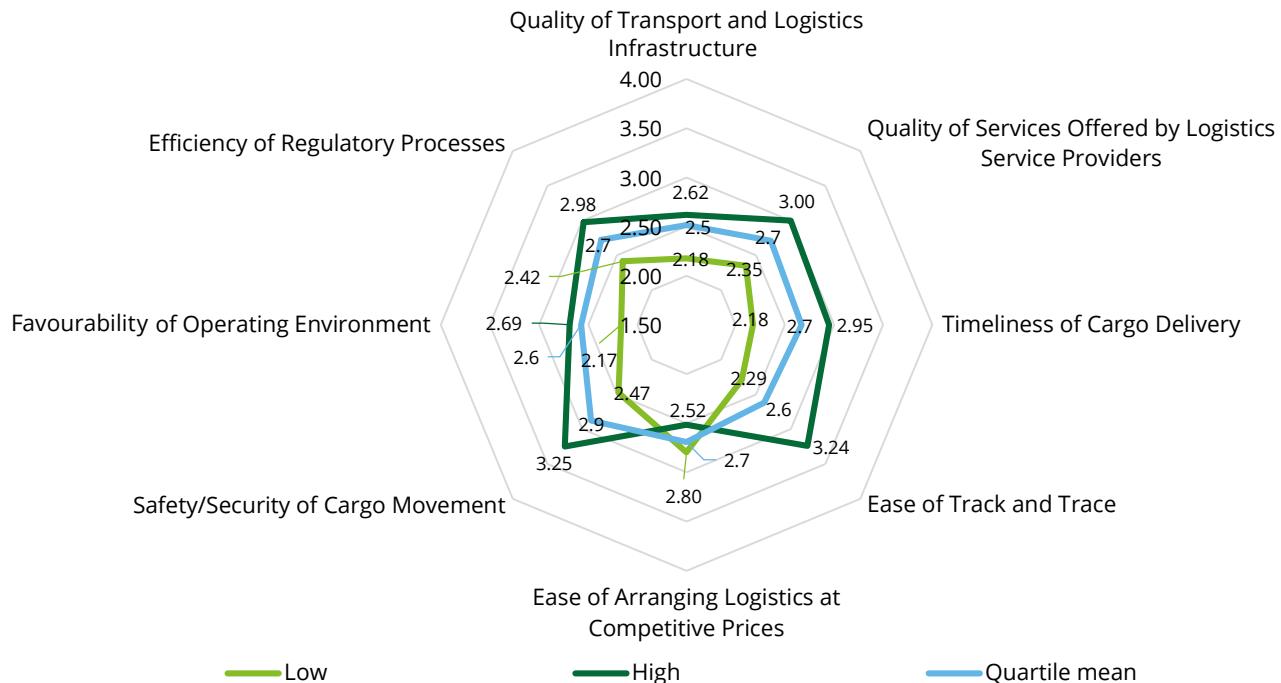
As noted earlier, performance on 'efficiency of regulatory processes' is not significantly differentiated across states. Mean scores for this indicator for quartiles 4 and 3 were amongst the two lowest indicator mean scores in these quartiles. Intriguingly, for quartiles 2 and 1, mean scores on 'quality of transport & logistics infrastructure' were even lower than the mean scores for this indicator – indicating the relatively larger perception variance with respect to the 'quality of transport & logistics infrastructure' across quartiles.

Another indicator where the performance perception is contrasting between quartiles pertains to 'favourability of operating environment'. While the fourth quartile states again have high scores on this indicator, score for Rajasthan (from the third quartile) is higher than all fourth quartile states except one) – predominantly due to the low impact of trade and transport unions in the state. Perception score for Maharashtra is lowest for this indicator within states in quartile four.

Majority of the states within the second quartile perceived to perform poorly on key aspects of the operating environment. Perception score for Kerala on this indicator stands out as the lowest within a bunch of low scores within quartile two states – on account of state labour policies, extent of road restrictions and impact of trade and transport unions perceived by detailed assessments / responses. The first quartile states have very low perception scores on this indicator and are seen as having relatively most unfavourable operating environment for logistics.

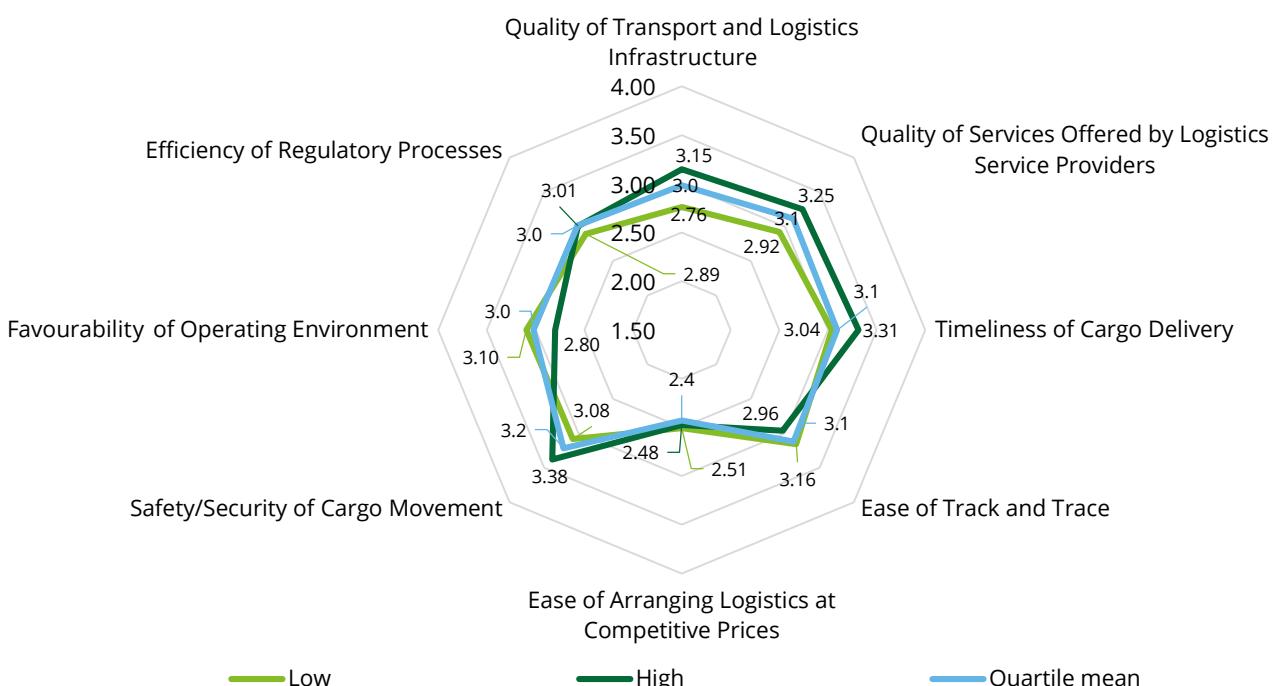
In 'efficiency of regulatory processes' - lack of facilities, delayed clearances, and poor information dissemination - came up in detailed assessments / responses as well as stakeholder interactions. While central agencies predominantly undertake these processes, implementation could be perceived differently across states on account of local skill, intent and availability of inspection agencies, and varying interpretations of process guidelines.

Exhibit 29: Comparison of logistics performance across 22 states in the First Quartile of LEADS scores

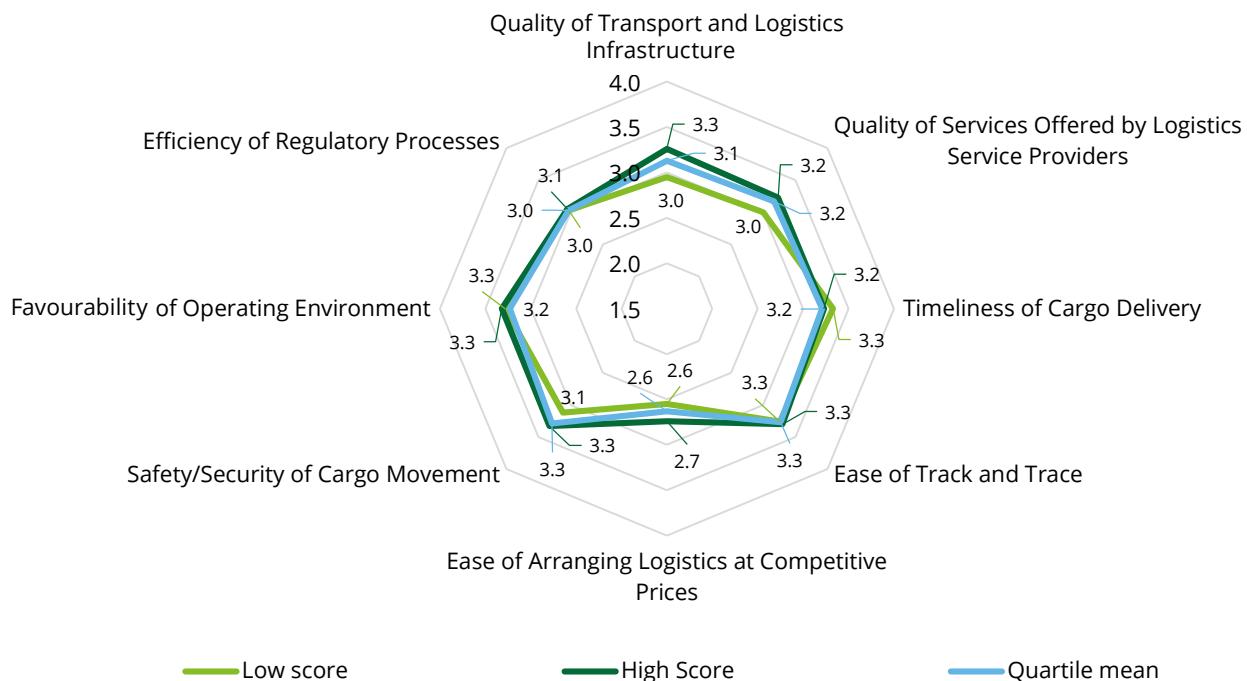


Source: Deloitte Analysis

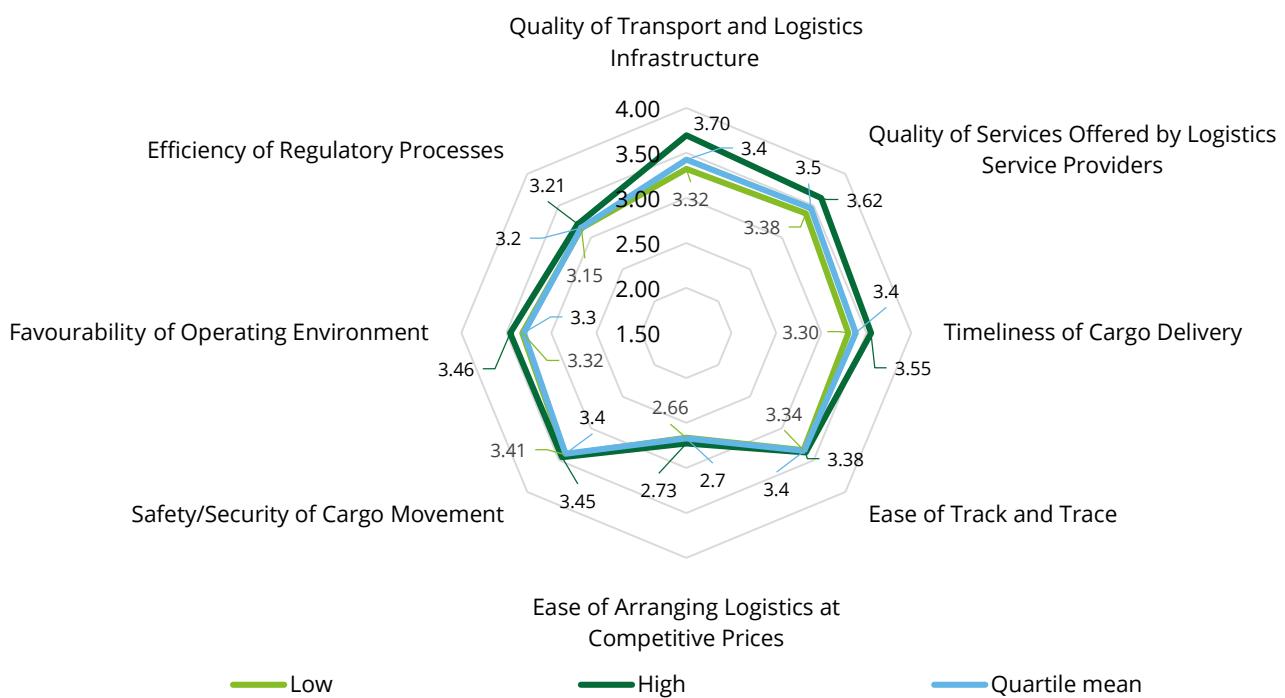
Exhibit 30: Comparison of logistics performance across 22 states in the Second Quartile of LEADS scores



Source: Deloitte Analysis

Exhibit 31: Comparison of logistics performance across 22 states in Third Quartile of LEADS scores

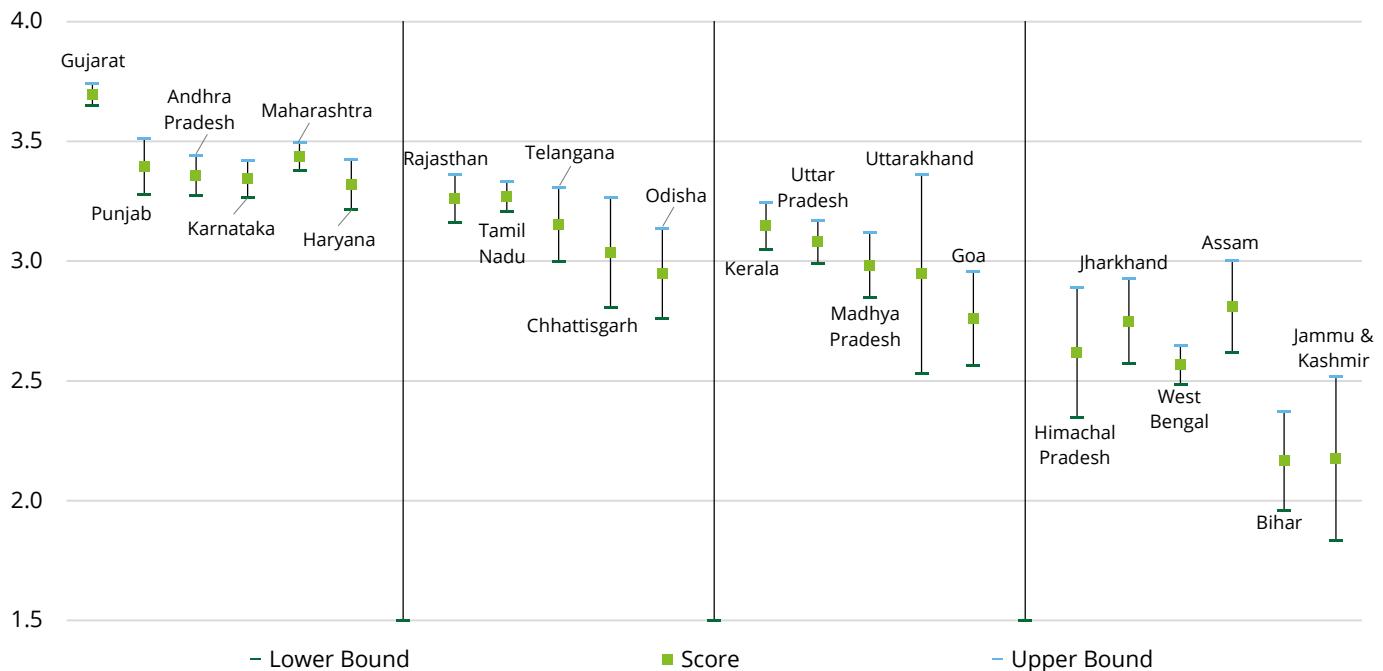
Source: Deloitte Analysis

Exhibit 32: Comparison of logistics performance across 22 states in Fourth Quartile of LEADS scores

Source: Deloitte Analysis

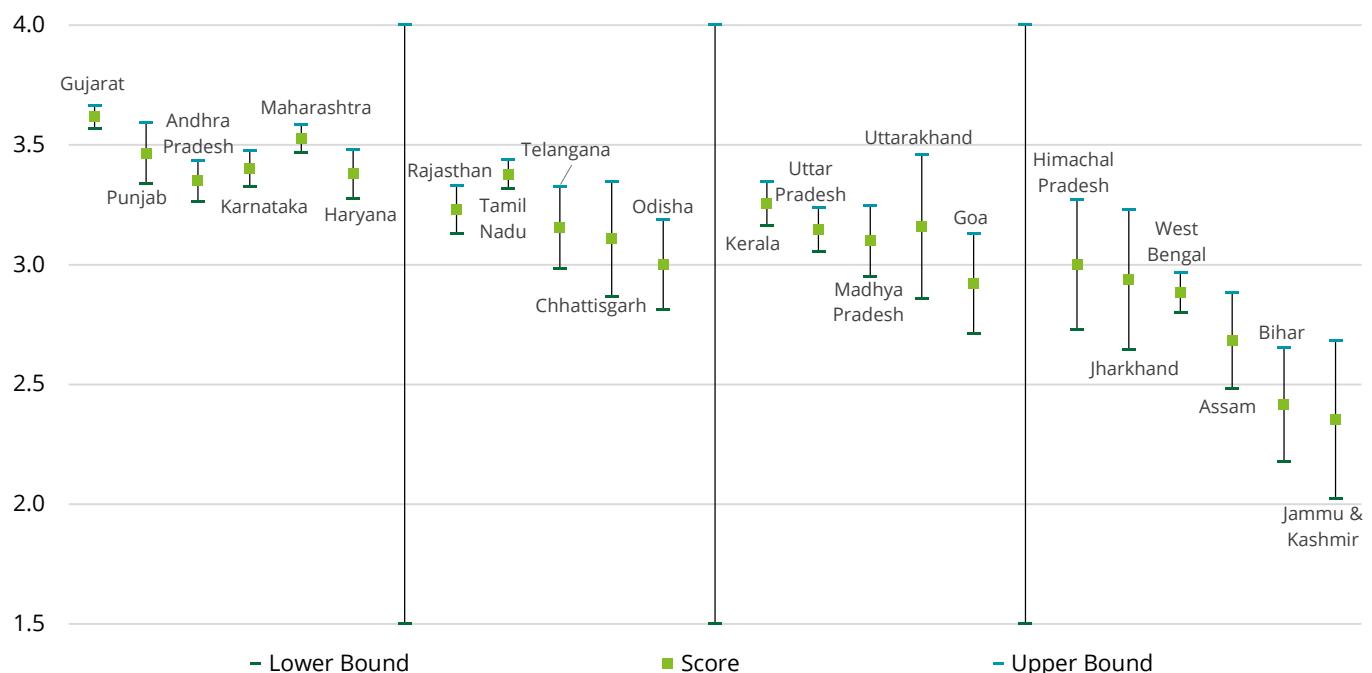
Exhibit 33: Indicator scores and bands for 22 states

