



CII Institute
of Logistics

BUILDING WAREHOUSING COMPETITIVENESS: UNLOCKING GROWTH THROUGH INTELLIGENT WAREHOUSING

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A Note by the Author

We are delighted to present this knowledge report on the transformative journey of India's warehousing sector, a cornerstone of our country's growing economy.

India is set to become a USD 7-trillion economy by 2030. This trajectory is underpinned by a dynamic consumer market, our country's rise as a manufacturing hub, and robust investments in logistics and warehousing infrastructure development.

Our paper on 'Building Warehousing Competitiveness: Unlocking Growth through Intelligent Warehousing' emphasises the need for sophisticated warehousing infrastructure considering the pivotal role these facilities now play in the supply chain.

In this report we study the evolution in warehousing meet the demands of contemporary business models, the need to adopt mechanization, real-time tracking, data analytics, and sustainable practices for faster and more efficient operations and how large logistics parks can become key drivers of growth for the sector.

I invite you to read this report with the hope that it serves as a valuable resource for industry stakeholders, policymakers, and businesses aiming to navigate and contribute to India's logistics and warehousing revolution.

Manish Saigal

Managing Director,
Alvarez & Marsal India

Foreword

It is with great pleasure that we introduce the report ‘Building Warehousing Competitiveness: Unlocking Growth through Intelligent Warehousing,’ a collaborative effort between the CII Institute of Logistics, a renowned center of excellence in logistics and supply chain management and Alvarez & Marsal, a global professional services firm providing solutions across industries. This report is a product of the dedicated efforts of the CII Warehouse National Network (WNN) which is committed to make the warehousing sector ready for future growth.

The report examines the evolution of the warehousing sector, which is fundamental to the country’s economic growth narrative. From traditional storage facilities to advanced logistics hubs, the transformation in warehousing reflects the broader economic shifts and innovations shaping India today.

We hope that this joint effort between the CII Institute of Logistics and Alvarez & Marsal will spark discussions and inspire innovation to advance the logistics and warehousing sector, supporting our country’s journey toward economic prominence.



India's growth story: Journey to becoming the third largest economy by 2030

The Indian economy is on a remarkable growth trajectory and on track to double its gross domestic product (GDP) to USD 7 trillion by 2030 as per estimates from institutions like the World Bank and the International Monetary Fund. This growth is fueled by and likely to sustain due to factors such as a growing consumer market, improved production to become a global manufacturing hub as well as robust investment in infrastructure upgradation enabled by advanced digital infrastructure.

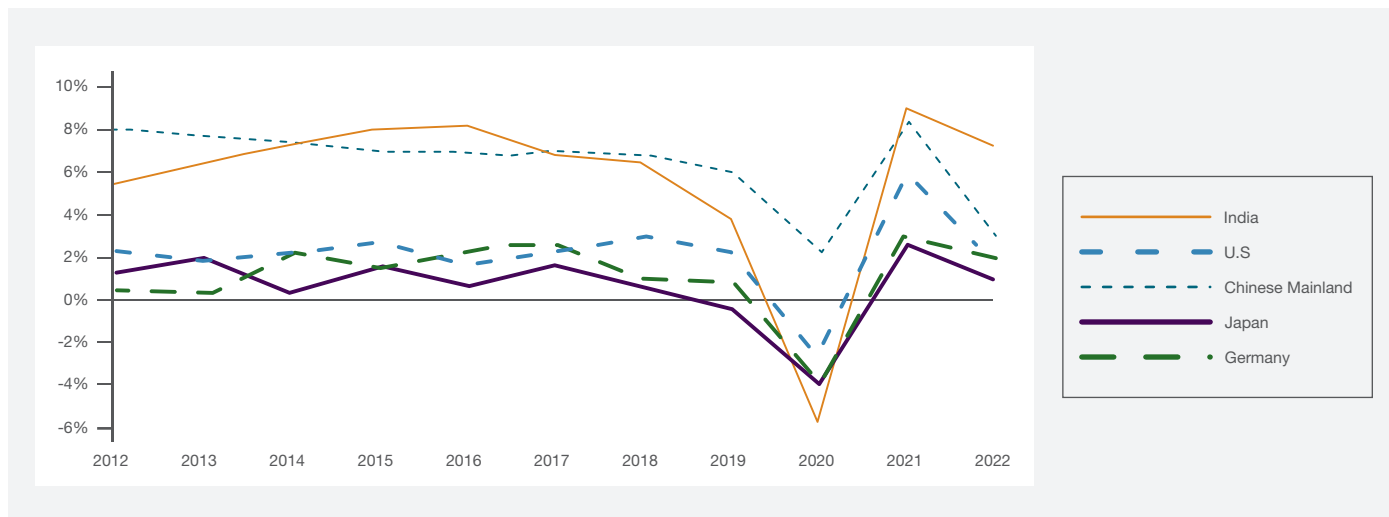


Figure 1: GDP growth (annual %)¹: India's growth outpaces that of major global economies

Infrastructure modernization is a key theme going forward in line with growing consumer demand and evolving business models. We are currently seeing demand shifting beyond the top eight cities, creating a need for a logistic ecosystem that is lean and efficient.

