PM GatiShakti
National Master Plan for Multi-Modal Connectivity

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GOVERNMENT OF INDIA
MINISTRY OF COMMERCE & INDUSTRY

INDIA LOGISTICS

FRAMEWORK FOR ASSESSMENT OF LOGISTICS COST IN INDIA

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LOGISTICS DIVISION
DEPARTMENT FOR PROMOTION OF INDUSTRY AND INTERNAL TRADE

Framework for Assessment of Logistics Cost In India

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For:
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FOREWORD

The vision of the Viksit Bharat by 2047 embodies a holistic approach to development, encompassing overall economic growth, social progress, environmental sustainability, and good governance. Logistics sector plays a crucial role in contributing to the overall economic growth of the country allowing India's competitiveness across the globe. Strengthening this sector demands targeted policy interventions and a concerted focus on infrastructure development and overall cost evaluation.

The Government of India, under the leadership of Prime Minister Shri Narendra Modi, has demonstrated unwavering commitment to this cause through transformative initiatives such as PM GatiShakti and National Logistics Policy (NLP). The NLP aims to reduce logistics costs, enhance infrastructure, and promote data-driven decision-making, while focusing on streamlining operations, boosting transparency, and integrating green practices. Complemented by digital tools like ULIP and dedicated freight corridors, the policy is driving a more efficient, competitive, and sustainable logistics ecosystem across India.

With such initiatives in place, it is important to estimate the logistics cost for India and also track it over time, in order to assess the efficiency of initiatives and identify the areas of further intervention. This document presents the framework to conduct the study on estimating the National Logistics Cost. The framework offers a hybrid methodology for the estimation of logistics costs, providing precise and stakeholder-specific insights to support decision-making. The study will assess the logistics costs at an aggregate level, breaking them down into components like transportation, warehousing, material handling and administrative cost. It will gather primary and secondary data to identify inefficiencies and cost drivers, highlight optimization areas, and develop a real-time dashboard integrated with platforms like ULIP and GSTN for continuous monitoring and data-driven decision-making. This framework is expected to serve as a reference for global logistics cost estimation methodologies, offering a more accurate tool for comparison and decision-making indicating major aspects of logistics, including region, mode, and sector. Additionally, the data-driven approach and real-time monitoring can be applied to other developing nations, promoting global best practices, optimizing supply chains, and making trade more efficient and sustainable.

In this context, I would like to appreciate the Logistics Division of DPIIT and NCAER (National Council of Applied Economic Research) for their proactive initiative and proposing a study on *Assessment of Logistics Cost in India 2023-2024* and Developing a comprehensive Framework for the same. I deeply appreciate the Taskforce Members for their invaluable insights that have enriched this initiative.

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Preface

The Government of India, under the leadership of Prime Minister Shri Narendra Modi, has demonstrated unwavering commitment to strengthen the logistics sector through transformative initiatives such as PM GatiShakti and National Logistics Policy (NLP). The NLP aims to reduce logistics costs, enhance infrastructure, and promote data-driven decision-making, while focusing on streamlining operations, boosting transparency, and integrating green practices. Complemented by digital tools like ULIP and dedicated freight corridors, the policy is driving a more efficient, competitive, and sustainable logistics ecosystem across India.

With such initiatives in place, it is important to estimate the logistics cost for India and also track it over time, in order to assess the efficiency of initiatives and identify the areas of further intervention. This document presents the framework to conduct the study on estimating the National Logistics Cost. The study will adopt a comprehensive methodology for this estimation by assessing the logistics costs at an aggregate level, and also by breaking them down into components like transportation, warehousing, material handling and administrative cost.

This framework document outlines the methodology which covers the collection of primary and secondary data to identify inefficiencies and cost drivers, highlight optimization areas, and develop a dashboard integrated with platforms like ULIP and GSTN for continuous monitoring and data-driven decision-making. This framework is expected to serve as a reference for global logistics cost estimation methodologies, offering a more accurate tool for comparison and decision-making indicating major aspects of logistics, including region, mode, and sector. Additionally, the data-driven approach and real-time monitoring can be applied to other developing nations, promoting global best practices, optimizing supply chains, and making trade more efficient and sustainable.

This document has been prepared by the Logistics Division of DPIIT and NCAER (National Council of Applied Economic Research), in consultation with the Taskforce, which was constituted to guide DPIIT and NCAER during the course of the study. The Task Force comprises members from NITI Aayog, Ministry of Railway, Ministry of Statistics and Programme Implementation, NCAER, academic experts, and other industry stakeholders.

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Executive Summary

Logistics is a cornerstone of economic development and global trade, acting as the binding agent of supply chains. Its performance directly influences national competitiveness, making the accurate measurement of logistics costs critical for benchmarking and strategic improvement. The National Logistics Policy (NLP) launched in Sept 2022 by the Government of India targets reduction in the logistics cost, creating a competitive logistics infrastructure, operating in a data-driven support mechanism which would eventually create an efficient logistics ecosystem in India.

Logistics cost has implications on the country's manufacturing sector, export competitiveness, and global positioning, etc. However, due to a lack of data in the public domain for the critical components of logistics cost, the non-official / floating estimates of India's logistics cost lack credibility. While it has been a practice to measure the Logistics Cost as a percentage of GDP across different economies, it has also been established that such comparison can be misleading due to variations in components of GDP. Besides, it does not help businesses or policymakers in making decisions for corrective measures. Expressing Logistics Cost as a percentage of GDP does not capture the mode-wise and region-wise variation in the Logistics Cost for a large and diverse country like India. Hence, a need was felt to develop a scientific logistics cost calculation framework, that is inclusive and stands the test of statistical and data-based methods.

