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WisdomTree Europe

The Real Estate Under Many Megatrends

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The Real Estate Under Many Megatrends

April 2022



**Introducing Real Estate
Powering the Growth of the Megatrends**

Introducing technology-focused real estate powering the growth of the megatrends



Cloud computing is a megatrend in its own right, changing the way that software and computer resources are consumed. The data centres that are central to its existence require specially designed warehousing to function.



Life Sciences are poised to gain a vast array of capabilities in the coming years. Laboratories are yet another example of very specialised real estate, without which many biotech, medical device and pharma efforts would struggle to get off the ground.



There is a lot of excitement around 5G connectivity—without the telecommunication tower sites designed to support this, the proliferation of this connectivity would not be possible.

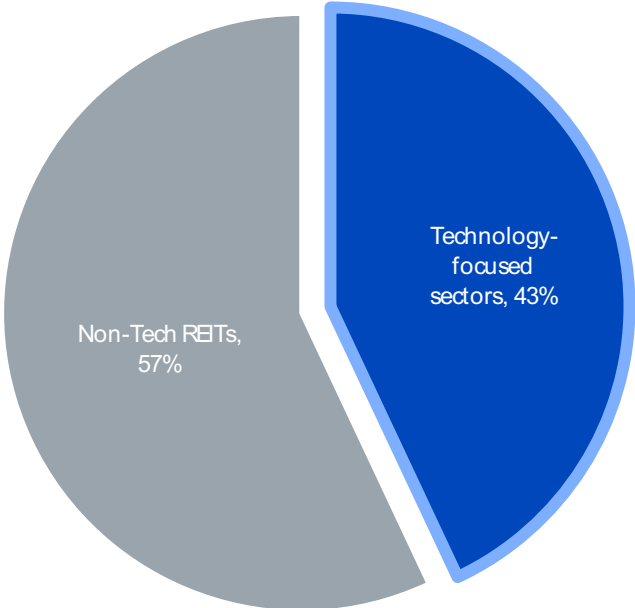


Modern logistics require a lot of very specialised buildings and warehouses, allowing more and more consumers and businesses to order anything they might need for fast delivery. One example of this is refrigerated storage, as many types of food need to be transported/stored within strict regulatory guidelines.

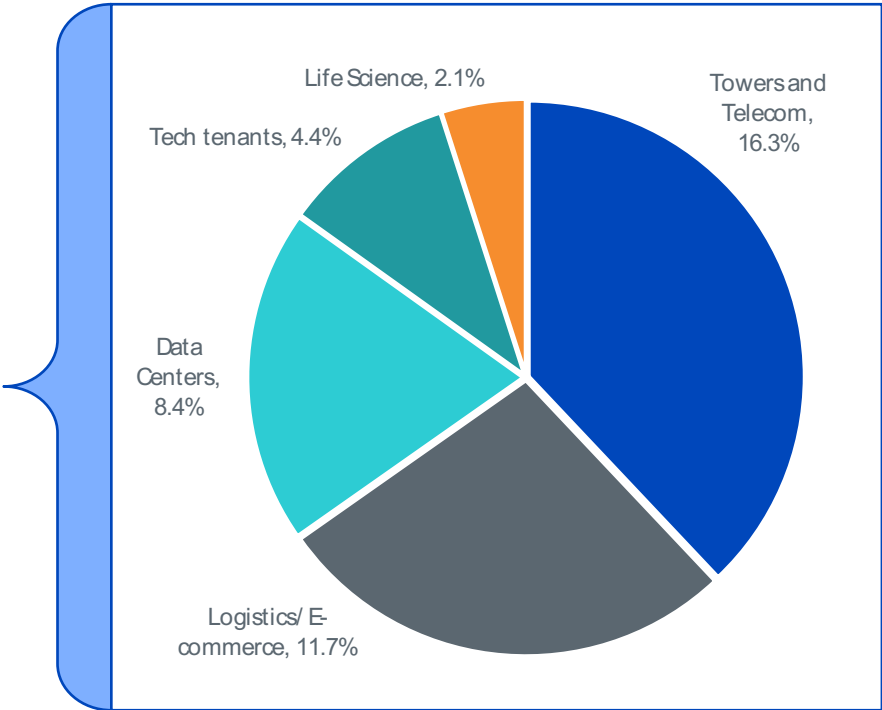
Source: WisdomTree.