Quality of Transport & Logistics Infrastructure



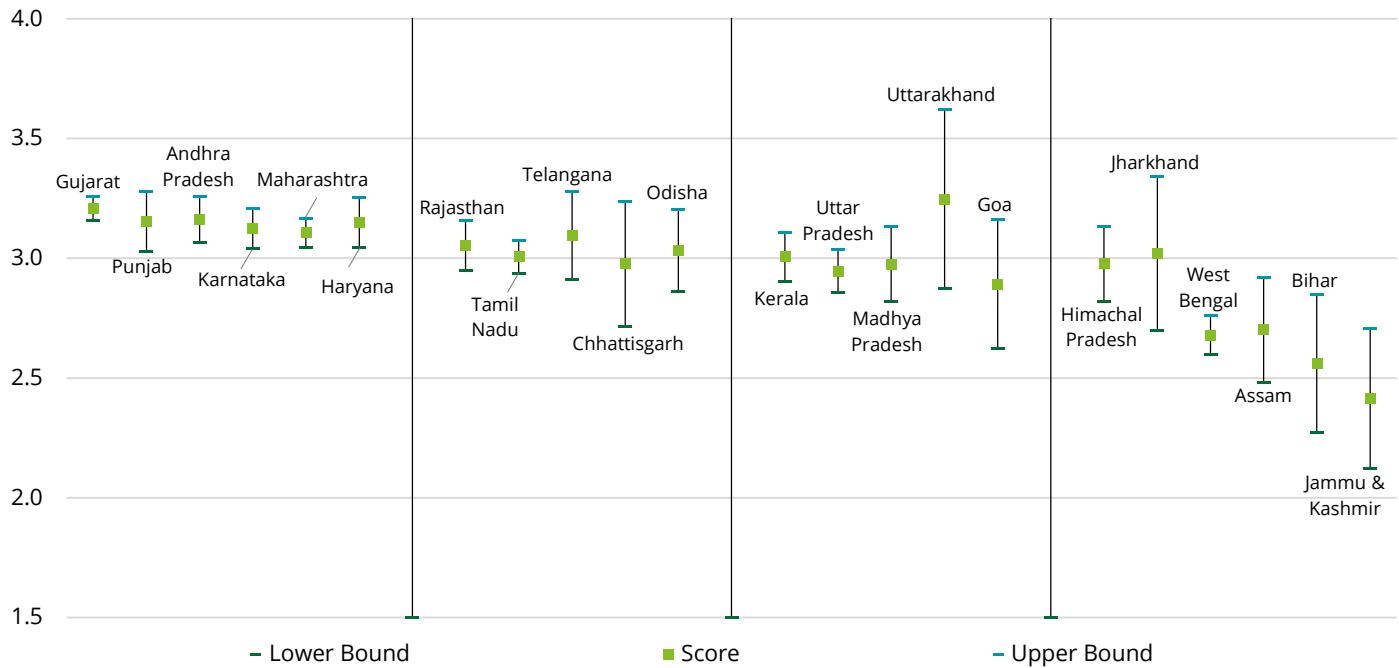
Source: Deloitte Analysis

Quality of Services Offered by Logistics Service Providers



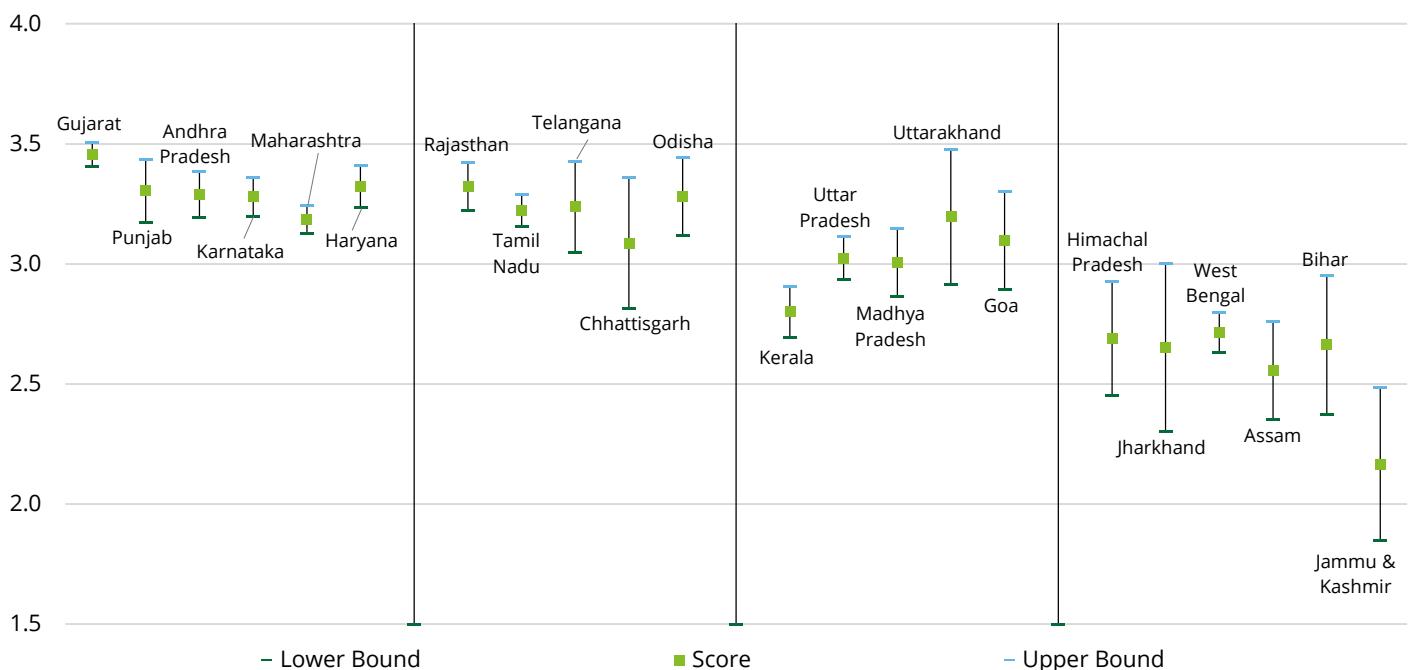
Source: Deloitte Analysis

Efficiency of regulatory processes



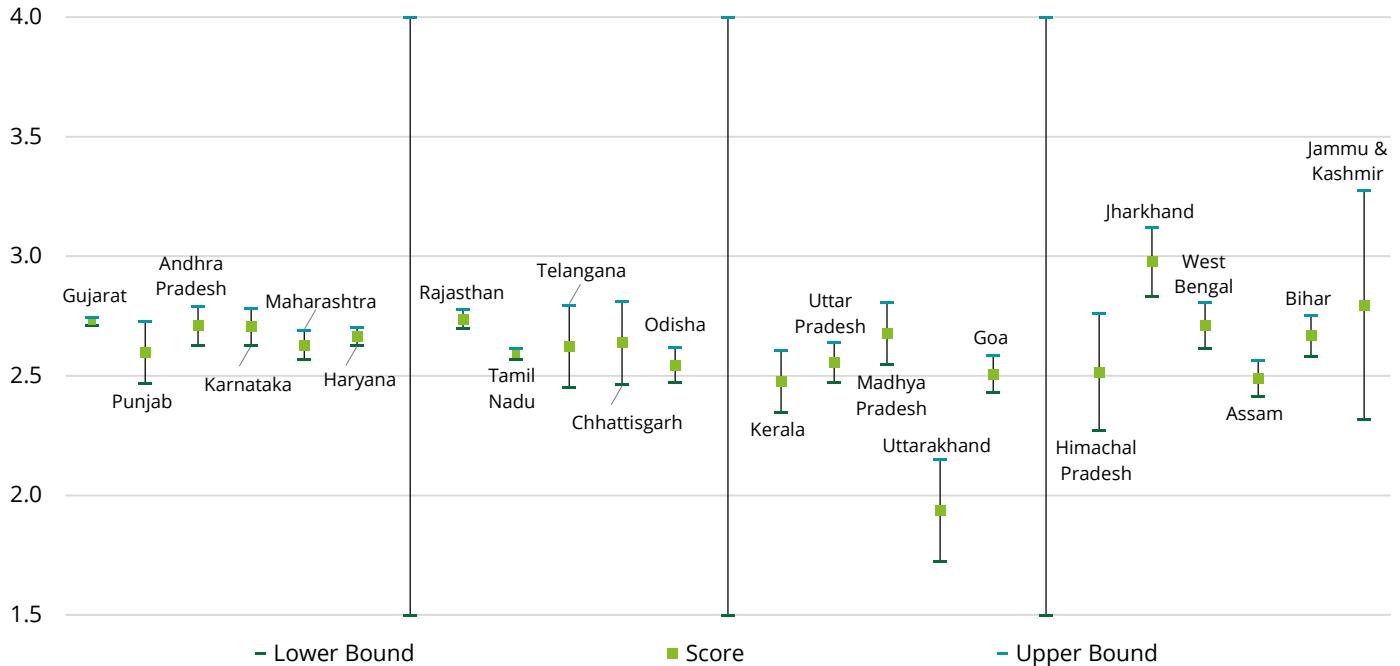
Source: Deloitte Analysis

Favourability of Operating Environment



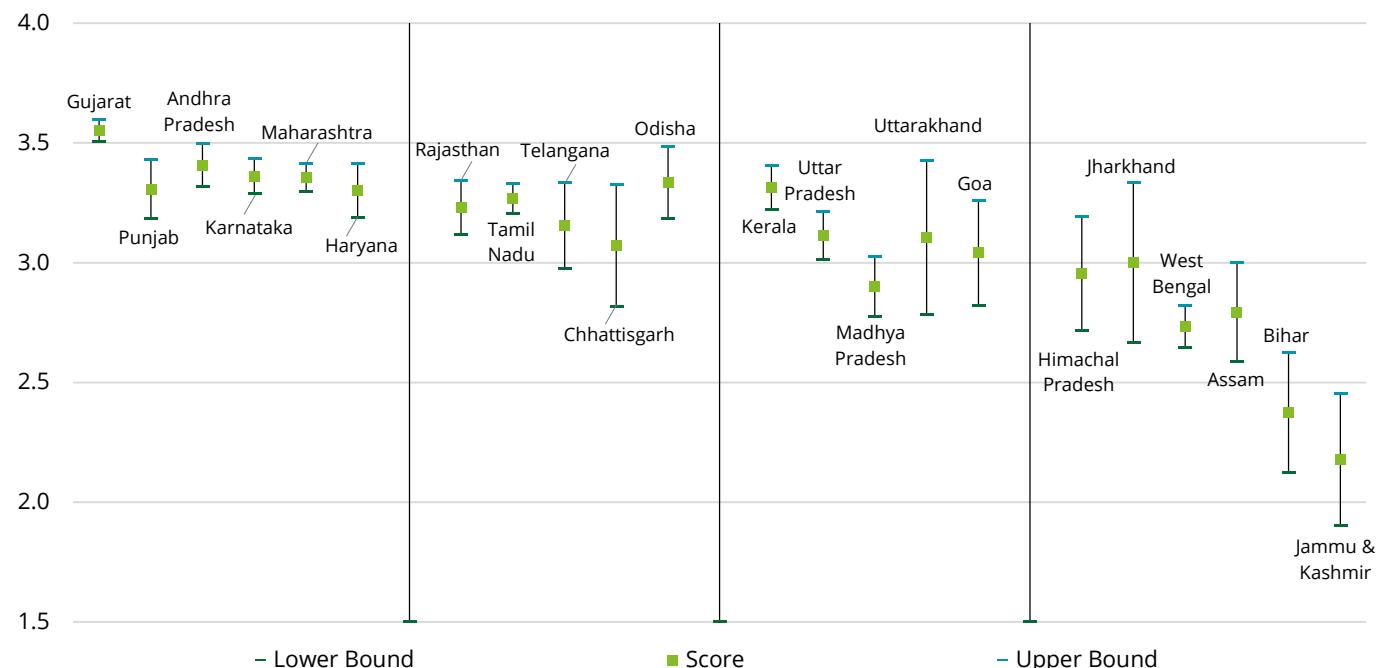
Source: Deloitte Analysis

Ease of Arranging Logistics at Competitive Rates



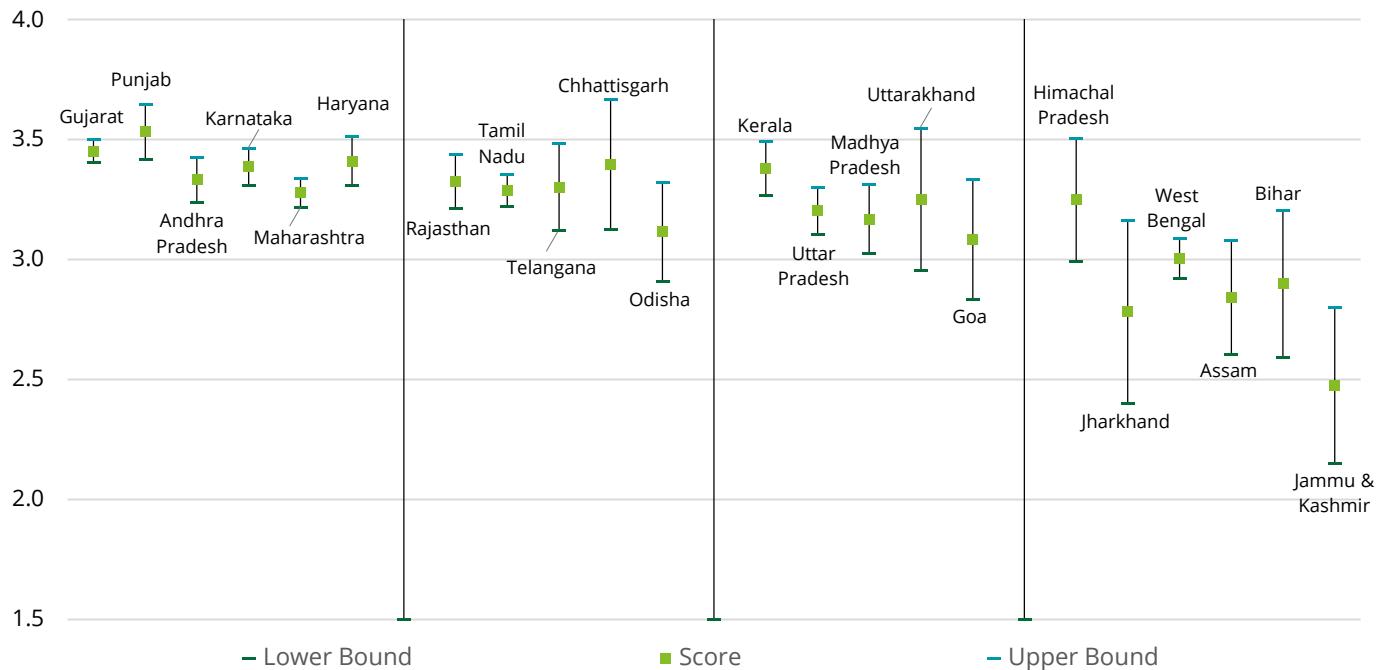
Source: Deloitte Analysis

Timeliness of Cargo Delivery



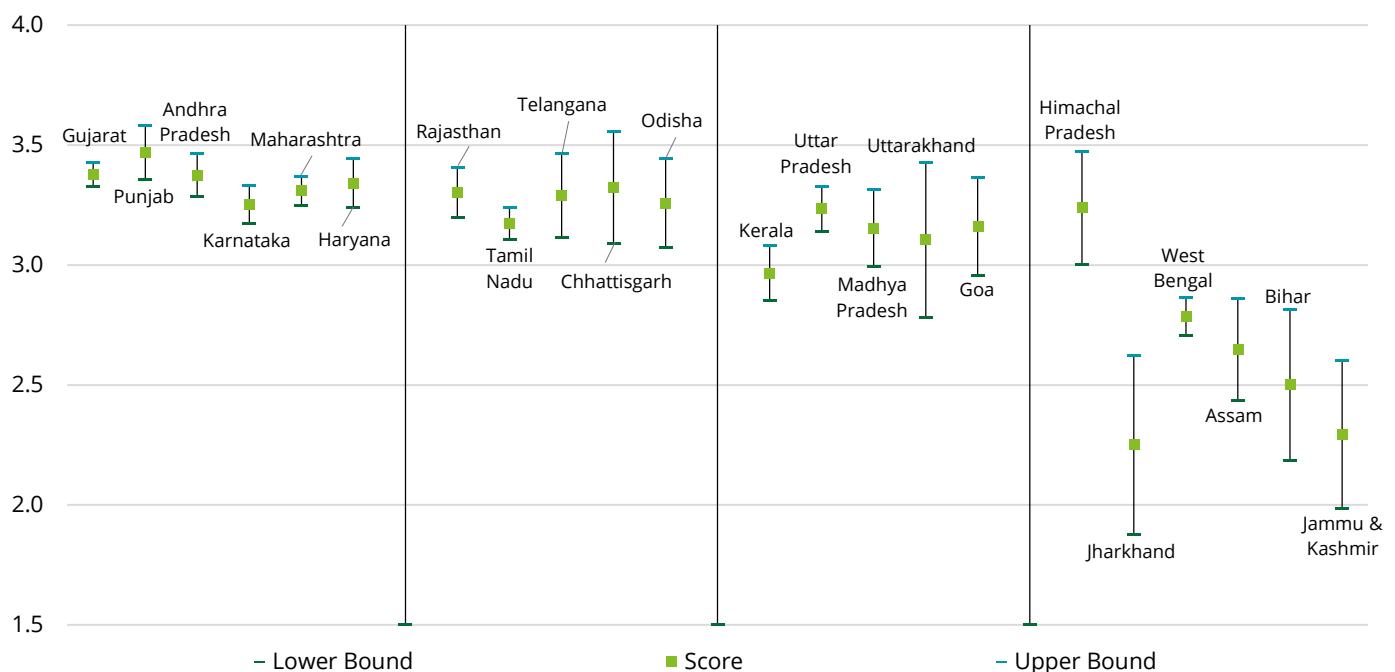
Source: Deloitte Analysis

Safety/Security of Cargo Movement



Source: Deloitte Analysis

Ease of Track & Trace



Source: Deloitte Analysis

Logistics performance for UTs and 5 states in the Hilly-East cluster

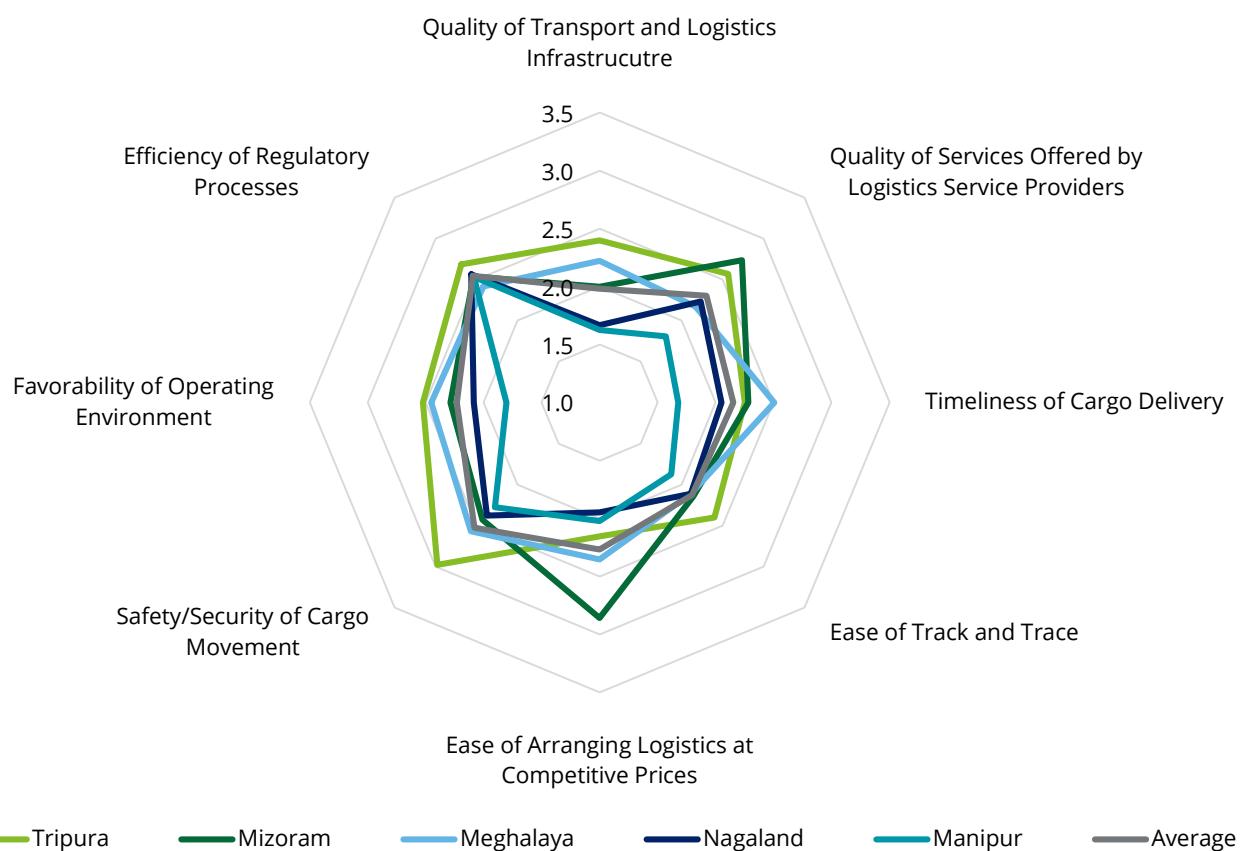
While adequate number of responses were received for 5 UTs to allow for meaningful statistical analyses, enough responses were not received for UTs of Andaman & Nicobar Islands and Lakshadweep Islands. Also, the weights derived for various indicators for UTs were similar as the ones for 22 states.

Statistical analyses indicated different weights for various indicators across certain states in the eastern part of the country – broadly categorized as part of a Hilly-East cluster. A lower number of responses were received for these states on performance across eight key indicators resulting in a wider statistical spread between the upper and lower bound of their scores. Scores were not computed for Sikkim and Arunachal

Pradesh due to inadequate number of user/stakeholder responses.

Further, the number of detailed assessments/responses to the other part of the survey were inadequate for undertaking any detailed analyses for UTs and states in the Hill-East cluster. The exhibits below present logistics performance of UTs and the 5 states in the Hilly-East cluster on LEADS scores.

Exhibit 34: Comparison of logistics performance across 5 states in the Hilly-East cluster on LEADS scores



Source: Deloitte Analysis

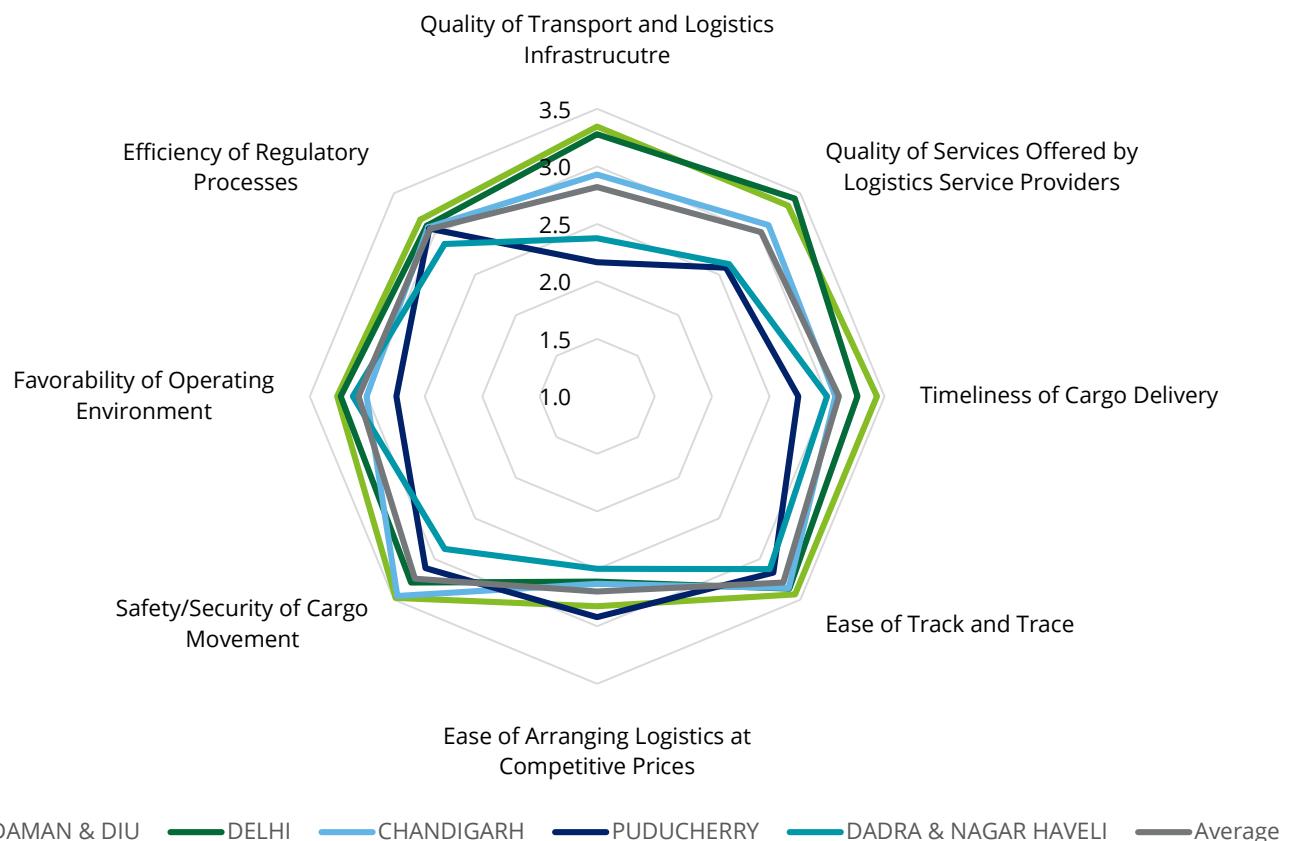
As can be seen from the exhibit above, the average indicator-wise scores for this cluster are lower than the lowest indicator-wise scores for the group of 22 states. In fact, for 6 of the indicators, the maximum perception-based scores across these states are lower than the lowest scores across the group of 22 states – including the indicators pertaining to ‘quality of transport & logistics infrastructure’ and ‘quality of

services offered by logistics service providers’. This highlights the severe logistics environment facing these states.

Based on the experience of reaching out to stakeholders during this study as well as interactions, a key issue that seems to be contributing to continuation of this environment is one of dis-economies of scale. This essentially means that the cargo volumes are possibly not conducive

to development of a market-based logistics infrastructure and services ecosystem for these states.

Accordingly, one of the ways of addressing the same would be to focus on solutions specific to their geographic context – creation of hub-and-spoke logistics network so that reliability of services – to and from the hub, can be developed over time.

Exhibit 35: Comparison of logistics performance across UTs on LEADS scores


Source: Deloitte Analysis

The overall LEADS scores for UTs are in line with the overall LEADS scores of states they are adjacent to. This seems to reflect the fact that due to their small geographical boundaries, they essentially rely upon and use the logistics ecosystem of their adjacent states.

The study found that performances on two of the eight indicators – quality of transport & logistics infrastructure and quality of services offered by LSPs – are perceived to be the key differentiators of logistics performance across these UTs.

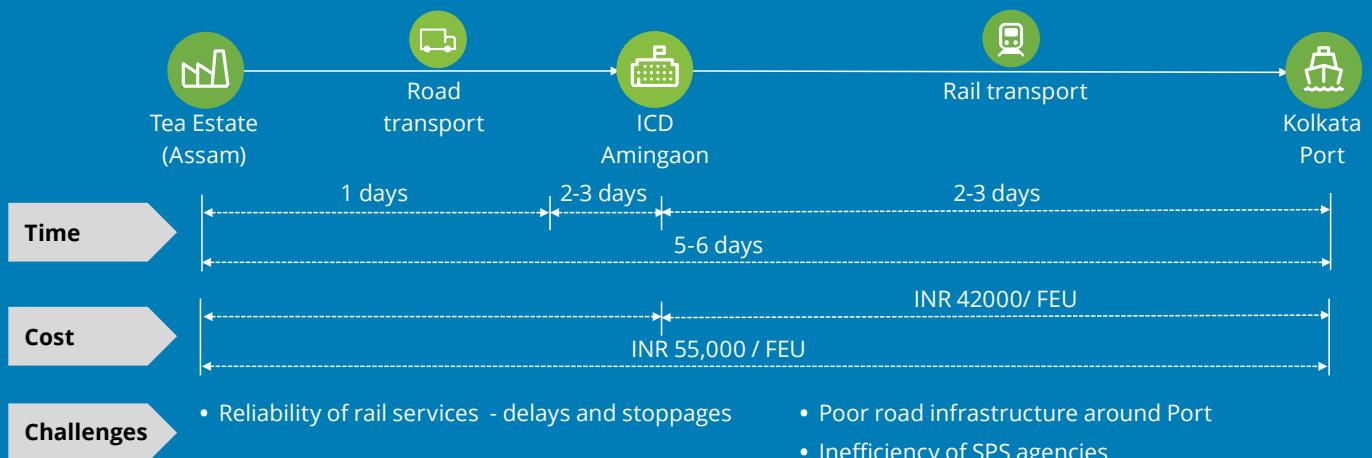
Multi-dimensional interactions in the field

Given the multi-dimensional nature of logistics, it may not be possible to see real-life instances where performance (or lack thereof) vis-à-vis any of these indicators can be seen to be manifesting individually. However, perception-based

assessments by users and stakeholders indeed reflect ground realities of the state of logistics. It would need to be noted that these ground realities are more likely to reflect a simultaneous inter-play of a number of issues.

The following groups of case studies – prepared based on field interactions with stakeholders, profile:

01. how lower perceived performances across indicators manifest in logistics chains across states in LEADS quartiles 1 and 2; as well as
02. how variation in performances across indicators (illustrated in the Box below), and their interactions, can manifest in inefficiencies in logistics chains even across states in LEADS quartiles 3 and 4 – where user perception scores are higher across indicators.

Box 9: Logistics Chains across states in LEADS quartiles 1 and 2**Tea exports: Assam to Kolkata Port**

Source: Deloitte Analysis

Tea is exported from West Bengal and North Eastern states through Kolkata and Haldia Ports – either in the original condition or in blended form (various grades are blended, repacked) via containers. Prior to containerization, it is transported domestically in break bulk form (with packaging done in 20kg, 30kg, and 50kg paper sacks).

Producer exporters based out of Assam send their cargo through ICD Amingaon directly to Kolkata Port. Break bulk cargo is brought from the estates to ICD Amingaon via trucks from where it is containerized and moved to Kolkata Port for exports (time - 1 day). At the ICD, tea is containerized in forty-foot containers, which are cleared by customs and then loaded on to the rakes. Typically, this process takes 2-3 days. Containers are sent by rail out to Kolkata port (rail journey takes about 2 to 3 days and costs approximately INR 42,000 per container).

A small amount of cargo also moves to Kolkata from Assam by truck. This journey leg takes about 5-6 days (due to poor road connectivity) and costs around INR 3500-4000/ ton

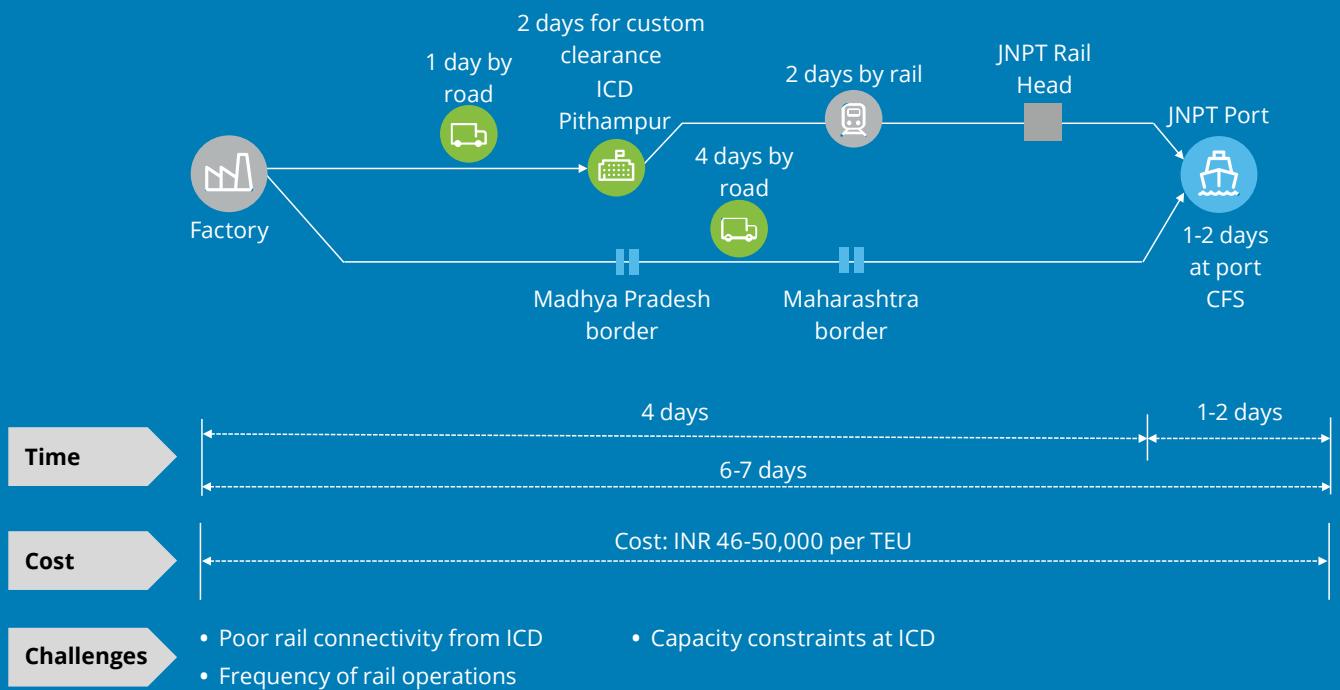
Prior to exporting, the sample needs to be tested and clearance certificates need obtained from Tea Board of India and Plant Quarantine office

A number of issues reported by stakeholders in this chain are as follows:

- At Kolkata, most exporters are located in the port area, and due to road movement restrictions, cargo cannot be moved between 8 am and 8 pm. Hence, major cargo movement takes place only at night. This restriction increases delays in export of goods;
- Delays in rail services from ICD Amingaon;
- Plant Quarantine department is inefficient in terms of issuance of certificates. With greater focus on digital document exchange, the overall export time can be reduced by upto a day

Engineering Goods Export: Madhya Pradesh to JNPT Port

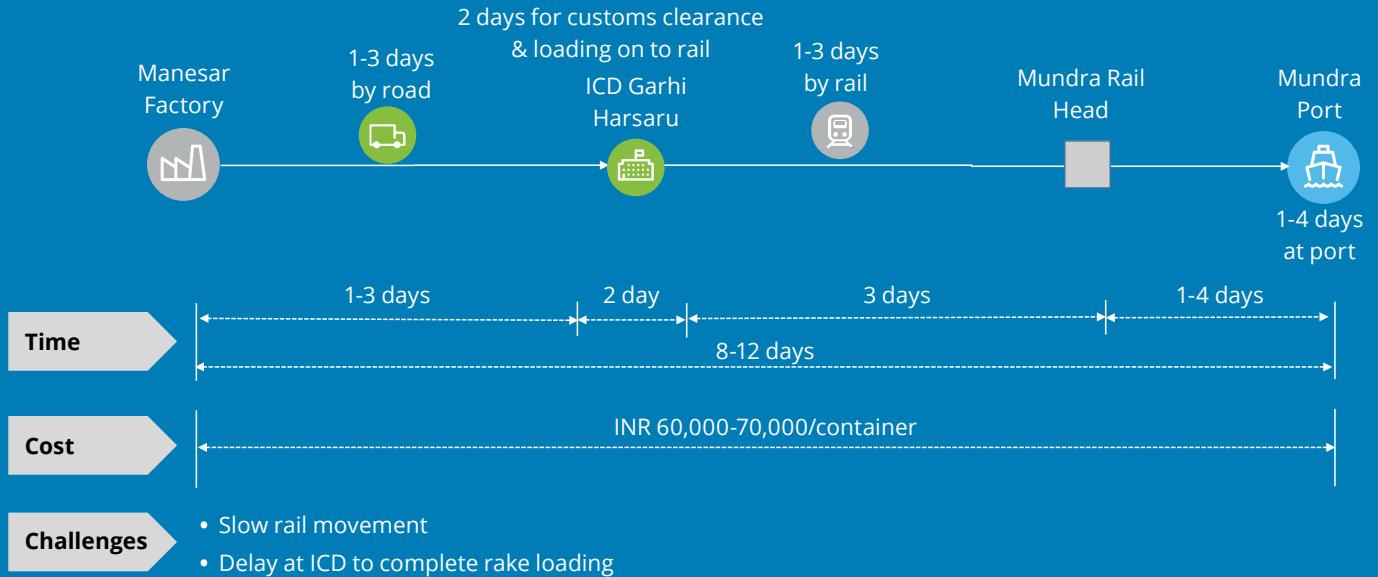
Madhya Pradesh is home to a large industrial base from where engineering products are manufactured and exported. Consignments move by road or by rail through ICD to JNPT.



Empty twenty-foot containers (TEUs) are brought to factories by road trailer, where they are stuffed and then sent to the ICD in Pithampur. Here, the containers are customs cleared and railed out to JNPT. This entire chain costs about Rs. 46,000-50,000 and takes six-seven days to reach the port. Alternatively, consignments are also sent directly through round-trip road trailer movement, wherein empty containers are first brought to the factory, stuffed and then sent to the port.

Problems faced were indicated to be delays in receiving customs clearances at the ICD and poor frequency of rail. As most exporters keep a tight margin for vessel connection, these delays lead to consignments missing the vessel cut-off dates. Another issue in the case of the ICDs in Indore is of poor rail connectivity. For instance, the rail terminal closest to the Pithampur ICD is at Tihi, which is about 20 kilometres away and so after the customs clearance at the ICD, containers move to Tihi by road – which further delays cargo movement. At Tihi, the frequency is only two trains per week, which was indicated by stakeholders as being inadequate to service the demand. Even in the case of the ICD at Dhannad, where there is no rail terminal, containers have to move to Naamli, which is 110 kilometres away. This extra movement by road from the ICDs to reach the railway terminals not only leads to delays but also adds Rs 4,000-5,000 per TEUs to the shipment cost, as reported by a stakeholder.

Further, capacity constraints at the CONCOR ICD in Pithampur have reportedly discouraged exporters from moving containers through the ICD. A stakeholder also reported that this leads to delays of up to four days. Given, these issues, some exporters indicated preferring to use road transport mode instead (even over the long distances involved).

Box 10: Logistics Chains across states in LEADS quartiles 3 and 4**Auto parts and accessories Export: Haryana to Mundra Port****Automobile Export – Haryana to Mundra Port**

It was indicated that empty containers are brought to the factory, stuffed and then sent to the ICD. Cargo from Haryana travels to ICDs that are located at Tughlakabad (Delhi), Ballabgarh, Palwal, Garhi Harsaru (Haryana) and also to Sahnewal and Ludhiana (Punjab). This movement takes around one-three days, while cost ranges between INR 10,000 and INR 15,000 per container, depending on the distance between the factory and the ICD.

At the ICD, the container takes a day to get customs clearance and an additional day for handling and loading on to rail. Rail transport to Mundra takes around three-four days and charges for terminal handling and rail transportation add another INR 40,000 to the shipment costs. Finally, once at the port, detention time experienced at the port reportedly ranges anywhere between one and four days before the consignment is loaded on to the vessel. Therefore, the total time taken by a container to reach the vessel varies from eight-twelve days and costs around INR 60,000-70,000.

The main issues indicated were relatively slower rail movement to Mundra as compared to JNPT because of route characteristics. Most exporters felt that rail transit time should come down. There is also delay at some terminals for want of completion of rake loads. Stakeholders felt that ICDs like Tughlakabad generate several trains per day and therefore reduce detention time at the terminal.

Leather Garment Export: Tiruppur to Chennai Airport

Tiruppur is a key textile and garments export hub located near Coimbatore in Tamil Nadu. It has been designated as a Town of Export Excellence (TEE) and contributes to more than 50% knitwear exports from India. Exports are mainly to European Union, the United States of America, Canada, Japan and Middle East.

Leather garments are sent by air to Middle East via Chennai airport. The garments are packed at the factory into cartons and are taken as break bulk by truck towards Chennai airport. On reaching the airport, cartons are unloaded and scanned after which they are examined by Customs and LEO is issued. Subsequently, cartons are taken to air cargo terminal for storage and are built up into Unit Load Devices (ULDs) as per specifications of carrier airline. The prepared ULDs are transferred from warehouse to ramp-side wherein they are loaded onto the carrier. In terms of time, it takes about 1-2 days to reach airport and further a day at the air cargo terminal prior to loading on carrier.

Some of the key issues faced were reported to be delays due to city restrictions on the plying of goods trucks. Additionally, the entry road to Chennai airport exhibits significant congestion, leading to long wait times. Customs processing was reported to be inefficient due to understaffing. Despite implementation of 24 x7 customs clearance, users expressed that this practice is yet to translate into reality. It was indicated that often customs clearance for cargo arriving at late evening/night is deferred to the subsequent day.

Leather Garments Exports – Tiruppur to Chennai Airport



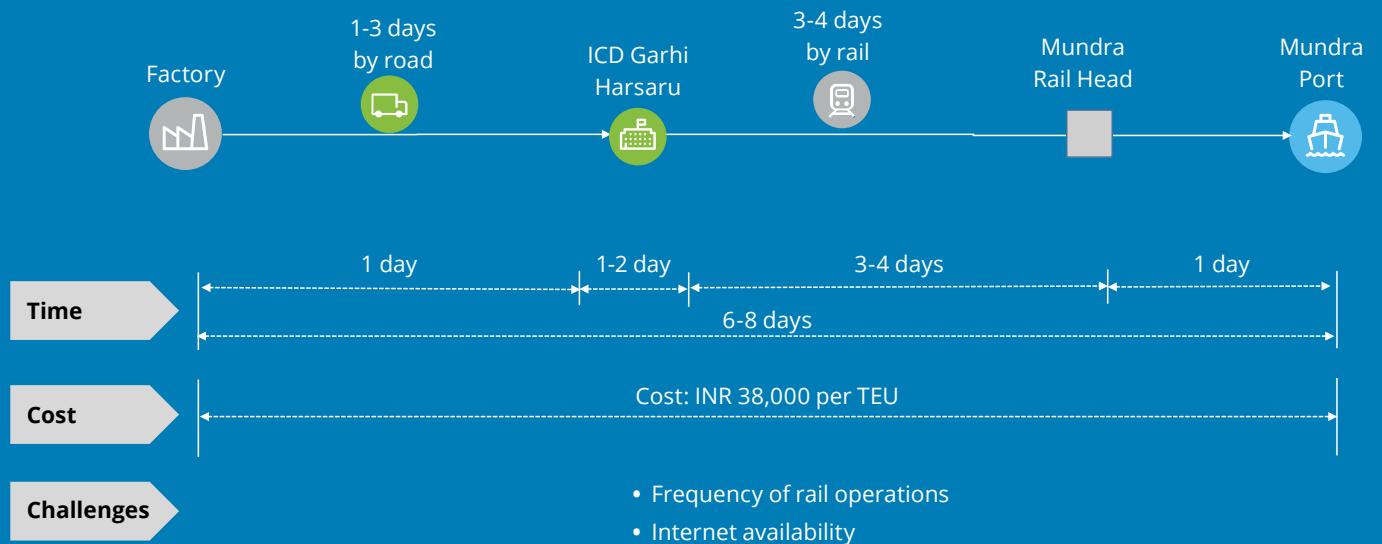
Process

- Packing into cartons
- Loading onto trucks
- Road transporter
- Freight forwarder/3PL
- Customs broker
- Air cargo agent
- Heavy vehicle cannot enter during peak hours
- Delay on account of stoppage by RTO agents
- Cargo documentation check
- Truck and driver permit check
- Truck unloading
- Consignment Scanning
- Customs Inspection
- Customs
- Security issues within examination areas
- Customs understaffing
- Overreach by customs officer
- ULD build-up
- ULD handing and storage
- Cargo terminal Operator

Cost

Challenges

Basmati Rice export: Karnal (Haryana) to Mundra Port



Basmati rice is exported from Haryana mainly to Middle Eastern and European markets. Basmati rice was reportedly being bagged in poly/PP bags (size ranges from 10kg-40kg) at the factory in Karnal and transported in break bulk form by truck to ICD Garhi Harsaru which is approximately 200 km away. This leg of the process typically takes upto 1 day (loading and transportation). At the ICD rice bags are stuffed into 20-foot containers, examined by Customs and Let Export Order is issued. Typically, this process takes 1-2 days (potentially more depending on rake build-up). The containers are then railed out to Mundra which takes around 3-4 days. Finally, the containers arriving at the port are loaded onto vessel (1 day).

