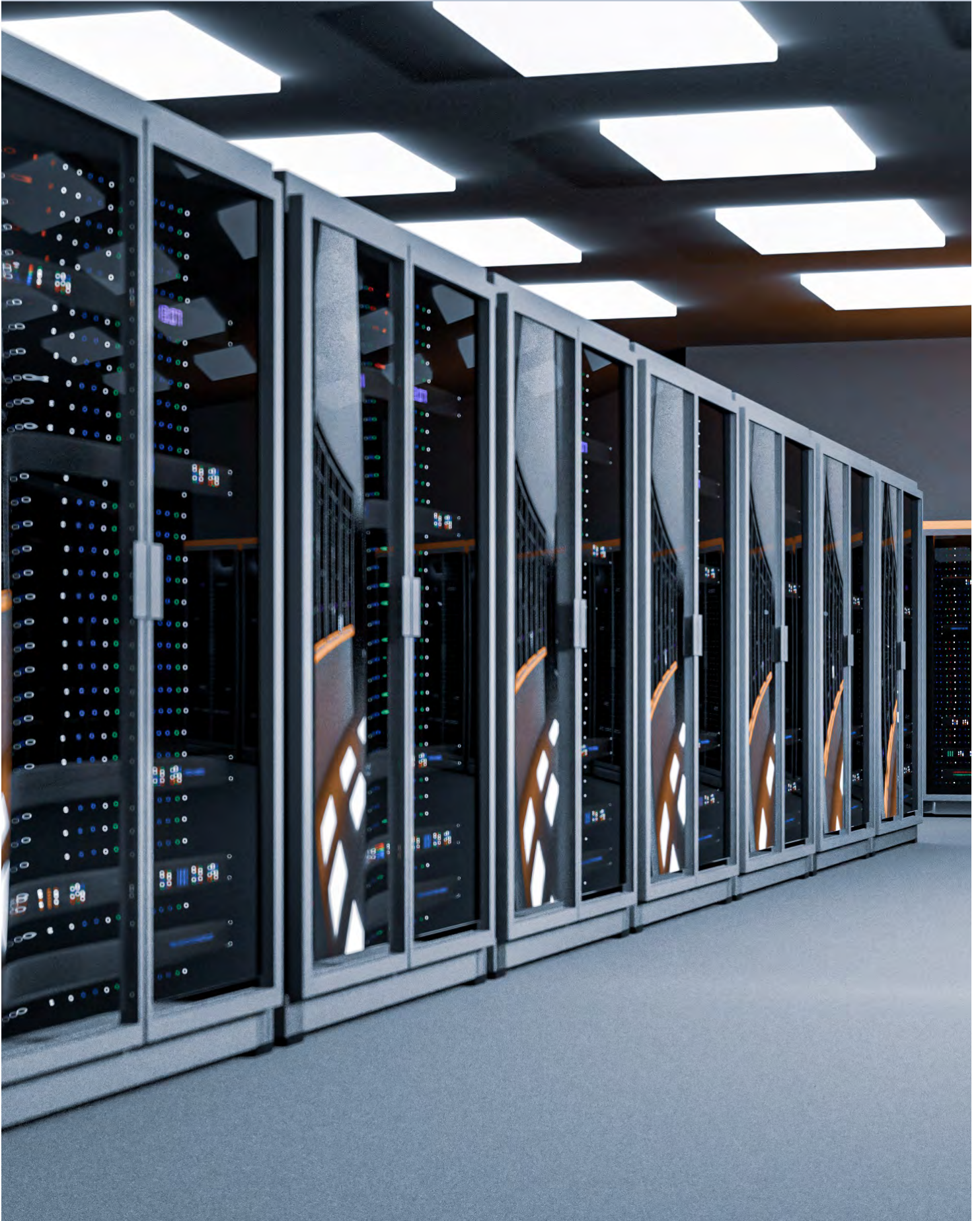


India | May 2021

SPOTLIGHT
Savills Research

Poised for Growth: Data Centres in India



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Preface

Indian Data Centre industry is witnessing robust growth in the era of virtualisation and cloud computing. The increased use of data consumption and internet bandwidth in the country is driven by expanding reach of social media, increased use of smart devices, data localisation, increased adoption of cloud services and digital transformation journeys of many Indian companies.

COVID-19 led lockdown has accelerated the usage of data resulting in increased demand for bandwidth as well as storage capacities. The government, private sector and individuals including a large student base started using digital means to operate their business or profession or for education.

The Government of India initiatives such as Digital India and emphasis on self-reliance and data protection through data localisation is expected to increase the volume of data in

the country, which will result in an increased demand for the Data Centre and cloud services.

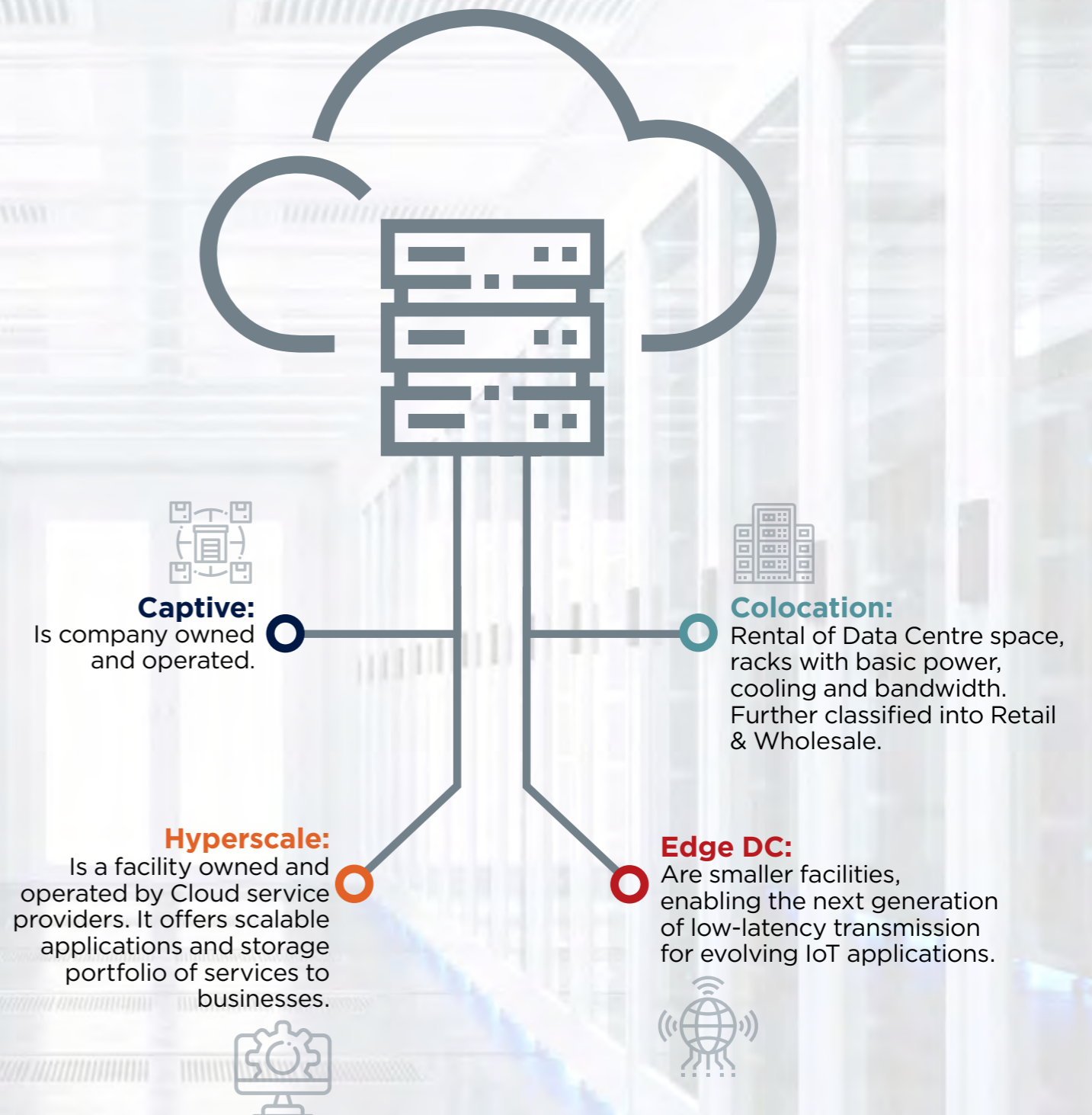
We expect the demand for Data Centre space to increase by around 15-18 million sq. ft. across the major cities in the next 4-5 years. McKinsey has identified India as the second fastest-growing digital economy and projected that IT and Communications sector will double in size by 2025 to contribute US \$355-435 billion to GDP.

This report aims to help the Data Centre operators, investors, cloud service providers and real estate developers to gauge the size and growth potential of the Indian Data Centre market. It will also help the stakeholders associated with the industry to take informed decisions on investments in this emerging sector.

A critical part of the digital infrastructure that connects people and businesses to one another and the rest of the world, Data Centres are a unique combination of property, energy and technology.





