

Department of Industries & Commerce
Government of Kerala



KERALA STATE LOGISTICS ACTION PLAN

SEPTEMBER 2021

KERALA INDUSTRIAL INFRASTRUCTURE DEVELOPMENT CORPORATION





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List of Abbreviations

Abbreviation	Expansion
3PL	Third Party Logistics
A&M	Approach & Methodology
AI/ML	Artificial Intelligence/Machine Learning
API	Application Programming Interface
ASAP	Additional Skill Acquisition Programme
B2C	Business to Customer
BS-VI	Bharat Stage VI
CFS	Container Freight Station
CIAL	Cochin International Airport Limited
CII	Confederation of Indian Industry
CLRA	Contract Labour Regulation Act
CUSAT	Cochin University of Science and Technology
DFC	Dedicated Freight Corridor
DGFT	Directorate General of Foreign Trade
DPR	Detailed Project Report
EODB	Ease of Doing Business
EPC	Engineering, Procurement, and Construction
EV	Electric Vehicle
EXIM	Export Import
FAR	Floor Area Ratio
FICCI	Federation of Indian Chambers of Commerce & Industry
FMCG	Fast Moving Consumer Goods
FSI	Floor Space Index
FTL	Full Truck Load
FTWZ	Free Trade Warehousing Zone
FY	Fiscal Year
GAIL	Gas Authority of India Limited
GDP	Gross Domestic Product
GIZ	Gesellschaft für Internationale Zusammenarbeit
GOI	Government of India
GPS	Global Positioning System
GSE	Government-Sponsored Enterprise
GST	Goods and Services Tax
HQ	Head Quarters

Abbreviation	Expansion
ICT	International Container Terminal
IGST	Integrated Goods and Services Tax
IIT	Indian Institute of Technology
INR	Indian Rupee
IOT	Internet of Things
IT	Information Technology
ITES	Information Technology Enabled Services
IWT	Inland Water Transport
K-BIP	Kerala Bureau of Industrial Promotion
KINFRA	Kerala Industrial Infrastructure Development Corporation
KMML	The Kerala Minerals and Metals Limited
KPI	Key Performance Indicator
KSDMA	Kerala State Disaster Management Authority
KSEB	Kerala State Electricity Board Limited
KSINC	Kerala Shipping & Inland Navigation Corporation Ltd
KSSAI	Kerala State Small Industries Association
KSUM	Kerala Startup Mission
LCS	Logistics and Customs Services
LEADS	Logistics Ease Across Different States
LINE	Logistics Innovators Network
LPAI	Land Ports Authority of India
LPI	Logistics Performance Index
LSG	Local Self Government
MC	Main Central
MHA	Ministry of Home Affairs
MHRD	Ministry of Human Resource Development
MMLP	Multi-Modal Logistics Park
MNC	Multinational Corporation
MRO	Maintenance, Repair, and Overhaul
MSME	Ministry of Micro, Small & Medium Enterprises
MT	Metric Tons
NA	Not Applicable
NBFC	Non-Banking Financial Corporation



Abbreviation	Expansion
NDMA	National Disaster Management Authority
NH	National Highway
NHAI	National Highway Authority of India
NITB	National Information Technology Board
NLP	National Logistics Policy
NSSO	National Sample Survey Office
PESTEL	Political, Economic, Social, Technological, Legal and Environmental factors.
PGA	Participating Government Agencies
PMU	Project Management Unit
PPP	Public-Private Partnership
PWD	Public Works Department
RKDP	Rebuild Kerala Development Program
RKI	Rebuild Kerala Initiative

Abbreviation	Expansion
RMS	Risk Management System
SH	State Highway
SLAP	State Logistics Action Plan
SLCC	State Level Coordination Committee
SME	Small and Medium-sized enterprises
SOP	Standard Operating Procedure
SPV	Special Purpose Vehicle
SRUTI	Society for Rural Urban & Tribal Initiative
SWC	State Warehouse Corporation
SWOT	Strength, Weakness, Opportunity, and Threat
ULIP	Unified Logistics Interface Platform
USA	United States of America
USD	United States Dollar



Executive Summary

Globally in advanced economies and developed logistics eco-systems, the logistics cost is less than 8% of GDP, whereas in India, it is upwards of 13%. This blunts the competitiveness of Indian economy, hence, to reduce logistics cost, improve quality and make the country more competitive, Government of India has launched a National Logistics Policy (NLP) with a 5-pillar approach. Taking this forward, Government of Kerala as part of this exercise has developed a State level logistics action plan for advancing the competitiveness of State from a logistics perspective. In this report, the Kerala Logistics sector is analysed in detail from multiple perspectives – Export and Import movements to and from the State, from production and consumption perspective, multiple modes of transport and their costs, and the futuristic trends that would drive logistics demand of the State. Being a consumer State, as evident from the e-way bill statistics data regarding movement of goods to Kerala, the State’s Logistics sector is primarily dominated by inbound logistics and road is the major mode of transport. As a part of this study, the potential of aggregation of logistics is examined in detail by a geo-clustering exercise and suitable aggregation points as well as inter-connection routes are identified. For Kerala to evolve as a well-functioning and competitive logistics eco-system, a key factor would be to reduce cost of the goods being transported via roads and by shifting traffic to other modes such as rail and water. Hence, there is a need to develop an effective middle-mile eco-system with all the modes of transport as well as third party logistics(3PL) players offering a range of services. Developing logistics sector also requires focussed efforts towards upskilling human capital in all the three main logistics areas – storage, transport, and services – at blue-collar, basic technical, advanced technical and management levels as well. The study also focussed on assessing the skill requirements and identifying areas such as cold storage, indigenous low-cost technologies etc. requiring interventions with respect to the State context. The study also analysed various aspects and assessed the potential cost savings that can be achieved by various initiatives like setting up mini-multi-modal logistics parks around these clustered points, increasing effective tonnage of roads, moving cargo to rail and water etc. A multi-dimensional analysis of cargo has been done from State’s perspective for prioritizing cargo initiatives under the plan.

The draft State Logistics Action Plan prepared as part of this study comprises of key Strategic Initiatives along with key sub-tasks, details of corresponding Implementing Authority/agency, timelines and KPIs. The timeline for implementation is categorised under Short (1-2 months), Medium (3 months to 1 year) and Long (5 years). The key strategic initiatives for the State are identified based on assessment of the existing logistics infrastructure capacity, future demand, inherent challenges faced by the stakeholders, NLP’s 5-pillar analysis and Logistics ease across different States (LEADS) framework analysis. The list of strategic initiatives identified under different heads such as Infrastructure Development, Transport Infrastructure, Logistics Facilities, Digitisation of Logistics operations, institutional development and policy measures are as follows:

A. INFRASTRUCTURE DEVELOPMENT – TRANSPORT INFRASTRUCTURE

1. **Increase tonnage of logistically important roads to support 4axle 6Wheel trucks (28.5 tonnes):**
In Kerala, the cost of road transport is high because majority of roads do not support large trucks with maximum tonnage (28.5) permitted nationally. It is recommended to further strengthen and augment the logistically important roads to support these type of maximum tonnage vehicles, which can drive down the cost of logistics.
2. **Develop cargo infrastructure for using rail and water transport:** Seamless switching between multiple modes of transport needs good storage, loading and unloading infrastructure at ports, railway stations etc. This is to be strengthened to enhance modal shift of traffic to rail and water and reducing cost of logistics.
3. **Green Logistics for last-mile delivery:** To reduce the ecological impact of logistics initiatives, feasibility of cargo Electric Vehicles for last-mile delivery can be explored.
4. **City Level Logistics:** As urbanization rate of Kerala increases, from a city-level perspective more logistics needs are envisaged, which would require dedicated logistics policy, storage, zones etc. by developing city level logistics plan.



5. **Rail Freight transport:** For industry to use rail effectively, there should be predictability and frequency in rail schedules, along with adequate infrastructure availability such as cold-chain, Ro-Ro support, good storage and loading facilities in stations etc. to be developed jointly working with Railways.

B. INFRASTRUCTURE DEVELOPMENT – LOGISTICS FACILITIES

6. **Develop return cargo (recyclable and other cargo) facilities and volumes (Reverse Logistics):** Kerala being a consumer State, the direction of flow of cargo is quite unbalanced with inward logistics dominating. Absence of return cargo drives up the effective cost of logistics. Hence to reduce the cost of logistics, trucks coming in will have to be provided with opportunities to pick up reverse cargo.
7. **Warehousing as business:** There is need for good quality warehouses with facilities like cold storage across the State. Hence in logistically important clustered zones identified in this report, it would be important to develop more warehouses with private investments. Hence warehousing as a business activity require a dedicated policy initiative.
8. **Exploring Feasibility of MMLP:** The Central Government has identified Kochi as a plausible MMLP node. The State shall support in conducting feasibility assessments for the same and pitch for future locations that can come under the next phase.

C. DIGITISATION OF LOGISTICS OPERATIONS

9. **Digitise State logistics:** State logistics entities like State warehousing corporations, Ports etc need to be digitized with external facing API's and applications that can give customers and businesses good visibility into availability of space, transport etc.
10. **Transportation Management Systems:** Logistically important roads could be regulated with state-of-the-art traffic and inspection management systems that can reduce the need to stop at multiple points and improve the smoothness of logistics functions

D. INSTITUTIONAL DEVELOPMENT

11. **Mini-MMLP's:** Upgrade selected SWC depots as mini-MMLP's. State warehousing corporation depots at logistically clustered points could be augmented to serve multiple types of cargo and serve as aggregation points to improve volumes in middle-mile. This would also develop the third-party logistics service provider eco-system.
12. **Specialized Skilling plan for Logistics:** Strategic skilling plan for logistics covering storage, transport & services need to be developed. A high-level skilling needs analysis is done as part of this. This can be further developed to improve curriculum and skilling plans at various levels
13. **Logistics plan for Disaster Management: Kerala, being prone to multiple natural disasters,** logistics for disaster management is critical for the State. . In regard to this, key aspects like backup transport routes, storage and distribution modes for essential commodities etc. needs to be mapped under logistics for disaster management.
14. **Industry Engagement Channel for legal, policy and standards setting:** As industry evolves, logistics needs would become more specialized. Hence, continuous interaction is needed from industry to keep the requirements from market clearly factored in various logistics initiatives.

E. POLICY MEASURES (REGULATORY STANDARDS)

15. **Industry Status for "Logistics Sector":** Logistics need to be considered as an industry in Kerala context to develop the infrastructure and investments in the State. Subsidies at-par with industries need to be provided for investors who are willing to invest in logistics sector
16. **3PL (Third Party Logistics) providers benchmarking framework: To evolve into a matured logistics market, there is a need to develop** third party logistics providers eco-system. In this regard, a benchmarking framework that assesses these service providers with various cargo handling capabilities is to be developed.



17. **Drone Delivery:** Drone delivery is being piloted across the world in multiple contexts. High ranges in Kerala like Idukki could be a good area to pilot drone delivery beyond line of sight as the economics of road delivery will be costly in such places.

An implementation approach is defined to focus upon the next steps to be undertaken to implement the State Logistics Action Plan swiftly in the State. The key roles and responsibilities assigned to State Logistics Coordination Committee, State Logistics Cell, Line Department working groups (including nodal officers from all Departments/Agencies covered under the action plan) and a dedicated Monitoring and Evaluation unit is described. The implementation approach also lays down the provision of taking regular feedback from industry players (both users and logistics service providers, infrastructure players etc.) and key experts at various meetings. To take forward the implementation approach, following are the critical action items:

- Formalise the sub-Department working Groups/Synergy council by nominating nodal officers from all stakeholder Department/agencies
- Operationalise a Project Monitoring Unit under the State Logistics Cell via a Government Order or appropriate notifications to monitor the progress of the initiatives listed in the final Action Plan document
- Request sub-Departments to share detailed proposals for the initiatives mapped under them based on the Department-wise mapped initiatives.
- Liaison with Finance Department and Central Government to finalise appropriate funding sources for the key strategic initiatives
- Conduct monthly review meetings to monitor progress of the exercise
- The State Logistics Cell is to provide monthly progress status to the State Logistics Coordination Committee before every Meeting.

All these initiatives are identified through secondary research, industry interaction sessions and based on data from various Government Departments such as GST, Transport, Food & Civil Supplies, etc. As multiple initiatives under the State Logistics Action Plan move ahead, these initiatives could also be refined further and wherever needed, primary research centric activities could be initiated. A systematic execution of the plan would improve Kerala's competitiveness in the logistics sector and offer seamless user experience for doing business in the State.



1. Introduction

As India endeavours to become a self-reliant USD 5 trillion economy by 2025, a modern and efficient logistics network must be developed to address key logistics challenges in India. The Indian logistics sector is highly fragmented and unorganized with complex regulations as various sectors are governed by multiple stakeholders. Further, it is highly skewed towards road freight (more than 60%). There are problems with asset utilization, last mile connectivity, low technology adoption in warehouses, high indirect cost on account of unpredictable supply chains etc. Due to all this, the country's logistics costs are above 13% of GDP whereas in advanced countries, it is about 8%.

To enhance logistics sector competitiveness, Ministry of commerce and Industry, Government of India has set up the logistics division for drafting a national logistics policy to provide a unified policy environment and an integrated institutional mechanism. The key objectives of National Logistics Policy are:

- (i) Developing Multi-modal Transport
- (ii) Digital Transformation of Logistics
- (iii) Sector Modernization
- (iv) Excellence in logistics and,
- (v) Logistics democratization

Five pillars of programmatic interventions are envisioned at a national level cutting across all aspects of logistics to drive efficiency, reduce cost and improve competitiveness. A master plan for National Logistics is being developed to have a long term (10 year) integrated view on developing logistics sector. It would

- Enable demand driven development of logistics
- Provide national multi-modal transportation and logistics framework and
- Help establish National logistics grids for optimization of logistics movement between major supply and demand clusters.

The state governments are mandated to develop master plans for State logistics, reflecting State priorities in alignment with master plan of national logistics. Each state will have its own unique logistics challenges & priorities. It is recommended that these be analysed in detail in conjunction with the prevailing logistics situation in state and an action plan is developed factoring all the state specific factors.



2. Objective of study

Importance of Logistics for trade and GDP growth

Logistics is one of the key elements of trade. Every manufacturing or distribution business incurs a logistics cost to ship their products to the consumers. This cost as a percentage of the total value of goods should be competitive for the state or country across its peers to attract investments and trade. Besides cost, there are other efficiency factors like service provider eco-system, ability to handle different types of cargo in a timely manner etc. that adds to the overall attractiveness of the state from logistics perspective. Hence, an efficient logistics plays a crucial role in determining the country’s competitiveness and therefore its GDP.

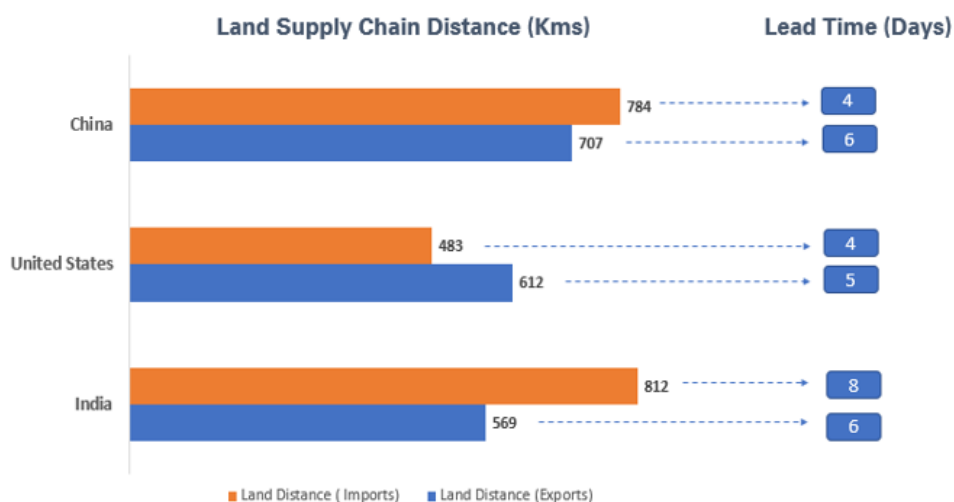


India ranks 44th on the World Bank’s Logistic Performance Index (LPI), a benchmarking tool that measures performance along with the logistic supply chain within the country, across 160 countries. The LPI has 6 Parameters namely Customs, Infrastructure, International Shipments, Logistic competence, Tracking and Tracing and Timeliness. India’s Global Rank on Infrastructure, which forms the base for other critical parameters, however, has a rank of 52, lower than the overall LPI rank depicting the need to target infrastructure. To further improve the LPI, India has to not only focus on improving its logistic infrastructure but also the competence and quality of logistic services.

Logistic costs in India are high due to higher travel lead times and skewed modal mix

One of the important parameters of LPI is the **Lead time – Land**, which measures the time taken to traverse a country’s land distance between production / consumption center and Sea port. A comparison of India’s land lead time with other countries with large land area such as China, United States of America shows that lead time to transit is higher in India compared to these countries.

Figure 1: Logistics costs – Comparison of India with China and USA



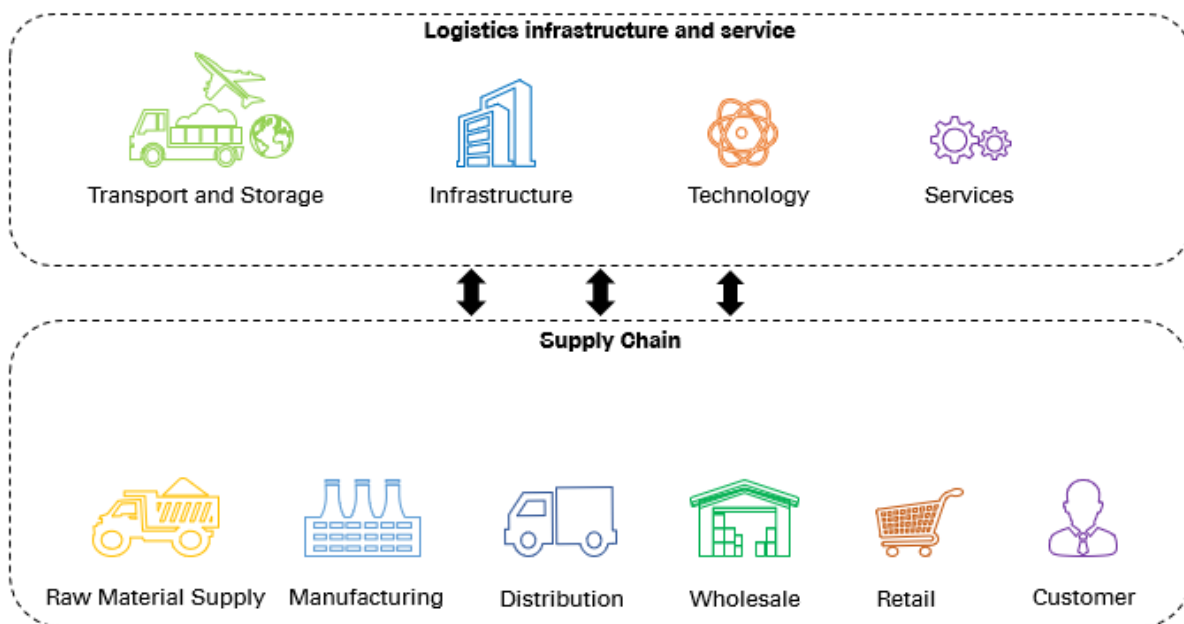
Source: KPMG in India Analysis 2021 based on market research



One of the key reasons for this higher lead time is low average speed of freight transportation on road and rail due to various constraints. On road, the constraints are poor road infrastructure, low driver productivity, restriction at city entry and exit and other challenges. Whereas with respect to rails, challenges include priority given to passenger trains over freight trains, saturated line capacities (up to 150% on key routes) etc. The modal mix is tilted in favor of road due to various reasons including low entry barriers in trucking (majority of the truck owners own one to two trucks), poor safety norms, overloading and other in-correct practices followed by trucking industry. Further, poor service qualities in rail owing to various challenges are also some of the reasons for lower inclination towards rail. To increase the logistic effectiveness of India and in effect for Kerala, there is a need to resolve these challenges.

Compared with the traditional logistics industry consisting of scattered and single-operational activities, modern logistics is systematic and integrated, providing a full range of one-stop service through extensive application of information technology and industry expertise for supporting the entire supply chain from transport and freight, warehousing management, and order processing to delivery and customer service. MMLP is one such proposition that would encompass an interplay of Infrastructure, Services and Technology.

Figure 2: Logistics Supply Chain



Source: Asian Development Bank

Kerala is one of the most well-connected State in the country in terms of its transport infrastructure. It has the highest density of roads, rail network spanning from one end to the other end of the State, which is almost running parallel to the national Highway, 4 international airports of which three are well connected to the mainland road and railway network, and 2 Major sea ports and multiple minor ports connected by a coastal sea line.

However, while the above exists, Kerala like many other States in the country has been primarily dependent on road infrastructure for freight movements and hence has a very high percentage of logistics dependent on the roads. Owing to the population density and urbanization, the roads are small and congested. Consequently, logistics operators in state have preferred smaller vehicles and this has resulted in underdeveloped material handling infrastructure and warehouses with limited mechanization



Kerala being one side a very consumer-oriented State, and at the other end producing most of the cash crops and export-oriented products like marine products, frozen food, other processed foods etc require an efficient logistics infrastructure primarily supporting multimodal logistics hubs. These logistics parks will address the issues of unfavourable modal mix, inefficient fleet mix and underdeveloped material handling infrastructure.

Efficient logistics are a critical enabler for policy initiatives such as “Make in India” and in the nationwide implementation of the uniform indirect tax system, the “Goods and Services Tax”. Logistics has been accorded “infrastructure” status in 2017, facilitating the availability of debt on easier terms and access to external commercial borrowings, longer tenor funds from insurance companies, and pension funds, as well as investment support. For institutional support, a new Logistics Division has been set up in the Department of Commerce, Ministry of Commerce and Industry, Government of India, to coordinate integrated development of the sector by way of policy changes, improvement in existing procedures, identification of bottlenecks and gaps, and introduction of technology-based interventions. Technological support is being provided through the development of a Logistics Portal which will serve as a transactional e-marketplace for logistics service providers and users. A Logistics Data Bank has been commissioned to track containers on a near-real-time basis.

In India, while factors like topography do play a role, there are also many attributed factors contributing to the inefficiencies present in the logistics movement, which are as follows:

- Skewed modal transportation mix with more than 60% freight movement by road,
- Underdeveloped material handling infrastructure as Warehousing landscape is highly unorganized with little or no value-added services.
- Inefficient fleet mix. Small and inefficient trucks with gross vehicle weight rating of 16–25 metric tons (MT) (compared to 26–39.9 MT trucks, have lower payloads.
- Freight cost for a 9 MT truck at `3.56 per ton–km is 2.5 times that for a 40 MT truck.
- Absence of logistics hubs to act as zones for freight consolidation and disaggregation
- Inefficient service model due to lack of investments in information technology and equipment technology, hence compromising productivity gains and service quality
- Fragmented institutional and governance structure.

The effectiveness of a logistic chain not only depends on the entire supply chain network but also on logistic parks, acting as key nodal points allowing the seamless flow throughout the network. An efficient network is thus able to transport freight from one end of the network to the other end seamlessly, i.e. from industrial production centres to consumption centres. The industrial outputs generated in the investment regions across the four locations particularly along the Kochi Bengaluru Industrial Corridor will need to be transported across the country seamlessly using Multi-modal logistics park. This can only be achieved if there are medium to large scale Multi-modal logistic parks which will act as a one stop solution for all logistic related matters. These logistic parks can provide logistic services such as customs, container transport, warehousing and storage and other value-added services such as packing, labelling etc. to the existing industries in proximity and upcoming industries planned in special investment regions.

The Strategic Vision Document prepared for Kerala Industrial Infrastructure Development Corporation (KINFRA) focusses on below key areas:

- Strategic Assessment: This section of the report focuses on the assessment of existing strategies, offerings, and vision of KINFRA. The key highlights of Kerala’s industrial scenario and KINFRA’s contribution in making Kerala better investor friendly State was assessed. This section also provides a detailed portfolio of KINFRA’s offerings, current vision and strategies deployed.
- Infrastructure Assessment: This section details out the performance of the Industrial Parks of KINFRA by reviewing location, utility, accessibility, infrastructure amenities etc. **A qualitative and quantitative assessment of industrial infrastructure and logistics infrastructure was conducted to identify critical**



industrial infrastructure gaps. To understand the parks performance, a detailed survey was conducted among the stakeholders to get valuable inputs to assess KINFRA's infrastructural offerings.

- **Performance Assessment and Benchmarking:** This section covered historical performance assessment of KINFRA with respect to revenue growth, financial analysis, scenario analysis. An extensive benchmarking exercise was conducted which covered strategies adopted by other southern industrial infrastructure development corporations, best practices adopted globally and at state/ national level.
- **Business Model Assessment:** This section covered assessment of KINFRA using various tools such as SWOT Analysis, Porter's Five Forces Analysis, PESTEL Analysis, and Critical Success Factor Analysis to derive key inputs for future strategy interventions and identify key opportunities for KINFRA.
- **Investment Potential Assessment:** Under this section assessment of the current investment ecosystem in the State, its limitations and possible growth opportunities for KINFRA was conducted.
- **Strategic Vision Development:** This section outlined the key principles for development of the vision. The future vision of KINFRA is tailored to focus on developing a sound and sustainable industrial ecosystem in the State for which robust infrastructure and support services are key. It is key to capture prospects and disruptions envisaged in the industrial landscape owing to new infrastructure requirements such as Industry 4.0 for industries to stay relevant.

The Overall Strategic Directive for KINFRA has given renowned focus on enhancing its logistics sector offerings based on the **qualitative and quantitative assessment of industrial infrastructure and logistics infrastructure to identify critical industrial infrastructure gaps undertaken as part of this study.**

To enhance logistics sector competitiveness, the Ministry of Commerce and Industry, has set up the Logistics Division, which has drafted a "National Logistics Policy" to provide a unified policy environment and an integrated institutional mechanism. A State Level Logistics Action Plan shall be developed by the nodal agency KINFRA, for implementing the policy recommendations in a phased manner.



3. State's Logistics sector

3.1 Overview

Kerala has a geo-strategic location with respect to international logistics. The state is near to International shipping channels connecting Middle East & South East Asia. The State is accessible through 17 seaports which include 1 major International Container Terminal (ICT) and another upcoming one at Vizhinjam. It has 4 international airports with regular connectivity to all parts of India as well as Middle East and South-East Asia. Kerala is historically a consumption driven State with a per-capita consumption expenditure in rural Kerala, twice that of rural India. Such consumption patterns are attracting a lot of demand from MNC's to look at State as a strategic market. Kerala accounts **for 5.4% of country's processed food exports and it hosts 75% of India's certified sea food units**, 5 state of the art food processing parks including two mega food parks. All this constitute a good base for cargo with varying destinations (intra-state, inter-state, and export). All these units also have need for sourcing input materials, many of which comes from outside of the state. For enhancing their competitiveness, the cost of logistics of these industries shall be as per the International standards. The Government of Kerala already has an ongoing program for developing inland water navigation connecting north-south regions, aimed at reducing the transportation costs to a great extent.

From an overview of logistics infrastructure, Kerala has 2.73 Lakh km of Roads, 1588 Km of Railways, 1687 Km of potential inland waterways, 585 km coastal route, 17 ports including major and minor ports and four cargo handling airports. Kerala has a total of 12 container freight stations (CFS) and 2 inland container depots. The State warehousing corporation has 56 depots with nearly 100% utilization. State also has 72929 MT of frozen storage capacity.

Kerala's logistics sector faces a lot of challenges. As the State is a densely populated one of the primary challenges is the lack of availability of land, aiding in unaffordable land costs for setting up advanced logistics infrastructure near the cities where consumption demand is more. Further, as many of the industrial parks are established in places having road as the only mode of connectivity, logistics costs are higher. Furthermore, the road characteristics of the state, Kerala along with its geographical factors pose serious limitations in tonnage limit of trucks on roads thereby increasing the overall logistics costs. Another challenge being the lack in flexibility of the labour markets and the absence of modern infrastructure in the existing state-owned warehouses.