Key challenges affecting this chain voiced by users are:

- Frequency of rail operations from ICD Garhi being low
- Issues pertaining to customs processing efficiency i.e. staff availability and lack of 24 x 7 processing
- Broadband connectivity issues – affecting customs processing

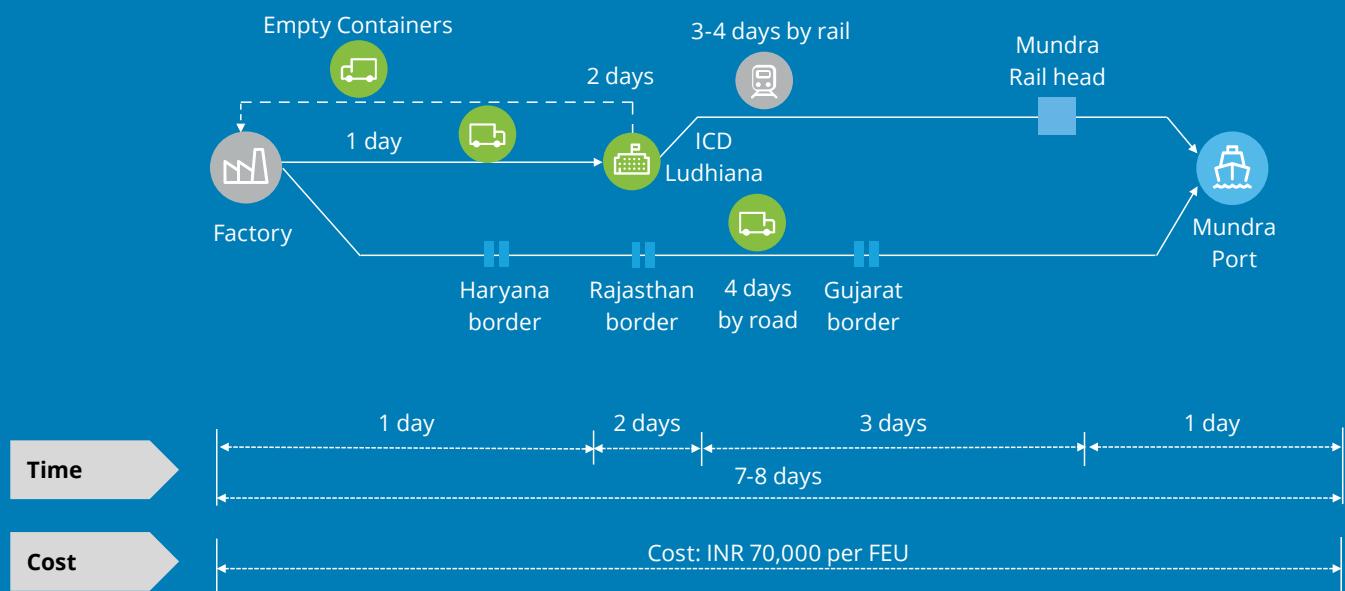
Cotton Yarn export: Ludhiana (Punjab) to Mundra Port

The textile industry accounts for 19% of the total industrial production of Punjab and contributes about 38% of the total exports from the State. Punjab accounts for 14% of the total cotton yarn production in India and is one of the leading exporters of yarn, hosiery and ready-made garments⁶. In particular, Ludhiana region is a key hub for exports towards markets including China, Germany and Belgium among others.

Empty containers are picked from empty yards in and around Ludhiana .Cotton yarn is containerized at factory into forty-foot containers. Given the nature of the commodity, containers utilized for stuffing need to be properly cleaned and washed prior to stuffing to ensure that bales are not contaminated by odour/ grease. Subsequently, containers are taken by road to ICD Ludhiana where Let Export Order is issued and railed out to Mundra port. Typically, this process takes 7-8 days in total. This includes 1 day for stuffing and transportation to ICD, 2 days at terminal, 3-4 days for rail transport and a 1 day for loading onto vessel.

Alternatively, stuffed containers are taken by road to Mundra port. Customs examination and LEO issue occurs at the port itself. This route was reported to be preferred by some exporters since it is considered to be more reliable than rail route in terms of time and cost. It takes about 4-5 days for truck to reach Mundra from the factory. Overall the logistics cost associated with each FEU is in the range of INR 70-75,000 per FEU.

Cotton Yarn Exports – Ludhiana (Punjab) to Mundra Port



Some of the key challenges faced were indicated to be inadequate availability of forty-foot containers. Imbalance in imports and exports leads to increased costs as empties need to be positioned into ICD Ludhiana from distant locations to cater to the needs of the Ludhiana cluster. Additionally, there is significant oversupply in terms of terminal facilities at Ludhiana with 5 facilities located within a 20 km radius. With volumes being distributed across these facilities there are diseconomies of scale wherein individual facilities are not able to attract enough volumes to run frequent rail services. On the road route, the high number of toll gateways were reportedly leading to queuing and stoppages.

Logistics: An enabler for exports

The perception-based LEADS scores for various states reflect the global trend of efficient logistics coinciding with economic activity. A cross-plot of the LEADS quartiles against export quartiles (which is a categorization of states based on their average exports by value for the

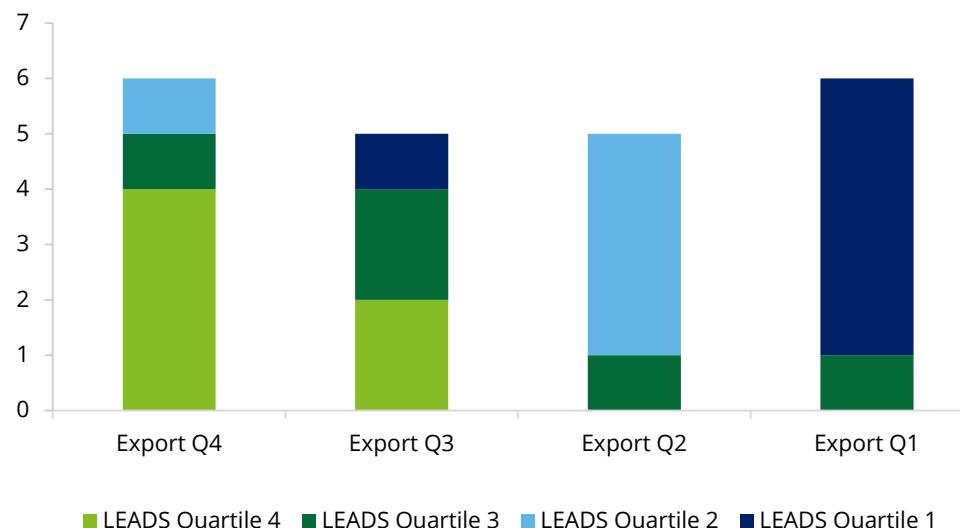
last three years) indicates that majority of the states with low LEADS scores related to exports quartile 1 – which comprises the lowest exporting states by value. Further, the proportion of states with lower LEADS scores decreases as export quartiles 2, 3 and 4 are considered.

Exhibit 36: Export quartiles based on average exports by value

Export Quartiles	States
Q4	Maharashtra, Gujarat, Tamil Nadu, Karnataka, Andhra Pradesh, Uttar Pradesh
Q3	Haryana, West Bengal, Punjab, Rajasthan, Telangana
Q2	Kerala, Madhya Pradesh, Odisha , Goa, Uttarakhand
Q1	Himachal Pradesh, Chhattisgarh, Bihar, Jharkhand, Assam, Jammu & Kashmir

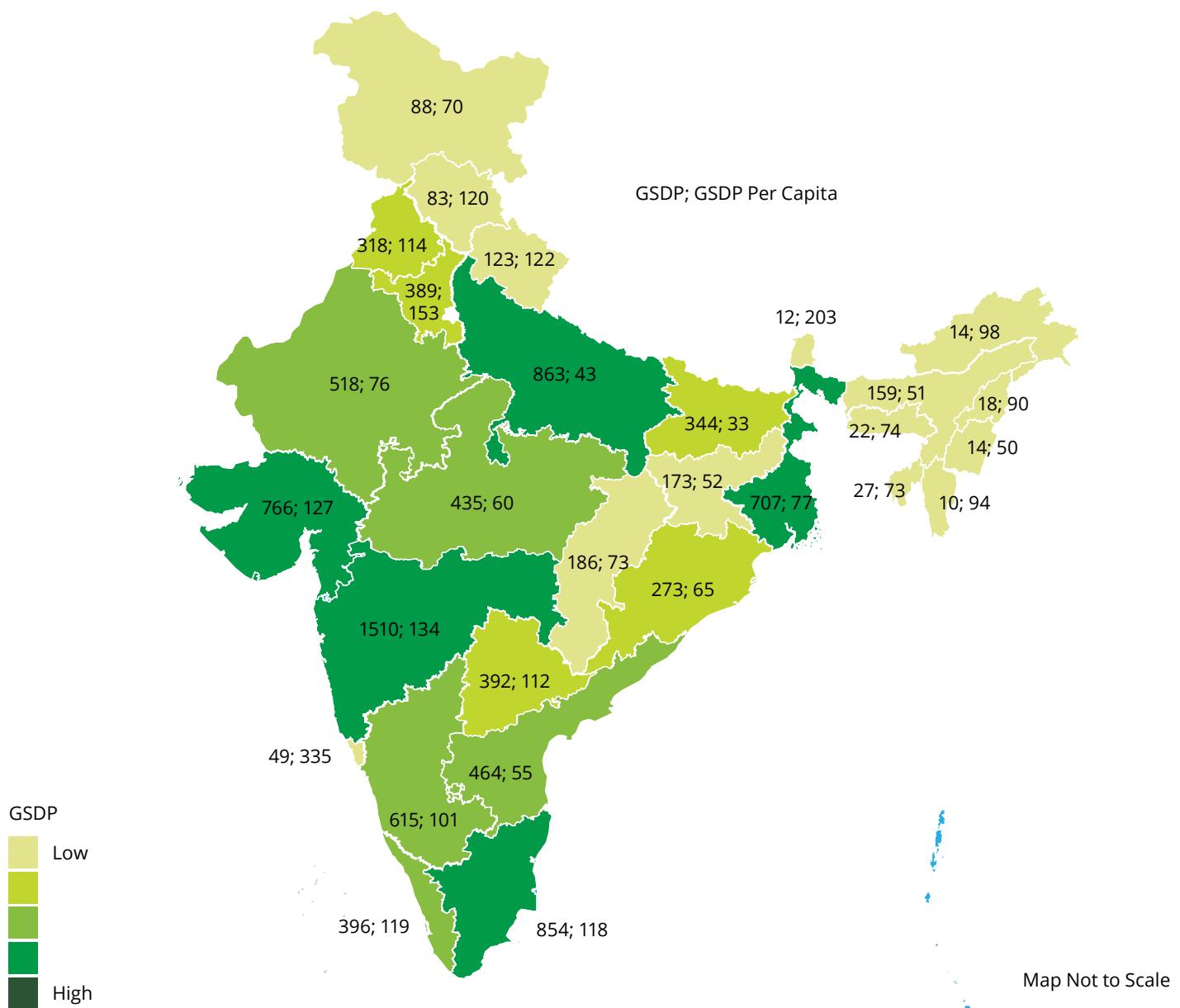
Note: The quartiles are based on the states' average exports by value for the years FY 2014-15 to FY 2016-17. Export values have been captured by DGCIS based on the state code entered in the shipping bills of the consignments.

Exhibit 37: Cross-plot of states' LEADS quartiles against export value quartiles

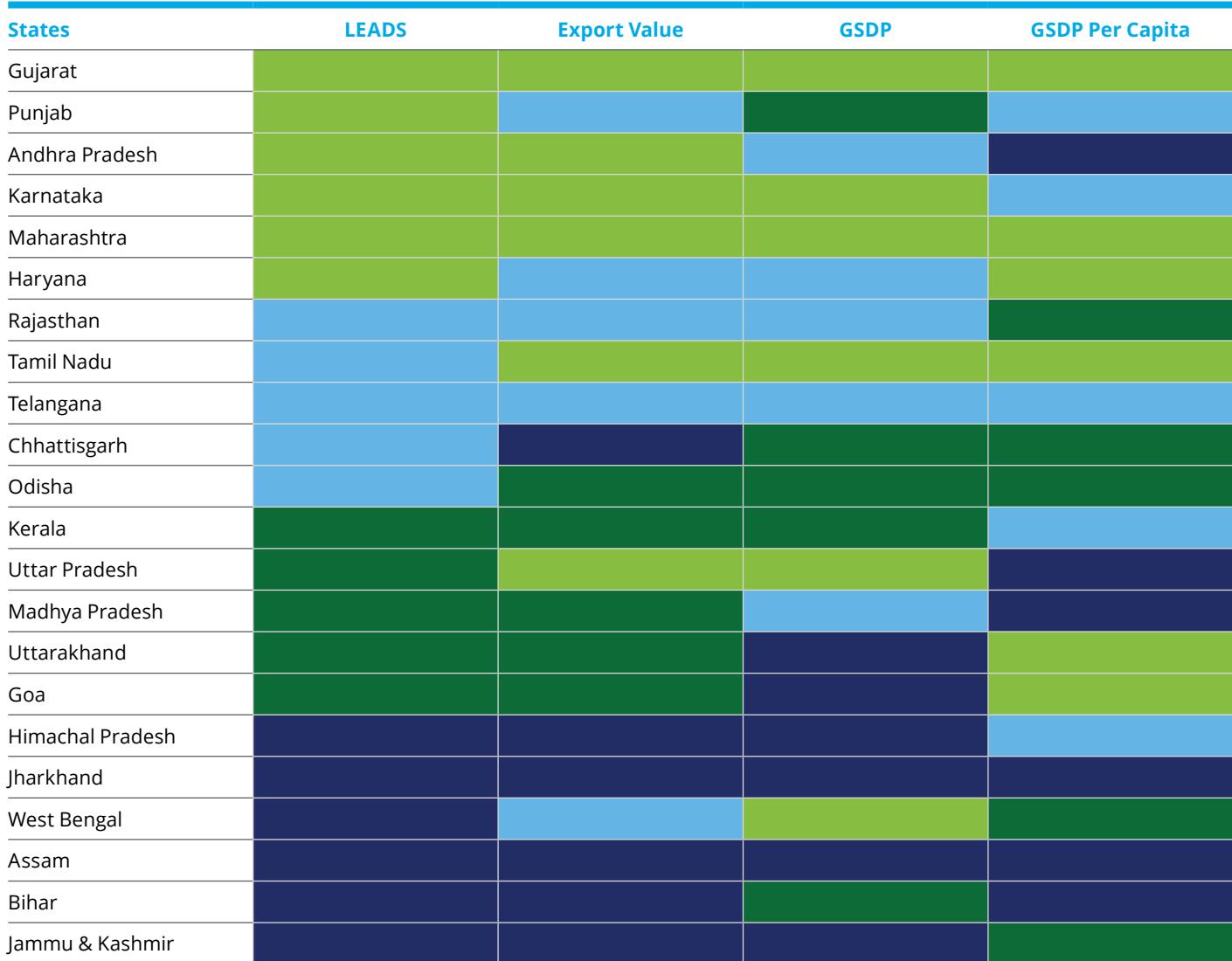


The study further sought to establish a correlation between rank ordering of states' LEADS scores, export values, GSDP values and GSDP per capita (Refer Exhibits).

Exhibit 38: GSDP (INR 000' Crore) and GSDP Per Capita (INR 000')



Note: GSDP (2013-14) and Population (2011)
Source: Niti Ayog, Census (2011)

Exhibit 39: Mapping LEADS scores, Export values, GSDP values and GSDP per capita

Quartile 4 Quartile 3 Quartile 2 Quartile 1

The Exhibit shows varying correlation of LEADS Index with these factors. Rank correlation between states' LEADS scores and their corresponding ranks with respect to:

- export values is 0.79,
- GSDP values is 0.54, and
- GSDP per capita values is 0.43.

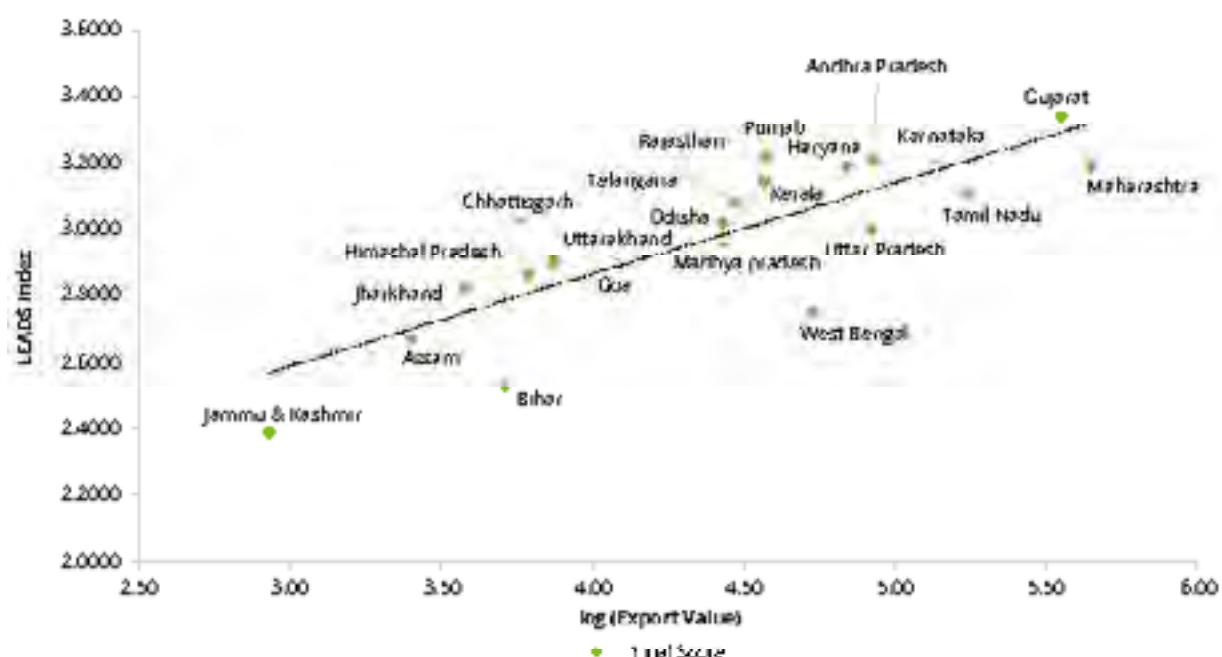
The statistically significant positive relationship between states' LEADS scores based rank ordering and their export values based rank ordering could indicate that states with a relatively high export performance also tend to have a relatively stronger logistics ecosystem. While, the relationship cannot imply causality, the presence of a strong logistics ecosystem can be seen as an enabling condition for a strong (non-services) export performance.

Box 11: Linkage between LEADS scores, Export values, GSDP values and GSDP per capita

There may also be a number of other variables that are linked / play a key role in higher logistics performance as well as higher export performance of states. For instance, there are states which are outliers to the above mentioned relationship.

Punjab figures in the fourth quartile of the LEADS index, third quartile for export values and second quartile in GSDP. The export value position can be attributed to both agricultural and manufacturing base for export cargoes from the state. At the same time, its relative LEADS score reflects the developed logistics ecosystem catering to the significant export volumes from the state. On the other hand, the small geographical size of the state may be a factor impacting its relative GSDP position. In contrast, West Bengal has a high export value as well as GSDP. However, its LEADS score is low – reflecting on the operating condition of terminal infrastructure, and service levels.

Exhibit 40: LEADS scores vis-à-vis Export Values

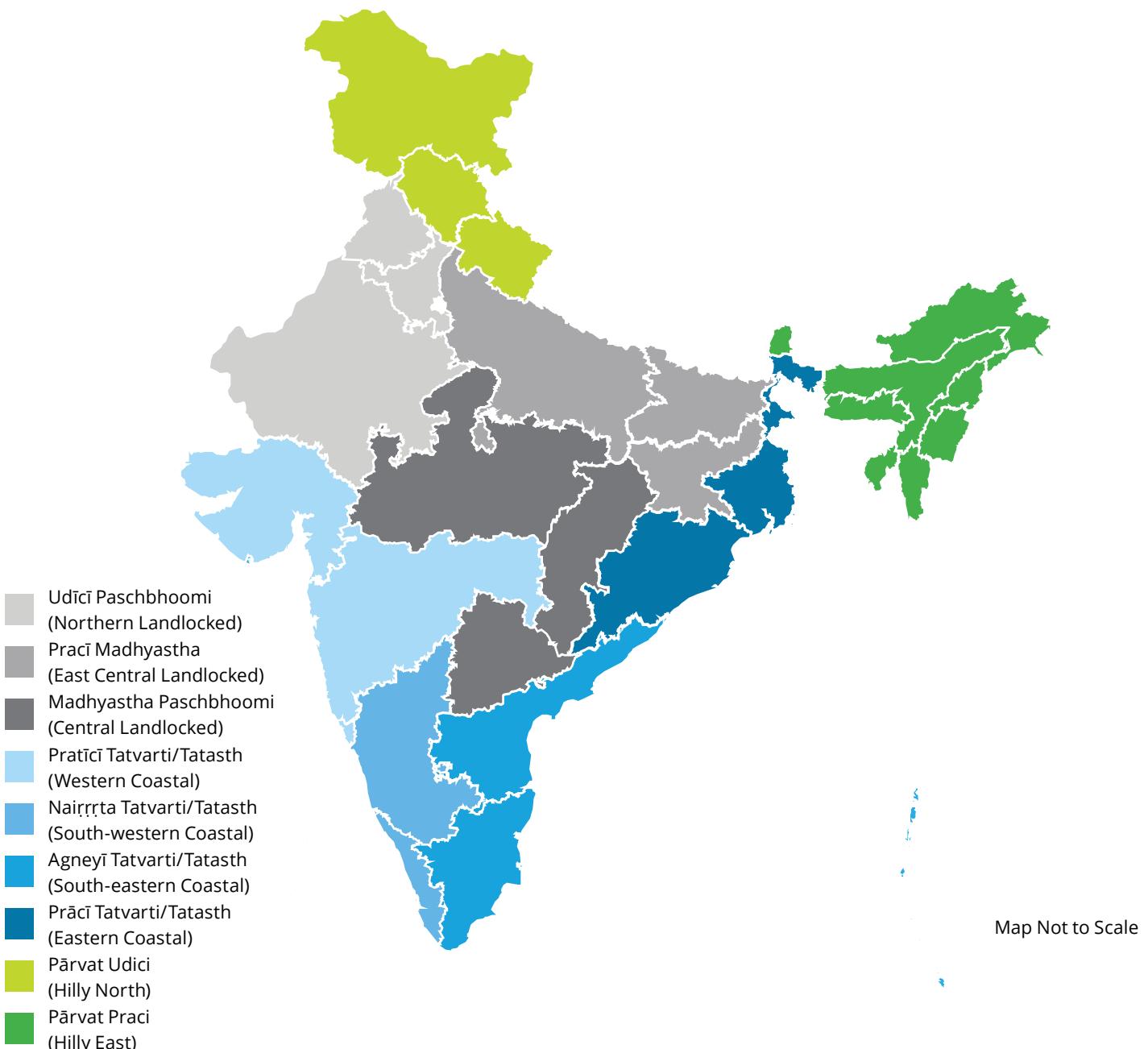


Source: Deloitte analysis

Logistics Performance across Sub-regional clusters

For comparative assessment of performance and to avoid comparison of states placed differently in terms of geographical characteristics, they have been segregated into hilly, land-

locked, and coastal states. Within this segregation, states with contiguous land parcels or exhibiting similar economic characteristics have been clubbed to form a unit.

Exhibit 41: Sub-regional Clusters

Source: Deloitte Analysis

An inter-cluster comparison shows that users don't perceive states' performance to be constrained only by virtue of them being landlocked. This is reflected in the fact that the northern landlocked cluster scores the highest on the LEADS Index. With the exception of timeliness and ease of arranging shipments

at competitive prices, the cluster is perceived to have performed well on the remaining indicators. It could indicate, that geographical disadvantages with respect to logistics, may be overcome by providing robust infrastructure facilities, quality services, facilitative regulatory, and operating environment.

Exhibit 42: LEADS scores for states

States	LEADS Index	Lower bound	Upper Bound
Prācī Tatvarti (Eastern Coastal Cluster)			
Odisha	3.02	2.91	3.12
West Bengal	2.75	2.70	2.80
Nairṛta Tatvarti (South-eastern Cluster)			
Andhra Pradesh	3.21	3.15	3.26
Tamil Nadu	3.11	3.07	3.15
Pratīcī Tatvarti (Western Coastal Cluster)			
Gujarat	3.34	3.31	3.37
Maharashtra	3.19	3.15	3.23
Goa	2.89	2.74	3.04
Agneyī Tatvarti (South-western Coastal Cluster)			
Karnataka	3.19	3.14	3.24
Kerala	3.00	2.95	3.06
Madhyastha Paschbhoomi (Central Landlocked Cluster)			
Telangana	3.08	2.97	3.19
Chhattisgarh	3.04	2.88	3.19
Madhya Pradesh	2.97	2.87	3.06
Udīcī Paschbhoomi (North Landlocked Cluster)			
Punjab	3.22	3.14	3.31
Haryana	3.19	3.12	3.25
Rajasthan	3.14	3.08	3.20
Pracī Madhyastha (East Central Landlocked Cluster)			
Uttar Pradesh	3.00	2.94	3.06
Jharkhand	2.82	2.67	2.97
Bihar	2.52	2.36	2.69
Pārvat Udīcī (Hilly North Cluster)			
Uttarakhand	2.90	2.69	3.12
Himachal Pradesh	2.87	2.71	3.03
Jammu & Kashmir	2.39	2.23	2.55
Pārvat Praci (Hilly East Cluster)			
Assam	2.68	2.53	2.82

On the other hand, the hilly eastern cluster scores the lowest on the index with respondents perceiving its performance on all indicators to be consistently low in comparison to the other clusters. While the cluster is characterized by difficult terrain, users' perceive its logistics performance being poor on all the indicators. Particularly, respondents perceive the quality of infrastructure as being a major impediment to logistics performance in the cluster.

Coastal clusters differ from hinterland states primarily in terms of presence of port infrastructure. Logistics performance across coastal states is dependent on the quality of infrastructure created, enabling regulatory and operating environment and geo-oceanographic characteristics of these port ecosystems. Trade is a function of coordination between several stakeholders' viz. logistics sector stakeholders, state governments, international shipping line and cargo owners. As such, coasts with ports having superior ecosystems have grown whereas others have stagnated.

Tatvarti (Coastal clusters)

A comparison of scores of the four

coastal clusters indicates that users perceive performance across eastern coastal cluster as the lowest, and that across western coastal cluster as the highest. This perception is held across all indicators except in the case of pricing wherein the former has a higher score. Logistics performances across both - south-eastern and south-western coastal clusters, are perceived to be at par, and their performances lies between that of eastern and western clusters.

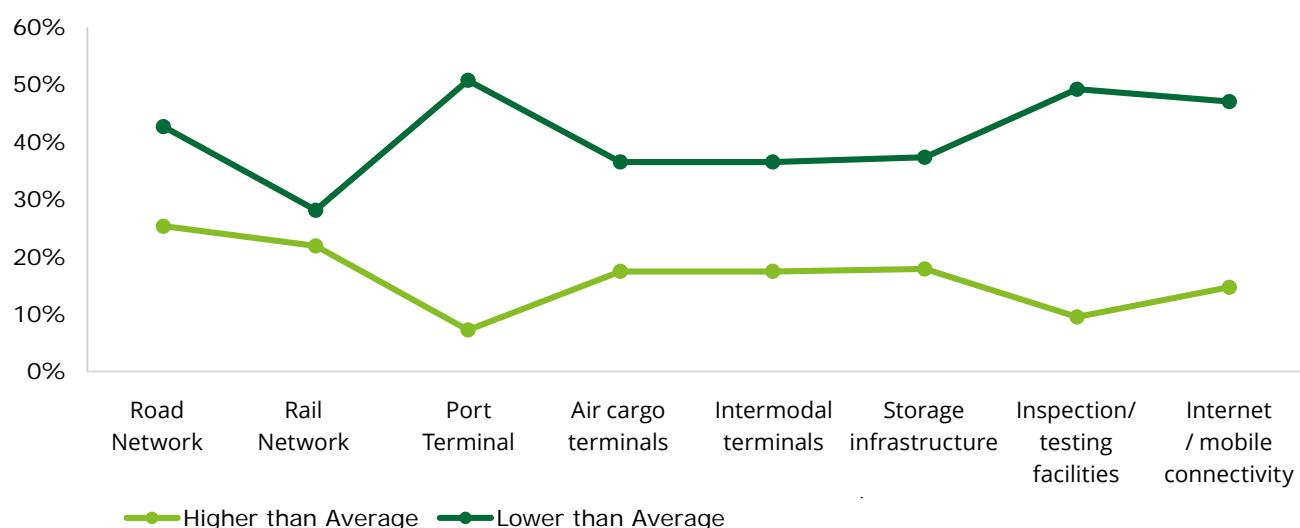
Prācī Tatvarti (Eastern Coastal Cluster)

Among coastal clusters, users perceive performance of the eastern cluster on the lower side.

Infrastructure and Services

Perception about quality of transport and logistics infrastructure is noticeably lower. Analysis of detailed responses for the cluster indicates that the quality of transport and logistics infrastructure (specifically road network, port terminal infrastructure, storage terminals and inspection/testing facilities) is perceived low (Refer Exhibit).

Exhibit 43: % of responses perceiving quality of infrastructure as high/low for eastern coastal cluster



There was a similar trend in the perceptions on quality of services pertaining to the corresponding fixed infrastructure facilities. Interestingly, user perception seems to be equally divided on the quality of rail infrastructure and quality of services provided by rail operator with almost 25 percent each of detailed responses find it to be high and low. This could be because the cluster has good rail connectivity only to some parts, impacting experience for some users.

Timeliness, Safety/security of cargo and Ease of track and trace

While internet connectivity is perceived as being high by ~40 percent of detailed responses, extent of digitalization in terms of frequency of electronic exchange of data with the same set of service providers (ones with low level of perceived performance), is perceived as being poor – noticeably so, for the rail operator.

Among all indicators, users find the ease of track and trace of cargo in the cluster as high. Out of the specific components of track and trace, users perceive the availability of track and trace information for all export/import consignments to be high but availability of real time information to be low.