They are operated as either colocation, managed hosting or hybrid facilities. Colocation provides space rental services for tenants who purchase their own servers, while managed hosting provides hardware & software for rent and 24-hour system support. Typically, retail operators provide managed hosting services, while wholesale operators provide colocation services.

Types of Data Centres








Classifications and Requirements




	Tier I Basic infrastructure 	Tier II Redundant site infrastructure capacity components 	Tier III Concurrently maintainable site infrastructure 	Tier IV Fault tolerant site infrastructure 
Minimum capacity component (redundancy)	N (non-redundant)	N+1 (redundant)	N+1 (redundant)	2N (fully redundant)
Distribution paths	Single, non-redundant	Single, non-redundant	Multiple, independent, usually only one is active	Multiple, independent, diverse, all are active
Minimum availability	99.671%	99.75%	99.98%	99.995%
Dual-powered IT systems	No	No	Yes	Yes
Concurrent maintainability	No	No	Yes	Yes
Fault tolerant power design	No	No	No	Yes
Compartmentalisation	No	No	No	Yes
Continuous cooling	No	No	No	Yes
On-site fuel storage	12 hours for engine generator(s)	12 hours for 'N' capacity	12 hours for 'N' capacity	12 hours for 'N' capacity

Source Uptime Institute

Data Centre Location Selection Criteria

Geographic location, favorable climatic conditions, availability of power, proximity to customers, fiber connectivity and real estate costs remain the key selection criteria for site selection before setting up a Data Centre.

Attribute	Site selection parameters	Ideal/ required parameters
 Power	<ul style="list-style-type: none"> Power availability 	<ul style="list-style-type: none"> Power availability is must with dual power source from two different substations through two different paths
	<ul style="list-style-type: none"> Record of major outage/ quality of power 	<ul style="list-style-type: none"> There should not be major outage and power quality should be good
 Communication Infrastructures	<ul style="list-style-type: none"> Availability of dense optical fiber cable (OFC) network 	<ul style="list-style-type: none"> Must
	<ul style="list-style-type: none"> Availability of fibre connectivity from different service providers 	<ul style="list-style-type: none"> Must
	<ul style="list-style-type: none"> Diverse entrance paths for optical fibre cable 	<ul style="list-style-type: none"> The entry should be from two diversified paths for better redundancy and higher uptime
	<ul style="list-style-type: none"> Availability of water supply 	<ul style="list-style-type: none"> Ample water supply and drainage should be available for various usages including chillers
 Accessibility	<ul style="list-style-type: none"> Availability of public transport 	<ul style="list-style-type: none"> The site should have basic transport facility nearby so that there is easy movement of manpower & material
	<ul style="list-style-type: none"> Proximity to Fire Station, Police Station, Petrol Pump, Hospital 	<ul style="list-style-type: none"> Emergency services should be nearby but not in immediate vicinity
	<ul style="list-style-type: none"> Proximity to major traffic arteries 	<ul style="list-style-type: none"> The site should be away from heavy traffic area

Attribute	Site selection parameters	Ideal/ required parameters	
 Natural Disaster	<ul style="list-style-type: none"> Proximity to coastal or inland waterways or flooding areas 	<ul style="list-style-type: none"> Not preferred 	
	<ul style="list-style-type: none"> Seismic Zone 	<ul style="list-style-type: none"> Zone III & below 	
	<ul style="list-style-type: none"> Fire, tornados, strong winds & earthquake 	<ul style="list-style-type: none"> The site should not be prone to such natural disasters like fire, tornados, strong winds & earthquake 	
	<ul style="list-style-type: none"> Flood history 	<ul style="list-style-type: none"> There should not be any major flood history in last 100 years 	
	<ul style="list-style-type: none"> Climatic conditions 	<ul style="list-style-type: none"> The site should not have very high humidity or higher ambient temperature throughout the year, average rainfall 	
	 EMI/ RFI	<ul style="list-style-type: none"> Electromagnetic Interference (EMI) 	<ul style="list-style-type: none"> There should be no high-tension cable near the site
		<ul style="list-style-type: none"> Radio Frequency Interference (RFI) 	<ul style="list-style-type: none"> There should not be any radio frequency around the site (i.e., far from Radio Station/ Airport)
 Proximity	<ul style="list-style-type: none"> Proximity to airport or flight path 	<ul style="list-style-type: none"> Not preferred 	
	<ul style="list-style-type: none"> Proximity to major metropolitan area 	<ul style="list-style-type: none"> Not preferred 	
	<ul style="list-style-type: none"> Proximity to high crime area 	<ul style="list-style-type: none"> Not preferred 	
	<ul style="list-style-type: none"> Others 	<ul style="list-style-type: none"> The site location should be away from valley, bottom of hill, industrial pollutants, sewerage, chemical plant, etc. 	

Building Requirements



Floor height

- Over 5m per storey (clear)



Floor loading

- At least 1500 Kg/m²



Layout

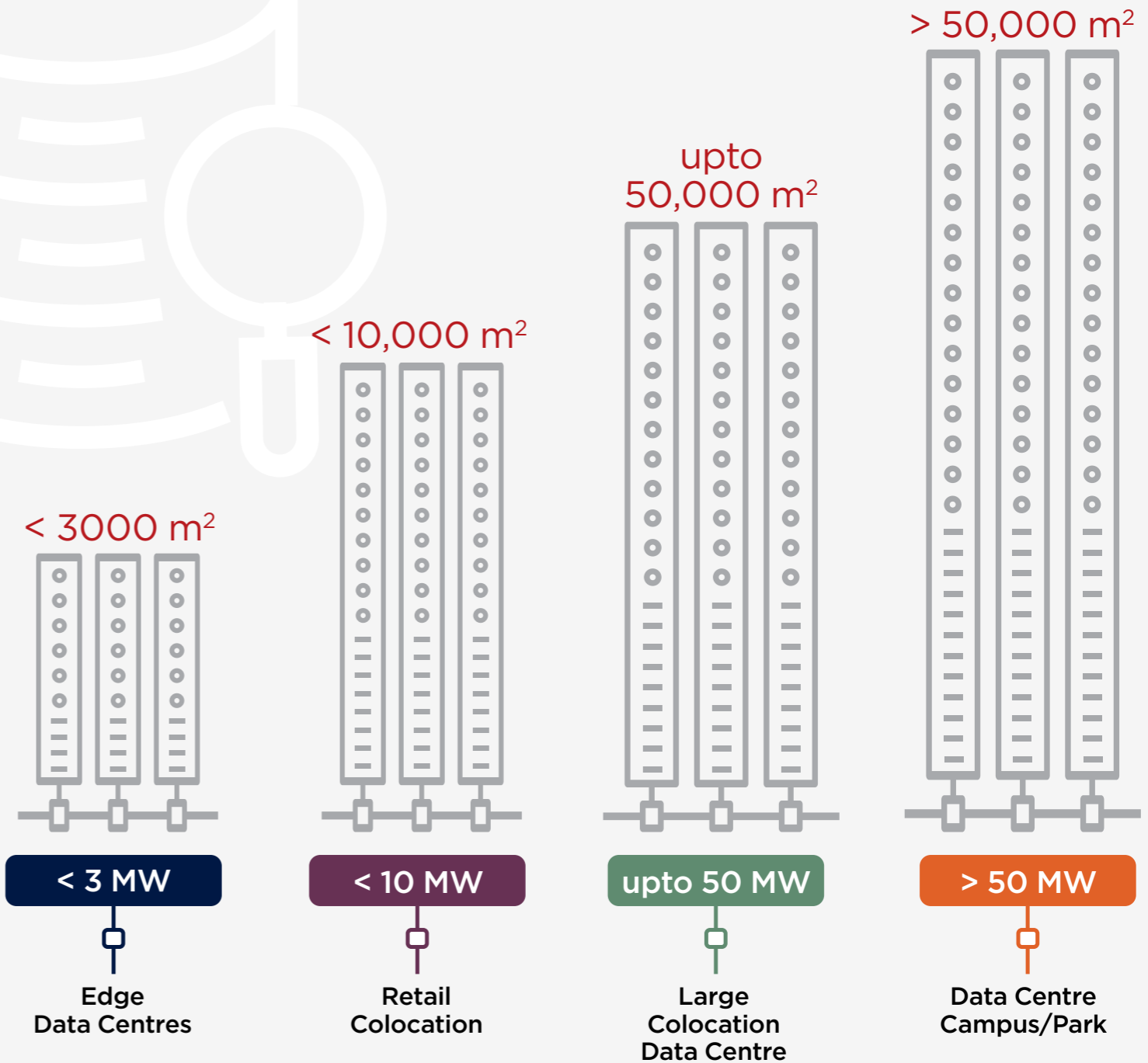
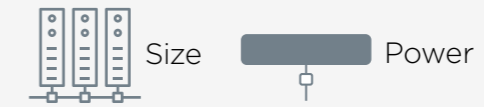
- Regular shape
- Sufficient space for substation, DGs, fuel storage, fire tank, pumps and chillers



