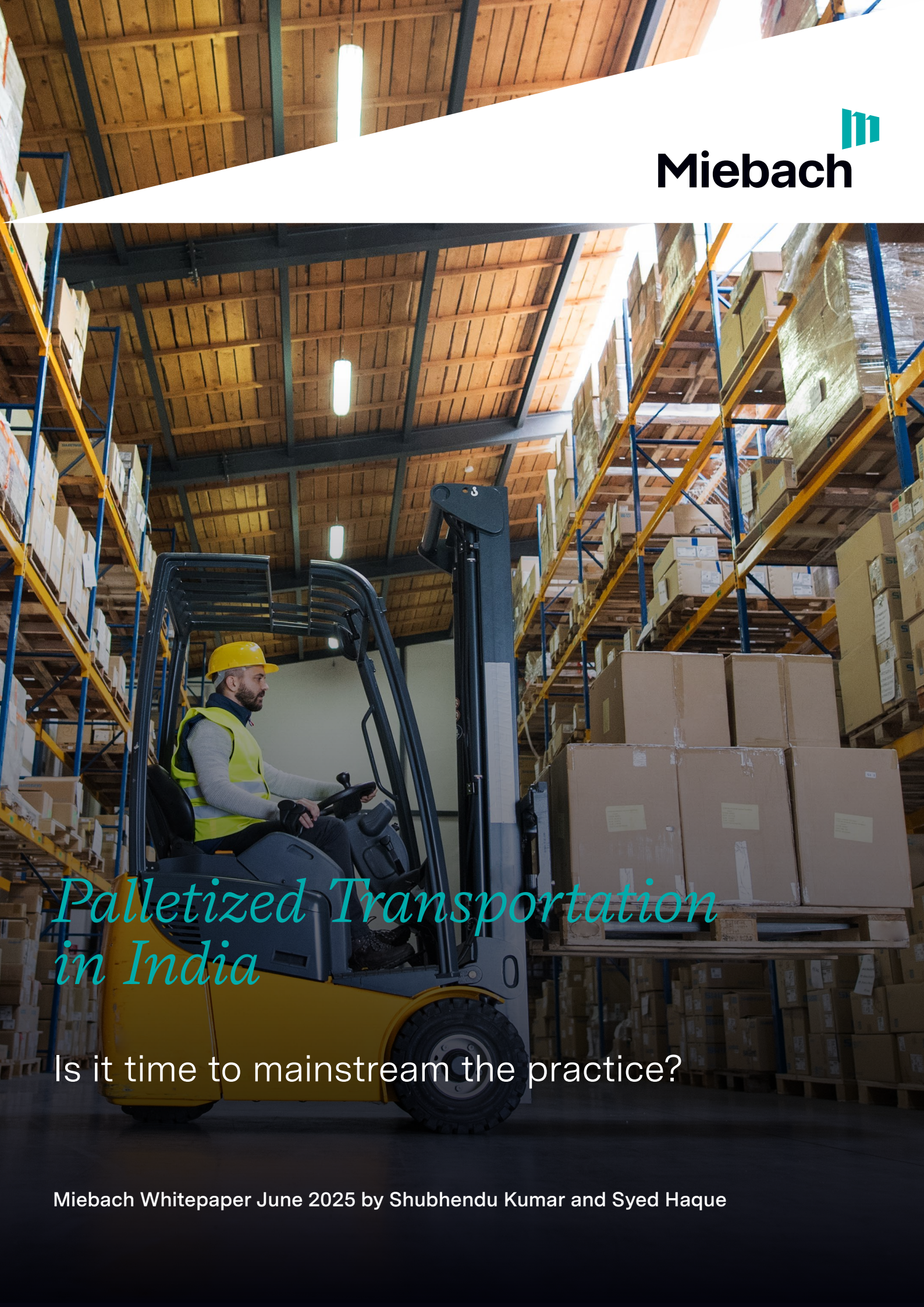

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Palletized Transportation in India

Is it time to mainstream the practice?

Miebach Whitepaper June 2025 by Shubhendu Kumar and Syed Haque

Content

Miebach Whitepaper

Over the next decade, we may see a paradigm shift with regard to palletized transportation – from
“Can we afford to palletize?”
to
“Can we afford not to palletize?”!

