Colliers

Research | Asia Pacific

Growth engines of innovation:

How Asia Pacific's technology hubs are reshaping regional real estate

June 2021

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Introduction:

Brace for impact: technology and the real estate trajectory

Today, technology is the most important business sector globally. This fast-growing sector makes up 65% of the world's top 20 public companies by market capitalisation.

The ongoing expansion and innovation of the technology sector in APAC is fuelling new possibilities for occupiers and owners alike. In fact, technology companies are now the major driver of office leasing demand in Asia Pacific (APAC), possibly accounting for 20% to 25% of demand for leased office space in the region over the next five years. This report highlights where the opportunities will be concentrated and outlines the strategies for both owners and occupiers to harness changing dynamics to serve their business goals.

The importance of technology companies as a source of leasing demand is only set to rise. Besides high real GDP growth by global standards, many APAC countries benefit from increasing urbanisation, high government investment in R&D and rising internet penetration – a good mix for technology companies.

In this report, we provide a new ranking of the most attractive established and upcoming technology submarkets within major APAC cities. This can serve as a guide for technology occupiers as they plan expansion. Since well-ranked technology submarkets ought to attract strong occupier demand, property owners should also focus on these districts for future investment and development opportunities.

We also outline opportunities for property owners beyond rental growth as the technology sector increasingly becomes a direct investor in APAC real estate. **Indeed, technology companies – especially Chinese firms – are emerging as a major new class of owner-occupier**. This creates an alternative source of capital for investors considering asset disposals, together with new opportunities for joint ventures and partnerships for developers. All this adds to the picture of an industry that is transforming not just lives, but real estate markets throughout the region.

Contents

All information in this report as of 22 June 2021

Executive summary

The technology sector is the key driver of office leasing demand in APAC.

- We see **Shanghai**, **Beijing**, **Bengaluru**, **Shenzhen** and **Singapore** as the **top five technology centres in APAC**, offering a compelling balance of infrastructure and talent for occupiers, and well-positioned to deliver future growth and investment opportunities for owners. The status of these cities reflects their large technology workforces, famous universities with a science focus and robust investment in research and development (R&D).
- However, other APAC cities are developing strengths in specific areas of technology, e.g. **Seoul and Hong Kong in fintech**. Meanwhile, **new technology centres are emerging** such as **Hyderabad** and **Sydney** – which deserve close attention.
- Based on a new methodology, this report ranks the **top 10 established technology submarkets** (where technology occupancy currently exceeds 15% of total office space) and **top 10 upcoming technology submarkets** (where we expect technology occupancy to exceed 15% of office space over the next five years) within major APAC cities, which occupiers should target for expansion.
- Among the established submarkets, we highlight Shangdi in Beijing. For upcoming submarkets, we highlight Yangpu in Shanghai, together with Whitefield and North Bengaluru in Bengaluru. Another upcoming submarket deserving mention is Sydney's CBD South.

Top 10 established technology submarkets in APAC, with scores

No.	Submarket	Score	Stock	Rent	Supply
1	Beijing Shangdi	3.4	1.5	37.4 ▲	0.8
2	Shanghai Caohejing	3.3	2.0	32.9 ▲	0.9
3	Shanghai Zhangjiang	3.3	1.9	31.1 ▲	0.8
4	Beijing Wangjing-jiuxianqiao	3.2	0.6	57.7 ▲	0.3
5	Beijing Zhongguancun	3.0	0.5	83.1 ▲	0.2
6	Bengaluru Outer Ring Road	2.8	5.0	16.9 ▲	1.1
7	Shenzhen Nanshan	2.7	1.3	45.2 ▼	2.1
8	Singapore Shenton Way / Tanjong Pagar	2.4	0.4	80.1 ▲	0.1
9	Singapore City Hall	2.4	0.5	79.0 ▲	—
10	Hyderabad Suburban Business District - HITEC City	2.4	3.4	13.0 < >	1.2

Top 10 upcoming technology submarkets in APAC, with scores

No.	Submarket	Score	Stock	Rent	Supply
1	Shanghai Yangpu	3.1	0.8	34.6 ▲	—
2	Shenzhen Qianhai	2.7	0.6	34.8 < >	1.6
3	Bengaluru Whitefield	2.7	2.7	10.8 < >	0.8
4	Bengaluru North Bengaluru	2.6	0.5	10.2 < >	0.8
5	Hyderabad Peripheral Business District	2.3	0.2	7.7 < >	1.3
6	Sydney CBD South	2.1	0.4	56.1 ▲	0.1
7	Delhi NCR Noida Expressway	2.0	1.8	9.7 ▲	0.6
8	Delhi NCR Golf Course Extension Road, Gurugram	2.0	0.7	11.7 ▲	0.3
9	Manila Quezon City	2.0	1.0	15.4 < >	0.1
10	Manila Manila Bay Area	2.0	0.4	15.7 ▲	0.2

Legend:
Scores: Scores out of 5 in Colliers' technology location ranking; **Stock**: Total office stock in millions of sq metres; **Rent**: Monthly NFA rent (US$ per square metre); **Supply**: Cumulative supply (2021–2025) in millions of sq metres.
▲ Rent rising < > Rent stable

"The technology sector is the key driver of office leasing demand in major APAC cities. While demand from MNC technology occupiers remains important, we expect APAC technology occupiers to predominantly drive demand and shape major office markets over the next five years."

Sam Harvey Jones
Managing Director | Asia Occupier Services

Key recommendations for occupiers

In planning their expansion, we recommend that technology occupiers **explore upcoming submarkets**, and also **pay close attention to the infrastructure and policy environment** in these locations. The following are identified technology submarkets and strategies in APAC:

Beijing

Focus on the Shangdi and Beiqing Road areas, northwest of better-known Zhongguancun, to benefit from high-quality new buildings and affordable rents.

Shanghai

Explore Yangpu as an alternative to Caohejing and Zhangjiang, due to its growing reputation as an entrepreneurial hub.

Shenzhen

Consider Qianhai for expansion, given the oversupply of space and government incentives.

Singapore

With supply tightening and the lack of real clusters, occupiers in Singapore should lock in space as and when it appears in preferred locations.

Bengaluru

Evaluate commuting challenges and transport links before relocating. Consider North Bengaluru for expansion as infrastructure improves and space becomes available and also due to its proximity to the airport.

Hyderabad

Consider the Off-SBD and Peripheral Business Districts, which offer a strong pipeline of office space from reputed developers and land for built-to-suit facilities.

Sydney

The emergence of CBD South as a new technology hub and the resultant new developments will give technology occupiers the chance to pre-commit to next-generation office space to attract and retain talent.

Manila

Focus on the Manila Bay Area and Quezon City, which should increase in popularity due to lower rents and supply of quality PEZA-accredited space.

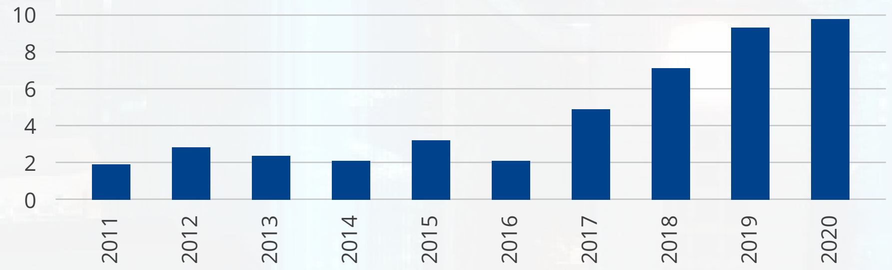
Seoul

Consider Seongsu-dong, Guro and Gwacheon for expansion, given the paucity of space within the established GBD and Pangyo clusters.

Key recommendations for owners

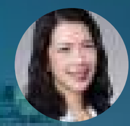
- **Concentrate on attractive upcoming submarkets for medium-term growth prospects**. While traditional technology clusters, such as Pangyo in Seoul and Beijing's Zhongguancun will remain vibrant, we see greater growth potential in fringe or upcoming districts as expansion, infrastructure improvements and, in some cases, government incentives encourage tech companies to explore new locations.
- **The tech sector will create opportunities beyond rental growth**. While the primary expansion strategy of multinational technology groups remains leasing, large Asian – especially Chinese – technology firms have become very active in direct investment and development.
- **In 2020, technology companies acquired nearly USD10 billion of real estate assets in APAC**, up fivefold from 2016. Surprisingly, Asian technology companies have favoured development sites over completed assets, suggesting they are planning for the long term. They are emerging as a **new class of owner-occupier** with large property portfolios.
- Developers and investors need to respond to the requirements of technology groups, which seek **redevelopment or conversion opportunities for built-to-suit office space**, as well as landbanks to roll out logistics and data centre platforms.
- Specifically, we recommend that:
  - **Investors consider technology companies as alternative buyers of aging assets;** they can also seek partnerships with technology firms to redevelop their assets with a clear exit once development is completed.
  - **Owners with landbanks and development capabilities in areas like logistics warehousing or data centres consider joint ventures** with technology companies to develop these assets to meet their partners' requirements. These ventures can be one-off developments or ongoing partnerships spanning multiple projects.
  - Investors with passive capital look out for **opportunities in real estate funds** set up by technology companies that are open to third-party investment.

Property acquisitions by technology firms in APAC (USD billions)



Source: RCA

"Beijing, Shanghai and Shenzhen are all top technology centres in China and APAC. Beijing's technology occupiers should look at the Shangdi and Beiqing Road areas as ideal locations for expansion, while asset owners in these areas are well-positioned to benefit from the expansion plans of these firms. Shanghai's Yangpu area and Shenzhen's Qianhai area are other ideal locations offering opportunities which both occupiers and owners should exploit."