The technology-focused sectors within real estate have increasingly grown in importance

REIT Sector Composition










Technology-focused sectors



Source: CenterSquare, Bloomberg. REIT (Real Estate Investment Trust) Sector composition is represented by the FTSE Nareit All Equity REITs Index. As of 31 December 2021. **You cannot invest directly in an index. Historical performance is not an indication of future performance, and any investments**

Opportunities in Real estate created by Technological Disruption

Sector	Technological Disruption Winner/Loser	Investment Implication
 Logistics/ Supply Chain	Winner	<ul style="list-style-type: none"> + Rise in Ecommerce sales necessitates build out of supply chain infrastructure + Demand for last mile distribution, infill markets and cold storage + Rent growth and collections extremely strong
 Data Centers	Winner	<ul style="list-style-type: none"> + COVID accelerated an existing robust and growing need for data storage + Specialists in the operation and development of technically complex assets
 Cell Towers	Winner	<ul style="list-style-type: none"> + 5G opportunity creates long growth runway for sector + Additional infrastructure spending as consumers demanding more video, less voice
 Life Sciences	Winner	<ul style="list-style-type: none"> + Aging demographics favor sector and have increased demand for lab space + Real estate specialists developing custom build outs in specific market hubs
 Office	Mixed	<ul style="list-style-type: none"> + Permanent remote work arrangements reducing overall demand for office space going forward + Opportunities favor modern offices that can be retrofitted to be efficient, technologically advanced, healthy spaces
 Hotels	Mixed	<ul style="list-style-type: none"> + Significant distress from travel bans and conference cancellations during COVID + Ongoing disruption from technology companies i.e. Airbnb
 Regional Malls	Loser	<ul style="list-style-type: none"> + Ecommerce penetration expected to continue to eat away at physical storefronts + Service retail still robust due to need to visit store to consumer service.

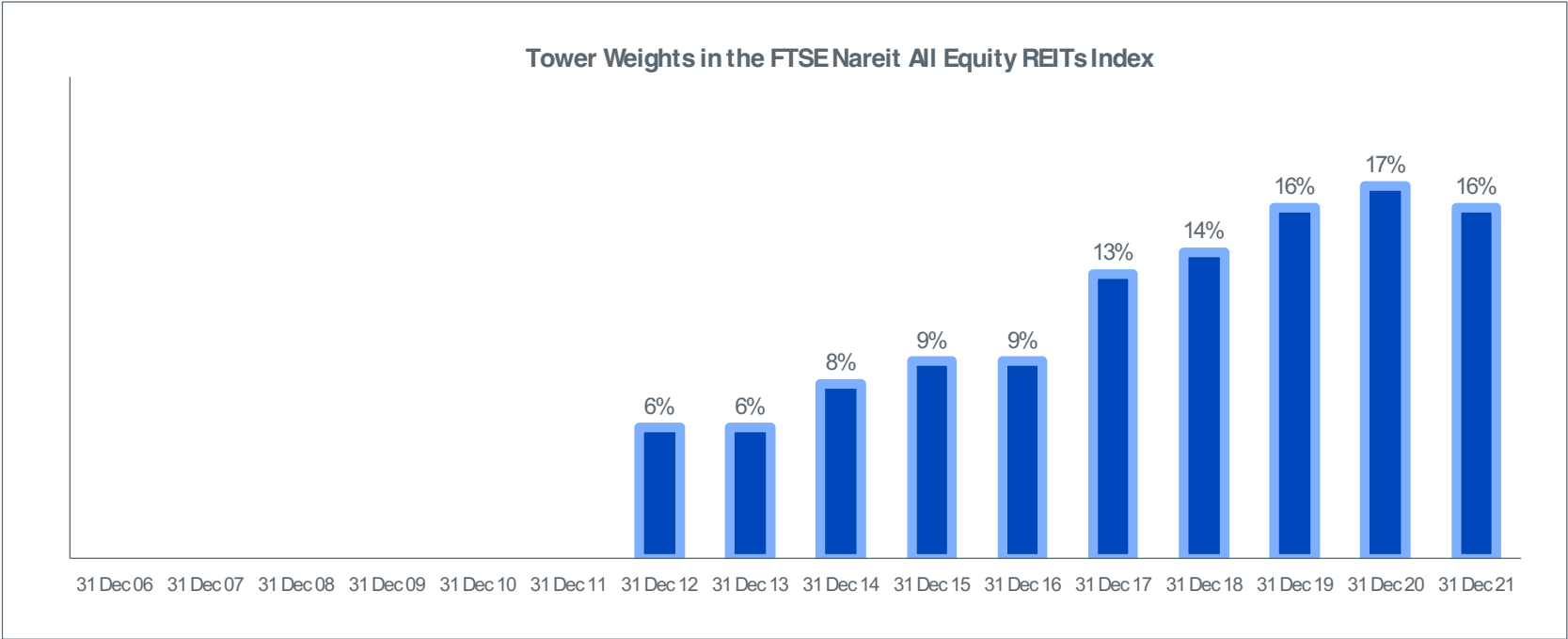
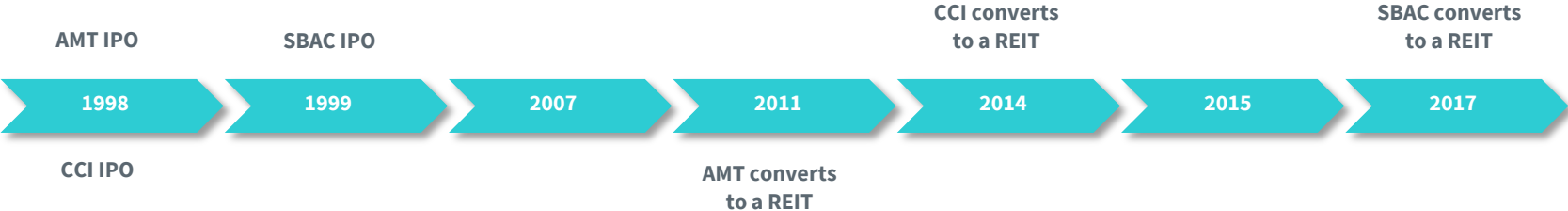
Source: CenterSquare, 2021.



