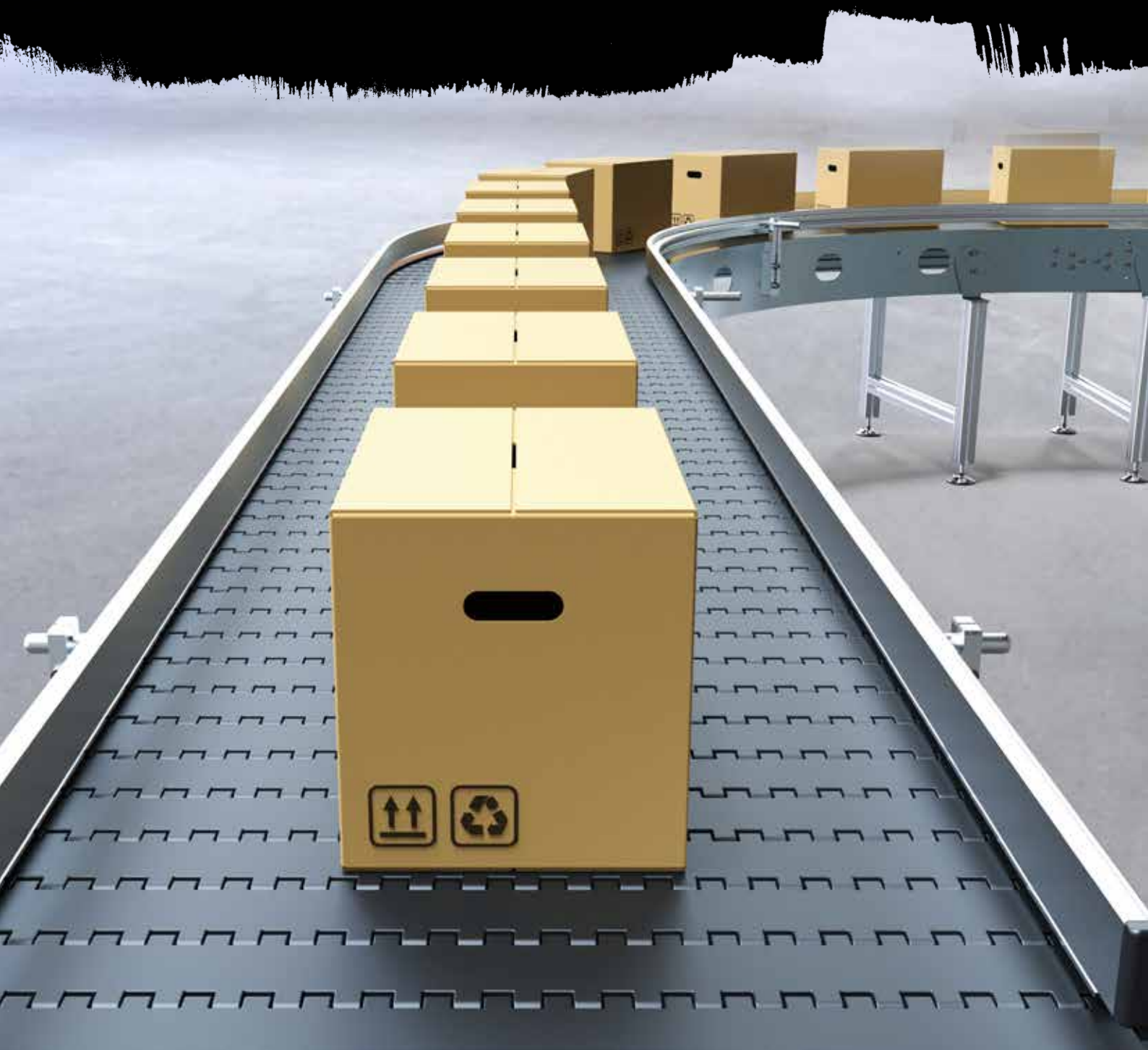


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# Indian Logistics and Warehousing: Tracing the *Lifecycle*

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*June 2019*



# Preface

India's logistics and warehousing sector is in transformation phase. The country's initiatives in introduction of structured Logistic Policy to create a strong infrastructure platform and to transform the sector into an integrated, seamless, efficient, reliable, cost-effective and technology-driven system aims to bring down logistics cost from present 14% to 10% of GDP by 2022. Warehousing, which comprises only approximately 10% of overall logistics cost has a significant impact on optimising the remaining 90% of logistics pie which includes transportation, inventory management, material handling, packaging etc.

To understand "Warehouse" as driver of cost effectiveness, it is important to understand its entire cycle of development from conceptualisation to operation & maintenance. This paper attempts to capture the lifecycle of warehousing in depth and explains numerous key elements involved.

At the conceptualisation stage, appropriate supply chain planning is necessary for plausible location selection for warehouse space. In all major cities, the sector has experienced stable growth in supply, demand and rental over the past few years. Foreseeable supply, which is expected to be double in the next 4 years, exhibit a strong market trend for "warehousing" per se. Marketability of the space shall always be a contingent to appropriate locations, specifications and any risk mitigated through appropriate measures. The liquidity infusion in the sector by the global investors is prompting the market to move towards organised and globally accepted warehousing space. Technology shall be one of the most important aspects, to optimise cost in construction. While in operation, the mechanised and automated material handling facility will bring in the much needed efficiency enhancement in warehouse box.

As Indian logistics sector's transformation is in progress, in the coming years it is going to experience several change in planning, construction and operation of the warehouses. All stakeholders, e.g. developer, occupiers, fund providers, project manager and maintenance operator needs a consolidated effort to synchronise their isolated preferences. This comprehensive study on lifecycle of warehousing attempts to trace the different elements of warehousing in this changing time.



**Ramesh Nair**  
CEO & Country Head  
JLL, India  
Rn.Office@ap.jll.com

# Introduction

In India, Logistic sector is currently passing through a transformation phase. The change is visible in different fronts including development pattern, occupier's preference, funding structure and technology inclusion in its sub-components. Warehousing rent which accounts for 10 - 15% of total logistic cost is gaining importance as much is optimisation of transportation cost, inventory management, handling, packaging and customer services.

An analysis on the impact of warehousing is required for logistic cost optimisation as position and quality of warehouse space controls overall logistic cost factors. Therefore, understanding the complete lifecycle of warehousing has become critical towards a holistic approach towards sustainability.

Through this study on the lifecycle of warehousing, JLL presents an insight into the prevailing market sentiments and its allied concepts with focus on the specific pointers across different segments that drive the sector.

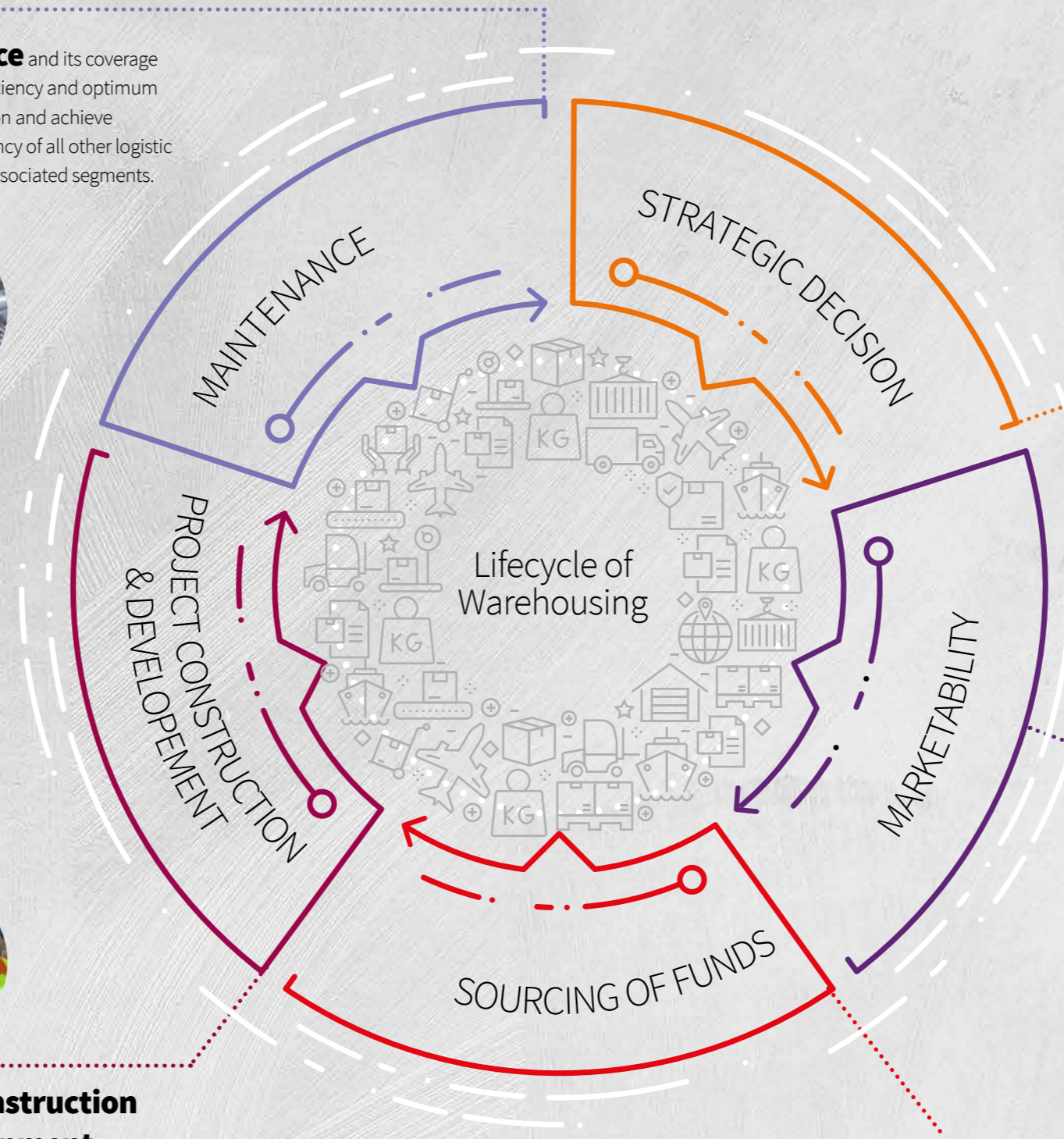
Government initiative towards standardisation, formalisation and ease of compliance process through policy reforms (e.g. GST, Logistic Policy, SEZ policy, Ecommerce policy, etc.), planned infrastructure development through comprehensive programme (e.g. Sagarmala, Bharatmala, etc.) and marketing of India as a destination having foreign investor friendly compliance makes the logistics and warehouse more and more promising.

This JLL study covers various major aspects of Indian Warehousing lifecycle.

**Maintenance** and its coverage  
- to ensure time efficiency and optimum equipment utilisation and achieve performance efficiency of all other logistic subcomponent & associated segments.



**Project Construction and Development** and its related technology - to ensure time bound development strategy



**Strategic Decision** to identify the most suitable location and technical compositions - to get answer to "where", "when", "how much" and "what" to develop



**Marketability** dynamics in Pan India context - to explain inter-relationship of demand, supply and pricing in warehousing segment



**Sourcing of Funds** in cost effective, competitive and hassle-free manner - to ensure availability of funding from alternative sources

# Strategic Decision

## Supply Chain - the Location Decision Maker

A key determinant that help in reducing this cost of logistics is through proper Supply Chain mechanism.