To track the cost of logistics in India, it is critical to develop a comprehensive methodology that looks into the granularity of the logistics ecosystem as well as plays a practical role for the industry in the reduction of logistics costs. The Department for Promotion of Industry and Internal Trade (DPIIT) has commissioned the National Council of Applied Economic Research (NCAER) to conduct a study on estimation of logistics costs in India for 2023-24, based on a comprehensive framework. Guided by a Task Force comprising representatives from NITI Aayog, Transport Ministries, Ministry of Statistics and Program Implementation (MoSPI), Academia, and other industry stakeholders, this study integrates EXIM and domestic cargo data for granular cost segregation.

Broadly, logistics costs encompass transportation, warehousing, and related services, with nations globally striving to reduce these costs in order to boost trade competitiveness. While developed countries use detailed bottom-up methods for cost estimation, developing economies like India often rely on top-down approaches due to limitations in data availability. A hybrid method combining these approaches is increasingly seen as optimal.

In India, logistics costs are perceived to be disproportionately high, impacting manufacturing growth and economic competitiveness. **By adopting this approach, the study aims to provide accurate and stakeholder-specific insights to create a foundation for sustained logistics cost reductions, aligning with national policy goals and infrastructure advancements.**

The objective of this study can be summed up as follows:

a) Phase 1: Framework Development

The Logistics Cost Estimation Framework outlines the methodology to be adopted for the study, which aims to assess the calculation of logistics costs at an aggregate level, per tonne per km, and as % of the value of produce. The study will identify components of total logistics costs like transportation, cost of carrying inventory, and warehousing, and calculate their percentage share to total logistics costs. Unbundling the components of logistics cost into sub-components will add a unique element to the proposed methodology for the study. A significant focus is placed on identifying attributes and components of logistics costs, which enables the development of strategy, providing data-driven support.

At its core, this study adopts a hybrid methodology i.e. combination of top-down & bottom-up approaches (primary data and secondary data) for a comprehensive assessment of logistics costs to provide holistic insights. This study will cover various commodities and modes of transport such as road, rail, air, and water, with route selection guided by trade volumes and connectivity. Process and stakeholder mapping will identify key logistics stages and thematic areas of policy reform.

b) Phase 2: Implementation, Data Collection and Analysis

Primary data will be gathered through stakeholder surveys and Key Informant Interviews (KIIs) targeting supply-side and demand-side stakeholders including logistics service providers, warehousing operators, industry representatives, etc. These surveys will detail the costs related to different components of logistics and will also identify logistics inefficiencies.

Sources for Secondary data include the Supply and Use Tables (SUT), National Accounts Statistics (NAS), e-way bills, and freight data from ministries such as Railways, Civil Aviation, and Ports. These datasets will aid in validating survey results and providing macro-level insights.

With the generation of big data in the form of GST/E-way bills, it is now possible to apply a bottom-up approach for estimating logistics costs in India. These data will provide the accurate volume of cargo movement across various routes in a more scientific way.

c) Phase 3: Optimization and Action

The study will provide tangible policy recommendations for implementation with the aim to reduce logistics costs in India. **The output of the study is expected to be as follows:**

- A detailed assessment of national logistics cost, expressed in absolute terms and in per tonne per kilometer, and as percentage of the value of produce.
- Break-down of logistics cost into its components and for specific commodities and routes, identifying areas for cost reduction and efficiency improvements.
- Identification of challenges impeding cargo movement
- Stakeholder-specific recommendations to policy-makers, industry stakeholders, and researchers to improve logistics efficiency and reduce costs.

- Data-driven framework, including a real-time dashboard integrated with logistics platforms like ULIP and GSTN, to ensure continuous monitoring and informed decision-making.

The table below summarises the expected output on logistics cost across different dimensions.

Across dimensions			**Output**
Commodity	Corridor/Route	Mode	◦ Logistics Cost per tonne per km
Components and sub-components	Corridor/Route	Mode	◦ % share of each component and sub-component in total cost
At aggregate level			◦ National Logistics Cost (Rs.) ◦ Cost as % to total value of the produce of agricultural, mining, and manufacturing products

1. Background

1.1 Introduction

Logistics have always played a crucial role over time and across industries, both at the micro and macro levels. Its importance in facilitating trade and driving economic development cannot be ignored. Historically, effective logistics planning was a key strategic factor in winning wars. In today's globalized world, logistics holds strategic significance, particularly in shaping the outcomes of trade wars. Beyond this, logistics serves as a critical bridge, ensuring seamless trade across the globe and maintaining the flow of goods and services in an interconnected economy. Global or regional supply chains are increasingly used to organize trade, and logistics services act as the **"glue"** that keeps supply chains cohesive. There is always a strong correlation between a nation's competitiveness and logistics performance, based on infrastructure or the capacity to provide affordable logistical services and supportive conditions.

On the macroeconomic scale, logistics costs are an important factor for a country's competitiveness. Given the acceleration in logistic activities over the last few decades and the increasing competition among different nations, the importance of a unified and reliable way to measure logistics costs is crucial. Most of the developed countries compute logistics costs regularly and use performance indicators for logistic activities to measure their efficiency level.