Tammy Tang
Managing Director | China

1. The unstoppable rise of technology

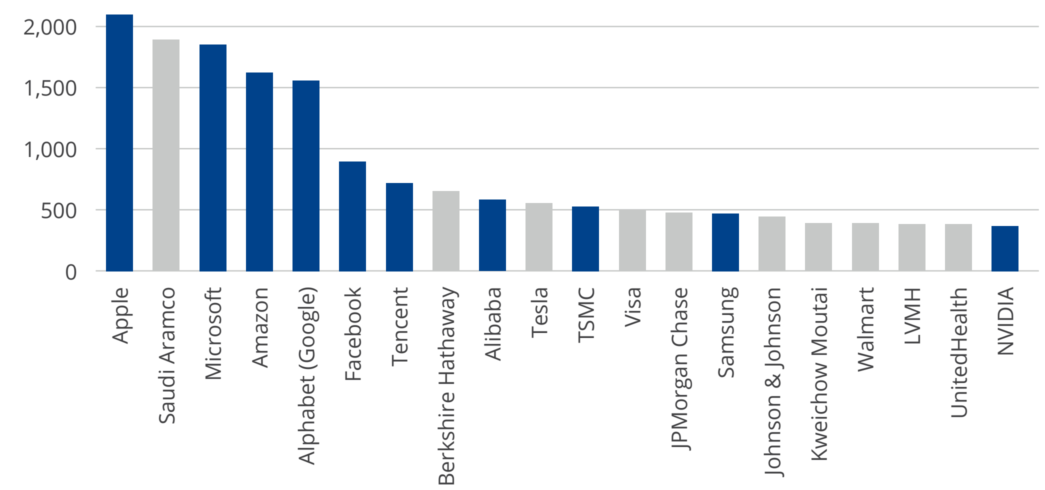
The technology sector represents 65% of the world's top 20 public companies by market capitalisation as at May 2021. Furthermore, Asian technology companies are growing in importance: the Chinese internet and e-commerce giants Tencent and Alibaba rank among those top 20, as do TSMC, the Taiwanese semiconductor producer, and Samsung, the South Korean technology conglomerate.

We have evaluated 16 cities and a total of 37 established and upcoming technology clusters across APAC. Our cluster definition is based on the proportion of technology occupiers as a percentage of total stock in each submarket, as follows:

- Established technology clusters currently have 15% or more technology occupiers
- Upcoming technology clusters will have 15% or more technology occupiers over the next five years

To score and rank the technology submarkets, we have evaluated the strength of the technology sector and the socioeconomic factors at a city level and the property sector at a submarket level. Details of the methodology and a summary of all the technology clusters can be found in the Appendix.

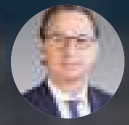
Top 20 public companies by market capitalisation (USD billions, May 2021, tech companies in dark blue)



Source: Bloomberg, https://companiesmarketcap.com/

"Within Asia Pacific, we are seeing Sydney's South CBD quickly emerging as a new technology hub. The new developments arising from that will enable technology occupiers to pre-commit to the next generation of office space to attract and retain talent in the industry."

Simon Hunt
Managing Director | Australia
Office Leasing



2. Market profiles

We will take a closer look at some of the key technology submarkets in the major APAC cities, their characteristics, the segments of the technology market in which they are strong, and their growth prospects next.

Shanghai

Home

Key tech subsectors
Semiconductors, SaaS, Internet

Upcoming tech subsectors
Smart manufacturing, AI, Fintech

From financial hub to tech standout

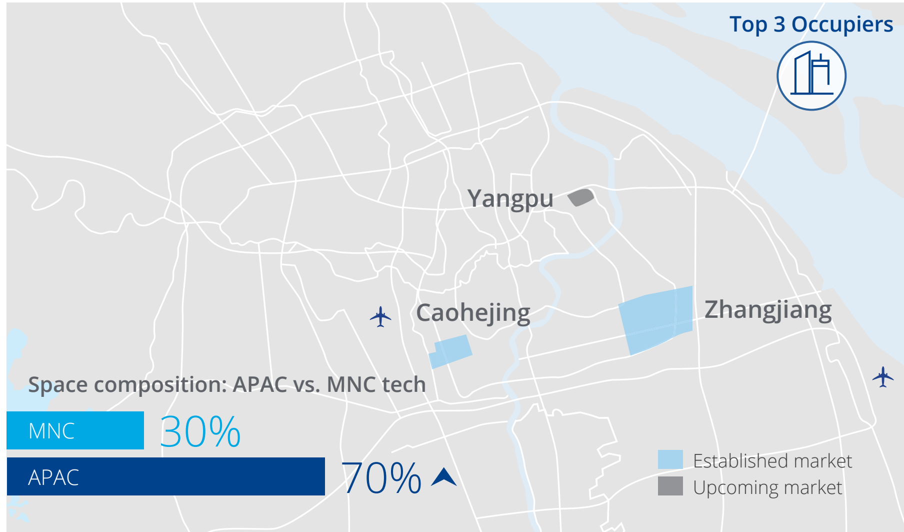
Shanghai authorities have made clear their ambition to transform the city into a science centre, while the city's financial and technology aspirations have converged with the launch of the Shanghai Stock Exchange's Star Market in July 2019 targeted at startup enterprises. The Yangtze River Delta around Shanghai is the most developed semiconductor region in China, with strength in production, chip design and assembly, testing and packaging. Shanghai has become well known for its software-as-a-service (SaaS) sector, home to some 400 companies. We see Shanghai building on its existing strengths in semiconductors, while the city's commercial dominance should aid its plans to develop smart manufacturing and AI, as well as fintech.

Real estate & workplace considerations

- With many technology occupiers needing 24-hour operations, asset owners are adopting variable air volume (VAV) HVAC facilities to support tenant requirements.
- Landlords are also providing space for generators for technology occupiers.

Outlook & recommendations

- Demand from the TMT (Technology, Media and Telecoms) sector should remain robust over the next five years.
- Vacancy should decrease until 2024, when we expect a wave of new supply.
- Technology occupiers should explore Yangpu as an alternative location, due to newer stock, and its growing reputation as an entrepreneurial hub.



Key market info	Aggregate	Caohejing	Zhangjiang	Yangpu
Total stock (sq metres)	7,097,392	2,022,682	1,933,009	774,625
Vacancy (%)	20.9%	18.6%	16.8%	24.8%
Supply (sq metres, '21–25)	2,621,712	875,094	821,171	NA
Avg monthly rent (USD/sq metres)	29.4	32.9	31.1	34.6
5-year rent growth (p.a.)	2.1%	2.1%	2.1%	2.1%

Tech occupier types | Operations | Building types | Property cycle

Established technology submarkets

Caohejing — Established | Offices & hi-tech manufacturing | Business & IT parks | Tenant-friendly

Located in south-west Shanghai, the Caohejing High-Tech Park is a renowned development that hosts 3,600 technology enterprises. Key sectors include Information Technology (IT), new materials, biopharmaceuticals, aerospace, environmental protection, new energy and automobile R&D.

Zhangjiang — Established | Offices & hi-tech manufacturing | Business & IT parks | Tenant-friendly

Zhangjiang High-Tech Industrial Park is a key technology submarket with a strong manufacturing base. It has 768 high-tech enterprises and 403 technology centres at the national, municipal or district level, and hosts 49 regional headquarters of multi-national corporations (MNC) and 138 foreign-invested R&D centres.

Upcoming technology submarkets

Yangpu — Established & upcoming | Office-based | Grade A and B office space | Tenant-friendly

Located in the northeastern part of central Shanghai, Yangpu is transforming into a high-tech centre. Home to many global and local technology leaders, including IBM, Oracle, and Baidu, Yangpu benefits from strong educational institutions that provide not only a superior talent pool but also an entrepreneurial climate.

Beijing

Home

Key tech subsectors
Internet, Software, IT services, Telecoms

Upcoming tech subsectors
AI and robotics

A top source of technology talent

Beijing has consistently invested in R&D, with spending averaging more than 5.5% of GDP from 2015 to 2019. The new economy, focused on technology, accounts for about 38% of the city's GDP, and this proportion should continue to grow. Well-known large technology groups with headquarters in the city include the internet enterprises ByteDance and Baidu, and the e-commerce platform Meituan, as well as the three major Chinese telecoms operators (China Mobile, China Telecom and China Unicom). Many technology occupiers prefer business parks in Beijing, due to lower rents than in conventional CBD office space.

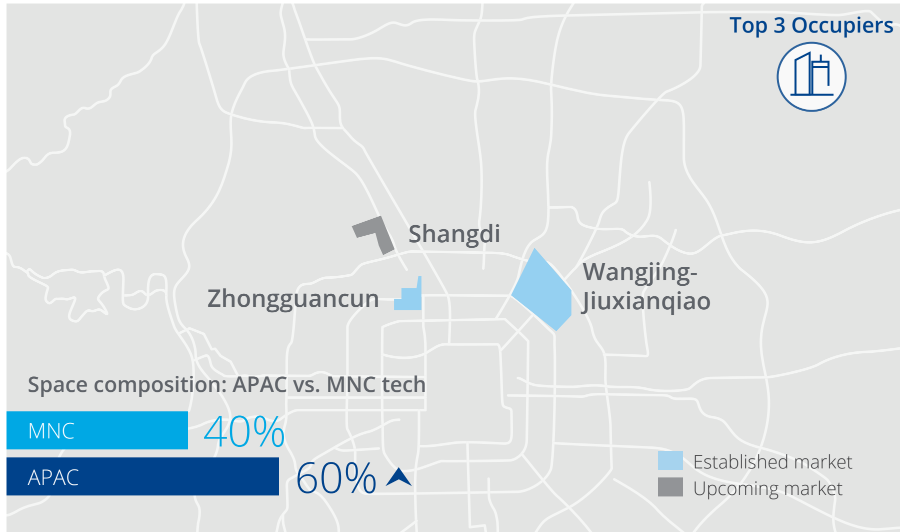
Real estate & workplace considerations

- Asset owners are incorporating technology such as facial recognition in buildings.
- Traditionally technology occupiers allocated 7 to 9 square metres per person in Beijing, we expect this to increase over the medium-term.
- Increasingly technology occupiers are creating environmentally-friendly workplaces that support the health and well-being of employees.