1.0 Introduction

In the last few years, there has been an increased emphasis on improving logistics efficiency and reducing supply chain costs in India. Currently, India ranks 38th out of 139 countries in World Bank's Logistics Performance Index, jumping sixteen places from 54th in 2014. However, there still are challenges to overcome, in ensuring efficient and healthy logistics within the country.

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Logistics cost in India as a percentage of GDP is higher than most developed countries and China. A portion of this is attributable to weak underlying support infrastructure – highways, ports, inter-modal connectivity, etc. With a strong focus on infrastructure building over the last decade (Dedicated freight corridor, Highway/Intermodal connectivity initiatives like Sagarmala project, Bharat Mala project, MMLPs, warehousing zones under schemes like PM Gati Shakti programme), the deficit on the infrastructure side has narrowed.

However, even as physical infrastructure sees significant improvements, a major challenge continues to hinder progress the lack of standardization across logistics assets, equipment, and operational practices. In India, the trucking ecosystem remains highly fragmented, with a wide variety of load body dimensions and configurations, with minimal adherence to standard formats.

This absence of standardization imposes a hidden but substantial cost on the entire logistics value chain. It leads to underutilization of assets, compatibility issues

across supply chain nodes, increased turnaround times, and overall inflated operating costs. Ultimately, this impacts the competitiveness of the Indian industry, both domestically and in global markets. Addressing this challenge is essential for unlocking the next level of efficiency in India's logistics ecosystem.

In India, truck sizes and configurations vary significantly by manufacturer and intended use. In India, CMVR rules stipulate only the maximum moving dimensions, and not specific load body or vehicle dimensions. Developed countries have a harmonized and simpler set of sizes and configurations, facilitating efficient intermodal transport, cross border logistics and also enable better functioning online freight markets, and hence better price discovery.

Developed economies such as Australia have implemented 12 bin classification (as illustrated in exhibit 1) since 1994 and established a single national system of laws (National Heavy Vehicle Regulator) for heavy vehicle in 2013.

Exhibit 1: Australian Truck Standards

Vehicle Type	Max length	Vehicle picture
Common Rigid Type	<12.5 m	
Common Semitrailer	<19.0 m	
Common Rigid + Semitrailer	<19.0 m	
Common B Double	<26.0 m	
Common Type 1 Road	<36.5 m	
Common Type 2 Road	<53.5 m	

2.0 Palletization in India

Palletization is an important aspect of standardization in logistics operations. Having a commonly accepted palletization scheme has been the key to efficient logistics across the developed world. Currently, the palletization level in India is low – particularly in transportation. As can be seen in the exhibit 2 below, pallet penetration in India is way behind the developed world and China.

Exhibit 2: Pallet penetration in India: Million Pallets per $Bn GDP (PPP) 2025 Projected

Country/ Zone	**GDP (PPP)** *USD Trillion*	**Estimated Pallet Pool** *(Billion Units)*	**Pallet Penetration** *(Mn pallets/ Billion GDP)*
	30.3	2.1	69
	39.4	1.4	35
	29.1	3.2	110
	17.4	0.1	7

Source: Miebach Analysis

2.1 Why mechanize? Why Palletize?

In the Indian context, the usual argument against mechanization has been low-cost labour availability. Traditionally, using loaders to stuff bags or cartons for floor loading in a truck has been a cheaper option than deploying material-handling equipment and pallets. The business case for even simple mechanization in loading/unloading (viz., telescopic belt conveyor) hasn't looked justifiable. However, if the overall cost in the chain is looked at more holistically, there is a definite case for palletization. Multiple indirect costs, such as higher product damage, high truck turnaround time, poor ergonomics, and higher admin costs don't get baked in.