The Government of India, under the leadership of Prime Minister Shri Narendra Modi, has demonstrated unwavering commitment towards the logistics sector through transformative initiatives such as PM GatiShakti, launched in 2021. This program emphasizes strategic infrastructure planning and execution to enable seamless logistics operations. India's **National Logistics Policy (NLP)**, launched in 2022, under PM GatiShakti initiative, aims to reduce costs and enhance efficiency to boost India's global competitiveness. It focuses on digitalization, multimodal transport integration, and infrastructure development, targeting a reduction in logistics costs.

Therefore, measuring national-level logistics costs for India is essential in order to know where it stands vis-à vis its competing countries. Along with this, it is equally important to identify the factors where there is scope to reduce costs.

1.2 Defining Logistics Cost

"Logistics" refers to the transportation and handling of goods between the point of origin and point of consumption, along with warehousing, cargo consolidation, and other allied services. The logistics infrastructure comprises nodes and connections, more recognizable as Ports, Stations, Multimodal Logistics Parks (MMLPs), Warehouses, and other business premises, connected by roads, railways, shipping, inland waterways, air routes, pipelines, etc., that are used by a wide range of carriers. This system is operated under a framework through a workforce with a wide range of knowledge of skills and technologies.

Of the many available definitions of Logistics, perhaps the most commonly used is the one given by the **'Council of Supply Chain Management Professionals'**. It defines it as: "that part of supply chain management that plans, implements, and controls the efficient, effective forward and reverse flow and storage of goods, services, and related information between the point of origin and the point of consumption to meet customers' requirements."

To understand more vividly, "Logistics costs" include all the costs incurred whilst moving a specific volume of cargo from point A to B; which entails the costs of transportation, order processing, inventory management, warehousing, material handling and storage, logistical packaging, customs (EXIM) and information. Each of these components is essential for accurately calculating overall logistics costs. Given their significant impact on trade dynamics, countries around the world are increasingly investing in strategies to reduce logistics costs, thereby enhancing their competitive footprint in the global trade landscape.

1.3 Measuring Logistics Cost

This section delves into the different methodologies that have been used by the previous studies to examine and estimate the Logistics Cost at the macro level. On a global scale, the World Bank (2007)[1] has developed the 'Logistics Performance Index (LPI)' which ranks countries qualitatively on various logistics indicators. However, this indicator does not provide any quantitative estimate of the logistics cost of any country.

Apart from this, there have been various single-country or multi-country studies to estimate the Logistics Cost. It has been established in the literature that most of the methods used to measure logistic cost at the micro level cannot be directly used to assess the logistic cost at the macro level. Previously published studies have adapted different methods based on the reliability and availability of the data. Rantasila (2013)[2] provides three alternate methodologies that can be availed to do a macro-level logistics cost study:

i. Collect empirical data directly from respondents using questionnaires (survey method).
ii. Estimate logistics costs using existing data from different statistical sources and/or create a model based on data collated from primary/ secondary sources. The modeling approach can be an econometric, analytic, or simulation type.
iii. Employ case study methods.

This means that the studies can be categorized into one of the three broad categories i.e. **statistical studies**, **survey-based studies,** and **case studies**. Some studies also adopt a **hybrid approach** i.e. a mix of statistical and survey-based studies to estimate the logistics cost of the nation. Each of these methodologies look at the logistics cost from a different perspective and can be chosen based on the availability of data and the purpose of the research. Individually, statistical studies usually approach the issue from the supply side, whereas survey-based studies approach it from the demand side of the supply chain. On the other hand, case studies typically address the issue at a micro level or for a specific industry.

[1]World Bank. (2007). *Connecting to Compete - Trade Logistics in the Global Economy*. World Bank.
[2]Rantasila, K. (2013). Measuring Logistics Costs, Turku School of Economics.

For the studies based on primary/ secondary data, there have been two approaches for estimating the logistics cost - the top-down and bottom-up approaches. The top-down approach disaggregates data published in national accounts to a level reflecting transport, storage, and other components of logistics cost as defined earlier. This method of calculating logistic cost is referred to as the disaggregated approach. The bottom-up approach computes logistics costs by aggregating detailed transport and warehousing data and relating it to specific products. This method is referred to as the aggregated approach.

Most of the developed countries adopt the bottom-up approach to estimate logistic costs. This approach is more data-intensive than the disaggregated approach. However, as the logistic sector is more organized in developed countries, the respective industries collate these data for their use, and the governments of the respective countries also maintain such databases. Because of the scarcity of data, developing countries use the former approach to arrive at logistic costs.

A few countries have also adopted the hybrid approach (top-down and bottom-up approach) which has the following advantages over other methods -

i. Aggregated and disaggregated approaches are entirely independent in their methods of analysis and source of data. This not only allows for logical checks but also allows the assessment of the propensity to outsource logistics tasks.

ii. The aggregated approach builds up the cost of logistics from its most detailed input elements. This is in contrast to the methods commonly used to extrapolate cost data based on sample surveys. The validity of data could be verified at the primary source before any aggregation takes place.

iii. The aggregate approach can be undertaken in an MS Excel spreadsheet platform. So, one can undertake sensitivity analyses by varying the parameters of the model (namely, mode of transport, cost per tonne-kilometres, and packaging cost.)

iv. The model focuses research on the refinement of individual input elements. It would even be possible to add an increased number of layers for the analysis of a particular industry in more detail.