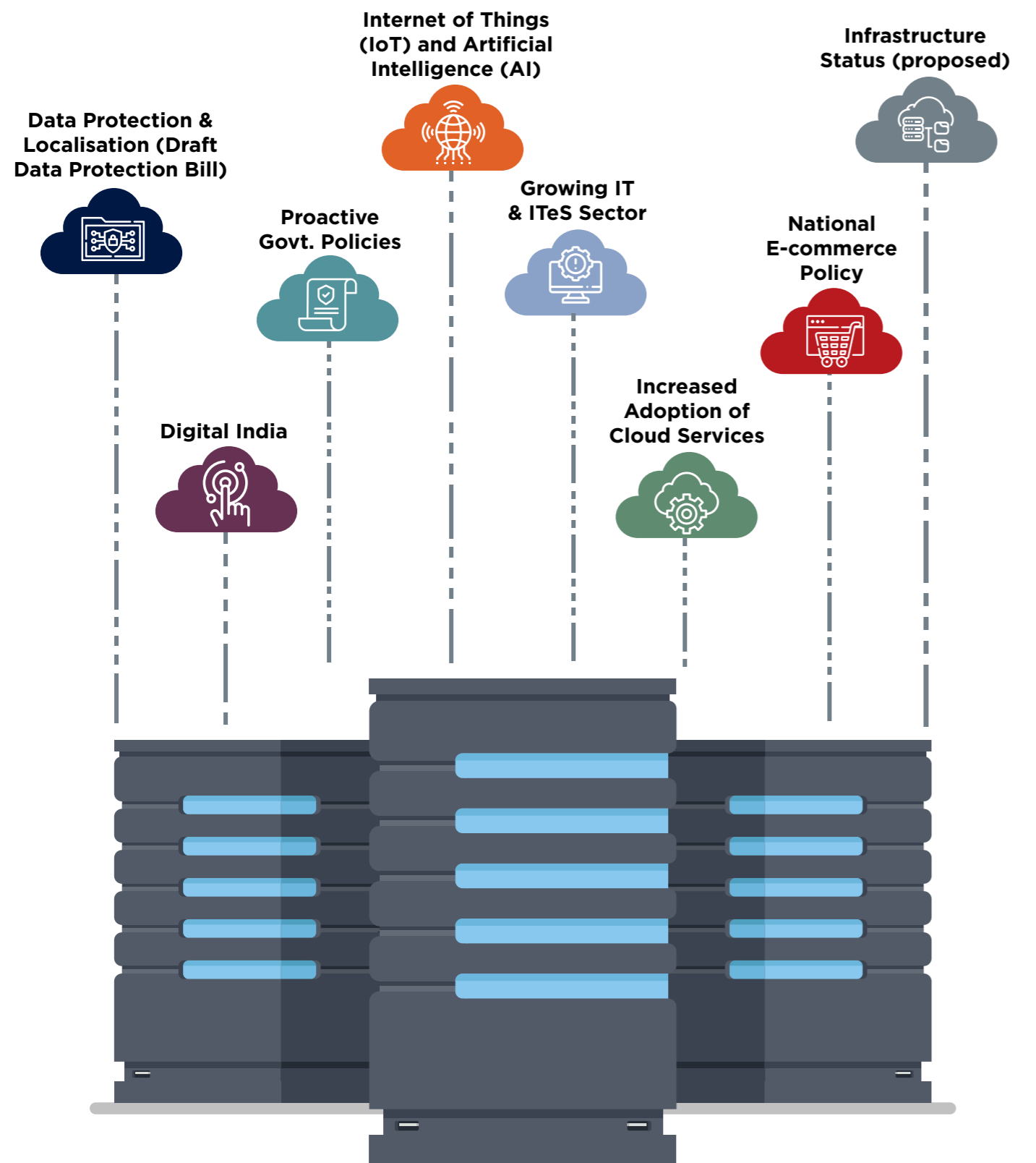
Other facility requirements

- Security systems such as CCTV and key card access
- Space for redundant power supply (such as back-up power lines, oil tank and back-up power generator)
- Space for redundant cooling system (such as chilled water pipes and cooler)
- Specialised fire suppression systems
- Multiple telecom carrier and fibre optic connectivity

Size & Power for Data Centres



Demand Drivers



Growing Edge Data Centre Demand

India is increasingly seeing a big opportunity in Edge Data Centres. The Smart City initiatives, adoption of 5G, Internet of Things (IoT), Artificial Intelligence (AI) are driving the demand for Edge Data Centres.

Data is the new oil

The Finance Minister of government of India, Nirmala Sitharaman announced that the government is planning to roll out a Data Centre policy enabling the private sector to establish Data Centre parks in the country. “Data is the new oil,” she said. Many state governments such as Maharashtra, Telangana and Tamil Nadu are already offering several incentive schemes for setting up Data Centre parks in their states.

Increased adoption of Cloud Services

The high upfront costs, higher power tariffs, maintenance-related issues, security and high real estate costs are increasingly tipping the scale in favour of Third-Party Data Centre operators. Many companies are investing in the

development of Data Centres in India. Additionally, major cloud service providers are also exploring setting up their own Data Centres.

The India Public Cloud Services (PCS) market, including Infrastructure-as-a-Service (IaaS), Platform-as-a-Service (PaaS), and Software-as-a-Service (SaaS), reached US \$1.6 billion in H1 2020, according to the International Data Corporation (IDC).

According to NASSCOM, cloud spending in India is estimated to grow at a CAGR of 30% to reach US \$7.1 billion in 2022. This is mainly driven by demand for cloud archiving, cloud backup and disaster recovery. The Covid-19 pandemic has created a shift towards the adaptation of cloud services that are more secure and scalable.

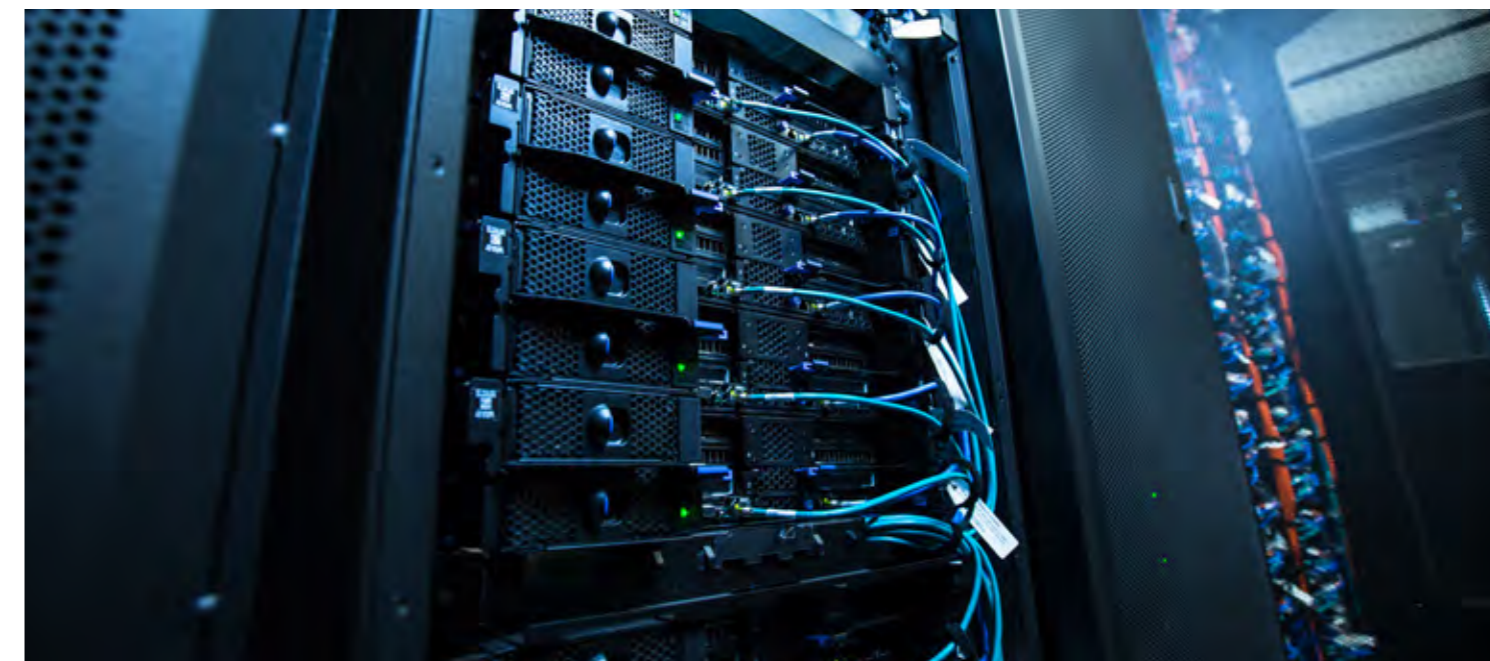
Growing internet & mobile broadband penetration in India

As per the Nokia Mobile Broadband Index, 2021 India has 702 million mobile broadband users and broadband penetration at 45% as of December 2019. This is significantly lower compared to China at 95%,