Favourability of operating environment and Efficiency of regulatory processes

Across the cluster, respondents

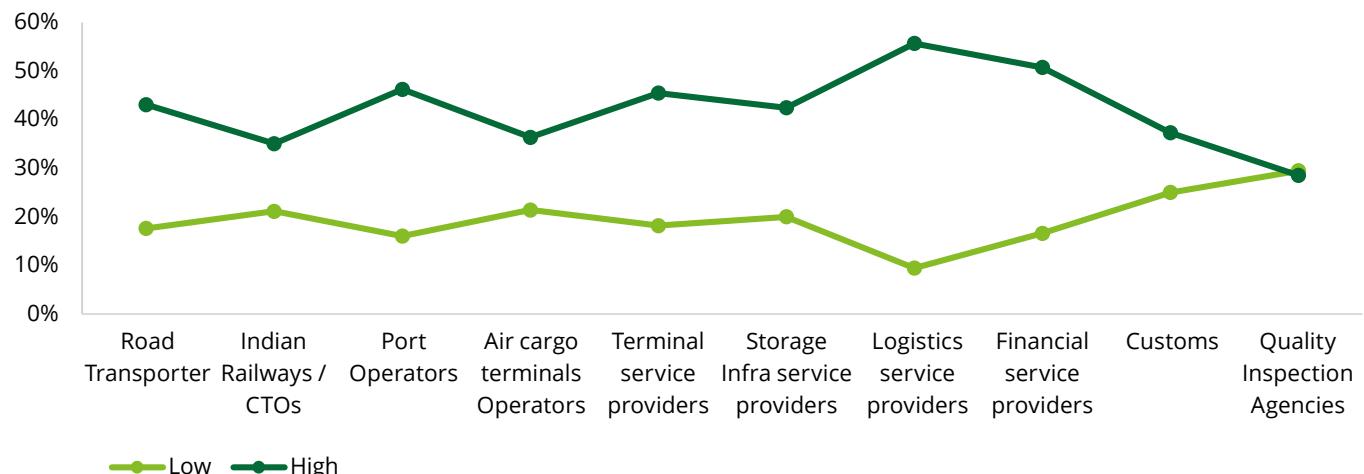
perceive the favourability of operating environment and efficiency of regulatory process to be low. Around 40-55 percent of detailed responses rate effectiveness of state labour policies, efficiency in enforcing contracts, availability of skilled labour to be low and extent of road restrictions on goods trucks during city transit to be high. In the context of the regulatory environment, users perceive quality of inspection facilities (~50 percent of detailed responses) and the services provided by customs and inspection agencies (40-45 percent of detailed responses) as to be low.

Pratīcī Tatvarti (Western Coastal Cluster)

In sharp contrast, users perceive the performance of western coastal cluster as high on all the indicators, particularly in the case of quality of services, timeliness and infrastructure.

Infrastructure and Services

About 40-50 percent of detailed responses for the cluster rate the quality of infrastructure facilities, particularly of port terminals, intermodal terminals, storage infrastructure and internet connectivity as being high. Further, the same trend in perceptions is observed for service providers pertaining to corresponding fixed transport and logistics infrastructure facilities. Perception of performance of logistics service providers in the cluster high. However, perception of the quality of

Exhibit 44: Responses on quality of services for western coastal cluster

services provided by inspection agencies is varying with ~30 percent of detailed responses rating it high and similar extent rating it low.

Timeliness, Safety/security of cargo and Ease of track and trace

Also, both internet connectivity and the extent of digitalization in terms of frequency of electronic exchange of data and making online payments is rated as being high for same set of the service providers (ones with higher level of perceived performance), except in the case of road transporters.

While the cluster is perceived to have a greater ease of tracking and tracing of cargo compared to the remaining coastal clusters, around 40 percent of detailed responses rated them lower on real time information and extent of availability of such information from an integrated service provider. Also, the cluster is perceived to have lower (by ~60% detailed responses) extent of loss or damage to the cargo.

Favourability of operating environment and Efficiency of regulatory processes

While the cluster is perceived to have a more favourable operating environment than the other coastal clusters, it is perceived to be at par with the efficiency levels of regulatory processes. On specific aspects of operating environment such as effectiveness of state labour policies, efficiency in enforcing contracts, and extent of road restrictions, perceptions were mixed.

Nairṛta Tatvarti and Agneyī Tatvarti (South-eastern and South-western Coastal clusters)

Users perceive logistics performance across indicators across both southern coastal clusters to be close to each other. The score for quality of transport and logistics infrastructure for both the clusters is in a very narrow range.

Infrastructure and Services

Detailed responses indicated that perception of facilities pertaining to road network, port terminals, intermodal terminals and internet connectivity was

high (35–45 percent of the responses). Noticeable difference in perception is observed with respect to quality of air cargo infrastructure with the south-eastern coastal cluster getting low assessment from ~40 percent of detailed responses and the south-western cluster getting high assessment from ~60 percent of detailed responses).

As is observed in other coastal clusters, users perceived quality of logistics services in a similar manner as that of corresponding infrastructure facilities, which is high. An interesting observation however, is with respect to the quality of services provided by air cargo operators in the south-eastern cluster, wherein an equal proportion of responses (~30 percent) received for the two clusters rated it as being high as well as low. It could potentially highlight an inconsistency in experiences of different users – potentially on account of multiple reasons.

Timeliness, Safety/security of cargo and Ease of track and trace

Users find the extent of electronic exchange of documentation with service providers as being high with the exception of road transporters,

rail operator and inspection agencies. Similarly, users perceive the frequency of online payments to be high with most service providers except road transporters.

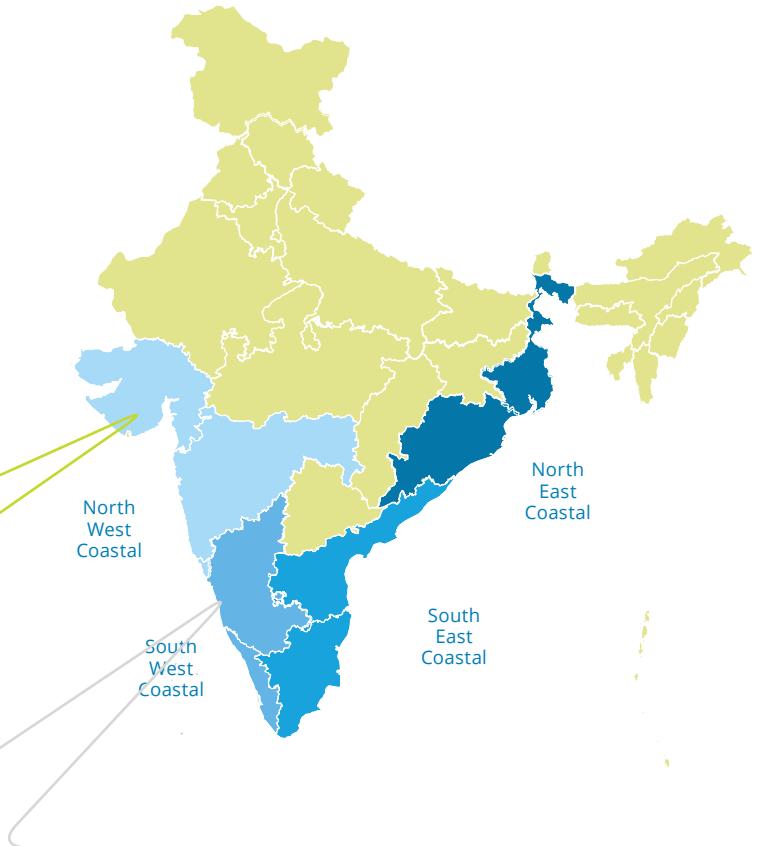
Users perceive the extent of loss or damage to cargo to be low across both clusters. In line other coastal clusters, ease of track and trace is perceived to be high. However, around 40 percent of detailed responses indicate the extent of availability of information from an integrated service provider and availability of real time information to be a challenge for both the clusters.

Favourability of operating environment and Efficiency of regulatory processes

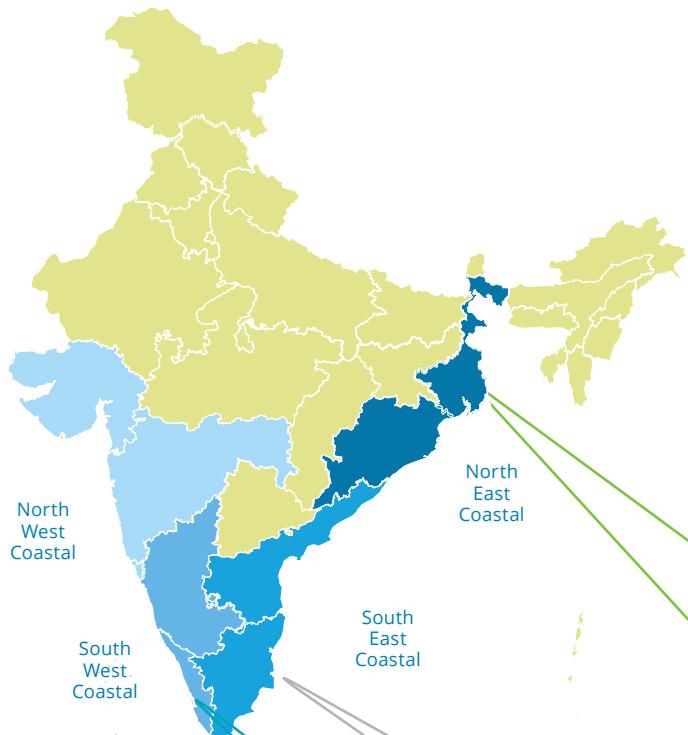
Favourability of operating environment is perceived to be lower for the south-western coastal cluster as compared to that for the south-eastern coastal cluster. On specific aspects of operating environment, 40-60 percent of detailed responses found effectiveness of state labour policies to be low and extent of restrictions on goods trucks during city transit to be high.

Exhibit 45: Respondent Feedback on Coastal Clusters**Western Coastal Cluster**

- Road network is a concern, especially with regard to port connectivity at Pipavav, Amreli, Una. During monsoons, quality of roads deteriorates rapidly
- Shipment transport prices are considered 'average to high'—expensive fuel being the major reason in comparison to other states. In fact, high fuel cost was cited to be one major reason for the overall higher logistics costs in Gujarat



- The road to JNPT port is substandard, both in capacity and quality, as are the arterial roads, considering the volumes handled. There is congestion at the JNPT Entry Gate. Even CFSs that are located just 5-7 km from the port experience a delay of 1-2 days in getting to port by road. The situation gets worse in monsoons.
- One solution that came up in discussions with stakeholders was to manage more clearances by rail even to nearby Customs-bonded rail terminals, from where existing CFSs could come into play. This would imply more cargo handling but may still save time. Many argued that state-specific agencies like Maharashtra CIDCO (City and Industrial Development Corporation) should look into providing better quality infrastructure for port approach roads to facilitate easier movement of goods trucks.
- Currently, there is an overcapacity at JNPT port in terms of CFS and ICDs. Presence of multiple players has led to strong competition and consequently competitive terminal rates as compared to other states
- At Nhava Sheva, the Jawaharlal Nehru Port Container Terminal offers cheapest rates followed by NSICT terminal and APM Gateway terminal. This differential pricing is because of the TAMP (Tariff Authority for Major Ports) rate of return pricing formula. It is difficult for TAMP price-bearing ports to compete as private ports link prices to market factors. The manner in which the formula is drawn up does not incentivize ports to increase throughput/efficiency. TAMP's responsibility is limited to tariff only. It does not have the authority to set and enforce performance standards
- Respondents pointed out in interactions that Customs should proactively facilitate procedures. Standard SOPs and protocols could be established and implemented suitably to ensure better turnaround times. DPD (Direct Port Delivery) and DPE (Direct Port Export) were considered welcome initiatives but the view was that these could have been implemented better
- Labour unions, particularly the local Mathadi unions, demand ad-hoc raises and rate revision, which end up being passed on to end users hitting price competitiveness. Efficiency of the labourers is also an issue; regular strikes and bandhs lead to congestion and delays that affect the overall ecosystem
- Initiatives such as the Logistics Data Bank (LDB) have put in place RFID tags on containers allowing for LSPs, terminal operators and end users (shippers) to track the position of containers in real time – ensuring visibility and transparency across the logistics chain
- CONCOR and other container train operators have seen a modal shift in traffic over the last decade from rail towards road. Some of the reasons stated for this were rigidity in rail freight slabs, congested rail line capacity leading to delays (expected that DFC would address this issue), and overloading of road vehicles



Easter Coastal Cluster

- Approach roads to Kolkata port are in exceptionally poor conditions and needs rapid improvement. This was attributed to the conflicts between the Kolkata municipal authorities and the port authorities with respect to the responsibility of repairs and maintenance.
- ICT infrastructure of the customs at the Port is marked by frequent downtimes which adversely affects timelines and volumes for cargo and container movement
- Warehousing facilities at Kolkata airport are not of required quality and limited space is available
- Absence of testing labs in the West Bengal and inadequate skill level of lab operatives were cited as key issues
- Lack of proper track and trace systems in road transport
- Kolkata has very strict traffic restrictions on peak time traffic movement in the city, the city potentially needs a dedicated freight corridor to realize the full potential of the logistics business

South Eastern Coastal Cluster

- Several districts in Tamil Nadu have poor rail connectivity, and exports suffer detention at locations within the state
- Additional exclusive air cargo facility is perceived to be urgently required for Chennai
- No rail connection to Tuticorin Port Terminal
- Tuticorin needs testing facilities with global standards – today it has to be carried out at Chennai, Madurai or Cochin
- ICD Irugur experiences labour issues , inadequate infrastructure, and poor cargo flow plan. A lot of cargo therefore moves on bonded trucks to Cochin.

South Eastern Coastal Cluster

- Unavailability of an Assistant Drug Controller (ADC) at Vishakhapatnam causes delays as the samples have to be sent to Hyderabad or Chennai for testing and acceptance
- Inadequate testing facilities for agricultural products like green peas

Southern Western Coastal Cluster

- Poor internet connectivity at ICD Whitefield
- CFSs in the region are perceived to be expensive. Exporters and Customs Brokers believe that an economic regulatory authority is needed to regulate prices
- Exporters prefer road transport over rail as it is much quicker. Exporters feel that moving by rail should be a cheaper alternative and train operators should start door-to-door delivery as a value-added service

Paschbhoomi (Landlocked clusters)

Comparison of indicator scores across the landlocked clusters indicates that users perceive performance of the northern landlocked cluster to be higher than the other landlocked clusters and that of the east central cluster to be the lower than the other landlocked clusters.

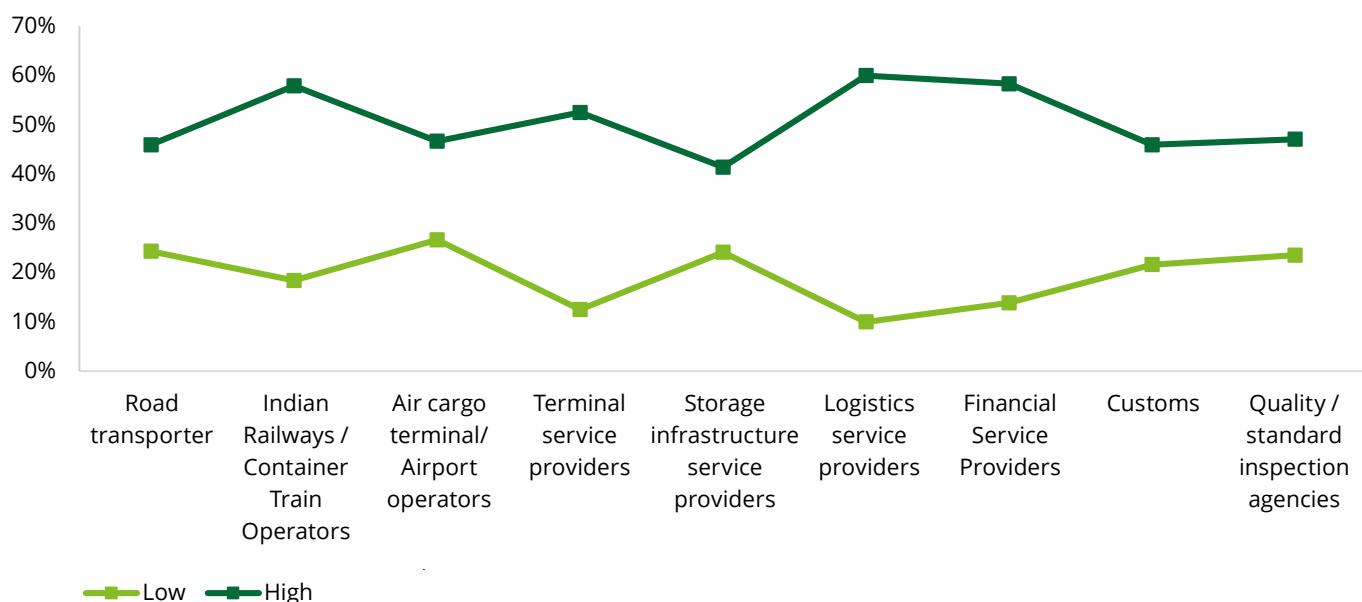
Madhyastha Paschbhoomi (Central Landlocked)

Perceptions of the users on logistics performance of the central landlocked cluster, as evident by the ratings assigned to the cluster, is consistent across indicators with slightly higher ratings on track and trace of cargo and safety of cargo.

Infrastructure and Services

Users perceived the quality of road, rail, intermodal terminal infrastructure and corresponding logistics services to be high (35 – 55 percent of detailed responses perceiving so). Perception was very different on quality of storage infrastructure, where ~40 percent of detailed responses rated it low.

Perception on quality of air cargo terminal infrastructure was mixed (potentially due to perception for Madhya Pradesh being low (~70% of detailed responses) and that for Telangana being high (~60% of detailed responses)).

Exhibit 46: Responses received on frequency of online payment**Timeliness, Safety/security of cargo and Ease of track and trace**

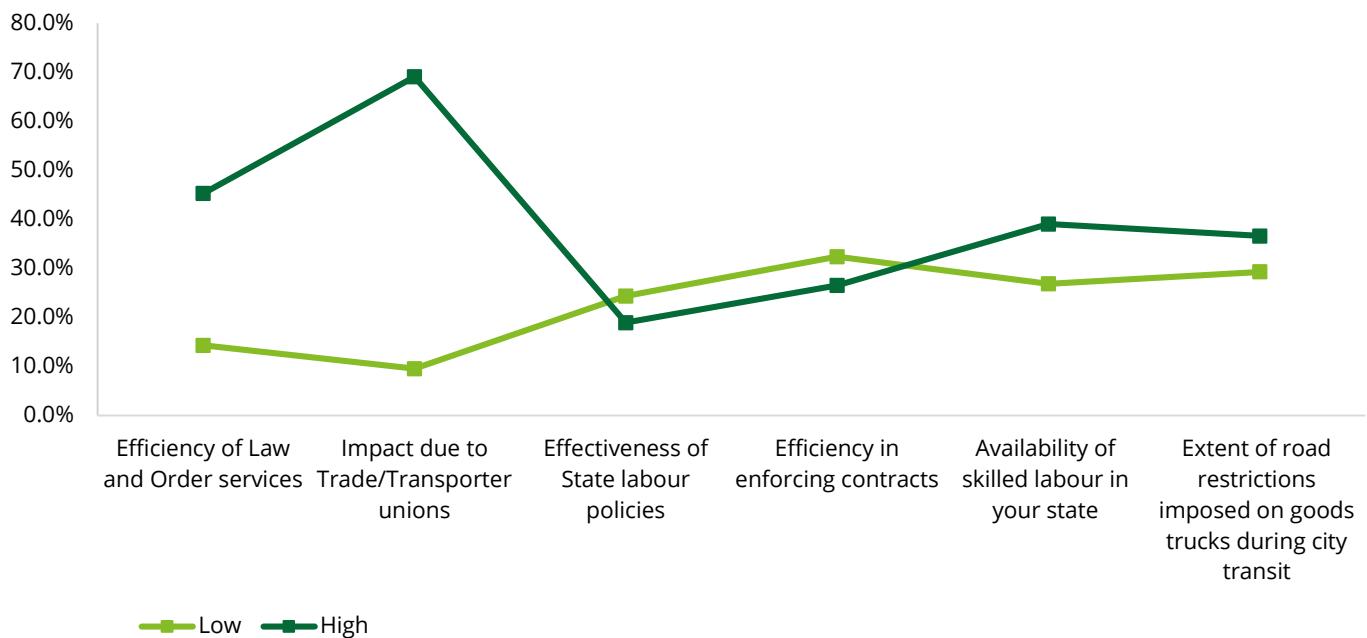
In terms of frequency of online payments, the cluster is perceived to have evolved well with high ratings for all stakeholders across the logistics chain. However, in terms of digital document exchange, users found the frequency with terminal providers and logistics service providers as high (~40 percent of detailed responses) and with road transporters and storage service providers as low (~40 percent of detailed responses).

On the specific components of ease of track and trace, users perceive the cluster to have a higher availability of track and trace information across all commodities (~50 percent of detailed responses), higher accuracy of information (~36 percent of detailed responses), lower extent of availability of information from single source, and mixed perceptions on real time information availability (~40 percent low performance and 33 percent high performance).

Favourability of operating environment and Efficiency of regulatory processes
Users perceive the cluster to have a higher efficiency of law and order service

and less impact due to trade unions. Responses are mixed in terms of aspects such as labour policy efficiency and city restrictions. The cluster is perceived to have better availability of skilled labour.

Exhibit 47: Responses received on operating environment for central landlocked



Udīcī Paschbhoomi (North Landlocked)

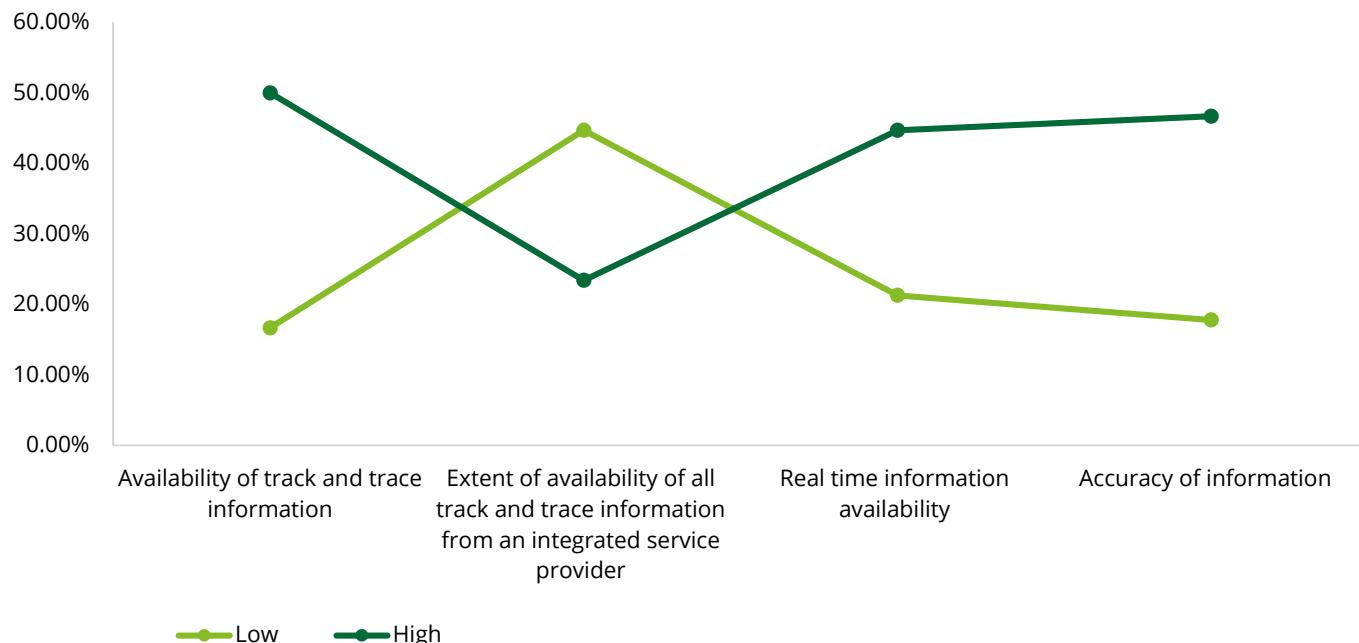
Users perceive the logistics performance of north landlocked cluster to be better on all indicators.

Infrastructure and Services

Users perceive the quality of transport and logistics infrastructure and that of logistics services across the cluster to be high (40-55 percent of detailed responses). Exceptions to this perception, however, were with respect to quality of air cargo infrastructure and inspection facilities, and their respective service providers (45-60 percent of detailed responses).

Timeliness, Safety/security of cargo and Ease of track and trace

Users perceive the cluster to have higher frequency of electronic exchange of documents with all service providers (40-55 percent of detailed responses). Exceptions emerge in the case of road transporters, air cargo operators and storage infrastructure service providers. Frequency of online payments with road transporters are perceived to be low (42 percent of detailed responses).

Exhibit 48: Responses received on aspects related to track and trace facility for northern landlocked cluster

Users perceive the extent of safety and security of cargo and ease of track and trace to be higher for this cluster. Their perception on all components of track and trace (availability for all commodities, from single source, real time availability, and accuracy) is high for this cluster.

Favourability of operating environment and Efficiency of regulatory processes

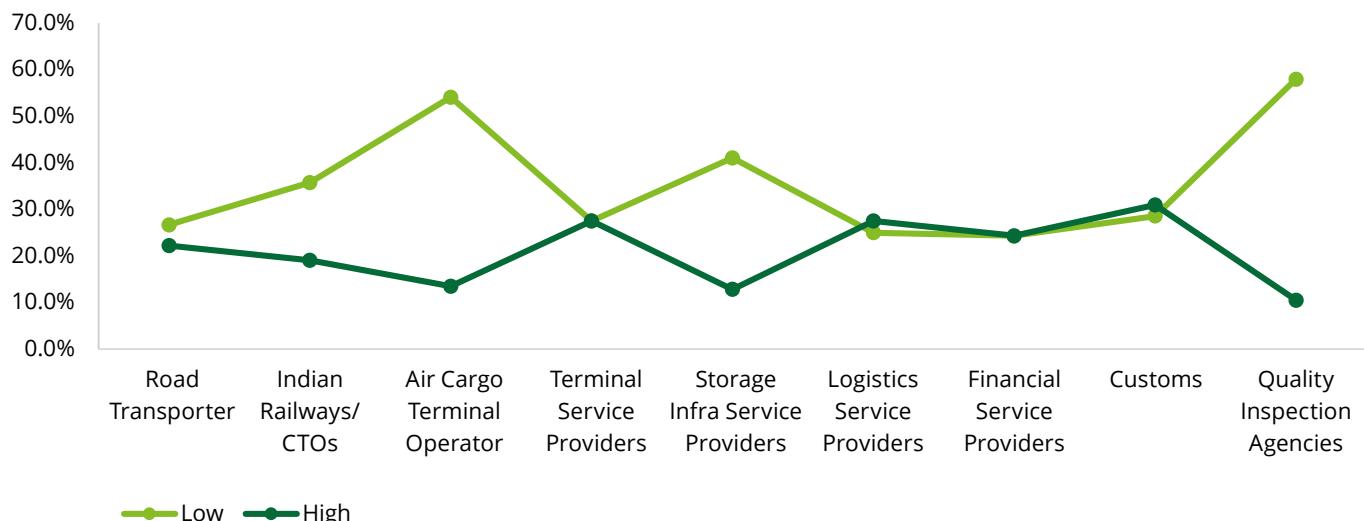
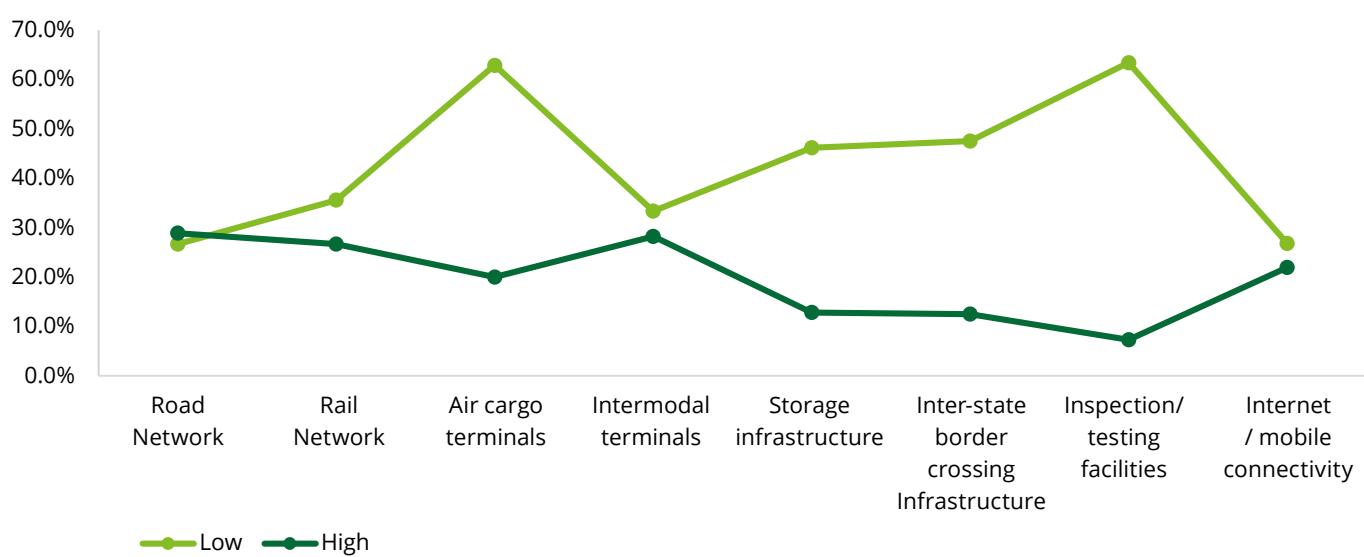
The cluster is also perceived as having the most favourable operating and regulatory environment across all clusters. The favourability of the operating environment is particularly highlighted in the case of low impact of trade and transport union on freight movement (~53 percent of detailed responses).

Pracī Madhyastha (East Central Landlocked)

The east land locked cluster has poor scores across indicators. Within this cluster, only Uttar Pradesh could be assessed at a detailed level due to lower response rate from Jharkhand and Bihar.

Infrastructure and Services

Users perceive the performance across this cluster on quality of transport and logistics infrastructure to be low. Perception on quality of rail infrastructure, terminal infrastructure, storage infrastructure reflects the overall trend (~ 35-45 percent of detailed responses perceiving it low). Similar perceptions are observed with respect to the quality of logistics services as well. Noticeably, air cargo terminal, testing/inspection infrastructure, and corresponding services are perceived to be of a low quality (~55 percent of detailed responses).

Exhibit 49: Responses received on quality of logistics infrastructure for the east central cluster**Exhibit 50: Responses received on quality of logistics services for the east central cluster**

Timeliness, Safety/security of cargo and Ease of track and trace
 Users perceive frequency of online payment to be high for logistics service providers (~40 percent of detailed responses), financial service providers (~37 percent of detailed responses), and Customs (~35 percent of detailed responses) and low for the rest (35-45 percent of detailed responses).

Favourability of operating environment and Efficiency of regulatory processes
 In terms of favourability of operating environment, it is perceived that the cluster has poor efficiency of law and order services, effectiveness of labour policy, and enforceability of contract and availability of skilled labour.