With the generation of big data in the form of **GST/E-way bills**, it is now possible to apply a bottom-up approach for estimating logistics costs in India. These data provide the accurate volume of cargo movement across various routes in a more scientific way. However, a survey is also important to quantify other elements of logistics costs. Therefore, for the present study, the **hybrid approach** will be used that will include a primary survey along with a **top-down** (disaggregated approach). This would help to comprehensively capture the Logistics Cost at an aggregate level and understand the sector-wise, mode-wise, region-wise, and commodity-wise variations in the Logistics Cost. Along with the data from National Account Statistics (NAS), a robust primary survey is going to be critical to capture the following elements of the study:

- Components of the Logistics Cost: Some components like administration and management cost are not available in the NAS.
- Unbundling the components of the logistics cost: For example – Transportation includes freight cost, material handling, pickup, and delivery.

- Regional Variation in Logistics Cost due to uneven development
- Sectoral or product-wise variation in Logistics Cost.

1.4 Metric to measure Logistics Cost

Measuring the Logistics Cost as a percentage of GDP has been a common practice to make the results for different countries more comparable. However, expressing Logistics Cost as a percentage of GDP is not the best measure to capture the cost and track its change over time. This is because the magnitude of the logistics cost of a country varies significantly based on its economic structure and the spatial distribution of production and consumption centres. Economies dominated by services naturally have lower logistics costs, while those driven by agriculture and manufacturing face higher logistics costs. Additionally, cost calculation as a percentage of GDP will not help businesses in decision-making. Therefore, comparing logistics costs as a percent to GDP across different economies can be misleading.

Additionally, GDP growth/size has multiple determinants some of which may not be relevant for logistics, yet show up while computing the logistics cost as a percentage of GDP. Developed countries have higher GDP, which may translate logistics costs into lower percentage of GDP. Developing/under-developed economies have lower GDP which may represent logistics cost as a higher percentage of GDP. Hence, the calculation of logistics cost as a percentage of GDP may not adequately capture logistics efficiency.

Additionally, expressing Logistics Cost as a percentage of GDP does not capture the region-wide variation in the Logistics Cost. For a large and diverse country like India with varying levels of development across various states, it is important to understand the zone-wise or region-wise difference in logistics cost for effective policy interventions.

There are also sectoral and product-wise variations in the Logistics Cost. Some commodities like coal are predominantly transported by railways while electronic and pharma commodities are mostly transported by air. There is also variation between containerized and non-containerized goods, temperature-sensitive and non-temperature-sensitive commodities, dangerous goods, etc. This results in significant variation in Logistics Costs across sectors and commodities. Measuring Logistics Cost as a percentage of GDP cannot capture these variations too.

Thus, there are significant gaps in estimating Logistics Cost as a percentage of GDP. An alternative metric can be to measure the logistics costs as a **percentage of the value of produce** or in terms of **per tonne per kilometre**. These metrics can incorporate the above-mentioned variations in a better manner and thus capture the Logistics Cost holistically. In the present study, the output i.e. The National Logistics Cost, will be expressed as a percentage of the value of produce and as **per tonne per kilometre**.

1.5 Logistics Cost of India

Before aiming at reducing the costs, it is important to accurately capture the Logistics Cost of India. There is a perception that logistics costs in India are high as compared to other countries with similar

environments and states of development. This perception is based on the World Bank's logistics index and also on some studies of logistics costs, particularly the one conducted by Armstrong & Associates Inc. They used a variant of the neural model given by Bowersox (1998)[3] to estimate the Logistics Cost of all the major and emerging economies of the world. While this is indeed a commendable effort, caveats need to be emphasized.

The neural model is estimated based on observed data of input variables (economy, infrastructure-related variables for countries, which are readily available from in World Bank database) and output (here, logistics cost as a percentage of GDP) variables of select developed countries. Typically, estimates of output variables of developed countries are available from alternative methods. So, one estimates a neural model for the control countries, which are the developed economies. Once the neural model is estimated for the control countries, the input variables for any country are put in the model to estimate the logistics cost as a percentage of GDP for the corresponding country. But for developing economies like India, where transaction costs are quite high in terms of costs and time, the quality of physical infrastructure is inefficient; the **application of a neural model estimated from developed economies data to assess the logistics cost of India may provide erroneous results**.

Higher Logistics Cost is a challenge for manufacturing growth which also limit the comprehensive development of the country. For this reason, the government of India has placed a high emphasis on reducing India's logistic costs through a variety of interventions by the private and public sectors. India has come out with the **National Logistics Policy** (NLP) and is in the process of framing the logistics policy along with the action plan at the state-level also.

The three broad targets of the NLP-2022 are:

Reduce logistics cost in India to be comparable to global benchmarks by 2030.

To be among top 25 countries in Logistics Performance Index ranking by 2030.

Create data driven decision support mechanism for an efficient logistics ecosystem

The reduction in logistics cost is expected to be achieved through improvement in transportation, warehousing, inventory management, and through efficiency in regulatory matters and order processing. It, therefore, becomes important to develop a full understanding of:

- Global benchmarks available
- Methodologies applied for developing these benchmarks
- Feasibility in the application of these methodologies to the Indian context

[3]Bowersox, Donald. - Roger J. Calantone (1998). Executive Insights: Global Logistics, Journal of International Marketing, Vol. 6, No. 4, pp.83-93.

- Best possible methods to measure logistics costs in India given current data limitations, and
- Methodology to derive logistic costs if newer sources of data were available.

In this context, DPIIT earlier commissioned a study to estimate the logistics cost to GDP ratio based on the available secondary data sources. In 2023, NCAER conducted a quick assessment using **Supply Use Table (SUT)** data, producing an estimate that logistics costs accounted for **7.8% to 8.9% of GDP for 2021-22**. However, this assessment study also proposed a more comprehensive study, including a primary survey, to accurately capture the logistics costs of the country.