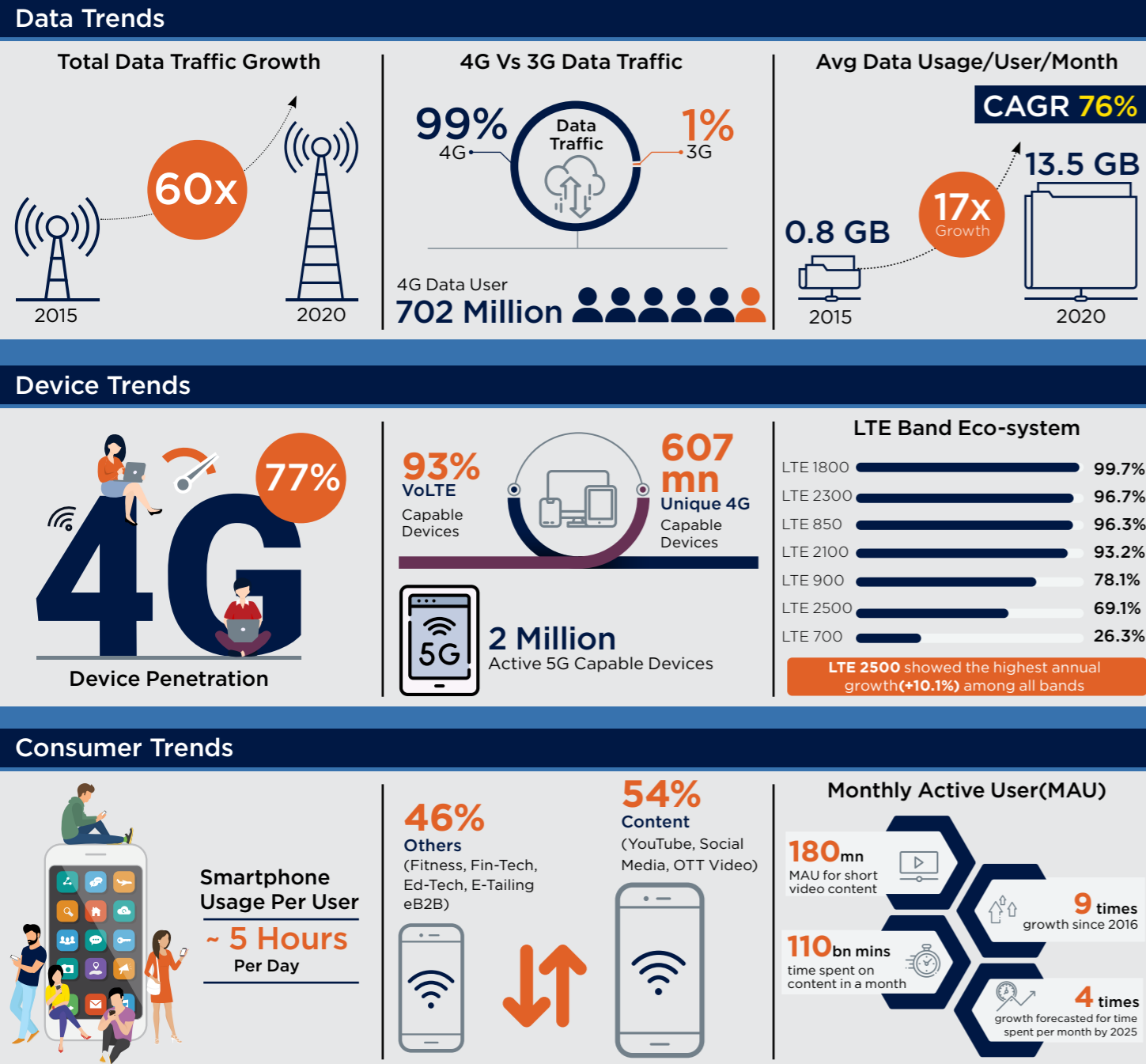
and other European nations that are in the range of 90-110%. The mobile data usage in India is likely to increase further due to increased number of 4G subscribers. India has 755 million internet subscribers, 2nd highest after China worldwide.

Surge in data usage

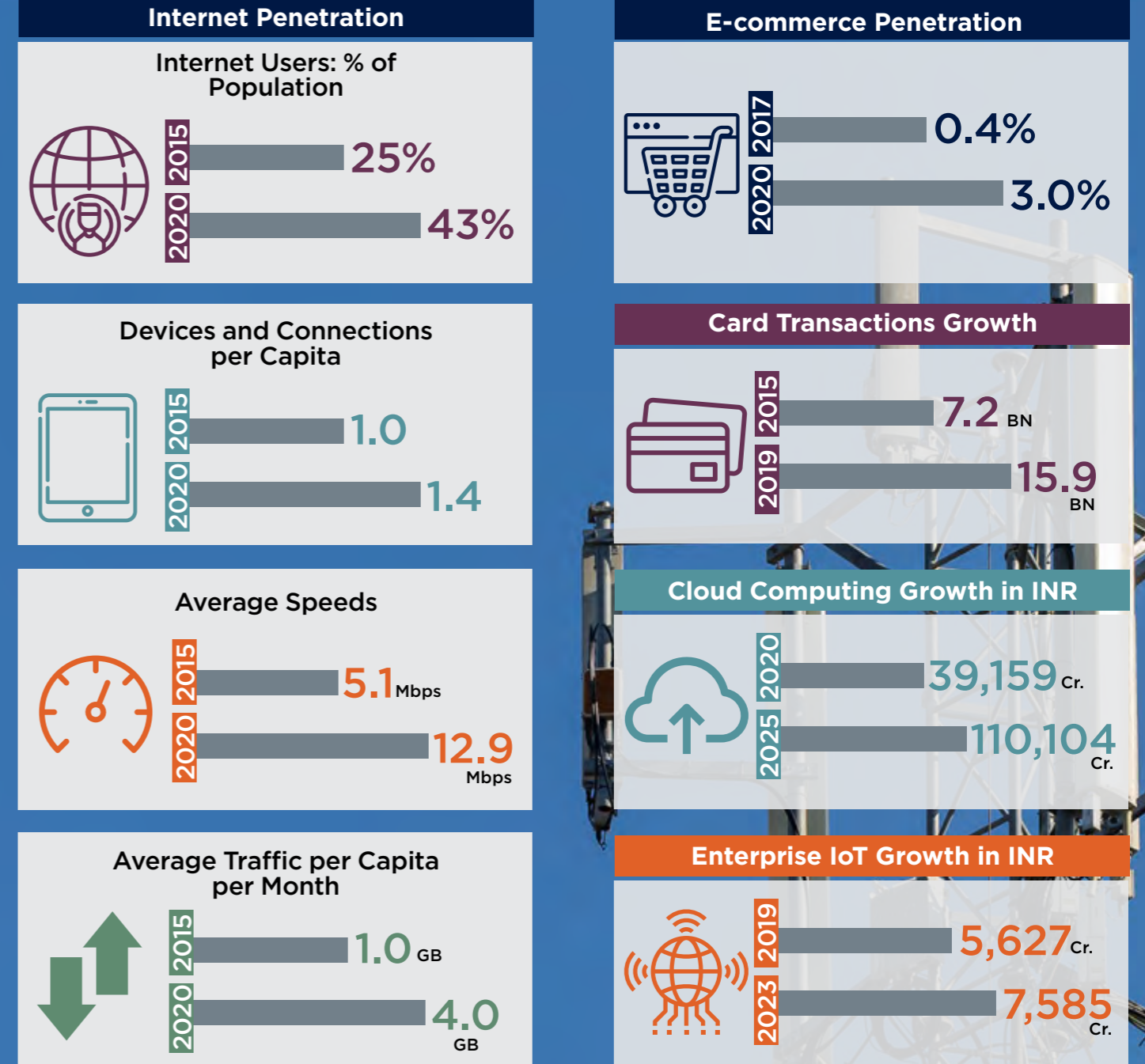
According to the Nokia’s Mobile Broadband India Traffic Index (MBIT), 2021, the data traffic grew 36% in 2020 in comparison to the previous year, primarily driven by 4G data consumption and addition of millions of data subscribers. In 2020, the data traffic grew by 60 times from 2015 levels, highest worldwide according to the report. The report also illustrated the average monthly consumption of data grew from 0.8GB in 2015 to 13.5GB in 2020 owing to online video consumption and increase in data subscribers. COVID-19 led lockdown has accelerated the usage of data resulting in increased demand for bandwidth as well as storage capacities. The government, private sector and individuals including a large student base started using digital means to operate their business and studies.



Mobile, Internet and E-commerce Penetration- Data Trends



Source Nokia Mobile Broadband Index,2021



Source CISCO

Source Frost & Sullivan

Proposed Data Centre Policy- 2020

The Data Centre Policy aims to make India global, promote investment in the sector, propel digital economy growth, enable provisioning of trusted hosting infrastructure to fulfil the growing demand of the country and facilitate state-of-art service delivery to citizens.