Exhibit 51: Respondent Feedback on Landlocke Clusters

Northern Landlocked Cluster

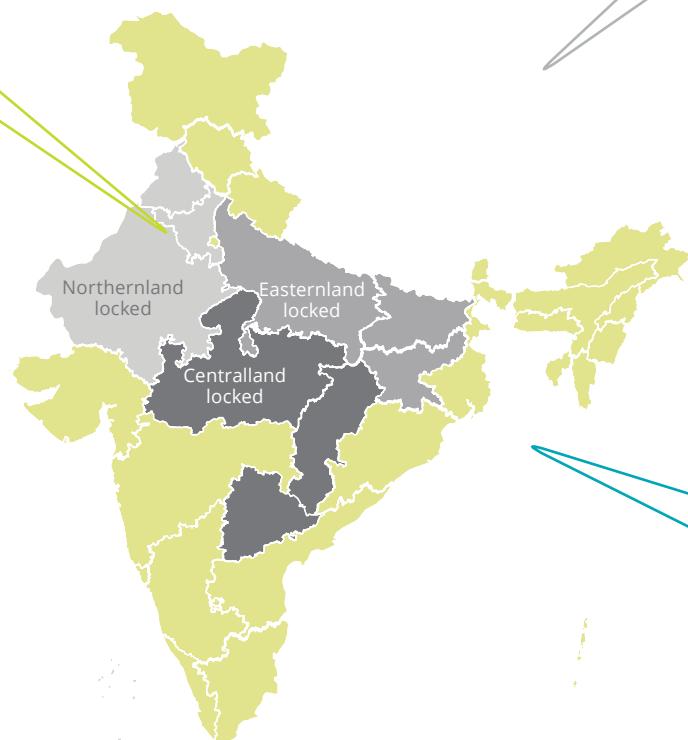
- Punjab has significant CFS/ICD overcapacity. Supply is almost twice that of existing demand. As a result, frequency of train services remains poor at several facilities, bringing down the overall logistics ecosystem quality. Due to this, container traffic that should come to Punjab ICDs/CFS heads to Tughlakabad, or goes directly via road to exit ports
- It takes around four days to completely fill a rake of 90 TEUs at Kanakpura ICD. This leads to inordinate delays of up to three days in rail movement to ports in Gujarat. Hence, despite being a safer and cheaper mode of transport, rail transport is losing out to road because exporters fear losing out on timeliness of cargo movement

• Imbalance between exports and imports in Ludhiana, leads to unproductive carriage. Quite often, these have to return empty. In order to attract export cargo from Baddi and J&K regions, port connectivity in terms of service frequency must increase.

- In Ludhiana, EIC-approved testing and inspection services are not available for key export items. The testing facilities in Ludhiana region is inadequate given its hub status (Plant Quarantine – located at Amritsar, Animal Quarantine – Kapashera (Delhi), Wildlife – Delhi airport, Drug controller – Delhi airport and FSSAI – Gurgaon)
- In Haryana, road connectivity is average. But more multi-lane highways are needed and better hinterland connectivity is required
- In Rajasthan, terminal infrastructure is inadequate. In the absence of the right equipment at the ICD Kanakpura, it is impossible to get labour to load heavy consignments of stone, weighing anywhere between 800 and 1000 kg
- Lack of C-TPAT warehouses causes US-bound LCL consignments to be sent first to certified warehouses in Dadri, Uttar Pradesh, after which it is sent to the ports in Gujarat

• Road transport is cheaper towards port as trucks are able to overload and pay speed money for passage at borders leading to better throughput.

• Trucks that deliver to hinterland offer throwaway prices on return to avoid empty trips back



Central Landlocked Cluster

- In Madhya Pradesh, Customs EDI does not function smoothly, making it challenging to file documents. Under CBEC Sevottam, an initiative of Central Board of Excise and Customs, it should not take more than 24 hours for export clearances and 48 hours for import. However, as a logistics service provider pointed out, this is almost never followed, highlighting need for regular monitoring of clearance time
- In Chhattisgarh, empty containers for exports are not sufficiently available, especially since the central and state government banned import of heavy metal scrap into Chhattisgarh to counter naxalism
- In Chhattisgarh, Raipur could be a major centre for food grain export, but the lack of aggregators is a major problem. Aggregation is a specialized service and there are not enough such private service providers in the state

Northern Landlocked Cluster

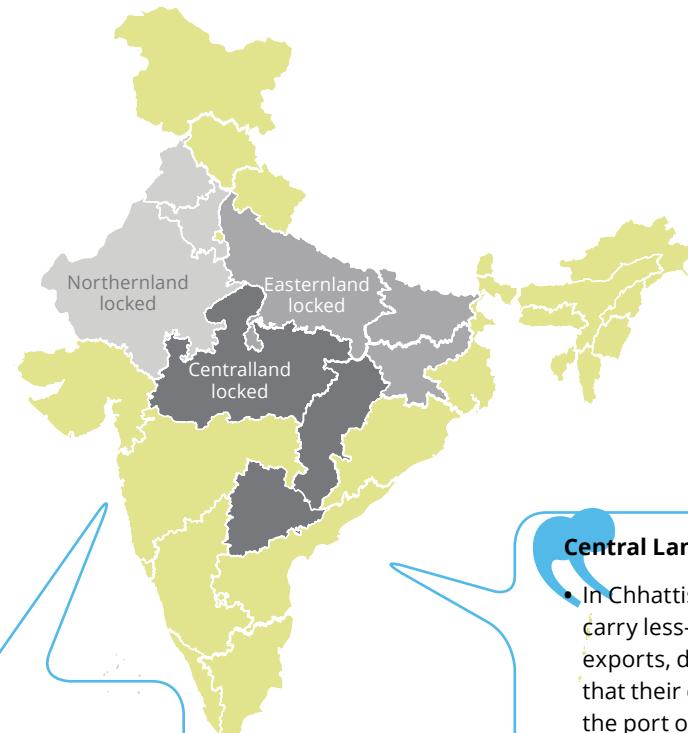
- Connectivity of Haryana region is expected to improve significantly through upcoming projects such as DMICDC, Kundli-Manesar-Palwal (KMP) Expressway, Eastern Peripheral Corridor, DFCs, more than 15 highway upgrades planned on national highways, and an Integrated multimodal park at Bawal over 1200 acres as a 50:50 joint venture between HSIIDC and DMICDC/DMIC Trust. The last will reduce the transport time from 14 days to 14 hours. All these will help decongest Delhi-NCR routes, reducing transit time for cargo movement. The 1-km stretch on both sides of KMP expressway will even be declared an investment zone.
- Haryana road transporters have largely adopted RFID technology. However, market demand from end consumers (shippers) is low for real-time tracking. In any case, quality of track-and-trace systems is not as high in Haryana as in states such as Maharashtra and Gujarat.
- The quality of infrastructure leaves a lot to be desired. Road transport is highly unorganized, Internet connectivity at terminals is poor leading to slow ICEGATE operations, and the warehousing service quality (mainly for rice) is not only poor but also severely short. Testing facilities too are not readily available in Haryana, but in Delhi. This is why cargo gets diverted to Tughlakabad over Panipat.
- Transportation prices in Haryana are high. When trucks transit through Delhi, they face high congestion and environmental tax on entry that is imposed by the National Green Tribunal. This hikes up the transportation charges.

East Central Landlocked Cluster

- In Bihar, despite recent improvements in road infrastructure, condition and capacity of the state's roads continues to be substandard. Raxaul is the most important gateway in the East region, accounting for 60 percent of exports to Nepal. The condition of the road connecting Bihar to Nepal is poor.
- Of the 19 check-posts between India and Nepal, Raxaul has the worst infrastructure. This is despite the fact that an ICP has been made at Raxaul. The ICP is not functional and the connecting road is yet to be constructed.
- The road to Raxaul is of poor quality. Even though Raxaul can still be approached, on crossing, there is a 200 m bridge that connects India to Nepal. A truck takes two days' time to cover this because of congestion.
- Internet Connectivity at Raxaul is poor. Power availability is another problem. Hence, documentation gets delayed, not even keeping pace with the physical movement of cargo.
- In Uttar Pradesh, major problems faced are on account of rail transit delays from ICD as most exporters keep a tight margin for vessel connection.
- In Moradabad, Uttar Pradesh, since imports are very low for the area, empty containers have to be positioned, mainly by rail from nearby surplus terminals like ICD Tughlakabad.
- Congestion on entry road to ICD Moradabad affects timeliness of cargo.

Central Landlocked Cluster

- In Telangana, clean storage and quality cold warehouses are essential for meeting pharmaceutical company requirements. The available infrastructure does not meet industry needs today.
- In Hyderabad, restriction on movement of heavy goods vehicles in the city is considered high. Movement is restricted between 07:00 hours to 23:00 hours in general – on some routes goods vehicles can only move between 11:30 hours to 15:30 hours during the day. Most stakeholders felt that the extent of restriction hampers the movement of empty containers to the factory and subsequent movement of the loaded containers to the ICD.
- The air cargo terminal in Hyderabad that is operated by Menzies Aviation is a good example of operations being managed well. Often the shipment exits the country the same day that cargo reaches the air cargo terminal.
- In Indore, air cargo terminal is short of cargo-handling equipment, has a lack of storage capacity and poor international connectivity. Most exporters therefore get the consignment cleared by the Customs at Indore airport and then transport it by road to Mumbai airport.
- Congestion on entry road to ICD Moradabad affects timeliness of cargo.



Northern Landlocked Cluster

- Stone movement in Rajasthan: Around 20 percent-25 percent of the stone mined in Rajasthan is exported to other countries. Typically, marble is mined at Udaipur, sandstone is mined at Khatu, slate is mined at Deoli, and quartzite is mined at Kota. Most of the mined stones are then transported by road to Kishangarh, popularly called the 'Marble Mandi', where it is agglomerated and then distributed primarily for domestic consumption.
- Empty containers come to Bagru from the ICD Kanakpura. These are loaded at the factory, sent back to the ICD by road for customs clearance and then moved to Mundra port in Gujarat through rail. In the case of Udaipur, empty containers from Mundra are brought to the factories by road, loaded and then sent back to Mundra by road. Majority of the movement happens directly from the factories to the port because of the absence of any terminal in Udaipur.

Central Landlocked Cluster

- In Chhattisgarh, Railways does not carry less-than-rake size for rice exports, despite representations so that their consignment can reach the port on time. In the lean season, however, Railways does offer this size but then it is a lean season for rice exporters as well.
- The unavailability of railheads in major rice-producing districts like Dhamtari too is a problem. In the peak season, the produce moves from the mills to the nearby railheads by road, but in the lean season it directly moves to the ports by road. That is because double handling will make smaller consignments more expensive

Pārvat Udīcī and Pārvat Praci (Hilly North and Hilly East Cluster)

In comparison to the landlocked and coastal clusters, user perception indicates lower overall logistics performance in the

case of the two hilly clusters. Number of detailed assessments/responses received for these clusters are inadequate to meaningfully assess their performance on specific sub-components.

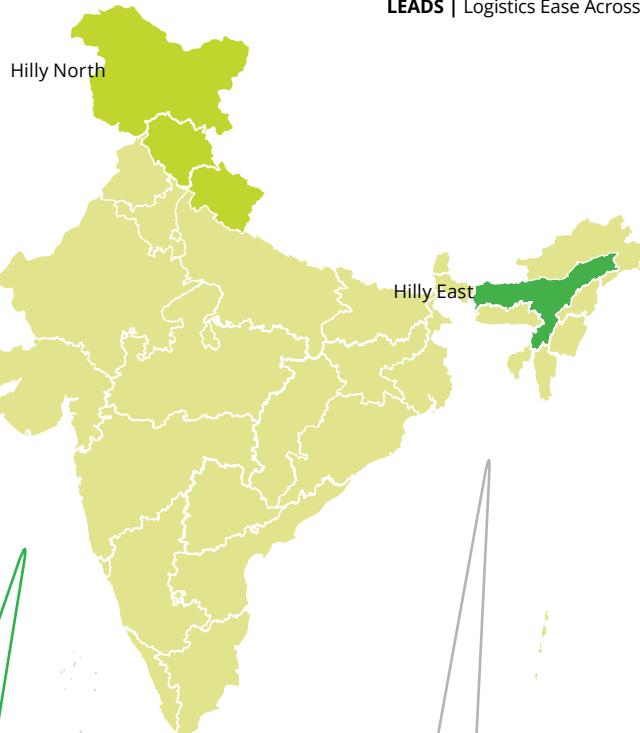


Exhibit 52: Respondent Feedback on Hilly Clusters

- In Himachal Pradesh, Baddi is an industrial town with a strong transporters' union. They charge higher prices resulting in higher costs for the transport users. To tackle this problem, the terminal in Dappar, Punjab, could be a sound alternative.
- In Uttarakhand, inadequate infrastructure including testing, sanitary and phyto-sanitary (SPS) facilities are a big damper to the exports of pharma and food products from Uttarakhand
- Respondents were not satisfied with the quality of railway services offered by CONCOR at Pantnagar ICD. An exporter of automotive seat covers mentioned that due to the dearth of 40' High Cube containers at Pantnagar, he is forced to transport his cargo from Dehradun all the way to Delhi by truck
- There are very few logistics services providers in and around Dehradun which causes inconvenience to users of transport services
- There is little focus on skill development in the logistics sector in Uttarakhand. Private companies aren't able to find adequate skilled manpower. However, the attitude of employees is perceived to be good and it is therefore easier to retain people. There are no labour or truck unions in Uttarakhand that hamper work
- Very few logistics services providers in and around Dehradun which causes inconvenience to users of transport services
- Warehousing capacity of Uttarakhand is far below the requirement, let alone there being enough certified warehouses.

- Tea production drives a large part of the north eastern economy. Therefore, the biggest logistic issues in the region pertain to making the trade of the commodity seamless. To begin with, respondents said it is important to improve road infrastructure, national and state highways, from Assam to Kolkata. Important to improve road infrastructure, national and state highways, from Assam to Kolkata
- Extensive road network would make it possible for Tripura and Cacher (in Assam) teas to be transported to Kolkata via Bangladesh. Cacher (in Assam) produces 60-70 million kg tea and Tripura produces 15-20 million kg tea. The current route to bring it to Kolkata takes 7-8 days, which also increases the overall cost. However, the Bangladesh route will take only 2-3 days
- At present, there are only two warehouses in the Inland Container Depot at Amingaon
- need for setting up a state-of-the-art Tea Park that provides warehousing, blending, packaging, sorting & testing, and customs facilities.
- In Assam, even after GST, toll tax has been literally one big barrier for the movement of goods. In fact, the toll tax has actually increased after the switchover to GST. There is also an additional cleanliness cess of 0.5 percent. Then, there are small taxes that are still being levied in some states when these should have in fact been removed once GST was introduced.

- After GST implementation, government in North Eastern States have defined transit time for the Logistics Service Providers in terms of a fixed amount of kilometres to be covered. This is meant to result in faster turnaround, greater up-time for trucks and timely delivery of consignment to end users.
- The condition of Agartala Road that connects Tripura Gate has improved in recent times. However, Manipur remains a laggard in logistics performance because of the poor operating conditions in the state. Drivers avoid going to the state. Other north eastern states exhibit similar characteristics. Only Tripura is perceived to be better

Cluster wise LEADS Summary Assessment

	Coastal			Landlocked			Hilly*	
	West Coast	East Coast	South Coast	Central	Northern	Eastern	North	East
Infrastructure & Services	●	●	●	●	●	●	●	●
	●	●	●	●	●	●	●	●
	●	●	●	●	●	●	●	●
	●	●	●	●	●	●	●	●
	●	●	●	●	●	●	●	●
	●	●	●	●	●	●	●	●
	●	●	●	●	●	●	●	●
	●	●	●	●	●	●	●	●
Safety & Ease of Track and Trace	●	●	●	●	●	●	●	●
	●	●	●	●	●	●	●	●
	●	●	●	●	●	●	●	●
	●	●	●	●	●	●	●	●
	●	●	●	●	●	●	●	●
Operating Environment & Regulatory Efficiency	●	●	●	●	●	●	●	●
	●	●	●	●	●	●	●	●
	●	●	●	●	●	●	●	●
	●	●	●	●	●	●	●	●
	●	●	●	●	●	●	●	●
	●	●	●	●	●	●	●	●
	●	●	●	●	●	●	●	●

*Note: The number of responses received for the two hilly clusters on detailed assessment are inadequate to meaningfully assess their performance on specific components.



LEADS to better logistics performance: A broad perspective

Focus on enablers and impediments

The survey results and stakeholder inputs presented in this study capture perceptions of logistics industry users and stakeholders across states and UTs, and bring out what they believe are to be the enablers as well as impediments to an efficient logistics system across the country.

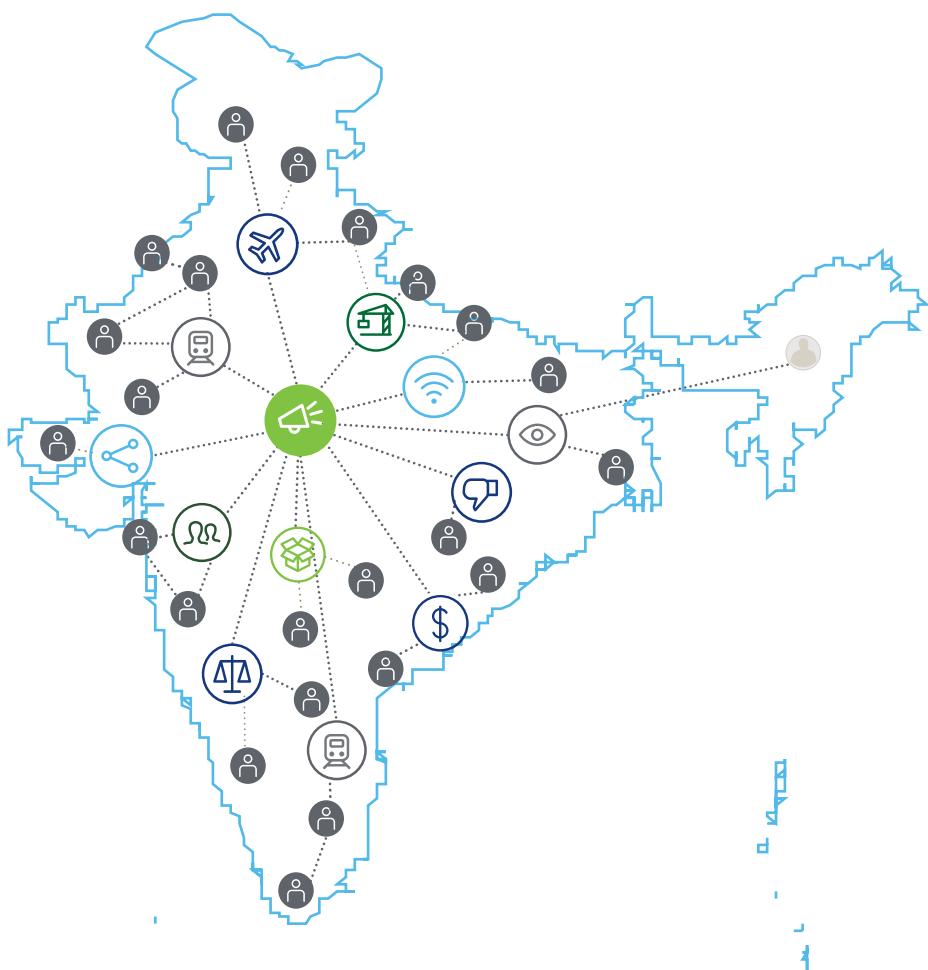
While some issues are specific to certain geographical boundaries, several others cut across states. For instance, problems

of inadequate terminal capacity, poor last-mile terminal connectivity and issues in regulatory services provided by government agencies, among others, are relevant across many states while being more pronounced for the eastern coastal cluster.

On the other hand, there are certain issues which are specific to certain states and which require interventions within the state's ecosystem. For instance, respondents reported that labour unions

created impediments for trade efficiency in states like West Bengal, Kerala, Maharashtra and Himachal Pradesh more specifically.

Enhancing logistics efficiency in the country is a complex agenda unfolding variously in different geographies. Concerted coordinated efforts would be required from all stakeholders, including the centre, state governments as well as the private sector – across a number of areas, to ensure that the country capitalizes on the leads from this study to distinctly improve logistics performance.



Multiple countries have targeted improvement in logistics performance on an ongoing basis. For instance, Malaysia has created a "living masterplan" outlining five strategic shifts and 21 action items for the development of the logistics industry. Such masterplan accounts for new developments and opportunities that may arise as well as address unanticipated challenges moving forward – with an aspiration to be the 'Preferred Logistics Gateway to Asia' by 2020. Similarly, the Chinese logistics sector has seen continuous government intervention through policy reforms to strengthen the quality of infrastructure and adopt digital technologies.

Strategic interventions

The key issues identified through survey responses and stakeholder interviews are presented in the Exhibit below.

Exhibit 53: Key issues identified through survey responses

Unified Process/Regulation	Digitalization	HR Capacity Building
<ul style="list-style-type: none"> High Cost / Cumbersome procedures of Setting up Terminal High Charges / rigid slabs of rail freight Customs Process not properly executed Delay in Clearance by Customs & SPS Agencies Frequent Stoppages leading to delay on road Delay due to lack of clarity with FSSAI Lack of coordination between regulatory authorities Processes not well defined for Special Cargo Inefficiency of Single Window Scheme 	<ul style="list-style-type: none"> Acceptance of PQ charges only through Credit/Debit Cards (transaction charges incurred) IT interface with Customs experience problems Real Time Trace & Track not available RFID only in Western Corridor Updates only through phone calls 	<ul style="list-style-type: none"> Lack of Trained Customs Staff / Manpower Shortage Lack of 24x7 customs clearance Lack of Manpower at CFS / SPS facilities Lack of skilled labour at Warehouse / CFS / Terminals Requirement of skilled truck drivers
Terminal Capacity Enhancement	Co-ordinated Master Planning	Ancillary Capacity Enhancement
<ul style="list-style-type: none"> Inadequate Port Capacity / Modernized Equipment Lack of Warehouse infrastructure / Certified WHs Delays due to capacity constraints at ICD/CFS Scanning Facility insufficient Inadequate infrastructure at International Borders Lack of Air Cargo Terminals / Rail Terminals Proximity to Army Ammunition Depot hinders expansion High Cost of container repositioning 	<ul style="list-style-type: none"> Location of Rail Terminal inside City Road Restrictions in City Lack of suitable land 	<ul style="list-style-type: none"> Insufficient SPS Infra Unavailability of E-seals Weighbridges unavailable Poor Internet Connectivity Lack of financial services in ICD area
Transport Network Enhancement	Improve Operating Environment	
	<ul style="list-style-type: none"> Lack of Road Connectivity to Airport/ Port Issues of Last Mile Connectivity Lack of International Connectivity Lack of Rail Connectivity / Rail Network Lack of Rail Schedules Limited Air Connectivity High Cost due to long distance travel by road for air cargo 	<ul style="list-style-type: none"> No Grievance redressal at Port Inefficiency due to Labour and Transporter Unions Law and order Issues Overloading of Trucks

Source: Survey analysis

Efficient and reliable supply chains can be built based on a range of interventions, including trade facilitation measures, coordinated infrastructure investment, enabling regulations, and skilled resource development.

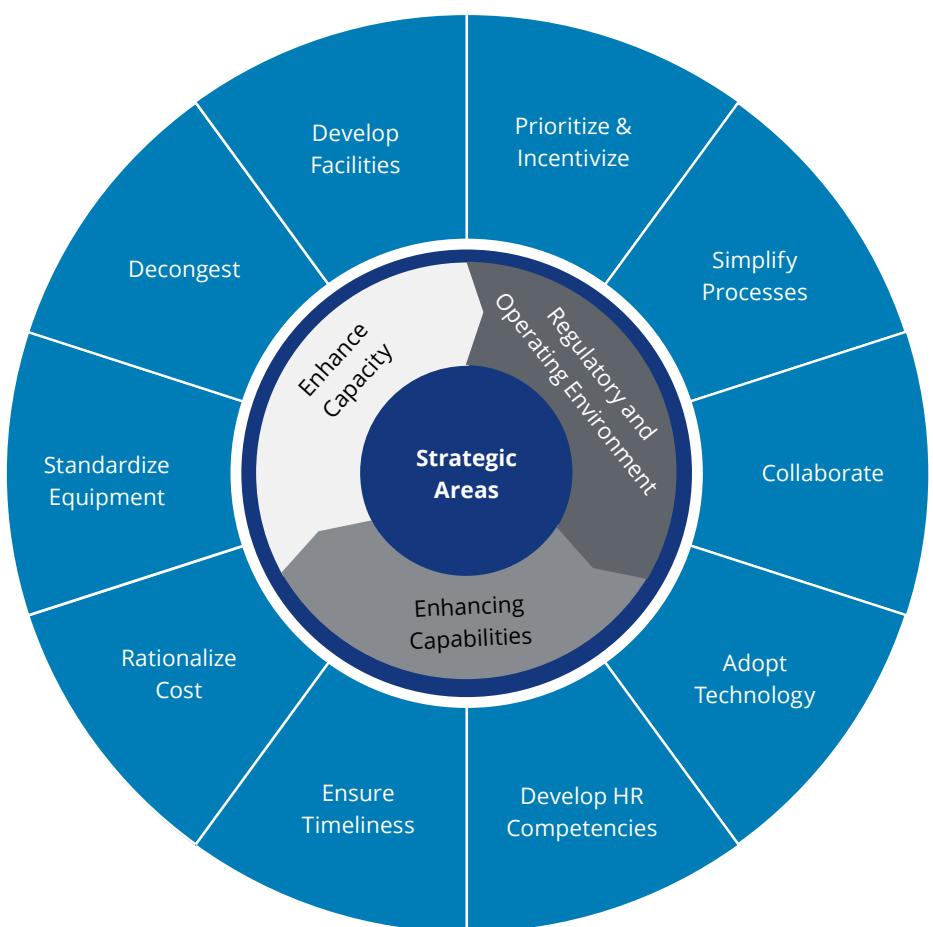
To provide a framework for actions, based on the identified issues, their impact and the nature of initiatives required to address them, such actions/interventions have been categorized across key strategic areas ("Strategic Areas"):

- Enhancing capacity,
- Enhancing capability, and
- Strengthening the regulatory framework and the operating environment

Any sustainable improvement in logistics performance will require stakeholders to identify and implement actions across these Strategic Areas. The exhibit below presents a broad framework to identify focus areas and actions while illustrating possible tools/enablers.

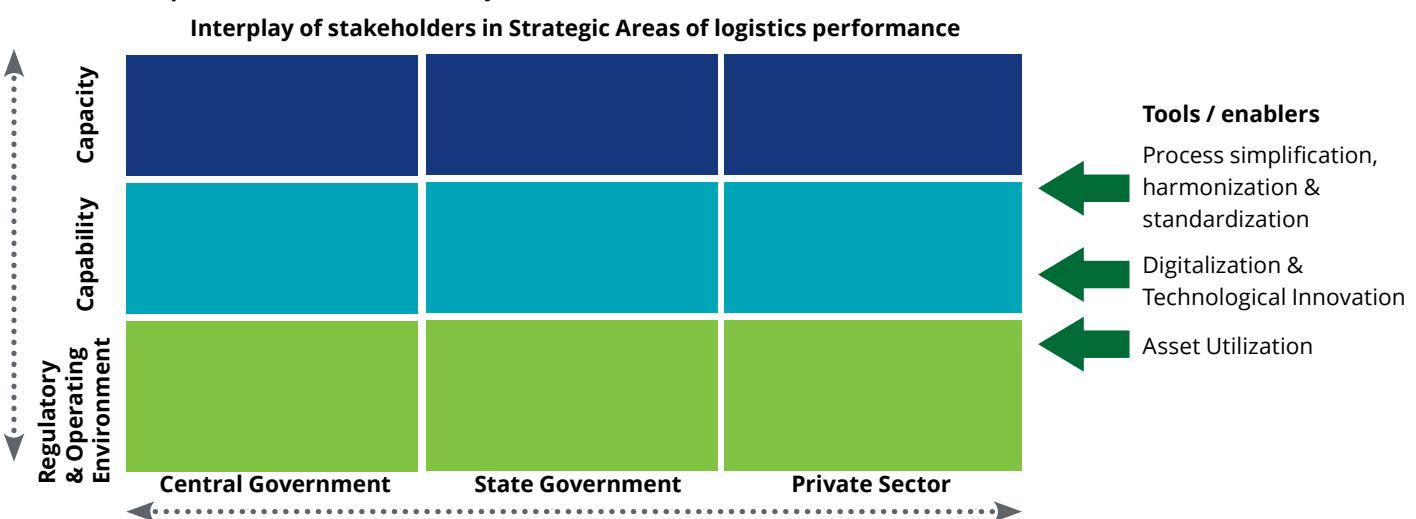
Under this framework, stakeholders would need to work in tandem on identified focus areas, even extending across state or regional boundaries. The identification and implementation of specific actions will need to be customised to the operating, geographical and economic context of the respective state/UT.

Exhibit 54: Strategic Areas



Source: Deloitte research

Exhibit 55: Proposed Framework to identify Focus Areas and actions



Source: Deloitte research

Broadly, the central government would need to focus on policy areas that impact the sector as a whole across the country and ensure a competitive market environment. State governments would need to look at specific guidelines as well as their implementation and ensure dissemination of information about such policy measures to all enforcing agencies, stakeholders and users. The central and state governments together need to catalyse performance of the logistics sector by offering a conducive operating environment to the stakeholders.

The private sector can play a role in facilitating policy development by sharing best practices, and take the lead in developing and operating logistics infrastructure and providing efficient services at competitive prices in response to user needs and requirements.

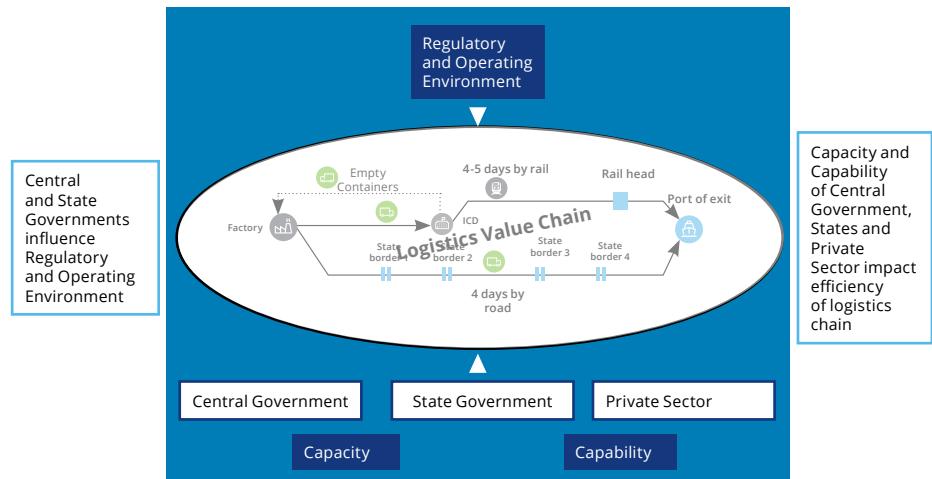
More specifically, the central and state governments need to focus on certain interventions directly under their influence, including for creation of infrastructure/facilities. Such interventions can be in areas where investment requirements are large and lumpy with a long gestation lag, for instance creation and addition of railway track capacity, road networks, port substructures, etc. Also, the government should leverage private sector involvement, through appropriately structured mechanisms.

Indicative focus areas across the identified Strategic Areas are presented below with potential roles identified for each of the key stakeholders.