The logistics cost for a large country like India, can be best estimated through a comprehensive study, based on a framework and methodology which captures the logistics cost closest to the realistic estimates. This document is the Framework for Estimating Logistics Cost in India as a part of the comprehensive study that has been commissioned to NCAER by DPIIT to estimate the Logistics Cost for 2023-24 and also develop a framework for future estimates. The study is guided by a Task Force constituted by DPIIT and comprising members from NITI Aayog, Ministry of Railway, Ministry of Statistics and Programme Implementation, NCAER, academic experts, and other industry stakeholders.

Developing a framework for future estimates is important given the government's plans and the scale of investment in developing infrastructure, making the movement of goods smoother and faster. Due to this, the cost of logistics is expected to reduce in a very short period. Hence, it is imperative to develop a mechanism to estimate the logistics cost on an annual basis.

It is also equally important that the mechanism can provide the tangible policy advice on ways to reduce logistics costs. This framework will take a mix of **EXIM** and **domestic cargo** movement for the study. The advantage of taking EXIM cargo is that it also covers the stages/components that are involved in the domestic cargo movement.

2. Objectives

The primary objective of the study is to estimate the Logistics Cost of India for 2023-24. The total Logistics Cost will be presented in absolute terms; in terms of per tonne per km; and as a percentage of the value of produce. Additionally, the study will provide a detailed breakdown of logistics costs by route, mode, commodity, and component. The specific objectives are as follows:

i. ***Calculation of Logistics Cost***:
   - At an aggregate level
   - Per tonne per km (Product Wise- OD – Mode wise Matrix)
   - As %age of value of produce

ii. Identify the ***components of the total logistics cost*** like transportation, cost of carrying inventory, handling, warehousing, etc., and calculate their percentage share to the total logistics cost

iii. ***Unbundling of the Component cost***: Break down the component costs into further sub-components, for example, the transportation cost will be broken into fuel charges, labour cost, material handling cost, etc.

iv. Identify ***dynamic contributors to the components of logistics costs*** which will aid in pinpointing strategy and policy reforms. The impact of change in the determinants on the overall cost can be visualized.

v. Develop a roadmap for the policy establishment in the form of strategic recommendations that can be categorized based on transportation modes, commodity level, stakeholders, and/or period needed for implementing the recommendations.

vi. Create a data-driven decision support mechanism/framework that can aid the Logistics Division in carrying out logistics cost analysis (periodically) to measure any change for an efficient logistics ecosystem.

3. Approach

The logistics costs, across the world, are calculated using one of the 3 main approaches, that is, survey approach, statistical approach, and case study approach. Some studies have used the hybrid approach as well, depending on the availability of data.

i. *Survey based approach* collects empirical data directly from respondents using structured or semi-structured questionnaires and provides estimates of logistics cost from the perspective of key stakeholders of the industries. Typically, questionnaires are canvassed to key persons (chief operating officers) in industries to solicit logistics costs of their respective industries. These responses are then aggregated by the suitable weighing scheme to arrive at the logistics cost of a country.

ii. *The statistical approach* uses statistical models and secondary data like National Accounts Statistics to derive the logistics cost of the country.

iii. *Case studies* typically address the issue at a micro level or for a specific industry. The information in this method is obtained through in-depth interaction with the relevant and knowledgeable persons of that industry.

The statistical approach alone does not provide the individual cost components of the logistics. The present study will hence adopt an **integrated or hybrid approach** to capture logistics costs holistically utilizing a primary survey along with relevant secondary data. The most relevant secondary data, which provides the government estimate of freight transport cost at an aggregate level, is the Supply and Use Tables (SUT), prepared and published by the Ministry of Statistics and Programme Implementation (MoSPI).

However, SUTs are available with a lag period of about 2 to 3 years. The latest available SUT is for 2019-20 and those for 2020-21 and 2021-22 are likely to be released soon. But the reference period of this study is 2023-24. To project the transport cost for this year, another important secondary source is the National Accounts Statistics (NAS), which is also published by MoSPI. The SUT and NAS will be used to triangulate the estimates obtained from the primary survey.

The primary survey shall be carried out to get the data/information from both the supply side and the demand side of the logistics ecosystem. From the supply side, the survey will be conducted with multiple of stakeholders that supply logistics services, like Logistics service providers for each mode of transport and warehouse service providers. For the demand side, the survey will be conducted from Industries for each selected product segment to gain data and key insights about their logistics cost as a proportion of total production cost.

Therefore, the target respondents will include the following:

- **Logistics Service providers**: These are expected to provide information/data on all the components of logistics costs that are borne by them. These primarily include costs related to

transportation including transfer fees (changing transport mode), pickup and delivery costs, material handling costs during transportation, and others.

- **Industry/Manufacturers:** The Industries are expected to provide information/data on the proportion of logistics cost in their total production cost. These will include the cost of transportation (own or through logistics providers), warehousing & storage (which is attributed to logistics, and not market demand), material handling, IT or IT-related innovation, etc. This information will help in identifying the pain points and also identifying the components that require the most or quicker intervention in reducing the overall cost.
- **Warehousing service providers:** A few Key Informant Interviews will be conducted with the Warehousing service providers to gain insights on keeping certain types of commodities in warehouses and factors related to logistics inefficiency. The cost of keeping these commodities also adds to the logistics cost. This, however, does not include the cost of inventory.
- **Others –** Subject matter experts, terminal operators, etc

The data on costs of other components, as relevant to them, will also be collected. These costs will be obtained for each mode of transport.