Outlook & recommendations

- Technology occupiers expanding their operations in Beijing should focus on offices within the Shangdi and Beiqing Road areas to benefit from high-quality new buildings, and affordable rents.

For further details, please see Colliers' report: Tech Occupiers Code Beijing's Future



Key market info	Aggregate	Zhongguancun	Shangdi	Wangjing-Jiuxianqiao
Total stock (sq metres)	3,958,617	539,001	1,547,923	596,232
Vacancy (%)	9.7%	3.9%	7.0%	7.7%
Supply (sq metres, '21–25)	1,623,808	249,631	785,596	319,900
Avg monthly rent (USD/sq metres)	45.9	83.1	37.4	57.7
5-year rent growth (p.a.)	2.1%	1.6%	2.9%	2.1%

Tech occupier types | Operations | Building types | Property cycle

Established technology submarkets

Zhongguancun — Established | Predominantly internet-based | Grade A | Landlord-friendly

The Zhongguancun technology hub is close to China's top universities and is well known as the birthplace of China's internet industry; it has also quickly emerged as a hotspot for AI development. We are seeing a northwestern tech corridor develop from Zhongguancun to Shangdi and further towards Beiqing Road.[1]

Shangdi — Established and upcoming | Office space and manufacturing | Business parks | Landlord-friendly

The Shangdi submarket hosts a critical mass of technology occupiers in Beijing, including giants, such as Tencent and Baidu. The development of Shangdi has benefited from the large-scale spillover demand from Zhongguancun.

Wangjing-Jiuxianqiao — Established and upcoming | Internet and e-commerce | Grade A office, Business parks | Landlord-friendly

Wangjing-Jiuxianqiao came into prominence after the global financial crisis in 2008. Building quality is higher than in the case of Shangdi and the upcoming Beiqing Road cluster. Wangjing is another hotspot for internet companies after the 4G wave in 2013.

Upcoming technology submarkets

Beiqing Road — Established and rapidly expanding | Office space and manufacturing | Business parks | Tenant-friendly

Beiqing Road lies in the northwestern corridor and absorbs spillover demand from Shangdi. It mainly comprises large campus facilities in business parks, and benefits from the policy advantages of the China (Beijing) Pilot Free Trade Zone.

[1] See Xinhua (13 December 2020), http://www.xinhuanet.com/english/2020-12/13/c_139586396.htm

Bengaluru

Home

Key tech subsectors	Upcoming tech subsectors
Captive centres, Business process outsourcing	SaaS, App development, Edtech (educational technology), Fintech

Leading Indian technology centre

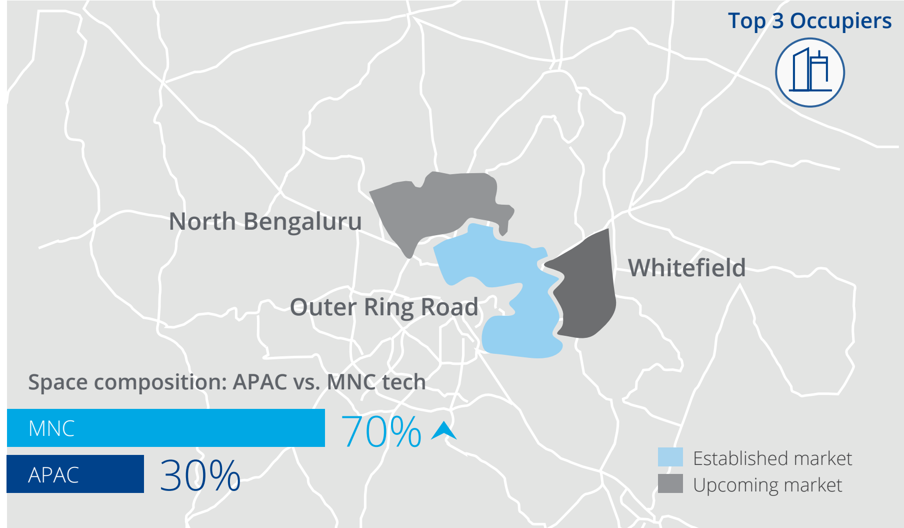
Since the early 1990s, Bengaluru has enjoyed a consistent supply of talent and high availability of office space. Due to challenges including overburdened infrastructure and limited vacancy in preferred submarkets, such as the Outer Ring Road (ORR), Central Business District (CBD) and Suburban Business District (SBD), we expect office demand to shift to towards Whitefield, where quality supply is available at competitive rents, with the upcoming metro rail completion set to fuel demand further.

Real estate & workplace considerations

- With captive centres and the BPO (Business Process Outsourcing) sector dominating the office landscape in India, space per person has fallen from more than 150 square feet in the early days to around 70 to 80 square feet today.
- After COVID-19, we expect this figure to increase and settle in the 100 to 120 square feet per person range.
- Given increased use of technology within the workplace and a more flexible approach from companies, we expect 20% to 25% of the workforce to be able to work from anywhere over the medium-to-long term.

Outlook & recommendations

- Traffic and accessibility during peak hours are a challenge across most of the city. This requires occupiers to evaluate residential locations, commuting times and district-level transport links when determining locations for expansion.
- Currently, North Bengaluru (defined as the micromarkets of Hebbal and Yelahanka) is not a technology cluster. However, we recommend that occupiers consider this location for expansion and consolidation as infrastructure improves and office stock becomes available.



Key market info	Aggregate	Outer Ring Road	Whitefield	North Bengaluru
Total stock (sq metres)	11,325,905	4,962,227	2,682,308	456,358
Vacancy (%)	11.6%	6.5%	19.9%	46.9%
Supply (sq metres, '21–25)	3,135,481	1,105,467	827,767	801,289
Avg monthly rent (USD/sq metres)	14.7	16.9	10.8	10.2
5-year rent growth (p.a.)	1.3%	1.4%	0.0%	1.1%

Tech occupier types	Operations	Building types	Property cycle

Established technology submarkets

Outer Ring Road (ORR)

Tech occupier types	Operations	Building types	Property cycle
Top technology and BPO occupiers	Office occupiers	Business parks	Landlord-friendly

The ORR is the epicentre of commercial office leasing in Bengaluru, accounting for 35% to 40% of Bengaluru's total annual leasing volume. This area houses major MNCs and accounts for 40% of total office stock.

Whitefield

Tech occupier types	Operations	Building types	Property cycle
IT and ITeS occupiers	Office occupiers	Special economic zones and busines parks	Balanced

This is a self-reliant, established peripheral IT district with several Special Economic Zones and IT parks. Reasonable rents attract companies looking to scale up and enjoy cost arbitrage.

Upcoming technology submarkets

North Bengaluru

Tech occupier types	Operations	Building types	Property cycle
R&D facilities	Office occupiers and high-tech labs	SEZs and busines parks	Balanced

After the opening of the new airport in Devanahalli in 2008, real estate development has picked up in the northern belt with various IT parks and planned Special Economic Zone supply. Connectivity is good, but social infrastructure is still in the development stage. New supply over five years is highest after the ORR.

Shenzhen

Home

Key tech subsectors	Upcoming tech subsectors
Hardware manufacturing, Internet	5G mobile, Biotech, Robotics

China's innovation engine

Shenzhen's economy was originally built on hardware manufacturing, and it remains the site of the main production facilities of Huawei and ZTE, the Chinese telecoms equipment producers, as well as Foxconn, the Taiwanese group thought to be China's largest private sector employer.

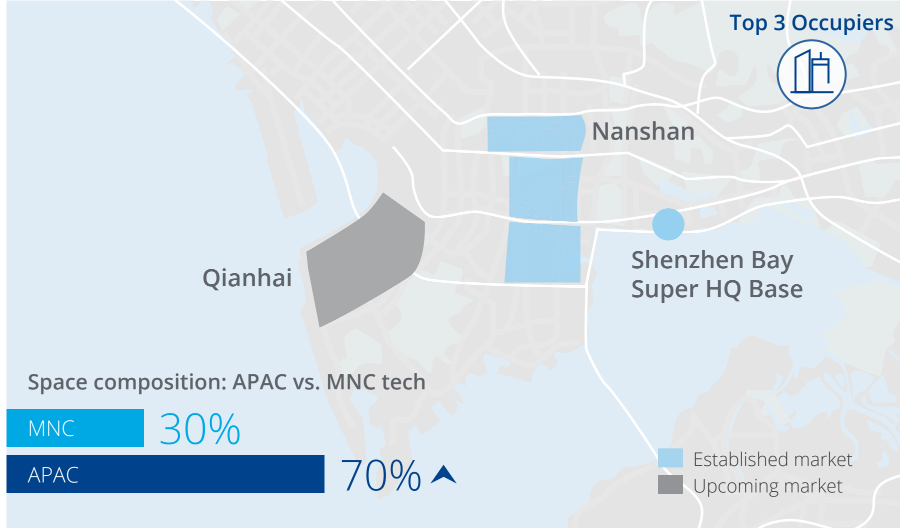
In addition, Shenzhen and the surrounding towns remain home to some of the largest production facilities of Foxconn. However, high investment in R&D has broadened Shenzhen's technology base, and today the city is equally well-known as one of China's leading internet centres. Notably, Tencent, Asia's biggest technology company by market value, has its headquarters in Shenzhen's Nanshan district. Shenzhen continues to invest heavily for future development. It is a leader in 5G mobile, while other fields of expansion include biotech and robotics.