Tech disruption and real estate opportunities

Exploring Cell Towers

The Growth and Evolution of Cell Towers



Source: CenterSquare. FTSE Nareit All Equity REITs Index as of 31 December 2021. AMT= American Tower Corp.; CCI = Crown Castle International Corp.; SBAC = SBAC Communications Corp.

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Cell Network Infrastructure: How to Provide Coverage

Macro Antenna Sites

- + Best way to provide more overall signal coverage
- + Utilized in less dense suburban and rural areas
- + Generally deployed with farther reaching low-band spectrum, but mid-band is being added
- + Tall and good line of sight to maximize signal propagation



Source: CenterSquare.

Small Cells and Rooftops

- + Commonly used in dense urban areas
- + Can be deployed with all spectrum, but will be more mid-to-high band spectrum for 5G
- + Utilized to add bandwidth and speed to cellular networks
- + Low levels of signal propagation requires greater site count



Cell Tower Ownership Structure

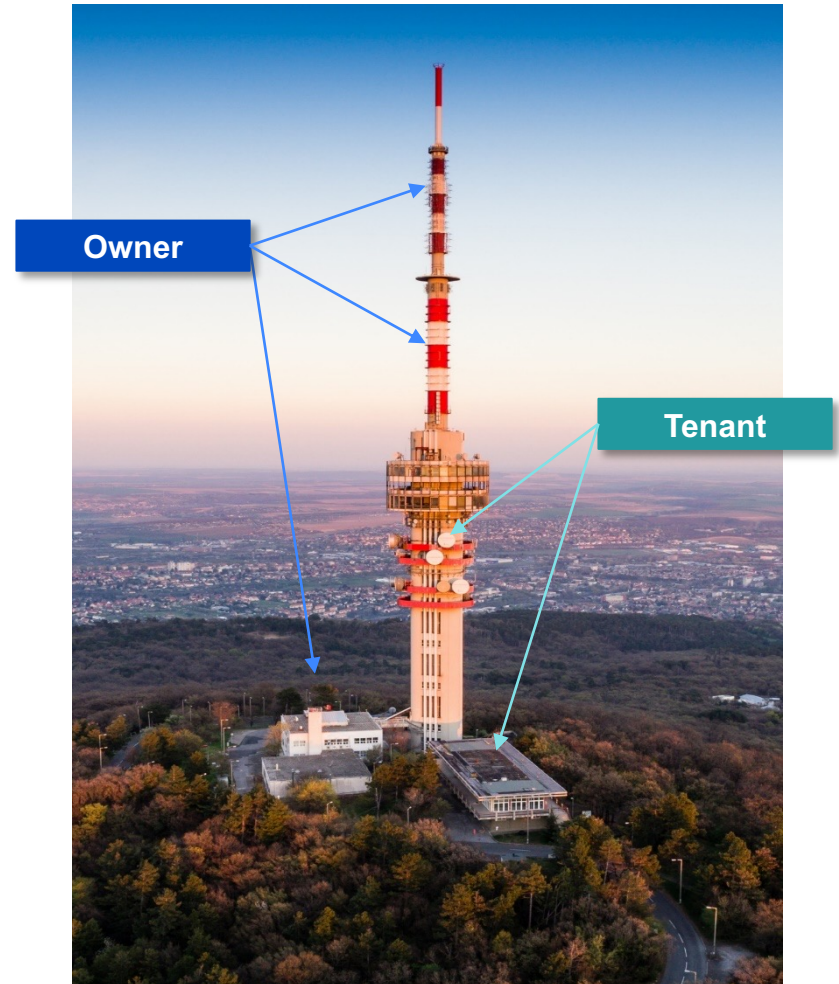
Tower Owner

- + Owns the physical vertical steel structure
- + Owns the shelter and base station structure
- + May own the land under the tower or likely control it under 30+ year lease structure