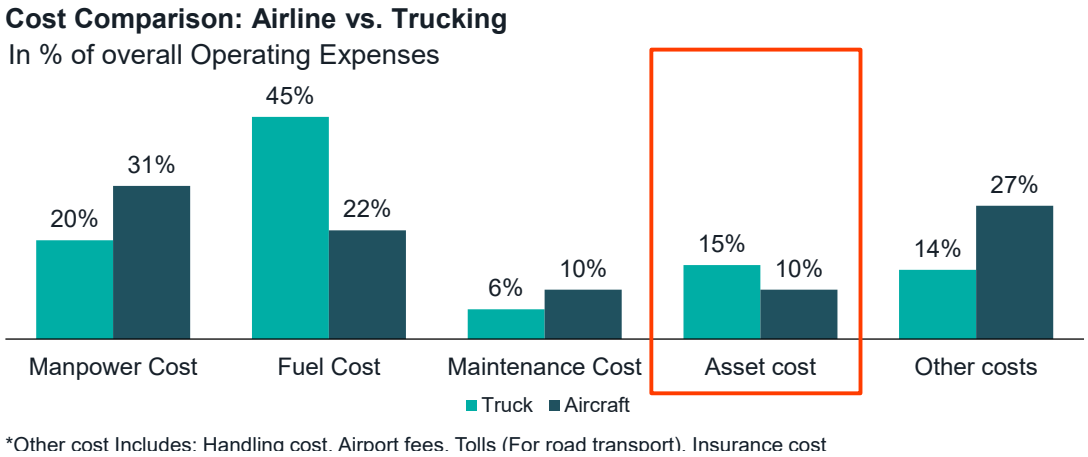
Palletization is clearly the better option when considering the overall cost of the chain.

2.2 Lack of Palletization: the hidden costs

Studies show that manual loading leads to higher turnaround time of trucks at the docks. Palletization can cut loading times by 80–90% (global studies show that unitized loads slash handling time to a tenth of manual methods. Additionally, high loading time also leads to queueing and congestion - particularly at large nodes). A truck plying on a line-haul route in India clocks 5,000-6,000 kms in a month. The actual running time of line-haul trucks is only 14%-16%. The waiting time at nodes is 1.5-1.8 times the running time. There is potential for a much higher level of transport asset sweating. Owing to high fragmentation levels in trucking, this goes unnoticed.

Comparing it with the more organized and much less fragmented airline industry, where there is so much focus on ensuring that planes are in the air as much as possible, maximizing capacity and minimizing downtime through optimizing schedules, fleet management, route planning and efficient ground operations. In fact, asset cost is higher in trucking compare to Airline as illustrated in exhibit 3 below.

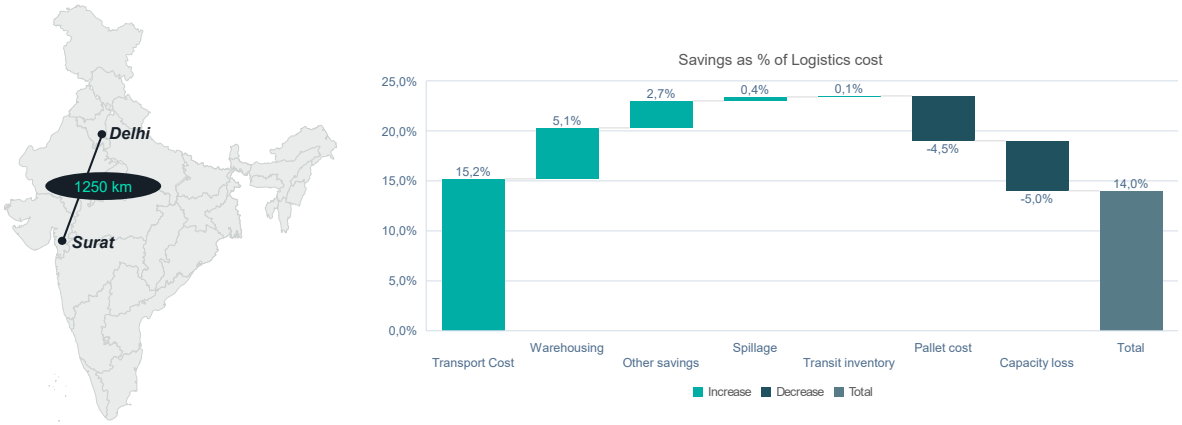
Exhibit 3: Cost comparison (Airline vs Trucking) in India



Source: Miebach Analysis

Improved truck utilization leads to a lower per-unit cost in transportation. Furthermore, a closer look at the overall cost reveals costs that are not immediately apparent – costs associated with higher in-transit inventory, loss in unloading and loading productivity, in-transit damages, breakages and other costs associated with operational inefficiency such as manpower and equipment downtime due to product damage, reduced productivity owing to poor ergonomics, increased risk of warehouse accidents, and compliance issues further contribute to the overall cost.