**How post GST era, Supply Chain Optimization presents as a major efficiency enhancement, cost reduction and time optimization opportunity**



Logistic cost currently holds 14% of GDP and aims to reduce below 10% by 2022\*

Supply chain optimization opportunities

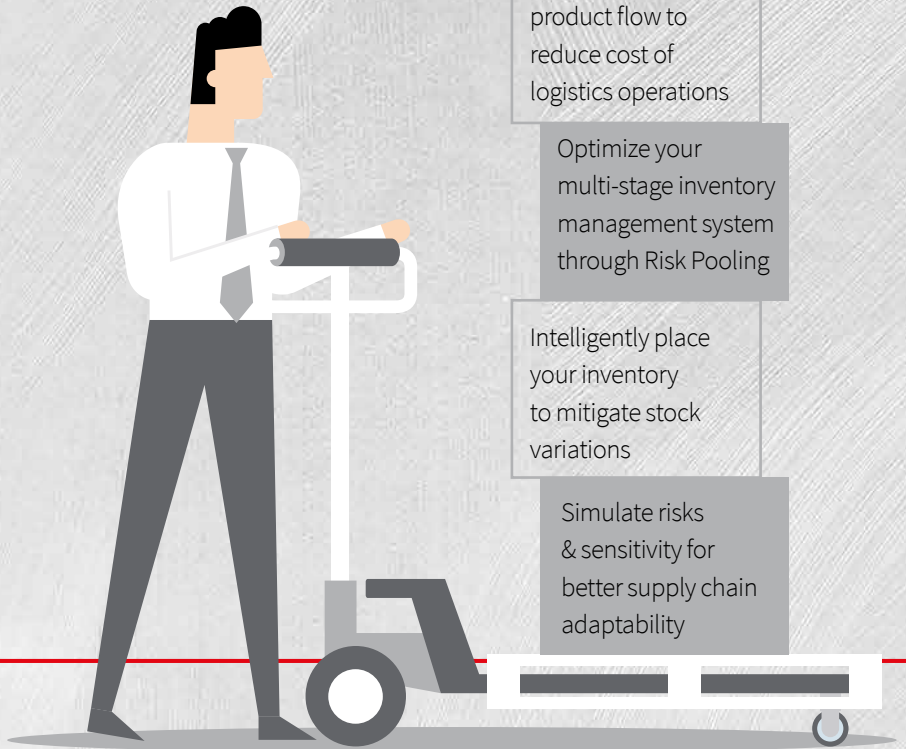
Strategically place your warehouse for increased customer serviceability

Optimize your product flow to reduce cost of logistics operations

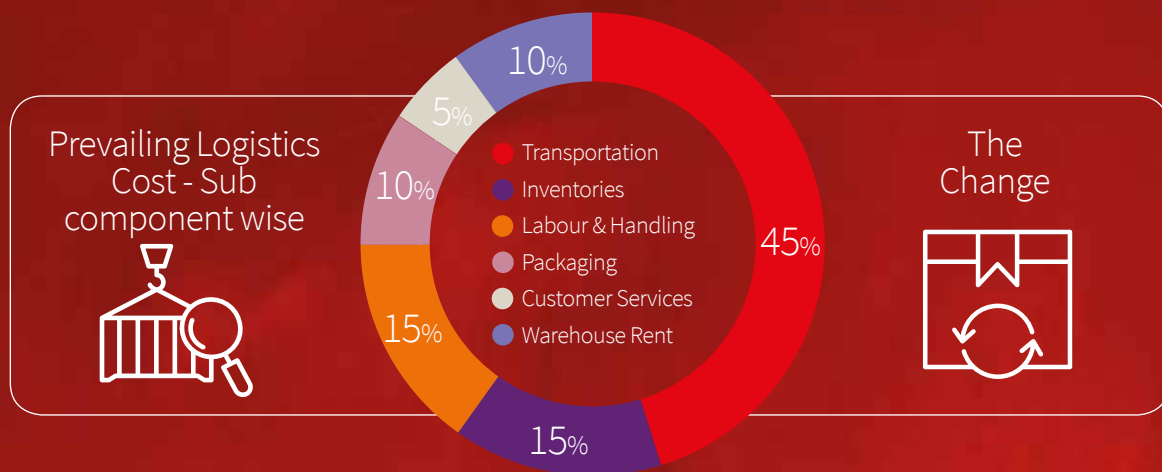
Optimize your multi-stage inventory management system through Risk Pooling

Intelligently place your inventory to mitigate stock variations

Simulate risks & sensitivity for better supply chain adaptability



Potential benefits organization shall realize\*\*



**10% - 12%**

decrease in logistics cost by facilitating an efficient inter-state flow of goods and accelerating the demand for logistics services

**30% - 40%**

reduction of freight time with digitization and handling efficiency

**20% to 30%**

decreased overall logistics cost

**80% of logistic cost can be optimised through efficient mode of transportation, just in time inventory management, efficient and time saving handling system, where location and scale of warehouse is the vital factor**



“GST has created a single national market and uniformity in taxes, as well as led to the removal of interstate checkpoints. This is leading to consolidation of warehouses into bigger spaces and greater overall efficiency, especially among larger and modern firms.”

**Rajesh Jaggi**

Managing Partner, IndoSpace

\*Government of India publication

\*\* JLL research

## Case Study - Location Decision Maker

To broaden our horizon on the benefits of supply chain mechanism we have run a hypothetical simulation model based on certain set of assumptions

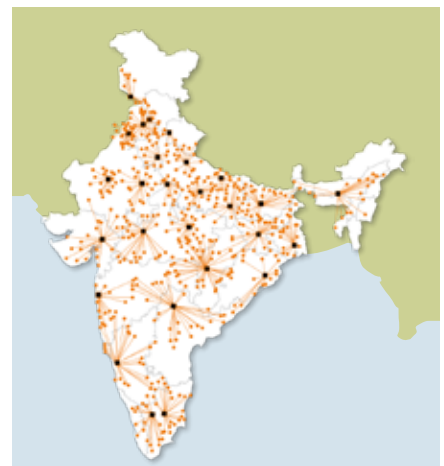
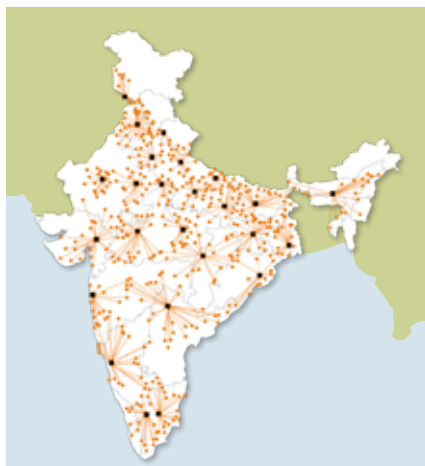
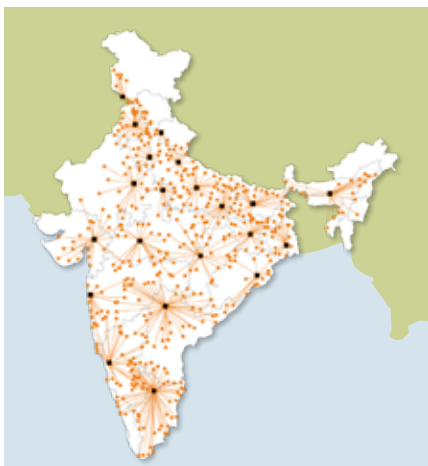
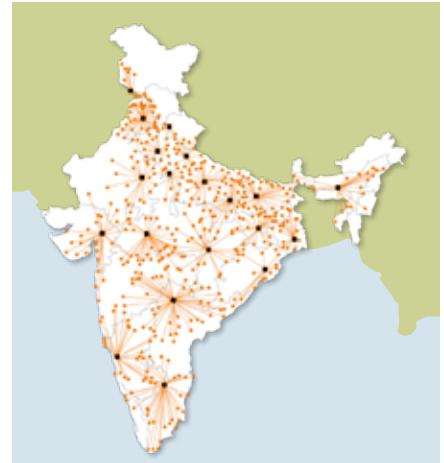
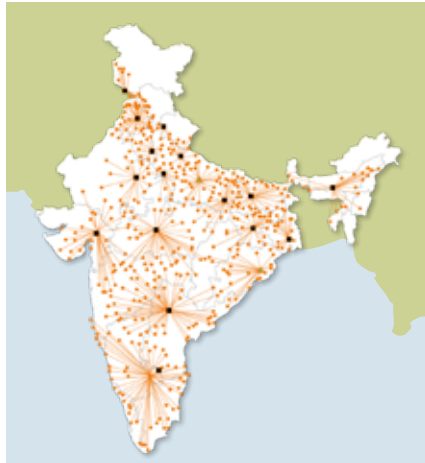
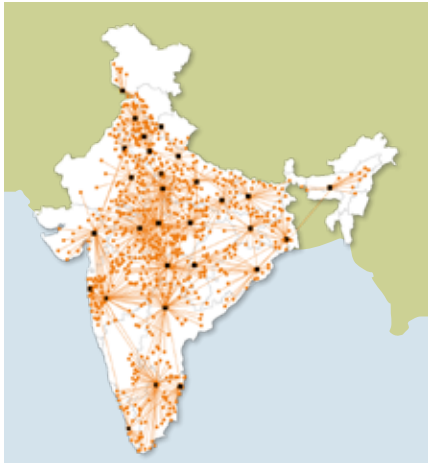
### Supply chain network optimization with projected volumes and GST impact

Leading manufacturing company in India to double volumes in two years span taken initiative in optimizing the network and last mile deliver

Baseline  
(Product1: 24 hubs, Product2: 37 hubs)

18 DC's

20 DC's

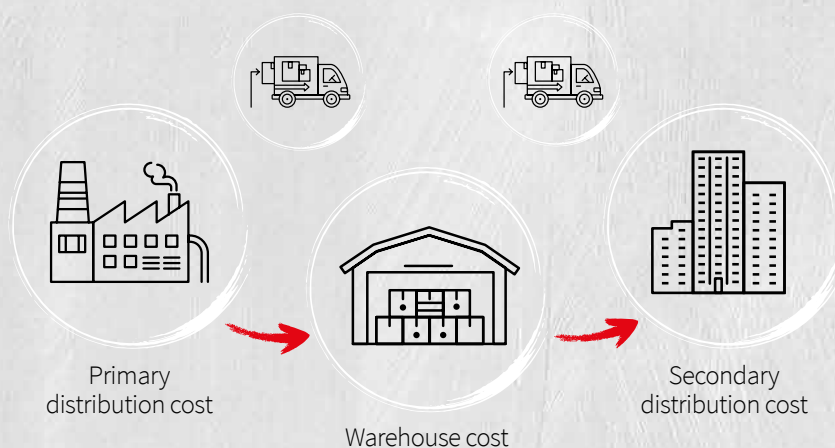


22 DC's

25 DC's

30 DC's

Benchmarking supply chain cost spent against various scenarios evaluated with mutually agreed candidate locations\*

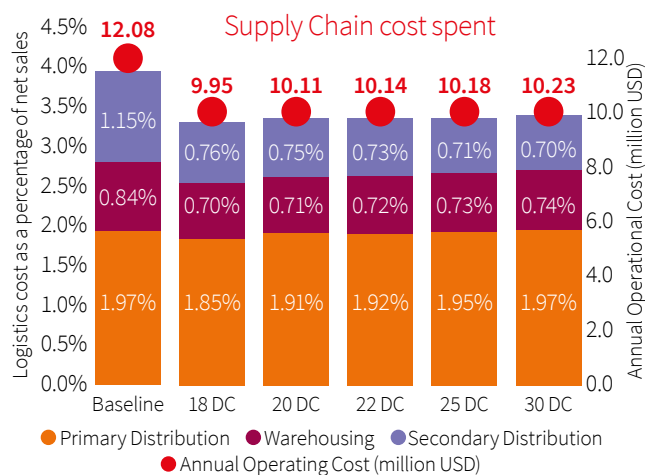


Warehouse cost and Primary/ Secondary distribution cost includes,

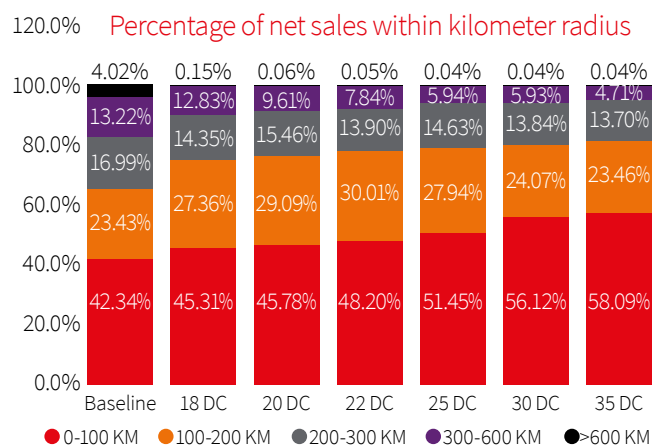
- Warehouse/DC rentals
- Material handling cost within warehouse
- Shipping and Delivery charges
- Administrative expenses
- Salaries
- Packaging expenses etc...

