

RESEARCH



NCR WAREHOUSING MARKET REPORT

NH-8 CLUSTER

GHAZIABAD CLUSTER

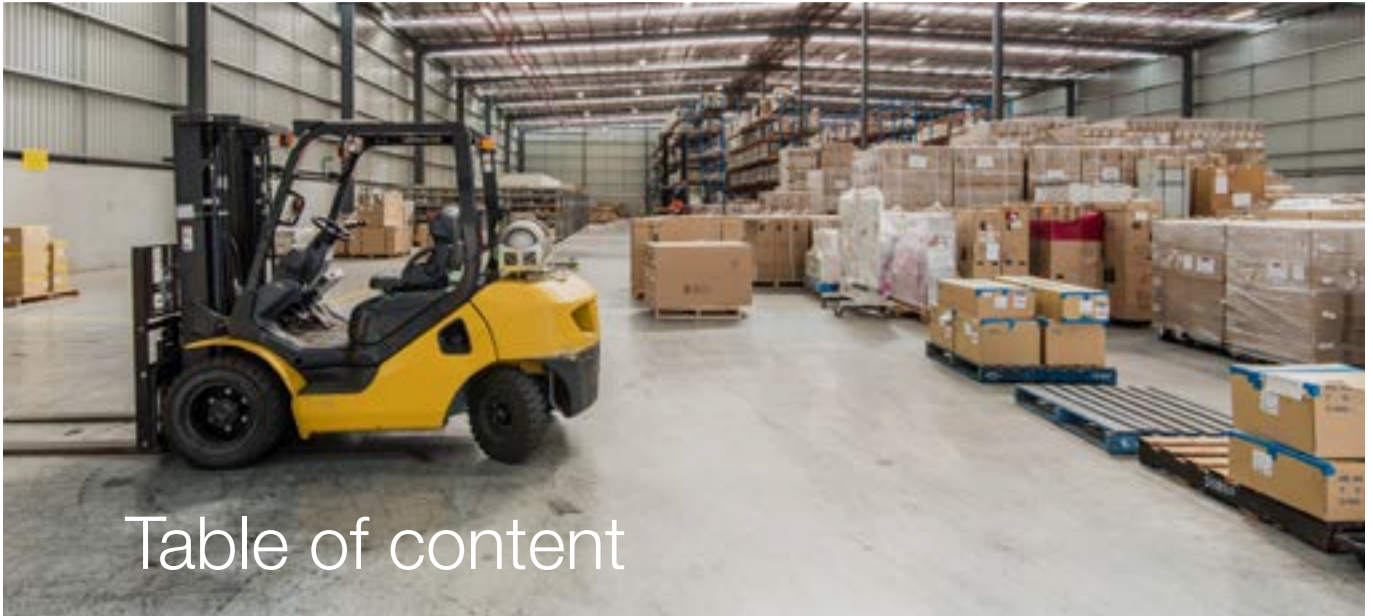


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1. Introduction

While logistics undertakes the critical role of connecting production centres to consumption markets, inefficiencies in managing it could lead to a severe disruption in the entire supply chain network. In India, the experience pertaining to this sector has not been very encouraging, leading to colossal losses during the transportation, distribution and storage of goods. Thus, any effort towards addressing this problem will meet with much appreciation.

The current environment is likely to accelerate progress in the logistics sector in India, considering the interest from government as well as private enterprises. The Government of India brought out the National Manufacturing Policy with the objective of increasing the share of manufacturing in the GDP to 25%. 'Make in India', the government's national initiative, places great importance on building best-in-class manufacturing infrastructure. The upcoming Goods and Services Tax Bill (GST Bill) will amalgamate several central and state taxes into a single tax, thereby mitigating double taxation and facilitating a unified national market. Further, inter-state industrial corridors, such as the ambitious Delhi-Mumbai Industrial Corridor (DMIC), and freight corridors, such as the Western and Eastern Dedicated Freight Corridors, are gaining renewed focus.

The logistics sector can be broadly classified into three areas – transportation, distribution and storage. In India, the transportation and distribution sectors have traditionally been a part of many studies,

with numerous reports and findings affiliated to them. However, it is the storage and warehousing sectors that have mainly remained under-researched. Although the warehousing segment constitutes only 15–35% of the total logistics costs, its importance is significant with respect to the role it plays in the smooth functioning of supply chain networks. With this thought process, we embarked upon the much-needed but uncharted territory of warehouse sector research in India. Our first report in the series—India Logistics & Warehousing Report 2014—was a detailed handbook introducing warehousing sector dynamics, such as demand drivers, policies and regulations, business models, and enabling infrastructure and emerging trends, among others. It set the ball rolling with regards to the exploration of the Indian warehousing market through a research on the key warehousing markets of Mumbai and Pune.

In this latest edition, we present our warehouse market study of the National Capital Region (NCR) – the gateway to North India and the country's largest urban agglomeration. The report provides an exhaustive analysis on parameters such as the spread of warehousing clusters, demand drivers, warehouse space requirements (estimated warehouse stock) and development feasibility. The demand drivers considered for the NCR warehousing market are the manufacturing and consumption sectors. The manufacturing sector-led demand comprises the requirements arising from the need for the storage of raw materials and finished products from industries such as automobiles, cement and food

processing, among others. In terms of consumption-led demand, all product categories, ranging from apparel and footwear to home and lifestyle, have been considered.

On account of the export-import (EXIM) activity, warehousing demand is serviced via Container Freight Stations (CFSs) and Inland Container Depots (ICDs). Further, agriculture warehouse demand is predominantly catered to by government enterprises and the unorganised market, with godown-type structures. Thus, EXIM and agriculture-led warehousing has not been covered in this version of the report.

The renewed focus on infrastructure development and the manufacturing sector offers opportunities across the logistics value chain. With regards to the warehousing sector, which is the subject matter of this report, we are witnessing the heightened interest of international financial and development institutions, global institutional investors and developers to participate in this accelerating opportunity. The Indian developer community, which has long been fixated on the traditional real estate asset classes, viz. residential, office, hotel and retail, have now opened its mind and wallet to enter into the segment. The improving regulatory environment for the Indian Real Estate Investment Trust (REIT), which also covers the warehousing segment, has added to this inclination. E-tail is already proving to be a juggernaut, expanding the market in terms of space and service standards. In light of such a promising environment, we believe that this report will serve as an actionable knowledge piece for your pursuit in the warehousing sector.



2. Major warehousing clusters in NCR

Historically, warehousing activities in NCR have been concentrated in the peripheral areas of New Delhi, such as Alipur, GT Road, Kapashera, Bamnoli, Dhulsiras and Okhla, with godown-type structures dominating the landscape. As land prices became unfeasible for such activities, they slowly started shifting outside the Delhi border. In the southern region, markets such as Kherki Daula and Manesar on NH-8 started attracting warehousing activities, while Kundli and Sonapat on

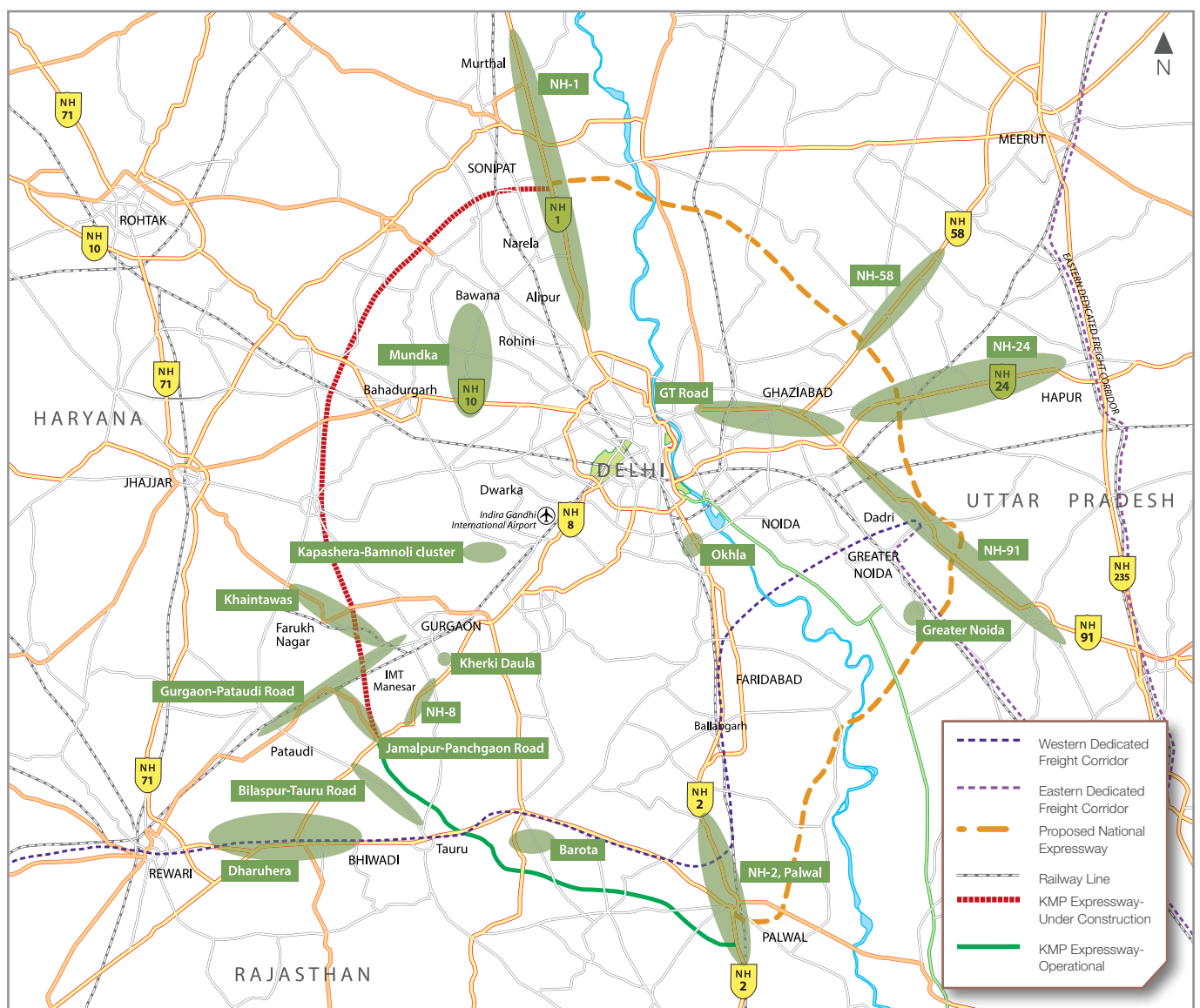
NH-1 in the northern region developed as alternative markets. Similarly, NH-91, NH-24 and NH-58 near Ghaziabad became attractive for warehousing activities as land prices on GT Road became unviable.

Over the last ten years, with residential and commercial development mushrooming on the NH-8 stretch, warehousing activities have gradually shifted towards locations on the internal roads of Haryana. These locations are just off the main national highway but well connected to it. Locations such as the Gurgaon-Pataudi road, Jamalpur-Panchgaon road, Bilaspur-Taururoad and Barota have witnessed a phenomenal growth in

terms of warehousing space over the last decade. Similarly, Dharuhera on NH-8 and Palwal on NH-2 have observed massive warehousing development in recent years.

For the purpose of this report, we have classified the various warehousing markets into two major clusters: NH-8 cluster and Ghaziabad cluster, based on factors such as geographical location, proximity to the national highway, access to the Delhi city centre and distance from the major manufacturing hubs. Since these two clusters collectively account for the majority of the warehousing space demand in the NCR market, the rest of the locations have been classified into the 'Others' category.