From a futuristic perspective, the urbanization rate of Kerala is expected to surge up to 90% by the mid 2030's from the current 70% leading to strong demand for urban logistics thereby surging demand projections for reverse logistics and return cargo as well. But as 56% of the State's geographical area is covered by the Western Ghats, infrastructural expansion seems constrained.

3.2 Kerala EXIM Scenario

The State has a trade deficit of 1 Lakh Crore with rest of the country while foreign trade is balanced¹. The import and export of the major goods are as depicted below:

Table 1: Export/Import Goods from other states to Kerala

Export/ Import	Major Goods	States
Import	Automobiles (Motor vehicle, two wheelers), Electronic consumer goods, light machinery and equipment and garments. Cereal imports of Rice and Wheat	Tamil Nadu, Karnataka, Andhra Pradesh, Telangana, Madhya Pradesh
Export	Petroleum goods, Petrochemicals, Rubber and Plastic products, Vegetables, Spices and Farm produce.	Tamil Nadu, Maharashtra, Karnataka, Gujarat, Haryana

¹ Kerala Economy, Gulati Institution of Finance and Taxation ; Sep 2020

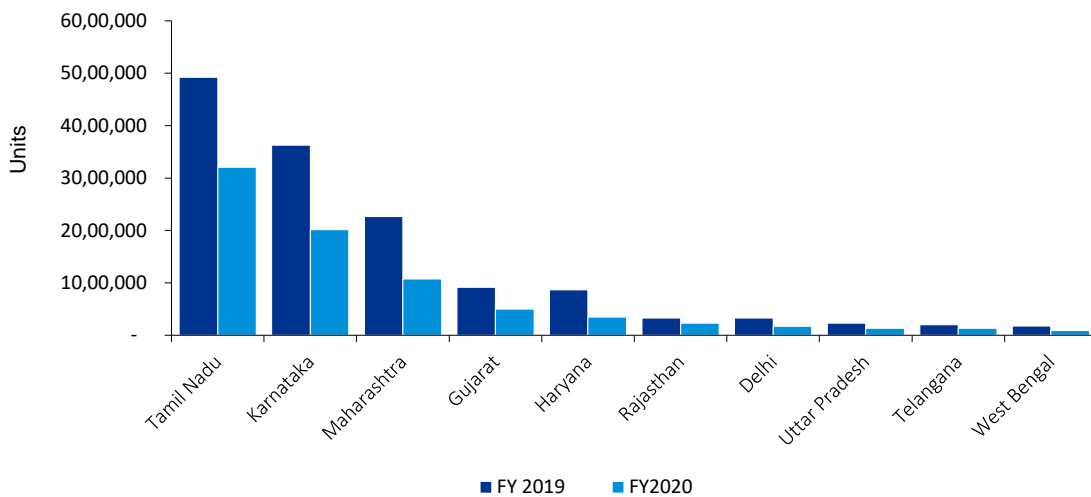


Table 2: Export/Import of goods from other countries to Kerala

Export/ Import	Major Goods	Countries / Regions
Import	Machinery, Intermediaries like chemicals, wood pulp, base metals) dominate its imports	China and South – East Asia
Export	Marine Products, Petroleum Products, Agriculture produce (Coir, Spices, Cashew, Nuts, Tea etc.), and Rubber Products topped the chart in FY 20. Jewelry accounted for nearly 60% of merchandise exports in FY19	USA, Europe, and Middle East

Traffic from other states to Kerala (inward) dominate over the traffic from Kerala to other states (outward). The graph also takes into consideration the impacts of Covid-19 caused in the travelling patterns of the people as evident for the year 2020.

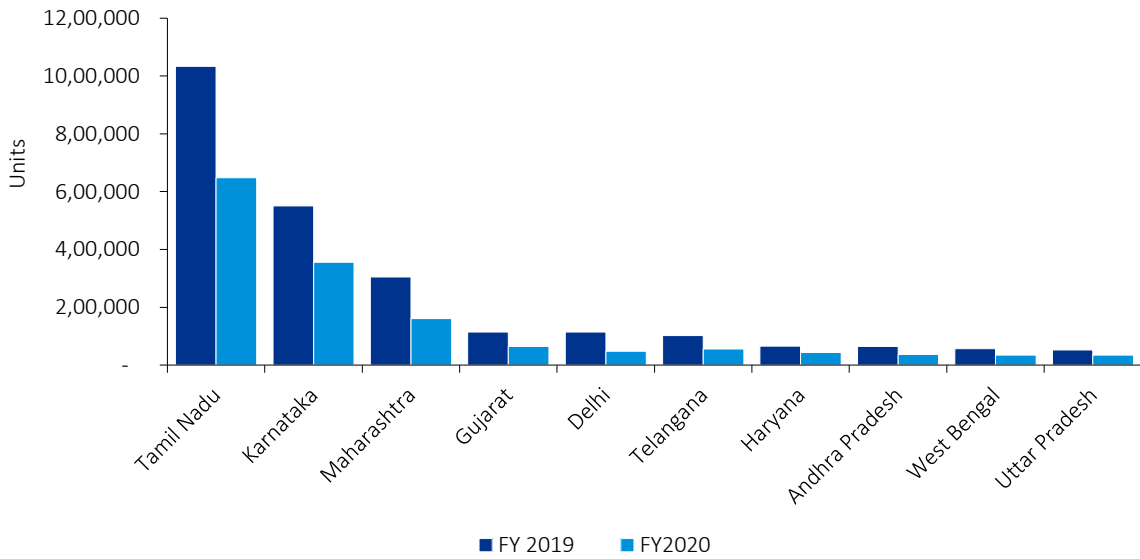
Figure 3: Import Consignments to Kerala - State-wise



Source: Eway bill statistics, State Goods and Services Tax Department, Government of Kerala



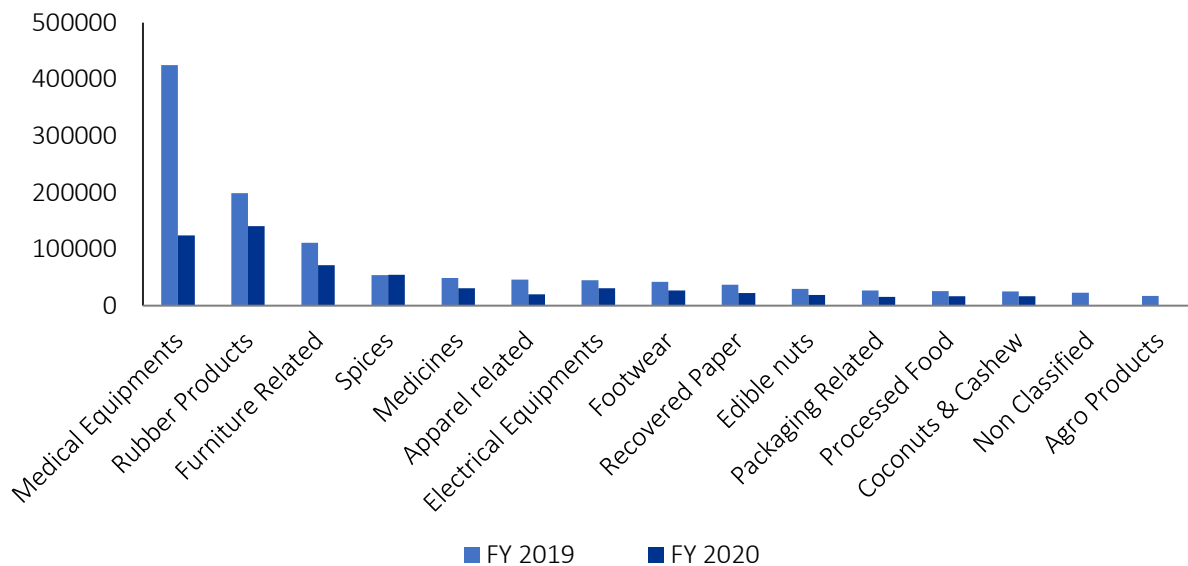
Figure 4 : Export Consignments from Kerala - State-wise



Source: Eway bill statistics, State Goods and Services Tax Department, Government of Kerala

From the above statistics, it can be seen that the logistics sector of the State is largely driven by inbound logistics and its needs. It is by and large dependent on road as well, as the traffic is flowing from neighbouring states. With respect to the sector-wise movements of a consignment from the State, the import / export details as given below:

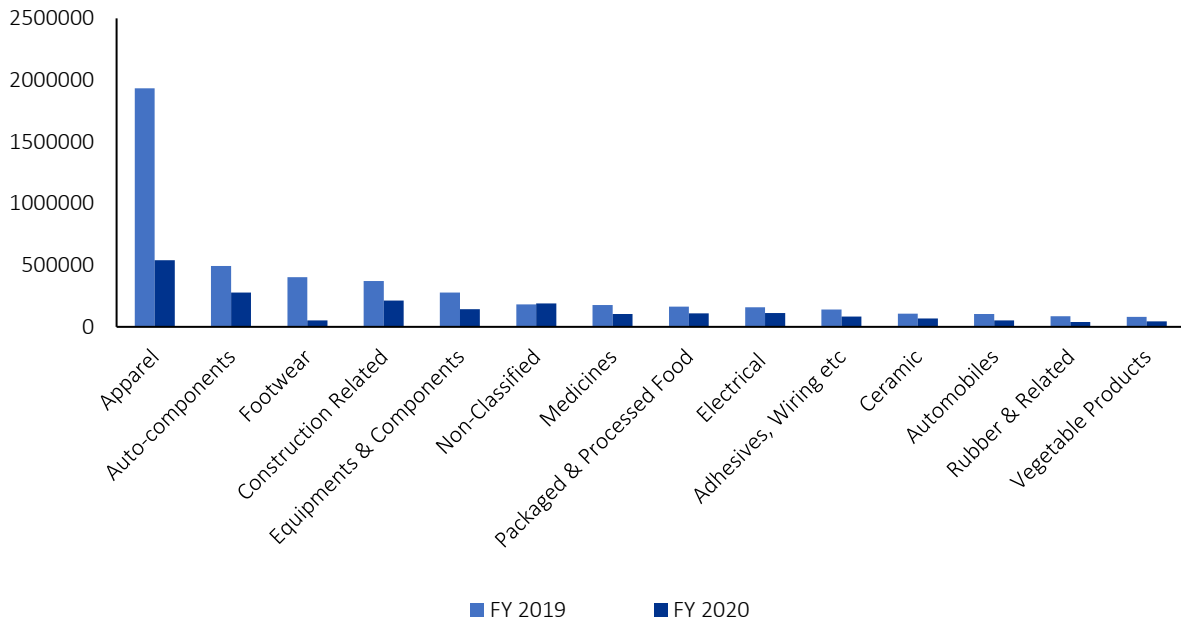
Figure 5: Consignment movement from Kerala to other States – Sector-wise



Source: Eway bill statistics, State Goods and Services Tax Department, Government of Kerala



Figure 6: Consignment movements from other states to Kerala sectorial



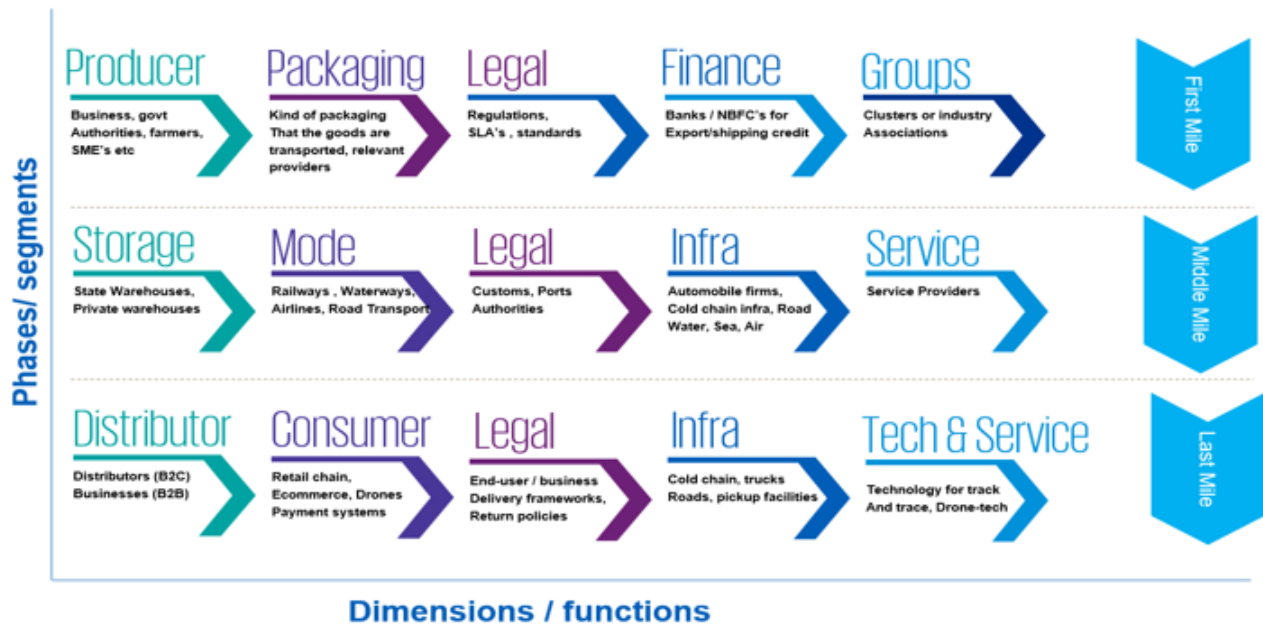
As evident from the above data, about half of the valuable goods are imported from Tamil Nadu and Karnataka and some of the majorly consumed foods such as cereals etc. are imported from Andhra Pradesh and Telangana.

3.3 Logistics Sector Ecosystem – Key Stakeholders

For efficiently intervening in logistics sector, we need a coordinated action strategy from multiple stakeholders like Industries Dept, Roads Transport Department, Railways, Seaports, Inland Water Terminals, Customs, Warehouses, and industry associations. Logistics in evolved economies is divided into First Mile, Middle-Mile and Last-Mile. These three phases have distinct characteristics and have different stakeholders and players. A comprehensive logistics eco-system can be visualized as deciphered below:



Figure 7: Logistics Eco-system Stakeholders - Phases vs functions



Source: KPMG in India Analysis 2021 based on market research

3.3.1 First Mile Logistics

The First Mile logistics phase consists of delivering goods from a producer’s farm/factory to an intermediate warehouse, before an exhaustive phase of delivery to follow. In this phase, the key stakeholders include - **producer or source businesses, packaging service providers, standard setting authorities , regulators** who decide on what could be transported on which mode and how, **Banks or NBFC’s** which provide the trade-financing or export financing arrangements, **industry clusters, and associations** or groups which can come together and get economies of scale by collective negotiations. Road is the most preferred mode of transport for First Mile Logistics, unless the commodity that’s being produced has an integrated pipeline, rail, or port linkage in close proximity of the factory.

3.3.1 Middle-Mile Logistics

In Middle-mile, goods are transported from the intermediate warehouse to the distributors warehouse near the destination. Typically, this is the longest part of logistics and this is where economies of scale come into picture. Middle mile comprises of all the modes of transportation such as Road, Rail, Water, Air. Consequently, it has **all the concerned authorities and service providers involved with these modes** act as the **key-stakeholders**. In developing economies, first-mile and middle-mile often overlap, and producers ship the goods directly to the distributor (in case of B2C) or to the end-business (in B2B) This kind of direct shipping is quite costly as the economies of scale is less. As a strategic priority to develop a state / country’s logistics sector, it is imperative that the middle mile is developed. It is in Middle mile that the large aggregation points like MMLP (Multi-Modal Logistics Parks) come into picture. In India, rail cargo is primarily used for Agro and related items from a middle-mile perspective. However, railways do not meet the new-age industry requirements and hence under-utilised by other sectors.

An efficient Middle Mile infrastructure is needed for third-party logistics (3PL) providers to operate seamlessly. This infrastructure includes, dedicated freight zones or aggregation points from where the mode of logistics could be shifted from one to another, advanced storage infrastructure, roads, trucks, ferries, rail-wagons supporting larger tonnage interconnecting these aggregation points. Such an eco-system with efficient turnaround time would attract more 3PL providers to come to Kerala. thereby resulting in increased benefits in terms of economies of scale.



3.3.3 Last-Mile Logistics

In last mile logistics, the end-delivery from distributors warehouse to the end-consumer or destination business is handled. The logistics sector has seen advent of technology for track and trace, returning goods, cash on delivery etc. mainly for the B2C segment. Advanced technologies like drone delivery are being piloted in this stage nationally and internationally. The Last-mile logistics phase include a multitude of services through road, ranging from a mix of vehicles from pickup trucks to bikes. The key stakeholders are **distributors, consumers, or end-businesses, regulatory or legal authorities** like consumer protection, automobile service providers, drone providers, infrastructure providers for last-mile cold-chain, technology, and service providers.

3.3.4 Key Government Stakeholders

- Logistics division with related Ministries
- Ministries of Civil Aviation, Roads, Railways and Shipping and related State Government Departments
- Agriculture, MSME and User Ministries, Railways, Shipping, Coal, Petroleum and Natural Gas
- Customs, DGFTs, PGAs, LPAI

3.4 Kerala's Logistics – Production Side

Considering, the comprehensive view of the goods produced in State, it could be categorized into Agro and Food Products, Minerals, Construction-Centric Goods, Finished Goods from Industry. Each of these categories are mapped and explained in detail in the sections below.

3.4.1 Minerals

With respect to the mineral produce, most of the produce is found near Chavara in Kollam, which is then used by KMML, for producing various industrial products. KMML markets their products worldwide and across India. The current road transit option for KMML is through Walayar (Palakkad) or through Nagercoil (for Southern Tamil Nadu market and ports). Limestone is produced mainly in high ranges of Idukki and Palakkad and is predominantly used in construction related industry.

Table 3: Major Minerals (Feeds into inter-state markets)

Type	2019-20 in Tonnes	2020-21(Est) in Tonnes	Key Areas with relevant production	Key Logistics Corridors
Ilmenite	97,736	99,990	Chavara, Kollam	Kollam – Palakkad, Kollam-Nagercoil, Kollam – Cochin Port, Kollam -Vizhinjam
Limestone	481,232	133,372	Palakkad, Idukki	Idukki/Palakkad/high ranges to all cities in Kerala
Zircon	6,133	5,682	Chavara, Kollam	Kollam – Palakkad, Kollam-Nagercoil, Kollam – Cochin Port, Kollam -Vizhinjam
Rutile	3,984	1,656	Chavara, Kollam	Kollam – Palakkad, Kollam-Nagercoil, Kollam – Cochin Port, Kollam -Vizhinjam

3.4.2 Minor Minerals

Ecologically as Kerala has been ravaged by natural disasters, exploiting minerals by quarrying is highly regulated. Hence there is a requirement of developing diversification of mineral sources produced in State



from a 5-year perspective and all the sources are to be connected to the main consumption centres through an efficient logistics network especially for the Construction sector.

Cargo incentive at the rate of ₹3/tonnes/km is provided for moving the cargo in waterways along the Kerala coast between Pozhiyoor in South and Manjeswaram in North, loaded/ unloaded at a non-major port. Government has disbursed approximately ₹136 lakh as incentive under this scheme since the launch of the Coastal Shipping Project². Hence the key factor driving logistics efficiency in this sector would be connecting the production areas (high ranges / quarries – which have a license) to the nearest port (inland / minor coastal port). This can drive the shifting of cargo to waterways – which can reduce cost and can reduce the environmental load.

Table 4: Minor Minerals (Largely Intra-state consumption)

Type	2019-20 in Tonnes	2020-21(Est) in Tonnes	Key Areas of production	Key Logistics Corridors
Granite	29,962,412	34,897,678	All high range districts like Idukki, Malappuram, Pathanamthitta, Palakkad	State Government has a special incentive scheme to promote transfer of construction related cargo through waterways. Hence, connecting production clusters of these with waterway ports (inland and coastal would be key)
Building Stone	6,766,017	1,586,660		
Ordinary Earth	550,751	44,000		
China Clay	809,168	311,918		
Laterite (Building)	41,473	33,452		
Laterite (Cement)				

3.4.3 Other Commercially Relevant Agro-Related Produce

Table 5: Other Key produce relevant to state logistics

Item/ Commodity	2019-20 in Tonnes	Key Production clusters	Key logistics corridors
Cashew Kernels	30,478	Kollam	Kollam – Kochi
Tea	76,983	Wayanad, Idukki	Idukki – Kochi, Wayanad – Kozhikode
Marine Products	235,950	Kochi, Allepey	Allepey – Kochi
Rice	587,078	Thrissur, Kottayam, Palakkad, Alleppey, Kannur	To all the corporations in Kerala
Pepper	34,545	Idukki, Wayanad	Idukki – Kochi, Wayanad – Kozhikode
Ginger	11,917	Wayanad, Palakkad, Idukki	Wayanad – Kozhikode, Palakkad – Kochi, Idukki – Trivandrum
Cardamom	10,076	Idukki, Palakkad, Wayanad	Wayanad – Kozhikode, Idukki – Kochi, Idukki – Trivandrum, Palakkad – Kochi
Rubber	551,030	Kottayam, Pathanamthitta, Ernakulam	Kottayam – Kochi, Pathanamthitta – Kochi

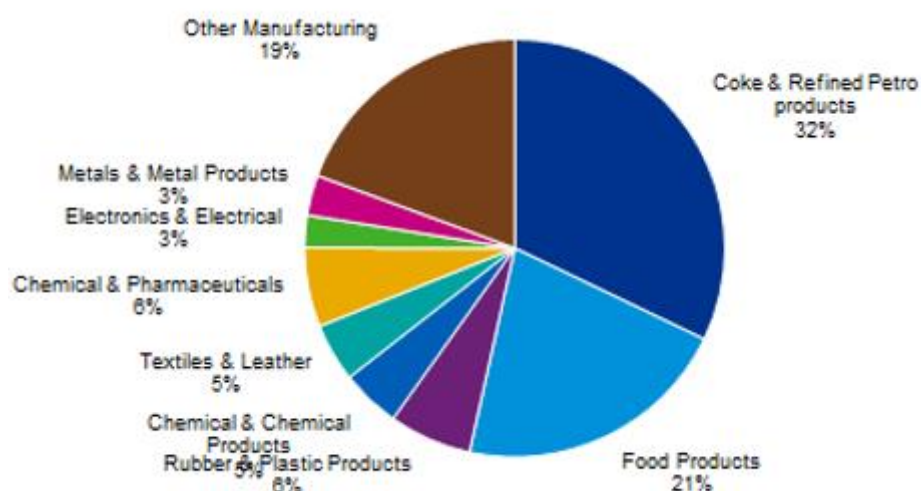
² Economic Review, Government of Kerala 2020



Item/Commodity	2019-20 in Tonnes	Key Production clusters	Key logistics corridors
Coffee	84,976	Wayanad, Idukki	Idukki – Kochi, Wayanad – Kozhikode

In terms of production value, major categories of industries in Kerala are shown in the pie chart below.³ Of these sectors, Petroleum and related products have an established logistics chain from Kochi for both export and import. Among all the other categories, the export of food products constitute a significant part. Hence for the purpose of logistics, the most material sector is food products.

Figure 8: Kerala Industrial Production across different sectors (2017-18)



3.5 Kerala's Logistics – Consumption Side

Kerala depends on the neighbouring states for majority of the resources including food items. The changing pattern of resource consumption in Kerala during the past 50 years has promoted the state as one among the topmost consumer states of the nation⁴. Major categories of consumption centric food and related cargo are given below (extrapolated from 2012 NSSO survey). As inferred from the table below, consumption outstands production in all categories. Hence from a logistics inflow to the State, the key transport routes from **Walayar** (Palakkad) and **Nagercoil** (south) to **all urban centres** are important.

Table 6: Key consumption items (food and related)

Item/Commodity	Perishability	2009-10 monthly per-capita consumption in kg(rural)	2009-10 monthly per-capita consumption in kg(urban)	2020 total consumption (adjusted for estimated 2020 population) in Tonnes
Cereals	Low	8.71	8.08	3,461,972
Cereal substitutes	Low	0.71	0.35	195,868

³ Annual Survey of Industries, Department of Economics and Statistics, Kerala, 2019, last accessed on 4 June 2021

⁴ Changing Scenario of Household Consumption Pattern in Kerala: An Emerging Consumer State of India, Springer Link ,

[https://link.springer.com/article/10.1007/s11205-016-1518-](https://link.springer.com/article/10.1007/s11205-016-1518-8#:~:text=Kerala%20depends%20on%20the%20neighboring,consumer%20states%20of%20the%20nation)

[8#:~:text=Kerala%20depends%20on%20the%20neighboring,consumer%20states%20of%20the%20nation](https://link.springer.com/article/10.1007/s11205-016-1518-8#:~:text=Kerala%20depends%20on%20the%20neighboring,consumer%20states%20of%20the%20nation), last accessed on 10 June 2021



Item/Commodity	Perishability	2009-10 monthly per-capita consumption in kg(rural)	2009-10 monthly per-capita consumption in kg(urban)	2020 total consumption (adjusted for estimated 2020 population) in Tonnes
(tapioca etc)				
Pulses and pulse products	Medium	0.58	0.69	273,406
Milk and milk products	High	3.11	3.7	1,468,416
Edible Oil	Medium	0.52	0.6	241,308
Egg, fish, and meat	High	2.73	2.78	1,150,719
Vegetables	High	4.96	5.67	2,276,063
Fresh Fruits	High	13.7	9.51	4,533,025
Dry Fruits	Low	0.04	0.06	21,456
Sugar	Low	0.83	0.86	356,428
Salt	Low	0.27	0.27	111,625
Spices	Low	0.59	0.58	242,976
Total				14,644,785

Similarly, the non-food items from a consumer perspective with their relative importance is given below. These values are estimated based on 2009-10 consumer spending survey, adjusted for inflation and population for 2020 levels.

Table 7: Key non-food items from consumption perspective

Item / Category	Perishability	2009-10 per capita per month in INR (Rural)	2009-10 per capita per month in INR (Urban)	2019-20 yearly consumer spend(total) in INR(Cr)	% Share
Intoxicants	Low	51.50	28.03	2,046.79	5%
Fuel and light	Low	97.96	125.47	5,950.37	14%
Clothing	Low	81.02	105.68	4,975.76	11%
Footwear	Low	13.84	19.09	879.55	2%
Print and education	Low	89.71	142.99	6,250.00	14%
Medical	Medium	166.00	205.56	9,882.11	22%
Entertainment	Low	27.50	40.88	1,831.72	4%
Furniture and fixtures -	Low	8.83	13.87	609.35	1%
Consumer durables and electronics	Low	168.74	264.20	11,620.32	26%
Total		705.10	945.77	46,944	100%

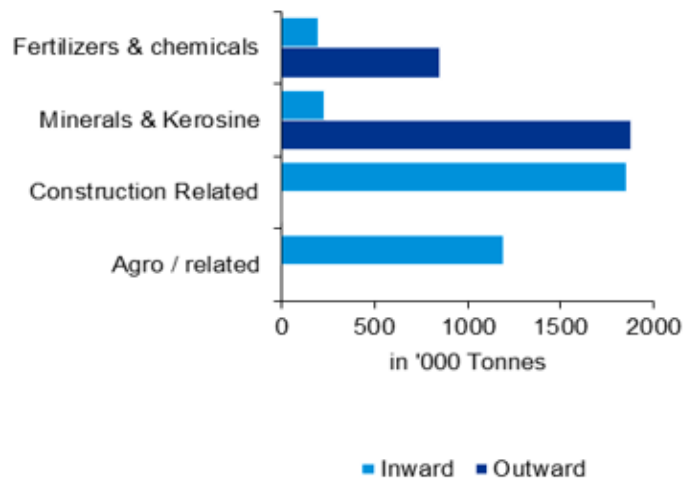


3.6 Kerala's Logistics – Middle-Mile Modes of Transport

Inter-State

Primarily Agro and related products, Construction, and mineral related sectors use rail for middle-mile logistics. Also, the traffic is mostly unidirectional and towards Kerala. Even though outward freight is about 80% of the inward freight, the wagons for outward freight are specialized (minerals and related products) and cannot be used for major inward commodities (Agro). Hence, the effective utilization of the available railway freight capacity is quite less in Kerala (less than 50%). **Similar trends are seen in cargo exported from the major ports in Kerala- Cochin as shown in the graph.** Excluding the Petro and related cargo (which requires specialized tankers), the general cargo outward movement is only **about 9% of the inward movement** which indicates high degree of unutilized capacity for outward shipping in the State.