\*cost calculated is basis not upto consumer but onto distributor channel near to consumer

## Sensitivity - To Reach Optimum Situation

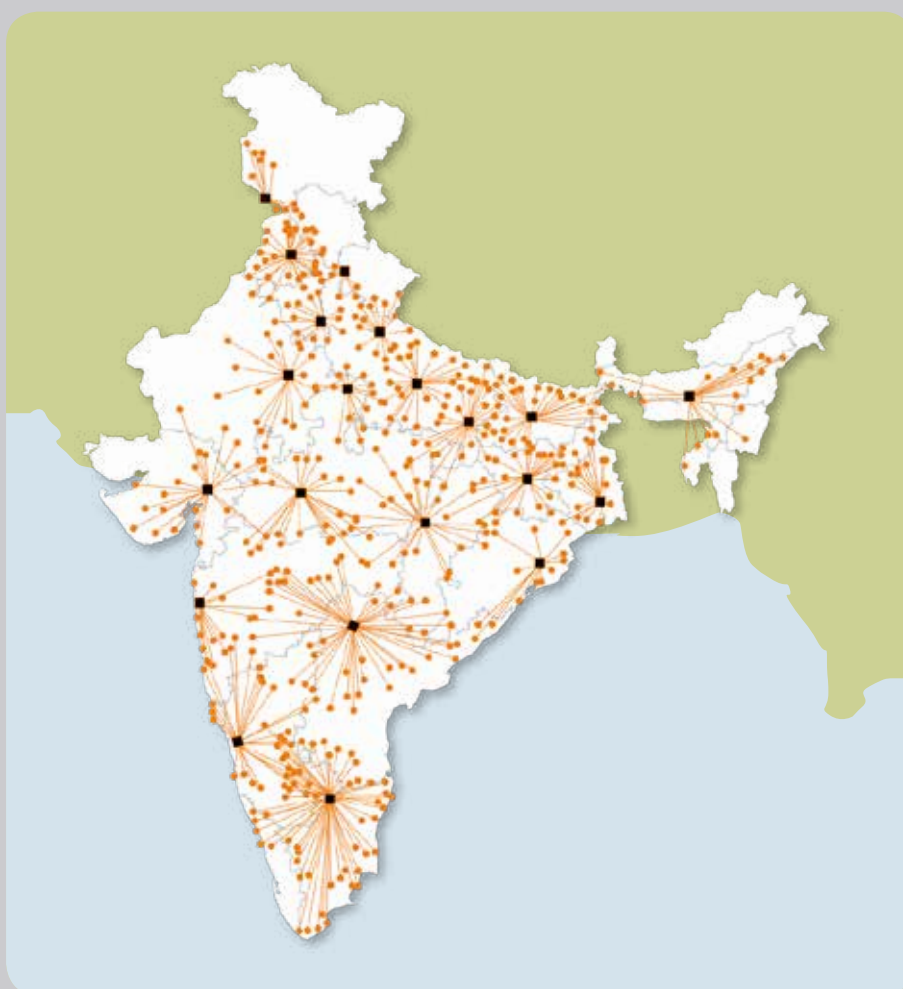


- 3.96% of logistics cost spent in baseline observed
- 3.31% would be To-Be cost in 18DC distribution network without changing the manufacturing locations
- 0.65% percentage reduction observed against net sales in logistics cost
- Saving of US \$2.13 Million



### Key take away

- Service levels with current network remains at 82.76% Net sales within 1day reach (i.e.<300KM)
- Sharp improvement in 18DC scenario noticed with 87% Net sales within 1day reach
- 22DC and 25DC scenario caters 92.11% and 94% Net sales respectively within 1Day reach, which is also close to target service level i.e. 95% Net sales within 1Day reach



### Cost Vs. Service trade off

- Scenario 22 DC Or 25 DC can be targeted initially for new network implementation
- Substantial improvement in Service levels can be achieved with marginal increase in cost in comparison with 18DC
- Degree of change and risk observed low

Are you looking for your warehouse footprint optimization? - JLL's Supply Chain Consulting practice can help."

## Warehouse Quality Matters in Supply Chain

The warehouse cost impact is significantly based on:

- Type of property
- Type of User and their corresponding requirements

These dynamics of user requirements, is directly dependent of quality of warehouse. The greater the grade of storage space, efficiency increases significantly in this regard. This one of the many reason why, occupiers have started to incline themselves for Grade A space specifications to reduce the scope of retrofitting and bringing Supply Chain requirements in-line to available spaces.

This have inherently triggered a shift for Grade B properties towards Grade A as a preferential choice

### Demand Drivers

Push from Grade B to Grade A

Parameters	Grade A	Grade B
Height (Mts.)	13	8
Floor Strength (Ton/Sq. Mts)	5	3
Construction Cost (INR/sft)	1,500	1,000
Rental (INR/sft/m)	20	15
Rent / pallet position (INR/ month)	57	87

Grade A Savings / pallet position **52%**

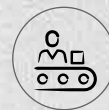
### Tangible Benefits

Higher Cargo Capacity



up to 50%  
additional floor-  
load capacity

Operational Efficiency



40%  
storage height  
up to 30%  
additional open space

up to 30%  
space for internal cargo handling

Clientele



Efficient material  
handling space,  
safety and security

### Intangible Benefits



**Safety & Security**

Improved default detection systems



**Time Management**

Optimise operational time and cost

## Inside the Box

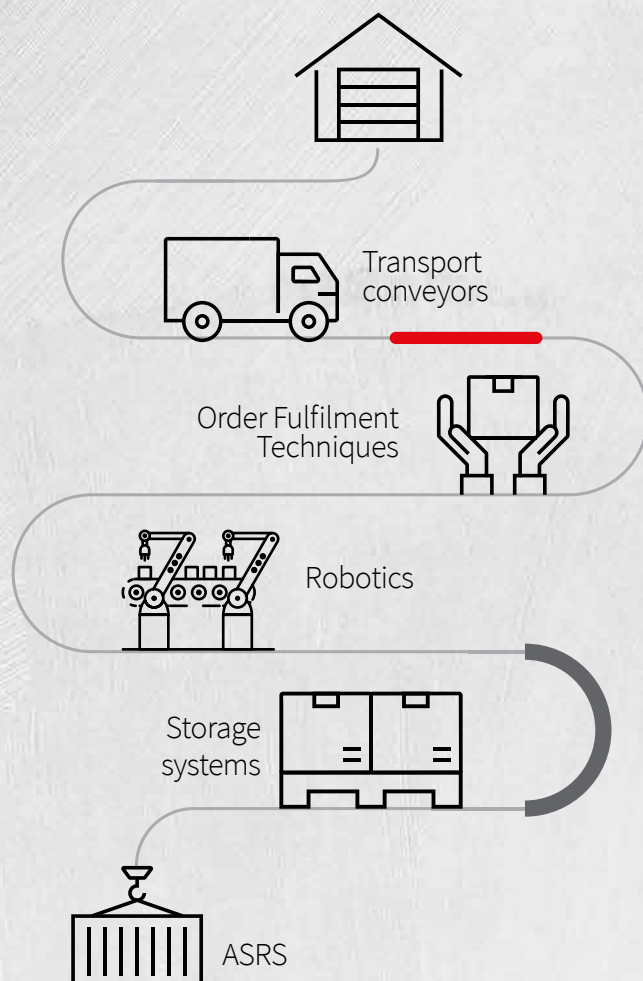
Typical Intralogistics (Inside Box) investment as a percentage of overall project cost\*

Phases	Description	Investment area	Investment percentage
I	Operations design	Professional services	1 - 2%
II	Integrated detailed design	Professional services	3 - 5%
III	Equipment and Software selection & Purchase	Equipment and Software	85 - 90%
IV	Implementation	Professional services	5 - 10%
V	Ongoing support & audit	Support services	1 - 2%

- In India, almost 75% of the warehouses run at a capacity of around 50%. This results in underutilized spaces within warehouse as well as less optimized operation cost
- Consequently, warehouses running at a 10+% operation cost to sale has better impact on customer service levels and product pricing strategy compared to warehouses having lesser operation cost to sale percentage.

### Solution wise visibility of potential investments by large enterprises

Most sectors have introduced several associated techniques such as:

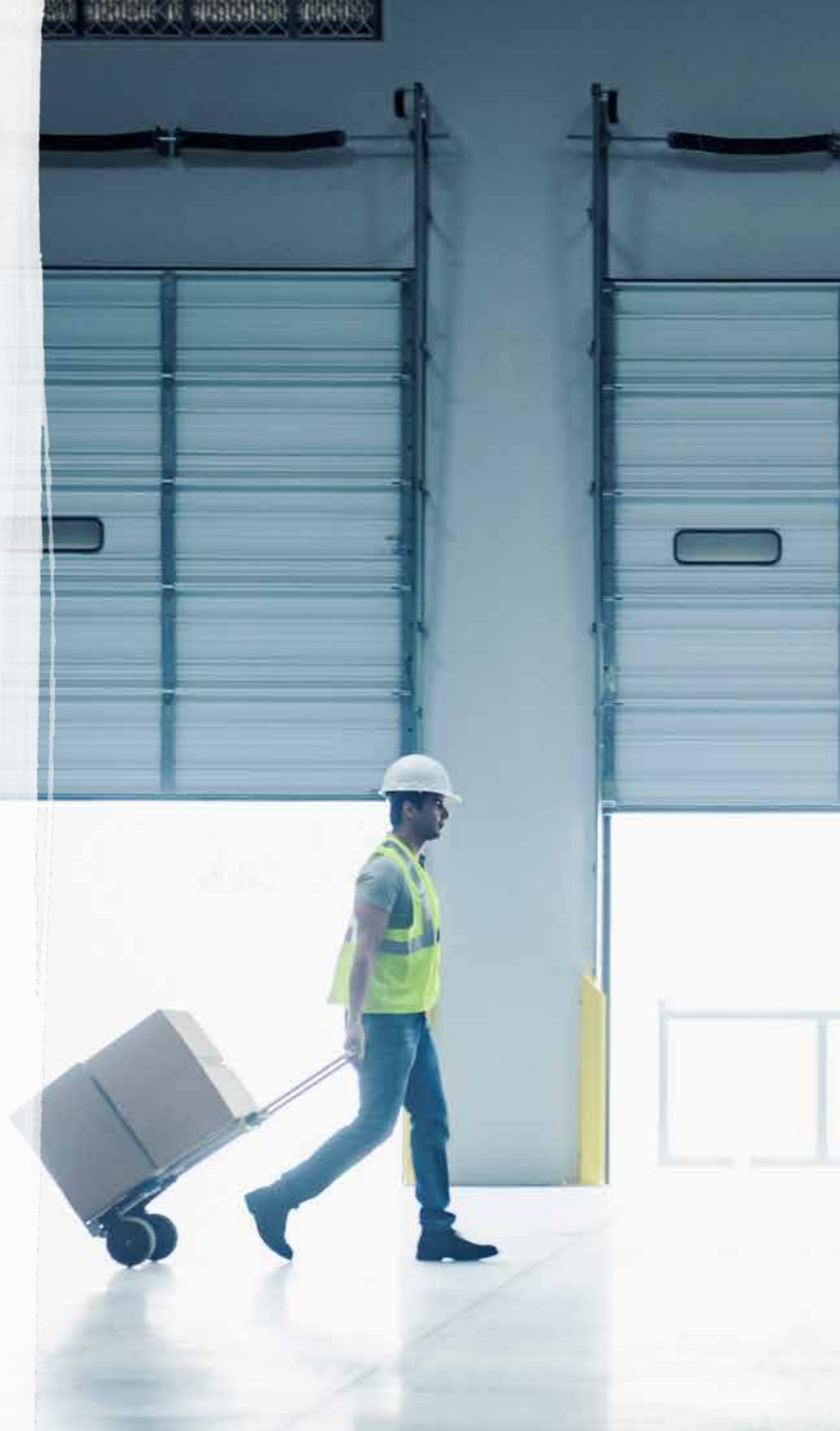


**BTS as a solution to specification related demand**

As the logistics sector involves multiple players in the various sectors, there is an invariably cost related to sector level specifications. However, the Indian warehouse market is not matured enough to provide for readily available spaces for such specifications which have resulted in a demand for specific client oriented, custom-solution based warehouse spaces also commercially known as Built-To-Suit (BTS).

In 2018, around 26% of total absorption contracted under BTS model.

\* Excluding land and building investment



## India's Warehousing Sector Comes of Age in 2018, Growth Prospects in 2019 Look Brighter

The year 2018 saw Indian Warehousing Sector coming of age, outshining some of the conventional real estate asset classes and attracting global investors. As per a study by JLL India Industrial Services, 2018 witnessed a 22% y-o-y growth in total stock in Grade A & B warehousing space in top eight cities at 169 mn sq. ft. compared to 138 mn sq. ft., a year ago. Interestingly, absorption clocked an unprecedented growth of 63% y-o-y growth to 31.8 mn sq. ft. last year from 19.7 mn sq. ft. in 2017. The robust growth in absorption reflects demand outstripping supply and vacancies dropping below 10% level for the first time ever.

Here's a snapshot of the key trends.

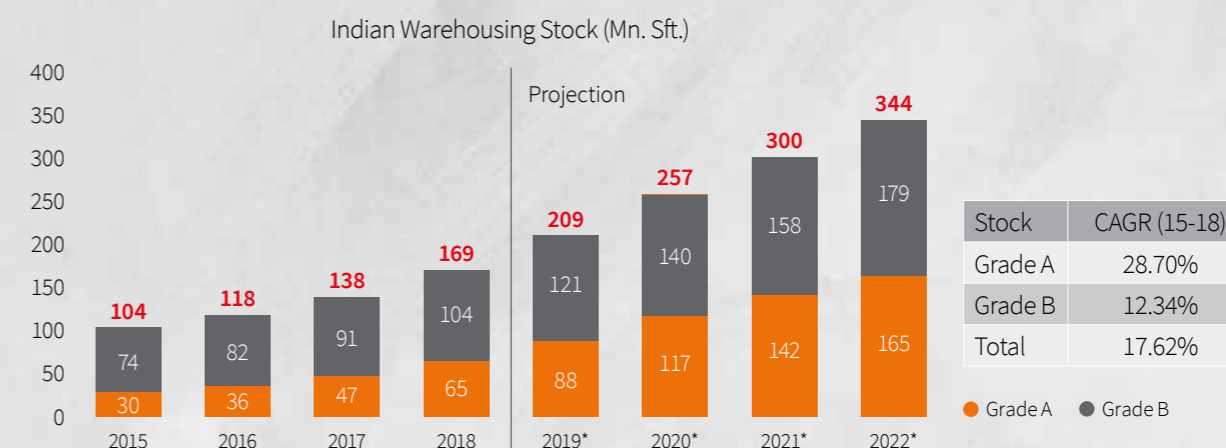
Logistics Sector US\$ 160 Bn in 2017  
expected to grow to US\$ 215 Bn. by 2020\*



India ranked 44 in World Bank's  
Logistics Performance Index, 2018

\*Economic Survey, Government of India 2017-18

### Warehousing Stock (Cumulative Supply)



"There are some challenges on the development side for not having experienced developers and land aggregation posing risks to development itself."