Exhibit 4: Case study of a leading Indian CPG company – Overall savings with palletized transportation



Source: Miebach Analysis

A case study of a leading Indian CPG company (as illustrated in Exhibit 4) highlights the tangible benefits of adopting palletized transportation.

Adoption of palletized transportation leads to ~14% overall reduction in logistics costs:

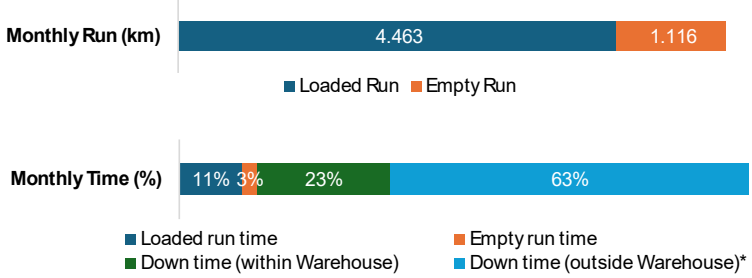
- ~15.2 % savings in transport cost due to reduced turn-around time at factories and depots, allowing higher trip frequency and better leverage on fixed costs in trucking. Actual loaded runtime of trucks in India is only ~11% as shown in exhibit 5.
- ~5 % savings in warehousing cost, enabled by streamlined handling processes, faster turnaround times, and improved space utilization.
- 3% cost savings driven by improved operational hygiene, including reduced admin expenses, better ergonomics, lower labour fatigue, and enhanced work force efficiency.
- Reduction in in-transit damages and breakages, leading to lower product loss, improved reliability, and enhanced safety across logistics touchpoints.

Additional costs associated with palletized transportation:

- -4.5% additional cost incurred towards pallet rental and movement hire.
- ~5.0% capacity loss attributed tare weight of pallets.

Over time, efficient pallet usage pays for itself through higher throughput, better asset utilization and lower logistics cost per unit.

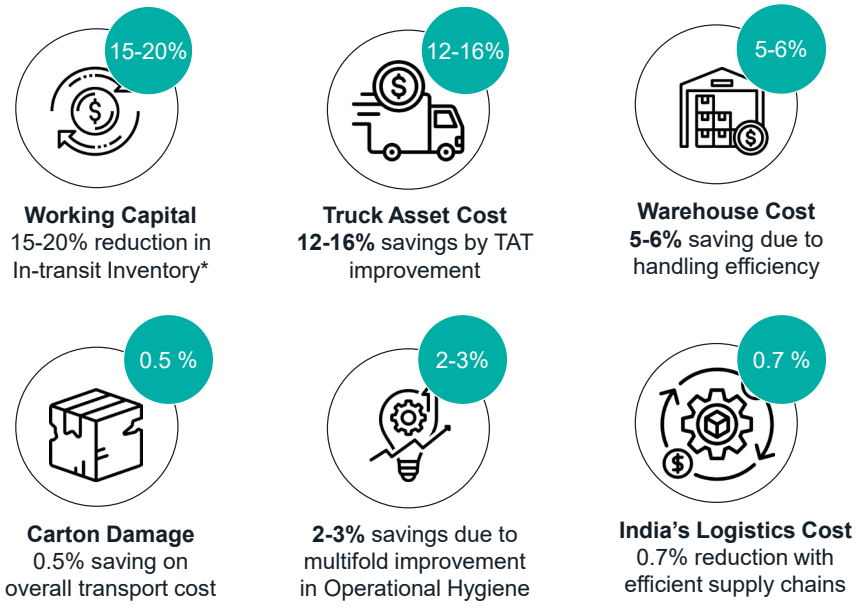
Exhibit 5: Line-haul truck run and utilization for a typical CPG company in India



*Down time (outside Warehouse) – refers to the idle time incurred while searching for a new load to be transported)

Source: Miebach Analysis

Exhibit 6: Estimated gains from palletized transportation



Source: Miebach Analysis

Taken together, these factors suggest that full-scale palletization of transport in India could unlock savings in the range of 3.0– 3.5 billion USD. It is important to note that this figure captures only the direct and quantifiable savings. At scale, several second-order benefits also typically follow standardization. Once a more efficient practice is adopted, network effects begin to amplify the impact: truck turnaround time shrinks further, reducing truck asset costs by 12–16% as shown in exhibit 6, collaboration models mature, and service levels improve across the board. In that sense, the 3.0– 3.5 billion USD in savings may well represent the floor, not the ceiling, of what is possible through the widespread adoption of palletization.