India has seen transformation in transportation infrastructure on the back of sustained investment in logistics:

Total budgetary outlay for infrastructure-related ministries increased from around INR 3.7 lakh crore in FY23 to INR 5 lakh crore in FY24²

Indian railways spent over INR 1.2 lakh crore for upgrading assets in the last five years to ensure swift services and safety⁴

The national highway network has expanded by 60 percent to 1,46,145 km by 2023 from 91,287 km in 2014³

The government's push towards creating 35 multi-modal logistics parks across India

This has created a growing need for warehousing in the country along with infrastructure development to support India's growth ambitions.

As a result, we are seeing an increase in high-grade warehousing infrastructure at the center of a streamlined supply chain. Warehouses are becoming a crucial element in delivering quality customer experience with a need for fast, accurate, cost-effective and transparent warehouse operations.

¹World Bank data - Annual percentage growth rate of GDP at market prices based on constant local currency

²Invest India


³Ministry of Road Transport and Highways

⁴Ministry of Railways

Section 1: Transformation in warehousing in line with customers' evolving business models


Warehouses play a pivotal role in delivering enhanced customer experience by adhering to the tenets of FACT: Fast processing, Accurate order fulfillment, Cost-effective operations, and Transparent real-time visibility.

Fast processing, storage, and dispatch capabilities:




The speed at which warehouses process, store, and dispatch goods is critical. With customers demanding faster delivery times, warehouses must be equipped with streamlined processes and suitable mechanization to handle large volumes of inventory quickly. Automated storage and retrieval systems (AS/RS), automated sorters, and real-time data analytics contribute to reducing processing times and ensuring that orders are dispatched swiftly.

Cost-Effective operations




Cost-effective warehouse operations are essential for maintaining competitive pricing and achieving economies of scale. By optimizing labor, energy usage, and space utilization, warehouses can reduce overhead costs. Techniques such as space optimization, cross-docking, just-in-time inventory management, and leasing of equipment contribute to lower operational costs, which can provide the customer with the advantage of enhanced service.

Accurate order fulfillment



Accuracy in order fulfillment directly impacts customer satisfaction. Minimizing picking errors through the implementation of automated picking systems, barcode scanning, and RFID technology ensures that customers receive the correct products promptly. This precision in order fulfillment reduces return rates and enhances the overall customer experience.

Transparent real-time visibility



Transparent, real-time visibility of inventory and cargo movement is crucial in today's fast-paced logistics environment. Customers and businesses alike, demand real-time updates on the status of their orders. Implementing advanced warehouse management systems (WMS) and Internet of Things (IoT) devices allow for real-time tracking and monitoring of inventory, providing customers with accurate delivery timelines and improving overall trust and satisfaction.

Warehouse developers have had to invest in high-grade and large-scale warehouses in order to meet these four criteria.

This trend is reflected in the growing demand for Grade A warehousing, which outpaced total warehousing demand growth and is expected to grow at ~12.5 percent till FY30, with total Grade A stock reaching ~410 million sq. ft.