Mission

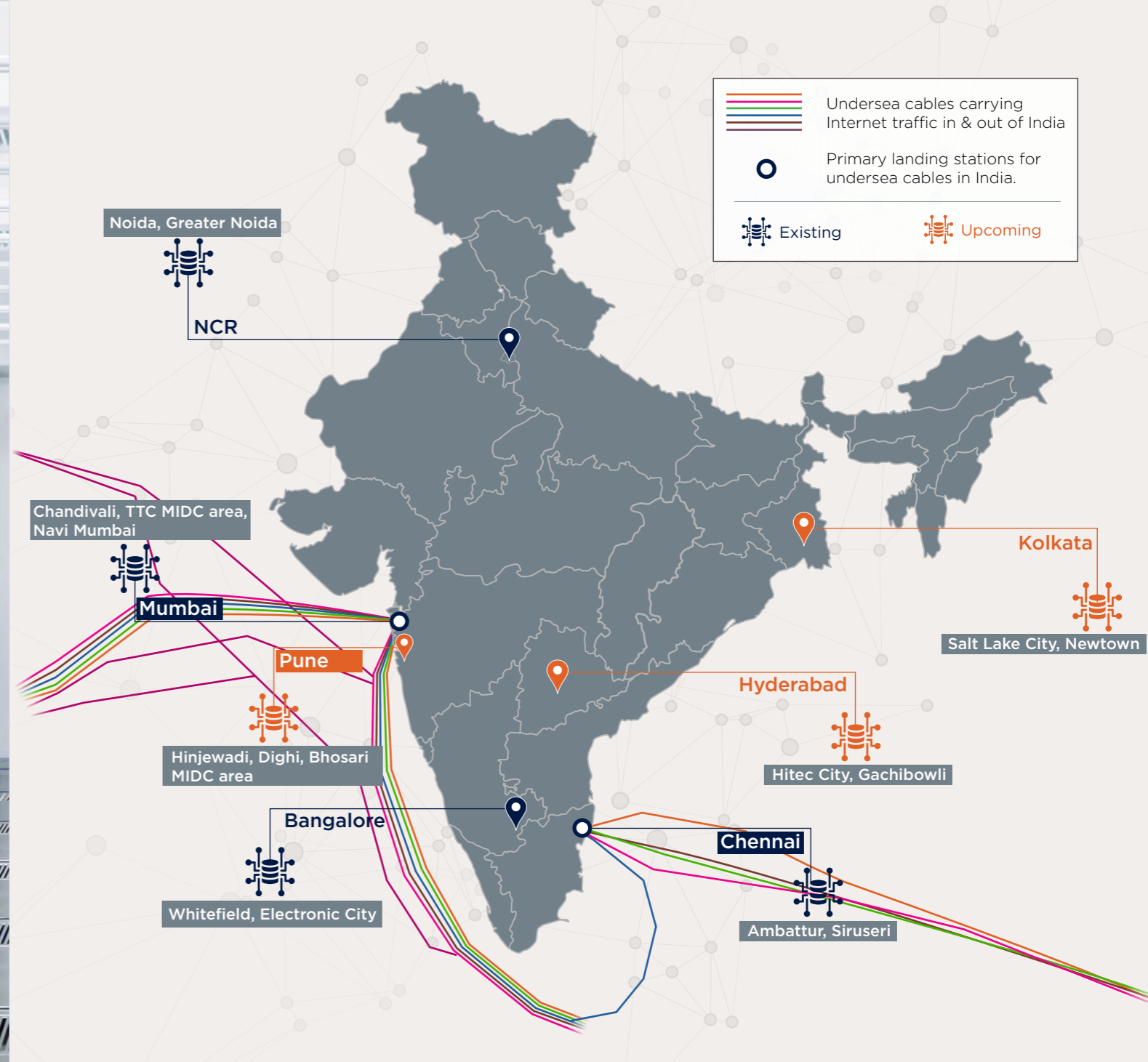
- ▶ Ensure sustainable and trusted Data Centre capacity in the country to meet the enormous demand generated in one of the fastest growing economies
- ▶ Strengthen India's position as one of the most favourable countries for Data Centres by incentivising and facilitating establishment of state-of-the-art Data Centres
- ▶ Encourage domestic and foreign investments
- ▶ Promote R&D for manufacturing and development of Data Centre related products and services for domestic and global markets
- ▶ Promote domestic manufacturing, including non-IT as well as IT components, to increase domestic value addition and reduce dependence on imported equipment for Data Centres

Source Ministry of Electronics & Information Technology, Government of India



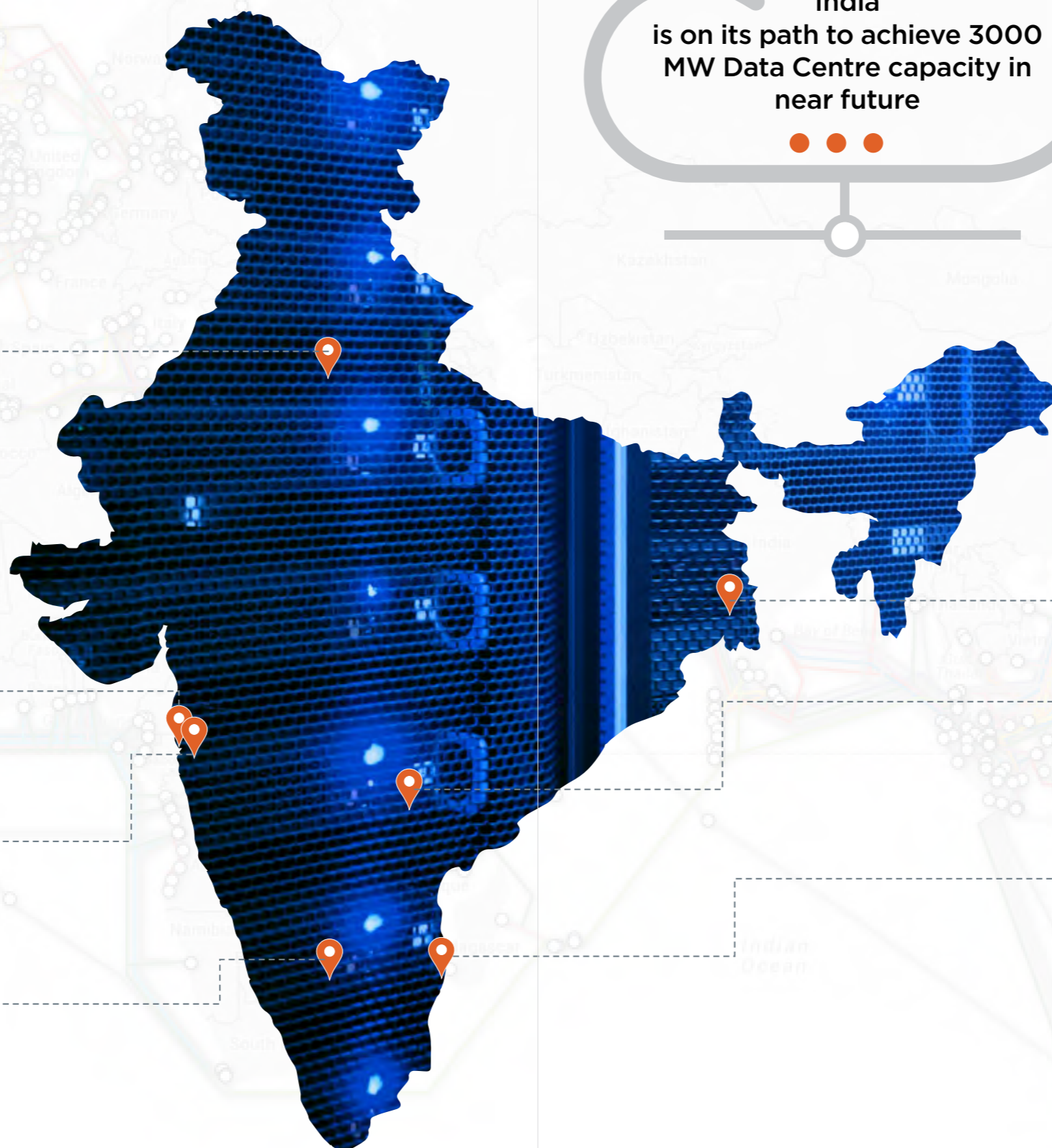
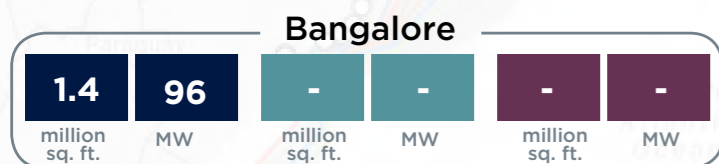
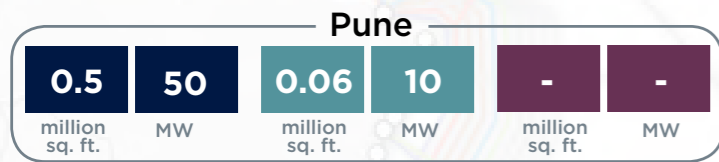
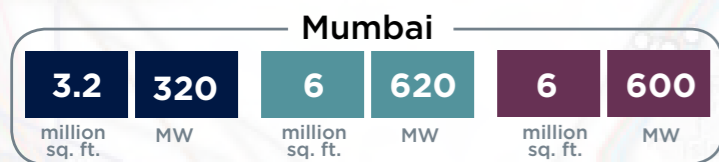
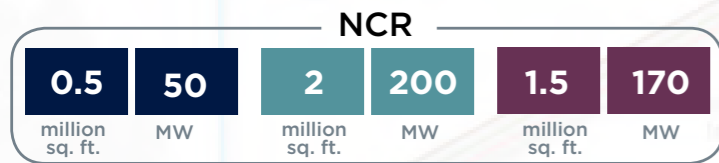
Data Hubs

At present, the Data Centre industry is very buoyant in cities such as Mumbai, Chennai, NCR, Bangalore and Hyderabad. India holds immense potential to become a Data Centre hub in APAC owing to the availability of high bandwidth speed, lower power tariffs and presence of hyperscalers. Additionally, availability of state-of-art infrastructure are likely to fuel the growth of India's Data Centre market.