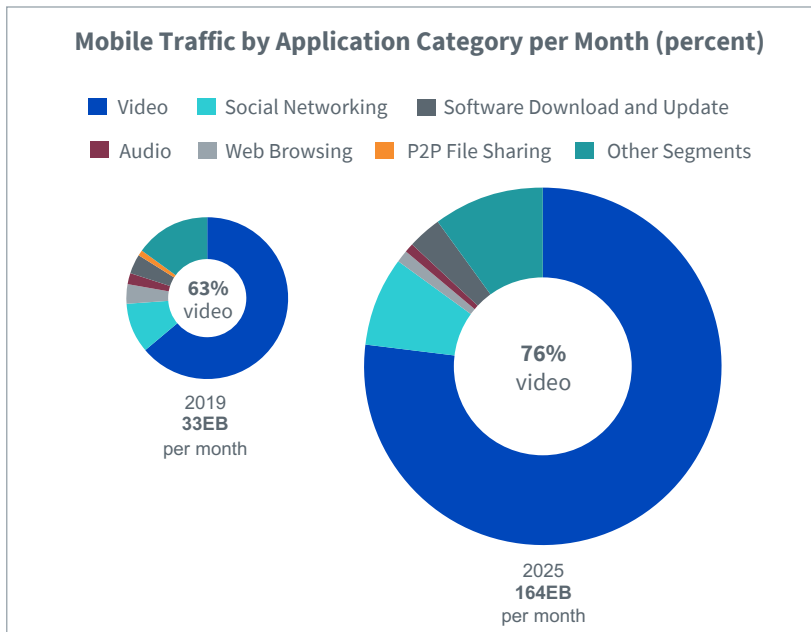
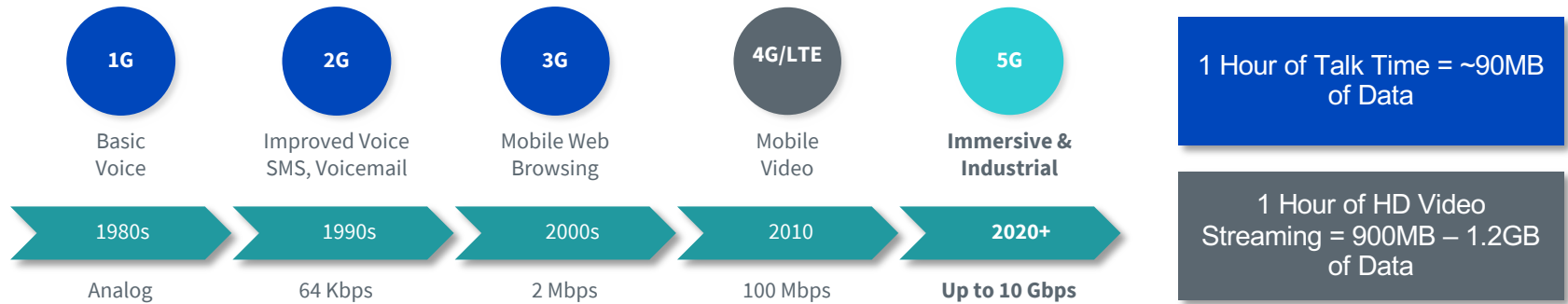
Mobile Network Operator

- + Owns antenna, radio equipment, etc.
- + Fiber/Cable services the tower
- + Base station equipment housed in the shelter

Source: CenterSquare.



Mobile Data Demand - More Video, Less Voice



Mobile traffic is expected to grow by **31 percent annually between 2019 and 2025**. Continuing recent trends, **most of this will come from video traffic**.

Main drivers for video traffic growth:

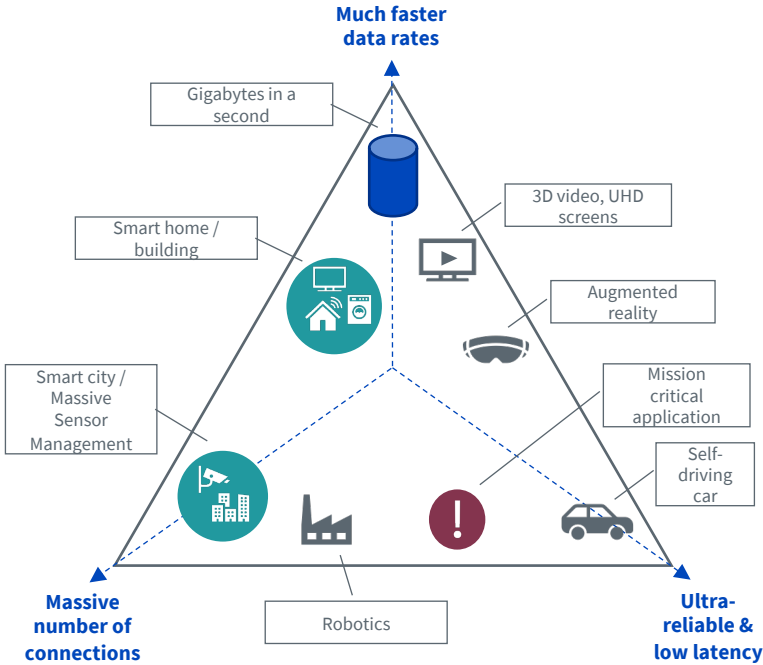
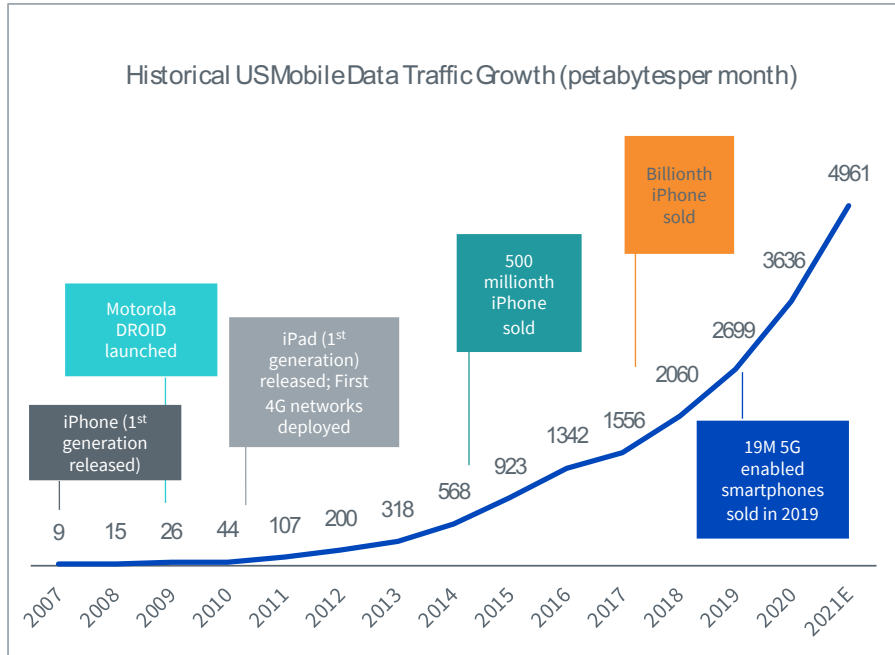
- + Video is part of most online content (news, ads, social media, etc.)
- + Video sharing services
- + Video streaming services
- + Changing user behavior
 - Video being consumed anywhere, any time
- + Increased segment penetration, not just early adopters
- + Evolving devices with larger screens and higher resolutions
- + Increased network performance through evolved 4G and new 5G deployments
- + Emerging immersive media formats and applications (HD/UHD, 360-degree video, AR, VR)