1) Enhancing Capacity

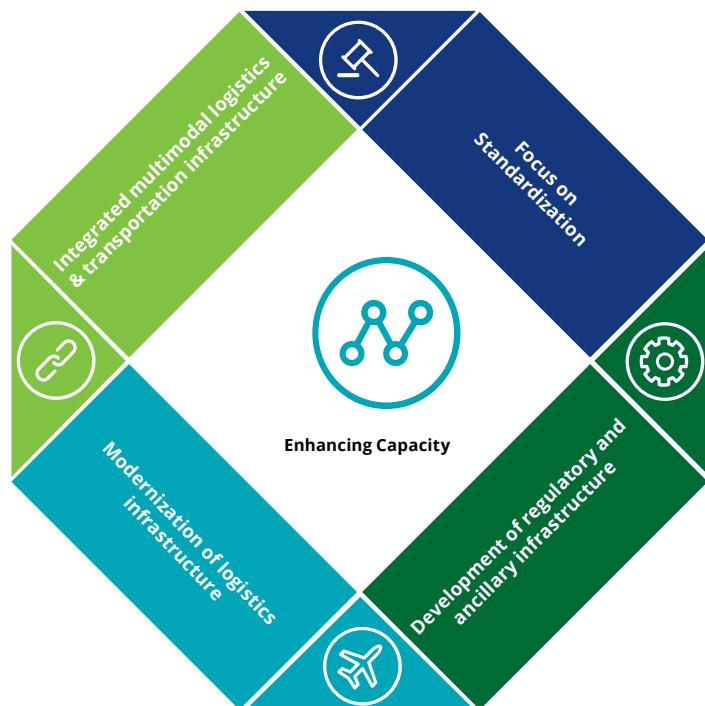
During the survey/interactions, stakeholders identified issues related to infrastructure constraints, like last mile connectivity gaps, inadequate network connectivity, and deficient terminal and storage capacity among others. A key issue that came up pertained to suboptimal investment in building scale in infrastructure, automation, human capital and technology.

Exhibit 56: Key stakeholders and their potential impact



Source: Deloitte research

Exhibit 57: Focus Areas for Enhancing Capacity



Source: Deloitte research

a) Develop integrated and balanced multimodal logistics and transport infrastructure and focus on an optimal modal mix

Development of integrated multimodal logistics and transport infrastructure is one of the key requirements for improving logistics performance – to provide efficient and cost-effective logistics solutions to users. An “Integrated Multimodal Logistics & Transport Infrastructure Policy” is needed that should draw a blueprint, and provide guidance, for holistic logistics infrastructure development across the country. Existing government initiatives such as Bharatmala project and Sagarmala Programme could have reference and linkage to this policy. The central government should lead the development of such a policy; given it alone has the wherewithal to focus on an integrated action plan across the entire country.

The dynamics of freight corridors and logistics infrastructure development is changing rapidly as centre and state governments increase their push for creating newer manufacturing clusters, and sub-regional economic corridors, among others. The central government should work on preparing a “National Freight Plan” that should identify the various consumption and production centres, analyse the cargo profile and plan to create infrastructure consistent with that need. Such a plan could be updated periodically to capture the evolving needs and shifting technological/consumption patterns across the industry.

The Ministry of Commerce and Industry has an Inter-Ministerial Committee (IMC) for approval of ICDs/CFSs. The IMC should assume a bigger role in evaluating various constraints that cut across different ministries and departments and bring all key players – Indian Railways, National Highways Authority of India (NHAI), Inland Waterways Authority of India (IWAI), state governments, private players, and regulators such as sanitary &

phytosanitary (SPS)– on a common platform. The scope of the committee should be expanded to cover the entire terminal landscape – which includes all variants like Multi Modal Logistics Park (MMLP), Private Freight Terminal (PFT) and third party warehousing. The committee can thus channel infrastructure creation in line with the integrated policy and National Freight Plan by providing required incentives for hinterland facilities, keeping checks on excess capacity creation, as well as by specifying timelines for action by all agencies. Such a coordinated effort would lead to better planning among relevant authorities and would lead to better connected infrastructure.

Currently, as a result of proliferating urban infrastructure in a number of states, logistics facilities have come within city boundaries, causing congestion. State governments, being responsible for the planning of state infrastructure, land acquisition and change of land use, would need to concentrate on regional master planning of land use and provide all necessary clearances accordingly – with defined Key Performance Indicators around timeline.

The role of state governments can, at the outset, be to formulate policies to guide sustainable logistics infrastructure development within the state – again in line with the national Integrated Multimodal Logistics & Transport Infrastructure Policy as well as the proposed National Freight Plan. Such policies would need to focus on aspects like integration of logistics networks with urban master planning keeping in view land availability, ancillary infrastructure particularly relating to water, power and fuel, rail and road connectivity – all in the context of production and consumption hubs, especially in a post-GST scenario.

For instance, a common problem across coastal states is the queuing of trucks on approach roads leading to ports. This only gets aggravated as most state governments impose restrictions on the

China National Logistics Strategy

As part of China's National Logistics Strategy, increased intermodality is required as one of the key aspects for logistics efficiency. During the 12th Five Year Plan (2011-15), ports, freight stations and logistics parks were recognised as “priority areas” in terms of funding, credit, and permissions, for upgrading and expansion, with increased focus on the coherence of the logistics network. In addition, specific efforts were made to support services such as roll-on/roll-off transport, direct transport between river and sea, and sea-rail combined container transport.

movement of freight trucks during the day to reduce city traffic congestion. A possible way to tackle this would be to develop dedicated truck corridors within or preferably, around cities for smoother movement of freight throughout the day. Further, again as an example, given the growing use of multi-axle road vehicles for long-distance road travel, urban plans must incorporate provisions for transport hubs outside expandable city limits, from where only smaller vehicles ply to and from the city.

State governments could consider awarding “priority” status to the creation of multimodal logistics infrastructure. They could also incentivise creation of infrastructure by the private sector, by facilitating land identification and its speedy acquisition and consolidation. They could also create land banks for logistics facilities and offer smaller parcels to prospective private infrastructure developers through a transparent process. They could further offer limited-period subsidies, pre-planning and provision of supporting infrastructure such as state highways, last-mile connectivity and utilities, and also establish one-stop grievance redressal mechanisms. States can also enter into MoUs with central agencies

such as the Indian Railways, IWA, IPRCL, NHAI etc. to better coordinate development of logistics infrastructure. While a number of these aspects could presently be happening across states, it would be important to take a concerted and coordinated pan-India view through the national Integrated Multimodal Logistics & Transport Infrastructure Policy as well as the proposed National Freight Plan.

b) Focus on Standardisation

Standardising specifications – of all productive assets (rolling stock, handling equipment, fixed structures etc.) and even documents – in their dimensions and specifications can go a long way in the effective functioning of a logistics system and in optimising costs for service providers. While asset standardisation, on its own, could be an efficiency enabler, it may have to be accompanied with a certain degree of customisation (depending on client or cargo needs) within prescribed dimensions and specifications of the asset.

Standardisation of logistics equipment and service providers

The Ministry of Land, Transport and Maritime Affairs (MLTM) of the Republic of Korea sets the direction for national logistics policy through the "Framework Act". One of the key objectives of the Framework Act is to strengthen the competitiveness of the industry. Through this Act, standardisation of logistics equipment, among other initiatives, is encouraged. The Act allows for preferential treatment of companies adopting standardised equipment, for example, by giving financial support or discounted service rates at public logistics facilities. The Act also uses standard to control entry into the international freight forwarding business. The registration of an entity may even be revoked in case the stipulated requirements are not met.

To be sure, even though logistics systems in India are moving towards standardisation, these are still piecemeal. The central government can focus on identifying and developing internationally accepted technical standards for logistics infrastructure based on aspects like safety, productivity, operating cost, and so on. State governments can allow additional incentives to companies adopting standardised equipment such as through certification of infrastructure, which financial institutions can use to provide preferential financing.

Standardisation or harmonisation of documents required for intra and inter-state movement would also be a key focus area. With the National GST Council's implementation of e-way bill for inter-state movement of cargo, states need to review their own processes to integrate these with the bill's stipulations.

c) Develop regulatory and ancillary infrastructure

Along with a focus on transport and storage infrastructure, an efficient logistics system also needs to ensure development of adequate regulatory and ancillary infrastructure. Such infrastructure includes, *inter alia*, testing and inspection labs and internet connectivity around ports and intermodal terminals to benefit from digitalisation. The central government should therefore promote the creation of regulatory infrastructure in line with the growth in the industry and new technologies. An example is the SPS infrastructure that supports Customs in meeting regulatory requirements.

State governments would need to coordinate with the central government for setting up of such infrastructure by assessing demand for these facilities as well as by providing necessary land and other supporting infrastructure. One possible solution could be for the central government to consider making use of land and other infrastructure available with central agencies such as India Post, Indian Railways for setting

Based on the discussions with exporters, it was observed that due to the absence of US Customs-Trade Partnership against Terrorism (C-TPAT) certified warehouses in a particular state, the exports to US had to first be sent to another state for the verification and were then sent to the ports for loading onto a vessel. This translates into additional transportation costs for exporters. In such a scenario, the State governments may look at providing incentives to those operators that set up certified warehouses in the state.

up a network of such testing facilities on a pan-India. State governments can also incentivise service providers such as telecommunication companies to set up the desired infrastructure around key logistics centres in the state.

d) Modernise logistics infrastructure and transport fleet

Modernisation of existing logistics infrastructure (both fixed and rolling) is needed for the growing logistics sector in the country. A modernised infrastructure that is geared to newer technologies and the changing profile of cargo can go a long way in reducing cost and improving efficiency of services. The central and state governments can incentivise the private sector in procuring new and efficient rolling stock and equipment.

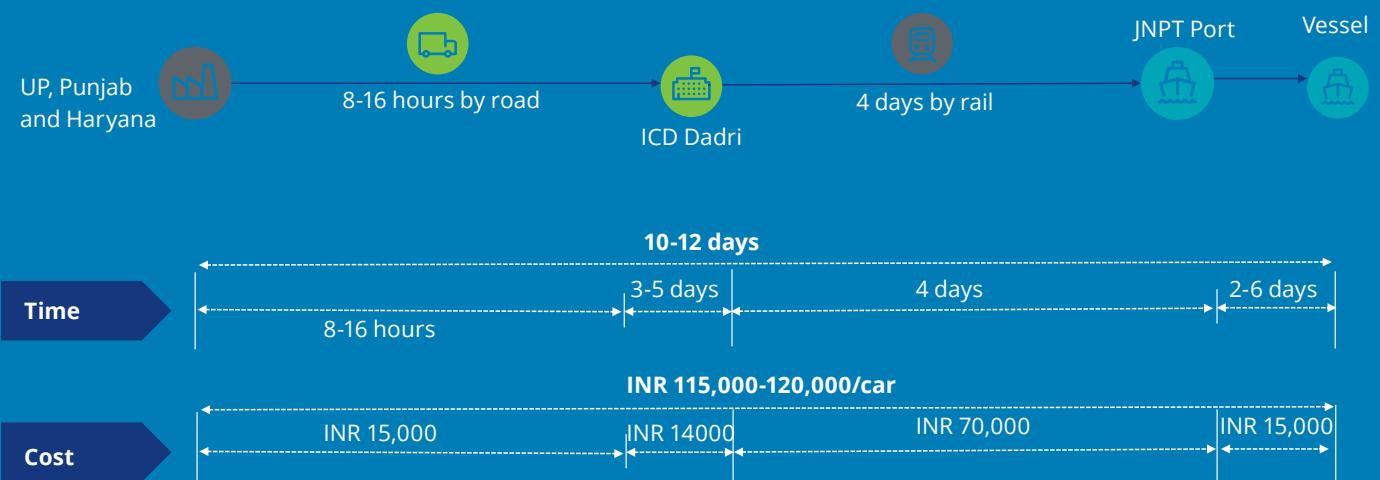
The central government can also facilitate partnerships between international and domestic logistics companies to foster modern technologies introduced by global service providers, through government-to-government bilateral cooperation agreements.

Box 12: Case study- Cargo chain requiring commodity specific infrastructure

Meat export - Dadri to Jawaharlal Nehru Port Trust (JNPT)

Meat is exported from Khurja, Ghaziabad, Rampur, Aligarh in UP and Dera Basai and Ambala in Punjab & Haryana. A majority (about 90%) of exports is to China and Gulf countries and 10% is routed to Europe.

Situation - Meat is transported in refrigerated trucks (at -18 degree Celsius) to cold storages at ICD Dadri (UP). This typically takes 8-16 hours depending on distance and costs approximately INR 12,000- INR 18,000 per 28-ton load (capacity of a forty foot container). The bigger exporters also tend to undertake stuffing at the factory itself in reefer containers, which are then moved to ICD/Dadri for rail-out. At ICD Dadri, cargo is segregated, sorted, repacked and subsequently stuffed into 40 - foot reefer container. Post customs-examination and Let Export Order (LEO) issue, stuffed containers are loaded onto train. This leg of the process typically takes 3-5 days and costs around INR 14,000 per FEU. Containers are sent by rail to JNPT port at a freight charge of approximately INR 70,000 per FEU.



Potential Interventions – Availability of the following infrastructure may substantially reduce the cost and time taken in export:

- Commodity specific infrastructural support:** Compared to factory stuffing of cargo, cold warehouse stuffing comes in handy for exporters who want to repackage it for different international destinations. The State government in concert with private sector should focus on creating more such facilities providing value added services at ICDs and other suitable areas to galvanise these export commodities. In the process, central government cold storage subsidy schemes should be suitably leveraged/marketeted.
- Commodity specific transport services:** Availability of reefer trucks can also be improved if encouraged by governments

Exhibit 58: Focus areas and role of central and state governments for Enhancing Capacity

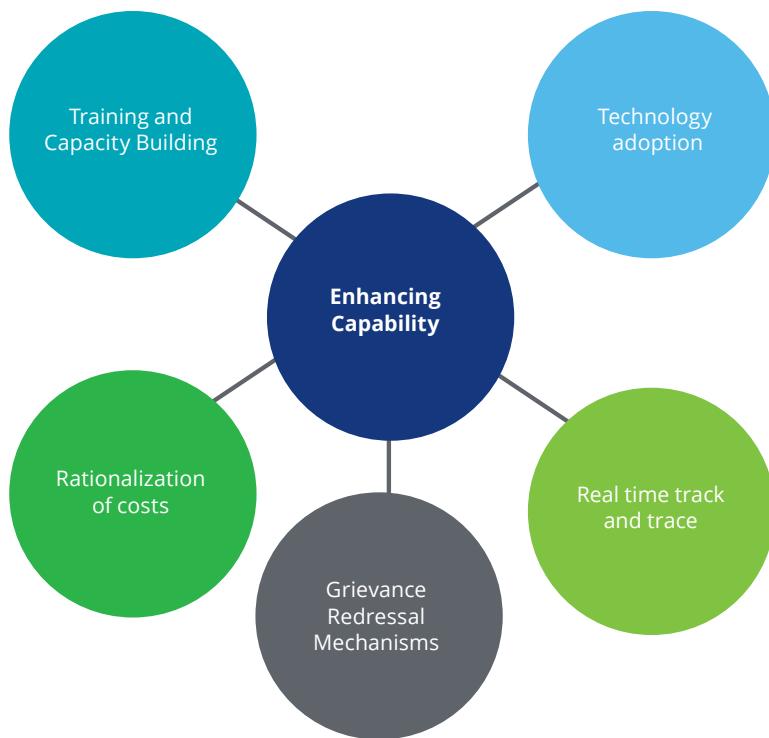
Focus Areas	Central Government	State Government
Develop integrated and balanced multimodal logistics and transport infrastructure	<ul style="list-style-type: none"> • Develop an Integrated Multimodal Logistics & Transportation Infrastructure Policy • Empower Inter-Ministerial Committee for ICDs/CFS to provide a common platform to all players • Create a National Freight Plan 	<ul style="list-style-type: none"> • Formulate State Level Logistics Policy • Regional Master planning and land acquisition & consolidation • Priority status to multimodal logistics infrastructure • Provide necessary clearances and supporting infrastructure
Focus on Standardisation	<ul style="list-style-type: none"> • Identify and develop unified standards • Policy for certification of infrastructure based on applicable standards and global practices 	<ul style="list-style-type: none"> • Incentivise companies for providing infrastructure based on defined standards • Standardise / harmonize documents required for transits
Develop regulatory and ancillary infrastructure	<ul style="list-style-type: none"> • Formulate policy to facilitate creation of regulatory infrastructure • Incentivise central agencies like India Post to share infrastructure for setting up of testing labs etc. 	<ul style="list-style-type: none"> • Assist in setting up of regulatory infrastructure • Incentivise various service providers to setup desired infrastructure
Modernisation of logistics infrastructure and transport fleet	<ul style="list-style-type: none"> • Promote modernisation of logistics infrastructure • Facilitate bilateral cooperation to access global technologies 	<ul style="list-style-type: none"> • Promote modernisation of logistics infrastructure through incentives

Source: Deloitte research

2) Enhancing Capability

Efficient and quality logistics services are vital to the performance of the sector. Provision of such services requires enhancing the capabilities of regulatory agencies as well as service providers through continuous focus on skill building/technology adoption. The key focus areas for enhancing capabilities of service providers and regulatory agencies that emerged from the survey results and stakeholder inputs are outlined below.

Exhibit 59: Focus areas for Enhancing Capability



Source: Deloitte research

a) Training and Capacity Building

A key issue stakeholders highlighted across states was the lack of trained manpower in the logistics sector. There is a need for coordinated interventions to upgrade skills – both operational and technical, create awareness about regulations, and boost the competency of regulatory agencies as well as the private sector.

The central government can facilitate development of skilled manpower for the sector, including that of regulatory agencies, by designing dedicated policies for skill development with an emphasis on technology adoption.

In addition to this, the centre can facilitate the creation of infrastructure for skill development through private sector

Partnering with industry associations for skill development initiatives

The central government has taken initiatives through Logistics Sector Skill Council (LSC) with the aim to develop skilled manpower as well as up-skill the workforce in India. LSC is focused on key areas of training the trainers (ToT), training the assessors (ToA), corporate membership, placement assistance and online orientation for trainers. CII also conducts training for empowering logistics professionals through Open house programs and In-house programs to expose them to best practices, technology advancements, tools and techniques for a holistic business perspective.

participation, especially through leading industry associations.

While the centre can provide national level policy support for capacity building in logistics sector, states would need to leverage such policy measures and focus on capacity building for state agencies and the logistics ecosystem at the state level.

The private sector can be roped in, for example, to develop Centres of Excellence at the regional level for which states can support them financially. For instance, as part of the Mukhya Mantri Kaushal Vikas Yojana, the Chhattisgarh Skill Development Authority offers a program on Courier and Logistics, which offers 12 courses for training related to loading, driving, forklift operation,

The UK government's SAFED program, which to date has trained around 10,000 truck and van drivers in "safe and fuel efficient driving techniques," is an example of direct financial support.

Similarly, the Thailand Industrial Ministry subsidises training sessions held by certified training agencies (e.g., APICS trainers).

glass handling, packaging, operation supervision, among others.

b) Technology adoption to enhance logistics performance

Use of modern technologies and digitally integrated supply chains can significantly shore up efficiency of cargo delivery through rapid access to information. Use of technologies like online payments, Internet of Things, analytics, autonomous logistics, blockchains or cloud computing is changing the way the sector is working across the globe. However, in India, the pace at which technology has been adopted has remained slow, leading to poor asset utilisation in the logistics ecosystem.

The central government can play a key role in bringing together various industry stakeholders and technology companies

Technologies like telematics enable remote visibility into the location, condition and security status of containerised cargo on a worldwide basis. This is opening up new options for shippers, 3PLs, intermodal operators, port communities and government agencies to minimise theft of cargo. Equipment like smart containers, with machine-to-machine (M2M) technology, are being used to provide global real-time visibility into equipment location and status, allowing the carrier to remotely control temperature, humidity and other climate settings for perishable cargo.

through an enabling policy and a conducive regulatory environment.

State governments can focus on identifying mechanisms to channel investment in creating and incentivising common platforms (using technologies such as cloud). Potential cases could include a platform to integrate transporters, or an online-market place for service providers, and so on. States can also focus on improving their regulatory environment and skill development of state regulatory officials.

c) Rationalisation of costs of infrastructure & service providers

Roads currently account for ~60 percent of total cargo movement in the country¹. During the survey, it was noted that stakeholders perceive high rail transportation cost as a deterrent against the use of rail. They also highlighted that the pricing of infrastructure and service providers was often inflated, either due to inefficiencies, or other factors like presence of unions. Inadequate and unreliable technological infrastructure (such as EDI systems), and slow network are also perceived to push up processing times and costs.

Based on discussions with industry stakeholders and taking into account competition and industry cost structures, the central government can consider adopting an economic regulatory approach to address issues related to pricing in a sustained manner – especially for coordinated development of a national freight market with focus on use of efficiency and appropriate modes of transport for various commodities and distances.

State governments can do a lot in this regard. For instance, they can create an enabling operating environment for effective labour policies, enforcing contracts and ensuring minimal disruption to service due to labour/union issues. State governments facing labour transport union issues may look at developing participative models for

engaging with labour and transport unions to minimise downtime and rationalising costs.

In addition, a number of respondents across states pointed to the dearth of service providers providing complete end-to-end third party logistics services at competitive pricing. State governments can encourage consolidation of the fragmented industry players to achieve economies of scale and operational efficiency. It can provide incentives in the form of subsidies, and tax-breaks to those LSPs who provide 'modern' integrated service offerings.

d) Develop grievance redressal mechanisms for logistics sector

Grievance redressal mechanisms are important to provide prompt review and resolution of issues stakeholders face in a transparent, cost-effective and time-bound manner. Such mechanisms are recognised and followed globally to bring in transparency.

The central government can develop grievance redressal mechanism across all aspects of logistics value chain. State governments should ideally work with the Centre to provide a "Customer Charter" that specifies well-defined procedures and timelines for various grievance redressal.

e) Real-time track and trace

Accurate and timely cargo information provides a number of benefits such as better planning, taking preventive measures to check wastage, especially in the case of perishable products, and so on. A number of technologies have been adopted in the logistics industry globally to achieve real-time track and trace, including RFID, barcodes, Near Field Communication and Industrial Internet of Things.

The survey respondents mentioned that the adoption of track-and-trace systems in certain parts of the country like Maharashtra and Gujarat is

1. India Integrated and Transport and Logistics Summit 2017, PIB India

comparatively better than the rest.

Initiatives such as the Logistics Data Bank (LDB) have promoted the use of RFID tags on containers and RFID tag readers at CFSs/ICDs and key highway toll points. These allow stakeholders to track in real time the position of containers – ensuring visibility and transparency across the logistics chain. However, stakeholders also pointed out that RFID reader network needs to be expanded further as it is currently applicable mainly on the western corridor route.

Mostly large transporters have adopted such technology and scaled up their track-and-trace systems to provide real-time tracking of trucks on parameters such as the exact location, truck idling time and geotagging. This can be proliferated throughout the industry through regulation for requiring all transporters to implement real-time tracking systems – standardised and facilitated by government.

While this is mainly a private sector-led initiative, the central government can create a policy framework incentivising, or even mandating, that industry stakeholders implement integrated track-and-trace system which can be used across different modes of transport. Such a system would also require availability of a common IT platform and standardisation of technology, for instance, through standardised cards, readers etc. State governments, in this case, should be ideally responsible for implementation through appropriate state-wise legislation.

Box 13: Case study - Cargo chain requiring services support

Buffalo meat export -Araria/Forbesganj (Bihar) to Haiphong/Vietnam via JNPT

Situation - Empty forty-foot reefer container (FEU) is positioned on a road trailer from an ICD in Kanpur (UP) to Araria, 900 km away, stuffed with 28 tonnes of buffalo meat and sealed. It is brought back to the facility in Kanpur for the Let Export Order to be issued. The container is then loaded on a train to JNPT port from where it is shipped out to Vietnam.

Consequences - This whole process takes on average 15 days (including 5-7 days for the road round trip, 2-4 days at terminal, 2-3 days for the rail haul and 2-6 days for loading on vessel) and costs over INR 250,000 excluding ocean haulage. Currently about 100 FEUs move in this chain per month, but the demand is likely to increase substantially as more slaughterhouses get operational. Transit time is high because of the long road haul, delays in arranging clearance at the factory and insufficient rail rakes and therefore infrequent service from the ICD. The high cost is the result of the long road haul of a reefer carrier.



Interventions

- Container Terminals:** Establishment of container terminal infrastructure would require coordinated efforts by state governments and private sector to establish suitable facility (in Bihar or West Bengal) to potentially re-route the cargo moving towards Kanpur. This could significantly reduce road haulage time and cost across the chain.
- Terminal Services Support:** It is essential that suitable quality and frequency of rail services be established to address exporter needs. Additionally, augmenting processing efficiency of customs staff is likely to attract cargo to the terminal.
- Shipping Services Support:** The next level of supply chain optimisation could involve shifting the port of exit from JNPT to Dhamra/Visakhapatnam to reduce rail logistics chain length, thus potentially leading to significant time and cost savings. To facilitate this, it is essential that a concerted marketing effort be taken by the port to attract shipping lines for the cargo to provide suitable quality and frequency of vessel/liner services from the port to the end destination Haiphong (Vietnam).

(These potential solutions would need testing on factors like land availability, rail connectivity, shipping line support, terminal operator willingness/project viability, port linkage and capacity etc.)

Integrated Efforts - The change has to be made through a coordinated effort at several levels involving terminal operators, container train operators, shipping lines, LSPs, regulatory agencies and state government (for land related issues and suitable operating conditions) and central government agencies (Customs and other regulatory support, Indian Railways, IMC clearance

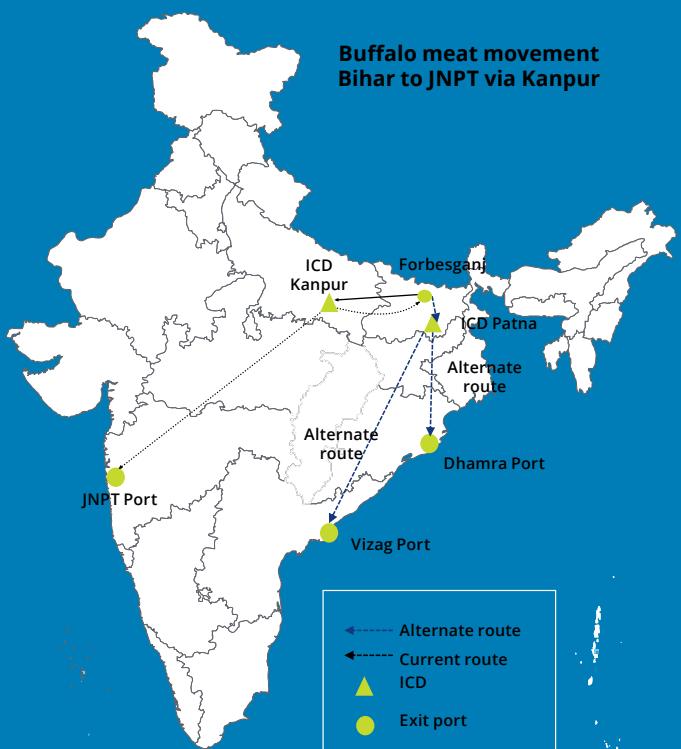


Exhibit 60: Focus Areas and Role of central and state governments for Enhancing Capability

Focus Areas	Central Government	State Government
Training and Capacity Building measures	<ul style="list-style-type: none"> • Design skill development policies with emphasis on technology adoption • Enhance competency levels of central agencies • Engage leading industry associations in skill development 	<ul style="list-style-type: none"> • State level policies for capacity building for the state. • Develop Centers of Excellence for logistics • Incentivise specialist logistics courses in educational institutions
Technology adoption for enhancement of logistics performance	<ul style="list-style-type: none"> • Provide platform for collaborative efforts for technology adoption • Channelise investment in creating / incentivising common platforms 	<ul style="list-style-type: none"> • Require state agencies to adopt latest technologies • Improve skills of state agencies for technology adoptions.
Rationalisation of costs of infrastructure & service providers	<ul style="list-style-type: none"> • Design economic regulatory approach for infrastructure /service providers • Promote adoption of cost efficient technology 	<ul style="list-style-type: none"> • Effective implementation of labour policies and contract enforcement • Provide incentives to LSPs for setting modern integrated service offerings
Develop grievance redressal mechanisms for logistics sector	<ul style="list-style-type: none"> • Frame policies focused on developing grievance redressal mechanism. • Develop I.T. interface for redressing grievances 	<ul style="list-style-type: none"> • Provide nodal officers for "Customer Charter" and timelines for grievance redressal
Real time track and trace	<ul style="list-style-type: none"> • Create a policy framework to incentivise track and trace across different modes of transport 	<ul style="list-style-type: none"> • Implement national policies and recommendations through state-specific legislations

Source: Deloitte research

3) Strengthening the regulatory framework and operating environment

One consistent feedback from stakeholders was the lack of coordination among multiple regulatory agencies and across multiple states. It was perceived to be a key deterrent for seamless logistics operations and for development of logistics infrastructure. Respondents pointed out that customs regulations are interpreted differently across states resulting in de-facto differences in

business practices. It is imperative for the central and state governments to simplify regulations – to avoid misinterpretation and ensure uniform application.

The industry expects the government to focus on modifying policies and regulations that affect the performance of logistics sector, ease customs procedures, expedite clearances through improvements in Risk Management System, enhance co-ordination between regulatory agencies and move towards an integrated platform to enable paperless

environment supported through technology.

Certain focus areas for strengthening the regulatory framework and operating environment are identified below.

a) Creating enabling environment for Trade and Logistics promotion

India is signatory to the World Trade Organization's Trade Facilitation Agreement, which came into force from 22 February 2017 following its ratification

by two-thirds of WTO membership². The trade facilitation agreement is aimed at transforming the trade ecosystem by reducing time and cost of doing business. This is achieved by infrastructure augmentation, but more essentially by creating an enabling environment for trade through simplified processes and accessible trade-related information.

In India, different authorities at the centre and at the state level are involved in regulating different services in trade and logistics. Respondents highlighted that the industry very often faces issues in regulatory compliances because of inter-agency communication gaps, fragmented information and disjointed regulations.

This leads to delays in processing, higher costs and lower quality of services.

The conceptualisation of a national policy for integrating regulatory requirements for logistics sector and simplifying processes is important. The Integrated Multimodal Logistics & Transport Infrastructure Policy, as proposed earlier, can include aspects related to strengthening institutional and regulatory framework for providing necessary direction to all regulatory agencies involved in trade and logistics.

Similar to the Logistics Division in the Department of Commerce, states also need to identify a nodal authority or a

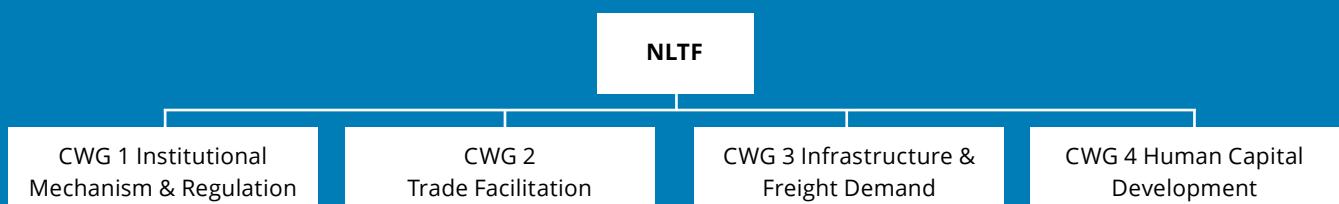
department to coordinate planning and implement initiatives of the centre. As state governments can play a facilitative role in infrastructure development, the identified nodal authority or department can also work with central government agencies for expediting progress on infrastructure projects.

State governments can also focus on conceptualising a state logistics policy for integrated transport and logistics, in line with the Centre's national policy. Such a policy should be aligned with Export Promotion schemes. Several states have already taken a lead in this by focusing on creation of a separate logistics policy.