Major warehousing locations in NCR



Classification of warehousing locations into major clusters

Warehousing cluster	Major warehousing locations
NH-8 cluster	Dharuhera, Gurgaon-Pautaudi road, Jamalpur-Panchgaon road, Bilaspur-Tauru road, Barota, KherkiDaula, Palwal and other such areas accessible from NH-8 and NH-2
Ghaziabad cluster	Ghaziabad, Dadri and other such areas accessible from NH-24, NH-91 and NH-58
Others	Alipur, Kundli, Sonipat, Murthal and Mundka

Source: Knight Frank Research

Snapshot of major warehousing clusters in NCR

	NH-8 cluster	Ghaziabad cluster
Major roads	NH-8 and NH-2	NH-91, NH-24 and NH-58
Connectivity	Dharuhera, Gurgaon-Pautaudi road, Jamalpur-Panchgaon road, Bilaspur-Tauru road, Barota, KherkiDaula, Palwal and other such areas accessible from NH-8 and NH-2	Connects to various ports in eastern India and the industrial belt of the Eastern Dedicated Freight Corridor (Eastern DFC)
Infrastructure	NH-8 is a six-lane national highway with flyovers and service lanes at all the major junctions.	NH-91 is a 2x2 ill-maintained road with vehicular and pedestrian congestion, leading to traffic snarls.
	NH-2 is a four-lane highway and witnesses frequent traffic congestion.	The NH-24 Hapur–Ghaziabad stretch is a 2x2 good quality road with a host of educational institutes.
	The expressway between Manesar and Palwal, which is part of the Kundli-Manesar-Palwal (KMP) Expressway, connects NH-8 and NH-2.	The NH-58 Ghaziabad–Meerut Road is a 2x2 good quality road with a host of old residential developments along the highway.
Demand drivers: major manufacturing sectors	Auto and auto ancillary, metals, textile and engineering	Food processing, metals, chemicals and pharmaceuticals
Demand drivers: consumption/retail sector	Delhi, Gurgaon and Faridabad	Delhi, Ghaziabad, Noida, Greater Noida and Faridabad
Warehousing space requirement from manufacturing sector	94 mn sq ft	57 mn sq ft
Warehousing space requirement from consumption/retail sector	30 mnsqft	34 mnsqft

Select warehouse operators	Ashiana Logistics, IndoSpace, Acorn Warehouses & Logistics Parks, Adani Group, Value Logistics	Satvik Logistics, Good Luck Warehouse, Future Warehouse Solutions, Lord Balaji Warehousing, Om Kiran Warehouse Complex
Rental value range (₹/sq ft/month)	12 - 21	14 - 20
Land cost range (₹ mn/acre)	25 -40	20 - 40
Competitive advantages	Proximity to the most industrialised region in NCR. More than 43% of NCR's manufacturing activity is located within a two-hour drive from this cluster.	Proximity to the manufacturing hubs of Ghaziabad, Faridabad and Sonipat. 42% of NCR's manufacturing activity is located within a two-hour drive from this cluster.
	Easily accessible to the two most important retail markets in NCR- Gurgaon and Delhi. Gurgaon and Delhi together account for more than 86% of the total retail spending in NCR.	Proximity to the densely populated consumption hubs of Ghaziabad, Delhi, Noida and Greater Noida. These hubs together account for 95% of the total retail spending in NCR.
Challenges		Frequent traffic congestion due to poor infrastructure and densely populated urban areas
	Rapid urbanisation, leading to unviable land rates for warehousing activity.	Takes significant time to convert land use from agriculture to industrial/warehousing
		Rapid urbanisation leading to unviable land rates for warehousing activity.
		Quality of internal roads starkly inferior compared to the national highways. This restricts the opening up of new land parcels for warehousing activities.

3. Total requirement for warehousing space

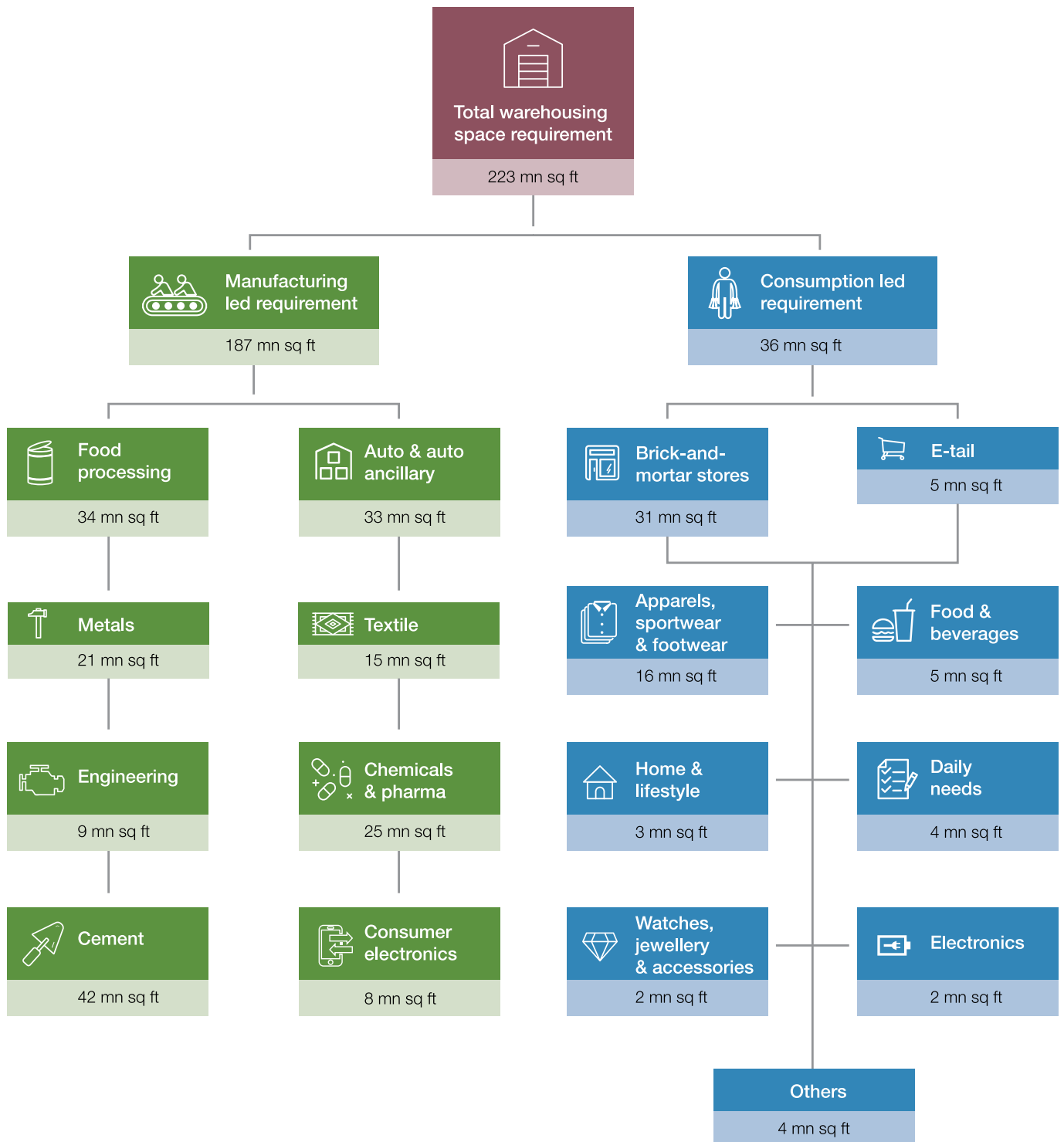
Currently, NCR's total requirement for warehousing space is estimated to be 223 mn sq ft, of which more than 80%, or 187 mn sq ft, is from the manufacturing sector. However, the majority of the warehousing requirement of the manufacturing sector is fulfilled by captive space, either in terms of space at the manufacturer's plant or company-owned warehouses. Although the trend of leasing a warehouse rather than owning it is steadily picking up with the emergence of third-party logistics players (3PL), it is still at a nascent stage compared to developed markets such as Europe and the US. These 3PL players, such as Safexpress, Blue Dart, TCI

and Future Supply Chain, among others, provide end-to-end logistics services, including a common warehousing facility, to multiple manufacturers, thereby reducing the need to have a separate warehouse. such a leasable market in NCR is currently estimated to be in the range of 100-120 mn sq ft. However, the share of annual transacted volume is approximately 7 mn sq ft.

With the Goods and Service Tax (GST) set to become operational, the need for captive warehouses will reduce further. We believe that a large number of manufacturers will outsource their logistics and warehousing requirements and focus on their core operations. This will create an additional demand for leasable warehousing space in NCR in the coming years.

In contrast to the manufacturing-led requirement for warehousing space, consumption-led requirement is mostly for leasable space, with very few operators fulfilling their needs through a captive warehouse. This is primarily due to the need to have a fulfilment centre as close to the urban area as possible in order to ensure quick delivery. Over the last ten years, this segment has witnessed a renewed traction, especially in the E-tail sector. As the time between placing an order and delivery has shrunk drastically with the advent of the E-tail sector, the need for warehousing space has also increased significantly. With the share of E-tail expected to rise steadily in the coming years, we estimate the demand for warehouses from this segment to increase proportionately as well.

Total requirement for warehousing space in NCR



Note I: The warehousing space requirement mentioned in the chart above is the total space requirement (estimated warehouse stock) as of April 2016. The majority of the warehousing requirement of the manufacturing sector is fulfilled by captive space, either in terms of space at the manufacturer's plant or company-owned warehouses.

Note II: The food and beverages category includes all the dining, quick service restaurants (QSR) and takeaways. The daily needs category includes all the FMCG products, grocery and other such daily retail products that are consumed on a regular basis.

Source: Knight Frank Research

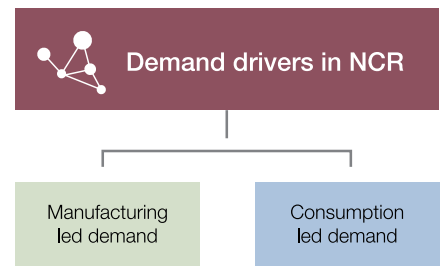
4. Demand drivers of warehousing space in NCR

The primary demand drivers of warehousing space in NCR can be broadly classified into two categories: manufacturing-led demand and consumption-led demand. The demand from the manufacturing sector arises predominantly due to the distance between the manufacturer's factories, raw material suppliers and the consumption markets of the final goods. The need to store the raw materials or final goods due to this distance, determines the amount of space required by each manufacturer. The quantum of space required is also dependent on the type of product that is

manufactured. Hence, each manufacturer will have a different requirement for space, depending on these factors.

Consumption-led demand, which is an equally important demand driver for warehousing space, is largely dependent on population, income level and the propensity to spend. The changing dynamics of the retail industry has resulted in the business model of a retailer becoming heavily dependent on a smooth and efficient supply chain network. In addition to this, the advent of E-tail in recent years has necessitated the need for huge warehouses close to urban centres in order to deliver in the shortest possible time. Such factors have brought the warehousing industry to the forefront of the retail business and compelled retailers to focus on this segment.

In the following sections, we have identified the key manufacturing industries in NCR, their current warehousing requirement, the major manufacturing hubs and the various regions within NCR from where the requirements originate. Similarly, in terms of consumption, we have identified the major product categories, their current warehousing requirements and important consumption clusters in the region.