Sources: Ericsson Mobility Report June 2020. American Tower Corp – “US Technology and 5G Update Q2 2021”, GSMA Intelligence.
 Note: Maximum theoretical downlink speed by technology generation, Mbps (10 Gbps is the minimum theoretical upper limit speed specified for 5G).
Forecasts are not an indicator of future performance and any investments are subject to risks and uncertainties.

Mobile Data Demand - New Technologies Necessitate a New Network

~57% Mobile Data Usage CAGR from 2007-2021

New Mobile Applications			
Augmented reality	Virtual Reality	Autonomous Driving	Smart Cities

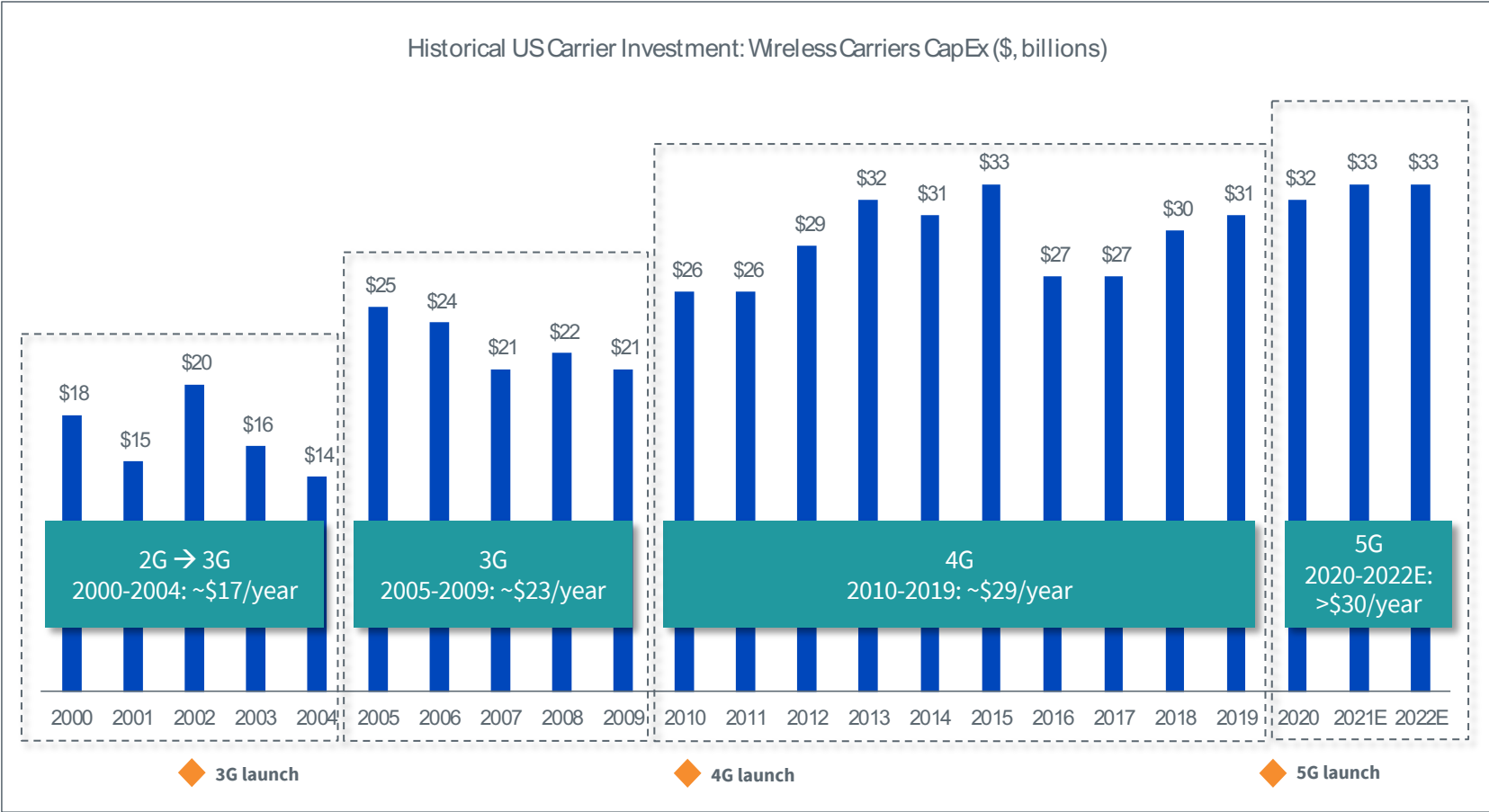


Source: CenterSquare, American Tower Corp – “US Technology and 5G Update Q2 2021”, GSMA, Cisco VNI, 2006-2016; 2014-2015 figures