Kolkata, Hyderabad and Pune are key upcoming cities as the demand across these locations have gone up due to improved network connectivity and digital transformation initiatives by the local governments and proximity to customers.

Stock and Supply

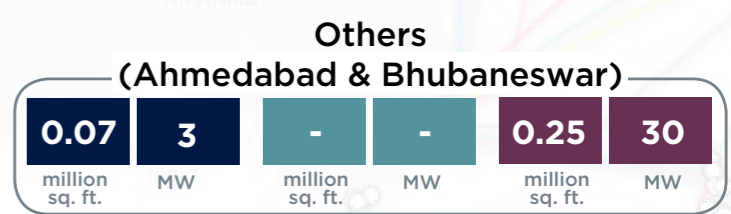
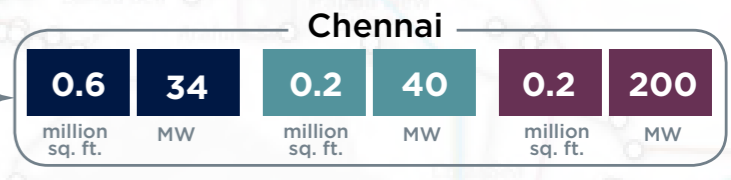
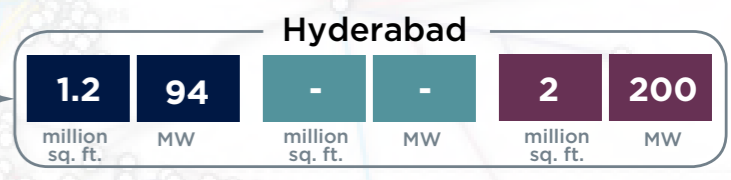
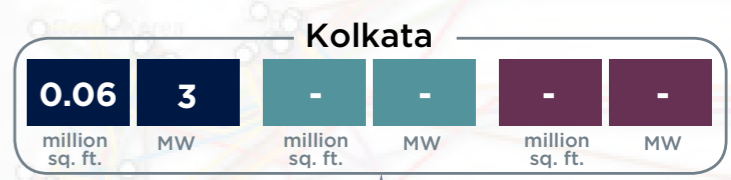


India is on its path to achieve 3000 MW Data Centre capacity in near future

Installed
Total **7.5+ million sq. ft. | 650+ MW**

Under Construction
Total **8+ million sq. ft. | 870 MW**

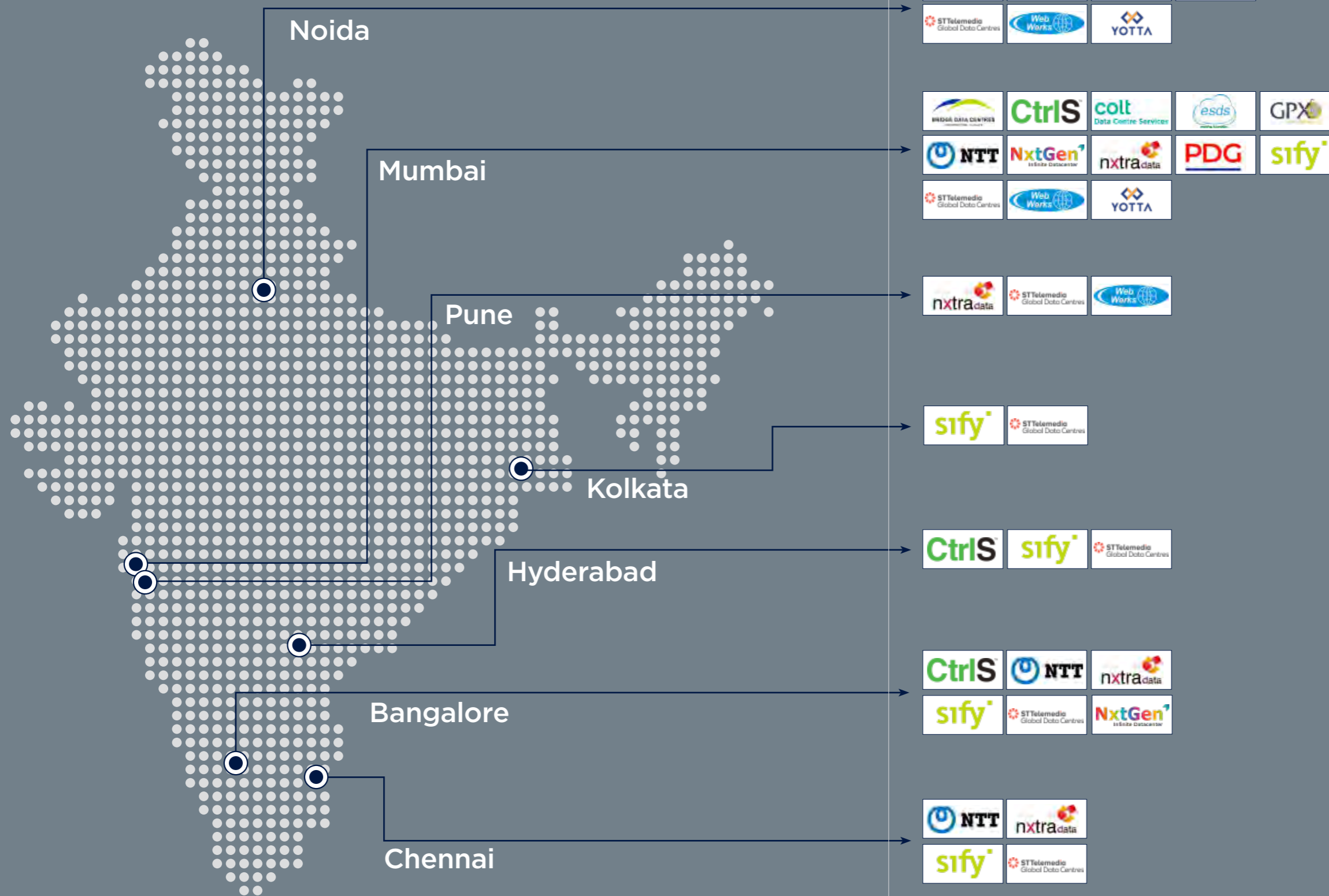
Proposed Development
Total **10+ million sq. ft. | 1200 MW**



Note: The under construction capacity can be expected to come online between 2021-2025

Disclaimer: The power capacity is the total power & not IT Power. Provided the demand continues to grow as anticipated.

Data Centre Operator Footprint in India



Operators

Grid of operator logos for each city as detailed in the table above.



Disclaimer: This mapping indicates presence of major operators with operational & under construction Data Centres across key cities in India

Global Data Centre Industry

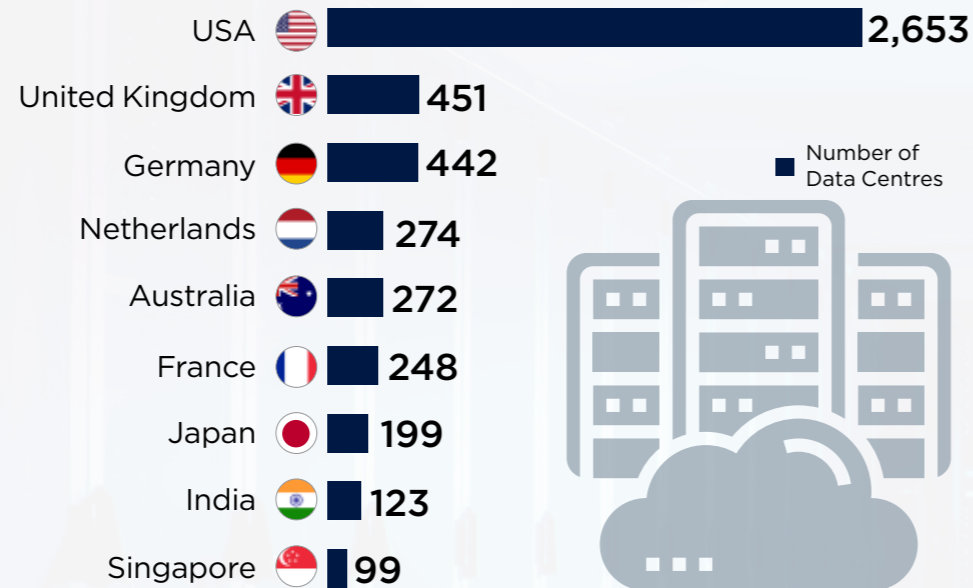
Data Centre Industry - India & Developed Countries

Indian Data Centre market is still at its nascent stage compared with some of the developed nations such as USA, United Kingdom, Germany and Japan. India has around 130 Data Centres as of Feb 2021 compared with 2,653 in USA, 451 in United Kingdom, 442 in Germany and 199 in Japan.