4.1 Manufacturing-led demand

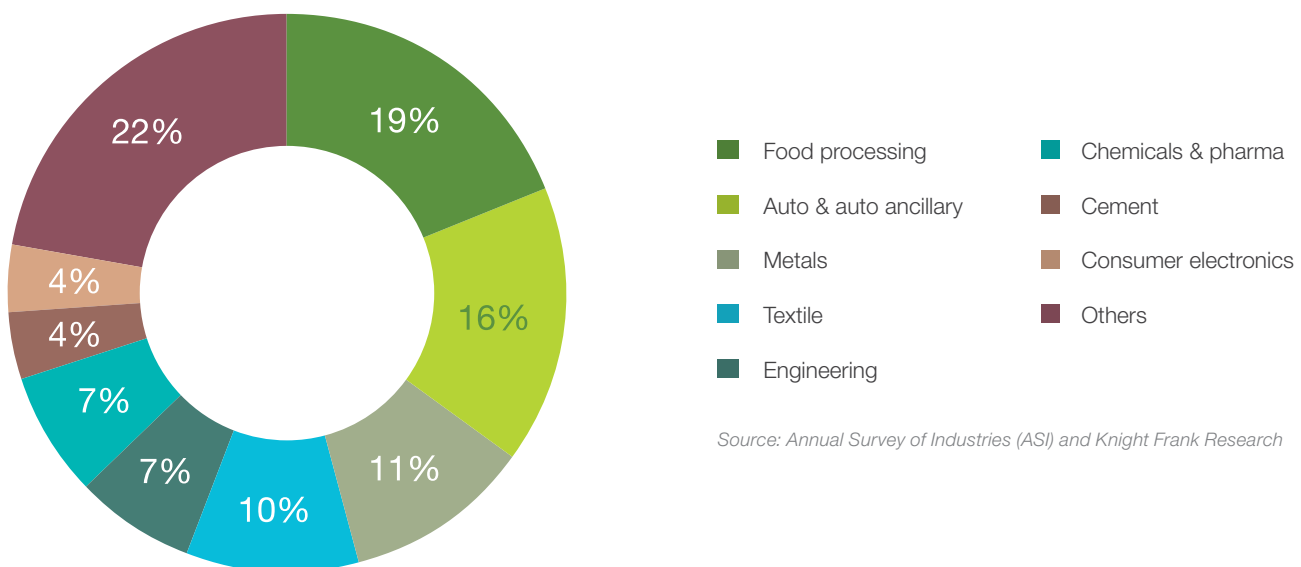
NCR is one of the largest manufacturing hubs in the country and accounts for the majority of the production activity in north India. Food processing, which includes dairies, rice mills, sugar mills, confectionaries, and alcoholic and non-alcoholic beverages, among others, has the largest share in the output in NCR. This

is followed by the auto and auto ancillary and metals industries. However, in terms of the requirements for warehousing space, the cement sector leads with more than 42 mn sq ft. As discussed earlier, the quantum and type of warehousing space required for each manufactured product is different. Additionally, each industry follows a different inventory cycle, which influences the amount of space required to a great extent. Hence, despite the cement sector contributing just 4% of NCR's total output,

its warehousing space requirement is the highest. The cement sector accounts for 23% of the total warehousing requirement from the manufacturing-led demand.

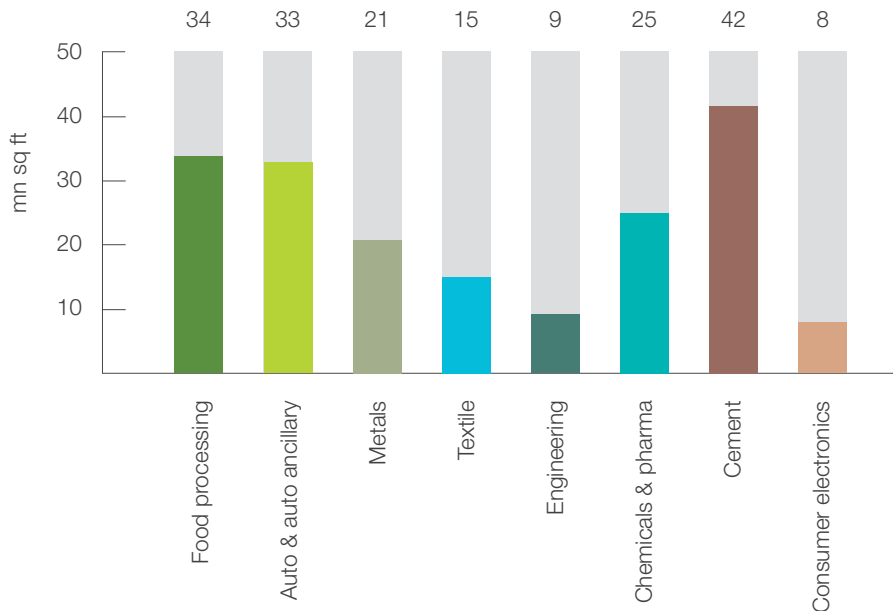
The other big demand drivers for warehousing space in NCR are the food processing, auto and auto ancillary, chemicals and pharmaceutical sectors. Just the top four sectors account for more than 70% of the total warehousing space requirement of the region.

Share in output of the various manufacturing industries in NCR



Source: Annual Survey of Industries (ASI) and Knight Frank Research

Warehousing space requirements of major manufacturing industries in NCR



Note: The warehousing space requirement mentioned in the chart above is the total space requirement (estimated warehouse stock) as of April 2016. This is calculated on the basis of the latest output data from ASI. The majority of the warehousing requirement of the manufacturing sector is fulfilled by captive space, either in terms of space at the manufacturer's plant or company-owned warehouses.

Source: Knight Frank Research

Manufacturing activities are concentrated largely in the southern and north-eastern parts of NCR. Currently, the NH-8 and NH-2 clusters in the southern region and the NH-24, NH-91 and NH-58 clusters in the north-eastern region together account for 85% of the total manufacturing activity within NCR. This is one of the primary reasons for which most of the existing warehouses operate from one of these clusters. While Delhi, NH-1 and NH-10

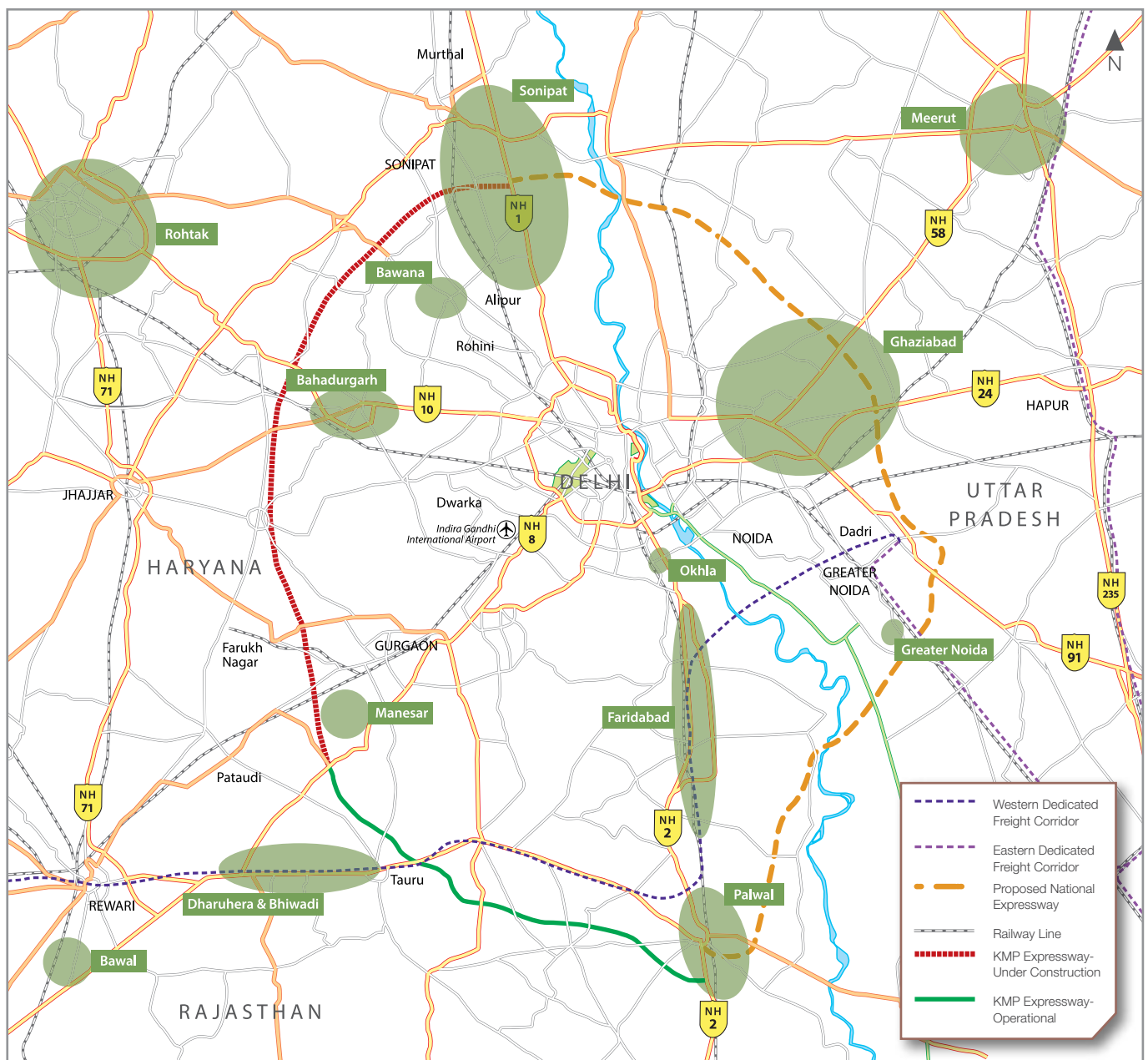
also have various manufacturing units, their share in NCR's total production output is considerably lower than the other regions.

The factors clearly indicate that the demand for manufacturing-led warehousing space in NCR will be concentrated primarily in the NH-8 and Ghaziabad clusters, with sectors such as auto and auto ancillary, cement, chemicals and pharmaceuticals and food processing leading in terms of this demand.

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Manufacturing Cluster	Industrial areas
Delhi	Industrial areas within Delhi, such as Narela, Okhla, Bawana and RohtakEoad, among others
NH-8 & NH-2	Industrial areas accessible from NH-8 and NH-2, such as Manesar, Bhiwadi, Neemrana, Faridabad and Palwal, among others
NH-1 & NH-10	Industrial areas accessible from NH-1 and NH-10, such as Sonipat, Panipat, Bahadurgarh and Rohtak, among others
NH-24, NH-91 & NH-58	Industrial areas accessible from NH-24, NH-91 and NH-58, such as Ghaziabad, Dadri and Meerut, among others

Manufacturing clusters within NCR

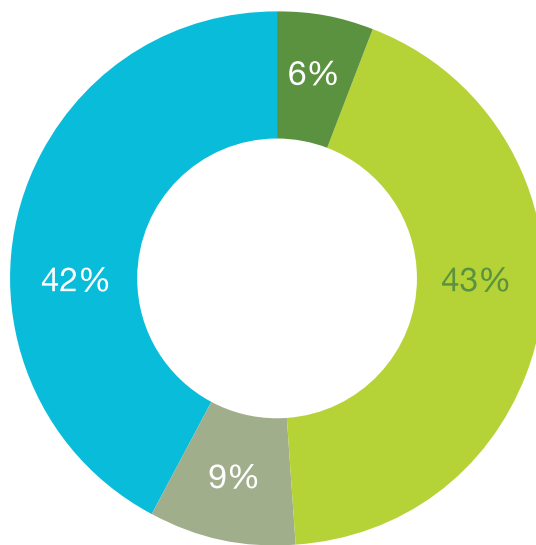


MAJOR MANUFACTURING CLUSTERS IN NCR

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These factors clearly indicate that the demand for manufacturing-led warehousing space in NCR will be concentrated primarily in the NH-8 and Ghaziabad clusters, with sectors such as auto and auto ancillary, cement, chemicals and pharmaceuticals and food processing leading in terms of this demand.

Share in output of each manufacturing cluster within NCR



■ Delhi ■ NH-8 & NH-2 ■ NH-1 & NH-10 ■ NH-24, NH-91 & NH-58

Source: Annual Survey of Industries (ASI) and Knight Frank Research

4.2 Consumption-led demand

In terms of retail spending, NCR is the largest market in India with Delhi, Gurgaon and Noida contributing the most. This retail spending not only includes traditional brick-and-mortar stores, malls, shopping streets and mom-and-pop stores but also accounts for the spending by consumers through the e-commerce medium. Hence, any type of consumer goods consumed within NCR, whether offline or online, is categorised in the retail spending.