provided by Cisco VNI Feb 2017; Forbes; 2017-2021 figures provided by Ericsson Mobility Report (latest Jun 2021), Altman Solon Research & Analysis. US mobile data traffic assumed to comprise ~97% of North America (US & Canada) traffic.

Notes: 1 petabyte is 1 million gigabytes. CAGR is compound annual growth rate.

Forecasts are not an indicator of future performance and any investments are subject to risks and uncertainties.

The Potential Cell Tower Opportunity



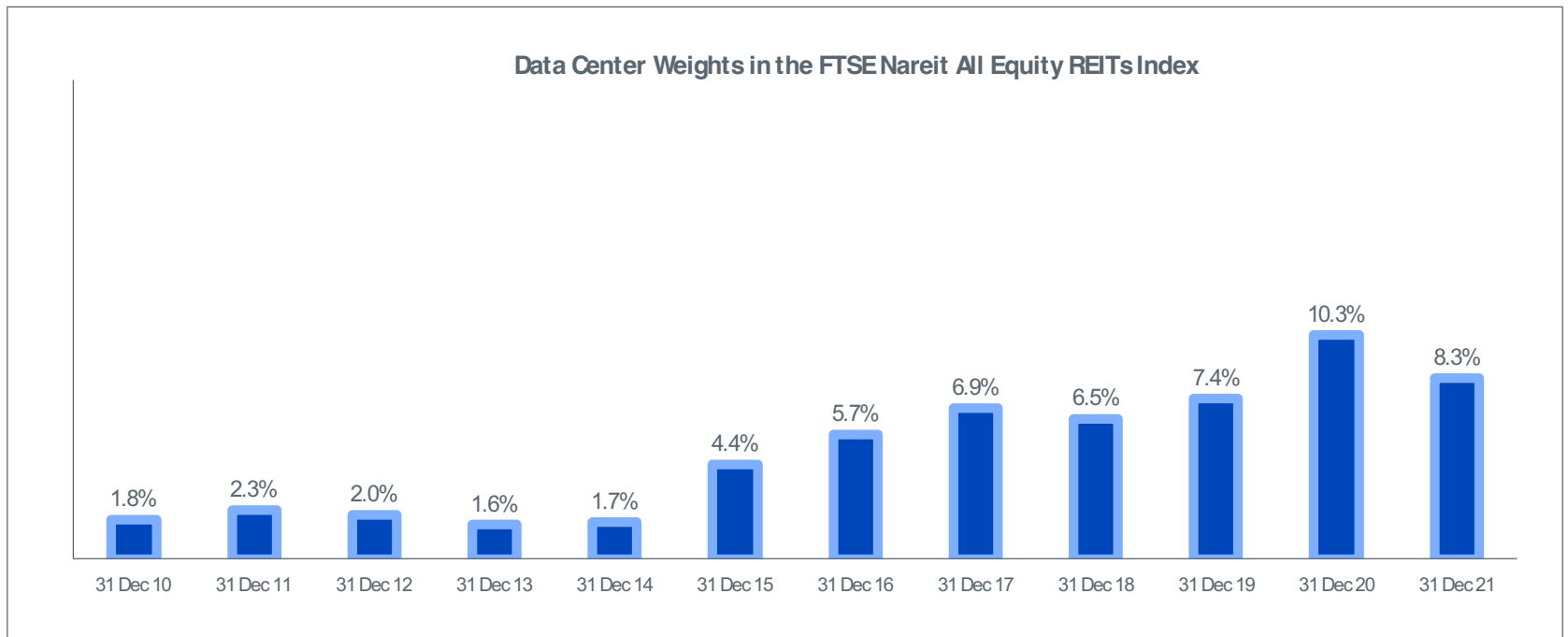
Source: American Tower Corp – “US Technology and 5G Update Q2 2021”, CTIA, BAML Wireless Matrix, Altman Solon Research & Analysis. Forecasts are not an indicator of future performance and any investments are subject to risks and uncertainties.