Sample Selection

For the survey with Logistics Providers, a scientific sampling plan will be developed, making sure that the selected sampling units are representative of the entire population or universe of logistics players. The data, as obtained from the sample survey, will be estimated for the population using appropriate statistical techniques. This is how the estimated values of each component and sub-component of logistics cost will be derived.

For the survey with Industries, key informants of a small sample of industries which is representative of major commodity types will be interviewed.

Expected Outcome

The survey findings will be able to present the **cost structure of logistics cost** across its components and sub-components. Since the cost structure is expected to show variation across commodities and also routes, therefore it will be presented for each commodity and trade route. Within these trade routes, different modes of transport will be studied and presented. These will include modes of transport across the first mile and last mile covering smaller geographies and also mid-mile covering larger geographies across national highways.

Apart from the transportation cost, other sub-components of the logistics cost including **warehousing cost** (square foot per day) will also be calculated from the study.

Since the logistics cost has huge seasonal variations, the study will also capture these variations (in percentage terms). The factors of seasonality can include festivals or weather conditions.

Besides costs, the survey will also gather data on the volume of products and distance travelled, so as to arrive at the cost per tonne per km. The preliminary interaction with the Taskforce members suggests that some of these data are available in the public domain or can be obtained from the

stakeholders. For example, the Ministry of Railways provides data on Freight Rate per tonne for each commodity, for each route, and for each wagon type.

Further, the aggregate **transportation cost**, by each mode of transport, will be validated with those available in India's Supply and Use Tables (SUT) respectively.

The selection of key contours of the study, being the most important aspect of the study, is discussed below.

3.1 Components and Subcomponents of Logistics Cost

Based on the literature review and interactions with the stakeholders, the components of logistics costs can be broadly categorized into Transportation, and Warehousing Costs. There are several sub-components within these costs. These are given below. However, this may not be an exhaustive list and will be firmed up after a **small pilot survey**.

i. Components of Transportation Cost

- Freight cost
- Pickup and Delivery
- Transfer fee
- Material Handling during transportation
- External Packaging - includes expenses related to protecting products during transit and storage, including material, labor, and labelling cost. Packaging is done to prepare goods for handling and transportation to the customers. It has to be compliant with safety and other regulations.
- Administrative cost – includes order processing, monitoring orders, IT-related services, maintaining transaction documents
- Cost of insurance of commodity/transport equipment
- Time Cost

ii. Components of Warehousing Cost:

- Material handling at the warehouse
- Rent
- Labor cost
- Other costs like cost of equipment and inventory management systems
- Administrative cost

It is important to draw the line between warehousing costs, which are direct and function-related, and inventory carrying costs that occur when capital is tied to the inventory itself. Companies often hold inventory as a strategic business choice, influenced by factors like market demand, supplier reliability, customer service expectations, etc. While the decision to maintain certain levels of inventory is driven by unique business needs and isn't technically a logistics cost, the associated carrying costs—

due to resources invested in managing and safeguarding this stock—form a substantial part of Logistics Cost.

3.2 Commodity Coverage

Commodities can be selected based on criteria including:

i. Commodities specific to modes of transport – Road, Rail, Water and Air. Some commodities are predominantly transported through a specific mode of transport. For example, coal is almost entirely transported by rail, electronics and pharma by air, etc.

ii. Further segregation of containerized and non-containerized as well as perishable (for example - dairy products, fresh fruits, etc.) and non-perishable cargo would also help because handling costs vary by these types.

iii. Within perishable, commodities can be distinguished into temperature-sensitive (e.g. vaccines, injectables, ice cream, etc.) and non-temperature-sensitive commodities.

iv. Commodities with a significant share in the country's freight movement. These commodities need to be included in commensurate with their share in the total cargo share in the country.

v. Include both sets of commodities – domestic and EXIM.

vi. Commodities will be selected from the HS classification of products.

The indicative list of commodities is as follows:

Table 1: Indicative List of Commodities

S.No.	Commodities
1.	Agricultural products
2.	Foodgrains, Flour, and Pulses
3.	Perishable goods like dairy products, fresh fruits, horticulture, etc.
4.	Processed Food
5.	Fertilizers
6.	Coal
7.	Cement
8.	Chemical products
9.	Textile items
10.	Pharmaceutical goods
11.	Petroleum Products and Gases
12.	Electronics items

S.No.	Commodities
13.	Automobiles
14.	Engineering Goods
15.	FMCDs
16.	FMCGs
17.	Iron and Steel products
18.	Leather, Rubber and Plastic Products
19.	Machinery and Machine Tools
20.	Dangerous Goods

3.3 Route Selection

For each commodity, the following are needed to be selected:

i. The routes where a significant proportion of a commodity moves.

ii. The routes to a major consumption hub or routes originating from a major production centre.

iii. The routes encompassing diverse geography spread, say, North-South and East-West directions.

The e-way bills data will enrich the selections of Origin-Destination routes for Road Transport. The route selections will be complemented based on relevant secondary research and primary pilot testing.

3.4 Modes of Transport

The selection of commodities and routes will be carried out for each mode of transport—rail, road, water (coastal and inland), air, and other non-conventional modes of transport (e.g. – slurry pipeline, conveyors, ropeways, etc.). Additionally, the analysis will consider the feasibility and efficiency of multi-modal transportation, where goods may be moved using a combination of these modes. This approach ensures that the most suitable and cost-effective logistics solutions are identified for different types of cargo and their respective routes.