3.0– 3.5 billion USD savings by full-cale palletization.

2.3 Sustainability and Environment Protection

Palletization also plays a positive role in cutting the carbon footprint and greening the supply chain. Wooden pallets, if sourced responsibly, are renewable, and most are recycled or repaired multiple times – the U.S. recycles **95%** of wood pallets, a benchmark for circular economy.

Many companies are now viewing pallets not just as equipment but as part of their sustainability strategy – for example, refurbishing old pallets, upcycling them into furniture, and using solar-powered pallet production facilities.

In mature markets like the United States and Europe, where labour costs are high, palletized transport is nearly ubiquitous – there are over 1.8–2.0 billion pallets in use daily in the U.S. alone.

For a country like India, which is grappling with both high logistics costs and pollution, this efficiency gain is doubly beneficial. Transportation through a pallet pooling system will help reduce CO2 emissions by ~2.5 million tonnes per year. Emission reduction will be owing to:

- Improvement in truck volume utilization
- Pallet re-use (as opposed to one way pallet use)

Additionally, there would also be indirect or second order benefits in this regard (viz. reduction in truck pool size requirement for same transport volume requirement, and consequently lower net annual addition to the fleet in the economy, compared to that in a 'do nothing' scenario).

Pallet pooling cuts CO2 emissions by 2.5 million tonnes annually.

2.4 Impact of palletization on workforce

As palletized load movement becomes more widespread, the demand for skilled labour, such as forklift operators and MHE (Material Handling Equipment) operators is expected to rise. This shift will reduce the dependency on unskilled labour for manual loading and unloading. Unskilled workers can be trained to operate MHE, engage in factory operations, and perform essential maintenance tasks, providing them with opportunities to enhance their skills and increase their income. Palletization will inevitably drive skill enhancement programs within the industries, opening new opportunities for these workers.

Furthermore, the growing demand for MHE will drive higher production levels, resulting in the establishment of new factories and facilities. This expansion will generate fresh opportunities for unskilled workers, not only in core operations but also in areas such as MHE maintenance and support.

Palletized movement and consequent improvement in truck run time will also help mitigate the current truck driver shortage in the country. According to an estimate by the Indian Foundation of Transport Research and Training (IFTRT), India is facing an alarming

shortage of drivers – more than 40% of India's (organised long-haul) trucking fleet are now without drivers. Overall, palletization has the potential to address this deficit. With palletized movement, an additional 10% of the truck population, i.e. half a million trucks will get operated by trained drivers, thus mitigating the problem significantly.

2.5 Safety and Compliance

A major contributor to non-fatal industrial injuries and long-term health hazards are accidents related to manual material handling (MMH). The tasks include diverse activities such as lifting, lowering, holding, pushing, pulling and carrying. Loading non-unitized loads (cartons or bags) can lead to problems like strains and sprains, dislocation (herniation) of the lumbar disc, fracture, joint inflammation, and laceration of muscle tissue. These injuries are detrimental to the labourers and are also a strain on the public health system.

Palletization improves worker safety and ergonomics while minimizing product damage through standardized handling.

Palletization reduces the need for manual handling, lowering the risk of strains, sprains, and other injuries associated with manual loading. It also enhances ergonomics by encouraging safer lifting techniques and minimizing physical strain on workers. Palletized movement promotes standardized loading and unloading procedures, reducing the risk of product damage.

This, in turn, helps prevent hazardous situations, such as spills or leaks from compromised materials.

Overall, palletized movement enhances workplace safety and promotes compliance with industry standards, benefiting both employees and employers.

The overall economics, especially with pooling and modern equipment financing, are increasingly in favour of palletized transport (as shown in Exhibit 5). Ultimately, palletization is an investment in efficiency, and in a competitive market, efficiency gains quickly translate to a stronger bottom line and ROI.

Over the next decade, we may see a paradigm shift with regard to palletized transportation – from “Can we afford to palletize?” to “Can we afford not to palletize?”