**Shashi Kiran Shetty**

Chairman, All Cargo Logistics

"We see huge potential in the logistics and warehousing sector; there is a continuous demand for high-quality modern logistics and warehousing facilities. IndoSpace has received overwhelming responses for our funds from leading global institutional investors which showcases that the investors are positive on the sector."

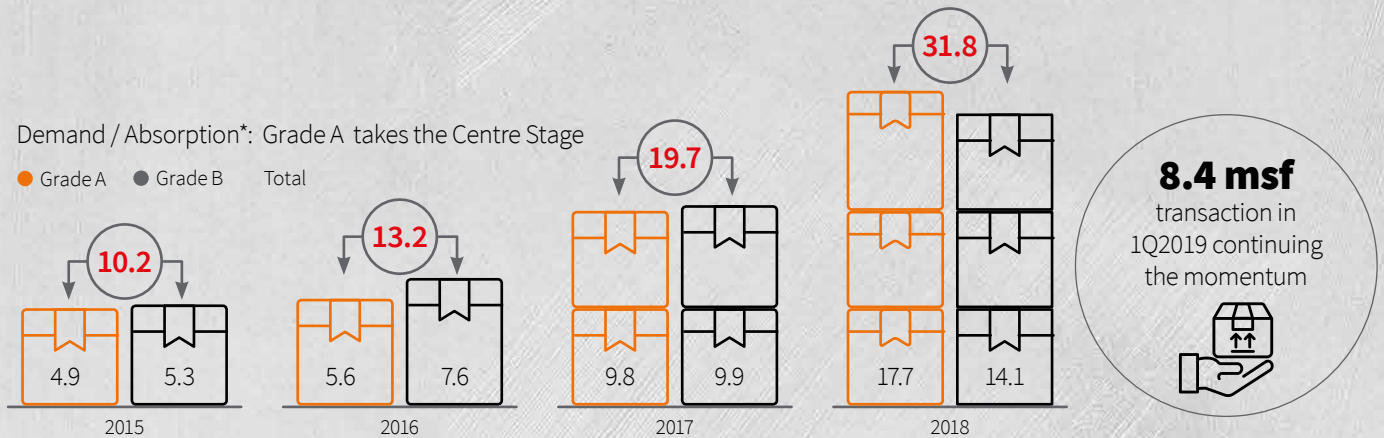
**Rajesh Jaggi**

Managing Partner, IndoSpace

## Demand Outstripping Supply

Demand / Absorption\*: Grade A takes the Centre Stage

● Grade A ● Grade B Total



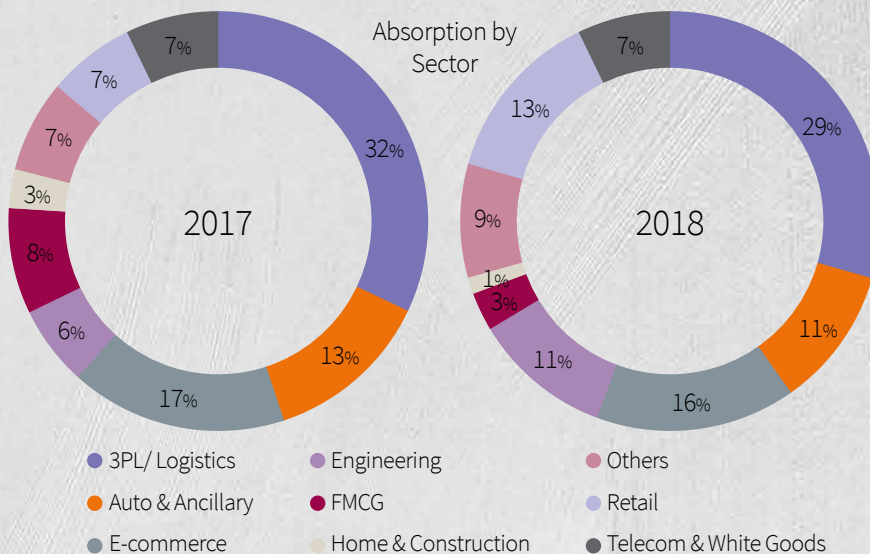
**CAGR 33.81%**  
growth rate **India annual absorptions** (2016-2018)



**56%** in 2018  
of the total 32 Mn sq.ft of industrial and logistics leases were concluded in **GRADE A spaces**

\*Absorption includes BTS Spaces as on Dec, 2018

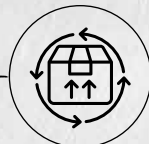
## Demand Drivers - Sectoral Share (2017 & 2018)



## Drivers for Future\*:

- 3PL market, currently pegged at ~USD6bn in FY 2018, can potentially reach ~USD17bn by FY25
- Auto industry became the 4th largest in sales and 7th largest manufacturer of commercial vehicles in 2017 and expected to reach \$ 300 bn by 2026
- Light engineering turnover is expected to increase to US\$ 115.17 billion by 2025F from US\$ 70 billion in 2017
- FMCG is 4th largest sector in the Indian economy and likely to be the third-largest consumer market by 2025

\*JLL industrial secondary research



## Top 3 occupier types

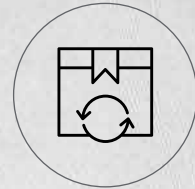
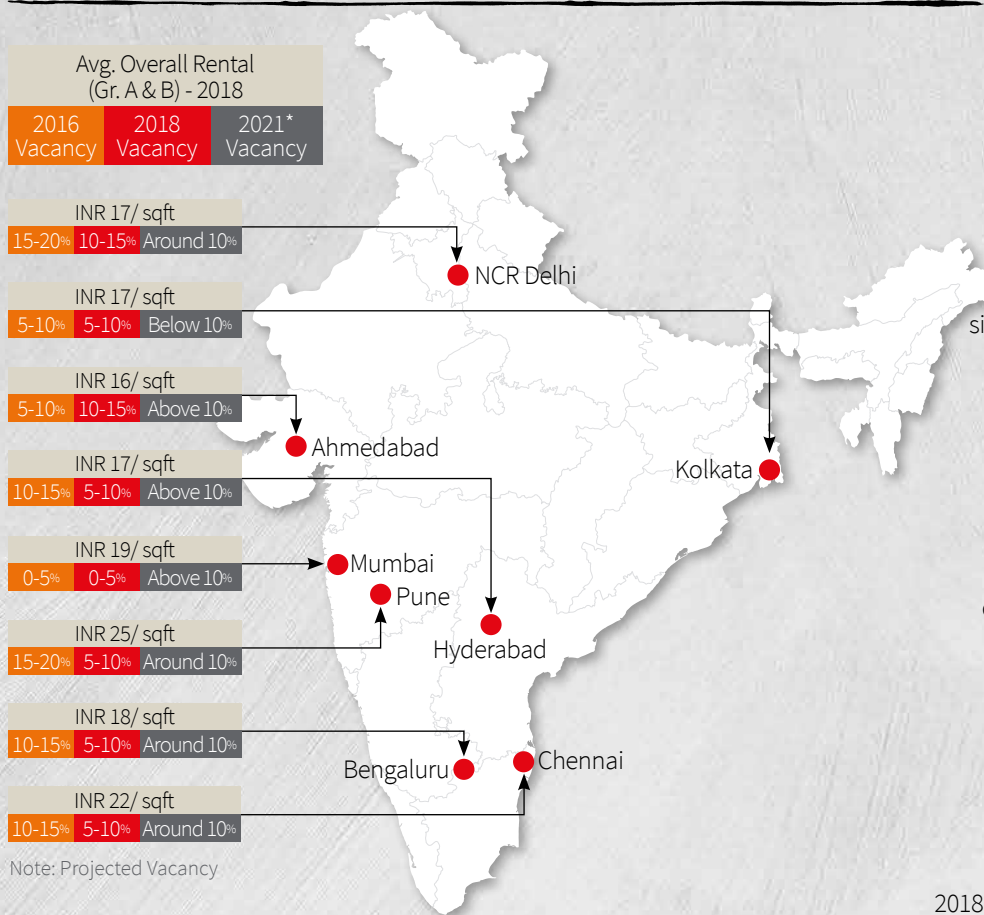
3PL, E-Commerce and Auto & Ancillary



“The overall impact on the sector should be positive in the long run given that various platforms are now focused on creating institutional grade warehousing and industrial parks across the country. The market size is undoubtedly large and we are seeing significant latent demand in most locations around the country.”

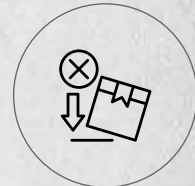
**Abhijit Malkani**  
Co-CEO, India, ESR

## India Overall Vacancy and Average Rent - Major Cities



~**10%**

India Vacancy would likely to maintain its stability in spite of significant increase in stock addition



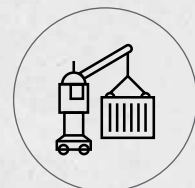
Average Vacancy is observed diminishing trend in last few years



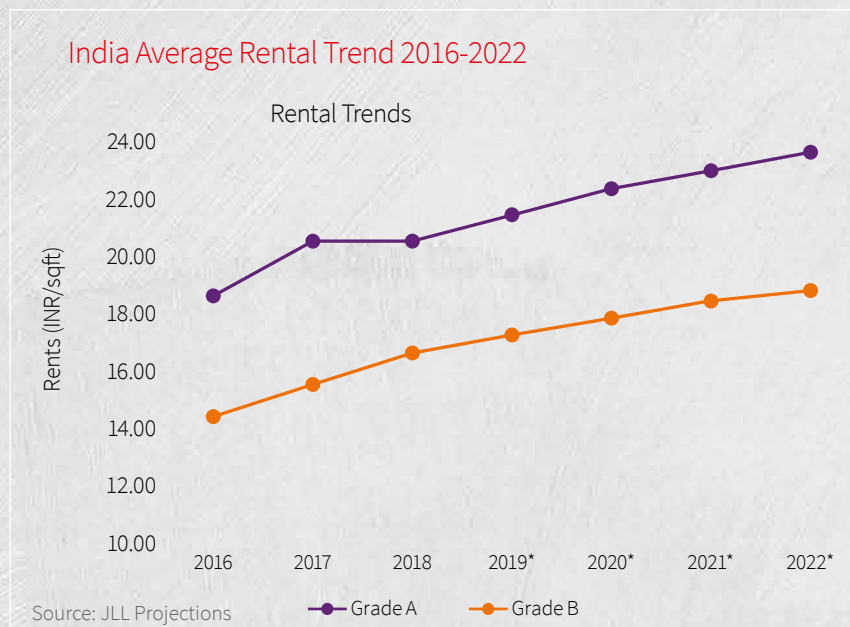
**21 INR/ sq.ft./ month**  
2018 Average Rent for **GRADE A spaces**



**17 INR/ sq.ft./ month**  
2018 Average Rent for **GRADE B spaces**



**Incremental Trend observed in average rent in past 3 years and expected to continue the same in future**



“FDI norms are transparent and inclusive, facilitating investment on a large scale thus enhancing India’s position as foremost destination for big ticket investments. As far as REITs or InvITs are concerned these are still the early days but the buzz they have created is a positive signal. And as for GST, there is big positive impact of same on India’s Logistics sector. It has enabled consolidation of smaller players and has emboldened the incumbents to go for large size Logistics Park thus enhancing the overall pie.”