Figure 9: Rail Freight To/From Kerala in 19-20



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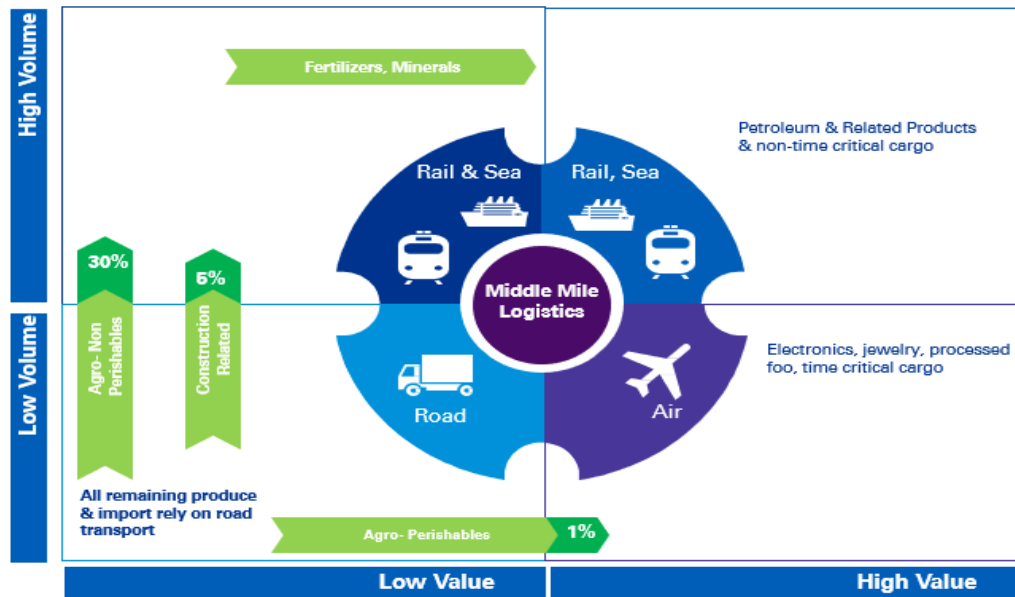
Similarly, Cochin International Airport Limited (CIAL)⁶, which is the largest air-cargo operating airport in Kerala has a domestic cargo uplift of 4013 tonnes for 2019-20, whereas the incoming domestic cargo for the corresponding period was 10994 tonnes. Here also, the uplift is only about **36.5% of inbound domestic volume**. Alternate modes of logistics are viable in middle-mile logistics only if it generates high volumes or has high value and smooth interconnections. A diagrammatic representation of middle mile in various segments is given below along with the cargo types used in Kerala.

⁵ Administrative report and Annual Accounts 2018-19, Cochin Port Trust

⁶ Annual Report 2019-20, Cochin International Airport Limited, July 2020



Figure 10: Inter-State Logistics (From/To Kerala) - Middle Mile Value vs Volume Analysis.



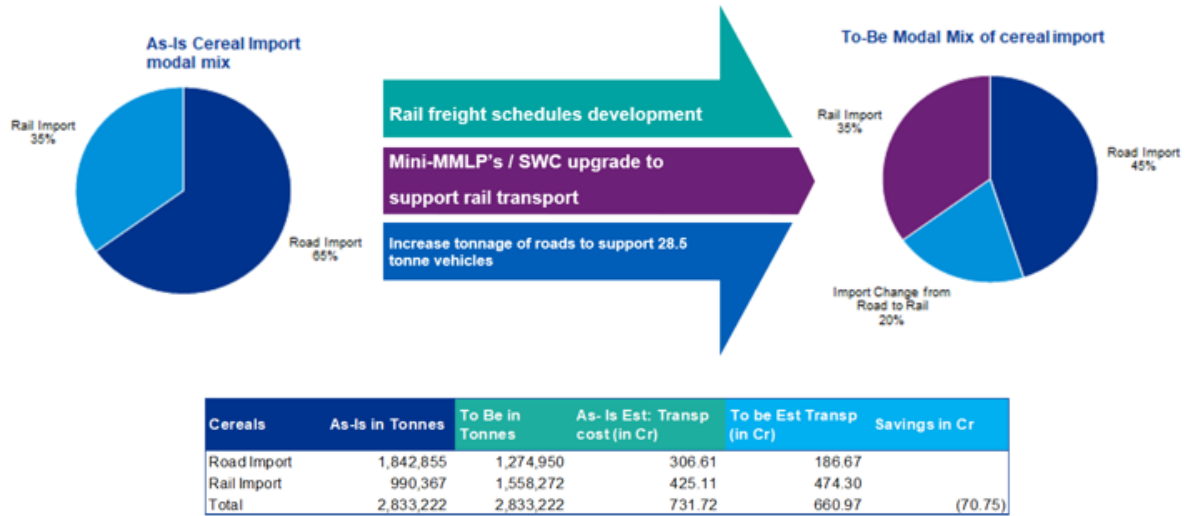
Source: KPMG in India Analysis 2021 based on market research

To enable modal shift of Agro-related cargo and Construction related cargo to move to Rail, the rail freight needs **predictability in schedules and smooth interconnection points**. As it is seen, only 30% of the Agro-non-perishables and 5% of the construction related (steel, cement etc) come via rail. For moving perishables to rail, in addition the mentioned points, it needs investment in **cold chain in transport and storage**. As these factors are improved, more and more finished good from industry will be moved to rail and sea. **Directional bars in the above infographic represents, major cargo types and the ideal modal-shift in middle-mile logistics** that the commodity should undergo for cost efficiency.

Despite of having lesser control of cargo entering into State, the merchants would have involved in more transactions through Rail and Sea, if the handling facilities are smooth. To exhibit, the import data of cereals with respect to its cost-saving potentials a in middle-mile are assessed as shown in the infographic below:



Figure 11: Estimated Cost savings in cereals import by various initiatives

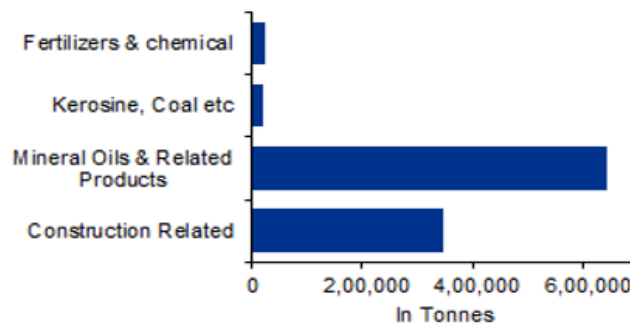


Source: KPMG in India Analysis 2021 based on market research

The import values are assessed as a difference between consumption values (based on 2009-10 NSSO values extrapolated to 2019-20) and production values of 2019-20. Rail freight values are taken from Indian railways. The unavailability of data on cargo quantity transported through road pose a serious challenge in conducting a similar assessment study for roads.

Intra-State

Figure 12: Internal Rail Transport in Kerala (2019-20)⁵



Intra-state rail freight sector in Kerala is heavily under-utilized despite having good north-south connectivity and frequencies. If smooth interconnection between other modes of transport and good quality storage is made available, more cargo, especially finished good may shift from road to rail.

Figure 13: Internal Rail Freight in Kerala (2019-20) ⁷

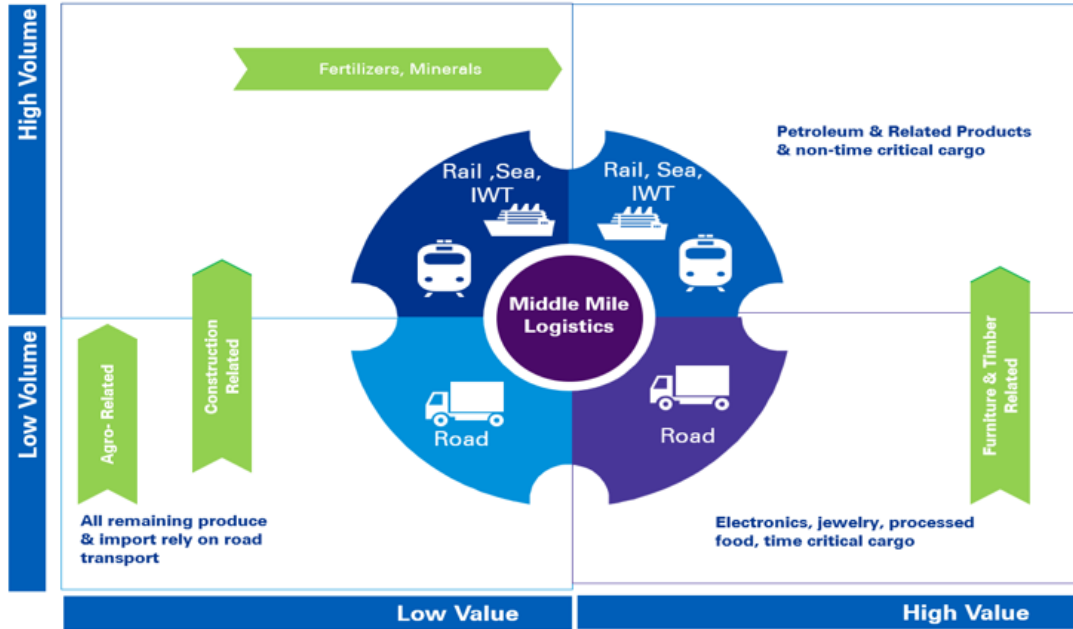
Commodity	Port	Coastal Import	Coastal Export
Machinery	Kollam	414.0	
Bricks	Kozhikode		2,316.0
Timber	Kozhikode		98.0
Azhikkal	Miscellaneous	1,372.0	

⁷Economic Review 2020, Kerala State Planning Board, January 2021



Minor port traffic is also quite less and very few commodity types move through the minor ports, despite its potential. A lot of non-time critical cargo could be routed through minor ports as coastal and inland water rates are the lowest. A comprehensive view of intra-state middle mile sector is given below:

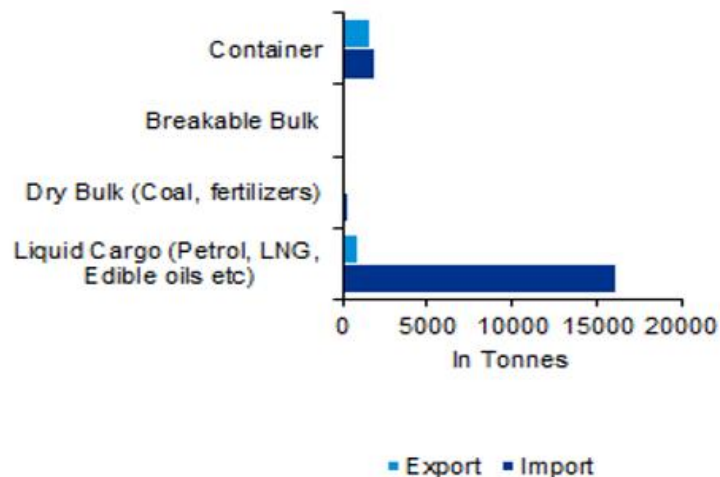
Figure 14: Intra-State Logistics (Within Kerala) - Middle Mile Value vs Volume Analysis



Source: KPMG in India Analysis 2021 based on market research

The utilization of non-road modes is quite low for intra-Kerala transport. Building smooth inter-connection / transport, switching points from one mode of transport to another, effective storage and handling facilities and predictability in schedules can prompt industry to switch more cargo commodities to rail / coastal / inland water transport. This is especially suited for commodities like timber and furniture. **Directional bars in the above infographic represent major cargo types and the ideal modal-shift in middle-mile logistics that the commodity should undergo for cost efficiency.**

Figure 15: Export / Import at Cochin Port 2018-19





From an Export / Import perspective, the choices are quite limited with the available modes of transport being sea and air only. Amongst this, primarily Cochin Port handles most of the volumes. Once Vizhinjam Port starts operating, more international shipping volumes are expected to come to Kerala. From a CIAL perspective (which is the major airport handling cargo in Kerala) the export value of international cargo is about 47727 tonnes for 2018-19 whereas the corresponding import value is about 10855 tonnes. This depicts that more goods are flowing out of the State. The unavailability of breakup of air cargo details for conducting a detailed analysis stands as a limitation.

3.7 Kerala's Logistics - Transport Modes and Cost Analysis

Kerala's Logistics transport sector in State could be mapped into intra-state, inter-state, and export markets. It is heavily dominated by road transport

Category	Road	Rail	Sea	Inland Water	Air
Intra-state	Dominated by Road	Minimal	Minimal	Developing, High potential sector	Minimal
Inter-state	Dominated by road	Mainly Food grains come via rail	Developing	Nil	Developing
Export	Nil	Nil	Exports through ICT	Nil	Developing

A multi-dimensional analysis of the logistics cargo from a State perspective is shown below. Each of the cargo-categories is ranked on a 5-point scale on multiple parameters and the ideal cargo sector for middle-mile logistics is mapped there (first mile and last-mile is almost always road except in places of dedicated rail-freight terminals or port terminals).

Table 8: Multiple Dimensions of Cargo

Category	Perishability	Vol	Val	Safety	Time-criticality	Sum	Ideal Middle-Mile Mode of Transport
Agro-perishables	5	4	1	1	4	15	Road /Rail with cold chain
Cereals	2	4	1	1	4	12	Rail
Textiles/ Apparel	1	3	3	2	3	12	Rail / Water/ Coastal
Print Material	1	3	3	2	4	13	Rail / Water/ Coastal
Construction related	1	5	2	1	2	11	Inland Water, Coastal, Rail
Medical	5	2	4	4	5	20	Road and Air
Furniture and Related	1	3	3	2	2	11	Rail / Water/ Coastal
Footwear	1	1	2	1	3	8	Rail / Water / Coastal
Consumer durables and electronics	1	2	4	2	4	13	Road
Intoxicants	1	2	4	5	3	15	Road
Processed Food including marine	4	2	4	2	4	16	Road/Rail/Air with cold chain
Electronics components	1	1	4	3	4	13	Road



Category	Perishability	Vol	Val	Safety	Time-criticality	Sum	Ideal Middle-Mile Mode of Transport
Jewellery and Related	1	2	5	4	3	15	Road, Air
Minerals and derived products	1	2	4	3	3	13	Rail and Road
Spices and Derived Products	4	3	3	2	4	16	Road, Rail

At national level, it is suggested to develop market driven demand centric framework for prioritizing the logistics needs. In a Kerala, the above multi-dimensional ranking framework could be used to prioritize the logistics needs for the State. The values shown are indicative and it is proposed that the industries department assesses these values involving all the relevant stakeholders.

Cost and speed levels (average) of multiple cargo modes relevant to Kerala were analysed in detail and given below. Please note that this is without considering loading / unloading charges which could be different in different modes. Detailed calculations and reference of this is given in **Annexure 2**.

Table 9: Cost of Multiple Transport Modes in Rupee-per-tonne-km

Category	Road	Rail	Sea	Inland Water	Air
Intra-state (within Kerala)	4.9-5.1	1.57	1.37	1.37	700 plus
Inter-state (national level values)	2.58	1.57	1.37	1.37	700 plus
Export	NA	NA	0.23	NA	700 plus

Based on these values, one can see that a cost reduction of **68%** is possible in shifting from road to rail and **73%** for a shift from road to water-more.

Table 10: Speed of Multiple Modes of Transport

Category	Road	Rail	Sea	Inland Water	Air
Intra-state	30-40 kmph	30 kmph	Not Applicable	30 kmph	600 kmph
Inter-state	50-60 kmph	24 kmph	30 kmph	30 kmph	600 kmph
Export	Not Applicable	Not Applicable	30 kmph	Not Applicable	700 – 800 kmph

As one can see from the table above, the effective cost of road transport is higher in Kerala (due to narrow and winding roads and consequently lower tonnage) and the speed on Kerala roads is lesser compared to the national average. Hence to be cost-competitive, the following two ways could be considered for the State:

- (i) Develop a middle-mile sector more reliant on rail and water (sea/inland waterways)
- (ii) Increasing the effective tonnage on roads by strengthening roads and straightening the curves



Not all roads can be expanded in Kerala due to the high population density. However, the key roads linking warehouses and consumption clusters can be identified and expanded in a calibrated way. Similarly, multiple interchange points could be developed at places where cargo can be shifted from road to rail or road to water transport. These points are recommended based on the geo-clustering analysis in the next section.

Summarizing all four modes of transport, a unified view of convenience, cost, and constraints of logistics in Kerala is given below:

Table 11: Comparative View of Different modes of logistics in Kerala

	Convenience	Cost	Constraints
Rail	Medium	Lower Than Road, Higher than sea/water	No cold/frozen storage transport. Geography limits rail expansion. Low warehousing infra near loading / unloading points.
Water (Sea and Inland Water)	Low.	Lowest	Under-developed minor ports infrastructure, low volumes. Customs issues even for domestic shipping to Mumbai.
Air	High	High. Hence suitable only for high-value cargo	Air-freight schedules. Under-developed hub-spoke model
Road	High	High	Tonnage of Roads. Low volumes that reduce possibilities of aggregation. Most of transport is point-to-point. As return cargo is practically absent, effective cost is high. Increasing due to high fuel prices as well

Source: KPMG in India Analysis 2021 based on market research

3.8 Kerala's Logistics – Clustering Points and Routes

Kerala has an existing network of State Warehousing Corporation depots, primarily used for storing and distributing Agro-related products. Such network State Warehousing Corporation depots is super-imposed on a Google Map with other logistically important points like rail-freight stations (loading and unloading together), ports (inland and seaports), airports, KINFRA-warehouses. After plotting these in the map, the assessment of the cluster feasibility has been done by measuring the distance between these logistical points. The details on geo-clustering, is as seen in **Annexure 3**. The geo-clustered logistically important locations in State are identified as listed below.



Table 12: Logistics Clusters in State

Area	Clustered logistics facilities	Approx. radius in km of clustered points	Strategic Importance
Kasaragod	a. 2 KINFRA Parks b. 1 State Warehouse c. Railway Terminal d. Port	15	Kasaragod is the northernmost district of Kerala which has a good share of natural resources. The district also has high potential for industrial development with enough land available for setting up new industries especially in the Agro and food processing sector. There is a good network of roads in the district along with rail connectivity in the coastal zone of the district. So, a logistic cluster can be planned at the coastal region near the Kasaragod port.
Azhikode and Kannur	a. Port b. Railway Terminal c. 3 KINFRA parks d. 2 State Warehouses e. Airport within 20km	20	Azhikode and Kannur are two major port cities with several key logistics points in the vicinity. With the development of an International Airport in Kannur, the industrial potential of the region has increased. With three KINFRA parks and two State warehouses in the vicinity, Kannur- Azhikode belt can be developed into a logistic cluster. Kannur/ region has a large concentration of geo-coded Agro products as well which needs good logistics connectivity
Thalassery	a. KINFRA park b. Port c. State Warehouse d. Airport within 20 km d. Railway Terminal	5	Thalassery, being a port city, has been historically known for its spice trade. The city has a logistic advantage of being connected by road, rail, and water with Airport within 20 km from the centre. Thalassery also has a KINFRA park and State warehouse within a 5 km radius.
Vadakara	a. Port b. Railway Terminal c. State Warehouse	5	Vadakara is situated about 50 km to the north of Kozhikode and 44 km to the south of Kannur. Vadakara is also a port city and is connected by rail and by national highway 66 passes through Vadakara town. There is also one State warehouse in Vadakara.
Kozhikode	a. Port b. Railway Terminal	5	Kozhikode is the second largest urban agglomeration in Kerala. It is one of the biggest economic hubs in Kerala. The city is well connected by water, rail, and road. Wayanad region is also well connected to Kozhikode.



Area	Clustered logistics facilities	Approx. radius in km of clustered points	Strategic Importance
Beypore	a. Port b. Railway Station c. KINFRA Part d. Airport within 15 km	15	Beypore is port town approximately to the south of Kozhikode. Beypore is the second biggest port in Kerala after Kochi and currently handles 100,000 tonnes of cargo and 7500 passengers per annum. It is connected by rail and road also. Calicut airport is also nearby within 15 km.
Kanjikode- Walayar	a. 4 KINFRA parks b. Malabar Cement Siding in Walayar c. State Warehouse Kozhinjampara d. State Warehouse in Palakkad	8	The Kanjikode Walayar region has great potential for industrial development. The region has 4 KINFRA parks in the vicinity. However, there are no rail loading and unloading facilities available in this region. Presence of Malabar cements at Walayar puts forth a potential for developing a general railway loading/unloading point or dedicated goods terminal. Kanjikode is well connected by NH 544. Additionally, there are two State warehouses in Palakkad and Kozhinjampara. This segment is the key logistics point for Kochi – Coimbatore – Bengaluru Economic corridor
Angamali	a. Railway Terminal b. Airport c. KINFRA park	6	Angamali is the northernmost tip of Ernakulam district. The town lies at the junction of NH 544 and MC road which are two main roadways to the south of the State. Additionally, the city is connected by rail and Nedumbassery airport is available in the vicinity.
Kochi	a. Railway Terminal b. Port c. 2 State Warehouses		Kochi is a major port city on the south west coast of India historically well known for trade. It is well connected through road, air, water, and rail. Kochi is the biggest port in Kerala handling 32.02 million tonne of cargo annually. Kochi is also well connected through road rail and air. It also has 2 State warehouses in the vicinity.
Kottayam	a. Railway station b. Inland port c. State Warehousing depot	7	Kottayam is the gateway to rubber and a major hub for publishing industry. This is the only developed inland water port in Kerala that is operational with cargo transport.
Alappuzha	a. Port b. Railway Terminal c. State Warehouse d. 3 KINFRA parks within 15 km	15	Alappuzha is historically well known for its trade and is often referred to as Venice of the East. The city is well connected through road, rail, and water. KINFRA is operating 3 parks within the 15 km of the town.



Area	Clustered logistics facilities	Approx. radius in km of clustered points	Strategic Importance
Thodupuzha	a. State Warehouse b. KINFRA park	6	Thodupuzha has an excellent network of highway and roads that connects the nearby towns and cities. The State Highway SH-08 which connects Muvattupuzha to Punalur. There are other State highways passing through Thodupuzha which connects to the inner parts of Idukki. Agriculture, industry, and small industries drive Thodupuzha's economy. There is a State warehouse and KINFRA park in the vicinity of Thodupuzha. Thodupuzha is also the gateway to spices from Idukki
Adoor-Kottarakkara-Punaloor (Pathanapuram)	a. 3 State warehouses b. KINFRA parks	15	There are three warehouses in close proximity to Adoor, Kottarakkara and Punalur. KINFRA has a park in Adoor. Adoor is well connected via M. C. road and has huge potential to be developed as a logistic cluster.
Chenganassery – Thiruvalla	a. Railway Terminal b. 2 State Warehouse c. KINFRA park	8	Chenganassery and Thiruvalla are two towns towards the south of Kottayam. These two cities are connected with the MC road and by rail. There are two warehouses and a KINFRA park in the vicinity.
Kayamkulam	a. Railway terminal b. 2 State Warehouses	10	Kayamkulam is a Municipality in the Alappuzha district of Kerala. It is well connected via road and rail. Kayamkulam is conveniently connected to the major cities of Alappuzha, Kochi, Thiruvananthapuram, Thrissur, Kollam, Palakkad, and Nagercoil by the National Highway 66. The Kayamkulam-Punalur (KP) road is a major thoroughfare that connects it to the State's eastern regions.
Kollam	a. 2 State warehouses b. Port c. Railway Terminal e KINFRA park within 20 km d. KMML in Chavara	20	Kollam has strong reputation since the days of Arabs and Romans. Kollam is well connected by road, rail, and water. KMML which is the largest manufacturer of metals and minerals is in Chavara which is within 20 km from Kollam. Additionally, there are two State warehouses and a KINFRA park.
Kazhakootam	a. 2 KINFRA Park b. Railway Terminal c. Airport (<10km)	4	Kazhakootam is one of the fast-growing regions of the State. It is an IT hub of Kerala. It has 2 KINFRA parks and Technopark, the place is well connected by road and has a railway loading and



Area	Clustered logistics facilities	Approx. radius in km of clustered points	Strategic Importance
			unloading terminal. It also has an airport in the vicinity.
Vizhinjam	a. Port b. 2 State warehouses c. Airport (<15km)	15	Vizhinjam is located at 16 km to the southwest of the Trivandrum city. The location is economically and geopolitically significant as a key point connecting the shipping between Southeast Asia and the Middle East. The place is well connected by road, water and has an airport within 15 km.

Source: KPMG in India Analysis 2021 based on market research and clustering exercise conducted

The strategic logistics routes in State are overlaid **on the selected clustered-points**. As evident, the routes passes through the vicinity of these clustered points. Strategically, once the ware-house corporations are upgraded and developed into modern organizations, these cluster points could serve as places where

- (i) Cargo could be stored, aggregated, and disaggregated
- (ii) Cargo could be switched from one mode to another mode of transport.

It showcases the designing of logistics centres in the developed world. Essentially this is nothing but a **mini-MMLP (mini – multi-modal logistics park)**. The potential savings due to shift in mode of transport (road plus rail/water) in a few key cargo routes if these mini-MMLP's are setup can be estimated as below:

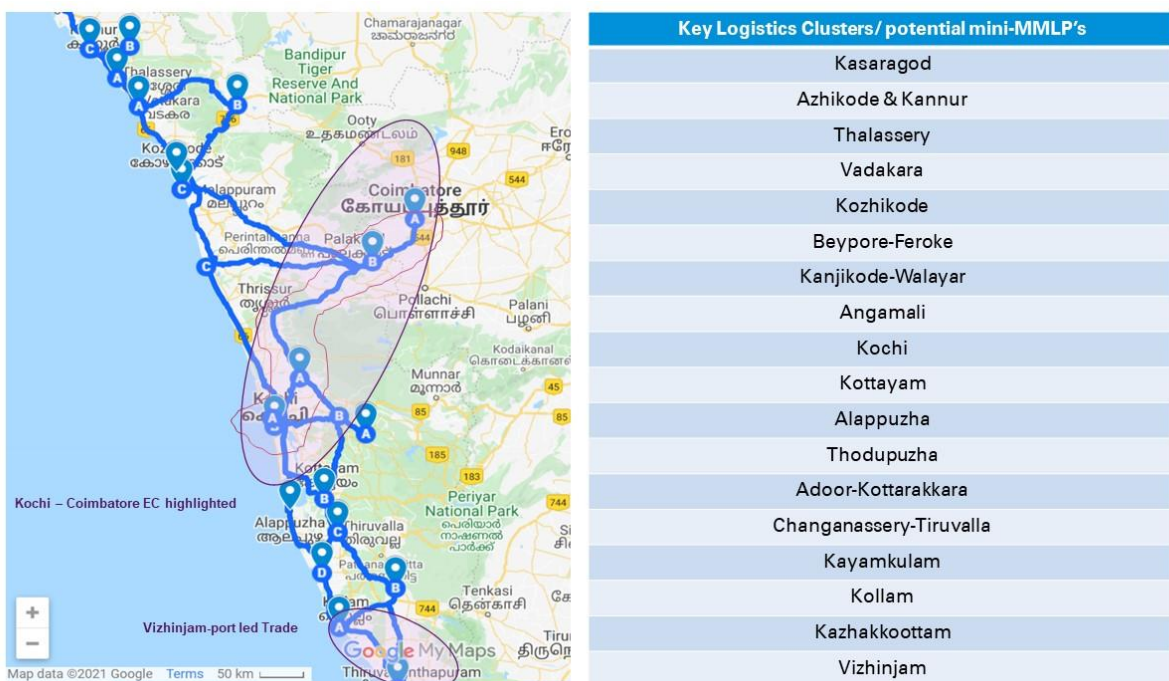
Route	Approx. total length	Approx. percentage of route that can be covered by rail	Approx. percentage of route that can be covered by coastal / inland water	Potential cost savings in rail + road mode	Potential cost savings in road + water transport
Thiruvananthapuram-Kochi	210 km	100%	100%	68%	72%
Kochi- Coimbatore	190 km	100%	0 %	68%	0%
Thiruvananthapuram- Angamali (M.C. Road)	233 km	100%	85%	68%	24%
Kochi – Kozhikode	182 km	100%	100%	68%	72%
Kochi – Wayanad	263 km	70%	66%	22.4%	18.5%
Kozhikode – Kanjikode	137 km	100%	0%	68%	
Kanjikode – Ponnani	100 km	70%	0%	22.4%	
Kollam – Palakkad	272 km	100%	50%	68%	14%



Route	Approx. total length	Approx. percentage of route that can be covered by rail	Approx. percentage of route that can be covered by coastal / inland water	Potential cost savings in rail + road mode	Potential cost savings in road + water transport
Thodupuzha – Kochi	60.5 km	0%	0%		
Kottayam – Kochi	72.2 km	100%	40%	68%	11%
Kanjikode – Beypore	130 km	80%	0%	25.6%	
Kalpetta- Beypore	84.5 km	0%	0%		
Kozhikode Kannur	91.7	100%	100%	68%	72%
Kalpetta- Vadakkara	83.9	100%	100%	68%	72%
Kannur- Kasaragod	90.4	100%	100%	68%	72%

Source: KPMG in India Analysis 2021 based on market research

Figure 16: Logistics Geo-clustering points assessed using proximity of key Railway Goods Stations, SWC depots, Ports, Airports, and Industrial Parks/Areas



Source: KPMG in India Analysis 2021 based on market research

3.9 Re-imagining State Ware-house Corporation Depots

Currently, State-warehousing Corporation’s Depot’s function from a storage and distribution perspective. In evolved logistics systems, third-party logistics service providers (3PL) use the network of logistics parks to provide aggregated and multi-modal shipping services. **It is recommended that the geo-clustered locations**



identified above are developed into a freight village / mini-multimodal logistics park equivalent entity (henceforth referred as mini-MMLP) under the leadership of State-Warehousing Corporations with individual P&L responsibility and multi-mode transport targets.