Palletization drives efficiency – boosting ROI and competitiveness.

3.0 Palletized Transportation: Current Challenges

3.1 Inconsistency in pallet sizes and quality

India does not have one uniformly adopted pallet size; both 1200×1000 mm (common internationally) and 1200×800 mm Euro pallets, and even other sizes, are used depending on the industry, leading to compatibility issues. Many smaller firms use makeshift or non-standard pallets that don't interface well with others' equipment.

3.2 Lack of pallet handling infrastructure in warehouses

For palletized transportation, efficient pallet-handling infrastructure is required at receiving nodes as well. These include dock levellers, forklifts, and pallet jacks. In many cases truck beds are not fabricated to enable movements of forklifts inside.

3.3 Palletization-Loss of truck load-ability

The tare weight of pallets and the loss of volumetric capacity are seen as additional costs associated with palletization.

3.4 Pallet Pooling and exchange system

Pallet pooling model is often seen as a higher cost option, and ownership is preferred. Also currently, there is no pallet exchange model. Developed markets like Europe have developed a strong pallet pooling and exchange model - the EPAL system has ~700 million Euro pallets in circulation, anchoring the entire industrial and retail supply chain in Europe. EPAL has developed a strong system of independent certification and inspection system; it has over 1600 EPAL licensees for producing and repairing pallets globally.

Pallet pooling is often overlooked in India due to cost concerns and lack of an exchange system, unlike Europe's efficient EPAL model.

4.0 Way Forward

The overall economics support the case for palletized handling and transportation. How do we make palletized transportation in India as ubiquitous as it is in the developed world? Apart from general improvement in awareness of the benefits, government initiatives and support can also play a critical role in faster adoption of palletized transportation. To accelerate the adoption, a multi-pronged approach is required.

Exhibit 7

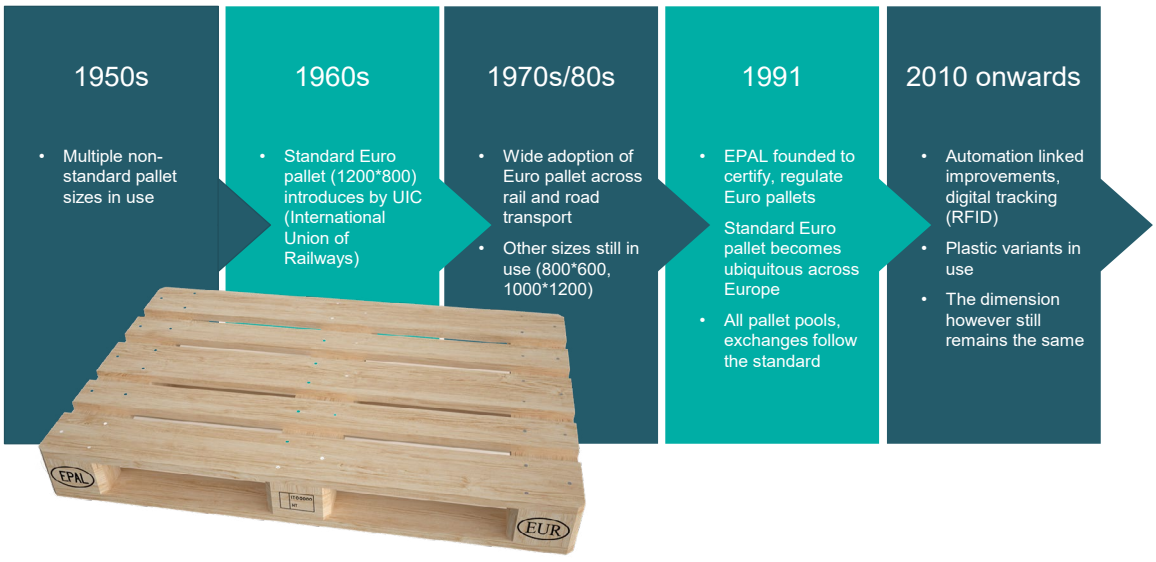
4.1 Promote standardization

Standardize on one or two pallet sizes, promote pooling to avoid one-way waste, create a recycling ecosystem early (with incentives for pallet return/repair), and ensure supporting infrastructure (forklift availability, loading docks designed for pallets) is built into all new warehousing and freight projects.