Real estate & workplace considerations

- The Qianhai authority is currently offering tax incentives to companies seeking to relocate to the district. Besides companies, Qianhai offers subsidised accommodation and transportation facilities to attract talented staff.

Outlook & recommendations

- Due to the ample new stock available within Shenzhen's technology clusters, occupiers can trade up from their existing premises.
- With an oversupply of space and government incentives on offer, technology occupiers needing good quality Grade A office space should consider Qianhai for expansion.



Key market info	Aggregate	Nanshan	Qianhai
Total stock (sq metres)	3,720,648	1,316,331	608,056
Vacancy (%)	21.0%	17.3%	44.2%
Supply (sq metres, '21–25)	4,119,367	2,051,942	1,570,887
Avg monthly rent (USD/sq metres)	47.8	45.2	34.8
5-year rent growth (p.a.)	-0.3%	-0.3%	-0.3%

Tech occupier types	Operations	Building types	Property cycle

Established technology submarkets

Nanshan

Tech occupier types	Operations	Building types	Property cycle
Established and upcoming	Offices and manufacturing	Grade A, B, Business, and IT parks	Tenant-friendly

The technology sector makes up about 60% of Nanshan's GDP and is the main driver of office demand. Within Nanshan, Hi-Tech Park Middle and South Zones have predominantly business parks that are popular with both upcoming and established technology occupiers. Meanwhile, Houhai has a steady pipeline of new supply that is popular with established technology companies.

Upcoming technology submarkets

Qianhai

Tech occupier types	Operations	Building types	Property cycle
Established and upcoming	Office occupiers	Predominantly Grade A	Tenant-friendly

Shenzhen's Grade A office development has been shifting westwards over the last three decades. Today, Qianhai has established itself as the upcoming CBD. Financial and technology sector occupiers have relocated or expanded their footprint to Qianhai to obtain government incentives and rental subsidies.

Shenzhen Bay Super HQ Base

Tech occupier types	Operations	Building types	Property cycle
Established	Office occupiers and HQs	Predominantly Grade A	Tenant-friendly

The Shenzhen Bay Super Headquarter Base has plans for 24-hour operation, a greenbelt, cultural facilities, and low-density living space. The area is still in the initial stage of construction, with 1.32 million square metres of office space scheduled to be completed by 2024.

Singapore

Home

Key tech subsectors
Social media, Internet, Mobility

Upcoming tech subsectors
Fintech, High-tech manufacturing

A base of choice for global technology giants

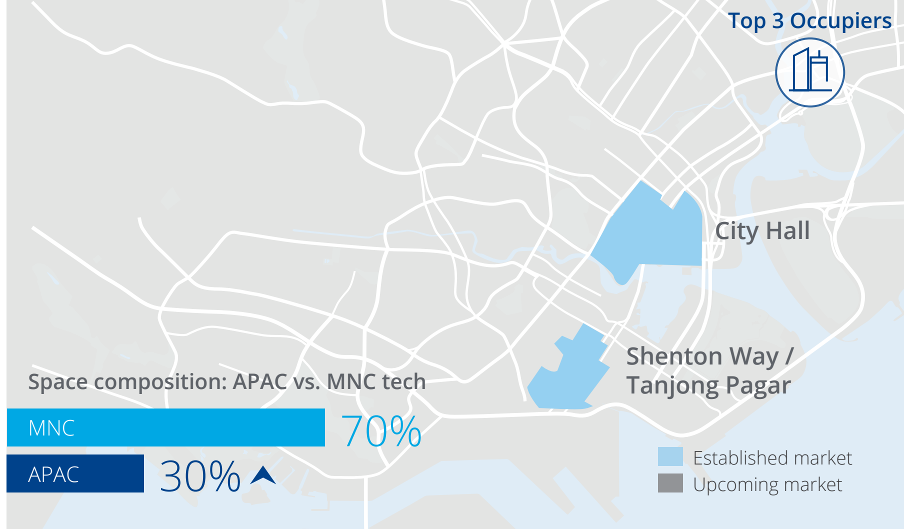
While Singapore is strong in most areas of the technology market, social media and internet perhaps stand out: Google, Facebook and Netflix all have their APAC headquarters in Singapore. Recently, Singapore has attracted interest from China's ByteDance and Tencent, which have expansion plans in Southeast Asia. Looking ahead, we expect Singapore to strengthen its position in fintech in particular. Moreover, Colliers has recently highlighted Singapore as one of the most attractive locations outside China for high-technology manufacturing operations.

Real estate & workplace considerations

- Singapore does not have an upcoming technology submarket as demand is likely to exceed supply over the next five years.
- While we have seen an increase in secondary space (sublease) coming into the market from occupiers in the financial services and related sectors, technology occupiers are expanding within Singapore.

Outlook & recommendations

- Singapore is a key growth market within APAC, with rents forecast to increase by over 3% p.a. on average over the next five years.
- We recommend technology occupiers strategically evaluate the variety that Singapore offers in terms of conventional, flexible and secondary spaces, and line each option up with their expansion plans.



Key market info	Aggregate	Shenton Way / Tanjong Pagar	City Hall
Total stock (sq metres)	812,645	358,691	453,954
Vacancy (%)	4.0%	4.3%	3.8%
Supply (sq metres, '21–25)	61,781	61,781	0
Avg monthly rent (USD/sq metres)	79.5	80.1	79.0
5-year rent growth (p.a.)	3.8%	4.2%	3.5%

Tech occupier types	Operations	Building types	Property cycle

Established technology submarkets

Technology occupiers are dispersed across Singapore's key business districts. While there are clusters within the Shenton Way / Tanjong Pagar and City Hall districts, we think that this reflects space availability rather than genuine technology agglomerations.

Shenton Way / Tanjong Pagar

Established and upcoming	Office occupiers	Mix of Grade A and B	Balanced

This area has been No.1 in Singapore for TMT occupiers since 2019, representing more than 20% of the stock. Accessibility is excellent, with MRT (Mass Rapid Transit) stations in Raffles Place, Tanjong Pagar, and Telok Ayer, plus multiple bus routes.

City Hall

Established and upcoming	Office occupiers	Mix of Grade A and B	Balanced

City Hall has more than 15% TMT occupancy and is a vibrant arts and cultural area, with modern offices, entertainment, retail, and hotel developments. Accessibility is excellent owing to the City Hall MRT station, the main interchange for Singapore's red and green MRT lines, plus many bus routes.

Hyderabad

Home

Key tech subsectors
Captive centres and BPOs

Upcoming tech subsectors
Biotech, AI, Machine learning

Development, supportive policy help India's second tech capital

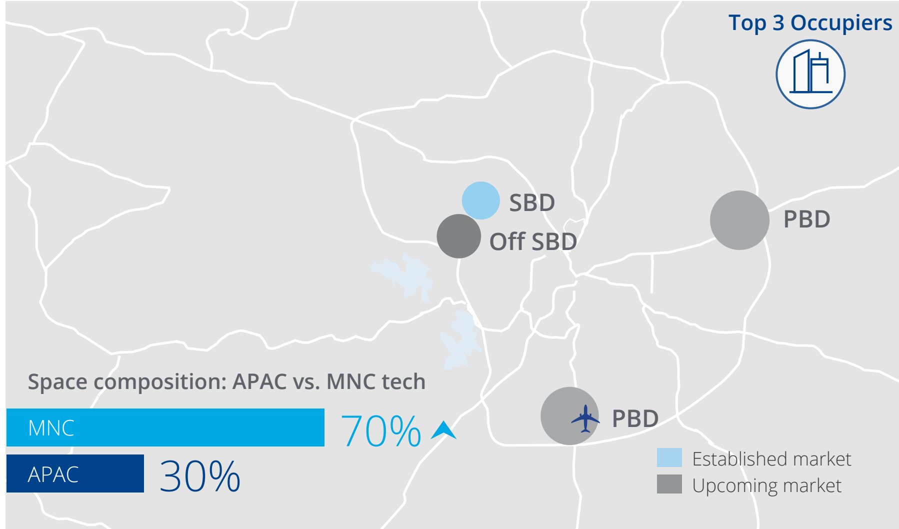
Today Hyderabad is one of the fastest growing in terms of office space demand, which has almost doubled from 0.50 million square metres to 0.88 million square metres in 2019. The government actively supports the industry by allotting land for the development of business parks and campuses. While smaller than Bengaluru, Hyderabad is also attracting talent and multinational companies to the city. Rents are 15% to 20% cheaper than in Bengaluru.

Real estate & workplace considerations

- From a real estate and workplace perspective, as in the case of Bengaluru, we expect space per employee to settle in the 100 to 120 square feet range in Hyderabad as well.

Outlook & recommendations

- While the SBD (Suburban Business District) is an established location, occupiers have to rely on existing and upcoming business and IT parks in the cluster. The Off-SBD offers a ready and strong pipeline of office space from reputed developers as well as land for built-to-suit facilities.



Key market info	Aggregate	SBD	Off SBD	PBD
Total stock (sq metres)	5,096,271	3,439,128	1,437,764	219,379
Vacancy (%)	13.6%	10.0%	17.8%	41.9%
Supply (sq metres, '21–25)	3,756,724	1,186,264	1,302,548	1,267,905
Avg monthly rent (USD/sq metres)	12.0	13.0	12.2	7.7
5-year rent growth (p.a.)	1.3%	0.9%	1.3%	1.0%

Tech occupier types	Operations	Building types	Property cycle

Established technology submarkets

SBD

Established	IT-BPM, consulting, engineering and manufacturing	Grade A office, business and IT parks	Balanced

Located in western Hyderabad, the SBD is a buzzing hub led by the presence of HITEC City, which houses over 90% of the technology enterprises in Hyderabad. The SBD market is strategically located with well-connected transport networks, adequate social infrastructure, and proximity to residential areas.