Among the various product categories, apparel, sportswear and footwear together have the highest share, at 43%, in the total retail spending in NCR. Thus, even in the warehousing space requirement, this category contributes the most, at 14 mn sq ft or 38%. Other prominent product categories include food and beverages, department stores and daily needs. The daily needs category includes all the FMCG products, grocery and other such daily retail products that are consumed on a regular basis. Just the top four categories account for more than 80% of the total warehousing space requirement in NCR.

The E-tail sector has emerged as a major driver for the incremental warehousing space requirement in recent years and

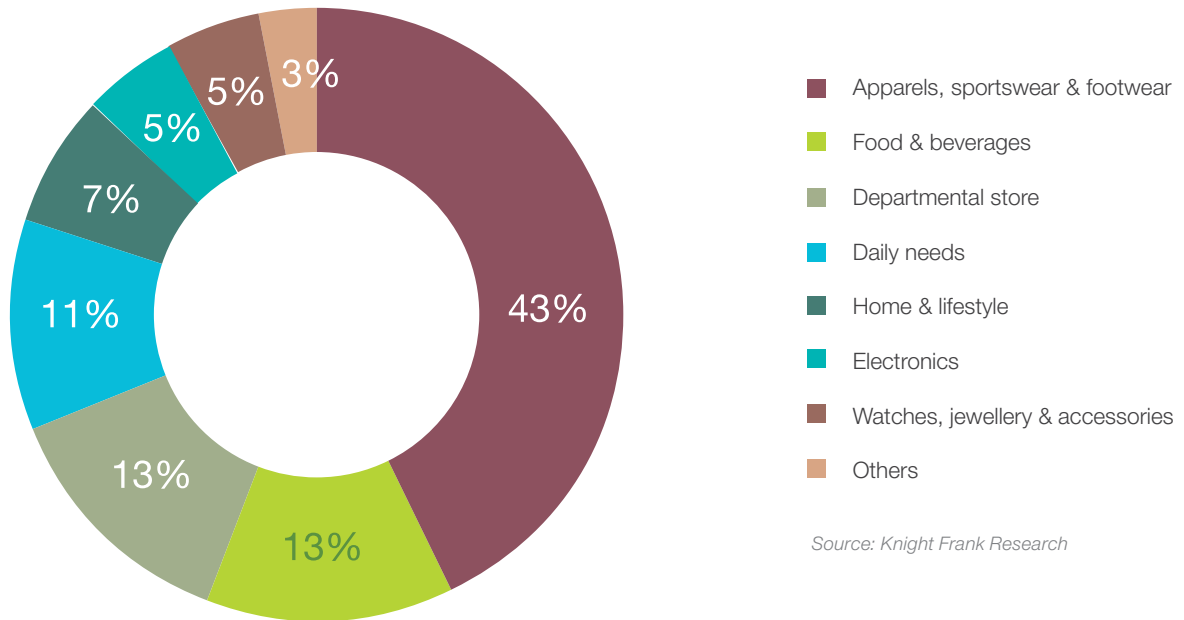
currently accounts for 14% of the total space requirement of the consumption-led demand. While brick-and-mortar stores still lead in terms of space requirement, at 31 mn sq ft, the E-tail segment contributes upto 5 mn sq ft. This is significant, considering that until just a few years ago, this entire segment was non-existent.

While the boom in the E-tail sector may have eaten into the market share of the brick-and-mortar stores to a great extent, our analysis indicates that the advent of this segment has expanded the overall consumption pie and led to a substantial increase in the urban consumers' propensity to spend. Hence, the warehousing space requirement by the E-tail segment is largely the incremental demand for space and not just a replacement of the demand for space by brick-and-mortar stores.

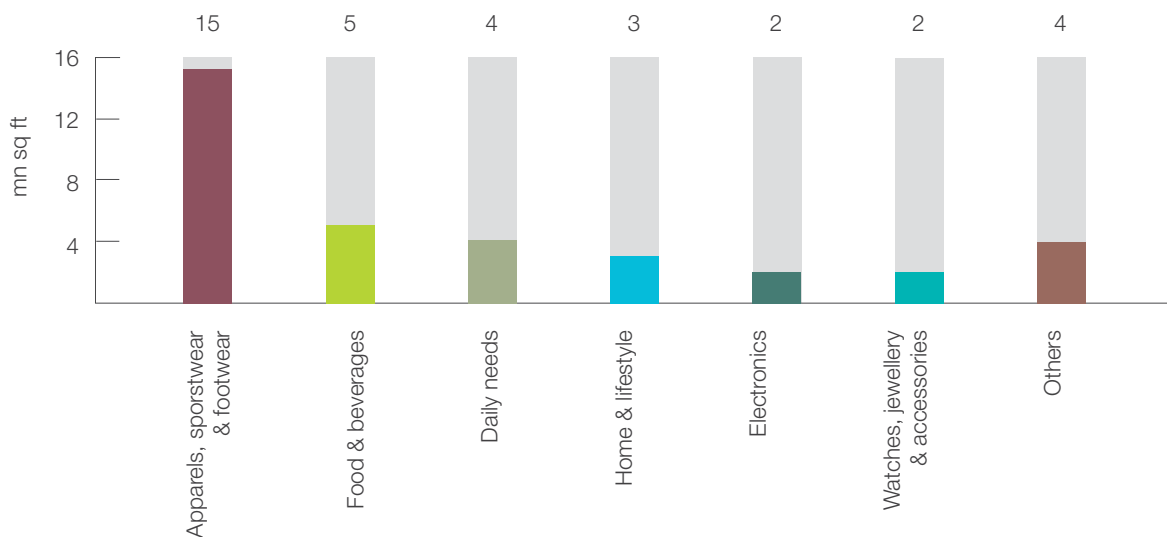
Going forward, we believe that the share of the E-tail sector will increase further in the total retail spending of consumers. This will invariably lead to a higher demand for warehousing space from this segment in the coming years. As per our estimates, the warehousing space requirement from the E-tail segment will increase by 60%, from the current 5 mn sq ft to more than 8 mn sq ft by 2020.

The E-tail sector has emerged as a major driver for the incremental warehousing space requirement in recent years and currently accounts for 14% of the total space requirement of the consumption-led demand. While brick-and-mortar stores still lead in terms of space requirement, at 31 mn sq ft, the E-tail segment contributes upto 5 mn sq ft. However, we estimate space requirement from the E-tail segment to increase by 60%, to more than 8 mn sq ft by 2020.

Category-wise split of retail spending in NCR



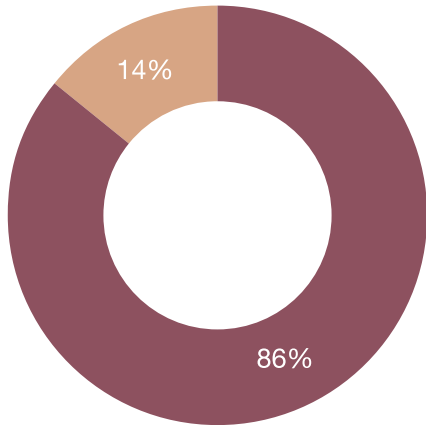
Warehousing space requirements for the major retail categories in NCR



Note: The warehousing space requirement mentioned in the chart above is the total space requirement (estimated warehouse stock) as of April 2016. The food and beverages category includes all the dining, quick service restaurants (QSR) and takeaways. The daily needs category includes all the FMCG products, grocery and other such daily retail products that are consumed on a regular basis.

Source: Knight Frank Research

Warehousing space requirements by E-tail and brick-and-mortar stores



■ Brick-and-mortar stores ■ E-tail

Source: Knight Frank Research

The NCR market can be further classified into five sub-markets — Delhi, Gurgaon, Faridabad, Noida and Greater Noida, and Ghaziabad — for the purpose of gauging the consumption-led demand. Delhi, the largest sub-market among these, accounts for 75% of NCR's population. However, it contributes to more than 80% of the total retail spending in the region. This is primarily due to the higher level of per capita income and the greater propensity to spend among Delhi's residents.

The above analysis indicates that the majority of the warehouses in NCR will

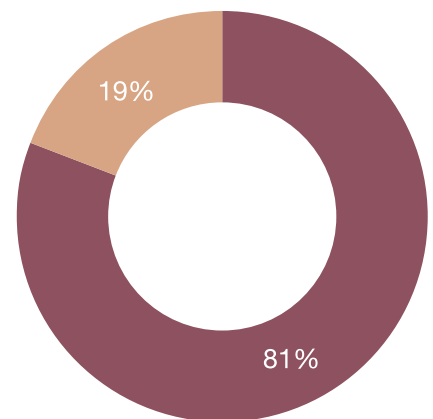
have to be located in areas that have easy access to Delhi, with minimal time to deliver products. This opens up the potential for all the major entry points into Delhi to be developed as warehousing hubs, be it NH-8 and NH-2 in the south, NH-1 in the north, NH-10 in the west and NH-24, NH-91 and NH-58 in the east. Currently, all these clusters have warehousing activities in some or the other form. However, NH-8 has the highest concentration of such warehouses, which are driven by consumption-led demand.

Cluster-wise population split in NCR



Source: Census 2011

Share of each consumption cluster in retail spending in NCR



■ Delhi ■ Others including Gurgaon, Noida, Greater Noida, Ghaziabad and Faridabad

Source: Knight Frank Research

5. NH-8 warehousing cluster

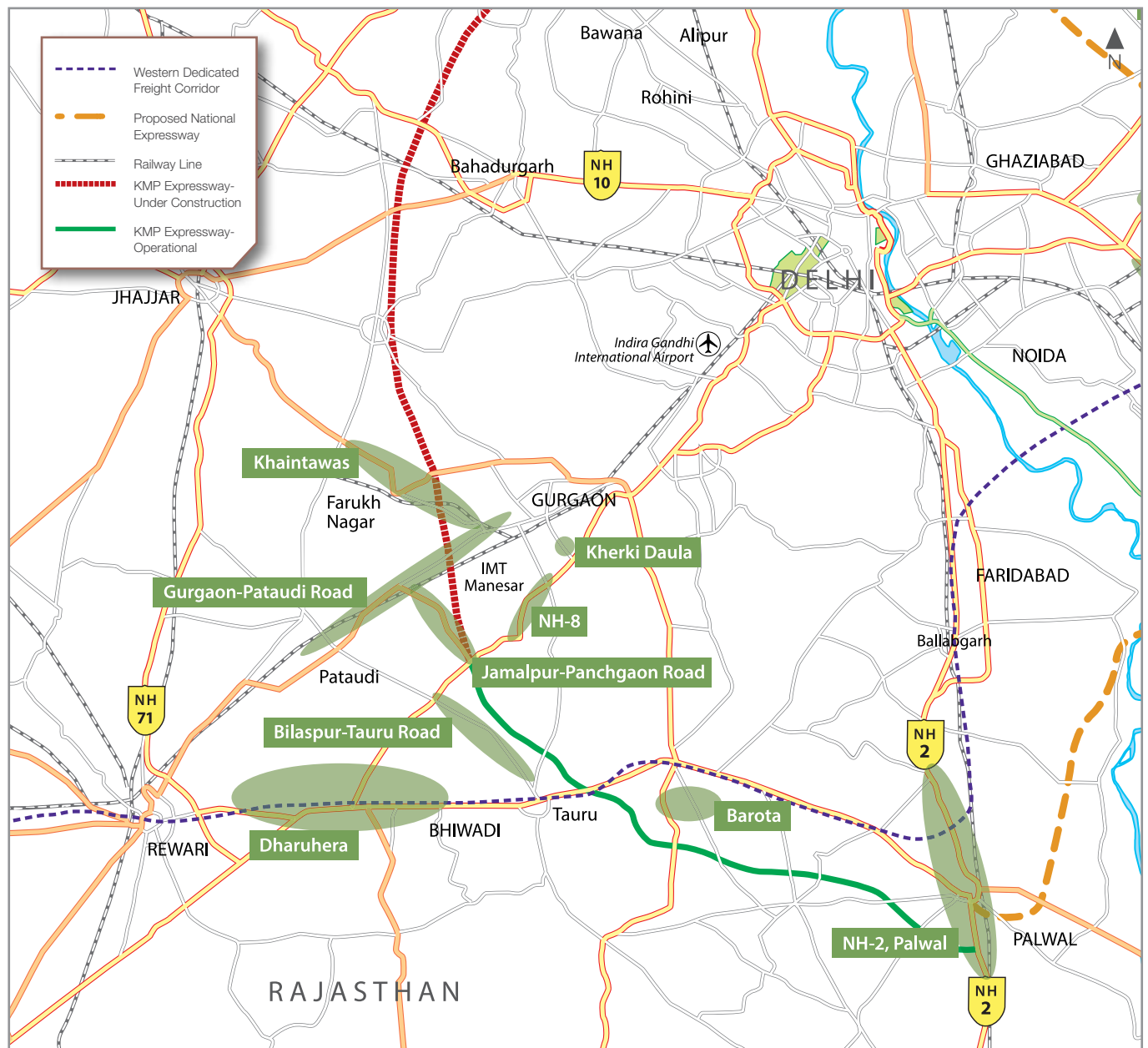
National Highway 8 (NH-8) and National Highway 2 (NH-2) are the two most important roads that connect NCR to the western and central regions of India. Apart from providing direct access from NCR to Jawaharlal Nehru Port Trust (JNPT), one of the busiest ports in the country, NH-8 is also connected to other important ports in Gujarat. Additionally, most of the industrial areas in Haryana and Rajasthan are