The Capabilities, investments required, policy changes needed for such mini-MMLP is given below:

Table 13: Logistics Parks: Capability and Investments

Capability	Investment and skill development	Policy Changes / Standards
Ability to handle multiple type of cargo (e.g.: Frozen food, hazardous cargo)	Cold storage, separation in cargo storage, upskilling and re	Benchmark the units for conforming to national cold-chain standards and safety standards – wherever relevant
Offer not just for storage, but also transport as well initially to other logistics parks	Infrastructure and skill to load/unload cargo to multi-modes (not just road). Negotiate with service providers for transport services as well	Ware-house corporation's functions should include commercial agreements with transport providers as well in multiple modes.
Develop the 3PL service providers eco-system	Integration between multiple transport modes, identical standards for tech across multiple logistics parks and modes	Common framework for 3PL players operating between multiple logistics parks Open benchmark on logistics parks on support of type of cargo, quality framework etc
Develop the logistics local cluster	Investment to develop the roads between depots and ports and stations PPP model investment opportunity for private sector participation	In the earmarked logistics clusters, new masterplan for real estate development to be developed involving the logistics parks units, zoning standards etc could be developed
Private players open to setup and develop the logistics clusters in such multi-modal points with private warehouses	PPP model investment avenues in such logistics parks	SPV formation in such agreed logistics parks
Target for inland-water transport and rail transport tonnage	Close working ability for logistics parks with inland water and rail transport	Umbrella agreements with railways and waterways bodies for time-bound cargo movement
Track and trace technology for inter-logistics parks movement	Technology platform investments	Open, inter-operable and secure logistics standards for data transfer for track and trace
Un-packings and Re-packing capability	Building a service driven organization which can aggregate and disaggregate at logistics cluster points	Develop cargo standards as to the dimensions of the cargo for last-mile and ideal cargo sizes for middle-mile

Source: KPMG in India Analysis 2021 based on market research



Government of India's Multi-Modal Logistics Parks (MMLP) pilot locations are coming up only by 2025. It is a large-scale investment, requiring commitment of significant land and resources. It is recommended that Kerala adopts an approach for these logistics parks / mini-MMLP independently, and depending on the volumes, can push for an MMLP proposal whenever the right opportunity comes. A clustering network would greatly increase possibility of return-route cargo as well, which can reduce the effective logistics cost.

It is recommended to launch a **strategic initiative** in this regard to **re-imagine the State warehouse corporations in the identified cluster centric points to convert them to mini-MMLP's** as described above.

3.10 Increasing the Tonnage of vehicles on road

Government of India's max tonnage permitted is as shown in the table below.

Vehicle Type	Tonnage	Logistics phase where it is used in Kerala
Single Axle with single Tyre	Up to 3.00 T	First Mile and Last-Mile
Single Axle with Two Tyres	Upton 7.50 T	
Single Axle with four tyres	up to 11.5 T	First Mile and Last-Mile
2-Axles with 4W	Upton 18 T	Middle Mile
2-Axles with 6W	up to 28.5 T	Not commonly used except in NH
4-axles with 6W	Upton 28.5 T	Not commonly used except in NH

Due to the nature of roads, population density and other geological factors, many state-highways are not equipped to handle multi-axle vehicles in Kerala. It is recommended that the **below two categories of road stretches** are upgraded to incorporate multi-axle vehicles with higher tonnage so that effective cost of road transport can be reduced. **This is recommended as a strategic initiative.**

Category A - Interconnection roads between potential mini-MMLP / clustering areas identified in the sections before.

Category B - Roads from Key factories into the nearest mini-MMLP / clustering areas

This can reduce the effective logistics costs for intra-Kerala transport by about 20% as well as facilitate better integration to the national logistics corridors.

3.11 Developing More Cargo Transport Rail and Water

Rail and Water transport are preferable options for Middle-mile logistics. Hence, the mini-MMLP's / clustering points envisaged before has tremendous importance in aggregating cargo, switching modes, and achieving economies of scale. However, switch between one transport mode to another takes time. And this can back-fire if it is straightaway attempted in time-critical cargo as our first mile and last-mile roads have low carrying capacity. Hence it is recommended that the push to Rail and Water transport is taken first for non-time critical cargo. From the multi-dimensional analysis, these are cargo like Construction Material related (Granite, limestone, cement etc) , furniture, textile and apparel , footwear etc. **It is recommended to launch a strategic initiative to push these types of cargo to water and rail transport.** This would involve working with Coastal transport, increasing capacity and frequency of vessels in different trunk routes, working with railways to increase the freight capacity in dedicated routes etc. A quarterly monitoring mechanism on the yield and tonnage in different routes can be used to assess the initiative periodically. This could be delegated as objectives of these mini-MMLP's recommended earlier.

3.12 Cost Reduction Potential in Key Logistics Routes

Based on various road factors, a detailed cost saving potential of various road centric initiatives are calculated in **Annexure 1**. A summary view of the numbers is as given below. Please note that these numbers are opex centric and the associated capex is not taken into consideration. If higher tonnage vehicles or BS-VI compliant cargo vehicles have to be procured, an associated capital expenditure also needs to be undertaken by industry / 3 PL providers. This would reduce the effective savings.



Table 14: Estimated cost savings / extra spend for different kinds of road centric initiatives

Type of Initiative	Fuel Cost Savings(+ve) / increase(-ve)	Trip Savings	Effective savings/extra spend
Increasing Tonnage of roads	-21 to -25%	35 to 37%	18.7 to 23.7 %
Multi-Laning	-30 to -38%		-30 to -38%
BS-VI upgradation	4 to 7 %		4 to 7%

Source: KPMG in India Analysis 2021 based on market research

This does not mean that multi-laning is bad. **Multi-laning is highly desirable for time-critical cargo (e.g.: frozen food)**. However, just by making a road multi-lane, without increasing the effective tonnage of roads (which would need strengthening of roads and bridges, straightening curved roads etc) is not going to be beneficial for **non-time critical cargo (spices, rubber, construction material etc)** as it is highly dependent on the cost of transport. Hence if we increase the effective tonnage of roads interconnecting the proposed mini- logistics parks (i.e., middle-mile), it can effectively increase the cost savings a lot. A tabular view of the logistics cost reduction potential in a few key logistics routes are given below. This is based on estimated savings that can be achieved by increasing the tonnage of road between two logistics parks in the route and potential that can be achieved by shifting cargo to rail / water.

Table 15: Est Cost savings by various interventions in middle mile

Logistics Route	Increase effective tonnage of roads	Shift middle Mile to Rail	Shift Middle Mile to Water transport	Key business sectors which would benefit
Kollam – Palakkad	18.7 – 23.7 %	68%	14%	Cashew and related
Idukki – Kochi	18.7 – 23.7%	Not Applicable	Not Applicable	Spices, Tea, Coffee
Alappuzha – Palakkad	18.7 – 23.7 %	68%	Not Applicable	Processed Food (If done with cold storage)
Wayanad- Kochi	18.7 – 23.7%	22.4%	18.5%	Spices

Source: KPMG in India Analysis 2021 based on market research

The key inference from above assessment is that the potential for cost saving in middle-mile logistics can be achieved to a large extent by implementing initiatives such as increasing effective tonnage limit of roads, developing intermodal points where cargo can be aggregated, disaggregated and switched from one mode of transport to another (i.e., mini -MMLP's).

3.13 First Mile Interventions

First Mile delivery is the place where manufacturer books a consignment from his factory to a destination through a service provider. There are very little players providing more value-added services such as delivery financing, customs clearance facilitation etc. This is exacerbated by the fact that the manufacturer has to make separate visits to banks or regulatory authorities for many of these purposes. While much of this is Government of India's remit , especially with export centric items, State Government can publish an assessment or ranking framework for third party logistics players on their ability to provide multiple services that can add value to an SME . It is recommended that such a ranking framework is undertaken with 3PL providers cutting across all phases in logistics.



Table 16: First Mile Challenges and Interventions

Challenge	Recommended Intervention
Lack of Financing	3PL players can partner with banks / NBFC's to offer delivery financing services
Lack of green/ sustainable packing	In the proposed ranking framework, special weightage can be given to 3PL players on providing green / sustainable packing
Insurance	3PL players can partner with banks / NBFC's to offer insurance services
Track and Trace	3PL players can provide this as a value-added service as well to businesses. GPS tracking etc could be tried in a B2B cargo initially Digitization of logistics systems can be run as a strategic initiative in the state context
Customs / Clearance etc	This needs more interventions at GOI level. Kerala can create a channel to address the typical import/export related concerns from the industry and take it to the central Government appropriately
Specialized skill for specific cargo	Kerala can run strategic initiatives to upskill different players in the logistics eco-systems both at labourer level for important cargo from State's perspective (processed food, spices, perishable vegetables) and at higher education level (partner with higher educational institution for such courses in State)

Source: KPMG in India Analysis 2021 based on market research and Industry Stakeholder discussions

3.14 Last mile interventions

Last-mile delivery in Kerala is typically sub-30 km radius, except for high ranges. The typical challenges with last-mile delivery are highlighted below along with recommended interventions.

Table 17: Last Mile Challenges and Interventions

Challenge	Recommended Intervention
High Fuel cost vis-à-vis value	Electric vehicles for Cargo. Allow EV Auto's to carry cargo up to certain limits in weight and dimensions. This can accelerate EV adoption as well
Delivery in High-Range Areas	Adopt drone delivery. This is being tried out in various parts of world. Kerala can take a lead to develop a 'beyond line-of-sight' drone delivery guidelines in the State in some high ranges with appropriate track and trace mechanisms
Lack of return cargo	Recyclable materials can be collected as return cargo. It is recommended that an initiative could be launched with Suchitwa-mission to collect return cargo and route it via the last-mile service providers providing service from the logistics parks
Track and Trace	This is being adopted technologically by various players. However, there is a lack of convergence of various standards and there is an initiative proposed at Government of India level for common logistics standards. As and when this gets developed, it can be adopted by service providers in State

Source: KPMG in India Analysis 2021 based on market research and Industry Stakeholder discussions



3.15 Kerala's Logistics – Industry view and challenges

A SWOT View of Kerala's logistics sector is given below.

Figure 17: SWOT View of Kerala Logistics Sector



Source: KPMG in India Analysis 2021 based on market research and Industry Stakeholder discussions

Industry stakeholder interactions were held to understand their key challenges and issues from a logistics perspective and their inputs are factored into the analysis.

- Lack of multimodal connectivity:** In terms of hinterland connectivity of ports, the approach has been primarily unimodal. State needs to implement efficient and modern multimodal systems, not just at the policy level but also on the ground.
 - On the rail front, the DFCs need to be commissioned on a timely basis. The railway network also needs to be ramped up considerably.
 - On the road front, the NHAI has given an impetus to port connectivity, but many crucial projects suffer from implementation delays. Upgradation of existing roads tonnage capacity etc. can help improve the carrying capacity of roads
 - As for other means of intermodal transport, coastal shipping and inland waterways transport need to be key focus areas as cargo evacuation by water is cheaper and cleaner, reduces cost and port congestion, and brings in efficiency. Inland water transport (IWT) should be integrated with multimodal/intermodal connectivity. This will enable efficient use of inland terminals having proper road and/or rail connectivity for seamless transfer of goods that will provide an efficient logistics supply chain.



2. **Ease of doing logistics:** A key ask from the Stakeholders was to prioritise and provide Industry status for Logistics, increase allocations for logistics and relax rules for ease of doing logistics business. Given the nature of the pan-India presence of logistics companies, policies that make it easy for businesses to manage multiple offices spread across the country is required. Not all businesses have resources to meet the micro-level compliance requirements under various laws, such as The Shops and Establishments Act, Trade Licenses and CLRA provisions.
3. **Port modernisation and digitisation:** Investments are needed to enhance port infrastructure in areas, such as modernising equipment to handle large volumes, navigational aids, and IT systems, and developing blockchain for logistics. This involves several agencies and inter-departmental coordinations. Creation of smart ports is an emerging concept of an automated port that uses advanced technologies, such as big data, Internet of Things (IoT), blockchain solutions and other smart technology-based methods to improve performance and economic competitiveness. A smart port is more efficient, effective, and secure, making it environmentally sustainable, economically efficient; it also has higher capability to handle port traffic
4. **Development of industrial corridors** - There is a need to promote green industrial corridors and logistics hubs alongside waterway terminals and foster waterways that run parallel to transportation corridors and urban centres
5. **Transshipment reforms** – Cumbersome customs, safety and security procedures for transshipment cargo have prevented its full exploitation until now. This needs to be addressed on priority to enable seamless transfer of transshipment cargo, followed by greater engagement with logistics companies
6. **Promoting Inland Water Cargo Transport:** A fuel efficient and environment friendly mode of transportation Waterways is a key strength of Kerala’s transport landscape. The total length of navigable route in Kerala is 1,900 km and the navigable rivers constitute about 54 per cent of the waterways. The 41 West-flowing rivers together with the backwaters are an integrated part of the inland navigation system in Kerala. However, freight movement through inland waterways at very nascent stage. One reason for the inland cargo transport not flourishing well is due to lack of depth in the waterway, lack of modern inland craft terminals and cargo handling systems, also due to the accelerated growth of water hyacinths etc. An initiative to tap the potential of cargo transport in the State in line with water transport is essential.
7. **Conventional Ways of Operations:** One of the most important bottlenecks affecting the State logistics scenario is the obsolete manner in which the sector operates in the current scenario where Middlemen charge brokerage and hence lead to an increase in overall operational costs. The sector lacks use of an integrated IT solution to manage swift operations across the supply chain.
8. **Minor Ports Development:** Intermediate ports have facilities for berthing, cargo handling and storage facilities. Most of the minor and intermediate ports in the State are seasonal in nature with insufficient infrastructure to handle even medium and small sized vessels throughout the year. Currently cargo operations take place only in four ports (Azhikkal, Beypore, Vizhinjam & Kollam) , the remaining ports in Kerala are now defunct due to various reasons.
9. **Lack of separate governing bodies:** While other service sectors such as Tourism, Healthcare, Education, IT-ITES and Shipping have specific departments, the logistics sector remains neglected, despite being crucial for the growth of the other sectors and the overall economy.
10. **Huge compliance burdens:** It is essential to create an enabling environment for the digitisation of documentation and seamless transfer of documents from one agency to another for reducing the compliance burden on the logistic service provider. Better approval processes to setup warehouses and easy tax rules with respect to combined warehousing and eCommerce shipping would help solve some of the prevailing pain points.
11. **Digitisation of tax regime:** Digitizing tax regime could have a huge impact on both profitability as well as attracting new players to the industry. Machine learning and Blockchain adoption can help improve the conventional setup and decrease wastage wherever possible. Start-ups, working solely for improving the logistics setup through technology need to be incentivised and helped in the initial



stages of their journey. Easy registration process and access to setup funding can help resolve the pertinent issues with conventional logistics setup.

12. **Easy tax rules for setting up warehouses:** eCommerce logistics has a very good run as far as economics are concerned but has shown signs of despair at times. Scattered warehousing needs are to be replaced by consolidated warehousing, something that Pickrr is working on aggressively.
13. **Pushing Digitisation:** Logistics companies and industry experts want the government to focus more on the digitalization in the following areas:
 - Infuse investments into digital technologies to push logistics innovations further.
 - Dedicated measures to boost digitalisation to drive transparency and bring in the required predictability in logistics.
 - While goods are moved from one place to another, it is generally required for the transporter to carry a hard copy of the invoice. The Government may look at digitising this by way of e-way bill.
 - Several industry players have implemented some of the latest technologies such as automation, Blockchain, IoT, AI/ML for smart warehousing and logistics. To provide the much-needed impetus, the industry is expecting policy support and tax relaxations that will help infuse investment particularly on technology and make India's logistics industry more competitive globally
 - Include Voice Command Technology and Automation in Warehousing and Freight Industry
 - Use of robots for packing, delivering and inspection as well as data analytics to monitor logistics flow to improve operational efficiency and turnaround time
14. **Sustainable logistics:** Electric vehicles seem to be the future not only to aid logistics but also for the case of sustainability. Logistics industry wants the government and budget to incentivize and subsidize the use of electric vehicles. Incentives for the usage of electric vehicles (EVs) for logistics purposes and for transportation of goods will help EV adoption in the long run.
15. **Rising fuel prices:** Rising fuel prices present a challenge for the logistics industry, as increasing costs typically force players to either raise prices or suffer financial losses. The additional taxes levied on petrol and diesel prices during the pandemic are further adding up to the costs of transportation.
16. **Well-being of Truck drivers:** As truck drivers are the backbone of the logistics and transport industry, the initiative will also emphasise on safety on highways, and driver's well-being through insurance, medical facilities etc. Looking at a registry of truck drivers integrated using Aadhaar to target and create well-being measures.
17. **Privatization of Logistics sector:** Active participation of private players is essential to expedite overall development of the sector under comprehensive partnership models for large players in the State and multi-national investors and companies. The government can also consider strategically bundling of assets in the privatization of logistics to ensure better value for all stakeholders. Encourage more public-private partnerships in the sector by creating synergies when privatizing, primarily, to maximize value and bring down logistics costs. There is a need to boost private sector participation in logistics infrastructure creation.
18. **Need for flexible labor force:** The lack of labor market flexibility is another challenge that the State of Kerala is facing from a logistics perspective.
19. **Lack of Modern infrastructure:** Lack of modern infrastructure facilities in the existing state-owned warehouse reduces the throughput. Also, the State lacks access to modern containers and transportation vehicles which are a key to meet the demand of new-age customers.
20. **Better Infrastructure facilities:** Investing in better road infrastructure will facilitate faster movement of goods, help in reducing the costs and improve turnaround time for vehicles. Improvement of air infrastructure and connectivity will help the logistics industry to boost this sector.
21. **Make Railway freight more dynamic:** The railway freight sector must be reviewed to make it more dynamic and market-focused to enable better value, ensure availability for manufacturers and bulk industries etc while enabling higher revenues for the railways over time
22. **Modernisation of Ports:** Mechanized berths, sufficient stockyard, and multimodal evacuation systems for fast turnaround of vessels are key enablers for productivity and efficiency of ports and



terminals. To achieve this, investments will be required in dredging, developing adequate civil infrastructure, and securing land along with the latest technology equipment to create a mechanized and environment-friendly cargo handling. Minor ports development in this regard is also a key factor. The State does not yet have enough top-class dedicated ro-ro terminals at its ports.

23. **Port-based Industrial SEZs:** Focus on the development of port-based industries and manufacturing hub in the State.
24. **Industry status for Warehouses and Logistics sector:** From better approval processes for setting up warehouses to easy tax rules with respect to combined warehousing and eCommerce shipping are some of the key suggestions sought in this regard.
25. **Need for Logistics skilling initiatives:** There is a dearth in qualified skilled Labour in the State. The industry faces challenges as proper training needs are not met for these resources to increase productivity
26. **Encouraging green logistics practices:** Focus on initiatives like tighter regulation of greenhouse gas emissions, reduction of carbon footprints, and promoting the use of solar roof panels. Such standards can be mandated for the sector.

3.16 Kerala's Logistics – Logistics Infrastructure Projects of the State under the National Infrastructure Pipeline

The Government of India has a focussed Infrastructure Vision 2025 under which bringing about convenient and efficient transportation and logistics is an important goal. While many of the initiatives including Sagarmala have brought about a significant change in the port and related infrastructure in the State and the country, the ground level impact of the same translating to increase in value of trade is yet to be ascertained.

The National Infrastructure Pipeline (NIP) for FY 2019-25 is a first-of-its-kind, whole-of-government exercise to provide world-class infrastructure to citizens and improving their quality of life. It aims to improve project preparation and attract investments into infrastructure. All projects (Greenfield or Brownfield, under conceptualization or under implementation or under Development) of project cost greater than Rs. 100 crore per project were sought to be captured. Logistics is one key sector amongst Transport, Energy, Water and Sanitation, Communication, Social Infrastructure and Commercial Infrastructure.

The key projects developed in the State under the Logistics and Transport sector are provided in Annexure 4. The synergised development of these projects in line with the State Logistics Action Plan will help deliver better results.

3.17 Kerala's Logistics – Navakeralam Perspectives

Under the Rebuild Kerala Development Programme (RKDP) which is implementing the State's strategic road-map for a Green and Resilient Kerala the importance of promoting Green Logistics and strengthening preparedness of the Logistics sector in light of floods and other natural disasters is to ensure a resilient recovery and development pathway for a Nava Keralam. It is essential to build a resilient transport system under Rebuild Kerala. Embedding Green logistics practices will play a key role in this system. Also, as cleanliness and recycling are a key angle, possibility of sending recyclable materials as return cargo from cities could be explored jointly with Suchitwa Mission.

3.18 Kerala's Logistics – Key KPI's to benchmark efficiency

Easily measurable KPI's that could be used to assess State's performance and efficiency. This will be different from LEADS but can feed into the LEADS framework.

- **Percentage of key-logistically important roads that support trucks of 28.5 tonnes**

This is easily measurable. The geo-clustering exercise in prior sections have identified the key logistically important roads. It is recommended that the State benchmarks what percentage of these roads support trucks of 28.5 tonne (including cargo weight)

- **Cargo Type and Loads in every quarter loaded and unloaded in ports**



This is a key indicator which can be measured easily. It is recommended to analyse this by cargo-type and loads and not just total loads. Modal cargo transport shift to water is envisaged to reduce the overall cost of Logistics

- **Number of EV vehicles registered in State designated for cargo**

Last mile delivery could become cost-effective if EV's come up there. Hence this could be used as a metric for assessing both the green-logistics aspect as well as cost-effectiveness of last-mile delivery

- **KPI's based on 3PL providers ranking framework**

It is recommended in the previous sections to develop a ranking framework for 3PL providers in State. Once that gets operational, various KPI's could be developed on its basis.

- **KPI's entered around cluster centric SWC depots/ proposed mini-MMLP's**

If the recommendation to develop cluster centric SWC depots gets accepted, various KPI's could be developed on its basis.

- **Cost of logistics as a percentage of their production tonnage and revenue for key companies registered in Kerala publishing audited financials**

This figure could be monitored for key companies and PSU's like KMML on a quarterly or yearly basis to see the effectiveness of logistics system

- **Write-off due to perished cargo as a percentage of their revenue for key companies registered in Kerala publishing audited financials**

Loss due to lack of cold-storage , good warehousing etc are key reasons behind lack of overall competitiveness in India. These could be benchmarked in a yearly / quarterly manner depending on publication of such data by various companies

- **Percentage of Return cargo in various modes of transport**

Availability of return cargo can bring in cost-efficiencies in many cargo sectors and bring in efficiencies. To measure this, developed tech-systems for cargo delivery is necessary. Once the digitization reaches the desired levels, this could be measured.

3.19 Kerala's Logistics – 5 year and 10-year view

Kerala is fast becoming an urban continuum. Historically Kerala has been a consumerist State with very few production clusters in the State. And these production clusters have been suffering from absence of good connectivity to inter-state networks as well as consumer points in the State. In coming 5 to 10 years, urbanization in Kerala would accelerate. Reverse migration to the State during the Covid pandemic is an indication that a large base of Keralites who have been employed in other states would want to come back to Kerala or look to retire back in Kerala due to the social infrastructure and accessible healthcare facilities in the State. This will add more demand towards good and would result in different types of goods flowing into the State. Hence every urban agglomeration would need to develop city-wise logistics plans , identify logistics zones, push for the required infrastructure etc. This advancing urbanization and aging of society will result in more demand for processed food, frozen food etc. This also would add to the logistics demand.



Figure 18: Key Futuristic considerations regarding future demand scenario

Consumerist Society	Urban Continuum	Geographically Constrained
About 55% of goods by value being used in Kerala are imported from other states or abroad. Hence logistics systems have evolved to cater to inbound logistics	State's urbanization is projected to grow from a present 71% (est.) to more than 90% by mid 2030's. Results in strong urban logistics demand & need for reverse logistics & return cargo.	56% of state is hilly areas covered by Western Ghats, which means limitations for rail, airports etc. & primary mode of cargo transport is road. Long shoreline & waterways present an untapped opportunity
	Current (2020s)*	Future (2030s)*
Population Growth	3.4 Cr	3.6 Cr
Population Density	860 /sq km	951/ sq km
Urbanisation - % Urban Population	69%	90%
Human Development Index	0.8	0.9
Per capita consumption	Rs. 1.58 L	Rs. 2.59 L

*Values are estimated based on KPMG in India Analysis 2021 based on research reports

Source: KPMG in India Analysis 2021 based on market research and Industry Stakeholder discussions

Below is the expected projection of consumption demand from a 5 year and 10-year perspective. As the urbanization in Kerala is rapidly increasing in Kerala and as the per-capita consumption for most urban food commodities is lesser than rural (e.g.: Cereal, fresh fruits etc), the overall food consumption has just marginally increased.