Tech disruption and real estate opportunities

Exploring Data Centers

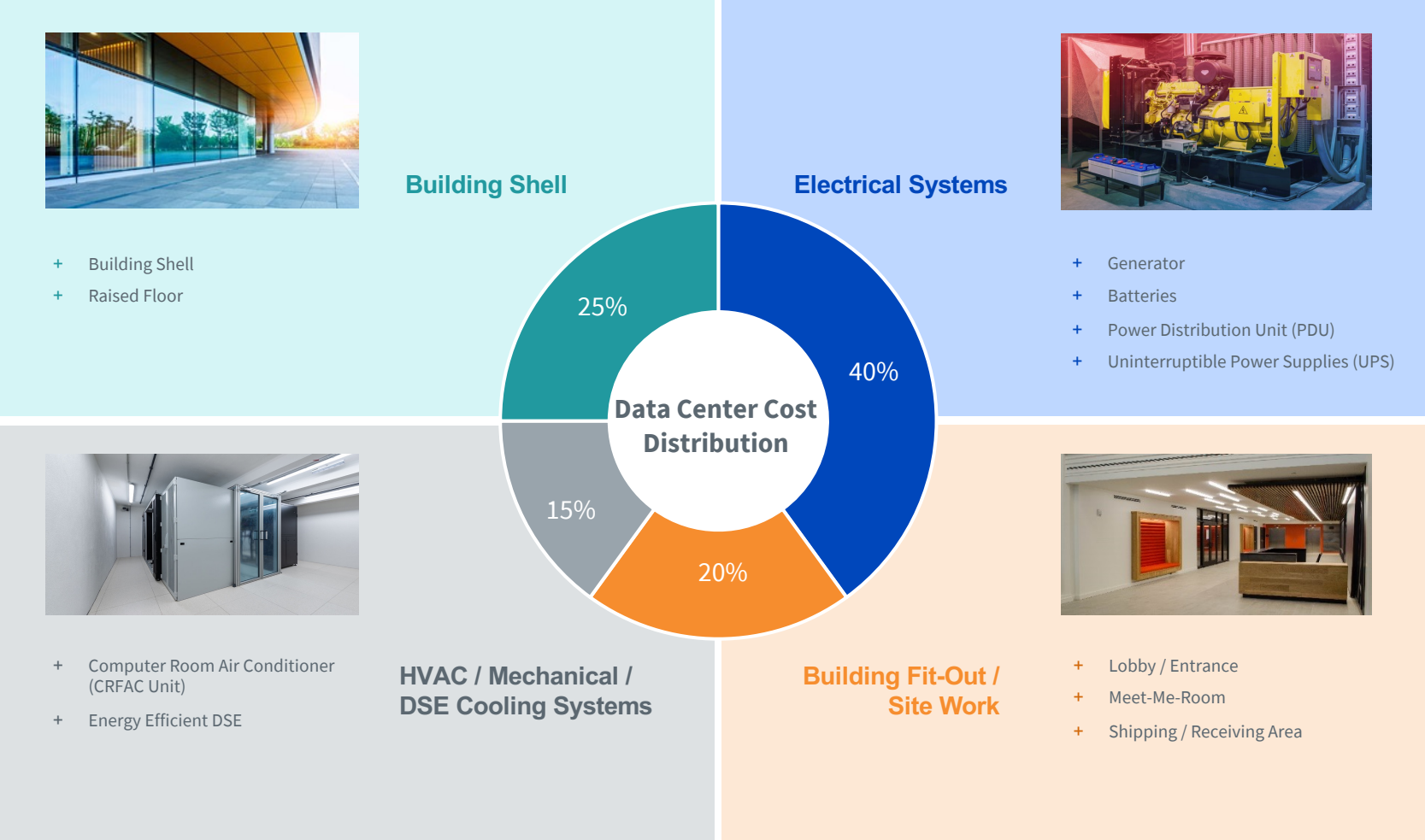
A Decade of Continual Evolution and Growth



Source: CenterSquare. FTSE Nareit All Equity REITs Index as of 31 December 2021. EQIX = Equinix Inc.; DLR = Digital Realty Trust, Inc.; DFT = DuPont Fabros Technology, Inc.; COR = CoreSite Realty Corp; CONE = CyrusOne Inc; QTS = QTS Realty Trust Inc (Blackstone Inc acquired QTS on 1 September 2021).

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What is a Data Center?