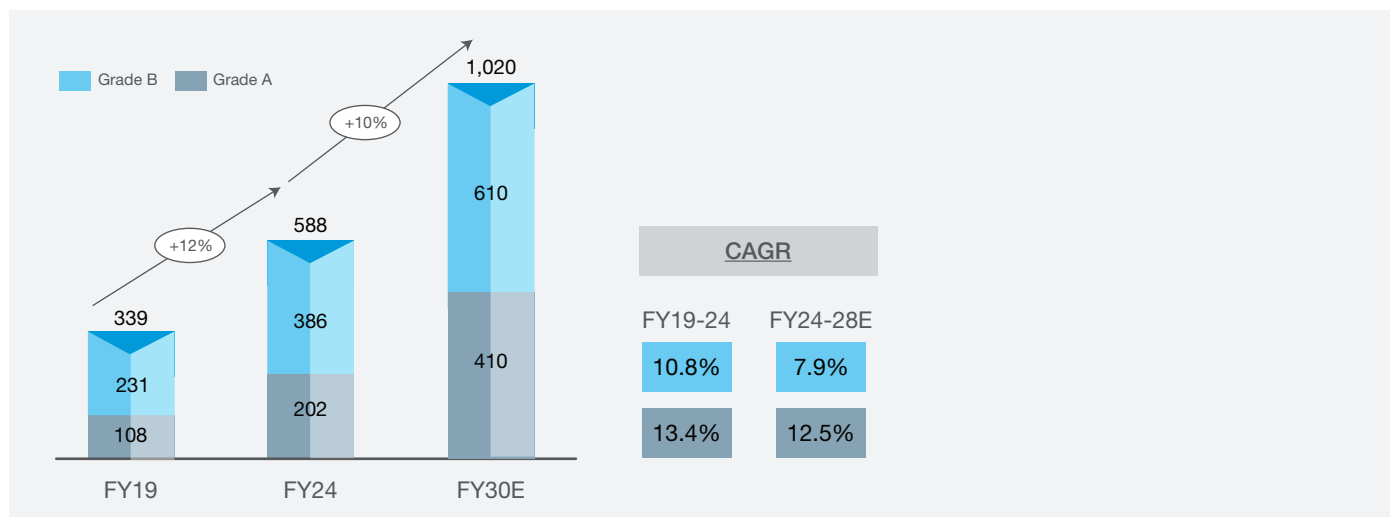


Figure 2: Grade A + B warehouse absorption in India (million sq. ft.)

Source: A&M data and analysis

Three key factors are driving growth in modern warehousing:

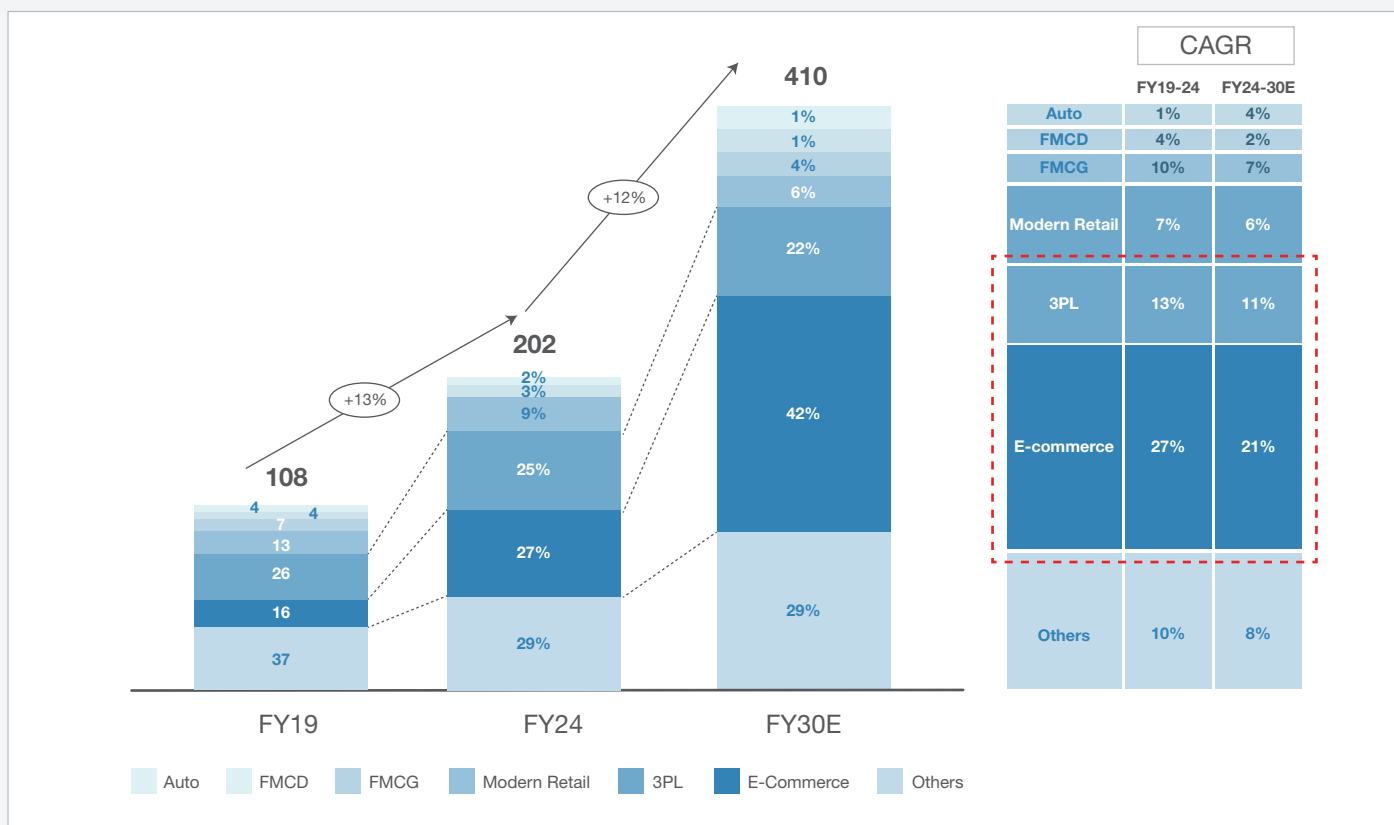


Figure 3: The growing share of ecommerce and 3PL in warehousing

Source: A&M data and analysis

- Evolution of business models and wider product assortments:**

As business models evolve and product assortments expand, warehouses must adapt to handle a diverse range of products. Companies are increasingly focusing on their core competencies and outsourcing non-core activities to specialist companies leading to the rise of service providers such as 3PL players, which leverage their expertise in logistics to drive efficiency. This evolution necessitates larger and more sophisticated warehouse facilities capable of storing various types of inventory from perishable goods to large, bulky items. Advanced sorting and storage systems and processes ensure that these diverse products are managed efficiently.
- Balancing faster and cost-effective operations:**

The challenge of balancing speed and cost-efficiency is at the forefront of warehouse management. High-grade, large warehouses leverage mechanization, automation and robotics to streamline operations while maintaining cost-effectiveness. These technologies enable faster processing times without significantly increasing operational costs, ensuring that businesses can meet customer demands for quick delivery at competitive prices.
- Rise in institutional investments and land scarcity:**

The rise in institutional investments in the logistics sector has led to the development of larger, more advanced warehouse facilities. However, the scarcity of suitable land poses a challenge. To overcome this, warehouses are being designed for vertical storage and multi-story operations, maximizing the use of available space. This trend ensures that even in areas with limited land availability, warehouses can still expand and enhance their capabilities.

These drivers have led to a transformation in warehousing infrastructure, impacting the size and scalability, role evolution, and ecosystem of warehouses.



- ❖ **Size and scalability:**
Modern warehouses are larger and more scalable, designed to accommodate future growth and technological advancements. These facilities are built with modular designs, allowing for easy expansion as business needs evolve. Scalability ensures that warehouses can handle increasing volumes of inventory and adapt to changing market demands.

- ❖ **Role evolution:**
The role of warehouses has evolved from mere storage facilities to integral components of the supply chain. They now serve as logistics hubs that facilitate the seamless flow of goods from suppliers to customers. This shift has led to the incorporation of value-added services such as packaging, kitting and returns processing within warehouse operations.

- ❖ **An interconnected warehousing ecosystem:**
The ecosystem surrounding warehouses has become more interconnected and technology-driven. Collaboration between various stakeholders, including suppliers, logistics providers, and technology vendors, is essential for optimizing warehouse operations. The integration of advanced technologies such as artificial intelligence (AI), machine learning (ML), and blockchain enhances the efficiency and transparency of the entire supply chain ecosystem.

The evolution of warehousing infrastructure is, therefore, crucial for delivering an enhanced customer experience and meeting the demands of modern logistics.

Section 2: Addressing complexity and the need for speed: smart solutions in warehousing

In the Indian context, addressing the increasing complexity and need for speed in warehousing requires the implementation of smart solutions:



Mechanization:

Mechanization, including the use of conveyor belts, pallet jacks, and AS/RS, enhances operational efficiency in Indian warehouses. For example, an Indian ecommerce company has invested in mechanized sorting and packaging systems to streamline operations and reduce manual labor. Similarly, an online grocer employs mechanized systems to increase speed and accuracy in order processing, ensuring that its warehouses can handle large volumes of inventory effectively.

Real-time tracking:

IoT devices and real-time tracking systems provide visibility and control over inventory and shipments. In India, where supply chain visibility is crucial for managing diverse and complex logistics networks, IoT technology enables real-time monitoring of goods. Some courier companies and 3PL logistics service providers utilize IoT solutions to track dispatch of shipments in real-time, ensuring timely and accurate deliveries.

Data analytics:

Advanced data analytics helps in demand forecasting, inventory management, and optimizing warehouse operations. In India, where consumer preferences and market conditions can change rapidly, data-driven insights enable warehouses to anticipate demand, manage inventory levels efficiently, and improve overall operational performance. A large ecommerce company, for instance, leverages data analytics to optimize its inventory management and enhance customer satisfaction.