Upcoming technology submarkets

Off-SBD

Established	Financial and IT-BPM (Business Process Management)	Business and IT parks	Tenant-friendly

The Off-SBD submarket includes the micromarkets of Gachibowli and Financial district and sees spillover demand from the neighbouring SBD. The Off-SBD initially attracted educational and sports institutes, and large campus developments of prominent Indian companies like ICICI, Wipro and Infosys, due to the availability of large tracts of land at cheap rates.

Peripheral Business District (PBD)

Established	IT-BPM, healthcare and pharmaceuticals	Business and IT parks	Tenant-friendly

The PBD location consists of two submarkets, Pocharam and Uppal in eastern Hyderabad, and Shamshabad in the south. It is an upcoming location for IT campuses, with adequate land and affordable rents. Shamshabad is close to the airport, while Pocharam and Uppal are well connected with the Outer Ring Road of Hyderabad.

Seoul

Home

Key tech subsectors
Internet,Telecoms, Gaming, Semiconductors

Upcoming tech subsectors
E-commerce, Fintech

Robust infrastructure and affluence lure tech firms

Seoul is a wealthy city with good infrastructure; it also has a reputation as an enjoyable city to live in. The Gangnam business district, or GBD – one of Seoul's three main business areas – is home to many big IT companies. Strong demand for space from technology occupiers in Seoul has spilled over from Gangnam to the Pangyo new city 10 to 12 kilometres to the south-east.

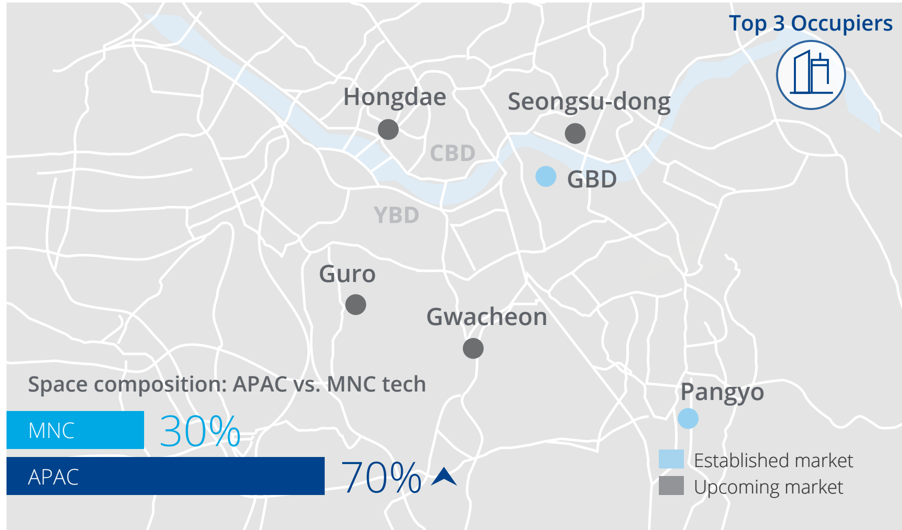
According to the OECD Digital Economic Outlook 2020, Korea ranked first in all areas of broadband infrastructure: 5G, fibre-optic broadband, download speed, and mobile data usage. E-commerce accounts for about 28% of total retail sales in Korea – a very high level. We expect e-commerce, fintech and gaming to continue to grow, led by "unicorn" companies such as Coupang, Market Kurly, Krafton and Kakao Bank.

Real estate & workplace considerations

- Korean work practices, like the local culture, are traditionally very conservative. COVID-19 has forced companies to be more flexible in how they operate.
- While we cannot foresee wholesale changes happening as fast as in other markets, we recommend that companies embrace new ways of working in order to remain competitive, boost recruitment and become more attractive places to work.

Outlook & recommendations

- Technology occupiers, especially in the gaming sector, are facing space shortages as their headcounts grow. As space is limited in Pangyo, we recommend Seongsu-dong, Guro and Gwacheon as new locations.
- In the established technology submarkets, the vacancy rate is much lower than in other districts of Seoul.



Key market info	Aggregate	GBD	Pangyo
Total stock (sq metres)	2,287,488	1,487,488	800,000
Vacancy (%)	6.5%	8.4%	3.0%
Avg monthly rent (USD/sq metres)	42.8	52.5	24.7
5-year rent growth (p.a.)	1.0%	1.0%	1.0%

Tech occupier types	Operations	Building types	Property cycle

Established technology submarkets

GBD

Established	Office occupiers	Predominantly Grade A	Landlord-friendly

Gangnam offers the most convenient access and the richest variety of startup supporting organisations and venture capital firms. These are grouped along Teheran-ro Street connecting Samseong Station to Seolleung Station. Global IT companies, such as Facebook, Google, and Amazon, are all located here.

Pangyo

Established and upcoming	Office occupiers	Mix of Grade A and B	Landlord-friendly

Pangyo is the optimal location for gaming-related technology tenants, helping make it the second-most popular technology cluster after Teheran-ro in Gangnam. Most leading Korean gaming companies, such as NCSOFT, Nexon, and Kakao Games are in Pangyo.

Upcoming technology submarkets

Hongdae, Seongsu-dong, Guro, and Gwacheon

Upcoming	Office occupiers	Mix of Grade A and B	Tenant-friendly

Hongdae and Seongsu are popular with startups and attract spillover demand from Gangnam. Technology companies cluster around the Guro Digital Complex to form Guro Valley where land is cheaper, attracting company HQs. The Gwacheon technology cluster has formed around the Gwacheon Knowledge and Information Town in the southern part of Gyeonggi-do.

For further details, please see Colliers' report:
Tech Occupiers in Korea

Sydney

Home

Key tech subsectors
Internet, Telecom, SaaS

Upcoming tech subsectors
Edtech, Fintech, Cybersecurity

Technology set to contribute to city's vibrancy

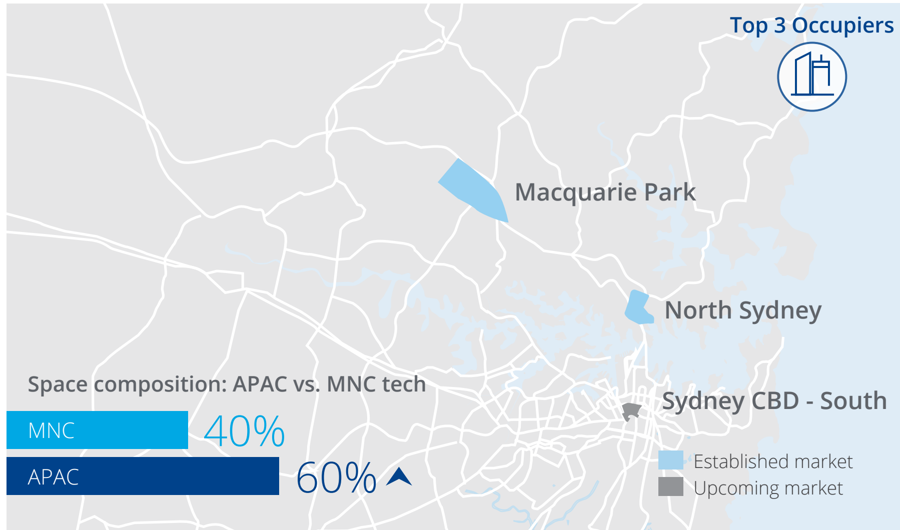
Sydney CBD is Australia's main financial and economic centre and the City of Sydney contributes 6.6% of national GDP. The finance and Insurance sector accounts for one third of occupancy in the CBD, together with professional services organisations and government tenants. However, the IT and Professional Services, Scientific and Technical Services sector has been a key driver of white-collar employment growth over the last 5–10 years, and should underpin future office demand. In addition, major improvements to Sydney's public transport network will enhance the connectivity between Sydney's office submarkets. Upon completion, the Sydney Metro Project will deliver 31 new metro stations and more than 66 kilometres of new metro rail, boosting connectivity between business and residential hubs. The Metro will extend into the CBD by 2024 and will run from Sydney's North West corridor including the Norwest, Macquarie Park, and North Shore office markets, through to the CBD and on to the South West corridor.

Real estate & workplace considerations

- The 5-year supply pipeline in Sydney will provide technology occupiers with options for flight-to-quality relocation or expansion on favourable terms in the current market.

Outlook & recommendations

- Whilst the traditional Sydney CBD is a well-established office market, the North and South of the CBD Core is providing a rare opportunity for technology occupiers to locate within revitalised growth precincts on the fringe of the traditional CBD.



Key market info	Aggregate	North Sydney	Macquarie Park	Sydney CBD-South
Total stock (sq metres)	2,244,826	922,793	934,710	387,323
Vacancy (%)	13.0%	14.8%	12.4%	9.8%
Supply (sq metres, '21–25)	321,503	119,568	129,146	72,789
Avg monthly rent (USD/sq metres)[1]	46.0	56.2	31.8	56.1
5-year rent growth (p.a.)	2.0%	-1.9%	3.8%	1.4%

Tech occupier types	Operations	Building types	Property cycle

Established technology submarkets

North Sydney

Established and upcoming	Office occupiers	Predominantly Grade B	Tenant-friendly

The North Sydney office submarket is located to the north of the CBD across the Sydney Harbour Bridge and may be considered an extension to the traditional CBD. It includes around 922,800 square metres of office stock of which only 40% is Prime grade (Premium and A-grade). Recent new developments have attracted major technology tenants such as Microsoft and Datacom and these tenants are expected to be a magnet for further technology company occupation.