On lines of European Pallet Association (EPAL) or GMA pallet in the US, we can implement in India an “India Pallet Pool” program or standard certification so that any pallet with a certain mark can be universally accepted for exchange or pooling.

Standardisation of pallet sizes will allow standardisation of palletizers, racking systems, material handling equipment, truck load beds and containers, ensure full inter-operability; thereby improving overall efficiency

Exhibit 8: Euro Pallet – The Evolution



Standardization brings in a lot of efficiencies. The initial euro pallet was developed as a part of an agreement between railways across the countries. It was designed to perfectly fit in European rail cars and trucks, reducing loading time significantly. Following standardization in pallet dimensions, the same has followed in intermodal containers ('pallet wide' containers, with an internal width of 2,440 mm enabling easy loading of 2 pallets side by side).

Studies indicate 10-15% more efficient use of space compared to non-standard pallets. Up to 25% reduction in overall logistics cost in some sectors.

Likewise, Australia uses 1165mm*1165mm*150mm pallets. Pallet racking module depth and width are accordingly standardized, and so is the forklift dimension; enabling all logistics assets to work in harmony and render efficient operations in the entire economy.

Studies indicate that standard pallets are 10-15% more efficient in terms of space usage.

Standardization gains: ISO Containers

ISO containers have helped streamlining international trade, by enabling efficient and cost-effective cargo handling and transportation across various modes of transport. This standardization ensures that containers can be easily transferred between ships, trains, and trucks without unloading cargo, reducing labour and time while increasing efficiency.

Standardization in pallets will go a long way in generating efficiencies.

4.2 Promote pallet pooling and circular economy

Support an open pallet pool that allows exchange. Possibly, an industry consortium could manage a pool of “Bharat pallets” (1 or 2 standard size. Viz. 1200mm*1000mm*150mm), on lines of EPAL. Also, enforce quality so that pallets are safe for use. Embrace pallet recycling to comply with any packaging waste rules that might come.

4.3 Offer fiscal incentives to promote palletization

Well-structured fiscal incentives go a long way in driving desired outcomes. E.g. FAME (Faster Adoption and Manufacturing of Hybrid & Electric Vehicles) policy, coupled with government support, has significantly boosted the adoption of electric vehicles (EVs) in India. Likewise, fiscal incentives are required to accelerate adoption of palletized transportation in India. They may be:

- Relax permissible load carrying capacity for trucks and trailers; offer increased permissible load carrying capacity to off-set the tare weight of pallets.
- Offer tax breaks or subsidies for companies that use certified pooling services (similar to how green initiatives are incentivized).
- Facilitating low-interest loans or investments for pallet pool providers to expand their network and pallet stock.

Increase of permissible truck loads would off-set pallet tare weight.

4.4 Promote training and skill building

Launch targeted skill-building programs focused on Forklift and MHE operation: create certification courses on pallet handling, including safety (e.g., correct stacking, inspection of pallets).

4.5 Monitor and periodic review

In the National Logistics Policy's implementation – monitor and publish an annual report or index on warehouse modernization, including pallet usage statistics and case studies, to keep momentum and identify gaps. Set targets for palletization, e.g., a certain percentage of warehousing and transportation to be palletized by 2030.

Promoting skill development in pallet handling and regularly monitoring progress can drive warehouse modernization.

5.0 Summary

There are significant challenges to implementing widespread palletization in India, including inconsistent pallet sizes, inadequate handling infrastructure, and issues related to truck loading. However, the long-term benefits of this initiative are considerable. Palletization can lead to a reduction in logistics costs, with potential savings of $3.0–3.5 billion through increased truck utilization, reduced volume loss, optimized loading configurations, and enhanced operational hygiene. This improved efficiency would elevate India's position in global business and logistics, contributing to a higher ranking in the Logistics Performance Index – an area of focus for both the government and industry leaders.

Palletization in India could cut logistics costs by up to $3.5 billion and boost efficiency, strengthening the country's global logistics standing.

Additionally, palletization contributes to a greener supply chain, reducing CO2 emissions by 2.5 million tonnes annually. It also offers numerous advantages for the workforce, including safer working conditions, better ergonomics, and opportunities for upskilling, training, and higher wages. A coordinated effort towards palletization, driven by the government through standardization of pallets, incentives, support for pooling and the circular economy, and skill development programs, could usher in a new era for logistics in India.