concentrated along these highways. These factors have resulted in NH-8 becoming one of the busiest national highways in the country over the last few decades.

Factors such as easy connectivity to NCR, access to the major industrial areas of Haryana and Rajasthan and direct port connectivity have led to a huge demand for warehousing space along these roads. Apart from the massive development of warehouses on either side of the national highway, locations such as Gurgaon-Pataudi road, Jamalpur-Panchgaon road, Bilaspur-Tauru road and Barotahave

witnessed an unprecedented construction of warehouses in recent years. Since the demand drivers for all the warehouse locations along NH-8 and NH-2 are similar, we have clubbed these locations into a single warehousing cluster for the purpose of this report and called it as the 'NH-8 warehousing cluster'. In the following sections, we have explained the primary demand drivers of the warehousing space in this cluster, market characteristics, infrastructure development, prevailing rentals and land rates, challenges and the future outlook.

NH-8 warehousing cluster



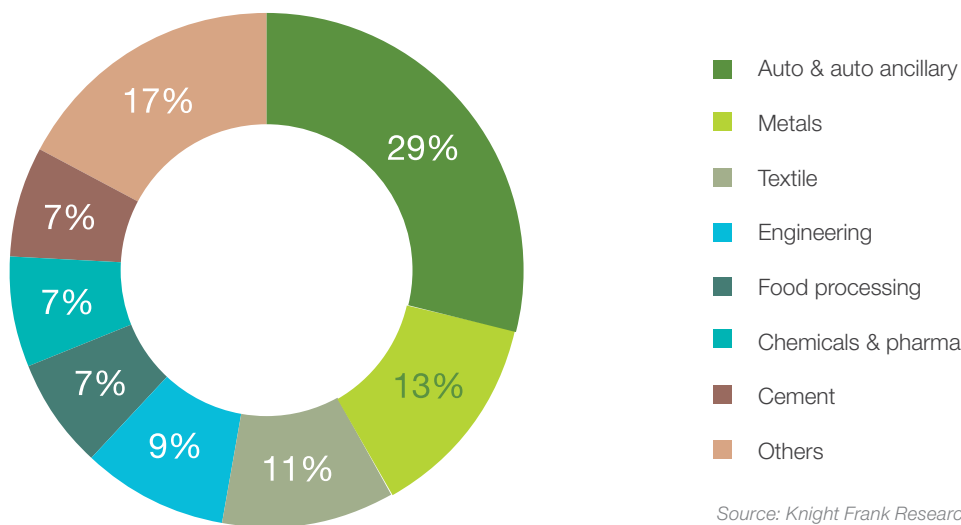
5.1 Demand drivers of warehousing space in the NH-8 cluster

The demand drivers of warehousing space in this cluster can be broadly classified into two sub-segments: manufacturing-led demand and consumption-led demand.

Of the two categories, the manufacturing-led demand accounts for the lion's share due to the massive concentration of industrial activity along these routes. Within the manufacturing segment, the auto and auto ancillary sector leads in terms of output, with auto majors such as Maruti Suzuki, Honda Motorcycle &

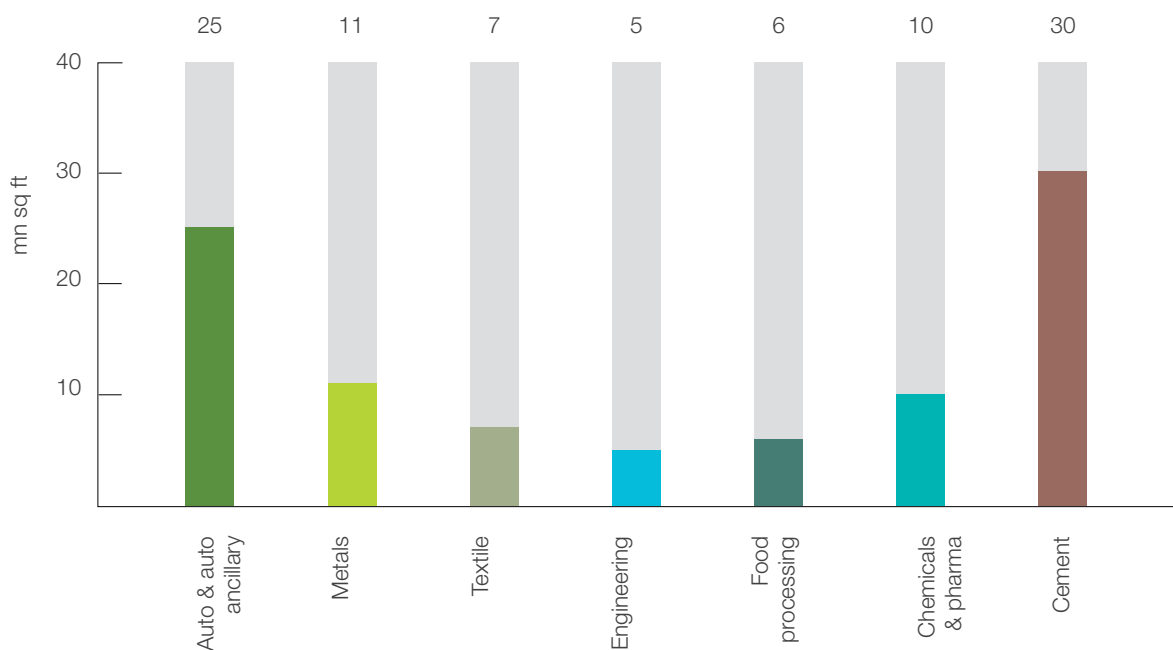
Scooter and Hero MotoCorp having their plants located within this cluster. Among the other manufacturing industries, the metals, textile and engineering sectors constitute a major portion of the output, followed by food processing, chemicals and pharmaceuticals, and cement.

Share in output of various manufacturing industries in the NH-8 cluster



Source: Knight Frank Research

Warehousing space requirement of major manufacturing industries in the NH-8 cluster



Note: The warehousing space requirement mentioned in the chart above is the total space requirement (estimated warehouse stock) as of April 2016. This is calculated on the basis of the latest output data from ASI. The majority of the warehousing requirement of the manufacturing sector is fulfilled by captive space, either in terms of space at the manufacturer's plant or company-owned warehouses.

Source: Knight Frank Research

The demand for warehousing space is closely linked to the type of manufacturing industries that are serviced through them. Hence, despite the auto and auto ancillary sector accounting for the largest share in terms of output within this cluster, it is the cement industry that requires the maximum warehousing space. Currently, the estimated requirement of warehousing space in this cluster by the cement sector is 30 mn sq ft, followed by the auto and auto ancillary sector, at 25 mn sq ft. The total warehousing space requirement from the manufacturing sector is in excess of 94 mn sq ft.

Apart from the manufacturing sector, there is also a very strong demand for warehousing space from the retail sector. The retail sector primarily includes all the consumption-led products, such as grocery, FMCG products, apparel, consumer durables and furniture, among others, which are consumed by end users. This also includes the demand serviced by online players, such as Flipkart, Snapdeal, Pepperfry and Big Basket. Since the NH-8 and NH-2 warehousing clusters are located in close proximity to the major consumption centres of NCR such as Delhi and Gurgaon, there is an inherent demand for warehouses from such companies and their dealers.

Currently, Delhi and Gurgaon account for more than 86% of the total retail spending in NCR. This means that upto 86% of NCR's retail market can be serviced through the warehousing cluster on NH-8. As per our estimates, the total requirement of warehousing space originating from consumption-led demand in this cluster is 30.6 mn sq ft, including 4.4 mn sq ft from the E-tail segment.

5.2 Types of warehouses and major players

Warehouses in locations such as Gurgaon-Pataudi road, Jamalpur-Panchgaon road, Bilaspur-Tauru road and Barota are relatively recent constructions. Most of the development on these roads comprises pre-engineered building (PEB)

type structures with 24-foot clear height and basic infrastructure such as power backup, ample parking space, fire-fighting equipment and insulation, among others. Some of the prominent occupiers are Lifestyle Home Centre, Arvind Brands, Amazon, TCI, Gati KWE and Fedex. However, most of the warehouses in Kherki Daula and certain parts of NH-8 are old godown-type structures with minimal amenities and poor infrastructure.

Currently, most of the incremental demand comes from E-tail sector companies that not only require adequate clear height within the warehouse for multi-level stacking of products, but also look for added amenities such as power backup, fire-fighting equipment and enhanced security. This has resulted in the majority of the new warehouses being constructed to adhere to such standards and move away from the traditional godown-type structure.

Select warehouse operators

Ashiana Logistics

Indospace

Acorn Warehouses & Logistics Parks

Adani Group

Value Logistics

5.3 Location and infrastructure

The NH-8 warehousing cluster can be divided further into two sub-markets based on their access from the two major roads: NH-8 and NH-2. NH-8 is a six-lane national highway starting from Delhi and passing through the most industrialised regions of country – Gurgaon, Jaipur, Ahmedabad, Vadodara, Surat and Vapi. The road finally connects to Mumbai and JNPT through NH-4. Apart from being the busiest national highway, it is also a part of the upcoming Delhi-Mumbai Industrial Corridor (DMIC).

Despite passing through Gurgaon, one of the most urbanised areas in the country,

NH-8 seldom witnesses traffic congestions due to the provision of flyovers and service lanes at all the major junctions. Although the majority of the warehouses are located on the internal roads of NH-8, the travel time from these roads to the highway is less than 15 minutes due to their excellent quality. This ensures seamless road connectivity between the various warehousing markets located in this cluster and the industrial areas situated along this route. Additionally, the Delhi city centre can be reached within a travel time of about 60-100 minutes from most of the warehouses located in this cluster.