As of 2020, the size of Indian Data Centre market is at US \$7 billion, this forms 3.5% of the global market size of US \$200 billion and 12.7% of the APAC (US \$55 billion) according to the Gartner, IDC & Cyber Media Research.

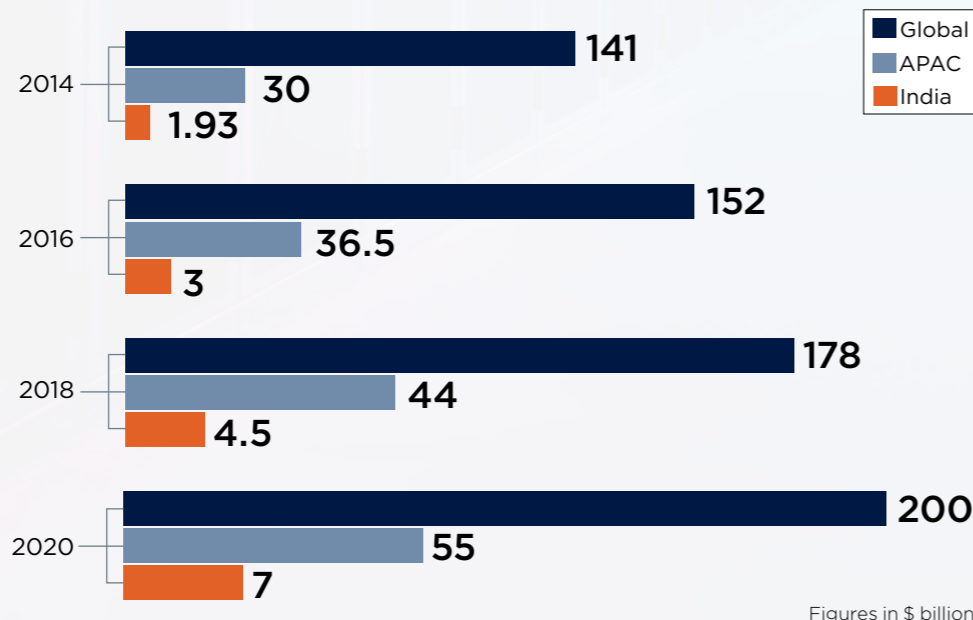
Data Centers have been one of the real estate asset class that is least affected due to COVID-19 related crisis across the globe including in India, indicating their crucial role in supporting continued business activity. Indian Data Centre market is likely to exhibit higher growth rate than the world average. As per NASSCOM, Indian Data Centre market investments are expected to grow at a CAGR of 5% (~2x of the global market) to reach about US \$5 billion per annum by 2025.