Contributors

“Would you like to get more insights on Palletized Transportation in India and Supply Chain Transformation or are you looking for a partner to support you in your supply chain project? Please get in touch with us!”

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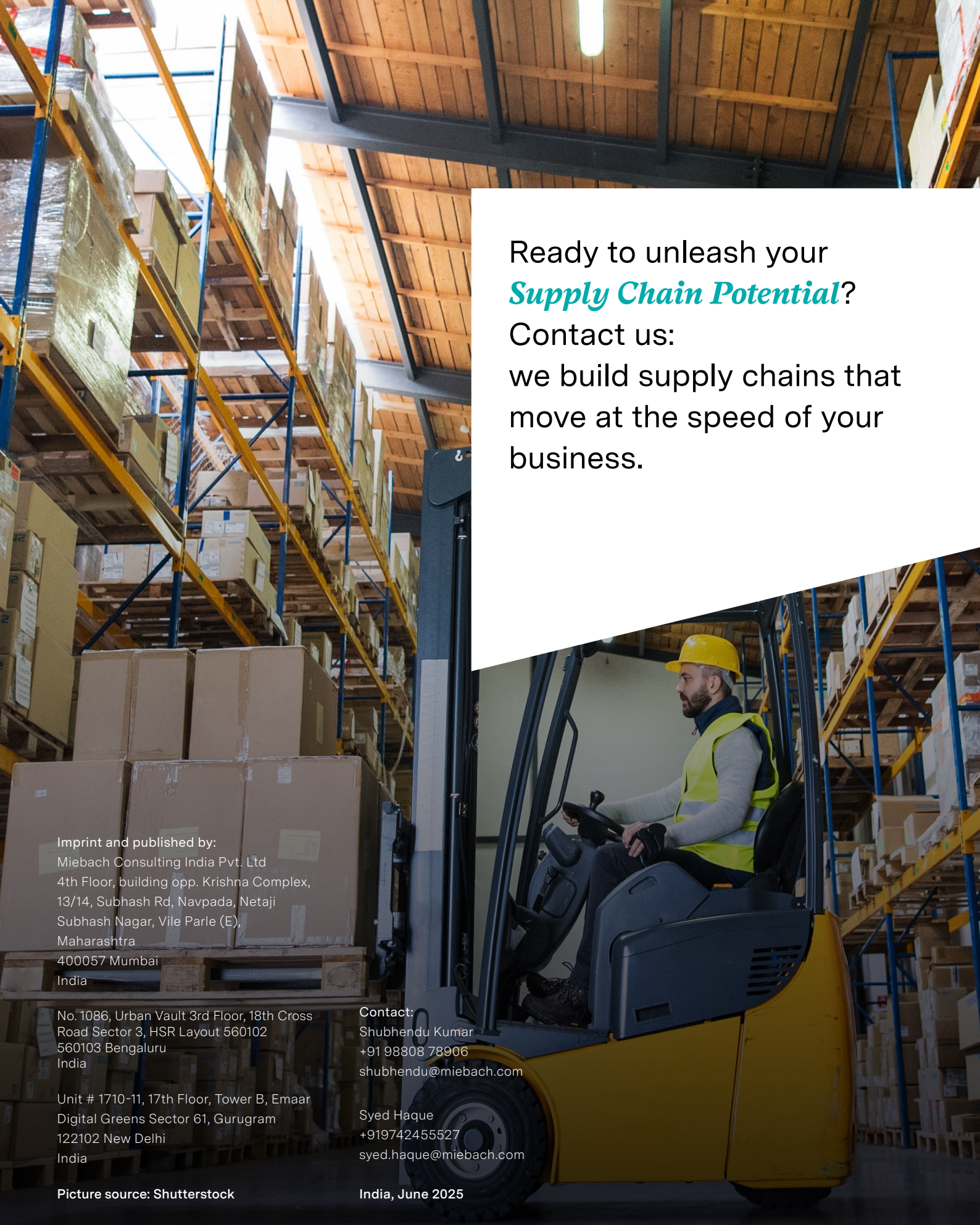

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