NH-2, which connects Delhi and Faridabad to central and eastern India, is a relatively narrower four-lane highway and witnesses frequent traffic congestion. The presence of various manufacturing units along the highway makes it difficult for a smooth flow of traffic. However, the recently inaugurated expressway between Manesar and Palwal, which is part of the Kundli-Manesar-Palwal (KMP) Expressway, has reduced the travel time between NH-2 and NH-8 significantly. The effective travel time has reduced to less than 60 minutes from the earlier 100-120 minutes. This has brought the various manufacturing units and warehouses located on NH-2 considerably closer to NH-8, thus narrowing the difference between the two warehousing clusters.

Warehouses located on the NH-8 cluster can service the two major consumption markets in NCR (Delhi and Gurgaon) within 100 minutes. Additionally, all the major industrial hubs located close to NH-8 and NH-2 can be accessed within two hours. However, servicing the industrial hubs of Ghaziabad, Bahadurgarh, Bawana, Sonipat and Rohtak from this cluster may exceed two hours and could extend upto three hours in certain cases. In addition to this, the transport of goods through Delhi in large commercial vehicles is taxed heavily and there is a strict restriction on their entry time. Such factors make these industrial hubs located on the northern and eastern part of NCR even more inaccessible from NH-8 and NH-2.

Road distance and transit time to important locations from warehousing clusters on NH-8 and NH-2

Distance from	km	Travel time in mins
Delhi City Centre (Connaught Place)	40 - 80	60 - 100
Gurgaon city centre (DLF CyberCity)	22 - 60	28 - 90
IMT Manesar	5 - 65	10 - 80
Dharuhera & Bhiwadi industrial belt	5 - 55	10 - 70
Bawal industrial area	28 - 100	30 - 100
Neemrana industrial area	52 - 120	50 - 130
Faridabad industrial belt	24 - 95	36 - 100
Palwal industrial area	5 - 80	10 - 90
Ghaziabad industrial belt	80 - 100	130 - 150
Bahadurgarh industrial cluster	40 - 110	60 - 140
Bawana industrial area	60 - 100	100 - 170
Sonipat industrial area	82 - 120	120 - 180
Rohtak Industrial cluster	70 - 90	140 - 160

Source: Knight Frank Research

Currently, the estimated requirement of warehousing space in this cluster by the cement sector is 30 mn sq ft, followed by the auto and auto ancillary sector, at 25 mn sq ft. The total warehousing space requirement from the manufacturing sector is in excess of 94 mn sq ft.

5.4 Rent and land cost of warehouses

Currently, warehouses that are closer to Gurgaon or located on the national highways are quoting the highest rental values. As we move away from the national highways towards the internal roads, the rental values reduce, based on the distance and travel time taken from the national highways. Also, warehouses located away

from the urban centres (Gurgaon and Faridabad) have lower rents, primarily due to the relatively lower cost of land in such areas. However, there are certain other factors that could influence the rental values, apart from the location and cost of land. Technical aspects, such as floor strength, fire safety equipment, power back-up, security, common amenities and quality of approach road, among others, have a direct bearing on the rent of the property.

Indicative rental values and land rates

Location	Quoted rent (₹/sq ft/month)	Quoted land rate (₹ mn/acre)
NH-8	16 – 19	30 – 40
Gurgaon-Pataudi Road	12 – 17	28 – 40
Jamalpur-Panchgaon Road	15 – 21	35 – 40
Bilaspur-Tauru Road	14 – 18	30 – 40
Barota	11 – 14	25 – 35
Dharuhera	12 – 17	25 – 40
NH-2, Palwal	15 – 18	30 – 40

Source: Knight Frank Research

5.5 Competitive advantages

The biggest competitive advantage of this warehousing cluster is its proximity to the most industrialised region in NCR. More than 40% of NCR's manufacturing activity is located within a two-hour drive from this cluster. Additionally, the concentration of auto companies in this region accentuates the need for warehouses to be located in the vicinity to their plants. This is primarily to service these auto plants in a minimum time period, as most of them follow the 'just-in-time' inventory system.

Another advantage is the ease of access to the two most important retail markets in NCR- Gurgaon and Delhi. Gurgaon

and Delhi together account for more than 86% of the total retail spending in NCR and hence, it becomes imperative for retailers to have their warehouses located as close to their target market as possible. Moreover, with the emergence of E-tail, the delivery time from the warehouse to the customer has shrunk to under three hours. In order to cater to such demand, it becomes necessary for E-tailers to have a warehouse within a driving distance of 60-90 minutes. Since the city centre of Delhi and Gurgaon can be reached within a time frame of 30-90 minutes from most of the warehousing markets situated in this cluster, it gives the cluster an edge.

5.6 Challenges

The biggest challenge of this warehousing cluster is the rapid urbanisation that this region has witnessed over the last ten years. This has inherently led to an exponential rise in land rates, thereby making most of the locations unviable for warehousing business. This is primarily because the appreciation in rental values has significantly lagged the increase in land prices. While developers that had previously purchased land at low rates are able to survive, any new development at the current costs seems unviable.

Going forward, If the current pace of residential and commercial development continues, we believe that even the existing warehousing players may convert their land into more lucrative uses, such as residential or commercial. This could push the future development of warehouses further south on the national highways or deeper into the interiors of Haryana. The downside of such a scenario is the likely increase in driving time and delays in servicing the target segment due to the poor quality of roads and infrastructure in these regions.

5.7 Outlook

NH-8 is expected to further consolidate its position as a manufacturing hub with the development of the Delhi-Mumbai Industrial Corridor (DMIC) along this route. Additionally, the presence of various automobile majors will continue to attract auto ancillary and engineering sector companies. With rising land rates and unaffordable rentals, warehouses are expected to gradually move towards the various internal roads in Haryana and the periphery of the highway.

Warehouse rents on locations such as NH-8, NH-2 near Palwal, and Jamalpur-Panchgaon Road within the NH-8 warehousing cluster have already moved beyond ₹15/sq ft/month and are quoting as high as ₹21/sq ft/month in certain cases. Such high rentals have already rendered warehousing activity for certain manufacturing industries unviable, and any further rise in rents could push the remaining occupiers towards alternative cheaper locations. Going forward, the rapid development of residential and commercial projects in the vicinity could threaten the feasibility of warehouse operations in certain locations of this cluster, such as

Manesar and pockets of Gurgaon - Pataudi Road. Such developments could lead to a sharp appreciation of land prices in the adjoining localities and this could push up the rental expectations of land owners even further.

Since land cost is the most critical component of warehousing development, it influences the realisable returns to a great extent. In order to understand the feasibility of land cost for warehousing activities, we have developed a land cost matrix. This matrix explains the feasible land cost that an investor should ideally pay in this cluster in order to achieve the expected return in the range of 10%-18% per annum, subject to the achievable rents. For example, with a returns expectation of 14% per annum and an achievable rental value of ₹18/sq ft/month, the feasible land cost amounts to ₹26 mn/acre. In other words, investors can fetch a 14% per annum return only if they are able to purchase land at or below ₹26 mn/acre at present and lease it at ₹18/sq ft/month. As the purchase price of land goes higher, the realisable return reduces. Similarly, as the achievable rental value increases, the feasibility of higher-cost land also goes up.

Feasible land cost matrix in the NH-8 warehousing cluster (₹ mn/acre)

		Investor Return per annum				
		10%	12%	14%	16%	18%
Prevailing rental value (₹/sq ft/month)	12	18	14	11	8	5
	14	25	20	16	12	10
	16	31	25	21	17	13
	18	37	31	26	21	18
	20	43	36	31	26	21

Note: The table presents 25 options of land cost in ₹ mn/acre at different investor returns and rental value combinations. The 10 options which are possible to source in the NH-8 warehousing cluster and are upward of the minimum prevailing land rate, which is ₹ 25 mn/acre in this cluster, have been highlighted.

Source: Knight Frank Research

In order to achieve returns upwards of 14% per annum, investors will have to consider new locations within the NH-8 warehousing cluster where the land acquisition cost is minimal, and is well connected to the national highway through a good quality 40-60 foot road. Locations that fit these criteria will be able to attract occupiers. We believe that the NH-71 stretch between Rewari and Jhajjar offers such an opportunity for future development.

Currently, most of the locations within the NH-8 cluster are feasible for warehousing activities at the prevailing land rates, subject to a minimum achievable rental value of ₹14/sq ft/month. However, rental values below this level may not even fetch returns of 10% per annum to the investors at the current land prices.

For investors to achieve returns upwards of 14% per annum, it is imperative that the land acquisition cost does not exceed ₹26 mn/acre and that it can be leased out at a minimum rental value of ₹18/sq ft/month. Considering the current market scenario, only certain locations, such as NH-8, Jamalpur-Panchgaon Road, Bilaspur-Tauru Road and NH-2 near Palwal are able to command a rental value upwards of ₹18/sq ft/month. However, the prevailing market price of land in these locations is higher than ₹30 mn/acre, thereby rendering them unfeasible for the 14% per annum investor return.

In order to achieve returns upwards of 14% per annum, investors will have to consider new locations within the NH-8 warehousing cluster where the land acquisition cost is minimal, and is well connected to the national highway through a good quality 40-60 foot road. Locations that fit these criteria will be able to attract occupiers. We believe that the NH-71 stretch between Rewari and Jhajjar offers such an opportunity for future development. Although this stretch is located further away from NH-8, the driving time to most of the manufacturing hubs located near the highway is less than 90 minutes due to the good quality 2x2 roads on this stretch. Additionally, the Delhi city centre can be reached within 120 minutes from here. Hence, based on these factors, we believe that the NH-71 stretch between Rewari and Jhajjar will witness considerable warehousing development in the coming years.

Assumptions	
Construction cost (₹/ sq ft)	1,200
Ground coverage	57%
Rental escalation per annum	5%
Occupancy	50%: First year 75%: Second year 100%: Third year onwards
Debt funding	80% of construction cost
Interest rate	12%
Tax rate	30%
Cap rate	10%

6 Ghaziabad warehousing cluster

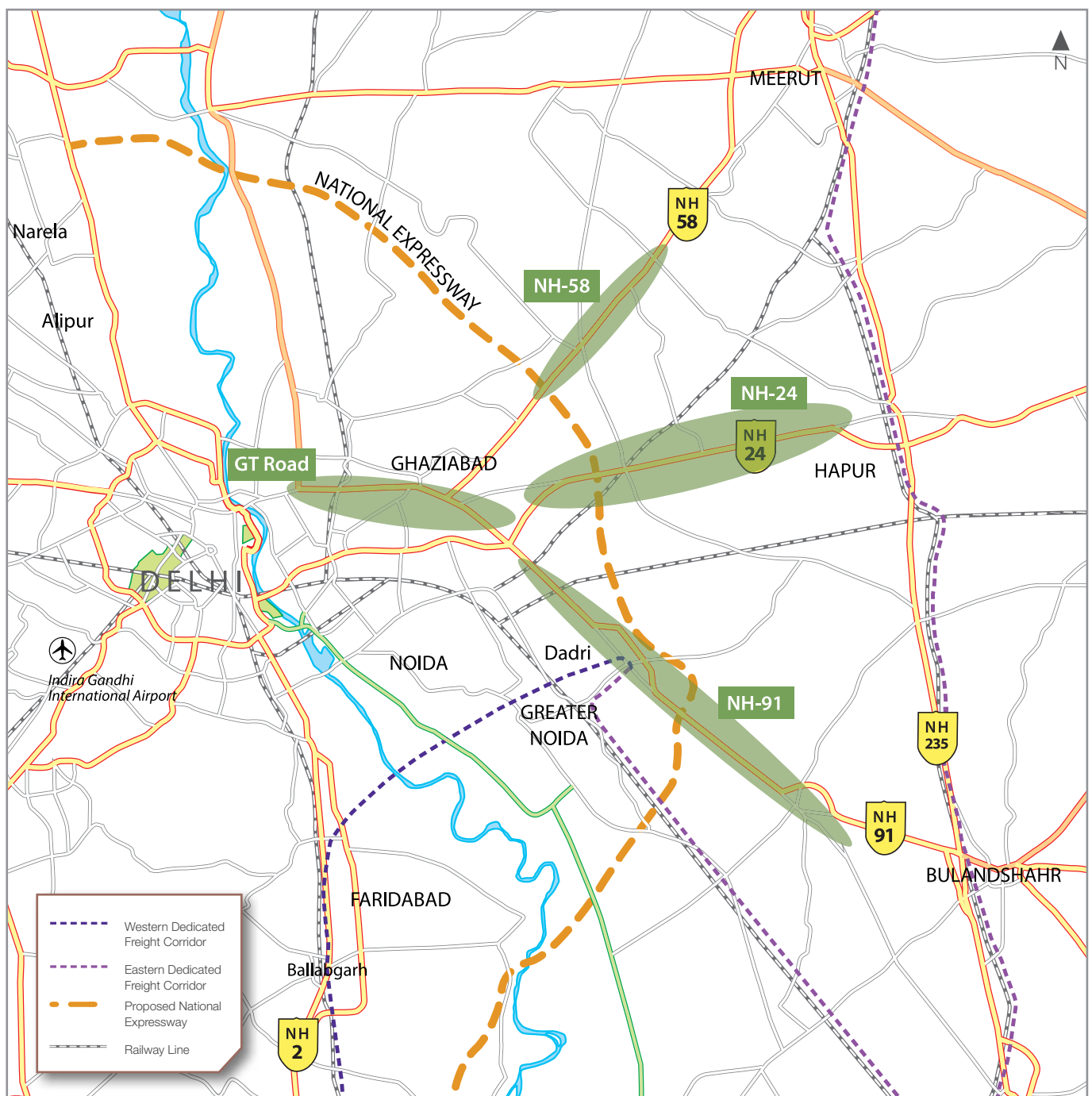
To the east of the National Capital Region (NCR) are the warehousing markets of National Highway 24 (NH-24) and National Highway 91 (NH-91). Spread around Ghaziabad, the gateway to the densely populated state of Uttar Pradesh, this cluster predominantly comprises markets