Sustainable practices:

Implementing green technologies and practices helps in achieving sustainability goals and compliance with ESG (environmental, social, and governance) standards. In India, where environmental concerns are drawing greater attention, warehouses adopting sustainable practices such as energy-efficient lighting, renewable energy sources, and waste reduction initiatives can help reduce companies' carbon footprint across the supply chain. A supply chain solutions company is leading the way by incorporating solar panels and energy-efficient systems in its warehouses, appealing to eco-conscious consumers and investors.

Section 3: Future-ready warehouses: Revolutionizing logistics infrastructure in India

Logistics infrastructure in India is undergoing a transformation, driven by the need for future-ready warehouses that can meet the demands of a rapidly growing and evolving market. These warehouses are revolutionizing the sector through superior infrastructure, integrated services, and a logistics ecosystem that fosters innovation. Here's how these elements are shaping the future of warehousing in India:

Superior infrastructure to drive productivity:

Future-ready warehouses in India are characterized by their superior infrastructure, designed to maximize productivity and efficiency. This involves the following factors:

- ❖ **Modern facilities:** Warehouses are being built with state-of-the-art facilities that include advanced storage solutions, temperature-controlled environments for perishables, and specialized zones for different types of goods. For example, the National Capital Region (NCR) is seeing a rise in high-tech warehouses equipped with AS/RS and advanced material handling equipment.⁵
- ❖ **Strategic locations:** Proximity to key transport hubs such as ports, highways, and airports ensures faster and more efficient distribution. For instance, the warehousing clusters around Mumbai, Chennai, and Bengaluru benefit from their strategic locations, reducing transit times and improving overall supply chain efficiency.⁵
- ❖ **Technological integration:** Adoption of advanced technologies like AI, ML, and blockchain enhances operational efficiency. Large Indian conglomerates are investing in AI-driven logistics solutions to optimize their warehousing operations and improve productivity.⁵

Integrated services - Inclusion of value-added services:

In order to stay competitive and meet the diverse needs of customers, future-ready warehouses in India are incorporating a range of value-added services within large logistics parks, including the following:

- ❖ **EV charging stations:** Warehouses provide electric vehicle (EV) charging stations to support the growing use of electric trucks and delivery vehicles. This is crucial for reducing carbon emissions and supporting sustainable logistics practices.
- ❖ **Dining amenities:** Offering on-site dining options for workers and visitors improves employee satisfaction and productivity. Logistics parks like the ones developed by national developers often include food courts and cafes as part of their amenities.
- ❖ **Parking yards:** Warehouses must establish large parking areas for trucks and delivery vehicles to facilitate smooth operations and reduce congestion. The presence of organized parking facilities helps in efficient vehicle management and reduces delays.
- ❖ **Security solutions:** Implementing advanced security measures, including surveillance cameras, access control systems, and on-site security personnel, ensures the safety of goods and personnel. This is especially important in high-value warehousing zones.

⁵Based on A&M's interactions with industry leaders



Creating a logistics ecosystem driving innovation:

Future-ready warehouses are not standalone entities; they are integral parts of a larger logistics ecosystem that drives innovation, which includes the following:

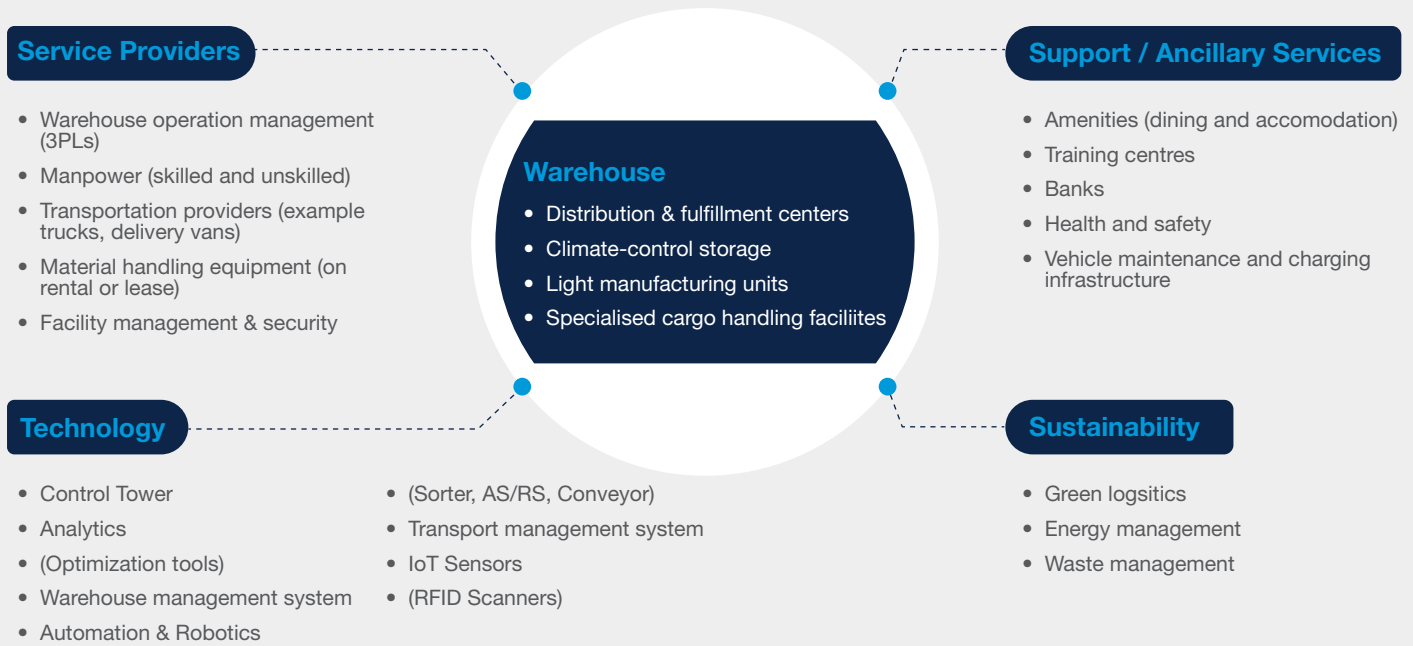


Figure 4: Logistics ecosystem in a park

- **Collaboration and partnerships:** Building strong collaborations between various stakeholders, including suppliers, logistics providers, technology vendors, and customers, fosters innovation. The Indian logistics sector is seeing increased partnerships, for instance, between a 3PL logistics player and a consumer appliances company, to create a more efficient and integrated supply chain.
- **Innovation hubs:** Many logistics players are establishing innovation hubs within warehouse facilities where new technologies and processes can be tested and implemented. These companies have innovation centers that explore new logistics solutions, which are then piloted geography-wise in their operations.
- **Sustainability initiatives:** Emphasizing sustainable practices within the logistics ecosystem, such as using renewable energy, reducing waste, and improving energy efficiency. Warehouses in India are increasingly adopting green practices, including the use of solar power and energy-efficient cooling systems.

With these advancements, India's warehousing sector is well-positioned to support the country's economic growth and provide a superior customer experience.



MMLPs: A key driver in modern warehousing growth

Multi-modal logistics parks (MMLPs) are expected to be one of the key drivers in the next phase of growth in modern warehousing in India. The Government is developing these MMLPs using public private partnerships on the Design Build Finance Operate and Transfer (DBFOT) Model. MMLPs are envisioned as integrated logistics facilities comprising transport hubs (railways and roadways, in a few cases waterways and airways), large warehousing parks, bulk storage facilities, truck parking, retail, commercial, and other common infrastructure facilities. The overall objective is to reduce the logistics cost by developing a network of large logistics facilities helping companies in implementing a true hub and spoke supply chain model.