Macquarie Park

Established	Office occupiers	Predominantly Grade A	Tenant-friendly

The Macquarie Park office market provides low-rise, campus style office accommodation within a business park setting, ideally suited to large-scale technology occupiers. Macquarie Park is located 18km from the CBD within the North West residential/employment growth corridor and will be one of the main beneficiaries of the new Metro line providing greater connectivity to North Sydney and the CBD.

Upcoming technology submarkets

Sydney CBD South Precinct

Established and upcoming	Office occupiers	Predominantly Grade B	Tenant-friendly

The Southern precinct is underutilised compared to the rest of the CBD. However, government investment has led to the development of the 'Central Precinct' which is slated to become a tech hub. This precinct will become home to Atlassian's HQ and the upcoming Central Place Sydney development is targeted at technology and innovation tenants. We expect Tech Central to become a world-class innovation and technology precinct.

[1] Prime Gross Face Rents

Home

Taipei

Key tech subsectors
Semiconductors

Upcoming tech subsectors
Biotech, AI, IoT

Building on a strong manufacturing base

Northern Taiwan, including Keelung, New Taipei City, Taipei, Taoyuan and the Hsinchu area, is the largest built-up area in Taiwan, accounting for 40% of the island's population.

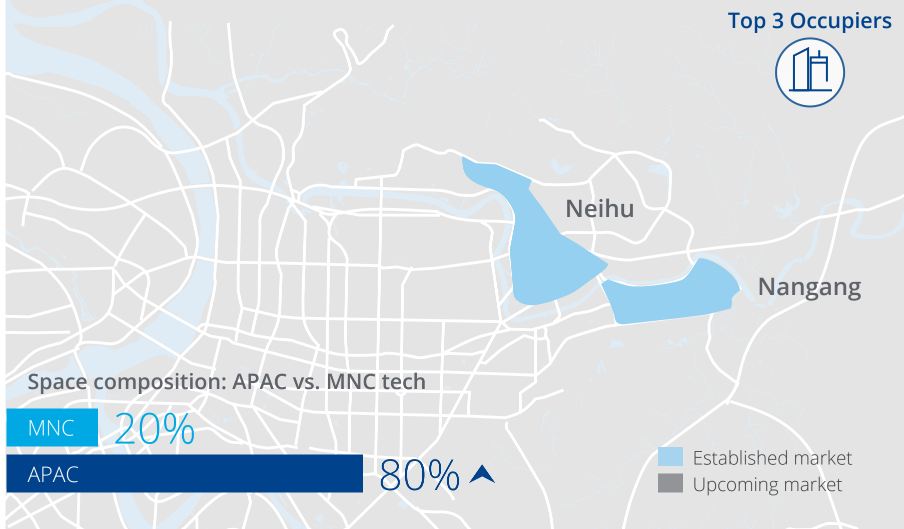
Taipei City itself is Taiwan's political and economic centre, while New Taipei City and Taoyuan City are important manufacturing bases, and the Hsinchu area is the largest base for technology manufacturing. As of May 2021, the world's most valuable semiconductor producer is TSMC (Taiwan Semiconductor Manufacturing Company), with a market capitalisation of USD532 billion. TSMC's headquarters and major operating plants are located in Hsinchu.

Real estate & workplace considerations

- From a technology perspective, Taiwan's hi-tech manufacturing stands out, unsurprisingly since it is considered to be the semi conductor capital of the world.
- From an office perspective, Taipei's office sector is expected to remain largely landlord-friendly until 2023.
- With a heavy influx of new supply (nearly 30% of total stock) scheduled to be delivered between 2024 and 2026, we expect the market to be tenant-friendly from 2024 onwards.

Outlook & recommendations

- While Neihu and Nangang remain the key clusters, particularly in high-tech manufacturing, we recommend alternative locations, such as Hsinchu Technology Park and Tainan, which are also seeing interest from technology occupiers.



Key market info	Aggregate	Neihu Technology Park	Nangang Business Park
Total stock (sq metres)	734,867	566,523	168,344
Vacancy (%)	9.3%	5.7%	3.5%
Avg monthly rent (USD/sq metres)	21.2	20.2	24.9
5-year rent growth (p.a.)	0.1%	0.1%	0.1%

Tech occupier types | Operations | Building types | Property cycle

Established technology submarkets

Taipei's CBD accommodates many of the technology occupiers from an office perspective, however, it is the high-technology manufacturing segment that drives Taiwan's technology sector. While most global IT occupiers have offices within Taipei, it is the semiconductor, consumer electronics, and computer manufacturing sectors that dominate the industry.

Neihu

Established	Predominantly manufacturing	Business and industrial park	Tenant-friendly

Located near Taipei, Neihu Technology Park is one of the principal technology developments in Taiwan. Home to companies like Nvidia and Samsung, Neihu's ecosystem is critical to Taipei high-technology manufacturing. The government continues to expand the infrastructure to ease congestion and alleviate transport problems.

Nangang

Established	Predominantly manufacturing	Business and industrial park	Tenant-friendly

Nangang Software Park is another critical element in Taipei's technology sector. Companies within the park focus on software and biotechnology solutions. In the future, the government expects technology occupiers within Nangang Software Park to focus on IC design and digital content, in addition to biotechnology.

Home

Manila

Key tech subsectors
Captive centres and BPOs

Upcoming tech subsectors
E-commerce, Fintech, Edtech

A star in regional outsourcing

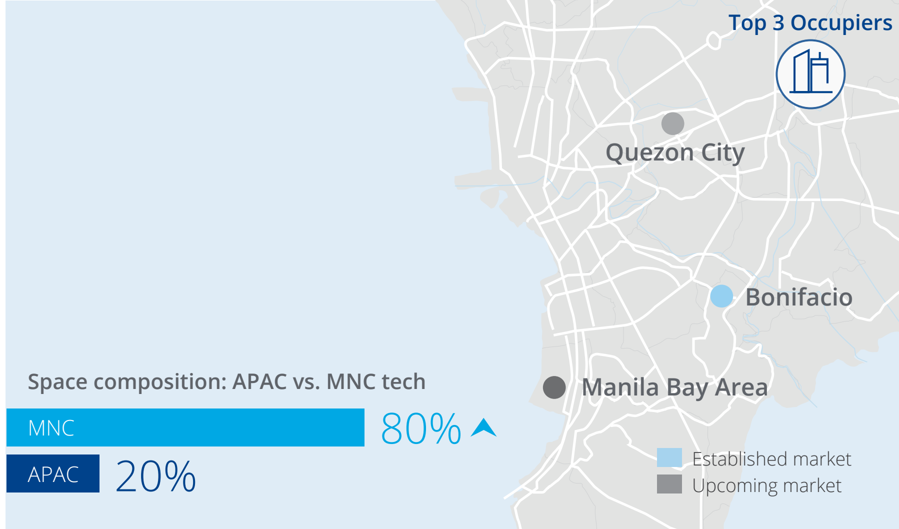
The Philippines' BPO (Business Process Outsourcing) sector is second only to India's within APAC. The sector accounts for nearly 10% of GDP and employs an estimated 1.3 million people across 1,000 companies and is a key office demand driver in Manila. With a relatively youthful population that is currently under or unbanked, fintech is expected to be a key growth sector in the future.

Real estate & workplace considerations

- Due to movement restrictions, the majority of staff were working from home for much of 2020. As a result, we have seen technology occupiers helping staff setup better home office spaces.
- As work resumes in the offices, technology occupiers are focusing on building a healthy physical work environment for their staff.

Outlook & recommendations

- Bonifacio Global City remains the preferred location for most technology occupiers due to the benefits of agglomeration.
- With new stock coming up in Quezon City and with POGOs (Philippine Offshore Gaming Operators) exiting their space in Manila Bay, their comparatively lower rents are attracting technology occupiers.
- We expect these locations to grow into prominent technology clusters over the next five years.



Key market info	Aggregate	Manila Bay Area	Quezon City	Bonifacio
Total stock (sq metres)	2,922,835	399,013	980,957	1,542,865
Vacancy (%)	7.2%	16.5%	6.9%	5.0%
Supply (sq metres, '21–25)	637,425	211,772	60,784	364,870
Avg monthly rent (USD/sq metres)	17.6	15.7	15.4	19.5
5-year rent growth (p.a.)	0.9%	1.9%	0.7%	0.6%

Tech occupier types | Operations | Building types | Property cycle

Established technology submarkets

Bonifacio Global City (BGC)

Established and upcoming	Office occupiers	Predominantly Grade A	Tenant-friendly

BGC is a key business district within Metro Manila, representing over 40% of the total office stock within the city. Popular with startups and global companies, the district saw rents steadily rising over the past five years until the economic downturn last year. It remains the go-to place for quality Grade A stock with good accessibility.

Upcoming technology submarkets

Manila Bay Area

Established and upcoming	Office occupiers	Predominantly Grade A	Tenant-friendly

Located in the west of Metro Manila and near the airport, Manila Bay is a popular business district. This district has seen a large stock of PEZA (Philippine Economic Zone Authority) accredited buildings. Popular with POGOs, Manila Bay is now seeing an exodus of these companies, making the location and its PEZA buildings a magnet for technology occupiers.

Quezon City

Established and upcoming	Office occupiers	Mix of Grade A and B and business parks	Tenant-friendly

Quezon City located in the north of Metro Manila is preferred by established IT-BPO companies as well as startups. With rapidly improving infrastructure and rents that are around 25% lower than in the established Fort Bonifacio, Quezon City offers a compelling option for technology occupiers.