Item/Commodity	2009-10 monthly per-capita consumption in kg(rural)	2009-10 monthly per-capita consumption in kg(urban)	2020 total consumption in Tonnes	Est: 2025 consumption levels in Tonnes	% Change of 2025 vs 2020	Est. 2030 consumption levels in Tonnes	% change of 2030 vs 2020
Cereals	8.71	8.08	273,406	288,542	6%	296,971	9%
Cereal substitutes (tapioca etc.)	0.71	0.35	1,468,416	1,550,448	6%	1,596,339	9%
Pulses and pulse products	0.58	0.69	241,308	253,875	5%	260,645	8%
Milk and milk products	3.11	3.7	1,154,738	1,199,150	4%	1,218,266	6%
Edible Oil	0.52	0.6	2,276,063	2,393,357	5%	2,456,163	8%
Egg, fish, and meat	2.73	2.78	1,150,719	1,199,150	4%	1,218,266	6%



Item/ Commodity	2009-10 monthly per-capita consumpti on in kg(rural)	2009-10 monthly per-capita consumptio n in kg(urban)	2020 total consumption in Tonnes	Est: 2025 consumpti on levels in Tonnes	% Change of 2025 vs 2020	Est. 2030 consumpti on levels in Tonnes	% chang e of 2030 vs 2020
Vegetables	4.96	5.67	2,276,063	2,393,357	5%	2,456,163	8%
Fresh Fruits	13.7	9.51	4,533,025	4,496,529	-1%	4,393,503	-3%
Dry Fruits	0.04	0.06	21,456	23,251	8%	24,425	14%
Sugar	0.83	0.86	356,428	371,172	4%	377,947	6%
Salt	0.27	0.27	111,625	115,700	4%	117,363	5%
Spices	0.59	0.58	242,976	251,362	3%	254,575	5%
Total			13,980,328	14,317,684	2%	14,376,458	3%

Source: KPMG in India Analysis 2021 based on market research

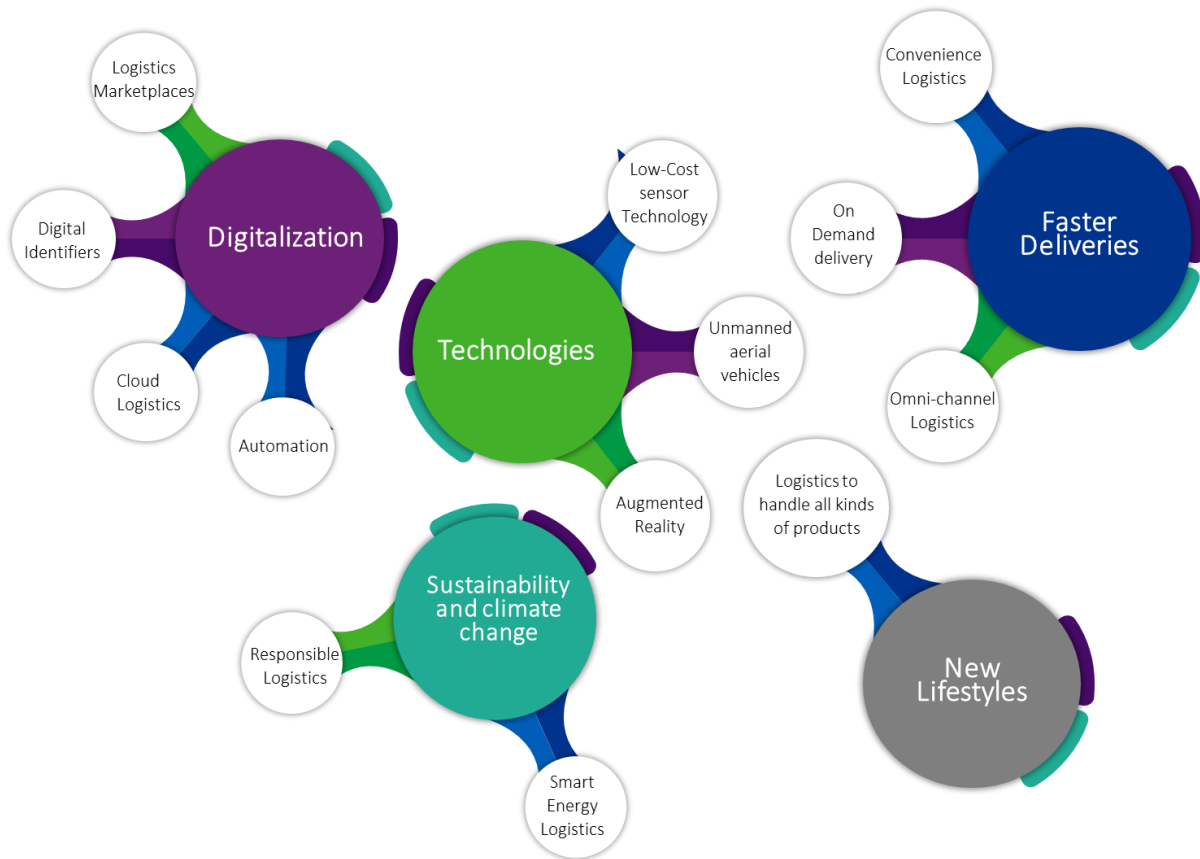
As the urbanization increases, it results in more difficulty in road centric initiatives. Hence the strategic projects like river linkage, coastal and inland water transport are of tremendous importance to the State. Also, EV adoption is gaining traction already in State with proliferation of 3-Wheeler EV autos. Once commercial EV's come up, if utilized effectively it will give good platform for reducing last-mile delivery cost.

The Kochi-Coimbatore economic corridor brings to us good opportunity to get investments in various aspects in this route like logistics. Similarly, the GAIL pipeline project and EV uptake together has great potential to reduce fuel transport in tankers.

The decreasing of economic growth in Middle East and crude-oil's expected decline can greatly reduce the economic opportunities for Keralites in Middle East. Hence, a strategy to develop alternate markets for finished goods from Kerala like Europe, South East Asia need to be looked into both from an air cargo and sea cargo perspective. With the ICT in Vizhinjam starting to operate soon, it should accelerate Kerala's cargo linkages to East and West.

The overall Logistics needs are also changing, and the State needs to embrace key trends as shown below.

discussions



Source: KPMG in India Analysis 2021 based on market research

As the economy matures, specialized logistics needs arise. From cold chain & frozen food to dedicated logistics for pharma, fragile items, segregation in reverse logistics, cost-effective technologies for storage and transport etc would arise. Similarly, need for sustainable logistics and recycling would also increase. All this would need good amount of investments in infrastructure, technology, and skills to obtain a competitive advantage for the State. These are factored in while preparing the State Logistics Action Plan.



4. State Logistics Action Plan Framework



Source: KPMG in India Analysis 2021 based on market research



5. Mapping of NLP Pillars to Kerala

The National Logistics Policy (NLP) is structured into five pillars and a detailed mapping of those pillars is done along with national initiatives. A corresponding State level initiative is also identified there that can complement the national initiative

5.1 Pillar 1 : Integrated Logistics Services

Central Government Initiative	Joint Initiative (State and Central)	Potential State level Initiative	State Stakeholder
National Logistics Efficiency, Advancement, Predictability and Safety Act (LEAPS) - Unified Legal framework for development of logistics sector, resulting in increased efficiency, transparency, competitiveness and ensuring modernization to achieve One Nation- One Contract - One Form paradigm		Assess the State laws - If there are laws that need to be assessed for improving the State logistics efficiency, mark that and start an initiative to evaluate those	Legal and Transport Departments
Master Plan for National Logistics Framework for Demand Driven logistics requirements (national level)		State Logistics Plan Prioritization framework based on the demand	Industries department
	Provide integrated national multi-modal transportation and logistics framework	As the MMLP standards are not quite feasible in a Kerala context, it would make sense for Kerala to be a part of MMLP standard setting exercise to influence the specifications and standards so that it becomes applicable to State's realities as well and required budgetary support comes from centre	Industries Dept
	National Logistics grids for optimization of logistics movement between major	Connecting State Grids to the national logistics corridor in road, rail, water, and air transport	Industries and Planning Depts



Central Government Initiative	Joint Initiative (State and Central)	Potential State level Initiative	State Stakeholder
	clusters of demand and supply		
Framework for development of modern warehousing		Warehouse standards depend a lot on type of goods as well as state-level climatic and geographic factors. Hence Kerala can take a lead in this, identify the key types of goods unique to the State (e.g.: spices , sea food, processed food etc) and develop standards for modern ware-houses comparable to international standards, yet relevant to Kerala. Once these standards are formed, it could be plugged to national standards	Industries , Agriculture and Civil Supplies Dept
		Land allotment is a State subject. Hence the aspect of land allotment to different types and sizes of warehouses, standards should be looked at the state-level	Industries and Planning Depts
Warehouse on cloud (a cloud-based marketplace to expose the warehouse rates, reviews etc for better capacity utilization and price discovery)		The digitization of warehouses from an external facing perspective to be done using open standards and API's . This would facilitate easy integration with this marketplace when it comes	IT Dept, Industries Dept, KSUM
	Technical advisory support and model concession agreements for developing bulk	State can do an exercise to assess the need of new warehouses, types and locations and see if it merits to have green-	Industries and Planning Departments



Central Government Initiative	Joint Initiative (State and Central)	Potential State level Initiative	State Stakeholder
	storage and modern warehouses on government land in a PPP model	field warehouses and if required, adopt a PPP model on State / central land whichever is most suitable	
Standards relating to palletization ,handling equipment, racking and trucking / containerization to be developed through technical panels aligned with global best practices		State to identify the priority and unique cargo sectors to State , develop the standards and play a leading role in standard settings. This could be started as a separate initiative at State level and combined with the national track when it gets running	Industries, Agriculture and Transport departments
Professionalization of logistics services iLog platform for registration, accreditation , ratings, review for logistics service providers		State can launch a skilling program to upskill and transform the logistics service providers so that they are seen as globally competitive in iLog when it comes into practice	Industries Dept
iLog platform for comprehensive integration between relevant systems, facilities, and seamless exchange of information			
Skilling and Training program	Advanced skilling and training programs to be launched in association with IIT's, IIM's	Pitch for such a program in State focussed on a strategically important sector (e.g.: marine logistics, food processing logistics, spices logistics etc)	Higher Education, Industries
	Certified logistics professional program scheme to be introduced to ensure availability of	A skilling transformation program to be launched for State logistics professionals (loading / unloading , warehouse operations, cold chain etc). These traditional	Labour and Industries Depts



Central Government Initiative	Joint Initiative (State and Central)	Potential State level Initiative	State Stakeholder
	qualified professionals	logistics professions to be mapped into a futuristic state and relevant skilling transformation programs to be launched targeting each of those streams	
<p>Research and innovation in logistics A network of academic and research institutions would be developed to drive interdisciplinary research, form centres of excellence in logistics etc</p>		State Institutions like IIT Palakkad, CUSAT can pitch for being a part of this from a strategically relevant cargo perspective	Higher Education, Industries
A logistics innovators network (LINE) would be formed to develop the start-up ecosystem. Annual accelerator program would be launched in collaboration with start-up India		Kerala already has a logistics accelerator program in collaboration with DP world running. In this context, it could be evaluated on scale-up possibilities, positioning it as national logistics accelerator partner etc. This needs a deeper analysis	KSUM, IT dept
Urban Logistics	City level logistics plan would be developed to streamline urban logistics , setting up dedicated logistics zones and last mile connectivity	Every corporation in Kerala can launch an initiative on the city logistics plan. In addition to the centrally specified schemes, corporations can include programs on sustainability in logistics, reverse logistics, green logistics etc	Industries, City Corporations
City level logistics ranking framework would be introduced to rank cities		As this can have a bearing on investment decision of corporates looking towards setting units in State, Kerala can take a leading role in having a ranking plan and improving its	Industries and City Corporations



Central Government Initiative	Joint Initiative (State and Central)	Potential State level Initiative	State Stakeholder
		position by benchmarking itself to leading cities in the world	
Green Logistics	Shift to water ways and railways	Strategic Program could be run to develop waterways and railways cargo. As identified in earlier section on State logistics. This could be done initially for non-time critical cargo	KSINC, Inland Water Transport, Industries, Transport
	Adoption of EV's	- EV's in good carrying vehicles are yet to evolve. Kerala has high cost in last-mile delivery. It could be explored if cargo could be delivered using passenger EV autos up to certain limits, which can accelerate EV adoption as well	Industry, Electricity and Transport Departments
	Promotion of reusable and collapsible containers	Could be plugged into the ranking framework of 3PL providers	Industries Dept
	Rewards and recognition to promote green logistics initiatives	Could be plugged into the ranking framework of 3PL providers and city logistics plans	Industries Dept
	Reverse logistics for push towards circular economy	This has two important bearings for Kerala. Reverse logistics can spur return cargo which can improve the unit-economics of many businesses by reducing the effective logistics cost. And this can drive sustainability in cities. A	Industries Dept, Suchitwa mission, city corporations



Central Government Initiative	Joint Initiative (State and Central)	Potential State level Initiative	State Stakeholder
		joint initiative with Suchitwa Mission is ideal	

5.2 Pillar 2 : Efficient and Multi-Modal Transport Infrastructure

Central Government Initiative	Joint Initiative	Proposed State Government Initiative	State Government Stakeholders
Promoting Intermodal Transport	Promoting transport infra and multimodal logistics facilities	Logistics clusters in the State are identified based on the geo-clustering of warehouses , ports, rail, industry areas etc. It is proposed that these areas be converted into logistics parks / mini-MMLP's	Industries, Planning, Transport and Ports departments
	Encouraging operators to adopt multimodal operations	Ranking framework of 3PL providers can include rail / water usage levels as a parameter	Industries, Transport
	Containerization of cargo to be encouraged	Volume of containerized traffic would be a key factor in getting MMLP investment in future. Hence this aspect could be measured and tracked, especially in Kochi-Coimbatore economic corridor	Industries and Ports department
Developing guidelines to promote transparency in freight and encourage competition across modes		A benchmarking exercise of 3PL players can look into this aspect of bringing transparency to the logistics eco-system Similarly, digitization of SWC depots can bring in API's that can expose a variety of parameters	Industries, IT
Improving trucking and road transport ULIP / unified logistics Interface platform to be developed integrating multiple		State can set up a task force with Industry and IT departments to work with centre when this initiative gets moving	Industries, IT



Central Government Initiative	Joint Initiative	Proposed State Government Initiative	State Government Stakeholders
other DB's like Fastag, Vahan, GST etc			
Digital trucking application would be developed to facilitate accreditation of trucking companies		A benchmarking exercise of 3PL players can cover this aspect	Industries, IT
Attracting freight for Indian railways	Developing customized offerings for unique commodity requirements	Southern railway division at Trivandrum has good volumes of cargo. A joint task force can be setup to work with railways to explore developing the cargo volumes considering all the State relevant aspects The logistics parks suggested once established can have KPI's centred around volume of traffic pushed into rail	Industries , Railway departments
	Promoting parcel business via scheduled timetable services	The earlier mentioned initiative can take a market development perspective and push for scheduled railway freight services	Industries, Railways
	Incentivizing service providers and users to shift to rail mode	Ranking framework for 3PL providers in State can be used to push for this	Industries
Promoting coastal shipping and inland waterways transportation	Developing dedicated berths for coastal cargo	Proposed logistics parks which are clustered near inland and seaports can take up this with shipping ministry	Industries, Ports. KSINC
	Developing mechanized cargo handling infra	Proposed logistics parks which are clustered near inland and seaports can take up this with shipping ministry	



Central Government Initiative	Joint Initiative	Proposed State Government Initiative	State Government Stakeholders
	Single window for cargo clearance		
	Long term contracts with public / private sector to achieve scale	An industry dept level task force can work with various industries, especially those handling non-time critical cargo to push for inland water / coastal cargo transport working with proposed logistical parks	
	Incentivizing service providers for coastal freight movement	3PL ranking framework to be encouraged to develop first and last mile delivery support from river / coastal centred logistical parks	Industries, Ports. KSINC
	Development of first and last mile transport		
	Development of river-sea vessels to increase carrying capacity		
	Customised vessel financing scheme	To be taken up in an initiative to promote water transport. Rates can be linked with 3PL ranking framework	
	Development of river-sea vessels to increase carrying capacity	State to participate in these discussions and highlight Kerala's point of view	
	Including inland vessels under tonnage tax scheme, removing disparity in GST rates on input/output activities		
	Modifying customs procedures for transportation of transit goods via IWT		
Increased use of pipeline infra Develop model guidelines for development of different categories of pipelines , parallel to / under railway		Analysis on the futuristic transport needs of the State and see what all items could be supplied via pipelines and develop model guidelines, PPP frameworks wherever applicable	



Central Government Initiative	Joint Initiative	Proposed State Government Initiative	State Government Stakeholders
	Right of way approvals from diff authorities to enhance cost-effective and safe movement of select commodities		Planning and Industries Dept
Airfreight for high value and perishables	Airfreight stations to be developed and co-located within MMLP's wherever possible	In Kerala context, logistics parks identified near the airports can be given a special task to develop airfreight.	Industries, Transport
	Explore utilization of unused airstrips for airfreight with special focus on perishable cargo		
<p>Promote Indian flag carriers</p> <p>Promote Indian flag carriers (air , ship) through encouraging investments and creating support system of financing, insurance, repair</p> <p>Promote Indian companies to own aircraft fleets and focus on air cargo operations for trade within India and overseas which would provide revenue and employment opportunities , esp. in aircraft maintenance , MRO etc</p>		State can give concessional rates at ports / airports for cargo fleet if the MRO business of aircraft / ship is done in the State	Industries, Ports

5.3 Pillar 3 : Meeting Logistics Needs of the Core Sector

Central Government Initiative	Joint Initiative	Proposed State Government Initiative	State Government Stakeholders
Modernizing logistics for Agri and allied sector	Integrated planning of Agri-hubs and handling facility	Potential logistics parks across the State with potential cargo of	Industries , Agriculture departments



Central Government Initiative	Joint Initiative	Proposed State Government Initiative	State Government Stakeholders
Develop national logistics grid for optimizing o-d movement for Agri-commodities with focus on		benefit has been identified in the section before. These proposed logistics parks could be evaluated in detail and specialized cargo centric initiatives and investments required could be identified	
	Shift to cost effective and environmentally sustainable modes		
	Setting up aggregation centres, packhouses, temp-controlled storage at strategic locations		
	Silo based impact , vertical storage of bulk grains		
	Enhance participation of start-ups for innovative solutions on storage and packing	Logistics accelerator by KSUM and DP World can be engaged to evaluate this	KSUM, Industries, IT departments
Driving MSME competitiveness Logistics e-Marketplace to function as a single window for all logistics services and EXIM certifications and facilitate transparent price discovery and remove information asymmetry on capacity availability of logistics infrastructure		To be tackled along with the mini-logistics parks initiative and digitization of State logistics	Industries
	Develop common logistic-related facilities to facilitate cost-effective and efficient supply chains for MSME clusters and ensure geographically balanced growth	To be tackled along with the mini-logistics parks initiative. The mini-logistics parks could be developed in a PPP centric mode that can facilitate private sector investments	Industries
	Promote start-up ecosystem in asset-light freight platforms and last-mile delivery and asset-based models	Logistics accelerator program could be broadened to include this	KSUM, Industries department



Central Government Initiative	Joint Initiative	Proposed State Government Initiative	State Government Stakeholders
	with focusing on warehousing, containerization, and palletization to achieve scale to provide cost-effective logistics to MSMEs		
Logistics for Priority Sectors – Identify sector-specific interventions for the Priority sectors under the ‘Make in India’ program aimed at enhancing logistic cost competitiveness based on global benchmarks		Once needs of State specific logistics like spices , food processing etc are identified, financing support for such schemes could be sought under Atma-Nirbhar initiatives	Industries
Logistics for Bulk Cargo Establish a National Logistics Grid for major bulk commodities with focus on innovative shift of modes (like slurry pipelines for coal and iron ore), bulk transport for cement and other cross-cutting solutions		Once the national logistic grids for major commodities gets developed, the bulk cargo modes could be integrated with it. The key factors in this angle would be - GAIL pipeline integration - Kochi – Coimbatore- B’lore economic corridor	Industries
Like use of wagon tippers and in-motion weigh bridges for railway		Could be taken along the initiatives to develop rail cargo sector	Industries
	Use of barges for movement of bulk commodities	KSINC, Ports and Industries department can jointly work for developing business cases for barges once sufficient volumes are established	KSINC, Ports and Industries
	Rake availability for bulk cargo movement,	Could be taken along the initiatives to develop rail cargo sector	Industries



Central Government Initiative	Joint Initiative	Proposed State Government Initiative	State Government Stakeholders
	Adequate storage infrastructure at rail sidings/ port terminals, along with investment in mechanization, and	The proposed mini-logistics parks can be developed further from this perspective wherever applicable	Industries
	Setting up MMLPs at key inter change points	Mini-MMLP's could be taken up in Kerala's context by re-imagining SWC depots	Industries
Hazardous Cargo , dangerous goods, and over-dimensional cargo Review and streamline transportation and storage of Hazmat, DG and ODC with unified standards and oversight mechanism and ensuring compliance by consignor;		Identify the major hazardous cargo in Kerala and develop their handling standards	Industries
	Identify and designate well- equipped logistics facilities, major corridors, and connectivity points for movement.	Review the present and proposed logistics facilities for that and see if it needs scaling up, connectivity and beefing up of security standards	Industries Dept
	Training of workforce involved to meet safety standards and reduce accidents	Relevant labourers to be given state of the art training aligning with the global best practices	Labour and Industries Dept

5.4 Pillar 4 : Logistics for International Competitiveness

Central Government Initiative	Joint Initiative	Proposed State Government Initiative	State Government Stakeholders
Improving Infrastructure for international trade Augmenting physical facilities at LCS		Can be evaluated along with mini-MMLP's / reimagined selected SWC depots	Industries



Central Government Initiative	Joint Initiative	Proposed State Government Initiative	State Government Stakeholders
Developing infrastructure for off border clearances to reduce border congestion			
Co-locating inland customs within MMLPs to maximize operational efficiencies			
Enhancing digitization to expedite clearances			
Promoting Free Trade Warehousing Zone (FTWZ) to enhance regional/ global trade			
Develop a Model Process Manual to provide guidance on streamlining and standardization of logistics processes with annual audit to assess logistics efficiency at ports and airports			
<p>Streamline Work with Customs and partner Government agencies</p> <p>Develop a robust IT platform and Risk Management System (RMS) for 6 major PGAs adopting a 'One Government Approach' to streamline inspections, sampling, testing and issuance of certification to expedite cargo clearance at port; integration with other IT systems to ensure seamless and paperless EXIM; explore outsourcing select PGA activities to certified third party vendors to improve service.</p>		To be tackled along with digitization of State logistics initiative	Industries, IT
<p>Develop a lab eco-system through</p> <ul style="list-style-type: none"> • a program to support accreditation of Indian labs conforming with standards of key trading partners, • electronic database of accredited labs, • SOPs for collection/ transmission of sample from ports to labs, and 		Can be taken along with initiative to set standards and increase competitiveness	Industries



Central Government Initiative	Joint Initiative	Proposed State Government Initiative	State Government Stakeholders
<ul style="list-style-type: none"> a discount mechanism for MSMEs to avail cost-effective facilities for trade 			
<p>Integration with Global Value Chains</p> <p>Develop Highly Facilitated Trade Corridors (HFTCs), a bilateral initiative between an Indian hub port / airport and a key hub port / airport in key destination market of importance, to support greater integration of India with GVCs; these would be built on digitization initiatives to enable secure digital data transfer and integrated with counterpart systems of international partners to drive competitiveness in GVCs</p>		<p>Vallarpadam Container terminal can take the lead in this by partnering with key destination ports for seamless data exchange, integrate with counterparty systems etc to speed up the cargo handling. This could also be applicable with respect to coastal cargo traffic to key domestic ports like Mumbai</p>	<p>Industries , Ports Departments</p>

5.5 Pillar 5 : Logistics for Emergency Response

Central Government Initiative	Joint Initiative	Proposed State Government Initiative	State Government Stakeholders
<p>Logistics for Covid</p>	<p>Develop robust response systems with the help of mapping and location technologies to ensure safety of the supply chains and logistics. These systems would use tools to ensure logistics operations continuity, while addressing the need to re-align routes and supply chain planning due to presence of containment zones in COVID pandemic.</p>	<p>Key goods (food , medicines, farm produce etc) supply chains to be mapped to all key distribution points of State and key backup routes for any disruption to main routes to be determined</p>	<p>KSDMA, Agri, Civil Supplies, Health, Industries Dept</p>
<p>Logistics for other emergencies</p>	<p>Support National Disaster Management Authority (NDMA) and</p>	<p>As Kerala has gone through disasters like flood, Ockhi , tsunami, it</p>	



Central Government Initiative	Joint Initiative	Proposed State Government Initiative	State Government Stakeholders
	<p>the Ministry of Home Affairs (MHA) in relief and rehabilitation operations through</p> <p>Developing Standard Operating Procedures (SOP) to ensure safety and minimal disruption of essential logistics services,</p> <p>Support in conducting mock drills to test preparedness</p>	<p>becomes important to have preparatory strategies for such calamities again. The SDMA needs to draw up a backup logistics plans for key cargo like food, medicines in case some localities get isolated as well as an SOP, Mock drills etc</p>	
<p>Strategic Logistics Assets</p>	<p>Identify strategic logistics assets and facilitate in upgrading them to meet military standards in terms of their design, construction and build quality as well as equipment capacities, as required.</p>	<p>Key points for handling food , medicines , water supply and energy supply to be identified and classified as strategic logistics assets. Plan to be prepared to upgrade the safety and reliability of these during disasters</p>	



6. LEADS Ranking Framework Analysis

Logistics Ease Across Different States is a framework used by central Government to benchmark the ease of logistics across different states and union territories in India. LEADS is derived from World Bank's LPI framework (Logistics Performance Index). While the framework, indicators and coverage are given in public domain, the exact calculation details are not available. There are three broad categorizations under LEADS – Infrastructure, Services, Operating and Regulatory Environments. Each of these sections, associated indicators and their relevance to a Kerala context are analysed below:

6.1 Infrastructure

Indicators	Kerala LEADS 2019 Ranking (National Max in brackets)	Definition	Coverage	Initiatives at state-level that can improve rankings
Availability of logistics infrastructure	3.18 (National Max – 3.92 by Gujarat)	Capacity in Relation to Demand	Road , Rail , ports, airports, dry ports, warehouses, and cold storage	Initiatives to increase tonnage of road, multi-laning, developing rail, water cargo and <i>mini-multi-modal logistics parks / logistics clusters</i> as identified in the sections earlier can improve rankings
Quality of logistics infrastructure	3.27 (National Max – 3.8 by Gujarat)	Operation and Maintenance Protocols, efficiency of infrastructure facilities		

Source: LEADS 2019 Report, Ministry of Commerce, Government of India and KPMG in India Analysis 2021 based on market research

6.2 Services

Indicators	Kerala LEADS 2019 Ranking (National Max in brackets)	Definition	Coverage	Initiatives at state-level that can improve rankings
Quality of logistics service providers	3.29 (National Max – 3.8 by Gujarat)	Ease of access of competent service providers, where competency refers to skill level of work force and level of technology adoption for service providers	<ul style="list-style-type: none"> • Haulage by different modes • Handling and storage of cargo • Freight forwarding • Customs broking 	<ul style="list-style-type: none"> • Ranking framework of 3PL service Providers
Ease of arranging logistics at competitive rates	2.92 (National Max of 3.45 by Gujarat)	Shipment prices in chosen state compared to price expectations, assessment of costs	<ul style="list-style-type: none"> • Shipment prices include those for transportation, handling, storage, 	<ul style="list-style-type: none"> • Developing mini-MMLP's around identified logistics clusters • Increasing tonnage of key-roads



Indicators	Kerala LEADS 2019 Ranking (National Max in brackets)	Definition	Coverage	Initiatives at state-level that can improve rankings
		and prices elsewhere	<ul style="list-style-type: none"> • value added services 	<ul style="list-style-type: none"> • Developing other modes of transport (rail, inland water, sea)
Timeliness of cargo delivery	3.27 (National max – 3.7 By Gujarat)	Timeliness of cargo delivery	<ul style="list-style-type: none"> • Unscheduled stoppages during transit • Average detention at borders • Documentary compliance check 	<ul style="list-style-type: none"> • Mini-MMLP's with customs clearance facilities can accelerate clearances
Ease of track and trace	3.27 (National Max – 3.53 by Gujarat)	Ability to obtain frequent, consistent, accurate information regarding cargo movement and condition	<ul style="list-style-type: none"> • Real time information availability • when cargo is in transit, in storage, • awaiting regulatory approval, etc. 	<ul style="list-style-type: none"> • Ranking framework of 3PL providers can push for this perspective. Further, the mini-MMLP's can also support open logistics standards for this
Safety and Security of cargo	3.47 (National Max – 3.7 by Punjab)	Consistency in delivering without damage / pilferage /deterioration	<ul style="list-style-type: none"> • Loss/ damage of cargo: • During transit • Handling at terminals • During inspection 	<ul style="list-style-type: none"> • Ranking framework of 3PL providers can push for this perspective • Similarly, an evaluation framework for mini-MMLP's can measure this as well

Source: LEADS 2019 Report, Ministry of Commerce, Government of India and KPMG in India Analysis 2021 based on market research