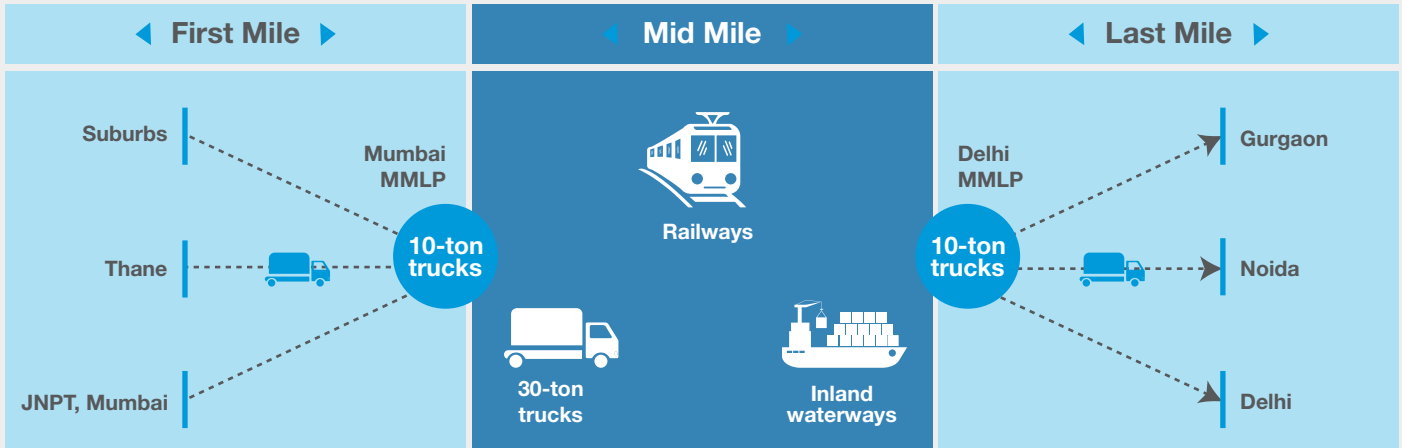


Figure 5: An ideal MMLP hub-and-spoke scenario

However, without an interconnected network of MMLPs, the full benefit of hub-and-spoke model may remain unrealized.

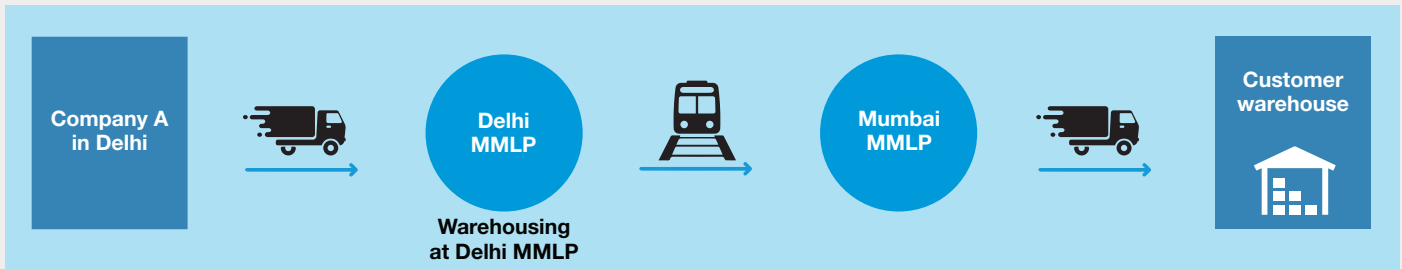


Figure 6: MMLP: An interconnected network

Most large warehousing parks in India cater to the domestic movement of goods and are generally focused on end consumer-centric sectors (FMCG, FMCD, e-commerce, etc.). Heavy manufacturing sectors (metal and steel, bulk cement, bulk chemicals/ petrochemicals, bulk agricultural products) still don't rely on a hub and spoke model in their supply chain due to limitations in adequate open access terminal facilities to handle such heavy movements (mainly rail-connected).

MMLP's offer several benefits, through which, the government aims to debottleneck the supply chain and transform the logistics landscape, especially modern warehousing.

- 1. Access to fully connected large-size land parcels at zero upfront cost:** The Government is aggregating land ranging from 100-400 acres for the development of MMLPs. Warehouse developers within the MMLP will gain access to these large-scale land parcels for 45-50 years with rail connectivity inside the logistics park, minimum four-lane road connectivity to the nearest state / national highways, and all utilities (water, electricity, sewerage) connected to the MMLP plot without engaging in the complex process of land acquisition, spending CAPEX towards land acquisition or facing hassles over land use conversion.

2. **Seamless multimodal connectivity:** MMLPs eliminate the inefficiencies of point-to-point transportation by integrating railways and roads, and in some cases, waterways and airways under one roof. It facilitates smoother transfer of goods between different modes, hence providing savings in transport and handling costs and a reduction in losses. This translates into faster delivery times, optimization of on-ground operations, and a reduction in overall logistics costs.
3. **Risk sharing and design flexibility:** MMLPs follow a revenue sharing model where developers don't owe the government any upfront payment. Moreover, they have the flexibility to design and develop the facility as per customer needs. This makes MMLPs a real proposition for large-scale warehousing developers.
4. **Permission to carry out light processing and provide value added services:** MMLPs go beyond just storage. It allows for value-added services like cold/temperature-controlled storage, packaging, labelling, sorting, kitting, and light manufacturing activities. This allows businesses to outsource these tasks, freeing up resources to focus on core operations.
5. **Avenue to cater to EXIM cargo:** MMLPs are designed to handle EXIM (Export-Import) container traffic from major gateway ports. This opens a broader customer base for warehousing companies to create bonded storage or establish a Free Trade Warehousing Zone within these MMLPs.
6. **End-to-end visibility:** With integrated IT systems across transportation and warehousing, MMLPs enable real-time tracking of goods throughout the supply chain. This empowers businesses to improve delivery schedules and enhance customer experience.