Home

Hong Kong SAR[1]

Capitalises on partnerships and talent access to become a technology gateway city

Key tech subsectors
Internet, E-commerce, Mobility

Upcoming tech subsectors
Health tech, Blockchain, Fintech

Given Hong Kong SAR's strengths in capital raising and its close ties to Mainland China, the city is situated in an ideal locality to access the technology talent pool in neighboring South China while backed by strong partnerships and funding support. The government-backed Cyberport and Hong Kong Science & Technology Park (HKSTP) currently serves as the gateways to help drive tech start-ups and innovation through purpose built-facilities and major R&D infrastructures. The HKSTP corporation, in particular, houses a robust science park for R&D, an InnoCentre for design enterprises, and three industrial estates (Tai Po, Yuen Long, Tseung Kwan O) for skills intensive business sectors, which will further help drive Hong Kong SAR's tech innovation.

Outlook & recommendations

- For business and software development, tech occupiers should consider Cyberport as it offers strong business development and incubational support. Prominent companies include Klook, Zhongan Technologies, Amazon Web Services and Hewlett-Packard.
- For product and hardware development, HKSTP in Tai Po New Territories offers purpose-built advanced R&D facilities, boasting 330,000 sq m of research and office space. Prominent companies include Philips, Nvidia, Fujitsu and SenseTime.
- In the long term, we recommend tech occupiers stay tuned on the upcoming Hong Kong-Shenzhen Innovation and Technology Park located in the Lok Ma Chau Loop. The park will be further supported by the proposed Liantang/Heung Yuen Wai Science Park in Ta Kwu Ling and the nearby across-the-border Shenzhen Innovative and Technology Zone. Together with the infrastructure and development in place, it will likely bring about greater integration with Shenzhen and the GBA.

Source: Cyberport rents: Colliers estimates; Cyberport companies; HKSTP rents; HKSTP companies

[1] Special Administrative Region (of the People's Republic of China)

Home

Tokyo

Technology renaissance underway

Key tech subsectors
Telecoms, Internet, Mobility

Upcoming tech subsectors
High-tech manufacturing

Electronics hardware drove Japan's strong growth in the 1980s; and in any ranking of APAC technology centres before 2000 Tokyo would have been at the top. However, major technological shifts at the turn of the century hit Japan hard, and many big electronics groups have struggled ever since. More recently, Japan has experienced a partial technology renaissance, led by large younger companies like Softbank (internet/telecoms) and Rakuten (e-commerce, online retailing, fintech). Besides Softbank, the telecoms operators NTT, and KDDI have headquarters in Tokyo and are both big owners and big occupiers of property. Most of Japan's traditional hardware groups such as Sony, Toshiba and NEC are also based in Tokyo, although apart from Sony, many have withdrawn from manufacturing largely.

Real estate & workplace considerations

- Most multinational occupiers have adopted flexibility in workplace location as well as policies to enable staff to work from anywhere.
- Traditional Japanese companies are following suit and we expect this to be a growing trend in the workplace.

Outlook & recommendations

- Shibuya, Ebisu and Roppongi have recently been regarded as technology clusters within the city. However, with technology occupiers well-represented across the five central wards, we believe that classifying districts into technology clusters is largely artificial within Tokyo.
- Local and multinational companies may consider moving their R&D facilities to Yokohama, since a technology cluster may be developing here, and rents are more than 30% cheaper.
- As occupiers have begun adopting the new ways of working, we are seeing a reduction in the overall demand within the market. Over the next five years, rents should drop by around 4.0% p.a.

Auckland

Home

A fast-evolving technology ecosystem

New Zealand's technology industry is rapidly expanding, it is currently the country's third-largest export earner and could become its largest by 2030.[1] In 2020 the nation's largest 200 technology companies generated export revenue of USD6.8 billion, up 8% YOY.

This revenue is forecast to reach USD11.5 billion by 2030. The industry now comprises over 21,400 companies employing over 120,000 people.[2]

New Zealand's technology companies with international reach include Weta Studios, Rocket Lab, and Xero. Local companies have also attracted significant overseas investment. In the opening half of 2021, acquisitions of New Zealand's technology companies totalled more than USD1.5 billion.

Auckland

New Zealand's largest city remains the powerhouse of the technology sector. Auckland hosts the local headquarters of many international technology firms, including Microsoft, Apple, Oracle and AWS. The sector's growth has seen it exert greater influence over the CBD's office market in recent years. At end-2020, technology companies occupied 11% of the total office stock and 12% of the prime-grade inventory.

Significant technology clusters have formed within the CBD with leading players showing a strong preference for the City's northern and waterfront precincts, particularly the Victoria Quarter, Viaduct Harbour and the Wynyard Quarter. The Wynyard Quarter is the city's innovation precinct. Technology companies including Datacom, Australasia's largest homegrown technology company, and IBM occupy 17% of its office space. At the heart of the precinct is GridAKL, an innovation campus that creates opportunities for entrepreneurs and startup businesses to connect and share ideas. GridAKL offers coworking environments which house a mix of startups, SMEs and larger companies.

The Victoria Quarter has the largest penetration of technology businesses accounting for 30% of all office space occupied by the CBD's technology firms. The most significant player is Spark, New Zealand's largest telecoms and digital services company. The adjoining Viaduct Harbour precinct houses Microsoft, HP and AT&T which, along with other technology companies, occupy 21% of the precinct's office space.

Key tech subsectors	Upcoming tech subsectors
Telecoms, Internet, E-commerce	SaaS, Agri-tech, Fintech

[1] Source: NZTech
[2] Source: Technology Investment Network

3. Shifting strategies:

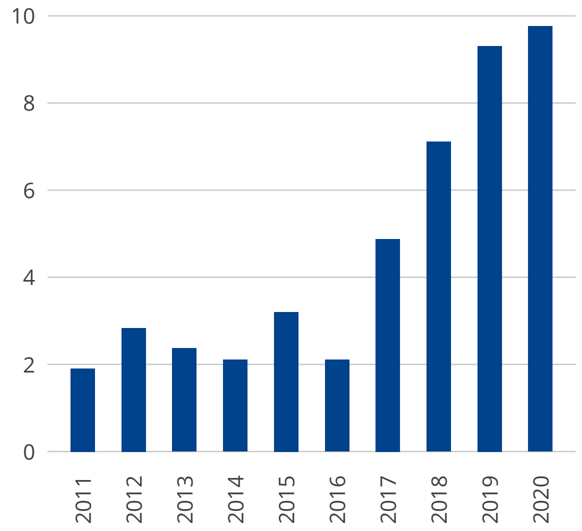
Investment implications and recommendations

Tech firms are on the acquisition trail. Reflecting strong growth within the technology sector, there have been notable movements by large technology firms to diversify into new areas.

With healthy balance sheets and a desire to tighten control over their real assets and infrastructure, major technology companies have increased their acquisitions of commercial real estate. **In 2020, technology companies acquired just under USD10.0 billion of real estate in APAC**, a fivefold increase from USD2.0 billion in 2016. Over the three years from 2018 to 2020, transaction volumes averaged USD8.7 billion, up 160% over the preceding three-year period.

Investment activity has been concentrated in mainland China, representing 70% of technology firm acquisitions in APAC over the past five years. This has been driven by some of the largest Chinese companies, which have, at times, been active elsewhere in the region. More surprisingly, technology firms have favoured development sites over completed assets, suggesting they are planning for the long term. Overall, 58% of transaction volumes over the past five years were allocated to development sites, with office and industrial assets the next most favoured sectors.

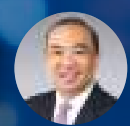
Property acquisitions by technology firms in APAC (USD billions)



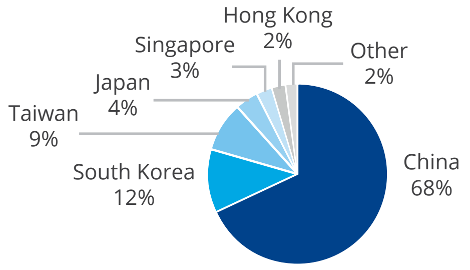
Source: RCA

"Large technology companies, especially Chinese technology firms, have been very active in direct property investment and development in APAC. These firms are now a major new class of owner-occupier. We work closely with this group of occupiers, together with property owners, to provide advice on repositioning aging assets and undertaking of joint redevelopment, to meet their existing and expanding occupational needs in offices, logistics & warehousing facilities and even data centres."

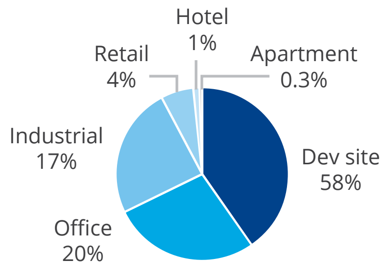
Terence Tang
Managing Director | Asia
Capital Markets & Investment Services



Technology investment by market (2016–2021 year-to-date)



Technology investment by sector (2016–2021 year-to-date)



APAC firms are following the global trend of undertaking large scale built-to-suit development projects, either for office occupation or for high-specification industrial buildings or logistics warehouses. However, APAC companies' investment strategies are more broad-based and include other strategic acquisitions not always directly for self-occupation. Groups with large data platforms often also set up internal teams to manage the roll-out of their data centre portfolios.

Technology companies have also been active in acquiring redevelopment opportunities. Several factors are driving this shift, including the difficulty of finding space in the leasing market in high-demand locations; as well as the desire to secure assets for sole use, blank canvases to meet niche design requirements or to maintain control over infrastructure. Large redevelopment opportunities are often favoured as they tend to be well-located assets where greenfield sites are scarce. Examples include the purchase by Bytedance of an underperforming shopping centre in early 2019 in Beijing for over USD1.3 billion. Alibaba also acquired a 50% stake in the AXA Tower redevelopment in Singapore, where it is already an anchor tenant. The e-commerce giant JD Group took control of an aging hotel in Beijing for around USD400 million, with plans to redevelop the asset for business and R&D use.