6.3 Operating and Regulatory Environment

Indicators	Kerala LEADS 2019 Ranking (National Max in brackets)	Definition	Coverage	Initiatives at state-level that can improve rankings
State facilitation and coordination	2.78 (National Max of 3.31 by Gujarat)	Efficiency and effectiveness of logistics/labour/land policies, law and order, tax breaks	<ul style="list-style-type: none"> • Law and order • City restrictions • Trade and transporter union • Labor laws 	<ul style="list-style-type: none"> • This could be plugged into EODB framework for logistics service providers (3PL) as well as proposed ranking framework of 3PL players
Efficiency of Regulatory Processes	2.99 (National Max of 3.41 by Gujarat)	Speed, simplicity and transparency in processing approvals and clearances, ease of documentation	<ul style="list-style-type: none"> • Customs • PGAs • GST • RTOs / Traffic Police 	

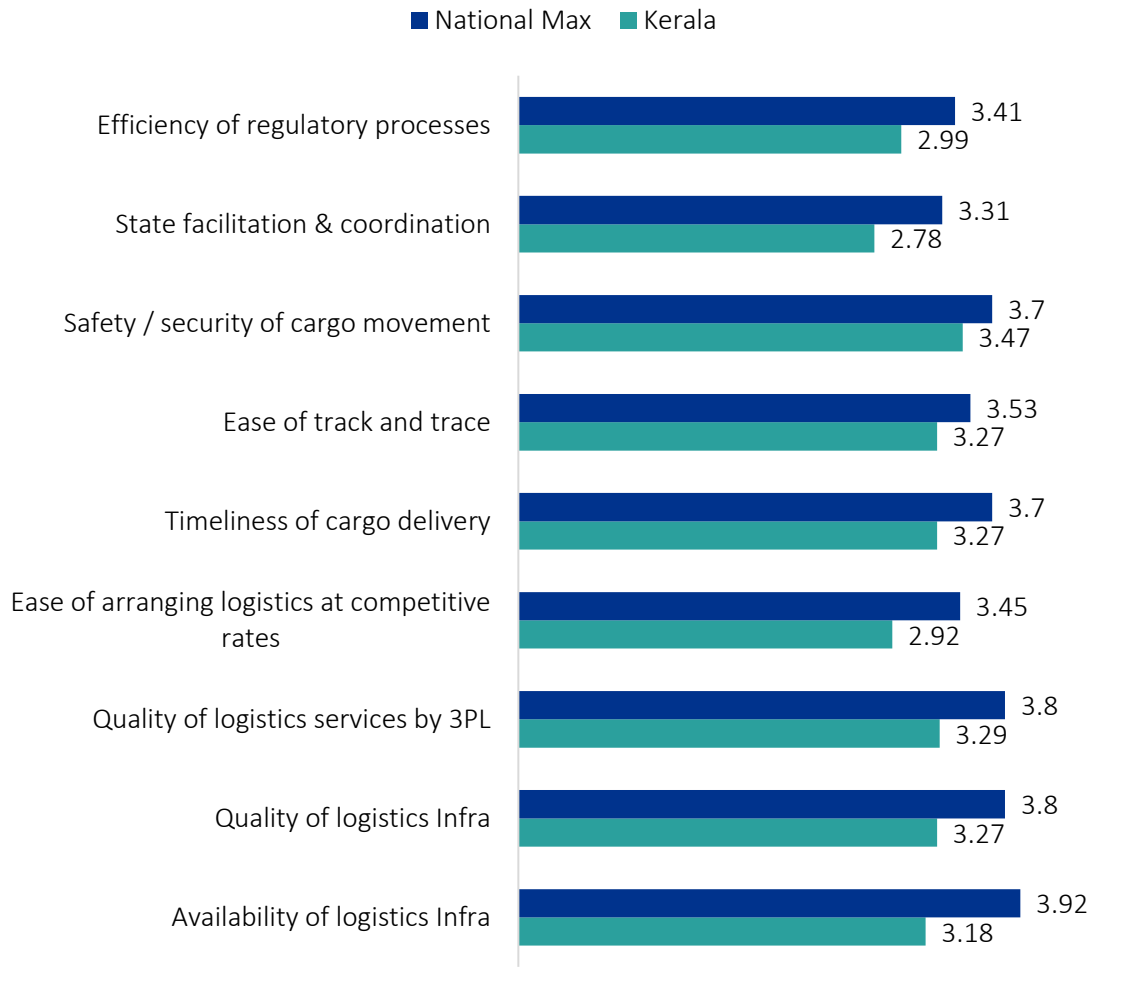
Source: LEADS 2019 Report, Ministry of Commerce, Government of India and KPMG in India Analysis 2021 based on market research

The following key challenges identified during various interactions with Industry stakeholders can be emulated with the LEADS 2019 assessment findings.

- **Availability of suitable hinterland connectivity** from current Industrial Parks, key industrial clusters etc. increases project costs
- **Stressed roads due to traffic density** along NH and interstate SH
- **High cost of Land near multimodal location** make financial viability as an issue
- **Lack of modern infrastructure** in existing State-owned warehouses reduced throughput
- According to Exim bank survey, nearly 14% respondents in Kerala consider **infrastructure as a challenge for exports**, especially the **lack of connectivity between ports and inland modes of transport**
- Development of a **multi-modal cold-chain network** involving two or more modes of transport for facilitating transportation and storage of perishable products was a key need that emerged
- **Strengthening the connectivity to major ports** in the State by Infusing more capital expenditure towards expansion/widening of roads
- Adoption of a public-private partnership model for **strengthening the existing network of waterways**
- Lack of **IT-enabled services to manage logistics infrastructure** at State level
- Need for **flexible labour force**



Figure 19: LEADS 2019-20 scores (Kerala vs National Max)



Source: LEADS 2019 Report, Ministry of Commerce, Government of India



7. Funding Sources

It is important to identify the funding sources for undertaking the projects envisaged under the targeted State initiatives. Exploring funding options from the following sources would be integral in achieving the expected outcomes with quality and in a time-bound manner:

- Government – Central Government funding under key programmes such as Sagarmala, Economic Corridor Development, Industrial Corridors, Atmanirbar Bharat etc. State funding support from Kerala Infrastructure Investment Fund Board, State Budget etc.
- International Financial Institutions (IFIs) such as the World Bank, the Asian Development Bank, Japan International Cooperation Agency, Gesellschaft für Internationale Zusammenarbeit (GIZ), etc.
- Private sector – SPV, PPP modes
- CSR initiatives would be integral to achieving certain expected outcomes with quality and timeliness.

The preferred funding options would vary based on the nature of projects. Many of the recommendations (e.g.: upgrading of selected SWC depot, increasing tonnage of roads etc) overlap with various Industrial corridor initiatives like **Kochi – Coimbatore corridor**. Hence , the respective industry corridor masterplans could be amended to include these initiatives as well to secure financing. Similarly, the SWC warehouse upgradation near the proposed food-processing, petrochemical park etc could be financially sourced from the respective budgetary support.

The State Government is also focussing on funding assistance under various Central Government programs such as Bharatmala, Sagarmala, Gati Shakti, MMLP nodes identified by NHAI includes Kochi as a node etc. The Government can utilise these projects and implement the related initiatives under the plan in PPP/SPV mode. The Kochi Palakkad corridor is one such project being developed in collaboration with Central Government. In a similar manner, support from other Ministries/Central Government can be explored.



8. Skilling in Logistics

An efficient logistics sector would require a skilled workforce adept with the latest trends and sector requirements. From a blue-collar labour perspective, in a mechanized world, there needs to be upskilling to work with different types of cargo which could be perishable, breakable, needs rapid turnaround etc. Hence the strategic logistics sectors of Kerala like food processing, marine food export etc needs specialized skills. The present cold-storage sector in Kerala is poised to grow multiple times. This needs quite good number of blue-collar logistics workers who knows to operate different types of cold storage in varying temperatures (frozen, chilled etc). Similarly, from an advanced skills perspective, the State needs newer low-cost technologies that can ensure such varying needs for strategic cargo of the State.

From a comprehensive sectorial skills perspective, a skill matrix could be visualized as below:

Figure 20: Skills vs Logistics Domain Matrix

	Storage	Transport	Services
Blue Collar Labor	Cold storage skills, Skilling programs could be run to upskill regular headload workers to operate in cold-storage environments. ASAP could run this	Transportation skills for truck drivers for longer drives with varying types of cargo	Headload workers can run – storage and transport as a service – serving businesses using spare capacity in warehouses
Basic technical skills labor	Technical skills to repair cold storage. ITI's could take up these type of courses	Technical skills to repair newer trucks, smaller coastal transport ships, EV repair skills	Set of services in merchant's premises could be operated by technically skilled people
Engineering and Higher-level technologies	Engineering institutes in the State could take up challenges to find low-cost cooling solutions for State's need.	Advanced engineering skills for inland water transport, large tonnage trucks, inter-modal transfer equipment's etc. could be explored in engineering colleges	Skilled engineers could form collectives to offer services for industry
Management	Management institutes could run programs on supply-chain, transportation, operational optimization etc. addressing the State's unique problems. Institutes could offer management programs to industry execs on various logistics aspects as well		
Digital	Digital technologies are creating newer paradigms for business operations in all logistics related sectors. From API's that can expose information to carry out transactions, technology arms of logistics infrastructure – whether industry or government - would need to develop both awareness and expertise in such areas.		

Source: KPMG in India Analysis 2021 based on market research

Logistics sector has evolved from a generalist level to a specialist's domain. 30 years back, the type of goods or modes of transport that a logistics worker would need to be proficient were quite limited. As the industries are evolving into more matured or specialized industries producing different types of goods with different logistical needs, the logistics professionals would also need to upskill themselves considering these multiple



dimensions. This is applicable to all types of workers – blue collar / technical / engineering / management / digital. The thinking and curriculum of logistics related subject needs to evolve based on such dimensions. An illustrative view of logistics skills dimensions is given below . This perspective could be developed further and integrated into different curriculums across various levels.

Figure 21: Dimension vs Problem vs Skills

Dimension	Problem Areas	Skills relevant
Fragility	How to ensure that cargo is not damaged in transport and storage?	Safe driving, packaging, safe storage,
Perishability	How to make sure that cargo does not perish quickly	Faster transport, right storage, safe packaging,
Transparency	How to communicate state of transport to sender and recipient regularly	Technology and API's for track and trace
Reverse logistics	Segregation of reverse logistics cargo	Identification of relevant cargo types quickly

Source: KPMG in India Analysis 2021 based on market research



9. Strategic Initiatives under the Action Plan

The key strategic initiatives identified for the Action plan was charted out considering the existing and future EXIM scenario of the State, key challenges faced by Industry stakeholders, LEADS assessment framework, and National Logistics Policy guidelines. The mapping of key initiatives against the Strategic initiatives and key needs/challenges are highlighted below.

Table 18: Matching Needs / Gaps with Strategic Initiatives

Needs / Challenges	Strategic Initiative
Absence of Middle-Mile logistics and 3PL providers	Re-imagine selected geo-clustering points centred around some strategically located State warehousing corporations as mini-MMLP's or logistics parks with individual P&L responsibility.
High cost of road transport	Increase tonnage of roads connecting proposed logistics parks by strengthening bridges and roads, straightening curves etc so that higher tonnage trucks can ply.
Leverage other modes of transport.	Push more non-time critical cargo into rail and water transport in such proposed logistics parks connected with alternate modes.
Underdeveloped First Mile Delivery and 3PL eco-system	Ranking framework of 3PL providers which measures aspects like financing support, insurance, green-packaging etc as well as integrated track and trace.
High cost of last-mile delivery	Drone delivery to be tried in beyond line of sight places with service providers, especially in high ranges.
Lack of Return Cargo	Develop return cargo by working with Suchitwa mission to collect recyclable materials in return trips from various places.
New modes of clean transport options	Explore possibility of using EV passenger autos for last-mile delivery, which can boost the EV adoption as well. Would need legal and policy changes.
Skills for Specialized Cargo	Kerala can run strategic initiatives to upskill different players in the logistics eco-systems both at labourer level for important cargo from State's perspective (processed food, spices, perishable vegetables) and at higher education level (partner with higher educational institution for such courses in state)
Limited Track and Trace Ability	Kerala can run strategic program with State warehouses, proposed mini-MMLP's to augment the tech stack, digitize cargo operations and consequently track and trace ability
Back-up plan for important cargo during disasters	Kerala can run strategic initiative with KSDMA to identify strategic logistics assets, important cargo to support during disasters and setup backup supply routes in such cases
City Level Logistics Strategy	Every corporation can run strategic initiative to identify critical zones and roads from a logistics perspective, set-up green packaging standards and work with Suchitwa mission to boost recycling and augmenting return cargo
Legal, Policy and Standards Rework	Each of the important cargo from State perspective can be analysed with industry participation, bottlenecks identified and rectified, potential standards that can make the sector competitive internationally be identified and established
Predictability and Infrastructure in Rail	Ro-Ro service in key industrial corridors is needed as it can reduce the cost as per industry. Similarly, cold-chain support in railway-freight is also essential



Needs / Challenges	Strategic Initiative
Under-developed water and coastal transport	The operator eco-system needs to be developed in water transport by multiple initiatives
Ease in opening and operating warehouses	Logistics and Warehousing are to be classified and notified “Industry Status” in the State.

The key discussion points of the 1st and 2nd Logistics Coordination Committee meeting to discuss the draft plan are taken into consideration while preparing the final Strategic Initiatives under the State Logistics Action Plan.

Table 19: Key Discussion Points of 1st State Logistics Committee

Sl. No	Key Discussion Points
1	Create aggregation points for farm produce and products from MSME sector at the first mile, preferably with multi-modal connectivity
2	Establish logistics parks with truck parking locations and warehousing facilities in peri-urban areas near cities
3	Move towards an eco-system of minimal inspection and stoppages of trucks by transport, tax, police etc
4	Identify truck movement choke points and address these bottlenecks with a view to improve truck travel time reliability in the State
5	Earmark dedicated parking spaces along highways and major roads for trucks and resting places for drivers
6	First Mile/Last Mile connectivity to National Economic Corridor and major transportation projects including major Rail, Air, Shipping, and Inland water waterways terminals
7	Transport infrastructure and traffic planning for last-mile delivery within city boundaries
8	Leverage coastal shipping and inland waterways (where available) and railways networks as an environmentally friendly and often cheaper alternative to transportation
9	Infrastructure and Planning for cargo movement for exports and imports wherever applicable
10	Ensure Modern material handling systems and facilities for weighing and X-Ray screening for safely managing cargo
11	Ensure availability of land and facilitative environment for conversion of land-use, FSI/FAR relaxation for warehousing, relaxation in height of warehouses etc
12	Effective implementation of Carriage of Goods by Roads Act – 2007
13	Special Focus on skill development and capacity building for logistics sector
14	Effective grievance redressal and dispute resolution mechanism
15	Promote innovations to promote green logistics and reverse logistics

Table 20: Key Discussion Points of 2nd State Logistics Committee

Sl. No	Key Discussion Points
1	All the initiatives mentioned in the draft action plan was discussed and the Departments were requested to fast track implementation of the same.
2	The unloading charges in the State are higher compared to other States and keep increasing 15-20 percent every year. The charges are to be standardised in consultation with Labour Welfare Boards
3	Data related to e-way bills is to be used to identify key locations for warehouses in the State. The termination points are to be studied and shared with Industries Department
4	There is need for proper warehousing facilities with proper cold storages etc. For this purpose, adequate Industrial land is to be identified. Huge warehousing facility for Seafood export is planned in 30 acres of land of Cochin Port Trust. The FMCG park is also under discussion
5	Ro-Ro Services ability to enhanced at Railway Stations and collaboration to develop warehouses at key Railway Stations.
6	Logistics Services are to be made available 24/7. The labour facilities should be enabled to function at night when most of the goods movement happens
7	Detailed Action Plan is to be developed for Inland Navigation Waterway Development. This project is under development by Coastal and Inland Navigation Department. The plan is to complete development in phases.

The State Logistics Action Plan is a logical continuation of these priorities in a structured way, requiring a multi-disciplinary program management effort with coordination with multiple departments and stakeholders to execute it successfully.

10. State Logistics Action Plan

Sl. No	Strategic Initiative	Key tasks	Implementation Authority/Agency	Timeline (Short, Medium, Long)	KPI
A. INFRASTRUCTURE DEVELOPMENT – TRANSPORT INFRASTRUCTURE					
1	Increase tonnage of logistically important roads to support 4axle 6Wheel trucks (28.5 tonnes)	<p>1.1. Finalize the key roads to increase tonnage taking forward the initial list identified in this report as part of geo-clustering exercise</p> <p>1.2. Identify the overlap of these roads in other State road programs (RKL, PWD road widening etc) and feed in logistical requirements to those programs for overlapping roads</p> <p>1.3. Create an infrastructure development plan to meet first Mile and last Mile connectivity to Kochi-Bangalore Economic Corridor, other industrial corridor projects and major transportation projects of the State</p> <p>1.4. Consider the tonnage aspect in designing of new roads and upgradation of existing SH</p> <p>1.5. Planning of Bypasses and ring roads in line with ensuring last mile connectivity through all SH and NH</p>	<p>Primary Department(s)</p> <ul style="list-style-type: none"> Public Works Department <p>Secondary Department(s)</p> <ul style="list-style-type: none"> Planning Transport Industries 	Medium	% of logistically critical road length supporting 28.5 tonne trucks
2	Develop cargo infrastructure for using rail and water transport	<p>2.1. Strategic Plan (Modal shift planning study) to push more cargo to rail and water with infrastructure, policies, operations, incentives, building</p>	<p>Primary Department(s)</p> <ul style="list-style-type: none"> Industries Coastal and Inland Navigation 	Medium	% increase in Cargo Type and Loads in every quarter loaded and unloaded



Sl. No	Strategic Initiative	Key tasks	Implementation Authority/Agency	Timeline (Short, Medium, Long)	KPI
		<p>predictability in rail/water transport schedules, industry promotion etc.</p> <p>2.2. To be run in close coordination with the initiative to transform SWC depots into mini-MMLP's. These SWC depots could function as the switching points for transfer to other modes of transport</p> <p>2.3. Develop Infrastructure plan for export cargo movement</p> <p>2.4. Prepare a detailed phase-wise action plan for Inland Navigation Waterway Development with focus on development of cargo/logistics facilities.</p>	<p>Secondary Department(s)</p> <ul style="list-style-type: none"> Ports Agriculture Food and Civil Supplies 		in ports and railway stations
3	Green Logistics for last-mile delivery	<p>3.1. Develop strategic plan for EV cargo vehicle adoption in last-mile delivery working with multiple departments</p> <p>3.2. Evaluate the feasibility of allowing/incentivising EV passenger autos also for last-mile delivery from a legal, standards, safety aspects</p>	<p>Primary Department(s)</p> <ul style="list-style-type: none"> Transport <p>Secondary Department(s)</p> <ul style="list-style-type: none"> Industries 	Medium	<p>%increase of EV cargo vehicles registered in State</p> <p>Load distributed from SWC depots in EV vehicles / Total Load</p>
4	City Level Logistics	<p>4.1. All City corporations to develop a detailed logistics plan which include:</p> <ul style="list-style-type: none"> Logistics zone identifications Cold storage locations Developing truck routes Parcel delivery terminals Urban Consolidation Centres 	<p>Primary Department(s)</p> <ul style="list-style-type: none"> Local Self Government <p>Secondary Department(s)</p> <ul style="list-style-type: none"> Industries 	Medium	<p>#of corporations with city logistics plans</p> <p>#compliance% at a corporation level (to be decided in the plans)</p>



Sl. No	Strategic Initiative	Key tasks	Implementation Authority/Agency	Timeline (Short, Medium, Long)	KPI
		<ul style="list-style-type: none"> Green packaging standards Parking and unloading zones Return cargo and recyclable cargo pickup points etc Cargo Vehicle parking locations Green packaging standards Vehicle use optimisation plan to optimise trip distance and the number of trips made by freight vehicles in the city by shifting truck traffic to off-peak hours during the night 	<ul style="list-style-type: none"> Transport Ports 		
5	Rail Freight transport	<p>4.2. Develop transformation plan for SWC depots identified in geo-clustering exercise to evolve as mini-MMPLP's (Freight villages)</p> <p>4.3. Integrate Minor Ports development initiatives to foster city-level logistics</p> <p>5.1. Open a regular interaction and engagement channel with railways to push for dedicated freight schedules from Kerala along with infrastructure support like cold-chain, Ro-Ro service warehouses etc.</p>	<p>Primary Department(s)</p> <ul style="list-style-type: none"> Divisional Headquarters of Southern Railway Transport <p>Secondary Department(s) Industries</p>	Long	<ul style="list-style-type: none"> #of dedicated rail freight schedules #capacity in tonnes in rail freight schedules #of cold storage wagon facilities in rail freight #Ro-Ro wagons servicing Kerala



Sl. No	Strategic Initiative	Key tasks	Implementation Authority/Agency	Timeline (Short, Medium, Long)	KPI
B. INFRASTRUCTURE DEVELOPMENT – LOGISTICS FACILITIES					
6	Develop return cargo (recyclable and other cargo) facilities and volumes (Reverse Logistics)	<p>6.1. Facilities for trucks coming into Kerala to pick up returned goods/cargo to avoid empty running and reduce logistic costs</p> <p>6.2. Develop strategic plan with LSGD, Suchitwa Mission, City corporations to collect and process recyclable and scrap cargo.</p>	<p>Primary Department(s)</p> <ul style="list-style-type: none"> Local Self Government Industries <p>Secondary Department(s)</p> <ul style="list-style-type: none"> Transport 	Medium	<p>Tonnes of return cargo booked by city corporations</p> <p>Tonnes of recyclable cargo booked by city corporations</p> <p>%of return cargo in various modes of transport</p>
7	Warehousing as business	<p>7.1. Provide Industry status for Warehouse business, rationalize licenses and rules making it easy to open warehouses in the geo-clustered logistics zones identified.</p> <p>7.2. Establish logistics parks with warehousing infrastructure, transportation infrastructure, and customer services in peri-urban areas near cities.</p> <p>7.3. Identify new dedicated industrial parks and plan for large logistics facilities. E.g. Seafood Park, FMCG Park etc.</p>	<p>Primary Department(s)</p> <ul style="list-style-type: none"> Industries <p>Secondary Department(s)</p> <ul style="list-style-type: none"> Local Self Government Legal 	Medium	<p>#of new warehouses opened in clustered logistics zones</p> <p>#of warehouses that are available as a service on cloud for booking</p>
8	Exploring Feasibility of MIMLP	<p>8.1. Identify and pitch specific locations in the State to get support from Central</p>	<p>Primary Department(s)</p> <ul style="list-style-type: none"> Industries 	Medium	



Sl. No	Strategic Initiative	Key tasks	Implementation Authority/Agency	Timeline (Short, Medium, Long)	KPI
		Government for development of MMPLPs in the next phase 8.2. Support NHAI in developing Kochi MMPLP node by providing suitable Government land etc.	<ul style="list-style-type: none"> Revenue 		
C. DIGITISATION OF LOGISTICS OPERATIONS					
9	Digitise State logistics	<p>9.1. Develop a digital plan for the logistics operations of government including entities like State warehousing corporation, transport operators etc. The architecture developed can be based on open standards, to which any industry players can plug-in as well. A Logistics Information Grid can be developed as part of the Digital initiative.</p> <p>9.2. Focus on initiatives to minimise inspections leveraging technology.</p>	<p>Primary Department(s)</p> <ul style="list-style-type: none"> Information Technology Industries <p>Secondary Department(s)</p> <ul style="list-style-type: none"> Local Self Help 	Short	#of SWC depots in which storage and transportation services can be booked, modified, and monitored online
10	Transportation Management Systems	10.1. Develop a strategic plan to develop traffic management technology systems in key cargo routes which can detect vehicles, types , numbers etc. The plan should constitute of detailed specifications of the system capabilities. It should also include traffic regulation strategies (Intelligent Transport systems) in key logistics routes	<p>Primary Department(s)</p> <ul style="list-style-type: none"> Transport <p>Secondary Department(s)</p> <ul style="list-style-type: none"> Industries 	Short	<p>Average speed in key logistics routes for trucks (up to the safe limits)</p> <p>#of electronic inspections of cargo vehicles without stopping (e.g.: video analytics, weighing platforms etc)</p>
D. INSTITUTIONAL DEVELOPMENT					



Sl. No	Strategic Initiative	Key tasks	Implementation Authority/Agency	Timeline (Short, Medium, Long)	KPI
11	Upgrade selected SWC depots as mini-MMLP's. This is essential for an effective middle-mile logistics eco-system to evolve	<p>11.1. Develop policies and frameworks to develop geo-clustered zones identified from a logistics perspective (e.g.: support establishment of warehouses, multi-modal points, cold storages, parking plazas, EV charging points etc.)</p> <p>11.2. Infrastructure planning for cargo movements for export and import at selected geo-clustered multi-modal SWC depots including facilities for inland customs clearance.</p>	<p>Primary Department(s)</p> <ul style="list-style-type: none"> Industries <p>Secondary Department(s)</p> <ul style="list-style-type: none"> Agriculture Civil Supplies Transport 	Medium	<p>#of SWC depots upgraded to mini-MMLP's</p> <p>Volume of non-food cargo handled in selected SWC depots monthly</p> <p>Volume of cold-storage related cargo handled by SWC depots monthly</p>
12	Specialized Skilling plan for Logistics	<p>12.1. NLP mentions about specialized logistics programs to be launched in institutes of higher education. Higher Education department can work with MHRD to set up such programs in IIT Palakkad / NIT Calicut / CUSAT etc focusing on logistics related to specialized cargo relevant to Kerala</p> <p>12.2. Develop a strategic skill upgradation plan for the blue-collar logistics workers of the State focussed on the specialized logistics needs of cargo like Spices ,Processes foods, ecommerce logistics, Consumer Durables, latest warehouse facility trainings etc. relevant to Kerala in</p>	<p>Primary Department(s)</p> <ul style="list-style-type: none"> Labour and Skills (ASAP) Higher Education <p>Secondary Department(s)</p> <ul style="list-style-type: none"> Industries 	Medium	<p>#of specialized logistics courses available in Kerala</p> <p>#Number of blue-collar workers who has gone through logistics skill development programs</p>



Sl. No	Strategic Initiative	Key tasks	Implementation Authority/Agency	Timeline (Short, Medium, Long)	KPI
13	Logistics plan for Disaster Management	<p>line with the globally recognized best practices.</p> <p>13.1. Preparation of strategic plan under the aegis of KSDMA to:</p> <ul style="list-style-type: none"> Identify the strategic logistics assets, routes, cargo whose strength should be increase Develop backup routes for critical cargo like food and medicines Develop standard operating procedures for logistics in case of disasters 	<p>Primary Department(s)</p> <ul style="list-style-type: none"> Kerala State Disaster Management Authority <p>Secondary Department(s)</p> <ul style="list-style-type: none"> Industries Rebuild Kerala Initiative- RKI 	Medium	
14	Industry Engagement Channel for legal, policy and standards setting	<p>14.1. Open a regular interaction channel with various key industry stakeholders to hear about their logistics perspective with respect to legal issues, policies, and standards.</p>	<p>Primary Department(s)</p> <ul style="list-style-type: none"> Industries <p>Secondary Department(s)</p> <ul style="list-style-type: none"> Local Self Government Transport 	Short	#of policy/law/standards changes brought about after consulting with industry
E. POLICY MEASURES (REGULATORY STANDARDS)					
15	Industry Status for “Logistics Sector”	<p>15.1. Prepare a dedicated Logistics Policy for the State outlining dedicated incentives for the Logistics sector players and determining guidelines to bring Ease of doing Logistics in the State</p>	<p>Primary Department(s)</p> <ul style="list-style-type: none"> Industries <p>Secondary Department(s)</p> <ul style="list-style-type: none"> Transport State GST Finance 	Medium	



Sl. No	Strategic Initiative	Key tasks	Implementation Authority/Agency	Timeline (Short, Medium, Long)	KPI
16	3PL (Third Party Logistics) providers benchmarking framework	<p>15.2. Earmark dedicated area for Logistics activities in all Industrial Parks/Zones in the State</p> <p>15.3. Facilitate LEADs survey assessment for the State and spearhead initiatives in collaboration with respective Departments in order provide adequate responses for evaluation of the survey parameters to Government of India</p> <p>16.1. Prepare a detailed benchmarking framework for 3PL providers assessing them on various aspects like ability for track and trace, insurance, multi-modes of transport, green packaging, EV use etc.</p> <p>16.2. This benchmarking framework could be used to incentivize 3PL players in Government linked schemes</p>	<ul style="list-style-type: none"> Planning ASAP (Skills) Legal Ports Agriculture Civil Supplies 	Short	#of 3PL players available in every logistics clustered zone above certain level in benchmark
17	Drone Delivery	17.1. Develop a policy framework and standards for drone delivery including zones, weight, safety, and tracking standards	<p>Primary Department(s)</p> <ul style="list-style-type: none"> Transport 	Medium	#drone delivery service providers



Summarizing the State logistics action plan above, logistics can be viewed as an interplay between three verticals (Storage, Transport, Services) and five horizontal perspective (Infrastructure, Operations, Technology, Human Capital, Policies and Regulations). The State Logistics Action Plan initiatives are summarized in the matrix view based on this horizontal and verticals perspective.