3.5 Process Mapping

For each selected commodity with a selected route, the entire process of cargo movement needs to be mapped. The process mapping would involve the following details:

i. Breaking the entire process into components like transportation, storage, packaging, etc. In some cases, the process may be linear like loading of cargo onto the truck, its transportation to the final point, and unloading.

ii. However, in other cases, the process may involve several stages like loading onto the truck for a short haul or on a rake for a long haul.

iii. The long haul may end at a warehouse which would involve some compliance procedures for the cargo to be again loaded onto a vehicle for a short haul.

Hence, it is important to break the entire process into **5-6 major segments/components** for an easier calculation model.

3.6 Stakeholders Mapping

This involves identifying the stages at which the cargo changes hands between stakeholders. Stakeholder identification is important from the perspective of policy reforms. Key stakeholders for the process would include (tentative list):

Table 2: Key stakeholders

Transporters	Freight Forwarders	Warehouse Operators
Shipping Lines/Airlines/ Railways	CFS/ICD Operators	3PLS
Industry	Exporters-Importers	CHAS
NVOCCS	Trade Associations Traders/ Agents	Customs/PGAS
Terminal Operators Maritime/ Air/Land	Subject Experts	Digital Players

4. Data Collection

The study will use a mix of primary and secondary datasets.

4.1 Primary Data Collection

This study aims to calculate the detailed structure of logistics costs in India, primarily through a **sample survey approach**. The primary data shall be collected through a **survey** as well as stakeholder consultations or **Key Informant Interviews** (KII).

The country will be divided into **five regions** based on the geographical distribution of states- North, East, West, South, and North East.

The study will encompass all major modes of transport: Road, Air, Rail, and Water (Inland and Coastal). A sample number of routes will be selected from each region and for each mode of transport. The selection will be done by making sure the good coverage across the geographies of India.

To analyse road transport costs, e-way bill data will be utilised to identify key trade routes within each of the five regions. The e-way bill provides the distance travelled and the taxable value of goods being transported, which will serve as the basis for classifying trade routes.

4.2 Secondary Data Sources

Relevant data points from secondary sources shall be obtained as part of the literature review. These will include:

Table 3: Secondary data sources

Logistics Cost estimation across other countries	Supply Use Table (SUT) for India
Ministry of Civil Aviation	Ministry of Ports, Shipping and Waterways
Ministry of Railways	E-Way Bill data by GSTN
Inland Waterways Authority of India	

For this study, mode-wise transport values will be sourced from Supply and Use Tables (SUT). Freight charges, measured in net tonne-kilometres (NTKM) by commodity, will be obtained from the Ministry of Railways via the Freight Operations Information System (FOIS).

E-way bill data will provide commodity-wise routes, aiding in the identification of the busiest routes for road transport. Similarly, cargo traffic data and other relevant information will be collected from the Ministry of Civil Aviation, the Ministry of Ports, and the Inland Waterways Authority to support the analysis across different transport modes.

5. Survey Methodology

The study shall adopt a scientific sampling approach for the primary survey. While the total sample size is tentatively proposed to be **3000 relevant stakeholders**, the distribution of samples by different types of stakeholders will be in proportion to the number of commodities and routes selected.

5.1 Sample Size and Allocation

For the survey, it has been tentatively decided to collect data from 3,000 relevant stakeholders across different modes of transportation. These stakeholders include **transporters, freight carriers, warehouses, agents, and other key players** in the logistics chain. However, the sample size will be affirmed after the e-way bills data are analysed as the sample design will be developed using this data. The sample for Key Informant Interviews (KII) with the industries will be based on the number of commodities covered in the study. Attempts will be made to cover up to 5 industries from each of the major commodity types.

5.2 Allocation of Samples

The total sample size of 3,000 will be distributed among four modes of transportation: Road, Rail, Air, Water, and other unconventional modes of transport. Commodity and route selections will also be considered based on the details provided in earlier sections.

The sample size will be in proportion to the cargo handled by each mode of transport and is tentatively proposed as follows:

- 70% for Road Transportation
- 10% for Railway Transportation
- 10% for Water transportation (Inland and Coastal)
- 5% for Air transportation
- 5% for Other unconventional modes of transport (slurry pipelines, conveyors, etc.)

(Note: In the case of railways, airways and maritime ports information on tariff and load is available in secondary sources, therefore the allocated sample size may be reduced. The extra sample size will be adjusted in the road transportation category.)

This allocation reflects the relative importance and volume of goods transported through each mode. Road transport, being the most widely used mode in India, receives the largest portion of the sample size, ensuring comprehensive coverage of stakeholders in this sector. This is followed by Railways. Air and Water transport, while significant, are allocated a smaller but proportionate share of the sample to reflect their roles in the logistics landscape.

5.3 Statistical Tool for Analysis

The analysis will be conducted using advanced statistical methods, with software such as STATA and SPSS employed for data processing and interpretation. The findings will be presented in the form of clear and visually impactful exhibits, including graphs, tables, and charts, to ensure the results are easily interpretable and actionable within the report.

In addition, a data collection **dashboard** will be developed to monitor field data as it is gathered, ensuring accuracy and timeliness. This dashboard will also provide valuable insights until the next comprehensive survey-based study is conducted. This approach will enhance data-driven decision-making and ensure continuous tracking of key metrics.