MNCs, Chinese tech firms exhibit different strategies

The primary expansion strategy for multinational technology companies in APAC remains leasing. MNCs have been active in direct investments in their home markets; however, their activity in APAC has been more subdued. Some of the larger MNCs have undertaken strategic acquisitions, largely aimed towards their logistics or data centre requirements. For example, Google's parent company Alphabet acquired three large sites in China in 2019 and 2020 for data centre developments.

Large Chinese technology firms have been far more active in direct investment into real estate. The reasoning behind the acquisitions is varied, as large Chinese technology firms acquire assets for their own occupation, develop master-planned projects partly for their own use, and sometimes undertake acquisitions for investment in areas related to their business. Large e-commerce platforms like Alibaba and JD.com have set up their own logistics arms with the aim of being actively involved in operating logistics platforms, making ownership of the assets a more favoured strategy.

Chinese technology firms are making their mark on the urban landscape, through big masterplanned communities and mixed-use development projects. Tencent acquired a 133 hectare site in late 2019 to create a planned community in Shenzhen's Dachanwan port area called Net City. The community is intended to be home to approximately 80,000 people, with a strong presence of Tencent offices and residences for its employees, as well as public amenities. Alibaba's investment in AXA Tower in Singapore is another example of an extensive redevelopment, with the firm teaming up with the Perennial consortium to build a large mixed-use project.

Chinese technology firms have also been investing in real estate platforms and funds, notably those aligned with their expansion plans. In 2018, JD.com invested USD306 million in the ESR platform. JD.com is already one of the largest tenants of ESR in China, so this is the type of strategic partnership that will benefit both parties. Tencent and JD.com were part of a consortium that in 2018 bought a large stake in Wanda Commercial Properties for a total investment of USD5.4 billion. Both Tencent and Alibaba have been undertaking strategic acquisitions to create synergies between brick-and-mortar retail and their online platforms.

Implications and opportunities:

A new engine of capital and development momentum

1

With major tech companies expanding and studying opportunities to create workplaces and logistics / data centre operations, we expect their transaction activity to increase further.

Across major APAC cities, acquisitions by technology companies of development and redevelopment sites have at times have been undertaken at record pricing – demonstrating their determination to attain preferred locations and that they tend to be less price-sensitive.

Investors studying aging asset disposals should consider technology companies as an alternative source of capital that is actively seeking strategic locations and redevelopment opportunities.

2

Developers with landbanks should evaluate partnering with technology companies to undertake built-to-suit projects on industrial or office sites. The development risk of these projects can be reduced by fund-through agreements[1], or on a turn-key basis.[2]

3

Technology firms will often lack the required development or construction capabilities to undertake major projects, creating opportunities for joint venture projects, and gives investors and developers the ability to value-add. Major technology firms have been active in joint-venture development arrangements across several sectors, including logistics warehouses, office assets and even residential developments.

4

Exploring these opportunities requires forging new connections. The tech sector is in some respects a self-contained ecosystem with its own norms and dynamics. Asset owners may want to consider a strategic partnership with a provider such as Colliers, which has strong corporate relationships with some of the world's largest technology firms pursuing real estate opportunities, to help identify and act early on potential deals or alliances.

[1] **Fund through**: also called a forward funding agreement whereby an investor acquires the project prior to completion and provides development funding through to completion.

[2] **Turn-key** – also called a forward purchase whereby the incoming investor and the developer agree to execute a sale and purchase agreement at completion of a project.

Appendix: City ranking and cluster scores

To rank the technology submarkets, we have examined more than 20 criteria under the following headings:

Technology sector factors (weighting: 50%)

Includes city-level global university rankings; growth of STEM (science, technology, engineering, and mathematics) graduates; IT and professional services employees; as well as domestic and foreign R&D and tech sector investment.

Socioeconomic factors (weighting: 30%)

Includes city-level GDP and growth; corporate tax rates; infrastructure spending; disposable incomes; average salaries; personal tax rates; as well as commute and innovation indices.

Property factors (weighting: 20%)

Includes cluster-level office stock, supply pipeline, space availability, current rent, and future rent growth.

City rankings

Top five cities overall and by technology sector factors: Beijing, Shanghai, Singapore, Bengaluru, Shenzhen

With technology sector factors enjoying a 50% weighting in our methodology, the top five cities by technology sector factors are likely to rank highest overall – especially if they also score highly in socioeconomic and property factors. The sheer size of the technology workforce and number of annual STEM graduates in Beijing, Shanghai, and Bengaluru put these three cities among the top five technology hubs in APAC. Meanwhile, Singapore's well-reputed universities, consistent government investment in R&D and high Foreign Direct Investment help it rank highly. Shenzhen is seeing an increase in both government and domestic investment with the growth of districts such as Qianhai and Shenzhen Super Bay Headquarters. Attracting and retaining the right workforce is a key challenge for technology groups; within the region, technology talent is increasingly mobile and markets like Singapore (regionally) and Shenzhen (domestically) benefit from this movement.

Top five cities by socioeconomic factors: Shanghai, Beijing, Shenzhen, Sydney and Singapore

Innovation is the bedrock of technology, while GDP growth, quality of living, infrastructure, corporate and personal taxes determine the longevity of cities. Besides Shanghai, Beijing, Shenzhen, Sydney and Singapore, score highly on these metrics within the region.

Top five cities by property factors: Bengaluru, Hyderabad, Delhi NCR, Shanghai, and Shenzhen

In addition to rent and rental growth, a key determinant for technology occupiers to grow is the availability of space. With ample space in new or outlying districts, Bengaluru, Hyderabad, Shenzhen, Delhi NCR and Manila, are the top markets by property factors.

Submarket rankings

Top 10 established submarkets

Overall, the top 10 technology clusters within the region are located in Beijing (Shangdi, Wangjing-Jiuxianqiao and Zhongguancun), Shanghai (Caoheijing and Zhangjiang), Bengaluru (Outer Ring Road), Shenzhen (Nanshan), Singapore (Shenton Way/Tanjong Pagar and City Hall), and Hyderabad (HITEC City)

Top 10 upcoming submarkets

We also see attractive upcoming technology submarkets in Shanghai (Yangpu), and Shenzhen (Qianhai), Bengaluru (Whitefield and North Bengaluru), and Hyderabad (Peripheral Business District), while technology submarkets in Manila (Quezon City and Bay Area), Delhi NCR (Noida Expressway and Golf Course Extension) and Sydney (CBD South) also show great promise.

Cities and technology clusters covered

#	City	Submarkets	Category	Tech sector score	Socioeconomic score	Property score	Total
1	Beijing	Shangdi	Established	1.9	0.9	0.6	3.4
2	Shanghai	Caoheijing	Established	1.7	1.0	0.6	3.3
3	Shanghai	Zhangjiang	Established	1.7	1.0	0.6	3.3
4	Beijing	Wangjing-Jiuxianqiao	Established	1.9	0.9	0.4	3.2
5	Shanghai	Yangpu	Upcoming	1.7	1.0	0.4	3.1
6	Beijing	Zhongguancun	Established	1.9	0.9	0.2	3.0
7	Bengaluru	Outer Ring Road	Established	1.2	0.8	0.9	2.8
8	Shenzhen	Qianhai	Upcoming	1.0	0.9	0.8	2.7
9	Shenzhen	Nanshan	Established	1.0	0.9	0.8	2.7
10	Bengaluru	Whitefield	Upcoming	1.2	0.8	0.8	2.7
11	Bengaluru	North Bengaluru	Upcoming	1.2	0.8	0.7	2.6
12	Singapore	Shenton Way / Tanjong Pagar	Established	1.3	0.9	0.2	2.4
13	Singapore	City Hall	Established	1.3	0.9	0.2	2.4
14	Hyderabad	Secondary Business District (SBD – HITEC City)	Established	0.7	0.8	0.9	2.4
15	Hyderabad	Off SBD (Gachibowli)	Established	0.7	0.8	0.9	2.4
16	Hyderabad	Peripheral Business District (PBD)	Upcoming	0.7	0.8	0.8	2.3
17	Seoul	Pangyo	Established	0.9	0.9	0.4	2.2
18	Seoul	GBD	Established	0.9	0.9	0.4	2.2
19	Sydney	Macquarie Park	Established	0.8	1.0	0.4	2.1
20	Sydney	CBD – South	Upcoming	0.8	1.0	0.4	2.1
21	Sydney	North Sydney	Established	0.8	1.0	0.4	2.1
22	Manila	Fort Bonifacio	Established	0.9	0.6	0.6	2.1
23	Taipei	Neihu Technology Park	Established	0.7	0.8	0.5	2.1
24	Delhi NCR	NH-48 Gurugram	Established	0.7	0.8	0.6	2.0
25	Delhi NCR	Noida Expressway	Upcoming	0.7	0.8	0.6	2.0
26	Taipei	Nangang Business Park	Established	0.7	0.8	0.4	2.0
27	Delhi NCR	Golf Course Extension Road, Gurugram	Upcoming	0.7	0.8	0.6	2.0
28	Manila	Quezon City	Upcoming	0.9	0.6	0.5	2.0
29	Manila	Manila Bay Area	Upcoming	0.9	0.6	0.5	2.0
30	Pune	Hinjewadi	Established	0.7	0.7	0.6	1.9
31	Pune	Kharadi	Established	0.7	0.7	0.6	1.9
32	Chennai	OMR Pre Toll	Established	0.7	0.7	0.6	1.9
33	Delhi NCR	Cyber City	Established	0.7	0.8	0.5	1.9
34	Delhi NCR	Sector 62, Noida	Established	0.7	0.8	0.5	1.9
35	Pune	Hadapsar	Established	0.7	0.7	0.5	1.8
36	Chennai	Mount-Poonamallee High Road (MPR)	Upcoming	0.7	0.7	0.5	1.8
37	Chennai	OMR Post Toll	Established	0.7	0.7	0.5	1.8

Source: Colliers

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