Table 21: Summarized View of State Logistics Action Plan

	Storage	Transport	Services
Infrastructure	Upgrade geo-clustered SWC's to Mini-MMLP's. Support multiple cargo, vertical storage, etc.	Increase tonnage of select logistically important roads to 28.5 tonnes.	Create urban logistics Plans for all municipalities and corporations for reverse logistics, return cargo and logistics zones.
Operations	Leasing of space in SWC to ecommerce players.	Build predictable schedules for rail freight, inland water transport, sea transport (port – port) and give visibility to industry.	Green Logistics for last mile delivery (EV, sustainable packaging etc.)
Technology	Digital transformation of SWC's - API's to see and book space, book return cargo etc.	Advanced Traffic and inspection management systems in logistically important roads, especially in Kochi – Coimbatore economic corridor Facility for trucks to fill in return cargo availability.	Provide a tech-platform for 3PL players to offer their services.
Human Capital	Develop specialized logistics courses in ITI's, engineering colleges by working with programs such as ASAP with training on specialized logistics programs on industry relevant cargo like frozen and processed food, sensitive equipment handling, pharma transport etc.		
Policies and Regulations	Warehousing as a business in logistically clustered zones.	Inspections and Related Processes to be completely digitized.	Develop the 3PL eco-system by easing regulations.

Source: KPMG in India Analysis 2021 based on market research

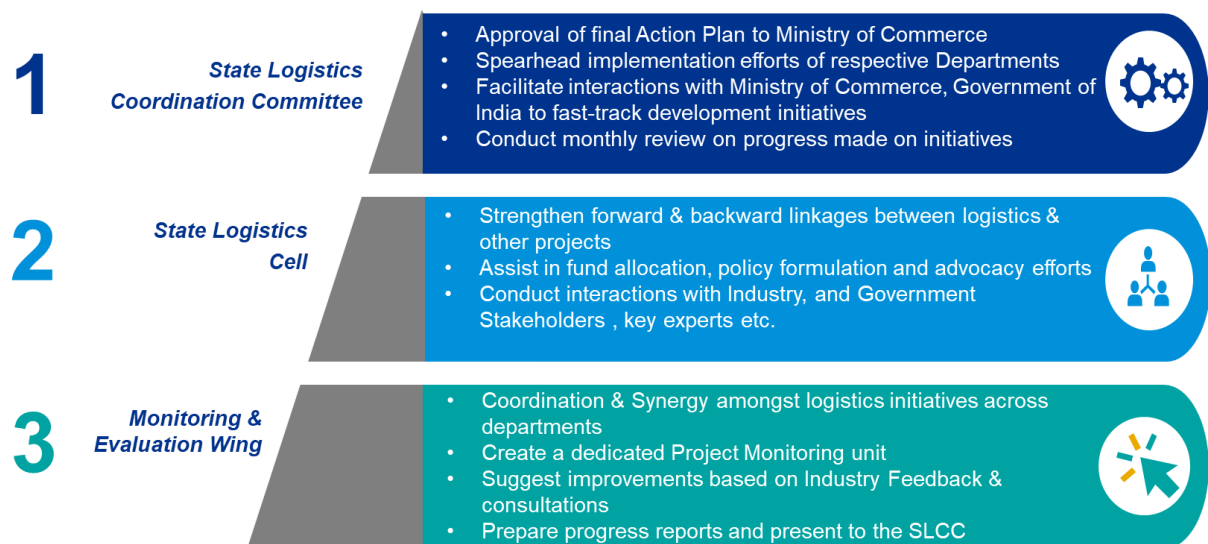


11. Way Forward

Next steps to be taken by Government to operationalise the State Logistics Action Plan

The action plan constitutes of Strategic initiatives with KPIs across different stakeholders (Departments/Agencies) to achieve implementation of the said holistic logistics sector development action plan. The initiatives are aligned with respective Primary and Secondary Departments and timelines are also specified under Short, Medium, and Long term. Short term initiatives refers to implementation within 3-12 months, Medium term within 1-2 years and Long term within 3-5 years. The implementation approach defined herewith will focus upon next steps to be undertaken to implement the State Logistics Action Plan. The section highlights the key roles and responsibilities assigned to State Logistics Coordination Committee, State Logistics Cell, Line Department working groups (including nodal officers from all Departments/Agencies covered under the action plan) and a dedicated Monitoring and Evaluation unit. The implementation approach also lays down the provision of taking regular feedback from industry players (both users and logistics service providers, infrastructure players etc.) and key experts at various meetings.

Figure 22: SLAP Implementation Approach – Key Roles and Responsibilities



As highlighted above the action plan would be implemented with the help of two levels of Governance Level 1 constitutes of the State Logistics Coordination Committee comprising of following members:

- Chief Secretary - The Chairman
- Principal Secretary (Industries) - Member
- Principal Secretary (Transport) - Member
- Principal Secretary (PWD) - Member
- Principal Secretary (Water Resources) - Member
- Principal Secretary (Labour and Skills) - Member
- Director General of Police - Member
- Chief Commissioner of Customs - Member
- Commissioner (State GST) - Member
- Central Excise Commissioner - Member
- Joint Director General of Foreign Trade, Kochi - Member
- Chairman and Managing Director, KSEB - Member
- Director (Industries and Commerce) – The Convenor



- Managing Director, KINFRA - Member
- Managing Director, KSIDC - Member
- Chairman, CII Kerala State Council - Member
- Chairman, FICCI Kerala - Member
- State President, KSSIA - Member
- State Head EXIM Bank of India - Member
- CEO, K-BIP – The Co-ordinating Officer and Agency

. The committee would largely cover a range of activities such as:

- Highest level of decision making with respect to logistics in the State
- Spearhead implementation efforts of respective departments
- Facilitate interaction with Ministry of Commerce, Government of India, and other Central Government departments

Level 2 constitutes of State Logistics Cell/Development entity which will strengthen the linkage between forward and backward linkages between logistics and other State projects, sort out the funding sources, take crucial decisions to the SLCC.

- Principal Secretary (Industries) - Chairman
- Secretary (Industries) - Member
- Secretary (Transport) - Member
- Secretary (PWD) - Member
- Secretary (Water Resources) - Member
- Commissioner of Customs - Member
- Commissioner (State GST) - Member
- Central Excise Commissioner - Member
- Transport Commissioner - Member
- Labour Commissioner - Member
- Inspector General of Police (HQ) - Member
- Chairman and Managing Director (KSEB) - Member
- Joint Director General of Foreign Trade Kochi - Member
- Director (Industries and Commerce) - Convenor
- Managing Director (KSIDC) - Member
- Managing Director (KINFRA) - Member
- CEO, K-BIP - Co-ordinating Officer and Agency

Level 3 is the Monitoring and Execution wing. Competent officials under Infrastructure Development, Services, IT, and Legal sections/working groups, Program Management Unit (PMU) etc.

At this stage, the Monitoring and Execution Authority will undertake the following activities:

- Setting up a project monitoring unit to monitor and oversee the implementation of the action plan
- Developing an outcome-based framework to assess the success of the action plan strategic initiatives and monitoring the same taking into consideration industry feedback as well
- Coordinating and conducting regular meetings of the State Logistics Coordination Cell and State Logistics coordination committee
- Preparing monthly progress reports on each of the Strategic Initiatives finalised under the State Logistics Action Plan



The State Logistics Action Plan comprises of listing of Key Strategic Initiatives outlined as part of the industry interactions, inputs from the first State Logistics Coordination Meeting, assessment of the needs and challenges put forth by industry players, evaluating the State's logistics sector demand-supply outlook and key logistics cost considerations. Key tasks identified under each of the Strategic Initiative and details of corresponding Implementing Authority/agency are provided. The timeline for implementation is categorised under Short (1-2 months), Medium (3 months to 1 year) and Long (5 years). KPIs are also tagged under each of The Strategic initiatives. The action enlisting above parameters is provided in Section 11 of this report.

To take forward the implementation approach, following critical action items require immediate attention:

- Formalise the sub-Department working Groups/Synergy council by nominating nodal officers from all stakeholder Department/agencies
- Operationalise a Project Monitoring Unit under the State Logistics Cell via a Government Order or appropriate notifications to monitor the progress of the initiatives listed in the final Action Plan document
- Request sub-Departments to share detailed proposals from Departments for the initiatives mapped under them based on the Short- and Medium-term initiatives.
- Liaison with Finance Department and Central Government to finalise appropriate funding sources for the key strategic initiatives
- Conduct monthly review meetings to monitor progress of the exercise
- The State Logistics Cell is to provide monthly progress status to the State Logistics Coordination Committee before every Meeting.

State's Industrial competitiveness depends on the execution. There is a presence of a lot of factors such as airports, long coastal line adjacent to International shipping channels etc that can aid to a lot in industry investments within the State, Kerala. The reduction in effective cost of logistics to match the international standards would be favourable to the industry and improve State's competitiveness in industrial development. Hence it is critical from a development and employment standpoint that we execute the state logistics action plan effectively.



Annexures

Annexure 1: Cost Savings in Multi-laning and increasing tonnage in Roads

International Council of Clean Transportation (<https://theicct.org/>) has done a detail study on Indian road conditions and its impact on logistics costs in Dec-2017¹. Specifically, with respect to rigid trucks for commercial traffic, the fuel consumption at 40 Kmph (mostly single lane road speed) and at 60 kmph (mostly double lane road speed) is given as per the table below in the study. All values taken for Rigid Vehicles (M3 Commercial Type) .

Government of India in 2018 slightly increased the allowable carrying capacity of 16.2 tonne trucks to 18 tonnes and 25 tonne trucks to 28.5 tonnes⁸. This ICCT⁹ study is not done after that. Hence the values arrived are based on pre-2018 standards, which may improve further if post 2018 standards are applied and a study is conducted. Similarly, all these are based on BS-IV norms for engines. Once vehicles catering to BS-VI norms become available, the effective savings can improve further as well.

Table 22: Fuel Consumption (Litre/100km) at 40kmph(single lane roads)

Type of Vehicle	Axle Config X Tyres	Weight Range (Tonnes)	Lower Weight Limit (ltr/100km)	Upper weight limit(ltr/100km)	Trucks in Kerala Roads
M3	2 X 4	12.0 - 16.2	14.7	16.2	Majority
M3	2 X 6	16.2 - 25.0	16.2	21.5	A few
M3	4 X 6	16.2 - 25.0	16.2	22.6	Mainly in NH stretches

Table 23: Fuel Consumption(Litre/100 km) at 60kmph(double lane roads)

Type of vehicle	Axle Config X Tyres	Weight Range(In Tonnes)	Lower Weight Limit(ltr/100km)	Upper weight limit(ltr/100km)	Trucks in Kerala Roads
M3	2 X 4	12.0 - 16.2	18.5	21.8	Majority
M3	2 X 6	16.2 - 25.0	21.8	28.4	A few
M3	4 X 6	16.2 - 25.0	21.8	31.9	Mainly in NH stretches

Using the above fuel consumption values, on multi-laning, a simple estimation of extra fuel spends due to higher speed.

Table 24: Estimated extra fuel spend due to Multi-Laning which results in increased speed

Type of vehicle	Axle Config X Tyres	Weight Range	Lower Weight Limit	Upper Weight Limit	Average increase in fuel spend due to higher speed
M3	2 X 4	12.0 - 16.2	26%	35%	30%
M3	2 X 6	16.2 - 25.0	35%	32%	33%
M3	4 X 6	16.2 - 25.0	35%	41%	38%

⁸ Ministry of Road Transport & Highways Notifies Increase in Truck Axle Load, Press Information Bureau, July 2018, <https://pib.gov.in/Pressreleaseshare.aspx?PRID=1538941>, last accessed on 11 June 2021

⁹ Fuel consumption standards for heavy-duty vehicles in India, International Council on Clean Transportation, December 2017



Similarly, most roads have tonnage standards. For a 4 axle 6 tyre truck to ply, the road's construction standards and bridges along the way should permit that. On upgrading the tonnage levels of roads to higher tonnage, fuel spending for higher tonnage vehicles will increase and estimated as below

Table 25: Estimated increase in fuel spend on increasing tonnage / vehicle plying capacity of roads

Capacity Increase (Axle X wheel)	Lower Weight limit	Upper weight limit	Average
2X4 to 2X6	10%	33%	21%
2 X4 to 4X6	10%	40%	25%

As the effective tonnage / carrying capacity of vehicles are increased, **number of trips required would be lesser and consequently, cost savings would be higher**. However, this would often need higher associated capex from logistics players for procuring higher capacity trucks.

Table 26: Estimated trip savings on increased tonnage on roads

Capacity Increase (axle x wheel)	Based on pre-2018 weight limits	Based on post-2018 weight limits	
2X4 to 2X6	35%	37%	
2 X4 to 4X6	35%	37%	

Summarizing the above numbers, effective cost savings for multi-laning and tonnage upgradation can be extrapolated in Kerala context as the table below. Please note that these numbers are Opex centric and the associated capex is not taken into consideration.

Table 27: Various Road centric initiatives and effective logistics cost saving potential

Type of Initiative	Fuel Cost Savings / increase	Trip Savings	Effective savings
Increasing Tonnage of roads	-21 to -25%	35 to 37%	18.7 to 23.7 %
Multi-Laning	-30 to -38%		-30 to -38%
BS-VI upgradation	4 to 7 %		4 to 7%

This does not mean that multi-laning is bad. Multi-laning is highly desirable for time-critical cargo. However, just by making a road multi-lane, without increasing the effective tonnage of roads (which would need strengthening of roads and bridges, straightening curved roads etc) is not going to be beneficial for non-time critical cargo as it is highly dependent on cost.



Annexure 2: Geo-Clustering

To achieve economies of scale in logistics, one needs to aggregate different kinds of cargo at optimal points. In Kerala's logistics context, the absence of such aggregating points is the reason behind lack of an effective middle-mile logistics eco-system – and consequently , higher costs. To assess the possibility of setting up such aggregated points, we examined the geographical proximity of multiple logistically relevant entities as shown below

- Ports (inland and seaports)
- State ware-housing corporation depots
- Rail-freight loading and unloading points
- KINFRA Parks
- Airports
- Other industry relevant areas

All these points were plotted in Google Maps and their clustering was observed. Similarly, an excel framework was used to measure the geo-coordinates' mutual distance. Using both approaches, a set of cluster locations where multiple type of cargo and modes of transport can converge were identified. The different zone-wise geo-clustering maps are shown below.



Figure 23: South Zone in Kerala Logistics Clustering Analysis

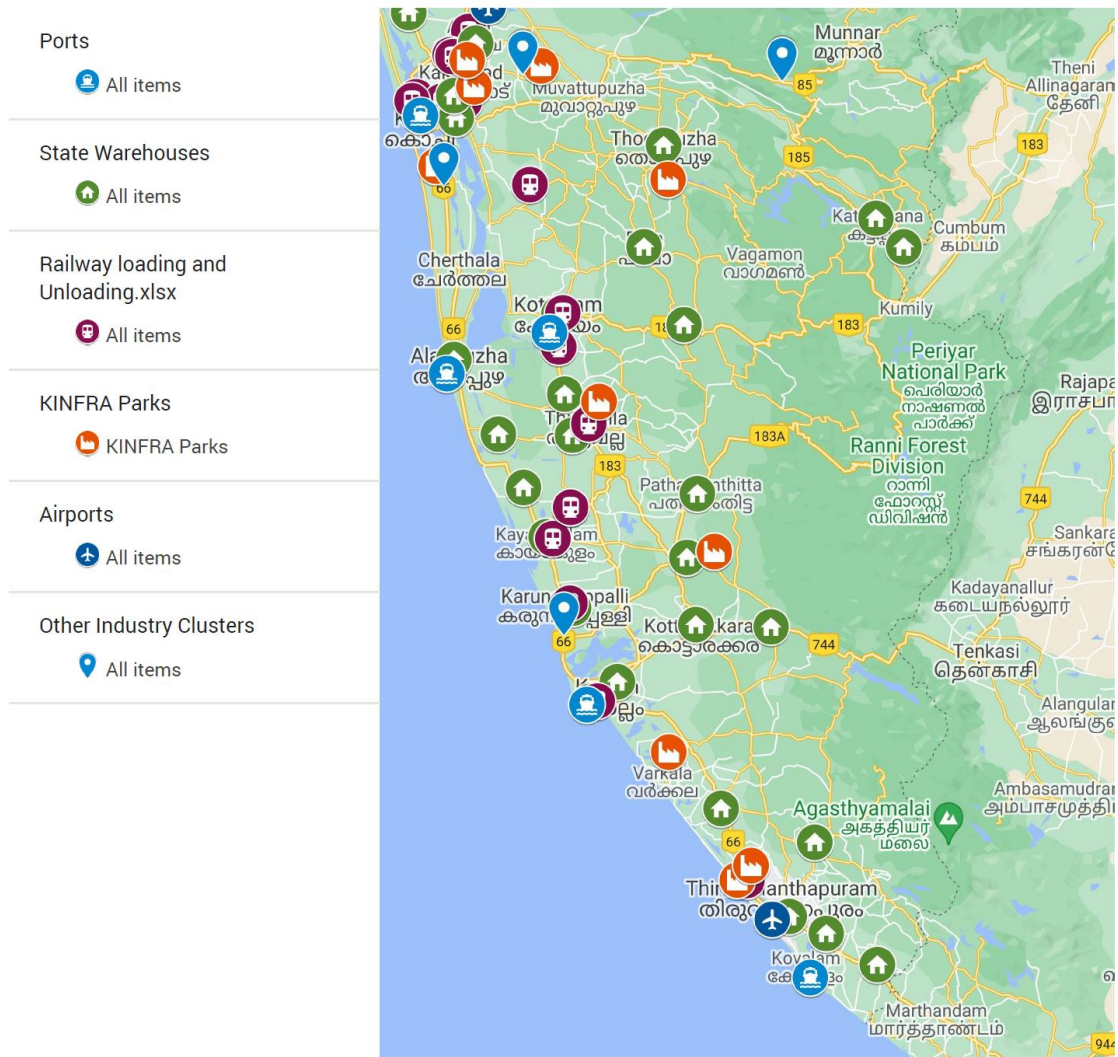




Figure 24: Central Zone in Kerala Logistics Clustering Analysis

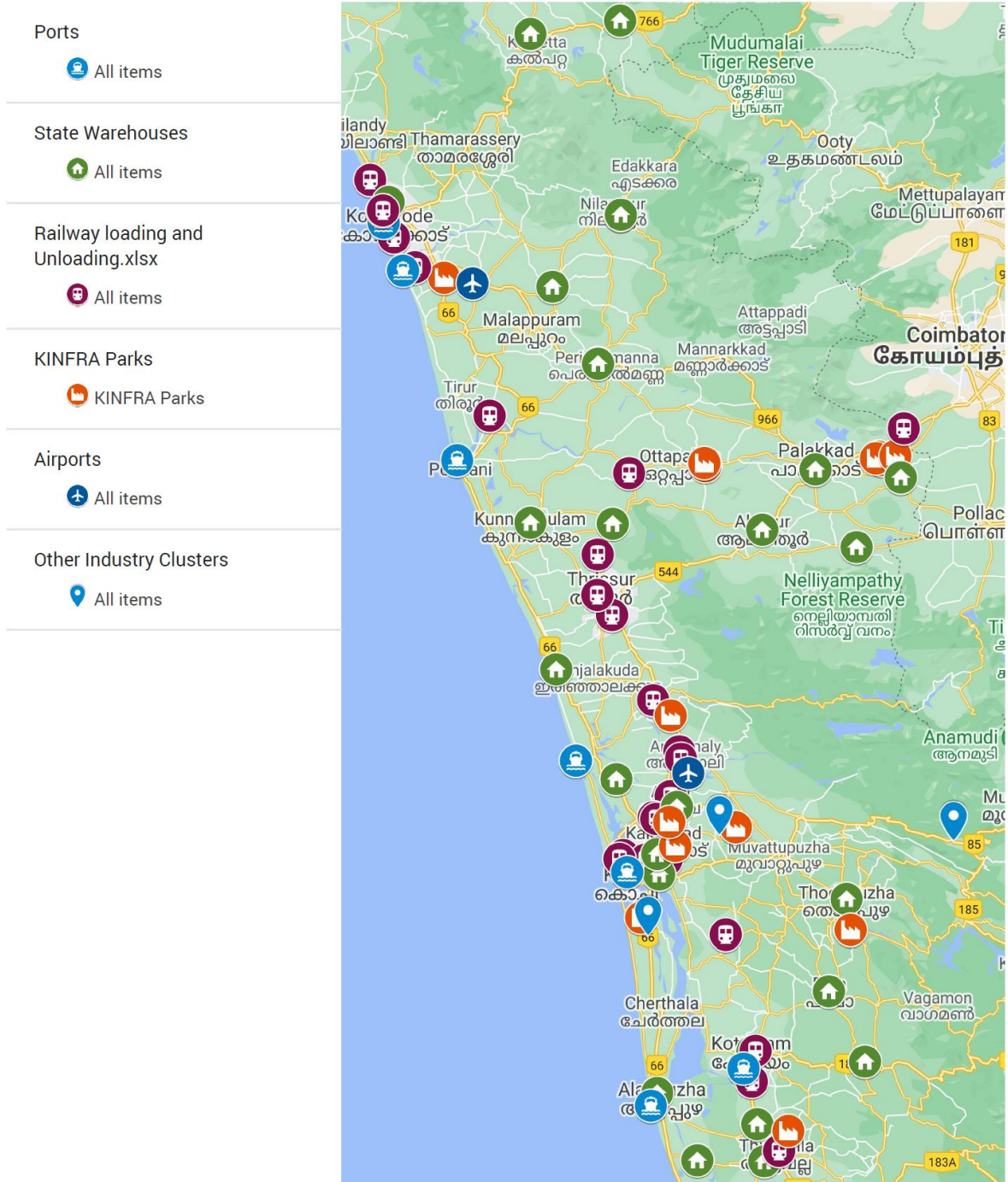
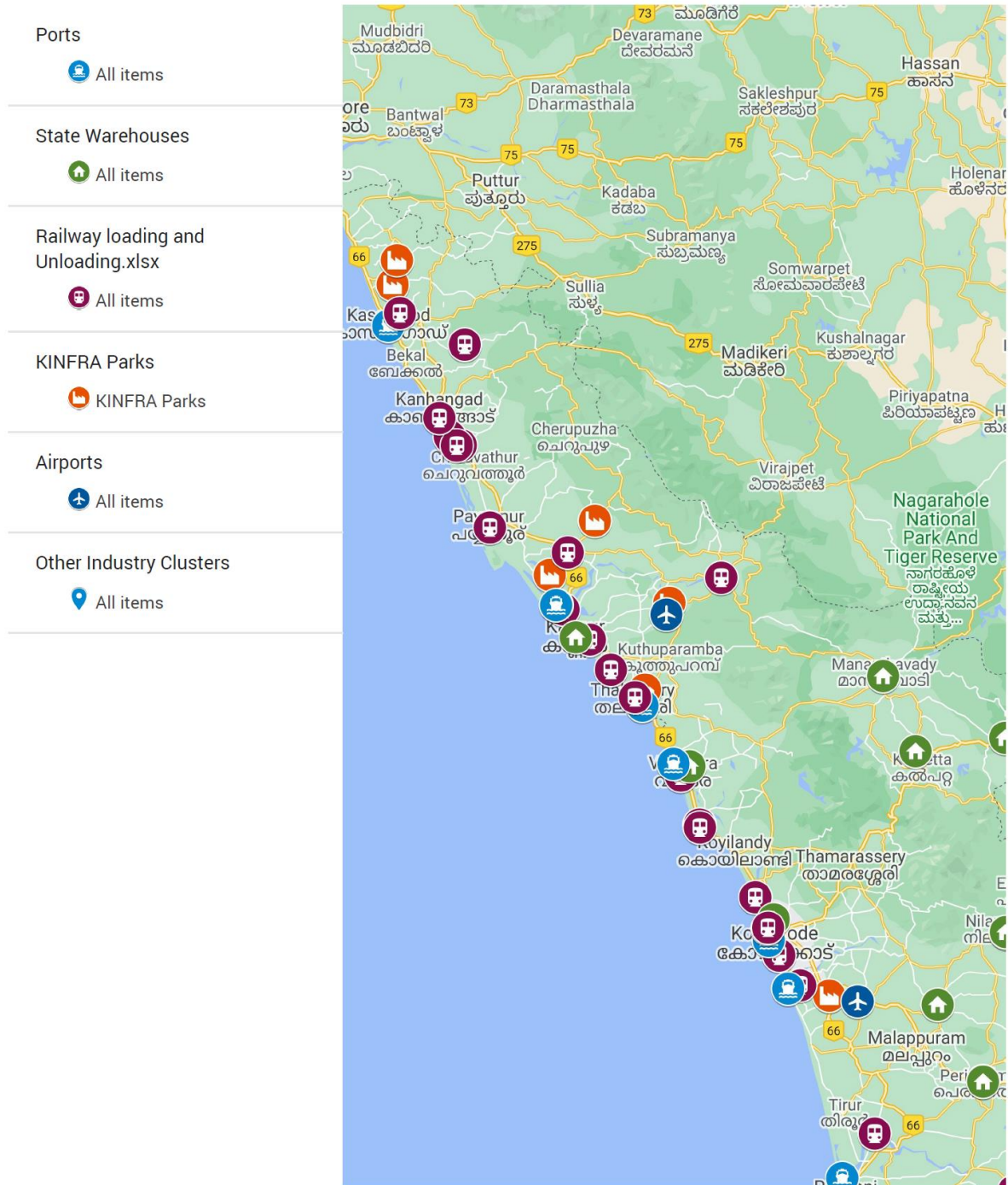




Figure 25: North Zone in Kerala Logistics Cluster Analysis





A snapshot on Excel-based approach for geo-clustering is shown below:

Figure 26: Excel Framework - Geo-clustering

	A	B	C	D	DI	DJ	DK	DL	DM	DN	DO
1	$\text{ACOS}(\text{COS}(\text{RADIANS}(90-\text{SB5})) * \text{COS}(\text{RADIANS}(90-\text{ES2})) + \text{SIN}(\text{RADIANS}(90-\text{SB5})) * \text{SIN}(\text{RADIANS}(90-\text{ES2})) * \text{COS}(\text{RADIANS}(\text{SC5}-\text{ES3}))) * 6378$			Longitud Location	Ponnani	Kollam	Vizhinjam	Kodungallor	Alappuzha	Kochi	
2				10.766667	8.88	8.3	10.179577	9.483333	9.954833		
3				75.9	76.6	77.2	76.163038	76.31667	76.26785		
4	Location	Latitude	Longitude								
7	State Warehouse Nedumangad	8.627377722	76.99807357		266.9	52.0	42.7	195.6	121.2	168.1	
8	State Warehouse Neyyattinkara	8.403062509	77.11437453		294.9	77.6	14.9	223.7	148.8	196.2	
9	State Warehouse Pallichal	8.460018423	77.01961589		284.7	65.7	26.7	213.3	137.7	185.8	
10	State Warehouse Kollam	8.885930618	76.58386407		222.4	1.9	94.1	151.2	72.7	123.9	
11	State Warehouse Karikode	8.921331729	76.63231265		220.6	5.8	93.2	149.2	71.5	121.8	
12	State Warehouse Kottarakara	9.025747294	76.77806566		216.4	25.4	93.2	145.1	71.9	117.6	
13	State Warehouse Karunagappally	9.056020256	76.55150726		203.4	20.3	110.3	132.1	54.1	104.8	
14	State Warehouse Punalur	9.021702431	76.91736455		224.0	38.3	86.1	153.2	83.6	126.0	
15	State Warehouse Pathanamthitta	9.264502692	76.78079183		193.1	47.2	116.9	122.4	56.5	95.3	
16	State Warehouse Parakode	9.148489641	76.76116097		203.4	34.7	106.1	132.2	61.4	104.8	
17	State Warehouse Thiruvalla	9.370982892	76.54926394		170.9	54.9	139.1	99.5	28.4	72.0	
18	State Warehouse Alappuzha	9.509423737	76.32947711		147.7	76.1	165.2	76.8	3.2	50.0	

Once this exercise was done, the geo-clustered zones along with key routes were plotted in a separate map again. All the key logistics clusters were interconnected, and key connections were made to immediate airports / seaports etc. Essentially, this is the network on which ideally a middle-mile logistics system should thrive on.