6. Output

The comprehensive study based on the hybrid approach to calculate the Logistics Cost will deliver a detailed assessment of National Logistics Costs. These costs will be expressed in absolute terms; in terms of per tonne per kilometre; and as a percentage of the value of produce. This study will also provide a granular breakdown of Logistics Costs by commodities and routes. This detailed analysis will help identify opportunities for cost reduction and efficiency improvements. The estimates of Logistics Cost will be presented across different dimensions, as summarised below:

Table 4: Output of the Study

Across dimensions			**Output**
Commodity	Corridor/Route	Mode	○ Logistics Cost per tonne per km
Components and sub-components	Corridor/Route	Mode	○ % share of each component and sub-component in total cost
At aggregate level			○ National Logistics Cost (Rs.) ○ Cost as % to total value of the produce of agricultural, mining, and manufacturing products

The specific output of the study will be as follows:

i. **National Logistics Cost**: A detailed assessment of logistics costs on a national level, expressed in absolute value terms and as per tonne per kilometer.

ii. **Percentage of the Value of Produce**: An evaluation of logistics costs as a percentage of the total value of the produce.

iii. **Commodity-Specific Logistics Costs**: A breakdown of logistics costs by specific commodities, allowing for targeted insights into which goods incur higher logistics costs.

iv. **Route-Specific Logistics Costs**: An analysis of logistics costs associated with particular routes, identifying key areas for potential efficiency improvements and cost reductions.

v. **Components of Logistics Cost**: A detailed examination of the various components that contribute to the overall logistics cost, along with their respective shares in the total cost. This will highlight the major drivers of expenses in the logistics sector.

vi. **Framework for Measuring Changes in Logistics Cost**: A robust framework designed to measure and track changes in logistics costs over a specified period. This will enable ongoing assessment and benchmarking against previous data.

vii. **Challenges Impeding Cargo Movement**: A comprehensive list of challenges that hinder the efficient movement of cargo, leading to increased costs. Understanding these obstacles is crucial for developing effective solutions.

viii. **Stakeholder-Wise Strategic Recommendations**: Tailored recommendations for different stakeholders aimed at enhancing logistics efficiency within the country and ultimately reducing overall costs. These strategies will be based on the insights gathered throughout the project.

ix. **Key factors affecting cost**: The study will identify the key factors that influence the logistics cost. These will also include factors like time, seasonality, etc.

x. **Seasonal Variation:** The study will give ballpark estimates on the seasonal variation in Logistics Cost which will be captured by the primary survey.

xi. **Data-driven framework (Dashboard)**: A data collection dashboard will be developed to monitor and verify field data as it is gathered, ensuring both accuracy and timeliness. This tool will offer ongoing insights, bridging the gap until the next survey-based study, and enabling continuous tracking of key metrics for more informed, data-driven decisions. Integration of the dashboard will be proposed with other logistics portals/platforms like ULIP, GSTN, MOSPI, ICEGATE, etc. In some cases, API integration will be explored for the dashboard integration.

This comprehensive report will serve as a valuable resource for policymakers, industry stakeholders, and researchers interested in improving logistics efficiency and reducing costs within the national framework.

7. Periodicity

This framework outlines the methodology for calculating logistics costs in India, initiated during the **first year** of the study. This phase employs a comprehensive hybrid approach, integrating primary survey and statistical techniques.

In the **second year**, cost estimation will be conducted exclusively through statistical methods, leveraging secondary data sources such as the Supply Use Table (SUT), National Accounts Statistics (NAS), and others. This transition is driven by the efficiency of statistical methods, as primary surveys are both time-intensive and resource-heavy, making the statistical approach more suitable for annual assessments.

Considering the government's proactive measures to reduce logistics costs, it is essential to reintroduce the comprehensive hybrid approach, grounded in the Logistics Cost Estimation Framework, in the **third year**. This approach allows for an in-depth analysis and can be repeated biennially to ensure robust and up-to-date insights into national logistics costs.

8. Annexure

The list of Taskforce Members is as follows:

1.	Sh. Rajeev Singh Thakur, Additional Secretary, DPIIT	Chairperson
2.	Sh. S K Ahirwar, Joint Secretary, DPIIT	Member Convener
3.	Sh. E Srinivas, Joint Secretary, DPIIT	Member Co-Convener
4.	Sh. Sagar Kadu, Director, DPIIT	Member Secretary
5.	Sh. Praveen Mahto, Principal Adviser, DPIIT	Member
6.	Sh. Sudhendu J. Sinha, Adviser (Infra Connectivity & E-Mobility), NITI Aayog	Member
7.	Sh. Balasubramanian Krishnamurthy, Joint Secretary, Department of Revenue	Member
8.	Sh. Alok Tripathi, Executive Director (Freight Marketing), Ministry of Railway	Member
9.	Sh. Rajeev Kumar, Deputy Director General, Ministry of Statistics and Programme Implementation	Member
	Dr. Poonam Munjal, Professor, NCAER	Member
11.	Sh. Manu Raj Bhalla, President, Warehousing Association of India	Member
12.	Sh. Prashant Seth, Joint. Director General, Federation of Indian Export Organisations	Member
13.	Sh. Samir Shah, Logistics Industry Representative	Member
14.	Sh. Shankar Shinde, Vice President, Federation of Freight Forwarders Associations in India	Member
15.	Sh. Pritam Banerjee, Head, Centre for WTO Studies, Indian Institute of Foreign Trade	Member

Notes

For any suggestions/feedback, please write to:

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