Section 4: Advantages of large logistics parks over standalone warehouses

Large logistics parks offer several advantages over traditional Grade-A standalone warehouses, making them a superior choice for businesses aiming to optimize their supply chain operations. These benefits include driving cost leadership through economies of scale, better business continuity with lower risks and operational challenges, and scalability at the same location without affecting the supply chain.

Driving cost leadership through economies of scale - Large logistics parks drive cost leadership by leveraging economies of scale through the following factors:

- **Negotiating power:** Logistics parks can negotiate better rates for utilities, maintenance, and services due to their larger operational scale. This reduces per-unit costs and increases overall cost-efficiency.
- **Shared infrastructure:** By sharing infrastructure such as security systems, IT networks, and utilities, logistics parks can significantly lower operational costs compared to standalone warehouses that bear these costs independently.
- **Centralized management:** Centralized management of logistics parks allows for more efficient use of resources and streamlined operations. This leads to cost savings in administration, logistics, and support services.

Better business continuity, lower risks, and operational challenges - Large logistics parks offer enhanced business continuity and lower risks compared to standalone warehouses on the back of the following:

- **Redundancy and backup systems:** Logistics parks often have robust redundancy and backup systems in place, such as alternative power sources and disaster recovery plans. This ensures that operations can continue smoothly even in the event of a disruption.
- **Comprehensive security:** Enhanced security measures, including 24/7 surveillance, access control, and on-site security personnel, reduce the risk of theft and damage, providing a safer environment for goods storage.
- **Operational resilience:** Logistics parks are designed to handle large volumes and can quickly adapt to changes in demand or supply chain disruptions. This operational resilience minimizes downtime and ensures continuous operations.

Scalability at the same location without affecting the supply chain - Scalability is a significant advantage of large logistics parks:

- **Expansion capability:** Logistics parks are designed with scalability in mind, allowing businesses to expand their operations within the same location. This avoids the need for relocating or setting up new facilities elsewhere, which can be costly and time-consuming.
- **Consistent supply chain integration:** Expanding within the same logistics park ensures that the supply chain remains integrated and uninterrupted. This continuity is crucial for maintaining efficient logistics and delivery schedules.
- **Flexible space utilization:** Logistics parks offer flexible space options, enabling businesses to adjust their space requirements according to their growth needs. This flexibility supports both short-term and long-term scalability plans.

These benefits collectively contribute to more efficient, resilient, and scalable logistics infrastructure, supporting the dynamic needs of modern businesses in India.

Looking ahead

India's growth trajectory towards a multi-trillion-dollar economy is intricately linked with the evolution of its logistics and warehousing sector. The transformation from basic 'godowns' to sophisticated logistic parks highlights the sector's critical role in ensuring efficient, cost-effective, and sustainable supply chain management, thus driving the nation's economic success.



About the CII - Institute of Logistics

The Confederation of Indian Industry (CII) works to create and sustain an environment conducive to the development of India, partnering with industry, the government and civil society through advisory and consultative processes.

CII is a non-government, not-for-profit, industry-led and industry-managed organization with more than 9,000 members from the private and public sectors, including SMEs and MNCs, and an indirect membership of more than 300,000 enterprises from 286 national and regional sectoral industry bodies.

The CII Institute of Logistics (CII -IL), established by the Confederation of Indian Industry as a center of excellence, serves as a driving force in propelling the growth and competitiveness of the logistics and supply chain sector.

Through its array of services, CII -IL acts as a catalyst, elevating the performance of Indian supply chains to unprecedented levels by establishing a sustainable ecosystem through active stakeholder participation and a global network. This ripple effect not only empowers industries to garner deeper insights into emerging trends, but also enables them to tackle industry-specific challenges of national significance while adopting globally recognized best practices in the logistics and supply chain sectors.

www.ciilogistics.com

AUTHORS:



MANISH SAIGAL

Managing Director

+91 98202 81030
msaigal@alvarezandmarsal.com



FARHAAN MUKADAM

Senior Director

+91 98205 65860
fmukadam@alvarezandmarsal.com



AABHAAS PARIK

Director

+91 91087 53785
aparik@alvarezandmarsal.com



PRASHANT KUMAR

Director

+91 99719 17035
pkumar@alvarezandmarsal.com



ABOUT ALVAREZ & MARSAL

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With over 9,000 people providing services across six continents, we deliver tangible results for corporates, boards, private equity firms, law firms and government agencies facing complex challenges. Our senior leaders, and their teams, leverage A&M's restructuring heritage to help companies act decisively, catapult growth and accelerate results. We are experienced operators, world-class consultants, former regulators and industry authorities with a shared commitment to telling clients what's really needed for turning change into a strategic business asset, managing risk and unlocking value at every stage of growth.

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