Number of Data Centres per country as of Feb 2021



Source Cloudscene and Savills Research

India's Data Centre Market Size in Comparison with APAC and Global

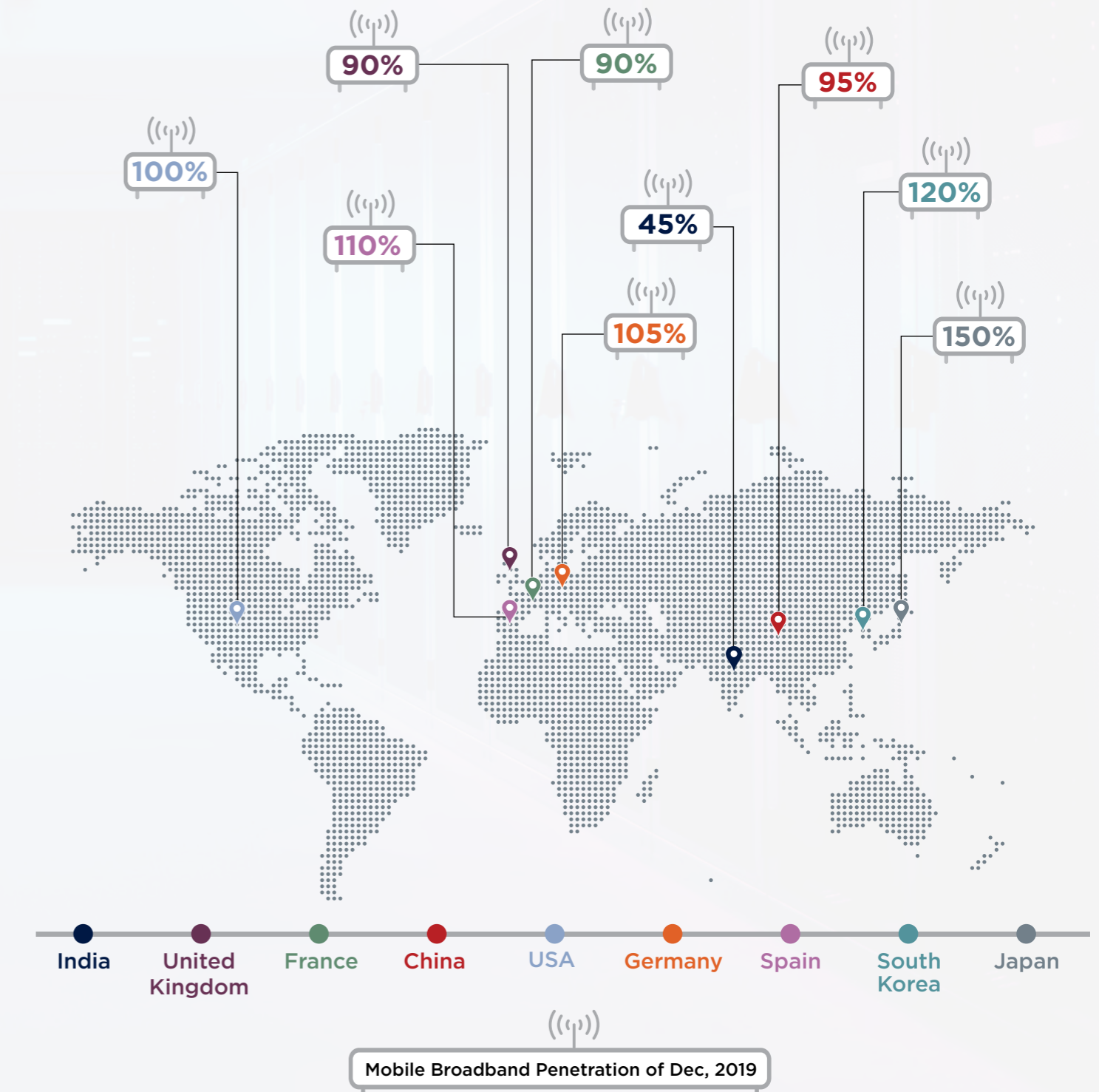


Source Gartner, IDC and Cyber Media Research

Mobile Broadband Penetration

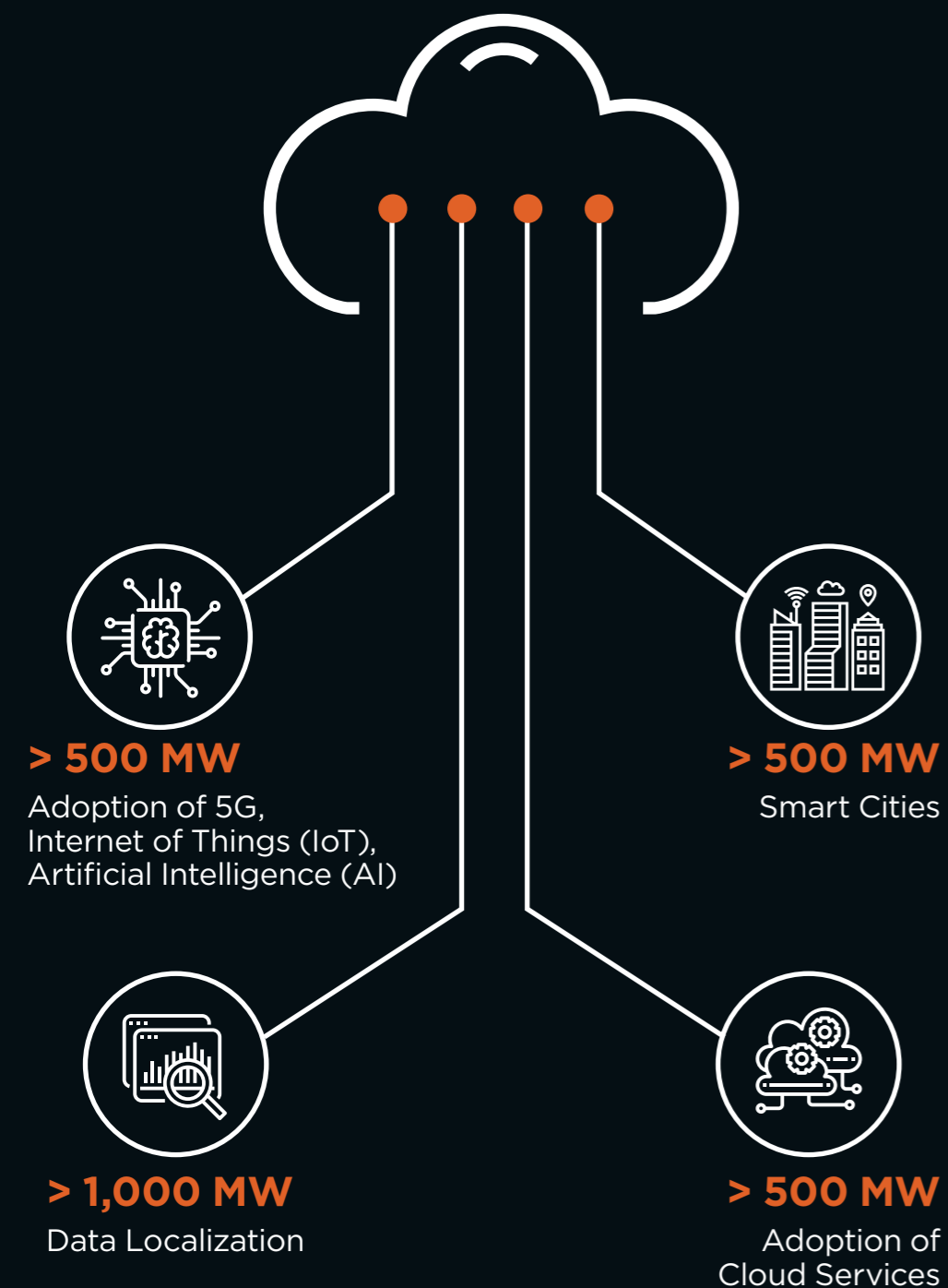
According to the Nokia Mobile Broadband Index, 2020, broadband penetration in India is at around 45%, which is significantly lower compared to China at 95%, other European nations at around 95-120% and

Japan at 150%. The mobile broadband penetration is likely to increase further and poses significant growth opportunities for Data Centre business in the country.



Source Nokia Mobile Broadband Index, 2020

Expected Data Centre Demand in India: 2021-25



Source Savills Research Estimates

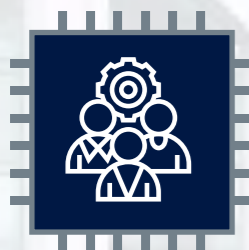
Investment Trends

As per NASSCOM, Indian Data Centre market can see cumulative investments of US \$25 billion between 2019-2025. Increase in investment activity is expected from private equity players, real estate developers and end occupiers. For instance, India's leading real estate developer, Hiranandani Group formed an entity, Yotta to establish Data Centres across India. Few of India's leading Industrial & Logistics as well as IT & Commercial parks developers are considering partnerships with Data Centre operators to diversify into Data Centre asset class. Similarly, many investors are looking to enter this asset class.

Major investments announced in 2020 & 2021

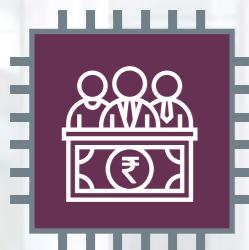
- Carlyle bought 25% stake in Nextra Data (wholly owned subsidiary of Airtel) for US \$235 million in July 2020.
- Equinix announced acquisition of India business of GPX Global Systems for US \$161 million in August 2020.
- Iron Mountain entered into an agreement to form a joint venture with Indian colocation Data Centre provider WebWerks. Iron Mountain expects to invest US \$150 million over the next two years.
- In 2021, global Data Centres operator EdgeConnex formed a JV with Adani Enterprises to develop 1GW Data Centre capacity in India over next 10 years.

Stakeholder Viewpoint



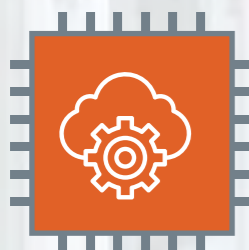
Developers

Data Centres are emerging as alternative real estate asset class for diversifying real estate portfolios. Reputed Indian real estate developers are partnering with global hyperscale operators for developing hyperscale Data Centres.



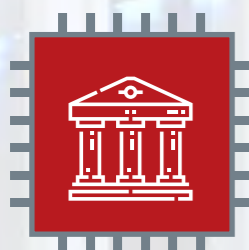
Investors

Investors are confident that Data Centre is a safe bet for their capital investment. The domestic and offshore funds are expected to diversify their portfolios and continue to invest in high yielding Data Centre assets and many foreign institutions are exploring opportunities to invest in this growth.



Operators

The increased application of new technologies like 5G, edge computing & the IoT and government initiatives such as Digital India, emphasize on self-reliance and data protection through data localisation will result in transformation from captive to colocation Data Centres.



Government

Is likely to offer incentive schemes for Data Centre development. The states such as Maharashtra, Telangana and Uttar Pradesh are offering specific incentives for Data Centre development, which includes subsidised land rates, subsidy on electricity costs and waiver on stamp duty. The government of Maharashtra, Tamil Nadu and Uttar Pradesh have already signed multiple MoUs with various Data Centre operators to build hyperscale Data Centre campuses.

Outlook and Opportunities

Considering the proliferation of internet usage and the advent of 5G, India's Data Centre market was already primed for rapid expansion. The growing demand for data and high bandwidth capacity, increased number of 4G subscribers and adoption of cloud has further pushed the demand for Data Centre services in India.

The Government of India led initiatives such as Digital India, emphasize on self-reliance and data protection through data localisation is expected to increase the volume of data in the country, which will result in an increased demand for Data Centre and Cloud services. The government of India is increasingly reliant on Data Centres for the Government-to-Citizen (G2C) delivery platforms, such as the National e-Governance Plan (NeGP), e-visa, and National CSR Data portal to name a few.

The 5G technology, which is likely to be launched in 2021, will push the adoption of IoT-enabled products in the Indian market. The market for big data and IoT is still in the nascent stage of growth. However, it has huge potential to be the strongest driver for Data Centre investments in the Indian market.

The high upfront costs, higher power tariffs, maintenance-related issues, security and high real estate costs are increasingly tipping the scale in favour of Third-Party Data Centre operators. Many companies are investing in the

development of Data Centres in India. Additionally, major Cloud service providers are also exploring setting up their own Data Centres.

Given the country's rich network connectivity, cost advantage, availability of skilled labour, low climate risk and strong data protection laws, India is well positioned to serve as a regional Data Centre hub in Asia and likely to attract significant Data Centre investments. We expect demand for Data Centre space requirement to increase by around 15-18 million sq. ft. across the major cities in the next 4-5 years.

New business models are likely to emerge including colocation services, pay-per-use utility model, built to suit, etc. Location and design, easy scalability, security, infrastructure, sustainable practices and reliable partner are the key determinants for Data Centre demand. In India, a captive Data Centre still has the highest market share however colocation service model is witnessing tremendous growth and is soon expected to be almost equal to captive.

Edge Data Centres is a big opportunity in India. Edge DCs are smaller Data Centres close to customers, away from submarine cable network. Smart City & Digital India initiatives will also create demand for Edge DCs. We anticipate tier II cities such as Ahmedabad, Jaipur, Nagpur, Kochi, etc. are likely to see investments towards Edge Data Centres.

Savills India Data Centre Service Offerings



Market Entry and Location Advisory Study



Property Valuation



Property Acquisition and Disposition



Project & Construction Management



Project Monitoring



Private Equity & Structure Debt



Market and Demographic Research



Technical Due Diligence



Colocation Services, Rackspace Leasing



Design & Build



Investments



Strategic Joint Ventures



Savills

Savills plc is a global real estate services provider listed on the London Stock Exchange. We have an international network of more than 600 offices and 39,000 associates throughout the Americas, the UK, continental Europe, Asia Pacific, Africa and the Middle East, offering a broad range of specialist advisory, management and transactional services to clients all over the world.

Savills India

Savills is India's premier professional international property consulting firm. Savills began its India operations in early 2016 and has since seen significant growth. With offices in Bengaluru, Mumbai, Delhi NCR, Chennai, Pune and Hyderabad; and also having serviced clients in Kolkata, Chandigarh, Guwahati, Bhubaneswar, Vadodara and Indore, Savills India has a strong pan-India platform to deliver to our clients.

Savills in India is a full-service advisor offering Commercial Advisory & Transactions, Project Management, Capital Markets, Valuations & Professional Services, Research & Consulting, Industrial & Logistics and Residential services. The blend of in-depth, sector specific knowledge with entrepreneurial spirit gives clients access to unique and innovative real estate solutions backed up by the highest quality of service delivery.

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