along the Ghaziabad–Dadri stretch on NH-91, the Ghaziabad–Hapur belt on NH-24 and the Ghaziabad–Meerut stretch on NH-58. Besides, warehouses can also be identified in parts of GT Road and Greater Noida.

Since the demand drivers for all these warehouse locations are similar, we have clubbed the locations into a single warehousing cluster for the purpose of

this report and named it the ‘Ghaziabad warehousing cluster’. In the sections below, we have explained the primary demand drivers of warehousing space in this cluster, market characteristics, infrastructure development, prevailing rentals and land rates, challenges and the future outlook.

Ghaziabad warehousing cluster



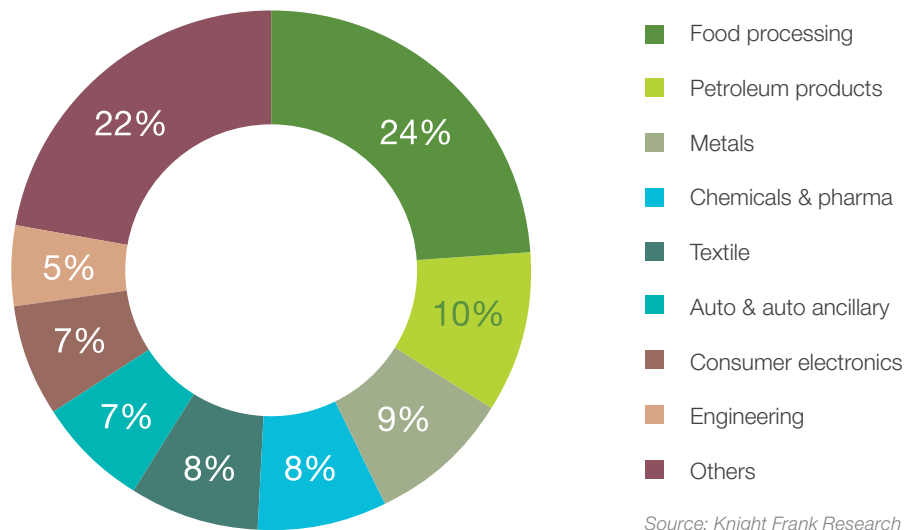
Knight Frank Research estimates the warehousing requirement from the manufacturing sector to be 57 mn sq ft in the Ghaziabad cluster. The food processing sector accounts for 31% or 18 mn sq ft of the manufacturing-led market due to the agrarian landscape and the presence of numerous dairies and ancillary activities in the cluster.

6.1 Demand drivers of warehousing space in the Ghaziabad cluster

The demand drivers of warehousing space in the Ghaziabad cluster can be broadly classified into two sub-segments: manufacturing-led demand and consumption-led demand. Of the two categories, the manufacturing-led demand accounts for the lion's share due to the massive concentration of industrial activity

along these routes. In the manufacturing segment, the food processing sector leads in terms of output, with food processing and dairy product firms, such as Mother Dairy and Amul Dairy, having their plants in this cluster. The food processing industry accounts for a quarter of the industrial output. This is followed by other manufacturing industries, such as petroleum, metals, chemicals and the pharmaceutical sector.

Share in output of various manufacturing industries in the Ghaziabad cluster



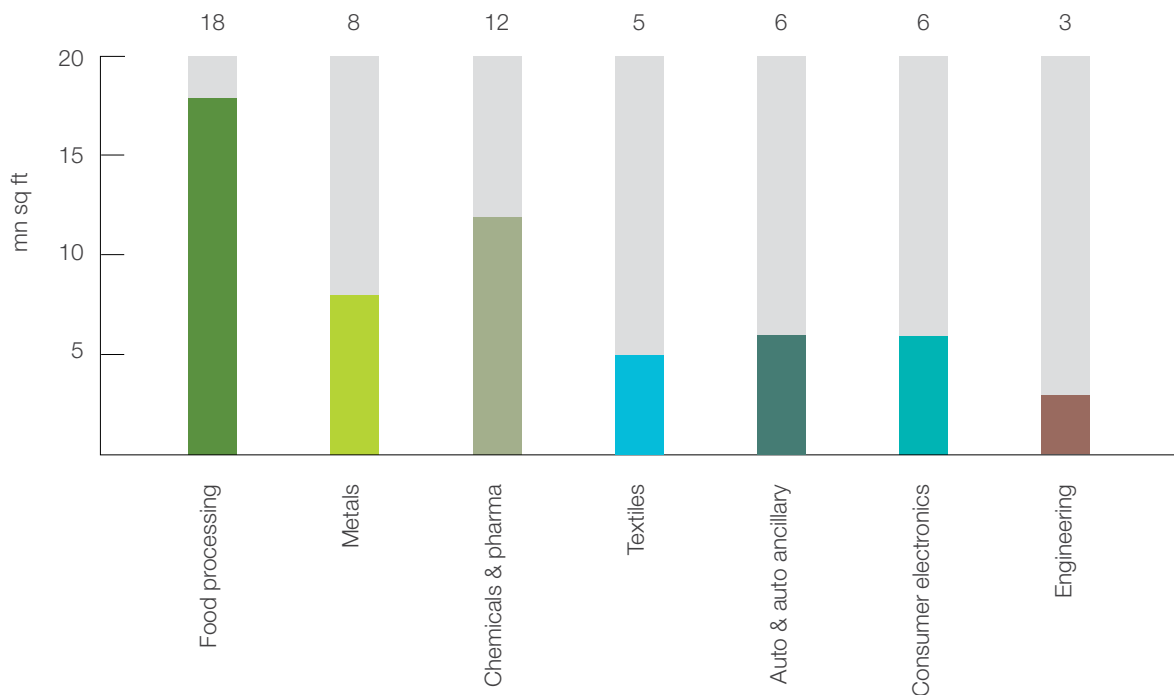
The Ghaziabad cluster accounts for 42% of the manufacturing sector output across NCR – only marginally lower than the 43% share of the NH-8 and NH-2 clusters. The prominence of such manufacturing sector activity creates the demand for warehousing space depending on the nature of the cargo and the target delivery timelines of the supply chain.

Knight Frank Research estimates the warehousing requirement from the manufacturing sector to be 57 mn sq ft in the Ghaziabad cluster. The food processing sector accounts for 31% or 18 mn sq ft of the manufacturing-led market due to the agrarian landscape and the presence of numerous dairies and ancillary activities in the cluster. The dairy products ecosystem has been created with companies

manufacturing products such as milking machines, milk testing equipment, butter churners, cream separators and milk analysers.

The chemical and pharmaceutical sector is the second largest occupier of warehouses in the cluster, with a warehouse market size of 12 mn sq ft or 21% of the manufacturing-led market. Companies such as Dabur, Century Laminating, Modi Paints and Simbhaoli Sugars are present in the cluster and are involved in the production of medicines, plywood, paints, alcohol, industrial chemicals and gases, among others. The warehousing demand composition favours the metals, auto and auto ancillary, consumer electronics, textiles and engineering sectors.

Warehousing space requirement of major manufacturing industries in the Ghaziabad cluster



Note: The warehousing space requirement mentioned in the chart above is the total space requirement (estimated warehouse stock) as of April 2016. This is calculated on the basis of the latest output data from ASI. The majority of the warehousing requirement of the manufacturing sector is fulfilled by captive space, either in terms of space at the manufacturer's plant or company-owned warehouses.

Source: Knight Frank Research

Besides the manufacturing sector, consumption-led warehousing requirement is also prevalent in this market. The consumption-led demand emanates from the storage requirement of product categories ranging from apparel, food and beverages (F&B), electronics, and home

and lifestyle. Such warehousing demand across NCR is estimated to be around 36 mn sq ft, which also includes 5 mn sq ft by e-tail players such as Flipkart, Snapdeal and Amazon. However, the most accessible consumption centres that can be serviced from the Ghaziabad cluster

are Ghaziabad, Noida, Greater Noida and Delhi. Together, these markets account for a warehouse requirement of 32 mn sq ft, which includes the e-tail demand of 4.3 mnsq ft.

6.2 Types of warehouses and major players

The warehouses in this cluster are a mixed bag of old warehouses by unorganised players and those with modern facilities. The warehouses at the beginning of the Ghaziabad–Dadri stretch on NH-91 are primarily old structures from the unorganised sector. The amenities and construction quality of these old warehouse facilities are of a lower specification. However, there are options of new facilities coming up in localities such as Dhoom Manikpur, Pilkhuwa–Hapur Road and Meerut Road (NH-58).

The project size in the cluster ranges from 50,000–500,000 sq ft and are

predominantly pre-engineered buildings (PEB). A few of the warehouse facilities only have sheds, and still fewer have only the RCC structure. The nature of the cargo handled by the occupier determines the choice of the structure. Since PEB structures offer relatively more vertical storage space on account of their greater floor–ceiling height, such structures are preferred by occupiers that use pallets and electric-powered forklifts for the purpose of stacking cargo. PEB structures generally provide a side/clear height of 24–28 ft. In contrast, RCC structures provide just 12–14 ft of vertical space for storage. The load bearing capacity of the floor is trimix 5 metric tonne per sq m.

Select warehouse operators

Satvik Logistics

Good Luck Warehouse

Future Warehouse Solutions

Lord Balaji Warehousing

Om Kiran Warehouse Complex

6.3 Location and infrastructure

The Ghaziabad cluster enjoys proximity to the manufacturing and consumption hubs of Uttar Pradesh, Haryana and Delhi. This strategic location has established it as an important warehousing cluster in NCR.

The NH-91 Ghaziabad–Dadri belt is a national highway, but has poor infrastructure. It is a 2x2 ill-maintained road with vehicular and pedestrian congestion, leading to traffic snarls. It is an old industrial town, dotted with old warehouses and residential development. Such a situation makes multi-axle truck movement slower. The situation is better around Dadri, where the bypass of the town area is managed with a 3x3 well-maintained stretch of NH-91. Going forward, the warehousing activities will benefit immensely with the

upcoming Eastern Dedicated Freight Corridor (DFC) alignment at Dadri.