Box 14 - Malaysia – The Logistics and Trade Facilitation Masterplan (LTFM)

Malaysia acknowledges trade as one its focus sectors, with ~40 percent jobs linked to export activities. To further strengthen its trade and logistics sector, Malaysia framed the Logistics and Trade Facilitation Masterplan (2015-2020) to reduce bottlenecks and enhance the country's position as the preferred logistics gateway to Asia. Through implementation of LTFM, Malaysia aims to improve its rank in the World Bank's LPI ranking - to be among top 20 countries.

The Ministry of Transport (MOT) was repositioned as the lead agency and focal point for logistics - the planning and development of the sector. MOT has, in turn, established the National Logistics Task Force (NLTF), a unit dedicated to driving and monitoring the implementation of the Masterplan. The Task Force also addresses concerns raised by various industry stakeholders. It is further assisted by four Cluster Working Groups (CWG).



Various stakeholders including government agencies, associations, academicians etc. are represented on the CWGs. Regular meetings are conducted to provide progress updates and address implementation challenges.

The Logistics and Trade Facilitation Masterplan (LTFM) lays out five Strategic Shifts and 21 Action as follows:

1. Strengthening the institutional and regulatory framework
2. Developing infrastructure and freight demand
3. Strengthening technology and human capital
4. Enhancing trade facilitation mechanisms
5. Internationalising logistics services

With the successful implementation of the LTFM, cargo volumes are expected to increase by 8% annually and additionally, create 146,000 new jobs, mostly in the high skilled category.

2. Source: https://www.wto.org/english/tratop_e/tradfa_e/tradfa_e.htm

b) Simplifying and automating regulatory processes

Various industry stakeholders have developed, or are in the process of developing, individual systems for automation of processes, specific to their requirements. These include Freight Operations Information Systems (FOIS), ICEGATE (which is being replaced by Single Window Interface for Facilitating Trade), Port Community System (PCS), among others.

While individual stakeholders have streamlined their processes, lack of integration between these systems results in users having to deal with multiple platforms requiring similar information. To address this, the central government may consider creating a unified platform where all stakeholders and regulatory authorities (Customs, other regulatory agencies, port, airport, DGFT, and banks, and so on) are able to process documents, exchange information, track shipments, transfer funds, and improve conformity to regulations.

The Logistics Department in the Ministry of Commerce has a mandate to develop a National Logistics Information Portal (NLIP). This will be an online logistics marketplace to bring together on a single platform various stakeholders, including logistics service providers, buyers as well as central and state agencies such as Customs, DGFT, Indian Railways, ports, airports, inland waterways, coastal shipping, among others. This portal can be evolved further from being just a marketplace to being a common platform for paperless clearances.

In addition to the central government, state governments also have a role in simplifying regulatory processes. State governments may encourage various state level agencies to integrate their systems / platforms with the centre's unified platform for seamless information exchange and processing. Focus on digitalisation to implement single window systems for improving

Box 15 – Simplifying and automating regulatory processes in Netherlands and Singapore

Leading logistics hubs and countries are leapfrogging towards developing integrated customs clearances, information and business platforms in addition to Single Window clearance systems. **Neutral Logistics Information Platform (NLIP launched by NL) and National Trade Portal (NTP launched by Singapore)** have pioneered an integrated IT ecosystem connecting businesses, community systems and platforms, and government systems. They will be a one-stop trade portal for Business-to-Government (B2G) and Business-to-Business (B2B) services.

By using such platforms, stakeholders upload consignment / commodity-related information only once, which is thereafter accessible by various related parties, including government agencies, logistic service providers, shippers, main ports, and so on. The owner of the information determines with whom and under what conditions the information is shared, so that any misuse is checked.

Such a massive effort requires as many as 30 key government departments or agencies coordinate their processes and procedures. NLIP, for example, is using the existing and successful information platforms at Schiphol (CargoNaut), the ports of Rotterdam and Amsterdam (Portbase) and the government (Digipoort) and will be extended to new platforms. All those platforms "talk with each other" leading to one integrated platform.

Some of the advantages of such platforms are expected to be-

Improved predictability and planning	Enhanced utilisation of transport systems and infrastructure	Supply chain optimisation
Less paper transaction cost	Competitive Advantage	Reduced administrative burden and compliance costs
Handy Company dashboard with integrated view of notifications and tasks	Secure cloud based Data repository	Social network to act as lobby for removing logistics barriers

the ease of starting businesses could also facilitate setting up of logistics businesses in the states by private sector players

c) Enabling seamless movement of cargo

The survey found that the industry believed border delays had come down after the implementation of GST. However, unscheduled stoppages for checks by regional transport authorities, law and order issues in select states, and trade union disturbances have been highlighted by respondents as persisting areas of concern that continue to inhibit cargo movement.

CargoCards used in Rotterdam are biometrics-based smartcards, which allow vehicle drivers to access a large number of locations in the port / terminal area for efficient delivery, pick-up and transit of goods. The card makes an important contribution to a fast, smooth and reliable logistics process. These cargo cards are unique to each vehicle driver and help ease entry/exit into the port area, avoiding the need for additional documents and checks.

Better coordination between government agencies and regulatory bodies may reduce delays because of such stoppages.

Additionally, respondents said delays because of "procedural" and "documentation" issues might be avoided by standardising processes and documents (e.g. E-way bill which is in

the process of being implemented).

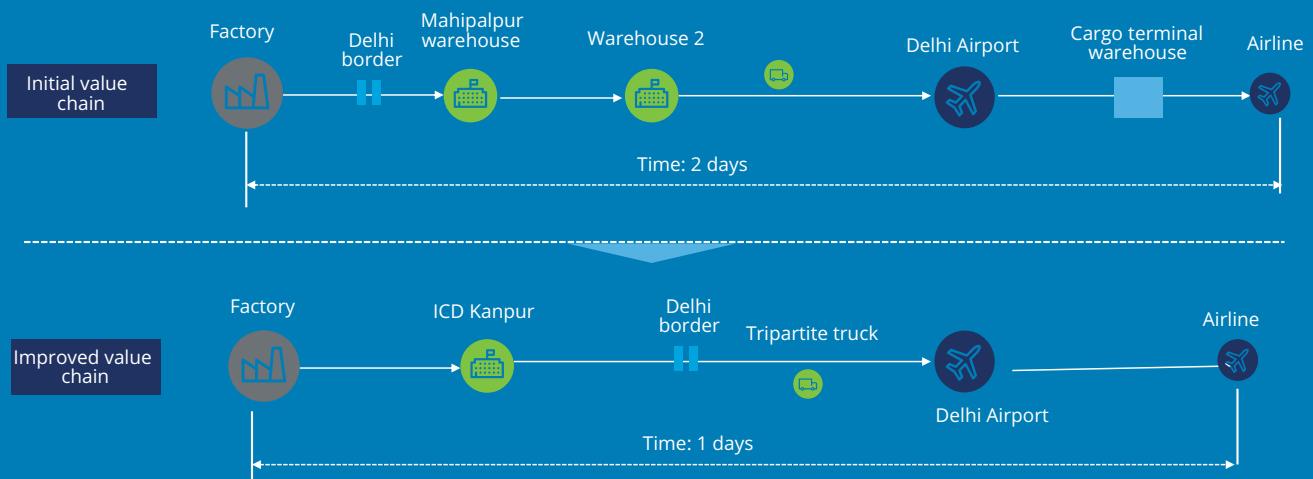
Technology advancements could also be used to reduce time spent on checks and authentication. Using technology (smart cards / barcodes), essential information pertaining to shipments may be retrieved easily and processed expeditiously at pre-determined stops.

Box 16 - Cargo chain requiring regulatory facilitation and process re-engineering

Air cargo from Kanpur to Delhi

Initial value chain - Air cargo moves from Uttar Pradesh to IATA accredited warehouse in Delhi. At the warehouse, cargo is reworked and brought to a local warehouse, and the airway bill is prepared locally. The cargo is shifted to Celebi's facility at Delhi Airport where it is Customs cleared and goes onto the airline. The entire process takes close to 48 hrs.

Regulatory facilitation - Through interactions with the Customs, facility for air cargo customs clearance was provided at ICD Kanpur, thus eliminating the need for clearance at the air cargo terminal at Delhi Airport. Cargo is re-routed towards ICD Kanpur, where it is Customs cleared, loaded in bonded trucks and transported directly to Delhi airport and the airline. Further, the existing truck carrier was trifurcated to facilitate carriage of bonded and non-bonded cargo (viz. one bonded cubicle for typical parcel size of 2.5-3 ton and two non-bonded cubicles for domestic cargo.) thus resulting in greater frequency and quality of truck services.



Outcome - Time taken for the entire chain has reduced to around 24 hours and multiple warehouse storage costs have reduced. Through coordinated efforts of multiple stakeholders (viz. transporters, exporters, customs, terminal operators, air cargo terminal operators), an in-demand service was fulfilled and both cost and time of transit were reduced almost by half

Exhibit 61: Focus Areas and Role of central and state governments for Strengthening the regulatory framework and operating environment

Focus Areas	Central Government	State Government
Enabling environment for trade and logistics promotion	<ul style="list-style-type: none"> Include aspects related to strengthening institutional and regulatory framework as part of Integrated Multimodal Logistics & Transportation Infrastructure Policy 	<ul style="list-style-type: none"> Focus on state policy for integrated transport and logistics Identify a nodal authority for coordinated planning and implementation Provide efficient law and order services
Enabling seamless movement of cargo	<ul style="list-style-type: none"> Identifying and developing unified technical standards 	<ul style="list-style-type: none"> Align state government processes with Centre Coordinate with state agencies to prevent unscheduled stoppages
Simplification and automation of regulatory processes	<ul style="list-style-type: none"> Develop unified platform to improve automation of processes, information exchange & paperless environment Focus on digitalization to achieve paperless environment 	<ul style="list-style-type: none"> Integrate infrastructure, systems and processes with centre's unified platform Focus on digitalisation to improve single window systems

Source: Deloitte research

Role of private sector in logistics performance improvement

In an integrated transport and logistics framework, private sector players can play an important role.

Private sector players can be providers of logistics infrastructure and services as well as users of such services and infrastructure. A few players such as freight forwarders or third party logistics service providers are both the users of infrastructure (such as terminals, ICDs, warehouses, etc.) and sellers who offer customised services to exporters and importers.

In the fast growing Indian logistics industry, growth of skills, technology and policy framework is as important

as physical infrastructure. Private sector can inform policy to help long-term planning for integrated development of logistics infrastructure. They can provide necessary inputs to public policy makers in identifying redundancies and impediments in regulatory and other allied processes, which impacts logistics performance.

By according infrastructure status to logistics, the government has addressed a major concern of the industry – something that is expected to facilitate financing for the development of infrastructure. Going forward, one of the key expectations from the private sector is to achieve economies of scale through pooling of resources and creating large integrated infrastructure facilities.

Private players can also play a vital role in attracting and retaining good talent in the sector. They can work in tandem with the central and state governments to create skill development facilities including in areas of terminal operations and management, warehousing (including retail and cold chains), among others. The private sector should also look into using technology for skill building through e-learning initiatives.

The survey established that competitive pricing and high levels of efficiency are a clear priority for the industry. The private sector focus on technology adoption and moving their own systems to digital platforms is critical to achieve significant improvement. Private infrastructure operators can

adopt futuristic technologies and rely on asset sweating to bring about efficiencies in their operations. Various real time track and trace technologies that are already available like RFID and GPS with geotagging can be leveraged along with robotics, blockchain, and automation. Modernisation of logistics infrastructure, by way of automated

handling equipment at the terminals, Automated Storage and Retrieval Systems (ASRS) in warehouses, and usage of IoT (Internet of Things), can be pro-actively explored.

Similarly, private sector can leverage cloud-based applications and big data to improve last-mile connectivity

and better order fulfilling. The world has moved from Single Window to Integrated Platforms. The private sector should focus on not just providing inputs to governments on these platforms, but also being a part of it, leading to a truly paperless environment.

Box 17 - Private Sector Initiative in tracking and tracing, Singapore

Right from 2007 to 2016, Singapore has remained among the top five performers in the LPI index. The country's logistics sector employs over 200,000 workers and accounts for over 7 per cent its GDP. At the core of Singapore's logistics ecosystem has been the drive to innovate, integrate and evolve its systems, processes and policies. One areas that has undergone continuous technological evolution for the benefit of the logistics community as a whole has been tracking and tracing of cargo.

In March 2005, the Container Depot Association, Singapore (CDAS), along with a group of haulier companies and assistance from an IT vendor, launched a track and trace Container Freight Management System (CFMS) for container operations. Subsequently, in June, CDAS supported by Singapore Logistics Association and Singapore Transport Association approached SPRING Singapore (an agency under the Ministry of Trade and Industry) for funding support. The idea was to upgrade CFMS by enabling two-way communication between the fleet controller, drivers and port operators. This upgraded system became Asia's first Containerised Traffic System (CTS) that was launched at the Singaporean port operator PSA's Pasir Panjang Terminal in 2008.

CTS was an integrated communications system comprising hardware and software components. Vehicles were installed with a Mobile Data Terminal (MDT), keypad, GPS Tracker and antenna. The Geographical Information System (GIS) incorporated in the CTS provided hauliers with regular updates including the vehicle's exact location, speed, trailer registration number (if towed), status of the engine, road name, among other details. The system thus, provided real time track and trace capabilities. In addition, it facilitated planning and scheduling of jobs therefore ensuring optimum usage of fleet, drivers and operators.

With the aim to integrate the logistics community, the CTS brought together transport companies with their container depots, shippers and drivers across Singapore. The system enabled truckers with resource sharing, planning, optimising and tracking routes, and improving communication with drivers. This became the foundation stone for increasing the vehicular movement in and out of the ports, thereby boosting throughput.

After the CTS, which was the first system developed domestically to address the needs of the road hauliers community in Singapore, CDAS launched the Electronic Container Trucking System (eCTS) in August 2016, which provided the same facilities as the CTS through a mobile application. To achieve integration of the logistics community, simplify communication and facilitate information sharing, the eCTS aimed to bring all the container logistics firms on a common platform. In addition, the system also made use of available technologies to upgrade depot operations, including notifications visibility for drivers, Automated Entry (eGate) into empty depots, real-time transaction records, pre-trip check, work safety compliance record, among other things to improve overall operational efficiency (Source: <http://cdasalliance.sg>)

Box 18 - Case Study - Cargo chain requiring logistics policy and infrastructural support

Automobile logistics - Manesar to Mundra

Manesar is a key automobile hub due to the presence of Maruti Suzuki manufacturing facility. Around 3000-4000 cars are exported per month from Manesar via Mundra Port.

In general, cars are transported via road in 18.75 m long trailers carrying 8 hatchbacks (ALTO) or 6-7 export mix cars each. The road transport leg takes 2-3 days to Mundra at INR 11,000 per car on an average.

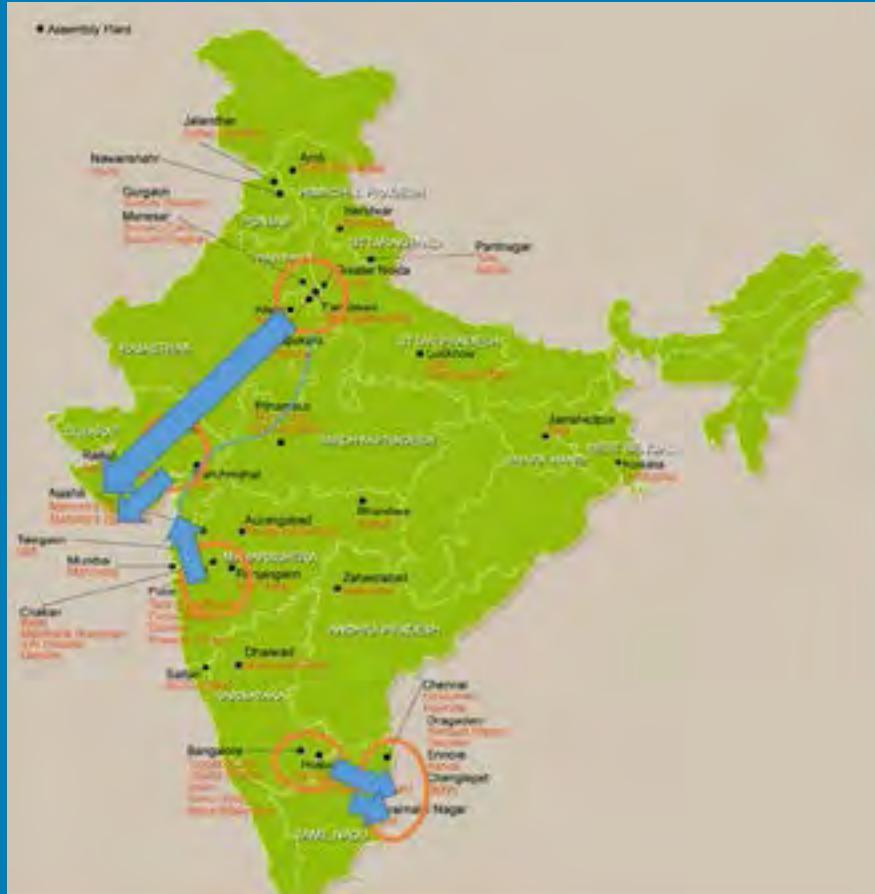
Alternatively, automobiles are also sent to Mundra in containers. Empty containers arrive at Manesar factory wherein cars are loaded on chassis (4 per container) and are transported by road trailer to ICD Patli terminal. This leg of the journey takes 1-1.5 days and costs around INR 500 per car. At Patli, containers are loaded and railed out to Mundra. This leg of the journey takes about 2-2.5 days and costs INR 9,000 per car.

Cars on reaching Mundra are parked in buffer yard where Pre – Delivery Inspection (PDI) is completed. Then customs examination occurs and finally cars are loaded onto vessel. This process usually takes 6-10 days, depending on vessel connection.



Observations on logistics of Automobiles for export.

- The flow of automobiles for export is shown in the map alongside. A minuscule portion of passenger vehicles is currently transported to ports for export. Road transportation mode is predominantly used due to very few suitable railway wagons being available. Old railway owned rakes are of very poor quality, and have largely been condemned. New automobile wagons are insufficient to cater to volumes. Cars are also carried in auto wagons from Manesar to Gurgaon (currently this mode is stopped due to technical problems). Cars are carried in trailers to Gurgaon rail terminal at about INR 300 per car. Time taken- 24 to 36 hours. Maruti pays INR 7,200 to Indian Railways to rail out the cars in automobile wagons.
 - Transit time is the most critical issue. In road haulage, a trailer travels 350-375 km/day, reportedly improved by 50-100 km per day from 1 July 2017 (Post GST). Rail transit remains unchanged at about 18 km/hour (430km/day), but if first and last mile detentions get added to the rail transit, road emerges as a far superior transportation mode. Presently, rail transportation always works out to be more expensive on total cost basis (10% more even in the most efficient route, where return traffic is available).



Potential interventions to optimise efficiency:

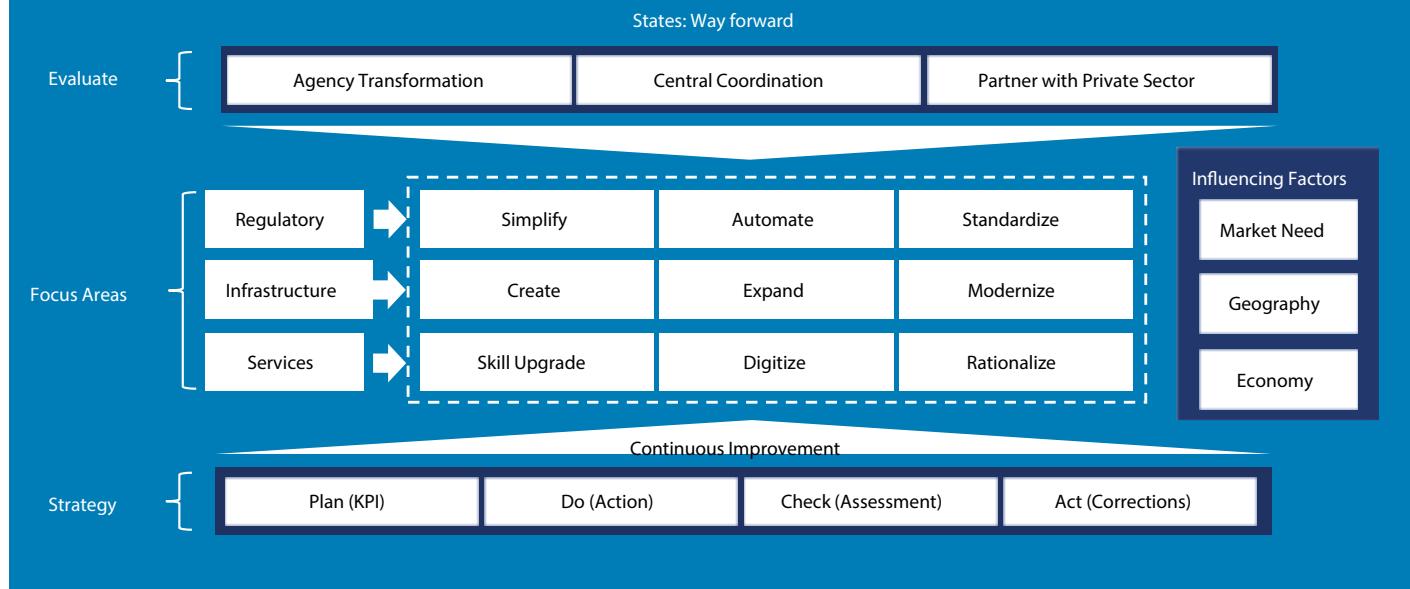
- **Infrastructural support:** Development of appropriate common user terminal (Auto hubs) in public private partnership mode through Indian Railways or any public agency at prominent loading points for export, viz. Bangalore, Pune and Manesar would be a key enabler for incentivising automobile firms to adopt rail mode of transport
 - **Policy change:** To address the issue of rail transit time, state governments and Indian Railways could potentially develop a suitably structured Transit Guarantee scheme for automobile transportation by rail. Additionally, this could be supplemented by rationalisation of railway haulage charge to incentivise rail transport and acquisition of more rolling stock by the operators. Together, these policy changes could be the key drivers effecting modal shift from road to rail.

Source: Analysis of SIAM data and Government Statistics

Box 19 - Implementation by state governments

States can prioritise focus areas for implementation based on their specific context – geographical profile, economic and trade profile, LEADS scores, and so on. They would also need to identify the relevant stakeholders to partner on these. They can collaborate either with the central government and its agencies, or with the private sector.

The actions plans would need to be formulated, executed against clear KPIs, and followed-up with continuous monitoring for improvement and correction.





Annexure: LEADS Questionnaire

Logistics Performance Across Indian States / UTs Survey 2017

Department of Commerce, Ministry of Commerce & Industry has commissioned Deloitte to undertake this survey and assess how users of logistics services for international trade experience performance of attendant functions across various States / UTs around relevant dimensions. The Ministry intends to bring focus to opportunities for improving logistics performance for international trade across States / UTs.

You are an important stakeholder in the Export/Import logistics chain and your inputs are critical. We invite you to participate in this survey. We will analyse and present the findings to policy makers in the Ministry of Commerce & Industry.

Survey Guidance / Instructions

General

- In this survey, the term 'State / UT' refers to the logistics community operating across the State / UT comprising both government and private sector participants
- Please select answers / options that best represents your experience of the Export/ Import logistics performance across your chosen State (s) / Union Territories against generally accepted industry standards or practices
- Unless specifically requested otherwise in any question, please respond to this survey with respect to your recent (last 2 years) experiences with Export / Import shipment logistics performance across State(s) / UT(s)

Follow-up discussion / views

- If you would like us to contact you for a follow-up discussion or would like to provide further information / views, please contact us at INLP@deloitte.com along with your contact details and we will reach out to you as soon as possible.

Responding to questions

- Please take the survey in one sitting.
- If you don't know the answer to a question for a particular State/UT or it is not applicable to you / your nature of operations, please leave it blank.
- This survey comprises three parts viz.
 - Part A: Overall Assessment : [Approx. 6-8 mins]
 - Part B: Detailed Assessment: [Approx. 20-25 mins]
 - Part C: Quantitative assessment: [Approx. 6-8 mins]

Thank You Very Much For Your Time And Participation In This Survey!

Begin Survey

Please select from each group the option that best describes your current work. You must complete questions marked * to begin the survey.

1. Name of respondent: _____

2. Location: _____

3. Nature of market you primarily deal with: *
 - Import
 - Export
 - Import and Export

4. Your position in your company / firm:
 - Senior Management Middle Management (Manager and above)
 - Supervisor
 - Operations executive
 - Other

5. Freight transport mode you typically deal with: *
 - Road
 - Rail
 - Air Transport
 - Shipping Line

6. Commodity type you primarily deal with: *
 - Bulk / break bulk
 - Container Cargo
 - Project / Special Cargo
 - Express Air Cargo
 - Most of the above
 - Others: Please specify

7. Please indicate the predominant nature of your involvement in international trade logistics*:
 - Shipper
 - ICD/CFS/PFT operator
 - Air Cargo Terminal operator
 - Port Terminal operator
 - Warehouse (industrial / 3rd party) operator
 - Cold Storage operator
 - Road transporter (hauler)
 - Indian Railways
 - Container Train Operator
 - Shipping Line
 - Airline
 - Freight Forwarder
 - Air Cargo Agent
 - Customs Broker
 - 3rd Party Logistics Service Provider

Part A

Please select up to 5 (FIVE) States / UTs where / across which you have operations / experience pertaining to international trade / Export-Import shipment logistics: *

State 1	<input type="text"/>
State 2	<input type="text"/>
State 3	<input type="text"/>
State 4	<input type="text"/>
State 5	<input type="text"/>

In this part of the survey, based on your experience with international trade logistics, please select options based on your perspective of the entire international trade / logistics chain across the State(s) / UT(s) and not with reference to just a part of the chain.

01. Rate the **Quality of transport & logistics infrastructure** in your chosen State(s) / Union Territories.

(**Quality** here refers to **capacity in relation to demand, operating conditions of infrastructure, and efficiency of operations**)
(Transport & logistics infrastructure includes road network, rail network, ports, airports, CFS/ICDs, logistics parks / freight terminals, warehouses, cold storage units)

	Very Low	Low	Average	High	Very High
State 1					
State 2					
State 3					
State 4					
State 5					

02. Rate the **Quality of services offered by Logistics Service Providers** in your chosen State(s) / Union Territories

(**Quality** here refers to **availability, competence, efficiency of services and ease of access to service providers**)
(Logistics services include haulage / transportation by different modes, handling & storage of cargo and containers, freight forwarding, customs broking and value adding logistics activities (consolidation, repackaging, labelling, last-mile connectivity, etc.))

	Very Low	Low	Average	High	Very High
State 1					
State 2					
State 3					
State 4					
State 5					

03. Evaluate the **timeliness** of cargo delivery to/from your chosen State(s)/Union Territories
(Timeliness refers to high frequency of delivery within scheduled or expected delivery times)

	Very Low	Low	Average	High	Very High
State 1					
State 2					
State 3					
State 4					
State 5					

04. Evaluate the ease of **tracking & tracing** cargo moving to/from your chosen State(s) / Union Territories?
(Track & Trace refers to the ability to obtain frequent, consistent & accurate information regarding movement and condition of cargo)

	Very Low	Low	Average	High	Very High
State 1					
State 2					
State 3					
State 4					
State 5					

05. Compare and state how **shipment prices to/from your chosen state(s)/Union Territories** are placed (higher/lower/similar) in comparison to **your price expectations, your assessment of costs, and generally available prices elsewhere for similar services in comparable circumstances**
(Shipment prices include those for **transportation, handling, storage, value added services, and informal charges**)

	Very Low	Low	Average	High	Very High
State 1					
State 2					
State 3					
State 4					
State 5					

06. Evaluate the **safety/security of cargo** movement to/from your chosen State(s)/Union Territories
(Safety/security refers to frequent delivery without damage/deterioration/pilferage of cargo due to logistics inefficiencies, accidents or theft)

	Very Low	Low	Average	High	Very High
State 1					
State 2					
State 3					
State 4					
State 5					

07 How favorable is the operating environment for export/import logistics in your chosen State(s) / Union Territories?

(Favorable operating environment is defined as low incidences of law and order issues, strikes, impact of trade/transporter unions etc.)

	Very Low	Low	Average	High	Very High
State 1					
State 2					
State 3					
State 4					
State 5					

08. Assess the Efficiency of regulatory processes in your chosen State(s) / Union Territories

(**Efficiency** refers to speed, simplicity, transparency in processing, ease of documentation)

(**Regulatory processes** include those relating to customs, health, sanitary & phytosanitary, quarantine, drug controller, FSSAI, inter-state border crossing agencies and all other such agencies)

	Very Low	Low	Average	High	Very High
State 1					
State 2					
State 3					
State 4					
State 5					

Part B

Please select any 1 (ONE) State/Union Territory where / across which you have larger operations / more experience (including transit) pertaining to international trade / Export-Import shipment logistics: *

State 1

In this part of survey, we request you to rate your chosen State (s) / Union Territories on key dimensions of logistics performance based on your experience as part of Export-Import logistics chain in India.