Link to Kerala Logistics Map: https://www.google.com/maps/d/edit?mid=1ovdtUclb85ISlyghq-ic9T_m9YMqwVhdandusp=sharing

Link to Kerala Logistics Route Map: <https://www.google.com/maps/d/edit?mid=1khFqeEMmCQ-4Je-mLWORVoXYEubQfjHoandusp=sharing>



Figure 27: Key Logistics Routes - South Kerala

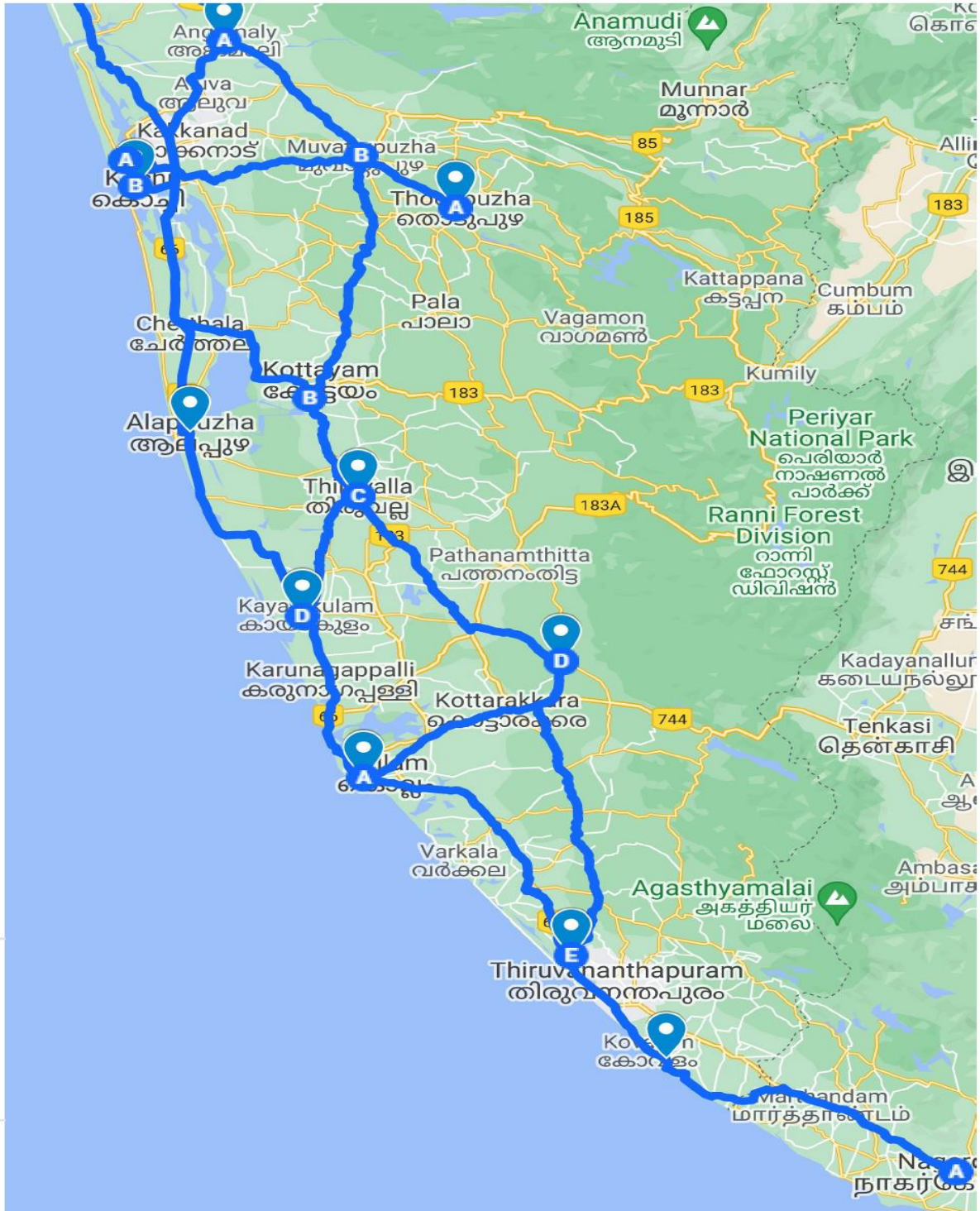




Figure 28: Central Kerala - Key Logistics Routes

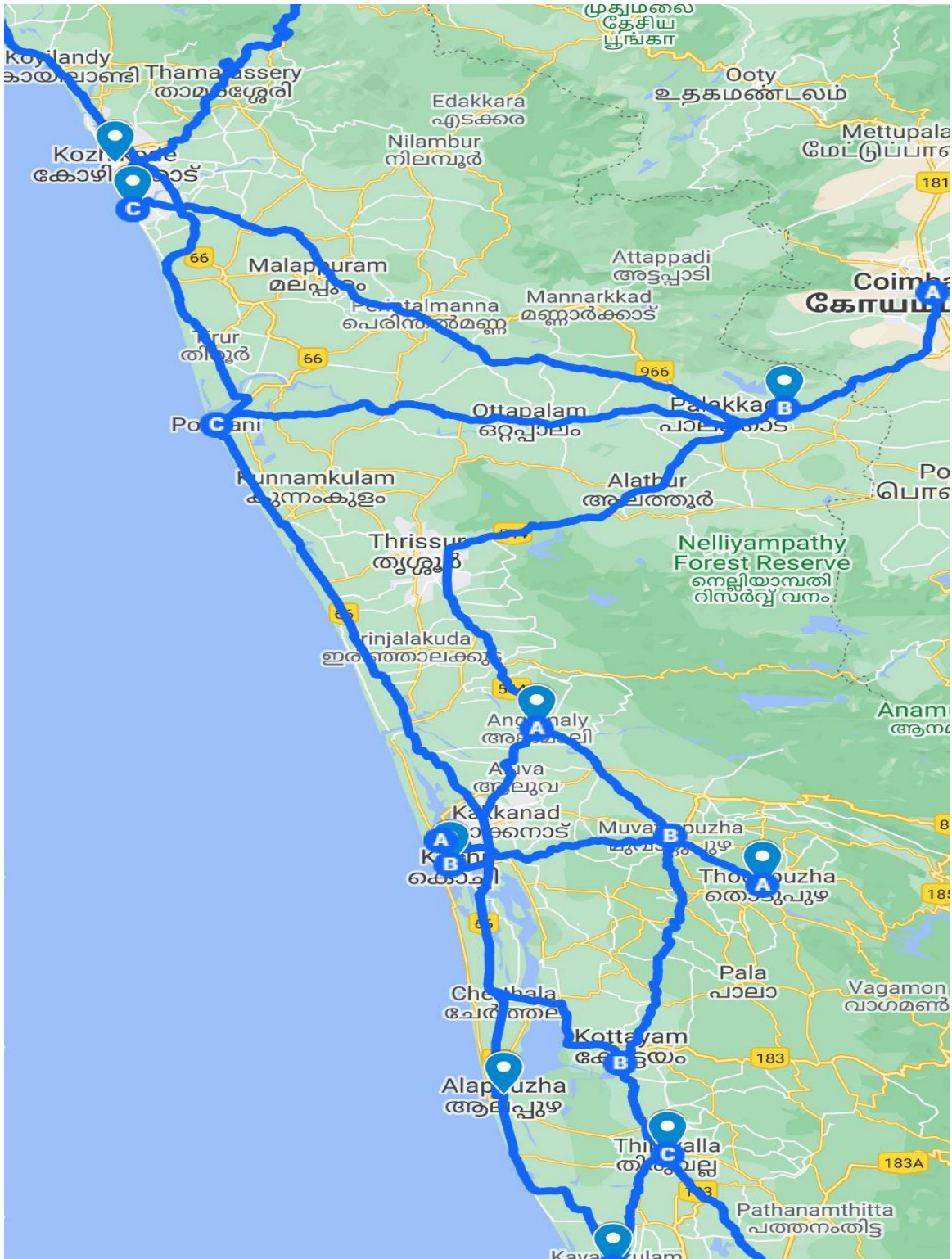
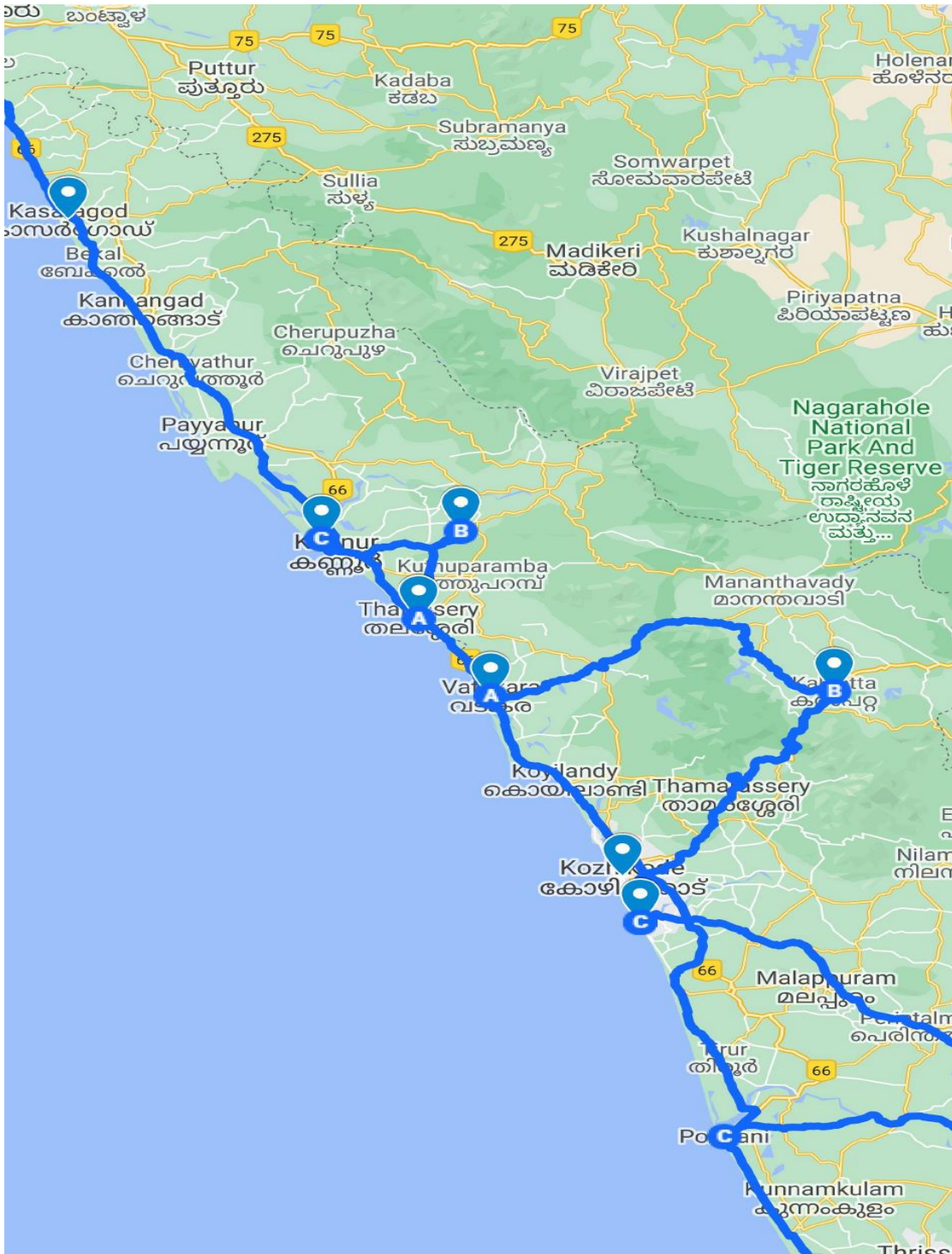




Figure 29: North Kerala - Key Logistics Routes





S. No	Starting Point	End Point	Distance (Km)	Key Roads	Key Logistics Points or main junctions en route
1	Nagercoil	Kochi	277	NH 66	Vizhinjam, Thiruvananthapuram, Kazhakkootam, Kollam, Kayamkulam, Alappuzha, Kochi
2	Thiruvananthapuram	Angamali	233	M.C. Road	Thiruvananthapuram, Pathanapuram, Thiruvalla, Kottayam, Muvattupuzha, Angamali
3	Pathanapuram	Kollam	40.8	NH 744	Pathanapuram, Kollam
4	Kayamkulam	Thiruvalla	28	NH 183, SH 6	Kayamkulam, Thiruvalla
5	Kottayam	Kochi	63.9	NH 66, SH 42	Kottayam, Kochi
6	Thodupuzha	Kochi	60.5	NH 85, NH 966B	Thodupuzha, Muvattupuzha, Kochi
7	Kochi	Coimbatore	191	NH 544	Kochi, Angamali, Kanjikode
8	Kanjikode	Ponnani (Port)	100	NH 544, NH 66, Palakkad-Ponnani Road	Kanjikode, Ponnani
9	Kochi	Mangalore	416	NH 66	Kochi, Ponnani, Kozhikode, Vadakara, Thalassery, Kannur, Kasaragod
10	Kanjikode	Beyepore (Port)	130	NH 544, NH 966	Kanjikode, Beyepore
11	Kalpetta	Beyepore(Port)	85.1	NH 766	Kalpetta, Beyepore
12	Kalpetta	Vadakara(Port)	83.5	SH 54	Kalpetta, Vadakara
13	Kochi	Kalpetta	251	NH 766, NH 66	Kochi, Ponnani, Kozhikode, Kalpetta
14	Thalassery	Kannur Airport	26	SH30, NH17, smaller roads	Thalassery, Pinarayi, Thazhe chovva, airport,
15	Azhikkal(port)	Kannur airport	35	Smaller roads	Airport, Mattannur, Koodali, Kattampally, Azhikkal

Table 28: Key Roads Identified as part of geo-clustering exercise



Annexure 3: Unit Cost and Utilization in Various Transport Modes

All the main transport modes in Kerala – Road, Rail, Air and Water were analysed and benchmarked through various sources as shown below:

Road

Niti Ayog has done a comprehensive analysis on various transport modes and overall road cost of transport has been arrived at approx. 2.58 Rupee per tonne-km¹⁰. Please note that this study has been done in 2018 and post that fuel prices has gone up, but at the same time tonnage of trucks has been increased. These two increase and decrease would approximately cancel out, especially in the long-haul trucking sector. Anecdotally also, the cost of various long-haul routes from various portals are in the range of 2.5 – 3 per tonne-km range unless it is specialized cargo like frozen food or minerals. However inside Kerala, most of the vehicles used for transport are sub 16- tonne capacity (often 10 tonne) and hence, the cost is seen as double (about 5) except in NH stretches. This is also verified anecdotally from various portals. In a Kerala road transport context, only less than 20% of trucks ply with Full Load (FTL). As an indicative number, KTC group, which is one of the largest road transport group based in Kerala, transports about 10000 tonnes of cargo daily with its fleet of 1000 trucks.

Taking this as a representative representation, if X% is the percentage of FTL for KTC, 18.2 is the FTL of an average truck, 9 tonne is the average partially filled load.

$$1000 X\% \cdot 18.2 + 1000(1-X\%) \cdot 9 = 10000$$

This solves for X = 10 – 11%. Assuming smaller marginal players have a higher percentage of FTL, the effective value of trucks with full load cannot move above $2 \times 10\% = 20\%$.

Similarly, on an overall road length perspective NH spread in Kerala is less than 20% of the State highways. So, even if part of State highways support max tonnage (28.5 tonnes), effectively a max of 25% may support the max tonnage.

Rail

Indian Railways publishes yearly reviews on cost per tonne-km. The rough value comes as about Rs 1.57 per tonne-km¹¹ for 2019-20

The rail cargo is highly dominated by Agro commodities with very minimal industrial goods, except for dedicated industrial carriers like Petrol, ammonia etc. From a Kerala perspective only less than 5% of the non-Agro products get transported through rail.

Inland Water Transport

Government of India in collaboration with SRUTI (Society of Rural Urban & Tribal Initiative) has done a detailed cost analysis on inland water transport. The study has focussed on various river routes and has arrived at an approx. cost of 0.74 per tonne-km for downstream and 2.00 per tonne-km¹² for upstream. So, an average level of 1.37 per-tonne-km is taken for water transport. Of course, this depends on the water-currents and other factors as well.

Coastal Transport

¹⁰ Freight Report, Niti Aayog, https://niti.gov.in/writereaddata/files/document_publication/Freight_report.pdf

¹¹ Indian Railways Year Book 2019-20, Ministry of Railways, 2020

¹² Strategic Report on Inland Waterways, Manthan Adhyayan Kendra and SRUTI, Dharmadhikary, Sandbhor, March 2017



As the coastal transport also follows same type of vessels mostly, an interstate/intra-state value for cost of transport is taken as the same (1.37 per tonne-km). However, for exports, the international shipping rates are remarkably lower and comes to about 0.23 per tonne-km

Air Transport

Air cargo is highly costly and is often used only for high value / perishable / time-critical cargo. The Air India rates work as a benchmark and start from 700 per tonne-km onwards¹³

¹³ EXPORT CARGO RATES, Air India Air Transport Services Ltd., http://cargo.airindia.in/Calc_static.aspx



Annexure 4: National Infrastructure Grid – Kerala Logistics Sector Projects

Sector	Sub Sector	Project	Project Status
Transport	Roads and Bridges	Kappirikkad-Edapally Border Road Development Project	Idea Stage
Transport	Roads and Bridges	Ramanattukura-Kuttipuram Road Development Project	Idea Stage
Transport	Roads and Bridges	Munnar-Mattakkuzhy Road Development Project	Idea Stage
Transport	Roads and Bridges	Azhiyur-Vengalam Road Development Project	Idea Stage
Transport	Roads and Bridges	Perole-Thaliparamba Road Construction Project	DPR/Feasibility Study in Progress
Transport	Roads and Bridges	Thaliparamba-Muzhapilangad Road Development Project	DPR/Feasibility Study in Progress
Transport	Roads and Bridges	KT or KL Border-Chengala Road Development Project	DPR Approved
Transport	Roads and Bridges	Kuttipuram-Kappirikkad Border Road Development Project	Idea Stage
Transport	Roads and Bridges	Thrissur-Edapally Road Development Project	Idea Stage
Transport	Roads and Bridges	Chengala-Neleshwaram Road Development Project	DPR Approved
Transport	Roads and Bridges	Vengalam to Ramanattukara Road Construction Project	Tender Awarded
Transport	Roads and Bridges	Kollam Bypass - Kadambattukonam Road Development Project	Idea Stage
Transport	Roads and Bridges	Asan Square - Airport Flyover Construction Project	Idea Stage
Transport	Roads and Bridges	Thuravoor Thekku-Paravoor Road Construction Project	DPR/Feasibility Study in Progress
Transport	Roads and Bridges	TNorKL Border - Vadakkanchery Road Development Project	Idea Stage
Transport	Roads and Bridges	Ernakulam City Ring Road Construction Project	Idea Stage
Transport	Roads and Bridges	Paravoor-Kottankulangara Road Construction Project	DPR/Feasibility Study in Progress
Transport	Roads and Bridges	KLorTN border-Munnar Rajapalyam Road Development Project	Idea Stage
Transport	Roads and Bridges	Tamil Nadu border- Villupuram NH-48 Road Construction Project	Notice to Proceed
Transport	Roads and Bridges	Kottankulangara- Kollam Bypass Road Development Project	Idea Stage
Transport	Roads and Bridges	Thalassery Mahe Bypass Road Construction Project	Notice to Proceed



Sector	Sub Sector	Project	Project Status
Transport	Roads and Bridges	Kadambattukonam-Kazhakuttom Road Development Project	Idea Stage
Transport	Roads and Bridges	Ramanattuka-Kavungal Road Development Project	Idea Stage
Transport	Roads and Bridges	Punaloor-Kollam Road Development Project	Idea Stage
Transport	Roads and Bridges	Palaruvi-Punaloor Road Development Project	Idea Stage
Transport	Roads and Bridges	Kazhakkootam- Mukkola Road Upgradation Project	Notice to Proceed
Transport	Roads and Bridges	Mukkola- Kerala Border NH-66 Road Upgradation Project	Notice to Proceed
Transport	Roads and Bridges	Widening to 2 lane with paved shoulder from Puthupady- Muthanga of NH 766	DPR/Feasibility Study in Progress
Transport	Roads and Bridges	Widening to 2 lane with paved shoulder from Mundakkayam- Kumily of NH 183	DPR/Feasibility Study in Progress
Transport	Roads and Bridges	Vadakkenchery - Thrissur NH -544 Road Upgradation Project	Tender Awarded
Transport	Roads and Bridges	Beyepore Road to Malaparamab beach Road Development Project	Idea Stage
Transport	Roads and Bridges	Kottoor -Ambasamudram Road Construction Project	Idea Stage
Transport	Roads and Bridges	Aroor-Thuravoor Thekku Road Development Project	Idea Stage
Transport	Roads and Bridges	Azhikkal to Puthuvalappu Road Development Project	Idea Stage
Transport	Roads and Bridges	Ayikulangara to Alappuzha bypass Road Development Project	Idea Stage
Transport	Roads and Bridges	Mattakuzhy-Kochi Road Development Project	Idea Stage
Transport	Roads and Bridges	Mannuthy- Amalanagar Bypass Road Construction Project	Idea Stage
Transport	Roads and Bridges	Thrissur -Vadanapilly Road Upgradation Project	Idea Stage
Transport	Roads and Bridges	Alappuzha bypass NH-47 Road Construction Project	Work in Progress
Transport	Roads and Bridges	SH-Alappuzha bypass intersection Road Development Project	Idea Stage
Transport	Roads and Bridges	Mudhiyam beach to Madhura bazaar Road Development Project	Idea Stage
Transport	Roads and Bridges	Payyabalam to Azhikkal Road Development Project	Idea Stage
Transport	Roads and Bridges	Manarcadu-Kidangoor Road Upgradation Project	Idea Stage
Transport	Roads and Bridges	Nattukal to Thanau Junction NH-966 Road Widening Project	Work in Progress



Sector	Sub Sector	Project	Project Status
Transport	Roads and Bridges	Kazhakuttom -Technopark Road Construction Project	Notice to Proceed
Transport	Roads and Bridges	Madhura bazaar to Chullikad Road Development Project	Idea Stage
Transport	Roads and Bridges	Kavungal-Pallikuth Road Development Project	Idea Stage
Transport	Roads and Bridges	Fort Vypin to Matysyafed Tourist Office Road Development Project	Idea Stage
Transport	Roads and Bridges	Angamaly Bypass Road Construction Project	Idea Stage
Transport	Roads and Bridges	Alappuzha City Road Upgradation Project	Not Disclosed
Transport	Roads and Bridges	Widening to 2 lane with paved shoulder from Kottayam - Ponkunnam of NH 183	DPR/Feasibility Study in Progress
Transport	Roads and Bridges	Chengannur Bypass Road Construction Project	Idea Stage
Transport	Roads and Bridges	Perinthalmanna Town Elevated Highway Construction Project	Idea Stage
Transport	Roads and Bridges	Kerala Road Construction Project	Idea Stage
Transport	Roads and Bridges	Construction of Smart Road Phase 4B PWD Roads	Notice to Proceed
Transport	Roads and Bridges	Construction of Smart Road Phase3 KRFB Roads	Notice to Proceed
Transport	Roads and Bridges	Construction of Smart Road Phase 1 and 2A PWD road	Notice to Proceed
Transport	Roads and Bridges	Cherkala Jalsoor Road Upgradation Project	Idea Stage
Transport	Roads and Bridges	Munderi - Kerala State Border Road Construction Project	Idea Stage
Transport	Roads and Bridges	Kalady Bypass Road Construction Project	Idea Stage
Transport	Roads and Bridges	Construction of Smart Road Corporation Roads	Notice to Proceed
Transport	Roads and Bridges	Arterial Roads Development Project	Tender Awarded
Transport	Roads and Bridges	Integrated Transit Node Development Project	DPR Approved
Transport	Railway Track	Shoranur - Ernakulam 3rd Railway Line Project	Idea Stage
Transport	Railway Track	Thiruvananthapuram - Kanyakumari Doubling Project	-
Transport	Railway Track	Turavur-Ambalapuzha Railway Line Project	Idea Stage



Sector	Sub Sector	Project	Project Status
Transport	Railway Track	Kumbalam-Thuravur Patch doubling Project	DPR/Feasibility Study in Progress
Transport	Railway Track	SilverLine [Semi High-speed Rail] from Thiruvananthapuram and Kasargod	Others - EPC for section wise and technology wise
Transport	Railway Track	Turavur-Ambalapuzha Railway Line Project	Idea Stage
Transport	Railway Track	Kuruppanthara - Chingavanam Railway Doubling Project	Tender Awarded
Transport	Railway Track	Ernakulam-Kumbalam Railway Doubling Project	DPR/Feasibility Study in Progress
Transport	Railway Track	Dindigul-Palghat Electrification of Railway Tracks Project	Work in Progress
Transport	Railway Track	Shoranur - Nilambur Road Electrification of Railway Tracks Project	Work in Progress
Transport	Railway Track	Kollam - Punalur Electrification of Railway Tracks Project	Others - Tender under finalization
Transport	Railway Track	Kollam - Punalur Electrification of Railway Tracks Project	Others - Tender under finalization
Transport	Urban Public Transport	Kochi Metro Rail Phase 2 Development Project	Others - Preparatory works in progress. Awaiting GOI approval
Transport	Urban Public Transport	Integrated Urban Regeneration and Water Transport System	Work in Progress
Transport	Urban Public Transport	Kochi Water Metro Development Project	Work in Progress
Transport	Urban Public Transport	Kochi Metro Rail Phase 1A Development Project	Work in Progress
Transport	Urban Public Transport	Kochi Metro Rail Phase 1B Development Project	Work in Progress
Transport	Urban Public Transport	Improving mobility for Kochi, Kochi Metro	Completion Certificate Issued
Transport	Inland Waterways	West Cost Canal 3 uncut portion Development Project	-
Transport	Inland Waterways	West Cost Canal Re-construction of 20 Bridges	-
Transport	Inland Waterways	West Cost Canal Development of Neeleeswaram - Bakel Reach	-
Transport	Inland Waterways	West Cost Canal Construction of 5 Nos.Navigation Project	DPR/Feasibility Study in Progress
Logistics	Bulk Material Transportation Pipelines	Bulk Material Transportation Pipelines	-



Sector	Sub Sector	Project	Project Status
Logistics	Bulk Material Transportation Pipelines	Kochi - Salem LPG Pipeline Project	-
Transport	Railway Terminal Infrastructure	Nemam Coaching Terminal Project	-
Transport	Railway Terminal Infrastructure	Kochuveli 2nd Coaching Terminal Development Project	Project Completed
Transport	Ports	Cochin Shipyard Dry dock Project Development Project	Work in Progress
Transport	Shipyards	Cochin International Ship Repair Facility Development Project	Work in Progress
Transport	Airports and Aviation Infrastructure	Trivandrum Construction of additional apron and GSE area near NITB	Project Completed



Kerala Industrial Infrastructure Development Corporation

(A Statutory Body of Govt. of Kerala)

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