**Shashi Kiran Shetty**

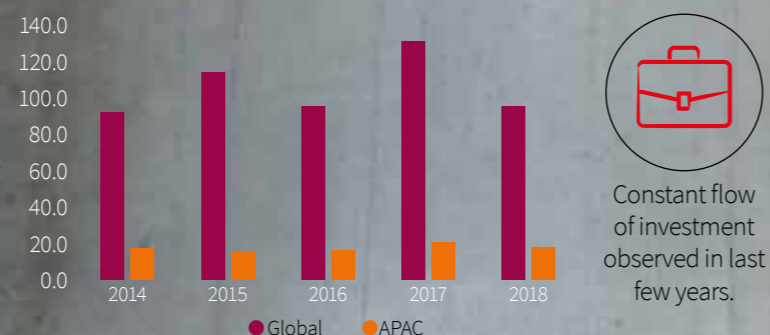
Chairman, All Cargo Logistics

## Capital Inflow - India Real Estate

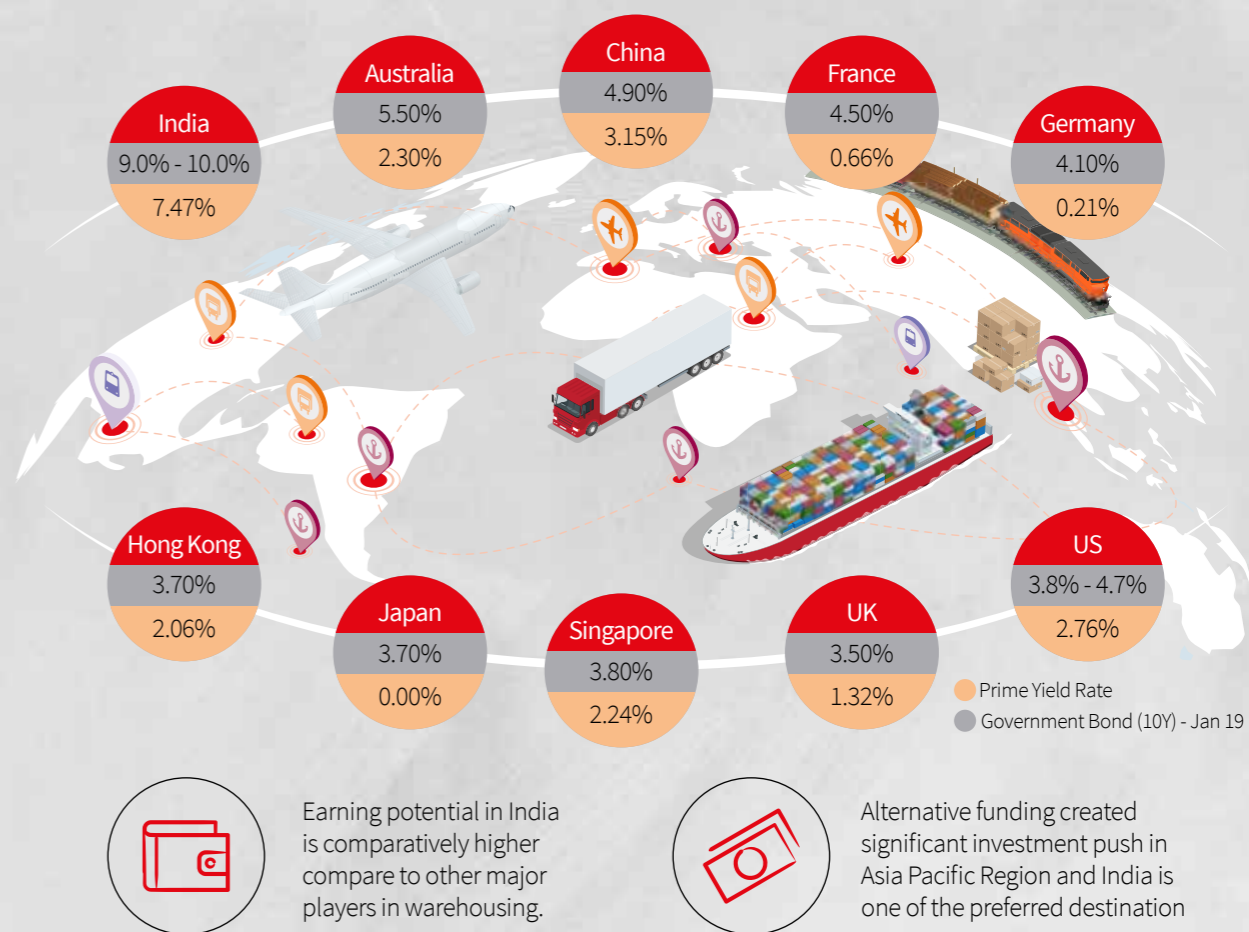
Globally, logistic has emerged as a promising sector for funding and warehousing as an institutional grade sector. The sector is emerged as a mainstream asset class and supported by the diverse range of capital sources. Globally, the warehousing, the newly emerged asset class, had attracted constant flow of investment totaling US\$530 billion over last 5 years. The sector observes investment from private equity players, institutional investors, equity funds, REITs, cross border investors etc.

The investment synopsis over last 5 years mentioned below:

Investment in Warehousing (US\$ billion)



The investment capitalization rates varied between 3.5% to 5.5% depending on geographies and investment risk. The following exhibits describes few fact and figures related to global logistics sector.



“FDI regulations in the industrial / warehousing sector are more favourable than other sectors. The announcement by the central government granting infrastructure status to the sector has further improved this. While the implementation of the GST has finally united all the Indian states into a single tax market and removed the implications of state lines on logistics strategy”

**Abhijit Malkani**

Co-CEO, India, ESR

“FDI norms in Industrial Real Estate have been considerably relaxed. Further relaxation has come in the form of private equity players being allowed to exit projects on completion of ‘built-up infrastructure’ which will allow for large scale park development across the nation, and more relaxed exit norms. While clear REIT framework is still wanting, and clarity on repatriation of funds and dual taxation needs to be there, the GST has been the single largest driver for this asset class.”



**Rohit Hegde**

Managing Director, KSH



“Buoyed by a vibrant economy and high returns, PE investment in India has seen a considerable amount of uptick. This is an exciting time to be involved in Private Equity (PE) in India. Large Global PE investors are either setting up India-dedicated funds or increasing allocations for Indian investments in their global portfolios.”

**Aditya Virwani**

COO, Embassy

## India - A Potential Investment Destination

India which is considered to be an emerging market in this sector, has observed significant momentum in the past 2 years as Global funds, Private Equity players continue to explore investment opportunities partnering with local developers and logistic players.

### Platform Deals (2017 and 2018)

S.no	Investor	Investee	Amount US\$ in Mn	Year	Objective
1	LOGOS	Assetz	400	2017	To build and manage specialised logistics and industrial parks in India.
2	Ascendas-Sinbridge	Firstspace Realty	600	2017	To acquire interest in 15 mn. sqft. of greenfield/ brownfield warehousing project in India
3	CPPIB	IndoSpace	500	2017	To acquire majority stake in joint venture entity i.e. IndoSpace Core
4	IFC	Mahindra Life Space	92	2017	To fund Mahindra Lifespace 3 nos. industrial clusters projects in Rajasthan, Gujarat and Maharashtra
5	Macquarie + Ivanhoe	Logos + Assetz	431	2017	To create fund focusing investment in logistics and warehousing projects
8	Everstone	GLP	500	2018	Joint Venture Fund to invest in warehouse technology, express logistics and last mile delivery
9	Allianz	ESR	1,000	2018	To develop warehousing space in 8 major cities of India
10	NIIF	DPW	3000	2018	To acquire/ fund port and logistic related infrastructure project in India
11	IndoSpace	GLP	700	2018	To raise capital to build 120 million sq.ft. of logistics infrastructure

“Preferred deal structures are equity investments and Joint Venture (JV) partnerships. It is a mix of buying ready stock, forward sale or JV structures with organised players.”

#### **Shashi Kiran Shetty**

Chairman, All Cargo Logistics

“IndoSpace held the final close on IndoSpace Logistic Parks III, the largest logistics real estate fund ever raised in India. The offering was significantly oversubscribed on the back of strong investor demand. US\$580 million of total equity has been committed to ILP III which, post leverage will create a corpus of more than US\$1.2 billion to develop and acquire industrial and logistics-related real estate investments in India.”

#### **Rajesh Jaggi**

Managing Partner, IndoSpace

Significant interest seen in warehousing and logistics sector from foreign institutional investor. The investment objective comprises diversified models. These are:



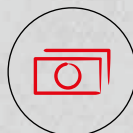
#### Project Level Investments

Buyer	Property Location	Deal type	Year	Value (USD Mn.)
IndoSpace	Gurgaon (New Delhi)	Land only	2019	12.5
	Oragadam (Chennai)	Land + Stabilised	2018	29
	Chennai	Land Only	2019	3
Ascendas Firstspace	Panvel (Mumbai)	Land / stabilised	2018	77.6
	Oragadam (Chennai)	Land Only	2018	30
	Periyapalayam Road (Chennai)	Land + Stabilized	2018	55
Logos India	Sriperumbudur & Oragadam (Chennai)	Land + Stabilised	2019	100
	Gurgaon (New Delhi)	Land Only	2019	23
ESR	Sohna Road (New Delhi)	Land Only	2019	19
	Chakan (Pune)	Land Only	2018	19
	Bhiwandi 1 (Mumbai)	Land + Building	2019	Undisclosed
	Bhiwandi 2 (Mumbai)	Land Only	2019	Undisclosed
Embassy	Bilaspur (New Delhi)	Land Only	2017	13
	Farukhknagar (New Delhi)	Land Only	2018	12
	Bhiwandi (Mumbai)	Land Only	2019	Undisclosed

Size of Actual investment have not reached its desired level as compare to prevailing platform level investment commitment. This is probably because of dearth of investable grade supply in most of the markets.



The viability and risk management shall be the key decision points for exploring investment options. Development financial sustainability for a warehousing project depends on 2 key parameters:



Cost of land  
(Typically, ~30%  
of project cost)



Potential Rental Revenue  
(depending on demand of high  
quality space and competition)

“The two main strategies we see in play are i) creation of platforms organically by building a team from the ground up to execute on the development strategy or ii) investment into companies that have an existing warehouse / industrial development business. In both of these formats, land acquisition is a key factor.”

**Abhijit Malkani**  
Co-CEO, India, ESR

“I think both private equity players and pension funds have largely focused on fully built rent generating assets to date. However, over a period of time, one would expect them to take a larger developmental risk and take early positions in areas such as land acquisition on project plans sanctioning stage.”

**Rohit Hegde**  
Managing Director, KSH



To assess impact of Land Cost and Achievable Rental, on Equity Internal Rate of Return (Post Tax), a test case run on 50 acre development with built up potential of 1 million sq.ft. was worked out. The Equity IRR (Post Tax) sensitivity matrix stands as below;

Equity IRR (Past Tax) in %		Land Cost Per Acre Rs. In Crore				
		0.70	1.00	1.50	2.00	2.50
Lease Rental Rs. Per Month Per Sq.ft.	16.00	12%	10%	7%	5%	3%
	18.00	15%	13%	10%	7%	6%
	20.00	18%	16%	12%	10%	8%
	22.00	21%	18%	15%	12%	10%
	25.00	25%	22%	18%	15%	12%
	28.00	28%	25%	21%	17%	15%

Land Cost



Achievable Rental

2 key sensitive factor which needs special emphasis while selecting investment opportunity

“Return expectations are again around 20% IRR for the opportunistic funds; while for core strategy investors who are investing in stabilized portfolios, such as the pension funds, the return expectations are around 14-16%.”

### Shashi Kiran Shetty

Chairman, All Cargo Logistics

“We believe that investors are targeting annual returns in the range of 18%-20% (onshore in INR terms) which should results in 12% - 15% returns in USD after accounting for tax leakages and currency depreciation.”

### Abhijit Malkani

Co-CEO, India, ESR



“IRR or Yield expectations will depend entirely on the risk profile of the investors and developers. If somebody comes in early and takes a development risk, they can expect project IRRs in excess of 20%. However, mature market players will be happy with a 10-12% yield (post tax).”

### Alope Bhuniya

CEO, Ascendas Firstspace

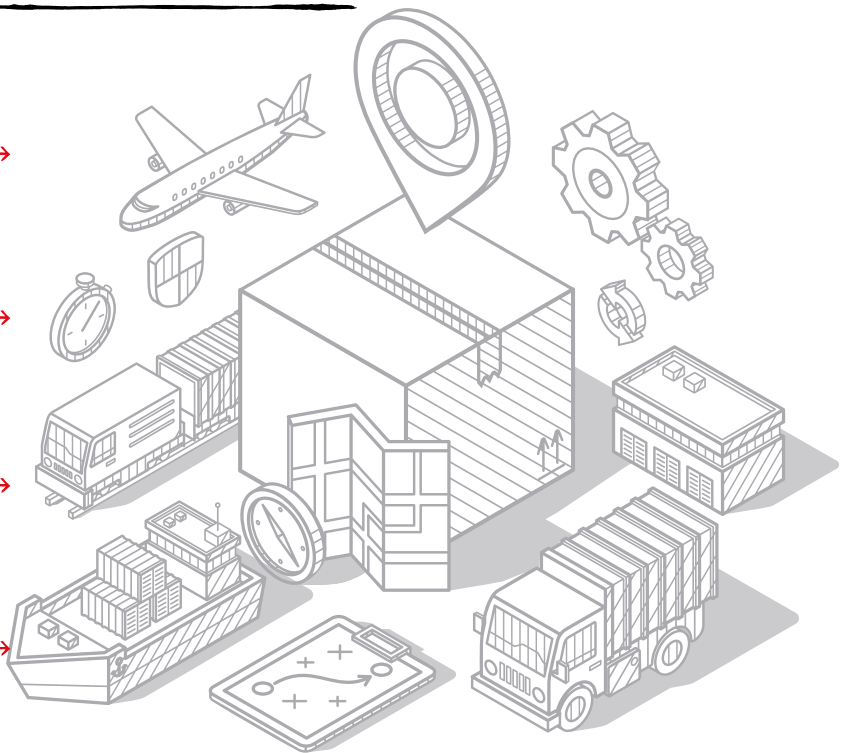
## Why PE investment is gaining momentum in warehousing space development project

Key Factors are:

→ GST and E-way Bill removes majority of bottlenecks in cargo storage and transportation.

→ Infrastructure investment in road, rail and waterways escalates potential opportunity in efficiency enhancement.

→ Increasing income level and customer preference increase acceptability of e-commerce/ retail chains and sectors.



In short, all these moves are opening up favorable opportunities in logistics sector for Indian Economy.