01. Rate the Quality of transport and logistics infrastructure with respect to your selected State/Union Territory

	Very Low	Low	Average	High	Very High
--	-----------------	------------	----------------	-------------	------------------

- a. **Road network**
- b. **Rail network**
- c. **Port terminal** infrastructure
- d. Air cargo terminals
- e. **Intermodal terminals** - ICD, CFS, PFT, Multimodal Logistics Parks, Integrated Check-Posts, Inland Waterway Terminals)
- f. **Storage infrastructure** such as Industrial warehouse, 3PL Warehouse, Cold / Controlled atmosphere storage etc.
- g. **Infrastructure at inter - state border crossing points** (such as weigh-bridges, parking spaces, utilities)
- h. **Inspection/testing facilities** (laboratories etc.)
- i. **Internet / mobile connectivity**

02. Rate the quality of following logistics Services offered in your selected State/Union Territory by:

	Very Low	Low	Average	High	Very High
--	-----------------	------------	----------------	-------------	------------------

- a. Road transporter (trucking company)
- b. Indian Railways /Container Train Operators
- c. Port operators
- d. Air cargo terminal/Airport operators
- e. Terminal service providers - ICD /CFS/PFT/Multimodal hubs/ Integrated Check-Posts etc.
- f. Storage infrastructure service providers (3PL warehouses, Industrial warehouses, cold storages etc.)
- g. Logistics service providers (such as Freight Forwarders / 3rd Party Logistics / Air Cargo Agents / Express carriers / Customs Broker/ Multimodal Transport Operator)
- h. Financial Service Providers (banking & insurance)
- i. Customs
- j. Quality / standard inspection agencies (including Health / Sanitary & phytosanitary agencies and other regulatory agencies)

03. What is the frequency of exchange of data / documents / information electronically (over internet / mobile applications) vis-à-vis the following stakeholders in your selected State/Union Territory

	Very Low	Low	Average	High	Very High
a. Road transporter (trucking company)					
b. Indian Railways /Container Train Operators					
c. Port operators					
d. Air cargo terminal/Airport operators					
e. Terminal service providers - ICD /CFS/PFT/Multimodal hubs/ Integrated Check Posts etc.					
f. Storage infrastructure service providers (3PL warehouses, Industrial warehouses, cold storages etc.)					
g. Logistics service providers (such as Freight Forwarders / 3rd Party Logistics / Air Cargo Agents / Express carriers / Customs Broker/ Multimodal Transport Operator)					
h. Financial Service Providers (banking & insurance)					
i. Customs					
j. Quality / standard inspection agencies (including Health / Sanitary & phytosanitary agencies and other regulatory agencies)					

04. What is the frequency of making online payments vis-à-vis the following stakeholders in your selected State/Union Territory

	Very Low	Low	Average	High	Very High
a. Road transporter (trucking company)					
b. Indian Railways /Container Train Operators					
c. Port operators					
d. Air cargo terminal/Airport operators					
e. Terminal service providers - ICD /CFS/PFT/Multimodal hubs/ Integrated Check-Posts etc.					
f. Storage infrastructure service providers (3PL warehouses, Industrial warehouses, cold storages etc.)					
g. Logistics service providers (such as Freight Forwarders / 3rd Party Logistics / Air Cargo Agents / Express carriers / Customs Broker/ Multimodal Transport Operator)					
h. Financial Service Providers (banking & insurance)					
i. Customs					
j. Quality / standard inspection agencies (including Health / Sanitary & phytosanitary agencies and other regulatory agencies)					

05. Based on your experience of moving Export-Import shipments to / from your selected State/ Union Territory, how would you rate the following vis-à-vis your price expectations, your assessment of costs and generally available prices elsewhere for similar services in comparable circumstances

	Very Low	Low	Average	High	Very High
a. Road transporter (trucking company)					
b. Rail transport charges					
c. Port operators					
d. Airport/Air cargo terminal charges					
e. Terminal charges (such as ICD/CFS/PFT/Multimodal Logistics Parks/Integrated Check Posts)					
f. Storage charges (for 3PL / industrial warehouses, cold / controlled atmosphere storages)					
g. Logistics Service charges (such as Freight Forwarders / 3rd Party Logistics / Air Cargo Agents / Express carriers / Customs Broker/ Multimodal Transport Operator)					
h. Financial charges for export/import shipments (banking/ insurance etc.)					
i. Charges for inter-state border crossing clearances (excluding toll charges)					

06. Rate the availability of track and trace information provided by the following stakeholders in your selected State/Union Territory

	Very Low	Low	Average	High	Very High
a. Availability of track and trace information for all export/import cargo consignments					
b. Extent of availability of all track and trace information from a single (integrated) service provider					
c. Real time information availability					
d. Accuracy of information regarding the shipment					

07. Please rate the extent of loss/damage experienced in cargo delivery of export/import cargo delivery to/from port of exit/entry in your selected State/Union Territory

	Very Low	Low	Average	High	Very High

08. Rate the extent of informal payments solicited at any stage in movement of cargo within your selected State/Union Territory

	Very Low	Low	Average	High	Very High

09. Please answer the following questions with respect to your selected State/Union Territory

	Yes	No	N/A	Don't know
a. Does the selected State / UT have an export promotion scheme?				
b. Does the export promotion scheme impact your operations in the State / UT?				
c. Does the selected State / UT have a logistics policy?				
d. Does the state logistics policy positively influence your experience with logistics operations in the State / UT?				
e. Do you see coordinated investments in transport & logistics infrastructure by various agencies in the selected State / UT?				
f. Have the nature of services / storage facilities by independent warehousing / storage improved over time in the selected State / UT?				
g. Has your use of warehousing / storage increased over time in the selected State / UT?				
h. Have the logistics operations / export - import chain improved in the selected State / UT over the last 1-2 years?				
i. Are you provided up-to-date information regarding regulatory changes linked to EXIM cargo processing?				
j. Is there an integrated single window processing facility for documents pertaining to export/import shipments				

10. Rate your selected state/Union Territory on aspects of operating environment comprising:

	Very Low	Low	Average	High	Very High
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- a. Efficiency of Law and Order services
- b. Impact due to Trade/Transporter unions
- c. Effectiveness of State labour policies
- d. Does the state logistics policy positively influence your experience with logistics operations in the State / UT?
- e. Efficiency in enforcing contracts
- f. Availability of skilled labour in your state (for activities such as terminal operations, truck driving, logistics services etc.)

11. Rate your selected state/Union Territory on the extent of road restrictions imposed on goods trucks during city transit within the state

	Very Low	Low	Average	High	Very High
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12. Answer the following questions pertaining to detention time experienced in your chosen State/Union Territory

- a. On account of documentary compliance check, on average in a month, how many times is your shipment stopped within your state
- b. What is the total detention time experienced for a shipment for all unscheduled stoppages within your state (please mention in hrs)
- c. What percentage of your consignments/cargo shipments are stopped at interstate border crossing points (in %)
- d. What is the average detention time for your shipment at the main State border check post (in hrs)

13. With respect to movement of export/import cargo movement to/from your selected State/Union Territory, the implementation of Goods & Service Tax:

	Strongly Disagree	Disagree	Undecided	Agree	Strongly agree
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- a. Has already reduced procedural requirements
- b. Will further reduce procedural requirements in the long term
- c. Has reduced transit time for movement of cargo/containers
- d. Has reduced delays/ detention times for cargo/containers at border check points
- e. Has reduced transit cost for movement of cargo/containers

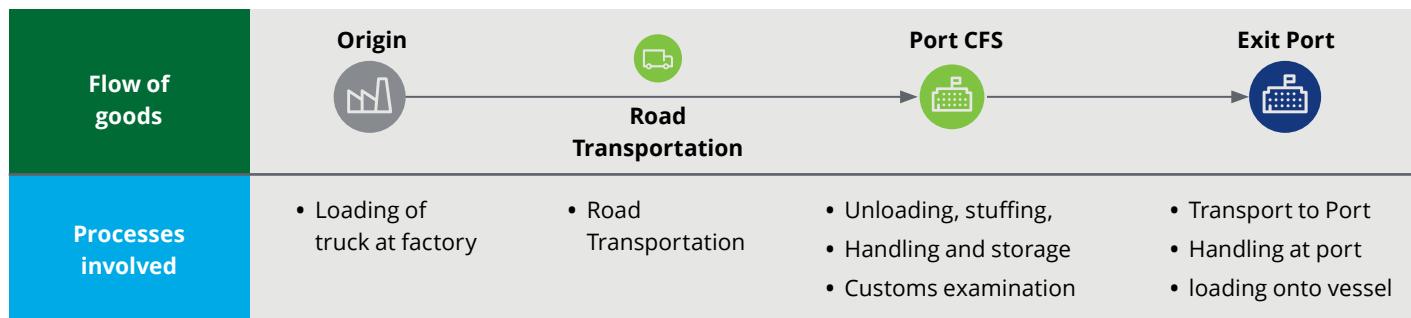
Part C – India level

14. Please select one or more of the following streams of cargo/container logistics chain which best describe the type of operations that you are familiar with

Export

Road movement – break bulk to Port CFS, with containerization at Port CFS	If selected please move to Pg. 13
Rail / road movement – containerized cargo – with containerization at ICD	If selected please move to Pg. 14
Rail / road movement – containerized cargo – with containerization at Factory	If selected please move to Pg. 15
Air cargo – by road to airport	If selected please move to Pg. 16

01. Break bulk cargo moving to Port CFS for Containerization



Mention Commodity Name

Select State of Origin of consignment

Select state from which consignment exits the country

Please mention time and cost parameters for the procedures listed below

	Time (in days)	Cost (in INR/TEU)
i. Loading of truck at factory		
ii. Road Transportation to Port CFS		
iii. Unloading, storage, stuffing, handling at CFS		
iv. Customs Processing		
v. Road Transport to Port		
vi. Storage, handling and loading onto vessel		

On overall average basis, what is the total time taken for completion of a shipment (in days)

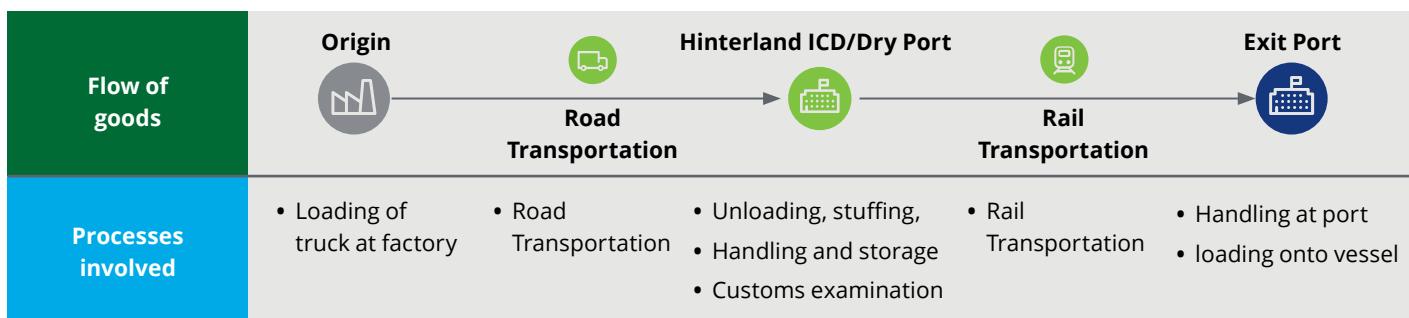
On overall average basis, what is the total cost for completion of a shipment ((in INR/TEU)

On overall average basis, what is the total delay experienced in completing a shipment (in days)

Please identify the procedures (upto 2) where there is maximum potential for reduction in time and cost from the following

	Time reduction (Select upto 2 from this column)	Cost Reduction (Select upto 2 from this column)
i. Loading of truck at factory		
ii. Road Transportation to Port CFS		
iii. Unloading, storage, stuffing, handling at CFS		
iv. Customs Processing		
v. Road Transport to Port		
vi. Storage, handling and loading onto vessel		

02. Rail / road movement – containerized cargo – with containerization at ICD (Containerized Cargo moving from factory to port with containerization occurring at ICD)



Mention Commodity Name

Select State of Origin

Select state from which consignment exits the country

Please mention time and cost parameters for the procedures listed below

	Time (in days)	Cost (in INR/TEU)
i. Loading at factory and road transportation to ICD		
ii. Unloading, storage, stuffing, handling at ICD		
iii. Customs Processing		
iv. Rail transport to Port		
v. Storage, handling and loading onto vessel		

On overall average basis, what is the total time taken for completion of a shipment (in days)

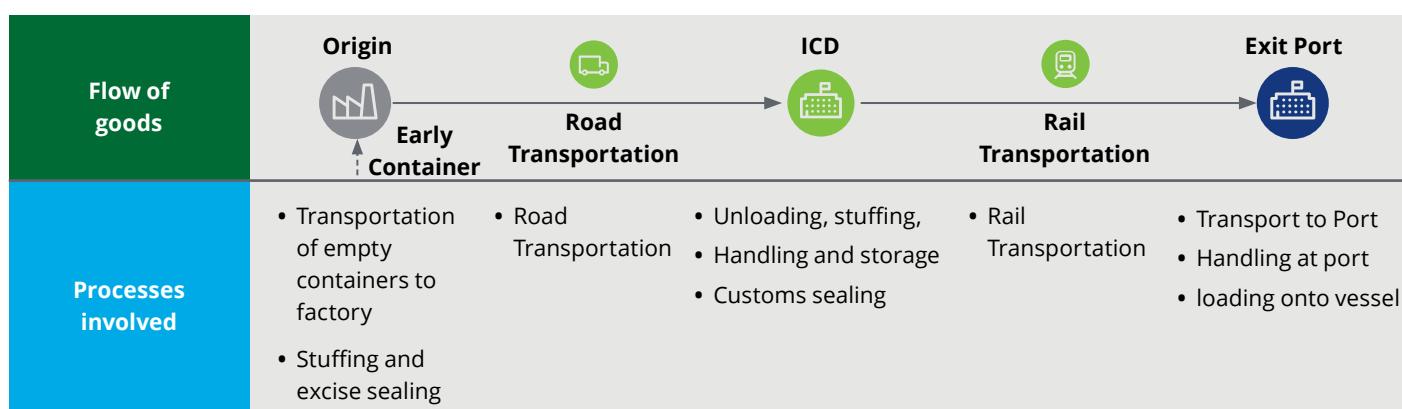
On overall average basis, what is the total cost for completion of a shipment ((in INR/TEU)

On overall average basis, what is the total delay experienced in completing a shipment (in days)

Please identify the elements (upto 2) where there is maximum potential for reduction in time and cost from the following

	Time reduction (Select upto 2 from this column)	Cost Reduction (Select upto 2 from this column)
i. Loading at factory and road transportation to ICD		
ii. Unloading, storage, stuffing, handling at ICD		
iii. Customs Processing		
iv. Rail transport to Port		
v. Storage, handling and loading onto vessel		

03. Rail / road movement - containerized cargo - with containerization at Factory



Mention Commodity Name

Select State of Origin

Select state from which consignment exits the country

Please mention time and cost parameters for the procedures listed below

	Time (in days)	Cost (in INR/TEU)
i. Empty container to factory, stuffing at factory and road transport to ICD		
ii. Customs sealing at ICD		
iii. Handling and loading at ICD		
iv. Rail transport to Port		
v. Storage, handling and loading onto vessel		

On overall average basis, what is the total time taken for completion of a shipment (in days)

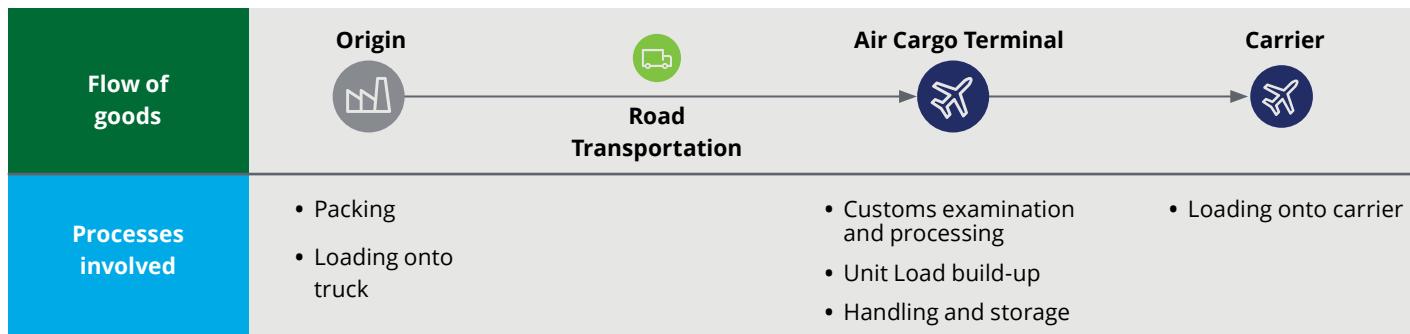
On overall average basis, what is the total cost for completion of a shipment ((in INR/TEU)

On overall average basis, what is the total delay experienced in completing a shipment (in days)

Please identify the elements (upto 2) where there is maximum potential for reduction in time and cost from the following

	Time reduction (Select upto 2 from this column)	Cost Reduction (Select upto 2 from this column)
i. Empty container to factory, stuffing at factory and road transport to ICD		
ii. Customs sealing at ICD		
iii. Handling and loading at ICD		
iv. Rail transport to Port		
v. Storage, handling and loading onto vessel		

04. Air Cargo logistics Chain – by road to airport



Mention Commodity Name

Select State of Origin

Select state from which consignment exits the country

Please mention time and cost parameters for the procedures listed below

	Time (in days)	Cost (in INR/TEU)
i. Packing and Loading onto truck		
ii. Road transport to air cargo terminal		
iii. Customs examination and processing		
iv. Storage, handling and transportation at air cargo terminal		
v. Loading onto carrier		
On overall average basis, what is the total time taken for completion of a shipment (in days)		
On overall average basis, what is the total cost for completion of a shipment ((in INR/TEU)		
On overall average basis, what is the total delay experienced in completing a shipment (in days)		

Please identify the elements (upto 2) where there is maximum potential for reduction in time and cost from the following

	Time reduction (Select upto 2 from this column)	Cost Reduction (Select upto 2 from this column)
i. Packing and Loading onto truck		
ii. Road transport to air cargo terminal		
iii. Customs examination and processing		
iv. Storage, handling and transportation at air cargo terminal		
v. Loading onto carrier		

Thank you

Bibliography

- Akdogan, M. & Durak, A. (2016). "Logistic and Marketing Performances of Logistics Companies: A Comparison Between Germany and Turkey". Elsevier.
- Arvis, J., Ojala, L., Panzer, J., Naula, T. & Mustra, M. (2007). "Connecting to Compete 2007: Trade Logistics in Global Economy". The International Bank for Reconstruction and Development/ The World Bank.
- Arvis, J., Saslavsky, D., Ojala, L., Shepherd, B. & Mustra, M. (2010). "Connecting to Compete 2010: Trade Logistics in Global Economy". The International Bank for Reconstruction and Development/ The World Bank.
- Arvis, J., Saslavsky, D., Ojala, L., Shepherd, B. & Mustra, M. (2012). "Connecting to Compete 2012: Trade Logistics in Global Economy". The International Bank for Reconstruction and Development/ The World Bank.
- Arvis, J., Saslavsky, D., Ojala, L., Shepherd, B., Busch, C., Raj, A. & Naula, T. (2014). "Connecting to Compete 2014: Trade Logistics in Global Economy". The International Bank for Reconstruction and Development/ The World Bank.
- Arvis, J., Saslavsky, D., Ojala, L., Shepherd, B., Busch, C., Raj, A. & Naula, T. (2016). "Connecting to Compete 2016: Trade Logistics in Global Economy". The International Bank for Reconstruction and Development/ The World Bank.
- Assocham. (2014). "Transport & Logistics in India".
- Betanzo-Quezada, E. & Romero, J. (2010). "An Urban Freight Transport Index". Elsevier Ltd.
- Bozoyan, T. (2016), 'Economic Overview Germany: Market, Productivity, Innovation', Issue 2016/2017, Market Intelligence Germany, Germany Trade & Invest, Berlin
- Çemberci, M., Civelek, M. & Canbolat, N. (2015). "The Moderator Effect of Global Competitiveness Index on Dimensions of Logistics Performance Index". Elsevier.
- Commonwealth of Australia. (2017). "Inquiry into National Freight and Supply Chain Priorities".
- Deloitte (2014) Competitiveness: Catching the next wave Panama
- Deloitte Research (2017) 'China Logistics Industry: Investment Promotion Report 2015-2016', Deloitte China (Report accessed at <https://www2.deloitte.com/content/dam/Deloitte/cn/Documents/cip/deloitte-cn-cip-china-logistics-industry20152016-en-170612.pdf>)
- Deloitte University Press. (2017). "The Future of Freight: How new technology and new thinking can transform how goods are moved".
- Deloitte, U.S. Council on competitiveness. (2010). "2010 Global Manufacturing Competitiveness Index".
- Deloitte, U.S. Council on competitiveness. (2016). "2016 Global Manufacturing Competitiveness Index".
- Department of Industrial Policy and Promotion, Government of India. (2015). "Assessment Framework for State Level Reforms Enabling Ease of Doing Business".
- Domingues, M., Reis, & V., Macário, R. (2015). "A Comprehensive Framework for Measuring Performance in a Third-party Logistics Provider". Elsevier.
- Dr. Debroy B., & Dr. Kaushik P.D.. (2017)."Barriers to Interstate Trade and Commerce – the case of Road Transport".
- Dumitache, C., Kherbash, O. & Mocan, M. (2016). "Improving Key Performance Indicators in Romanian Large Transport Companies". Elsevier.
- Dun & Bradstreet. (2016). "Port Logistics Issues and Challenges in India".
- Ekici, S., Kabak, O. & Ulengin, F. (2016). "Linking to Compete: Logistics and Global Competitiveness Interaction". Elsevier.
- Federal Ministry of Transport and Digital Infrastructure (2016) 'Logistics – the Smart Transport of Goods' (Accessed on <https://www.bmvi.de/EN/Topics/Mobility/Freight-Transport-Logistics/Logistics-in-a-nutshell/logistics-in-a-nutshell.html>)
- Federation of Indian Export Organization, Ministry of Commerce, Govt. of India. (2014). "Concept Note on Export Potential of Uttarakhand".
- Foa & Tanner. (2011). "Methodology of Indices of Social Development".
- Frost & Sullivan, CII. (2015). "Mega Trends in the Indian Logistics Sector for 2015-16".
- Global Coalition of Efficient Logistics. (2012). "Shipment Efficiency Analysis: Malaysia".
- Global Coalition of Efficient Logistics. (2013). "Shipment Efficiency Analysis: India".
- Government of Andhra Pradesh. (2015). "Industrial Development Policy 2015-20".
- Government of Arunachal Pradesh, Department of Trade and Commerce. (2014). "Export Strategy Plan for the State of Arunachal Pradesh".
- Government of Assam, Industries and Commerce Department. (2014). "Export Policy of Assam 2014".
- Government of Bihar, Department of Industries. (2016). "Bihar Industrial Investment Promotion Policy, 2016 for Promoting Industrial Development in the State".
- Government of Gujarat, Industries and Mines Department. (2014). "Gujarat Export Strategy".

- Government of Haryana, Industries and Commerce Department. (2014). "Haryana Export Strategy".
- Government of India, Department of Commerce. (2006, 2007, 2008, 2009, 2011, 2012, 2013, 2014, 2016, 2017). "Minutes of the Session of Standing Committee on Promotion of Exports (SCOPE)-AIR".
- Government of India, Department of Commerce. (2006, 2007, 2008, 2009, 2011, 2012, 2013, 2014, 2016, 2017). "Minutes of the Session of Standing Committee on Promotion of Exports (SCOPE)-SHIPPING".
- Government of Jammu and Kashmir, Industries and Commerce Department. (2014). "Broad templates for States Export Strategy".
- Government of Jharkhand. (2016). "Jharkhand Industrial and Investment Promotion Policy 2016".
- Government of Kerala, Department of Industries and Commerce. (2015). "Kerala Industrial & Commercial Policy Amended-2015".
- Government of Madhya Pradesh, Department of Commerce, Industry and Employment. (2014). "Industrial Promotion Policy 2014".
- Government of Manipur, Commerce and Industries Department. (2016). "Manipur State's Export Strategy".
- Government of Puducherry. (2015). "Export Promotion Strategy for the Union Territory of Puducherry".
- Government of Rajasthan. (2014). "Draft Paper for Strengthening and Strategizing the Export Promotion in Rajasthan".
- Government of West Bengal (2013) "Investment and Industrial Policy of West Bengal 2013".
- Jiang, X. (2016) 'China's Logistics Development Environment' in 'Contemporary Logistics in China', Springer, Berlin Heidelberg
- Jones Lang Lasalle. (2015)." Indian logistics - Taking Giant Leaps Forward".
- IMF Working Paper (2017), Panama's Growth Prospects: Determinants and Sectoral Perspectives, Kimberly Beaton and Metodij Hadzi-Vaskov (Authorized for distribution by Valerie Cerra, July 2017), Western Hemisphere Department, IMF
- Kathuria, Sanjay, and Mariem Mezghenni Malouche, eds. 2016. Strengthening Competitiveness in Bangladesh Thematic Assessment: A Diagnostic Trade Integration Study. Directions in Development. Washington, DC: World Bank. doi: 10.1596/978-1-4648-0898-2. License: Creative Commons Attribution CC BY 3.0 IGO
- Kucukaltan, B., Irani, Z. & Aktas, E. (2016). "A Decision Support Model for Identification and Prioritization of Key Performance Indicators in the Logistics Industry". Elsevier.
- Kunadhamraks, P. & Hanaoka, S. (2017). "Evaluating the Logistics Performance of Intermodal Transportation in Thailand". Emerald Insight.
- Kunaka, C. & Rizwan, N. (2016) – "Strengthening Competitiveness in Bangladesh – Thematic Assessment – Trade Facilitation and Logistics".
- Lai, K., Ngai, E.W.T & Cheng, T.C.E. (2003). "An Empirical Study of Supply Chain Performance in Transport Logistics. Elsevier B.V.
- Lau, K. (2011). "Benchmarking: An International Journal". Emerald Insight.
- Logistics Alliance Germany (2013), 'Logistics Solutions' (Report accessed at http://www.logistics-alliance-germany.com/fileadmin/user_upload/Dokumente/Deutschland/Downloads/LAG_Logistics_Solutions_-_Brochure.pdf)
- Marti, L., Martin, J. & Puertas, R. (2017). "A DEA-Logistics Performance Index". Journal of Applied Economics.
- National Shipping Board, Ministry of Shipping, Government of India, Indian Institute of Foreign Trade. 2016. "Report on end-to-end Logistics and Costs for Shipping Through Ports".
- Oajala, L. (2012). "Measuring National Level Logistics Costs: Overview of Worldwide Empirical Evidence". Turku School of Economics, Finland.
- OECD (2016), OECD Factbook 2015-2016: Economic, Environmental and Social Statistics, OECD Publishing, Paris.
- Ojala, L. (2008). "Methodology of Logistics Performance Index". Turku School of Economics, Finland
- Organisation for Economic Co-operation and Development, Corporate Partnership Board, International Transport Forum. (2015). "Drivers of Logistics Performance: A Case Study of Turkey".
- Organisation for Economic Co-operation and Development, Corporate Partnership Board, International Transport Forum. (2016). "Data Driven Transport Policy".
- Organisation for Economic Co-operation and Development, International Transport Forum. (2015). "Logistics Strategy and Performance Measurement: Mexico's National Observatory for Transport and Logistics".
- Organisation for Economic Co-operation and Development, International Transport Forum. (2017). "Strategic Infrastructure Planning: International Best Practice".
- Organisation for Economic Co-operation and Development, JRC European Commission. (2008). "Handbook on Constructing Composite Indicators".
- Organisation for Economic Co-operation and Development, World Trade Organization. (2015). "Trade In Value Added".
- Organisation for Economic Co-operation and Development. (2014). "Calculating the Potential Impact of the WTO Trade Facilitation Agreement on Trade Costs".
- Organisation for Economic Co-operation and Development. (2014). "OECD Trade Facilitation Indicators: State of Implementation".
- Organisation for Economic Co-operation and Development. (2015). "Drivers of Logistics Performance: A Case Study of Turkey".
- Organisation for Economic Co-operation and Development. (2015). "Implementation of the WTO Trade Facilitation Agreement: The Potential Impact on Trade Costs".

- Oxford Business Group. (2013), 'The Report: South Africa 2013', Oxford Business Group (Accessed at https://books.google.co.in/books?id=fSANAQAAQBAJ&pg=PA133&lpg=PA133&dq=south+africa+logistics+efficiency+of+customs&source=bl&ots=mYsg_0-Rz&sig=B0uKz8Unq0uNlarFSVW-M7k53ljQ&hl=en&sa=X&ved=0ahUKEwjz2KaQyoTYAhVI5oMKHR9LDfk4ChDoAQgIMAA#v=onepage&q=south%20africa%20%20logistics%20%2B%20efficiency%20of%20customs&f=false)
- Özçelik, E., Çetinkaya, C., Erbas, M. & Kabak, M. (2016). "Logistic Performance Evaluation of Provinces in Turkey: A GIS-based Multi-criteria Decision Analysis". Elsevier
- Pateman, H., Cahoon, S. & Chen, S. (2016). "The Role and Value of Collaboration in the Logistics Industry: An Empirical Study in Australia". Elsevier.
- Government of Karnataka 2010. "Pre-feasibility Study for (transport) Logistics Architecture in Karnataka Volume I". Infrastructure Development Corporation (Karnataka) Limited, Government of Karnataka.
- 2014. "Karnataka Industrial Policy 2014-19". Commerce and Industries Department, Government of Karnataka.
- 2014. "Karnataka Export Promotion Policy-2014-2019".
- 2017. "Infrastructure Development Strategy & Investment Plan Report". Infrastructure Development Department, Infrastructure Development Corporation (Karnataka) Limited, Government of Karnataka.
- Rivera, L., Sheffi, Y. & Knoppen, D. (2016). "Logistics Clusters: The Impact of Further Agglomeration, Training and Firm Size on Collaboration and Value Added Services". Elsevier.
- Saisana M. & Tarantola S. (2002). "State-of-the-art Report on Current Methodologies and Practices for Composite Indicator Development, EUR 20408 EN, European Commission-JRC: Italy".
- Sangwan, K. (2017). "Key Activities, Decision Variables and Performance Indicators of Reverse Logistics". Elsevier.
- SARS (2016), 'Customs Modernisation' (Accessed at <http://www.sars.gov.za/ClientSegments/Customs-Excise/AboutCustoms/Pages/Modernisation.aspx>)
- Sharpe A. (2004). "Literature Review of Frameworks for Macro-indicators, Centre for the Study of Living Standards, Ottawa, CAN".
- Solakivi, T., Ojala, L., Laari, S., Lorentz, H., Töyli, J., Malmsten, J. & Viherlehto, N. (2014). "Finland State of Logistics". University of Turku.
- Su, S. & Ke, J. (2015). "National Logistics Performance Benchmarking for Trade Connectivity – An Innovative Approach". Research Gate.
- Government of Tamil Nadu, (2014). "Tamil Nadu Industrial Policy 2014". Industries Department, Government of Tamil Nadu.
- (2014). "Tamil Nadu export strategy 2014-15 to 2019-20".
- Technavio. (2015). "3PL Market in India 2015-2019".
- The United States Chamber of Commerce. (2010). "Transportation Performance Index".
- The World Bank (2007) 'Domestic LPI Performance', (Accessed at <https://lpi.worldbank.org/domestic/performance/2007/C/ZAF#chartarea>)
- The World Bank (2016) 'Domestic LPI Performance', (Accessed at <https://lpi.worldbank.org/domestic/performance/2016/C/ZAF#chartarea>)
- The World Bank. (2013). Unlocking Growth Potential through Regulatory Reform and Complementary Measures.
- Transportation Association of Canada. (2006). "Performance Measures for Road Networks: A Survey of Canadian Use".
- Transportation Research Board. (2011). "Performance Measures for Freight Transportation".
- UNESCAP (2013) 'Guide to Key Issues in Development of Logistics Policy', Transport Division, United Nations Economic and Social Commission for Asia and the Pacific
- United Nations Conference on Trade and Development. (2005). "Trade and Development Index".
- United Nations Conference on Trade and Development. (2015). "Review of Maritime Transport 2015".
- United Nations Economic and Social Commission for Asia and the Pacific, Organization for Economic Cooperation and Development, ARTNeT, UNNExt. (2015). Indicators for Trade Facilitation: A Handbook.
- Williams, A. (2017), 'Logistics Industry Group Launches Tech Platform for Seamless Tracking of Goods', The Straits Times, published on 9 November, 2017 (Accessed on <http://www.straitstimes.com/business/logistics-industry-group-launches-tech-platform-for-seamless-tracking-of-goods>)
- Woo, J. (2016), 'Innovation gives Container Logistics a Boost', The Straits Times, published on 24 August 2016 (Accessed on <http://www.straitstimes.com/business/companies-markets/innovation-gives-container-logistics-a-boost>)
- World Bank. 2016. Doing Business 2016: Measuring Regulatory Quality and Efficiency. Washington, DC: World Bank. DOI: 10.1596/978-1-4648-0667-4. License: Creative Commons Attribution CC BY 3.0 IGO
- World Bank. 2017. Doing Business 2017: Equal Opportunity for All. Washington, DC: World Bank. DOI: 10.1596/978-1-4648-0948-4. License: Creative Commons Attribution CC BY 3.0 IGO
- World Economic Forum. (2016). "The Global Enabling Trade Report 2016".
- World Economic Forum. (2017). "The Global Enabling Trade Report 2016-17".
- World Trade Organization. (2017). "World Trade Statistical Review 2017"
- Yergaliyev, R. & Raimbekov, Z. (2016). "The Development of the Logistics System of Kazakhstan as a Factor in Increasing its Competitiveness". Elsevier.
- Yun, G. (2017), "Ghost Port': Asia's First Fully-automated Port Begins Operations in Qingdao', CGTN (Accessed at https://news.cgtn.com/news/3d637a4e31677a4d/share_p.html)

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