The NH-24 Hapur–Ghaziabad stretch also enjoys good connectivity, with the presence of the manufacturing and consumption hubs of NCR, as listed in the adjoining table. The stretch is a 2x2 good quality road with a host of educational institutes. On account of its accessibility to the agricultural markets and dairy farms that dot the cluster, this warehouse space has been taken up by many food processing and milk product companies, such as Mother Dairy.

The NH-58 Ghaziabad–Meerut Road, which is part of the same cluster, is a 2x2 good quality road with a host of old residential developments along the highway. The warehousing market here benefits on account of the ample

availability of land and its proximity to the industrial hubs of Faridabad, Ghaziabad and Sonipat. Notable names, such as Dr. Reddy's and Safexpress, have warehouse facilities in this belt.

The warehouses present in this cluster have the strategic advantage of being located within a two-hour distance from the manufacturing hubs of Ghaziabad, Faridabad and Sonipat. However, the automobile cluster of IMT Manesar is located more than two hours away, making the industry's 'just in time' delivery requirement challenging. Servicing Bhiwadi and Neemrana would entail even more time. The most vibrant consumption hubs of Delhi and Gurgaon are located approximately two hours away.

Road distance and transit time to important locations from the Ghaziabad warehousing cluster

Distance from	km	Travel time in mins
Ghaziabad industrial belt	5–35	15–50
Delhi City Centre (Connaught Place)	25–65	60–120
Faridabad industrial belt	40–70	90–130
Sonipat industrial area	55–90	100–140
Gurgaon city centre (DLF CyberCity)	45–85	90–150
Palwal industrial area	75–100	120–160
Bawana industrial area	45–80	100–160
IMT Manesar	70–110	120–180
Bahadurgarh industrial cluster	55–90	120–180
Dharuhera & Bhiwadi industrial belt	90–130	150–200
Bawal industrial area	120–155	160–220
Rohtak industrial cluster	100–140	170–220
Neemrana industrial area	140–180	180–240

Source: Knight Frank Research

6.4 Rent and land cost of warehouses

The rental values in the cluster are almost similar on the highways, with the Dadri region commanding marginally higher rentals in the cluster. The rentals are lower on the internal roads, as one moves away from the national highway. The rents displayed in the adjoining table reflect the facilities with standard construction and amenities. It would be higher if there are specific requirements for flooring, structure height, insulation and other capex within the facility.

Other terms of tenancy may also have a bearing on warehouse rents, specifically clauses related to the security deposit, rent escalation and lease tenure. The market practice for the security deposit is 4–6 months of rent. The rent escalation clause, which determines the quantum and frequency of rental increments, is usually 5% p.a. The market practice for lease tenure, i.e. the minimum period for which the landlord and tenant are bound to honour the occupancy, varies largely on a case-to-case basis, usually in excess of five years.

The industrial setups in the Ghaziabad cluster are within the urban area, unlike the NH-8 cluster, where industrial activity is well beyond the Gurgaon city area. The presence of dense residential and industrial activity together has impacted the vehicular traffic movement. Additionally, quality of internal roads is starkly inferior compared to the national highways. This restricts the opening up of new land parcels for warehousing activities.

Indicative rental values and land rate

Location	Quoted rent (₹/sq ft/month)	Quoted land rate (₹ mn/acre)
Ghaziabad–Dadri, NH-91	16–20	30–40
Ghaziabad–Hapur, NH-24	15–19	20–35
Ghaziabad–Meerut, NH-58	14–19	20–35

Source: Knight Frank Research

6.5 Competitive advantages

The biggest competitive advantage of the Ghaziabad warehouse hub is its proximity to the densely populated consumption hubs of Ghaziabad, Delhi, Noida and Greater Noida. This makes it a credible location for consumer-oriented (B2C) companies that can serve the NCR consumption market from their warehouses in this cluster. The next advantage is its proximity to the manufacturing hubs of Ghaziabad, Faridabad and Sonipat.

Warehouse occupiers are sensitive to rentals and thus, warehousing clusters that are in a position to offer affordable space would enjoy a competitive advantage over the others. With warehouse rentals in the range of ₹14–20 per sq ft per month, Ghaziabad fares well. The ample

land availability implies that the rentals will continue to remain affordable for a considerable amount of time.

The Dadri node of the cluster is on the Eastern Dedicated Freight Corridor alignment and will thus lead to heightened cargo movement along the eastern part of the country. This will increase the warehousing requirement in the Ghaziabad cluster.

The availability of manpower is another factor that lends competitive strength to this cluster. NCR is a densely populated urban agglomeration, and the presence of residential catchments for all income groups in and around Ghaziabad ensures an abundant supply of skilled, semi-skilled and unskilled workers.

The Ghaziabad cluster will be dominated by the food processing industry, and manufacturing companies from the lower end of the spectrum. The ample availability of land at feasible costs that is in sync with the quoted rents implies a steady supply of warehouse space in the cluster. Hence, we believe that no new markets will emerge in this cluster in the near future.

6.5 Competitive advantages

The biggest competitive advantage of the Ghaziabad warehouse hub is its proximity to the densely populated consumption hubs of Ghaziabad, Delhi, Noida and Greater Noida. This makes it a credible location for consumer-oriented (B2C) companies that can serve the NCR consumption market from their warehouses in this cluster. The next advantage is its proximity to the manufacturing hubs of Ghaziabad, Faridabad and Sonipat. Warehouse occupiers are sensitive to rentals and thus, warehousing clusters that are in a position to offer affordable space would enjoy a competitive advantage over the others.

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6.6 Challenges

The Ghaziabad warehouse cluster has its share of challenges. Being an old industrial town, the industrial setups in this cluster are within the urban area, unlike the NH-8 cluster, where industrial activity is well beyond the Gurgaon city area. The presence of dense residential and industrial activity together has impacted the vehicular traffic movement. The cargo movement is also impacted by the quality of roads, which are generally 2x2-lane roads without service lanes. These are inferior compared to those in the competing NH-8 cluster and thus, cargo movement at similar distances take a longer delivery time. Additionally, quality of internal roads is starkly inferior compared to the national highways. This restricts the opening up of new land parcels for warehousing activities.

Our interactions with landowners and warehouse developers highlight another difficulty regarding the regulatory environment. Due to the ambiguity of land laws, the conversion of land use from agriculture to industrial takes much longer in the Ghaziabad cluster compared to the NH-8 cluster in Haryana. Such a situation results in taking a longer time for any development project.

Another set of challenges arises on account of the competition from the

development of alternative residential real estate, which influences the land price in warehouse localities near Ghaziabad city. While the rents continue to remain at an affordable level, land has become expensive, mainly for land parcels abutting the highways.

The other critical challenge arises on account of the NH-8 warehouse cluster, which offers a relatively superior occupier profile at a similar occupancy cost. This is the case for both, the manufacturing-led and consumption-led demand, which includes e-commerce. The manufacturing base of NH-8 is much stronger on account of the strong presence of the automobile industry, which pays relatively higher rentals because of its 'just in time' inventory model. The auto and auto ancillary sector contributes 29% of the manufacturing output in the competing NH-8 cluster in contrast to just 7% in the case of the Ghaziabad warehouse cluster. Such industrial activity implies that the demand for automobile space in the competing NH-8 cluster is 25 mn sq ft or four times that of the Ghaziabad cluster, resulting in a better occupier profile.

Similar is the case with the consumption-led demand on account of the vibrant Gurgaon residential and office development over the last decade. The consumption markets of Delhi and Gurgaon can be serviced through a warehouse on the NH-8 cluster, in line with the tight delivery requirements of even the e-commerce players. Likewise, companies such as Amazon, Arvind Brands and Lifestyle, and several logistics firms such as Future Supply Chain, Fedex, TCI and Safexpress, have favoured the cluster. Further, the overall infrastructure and business environment are superior in the NH-8 cluster compared to the Ghaziabad cluster. The completion of the Manesar–Palwal stretch of the upcoming Kundli–Manesar–Palwal (KMP) expressway has added sheen to this warehouse cluster.

6.7 Outlook

In terms of geography, the warehouses are currently concentrated mainly on the Ghaziabad–Dadri stretch on NH-91, Ghaziabad–Hapur belt on NH-24 and the Ghaziabad–Meerut stretch on NH-58, besides some presence on GT Road and Greater Noida.

The future demand for warehousing will be shared mainly between the NH-8 and Ghaziabad clusters. The competing NH-8 cluster has superior infrastructure, well developed internal roads, celebrated manufacturing clusters and a growing residential and office catchment. Thus, the bulk of the warehousing demand from high-value manufacturing sector occupiers and e-commerce companies would be centred in this cluster. The progress on the Kundli–Manesar–Palwal Expressway and the Western Dedicated Freight Corridor (Western DFC) will improve the future prospects of this competing market even further.

On the other hand, the Ghaziabad cluster will be dominated by the food processing industry, and manufacturing companies from the lower end of the spectrum. The ample availability of land at feasible costs that is in sync with the quoted rents implies a steady supply of warehouse space in the cluster. Hence, we believe that no new markets will emerge in this cluster in the near future.

From the pricing perspective, i.e. the achievable rent or on-going land rates, this hub offers a range of options. With land rate as the most important determinant of warehouse financial feasibility, it is crucial to get it right to achieve success in a warehouse development project. In order to understand the feasibility of land cost for warehousing activities, we have developed a land cost matrix. This matrix explains the feasible land cost that an investor should ideally pay in this cluster in order to achieve the expected returns in the range of 10–18% per annum, subject to the achievable rents. For example, with a return expectation of 14% per annum and an achievable rental value of ₹18/sq ft/month, the feasible land cost amounts to ₹26 mn/acre. In other words, investors can fetch a 14% per annum return only if they

are able to purchase land at or below ₹ 26 mn/acre at present and lease it at ₹18/sq ft/month. As the purchase price of land goes higher, the realisable return reduces. Similarly, as the achievable rental value increases, the feasibility of higher-cost land also goes up.

Feasible land cost matrix in the Ghaziabad warehousing cluster (₹ mn/acre)

		Investor return per annum				
		10%	12%	14%	16%	18%
Prevailing rental value (₹/sq ft/month)	12	18	14	11	8	5
	14	25	20	16	12	10
	16	31	25	21	17	13
	18	37	31	26	21	18
	20	43	36	31	26	21

Note: The table presents 25 options of land cost in ₹ mn/acre at different investor returns and rental value combinations. The 14 options which are possible to source in Ghaziabad and are upward of the minimum prevailing land rate, which is ₹ 20 mn/acre in this cluster, have been highlighted.

Source: Knight Frank Research

Assumptions	
Construction cost (₹/sq ft)	1,200
Ground coverage	57%
Rental escalation per annum	5%
Occupancy	50%: First year
	75%: Second year
	100%: Third year onwards
Debt funding	80% of construction cost
Interest rate	12%
Tax rate	30%
Cap rate	10%



KEY CONTACTS

INDUSTRIAL

Balbir Singh Khalsa
National Director,
Industrial & Landlord Rep
balbirsingh.khalsa@in.knightfrank.com

Pinkesh Teckwani
Director, Industrial
Pinkesh.teckwani@in.knightfrank.com

RESEARCH

Dr Samantak Das
Chief Economist & National Director
samantak.das@in.knightfrank.com

CORPORATE

Shishir Bajjal
Chairman & Managing Director
shishir.bajjal@in.knightfrank.com

AUTHORS

Vivek Rathi
Vice President, Research
vivek.rathi@in.knightfrank.com

Hetal Bachkaniwala
Vice President, Research
hetal.bachkaniwala@in.knightfrank.com

PRESS OFFICE

Sukanya Chakraborty
Director, Marketing and
Communications
sukanya.chakraborty@in.knightfrank.com

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