However, the sector is not yet mature and experiencing multiple risk which needs adequate attention and mitigation measures. The scenario will consolidate as investment momentum continues in near future. As a measure to manage financial sustainability for warehousing, the cost of land needs special focus for its recoverability risk considering competitive market environment. The hypothesis considered in this study, indicates cost of land below Rs.1.5 Crore could be a sustainable benchmark number for investment.

“Technology disruptors are an absolute necessity in the fractured domestic logistics market, and most of them are largely focused on movement of goods. The transport market is very fragmented, and extremely inefficient, and the investments in this space will help transform the market, and will eventually make manufacturing in India far more competitive. On the other hand, post implementation of GST, there has been significant investments in the logistics infrastructure sector. This has been largely spearheaded by three category of investors - strategics such as Ascendas; private equity investors such as Warburg Pincus, Morgan Stanley; and pension funds such as CPPIB”

### **Rohit Hegde**

Managing Director, KSH

“Logistics Real Estate is going to see an ocean of change considering that the funds are looking to build high quality yield assets with top notch tenants. The sector on the whole will see a lot of investment activity coupled with consolidation down the road.”

### **Aditya Virwani**

COO, Embassy

# Project Construction & Development

## Grade A Space - the Value Proposition

Globally, “Grade A - Warehouse” is being planned, designed and constructed with better:

Designing with extra height,  
floor load and finishes;



Infrastructure with access  
to mechanised MHEs, fire  
detection, clean environment;



Land Use with space for parking,  
heavy vehicles/ MHEs movement,  
multi-modal connection.



Incremental presence of national and international brands in  
logistics sector, India is heading towards an organised as well as  
standardised warehousing platform.



“We seek compliant high-grade warehousing spaces at our preferred locations. There’s lack of clarity on relevant compliances in those locations. Hence prices we pay are arbitrary and we have to absorb higher rental costs in BTS options. These BTS options come with a risk of non-delivery or delayed delivery, which have significant impact on our business. Clarity on requisite compliances and their implementation, Improved construction technology with efficient project management will ensure warehouses are delivered on time and as per quality specs we signed for our businesses.”



**Amit Malakar**

President & Business Head, Sical SCS



It is extremely important to have the comprehensive detailed design and engineering for all projects done in advance rather than doing it in stages, as well as holding design workshop and involving all stake holders from client side so that they are able to express their requirements.”

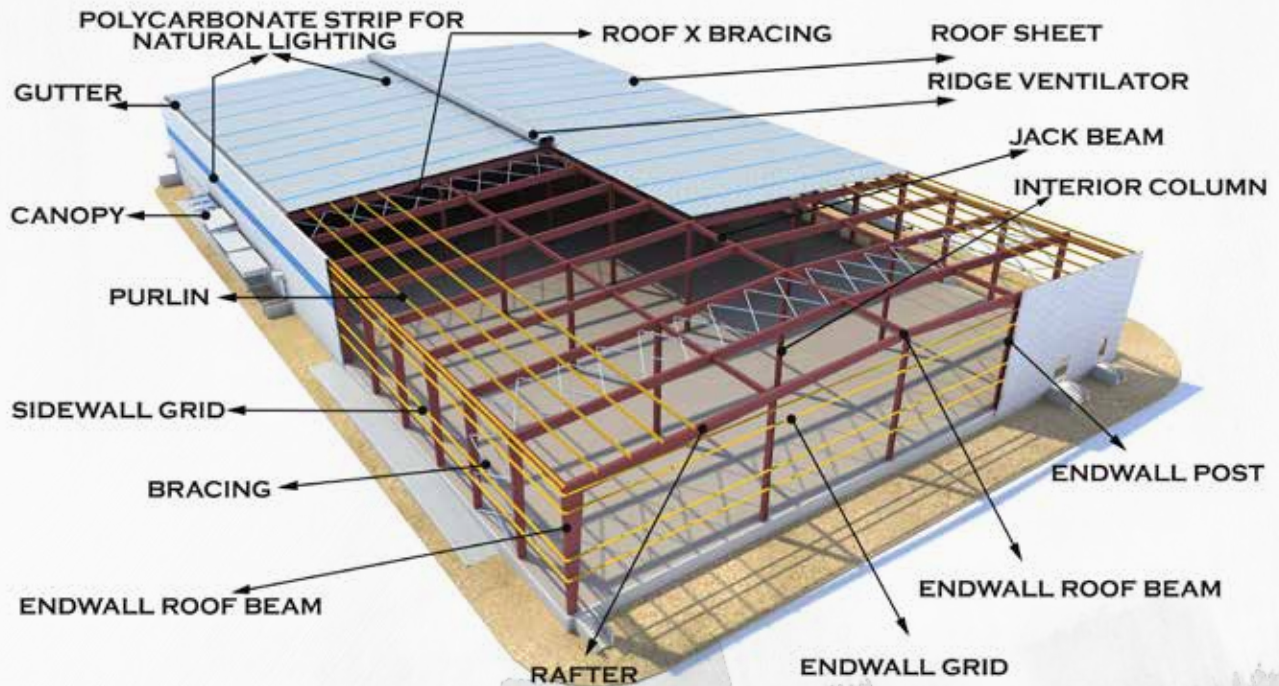
**Hemant Prabhu Keluskar**

COO - Infrastructure & Industrial, Nidar Group of Companies

## Grade A Specification

Sl. No.	Specifications	Grade A
1	Clear Height	9-13.5 m
2	Flooring	FM Global II Compliance Laser Creed Floors
3	Floor Load	5+ Tons / sqm
4	Type of Structure	Pre-engineered structure from reputed / leading PEB vendors
5	Docking Area	Dock levellers, Automated panelled or shutter doors, 20 to 30 meters set back as docking apron, etc.
6	Plinth Height	1.2 m above Ground level
7	Canopy Length	4 m and above
8	Column Bay Span	16.8 – 27 m X 8 - 10 m
9	Fire Safety	Sprinklers / Fire hydrants with required DG & Water Storage system
10	Sky lighting	~5% of roof area
11	Air Circulation	5 to 6 Air changes with Louver systems
12	Infrastructure	STP, Insulation, D.G., Storm Water & Drainage Systems, Concretised Roads
13	Ground Coverage	Max 50% ground coverage with sufficient all around setbacks and parking facilities
14	Warehouse Walls	3.5 m precast concrete walls / Waffle creed RCC panels
15	Compound Walls	8-10 ft. concrete walls with additional 2-3 ft. of Y angles & circular barbed wires
16	Wall Panels	0.50 mm TCT single skin, SMP coated, Galvalume (AZ150 GSM) profiled sheets
17	Insulation	Roof and Side cladding as required with latest insulation material
18	Roof Type	Standing Seam sandwich panel with Louvers ventilation system
19	Docking Provision	1 per 1,000sqm / loading and unloading area of 30m for one side docking and 45m for back to back loading
20	Approvals/ Compliance	Zone, Usage, Plan sanctions, Environment clearance, occupation Certificate, Fire NOC all required approvals in place

## Typical Components of a Grade A Warehouse

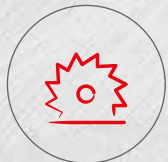


## New Technologies

### Off-site Fabrication / Pre-Fabricated Steel Members:



**Steel Fibre Concrete Flooring:** Steel fibre concrete flooring can provide superior resistance to minimize cracks in hardened concrete, as well as maximum resistance to withstand heavy loads, either dynamic or static. It can be used to create “joint-less” floors that have minimal joints, providing spaces without joints as large as 40 or 50-meter span wide.



**Laser Screed Flooring:** A laser-emitting device is placed on a static location outside the pour. Two laser receivers on the ends of the screed align themselves with the laser to keep a floor pour level during placement. An auger inside the screed levels and vibrates the concrete as the screed pulls over the wet surface. The floor produced as a result of this is more precise and construction is faster.

### Battery operated Screw Machine and Bolts tightening machine (Cordless impact wrench).



**Spider Boom Lift:** These are very useful to work on Mezzanine or Deck Slab. Very Light weight and Safe.



**Puf Insulated Sandwich Wall:** These are very good alternation instead of double layer cladding sheet arrangement. Also interlocking system is this panel make easy installation as well as aesthetic look too.



**Motorised Chain Block:** Very useful apparatus in Shifting and installation of Purlin, Bracing and other roof elements without much hard work.

“Innovative concepts in design are highly valued not for their own sake but for their contributions to reducing costs and to the improvement of aesthetics, comfort or convenience that needs to be seen in a well-designed facility. However, the developer as well as the design professionals must have an appreciation and full understanding of the technological complexities often associated with innovative designs in order to provide a safe and sound facility.”

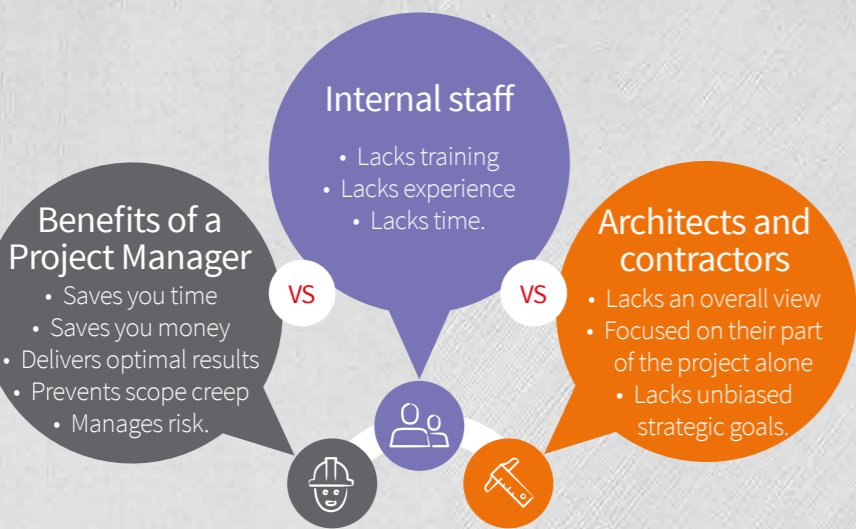


**Kalyan Borade**

Director, Real Estate, Agility Logistics

Projects & Development Services (PDS)

Why hire a Project Manager?



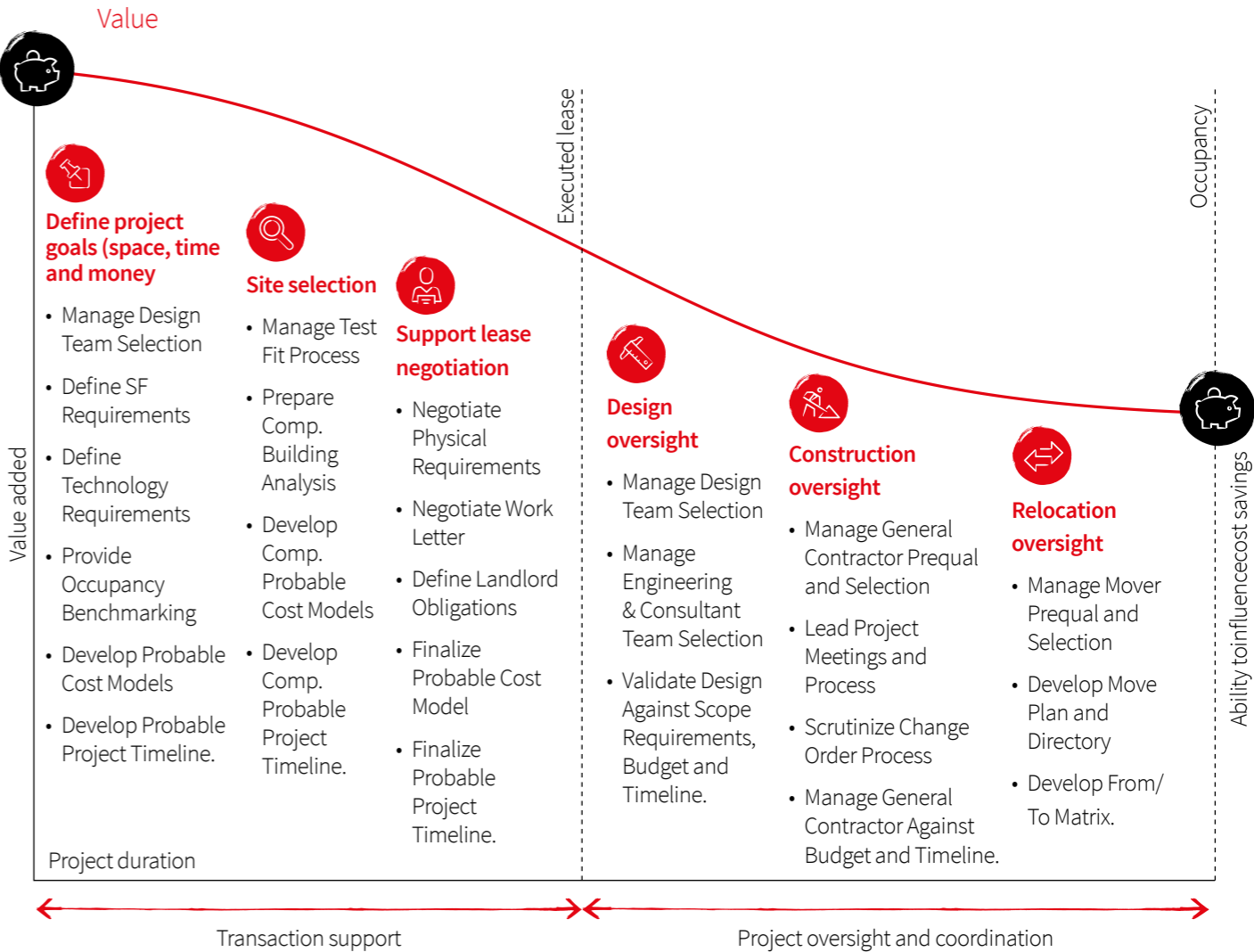
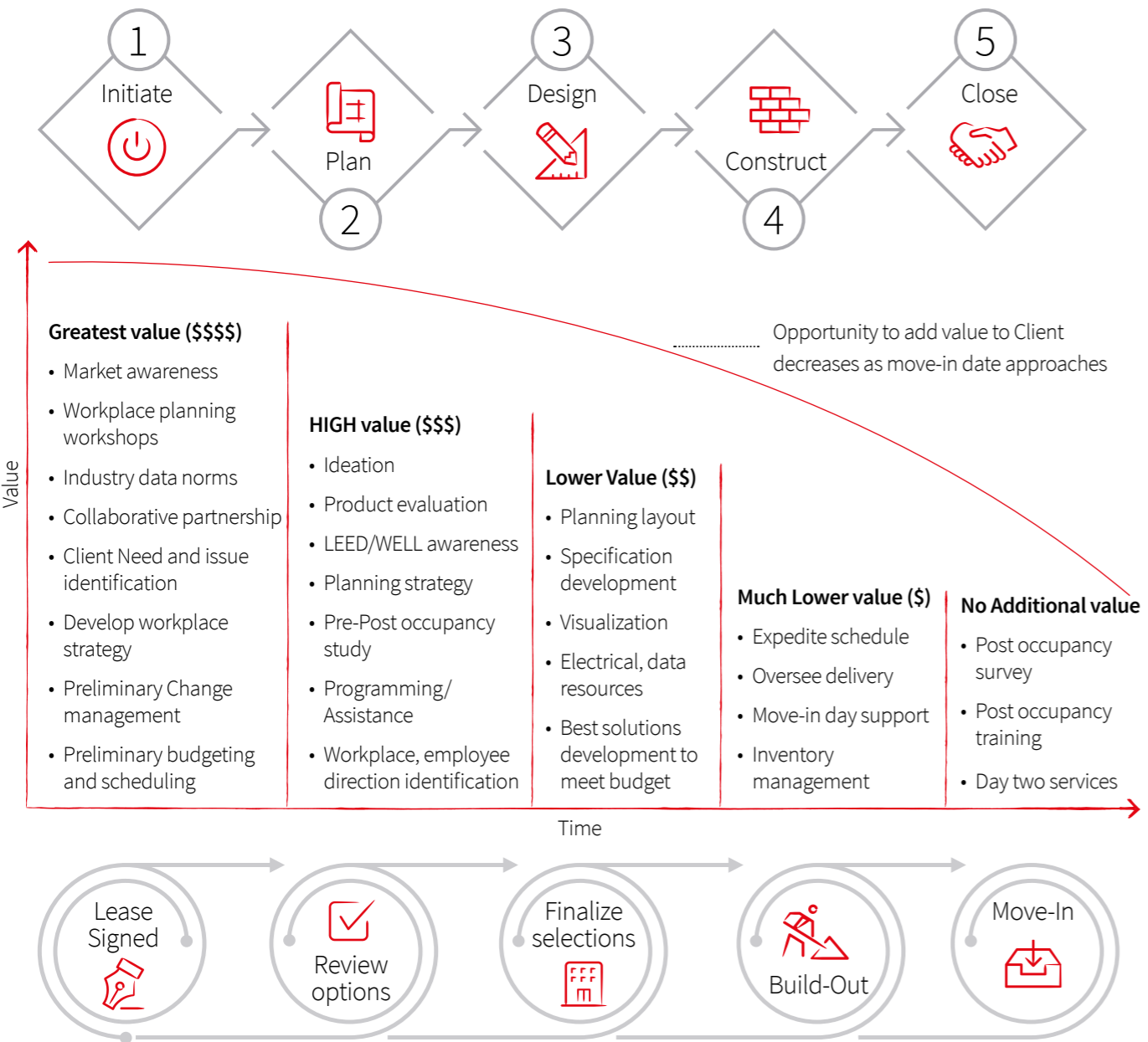
What do project managers offer ahead of engineers, architects and contractors?

Project managers are with you from the start to project completion. Supporting and keeping you informed every step of the way. Our managers help scope the project, providing a clear vision and strategy based on your objectives. Our managers deliver on aspect of the project including liaising with consultants, engineers, architects and contractors. In addition they are motivated from a timing and cost perspective to ensure the project meets your vision and timeline. Whilst engineers, architects and contractors are specialists within their own field, they rarely have the expertise to deliver in the same way, across disciplines.

Why hire a Project Manager?



Value of Early Project Engagement



Strategic project management services save money and time

Project success requires sound, smart decision making from the team leader or project manager. The facility development process is often complex – involving a multitude of consultants, vendors and contractors –and is increasingly subject to the accelerated pace of changes in business. Hiring an experienced project management team to coordinate this process and ensure long-term flexibility avoids the risk of scope creep and the ensuing cost increases, unmet deadlines, liability and lost business opportunity.

# Maintenance

## Property & Asset Management (PAM) Services

Why manage Industrial & Logistics properties through a specialist?

Maintain the common areas through processes including

Meeting the demanding need of specific requirements from occupiers in managing the premises



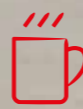
Provision of controlled security



Efficient traffic & parking management

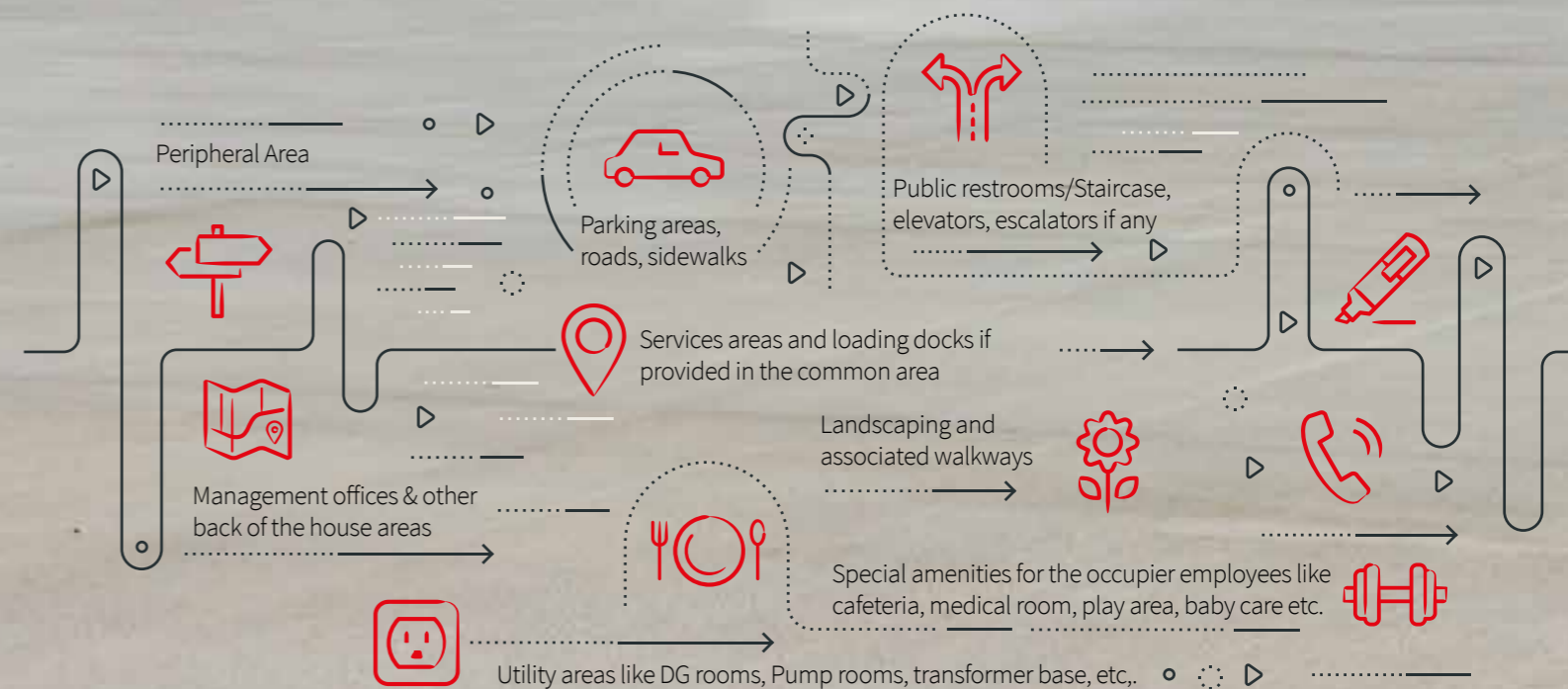


Functional management of amenities and facilities



What is Common Area?

Any area or facility designated by the owner for the convenience and use of occupier and their customers will be defined as common area. The definition varies widely. Following is the list of those areas most often included within the definition of common area.



## Common Area Maintenance (CAM) Charge

CAM include all expenses incurred in operating, managing, repairing, securing, insuring, and improving the common area, equipment's and facilities



**It changes from region to region, property to property**  
**Range in India - INR 1-2/ sq ft/ month**

## Common Area Maintenance - Salient Features

### Identify the need - bring the users and the service providers on the same platform for optimum effectiveness of the property

- Services to be included/ excluded should be identified well in advance before the signing of agreement
- Future Escalations due to uncontrollable parameters like minimum wages, fuel prices, electricity tariff rates, any payable taxes etc. to be agreed before the dotted line is signed



### Best Practice Procedures - to meet the international standards and cost savings

- Services provided should be regularly audited
- SLAs and KPIs to be framed and mutually agreed
- Benchmarking property with similar competitors



### Variation within region and reduction in CAM

- Minimum wages, fuel prices, electricity tariff rates, usage pattern of the property etc all contribute to variable expenses on monthly / annual basis as they are different in various states.



## How to reduce CAM?

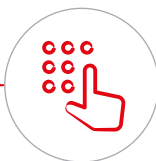
**Regular track**  
on expenses v/s  
planned operating  
budget



**Proper planning**  
- Ramp up plan  
in case of lesser  
occupancy



**Choice of equipment** to  
provide maximum  
efficiency



## How to Offset CAM?

**Advertising**



**Sponsors**



**Events**



Technology is the best option to fall back on. It can save a lot of human error and bring in tremendous Speed, Efficiency, and Agility

“Our approach and modus operandi are to look for both organic as well as the acquisition of prime warehousing properties to further our cause of maximizing stakeholders’ value. With the unprecedented growth in this asset class, rising customers’ expectations and the need for standardization all of it call for a professional and specialist management of this sunrise sector. The specialist professionals enhance efficiency, increases throughput and bring professionalism which is much needed in the evolution of the organized warehousing.”



**Sandeep Chadha**

CEO, Warehouse Capital Advisors

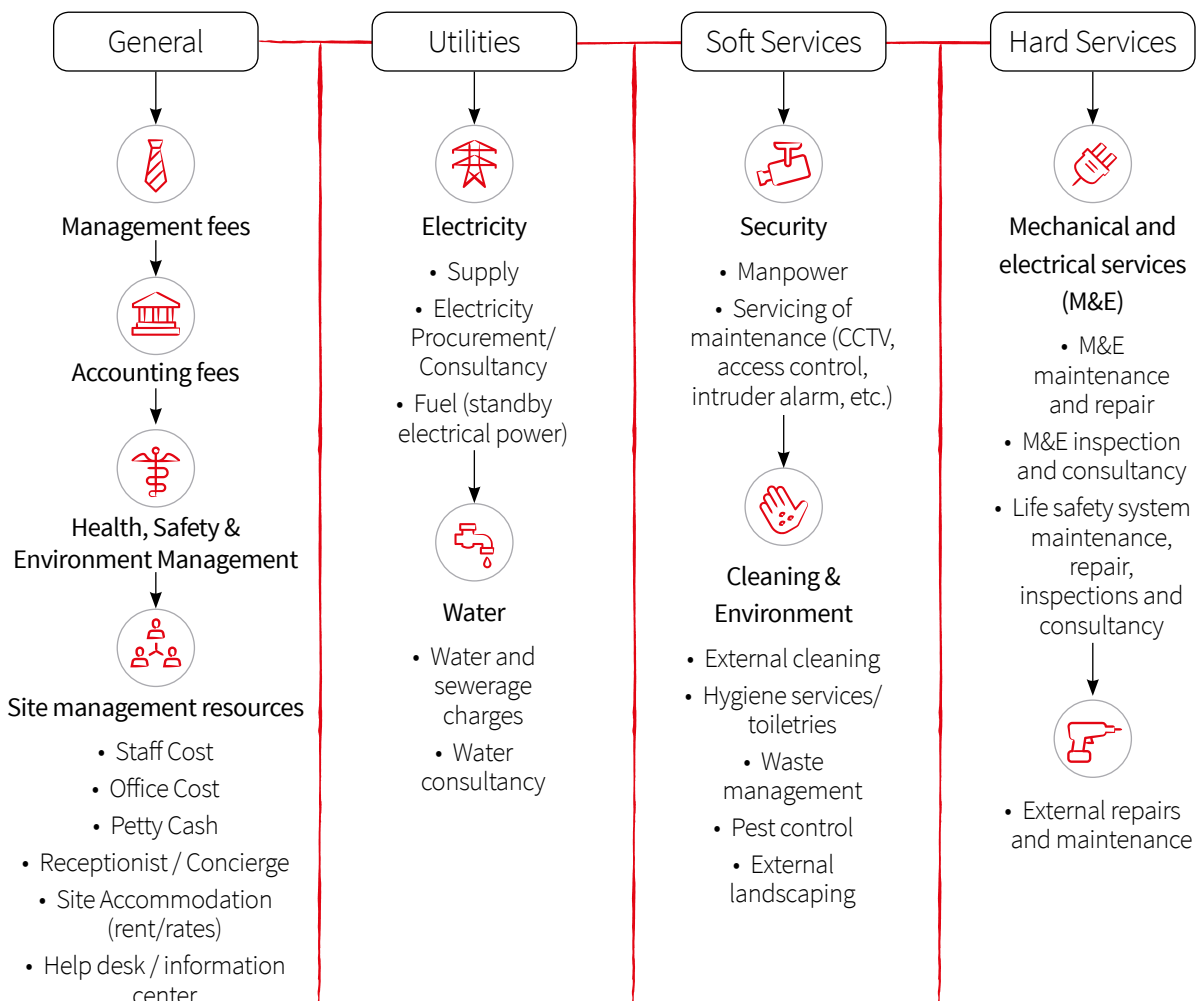
## Common Area Equipment

- DG sets supplying to the common areas
- Traffic system
- Security system and equipment
- STP and Water treatment plant
- Fire Detection, Fighting & sprinkler



- Water storage, supply, drinking water and flushing systems
- Electrical equipment & lighting systems
- Plumbing and Sanitation
- Ventilation & Exhaust Systems

## Major CAM Components



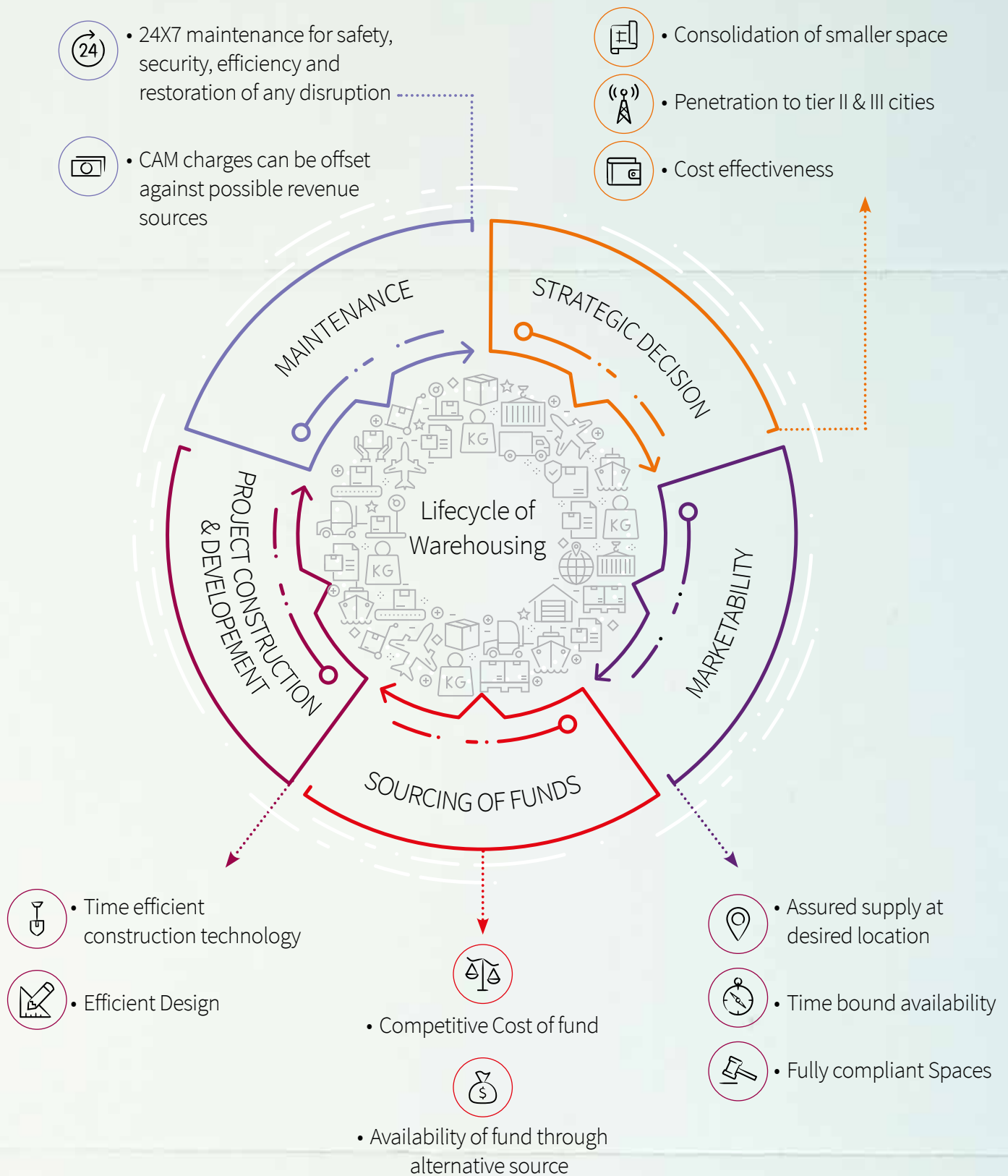
“Efficiency of warehousing space is very much depended on maintenance during operational stage. Value for Money can only achieved if the space has adequate operating system for in-boundary traffic management, assured safety and security, uninterrupted infrastructure support,



clean environment, prompt restoration of any default. Professional agency for managing warehousing space could be better option in near future for operation and maintenance of warehousing project assets.”

**Mehul Shah**  
CEO, Logos India

# Conclusion



## India Warehousing Show - Biggest platform for logistics & supply chain community!

As India's largest business event catering to warehousing, logistics, material handling and supply chain sector, India Warehousing Show welcomes over 15,000 professionals catering to these industries over three days every year. In the format of exhibition held alongside focused conferences, workshops, matchmaking programs and excellence awards, India Warehousing Show over the past one decade has emerged as the 'must attend' event for the supply chain community in India.

India Warehousing Show is organised by Reed Manch Exhibitions, a division of Reed Exhibitions, a global leader in events with a portfolio of about 550 events globally. Reed Manch Exhibitions and Reed Exhibitions India boasts a vast portfolio of events catering to logistics, retail, packaging, corporate gifting and machine tools industry.

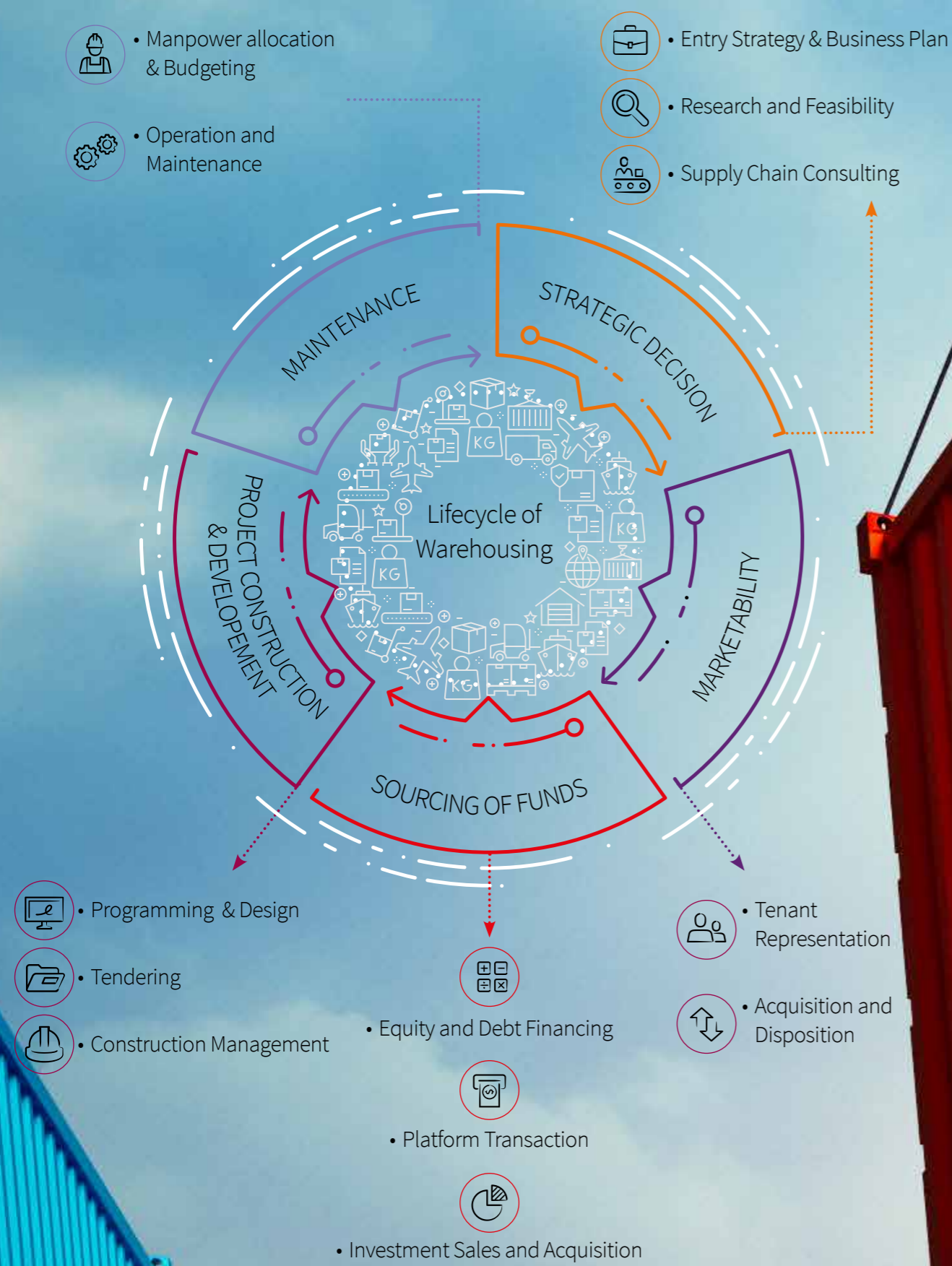
To know more, check out

**<https://www.indiawarehousingshow.com>**

9<sup>th</sup> INDIA  
**WAREHOUSING**  
SHOW 2019

 **Reed Manch  
Exhibitions**

# JLL's *Comprehensive* Solutions



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## About JLL

JLL (NYSE: JLL) is a leading professional services firm that specialises in real estate and investment management. Our vision is to reimagine the world of real estate, creating rewarding opportunities and amazing spaces where people can achieve their ambitions. In doing so, we will build a better tomorrow for our clients, our people and our communities. JLL is a Fortune 500 company with annual revenue of \$16.3 billion, operations in over 80 countries and a global workforce of over 90,000 as of December 31, 2018. JLL is the brand name, and a registered trademark, of Jones Lang LaSalle Incorporated. For further information, visit [jll.com](http://jll.com)

## About JLL India

JLL is India's premier and largest professional services firm specialising in real estate. With an estimated revenue for FY 2018-19 expected to be approx. INR 4,000 crore, the Firm is growing from strength to strength in India for the past two decades. JLL India has an extensive presence across 10 major cities (Mumbai, Delhi NCR, Bengaluru, Pune, Chennai, Hyderabad, Kolkata, Ahmedabad, Kochi and Coimbatore) and over 130 tier II & III markets with a cumulative strength of close to 11,000 professionals.

The Firm provides investors, developers, local corporates and multinational companies with a comprehensive range of services. This includes leasing, capital markets, research & advisory, transaction management, project development, facility management and property & asset management. These services cover various asset classes such as commercial, residential, industrial, retail, warehouse and logistics, hospitality, healthcare, senior living and education.

JLL India won the Five Star Award for 'Best Property Consultancy at the International Property Awards Asia Pacific 2018 -19. The Firm was also recognised amongst the 'Top 100 Best Places to Work in India' in 2017 & 2018 in the annual survey conducted by Great Place to Work® and The Economic Times. It has also been acknowledged as 'Property Consultant of the Decade' at the 10th CNBC-Awaaz Real Estate Awards 2015. For further information, please visit [jll.co.in](http://jll.co.in)

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