Source: Digital Realty investor presentation, September 2021.
 Note: Percentage costs for data center development shown are based on a sample Digital Realty data center build and are not necessarily representative of all development projects.

The Data Center Continuum

Network-dense Data Centers

- + Highly connected data centers; internet gateways
- + Hard to replicate
- + Strong pricing power



Enterprise Data Centers

- + Serve corporate IT departments and large technology companies
- + Account for majority of data centers
- + Can be wholesale or retail colocation



Source: CenterSquare.

The Data Center Business Lines

Wholesale

- + Lease large blocks of space
- + Greater power needs
- + Longer term leases
- + Single tenant or few tenants
- + Lower price per unit
- + Less service oriented

Retail Colocation

- + Lease smaller spaces
- + Smaller power requirements
- + Shorter term leases (with renewals)
- + Multi-tenanted, benefit of an ecosystem
- + Higher price per unit
- + More value-add services

Interconnection

- + Initial installation fee and monthly recurring charges for cross-connect
- + Very high margin and “sticky” business
- + Connections can be virtual or physical



Source: CenterSquare.

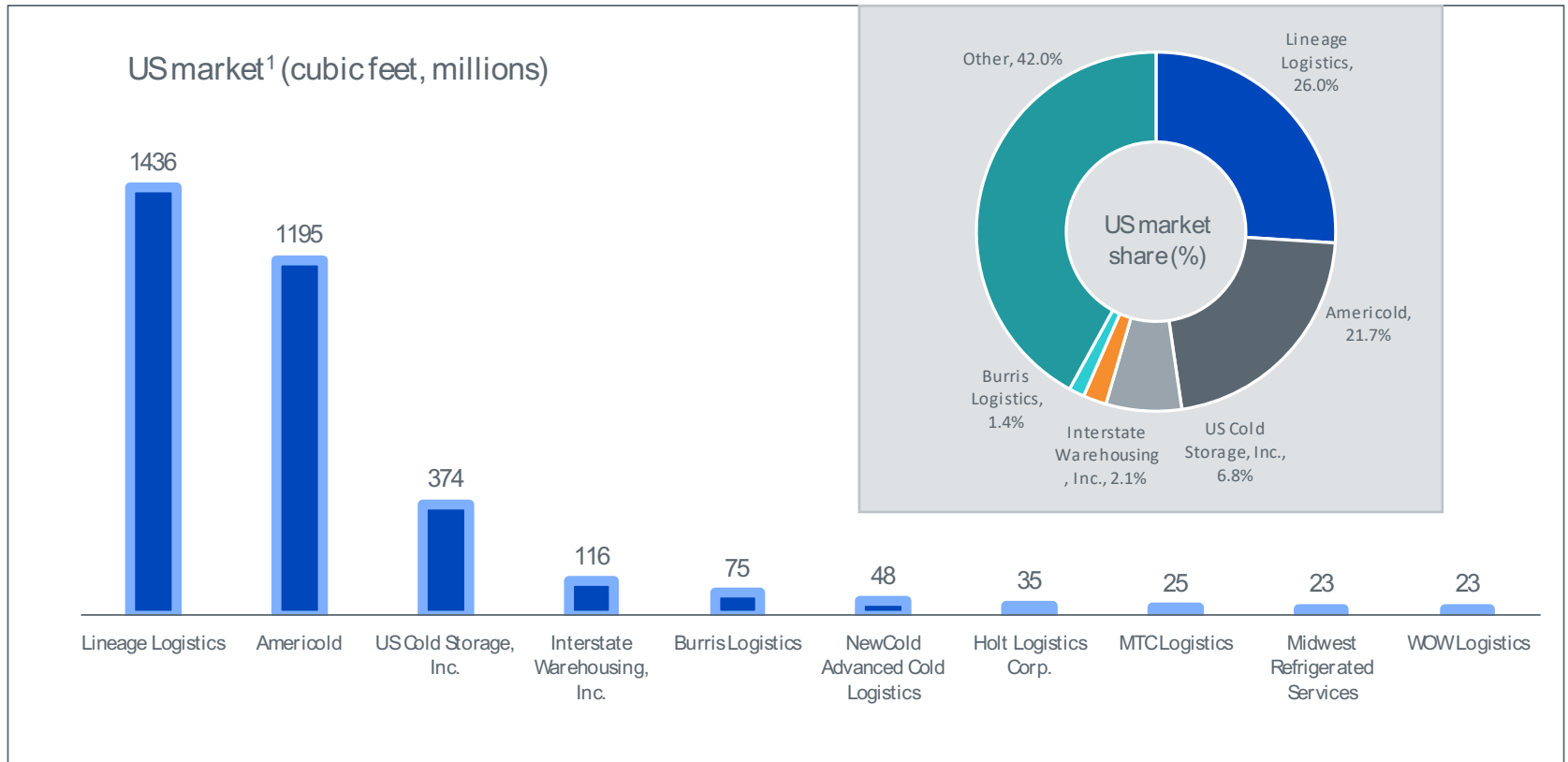


Tech disruption and real estate opportunities

Exploring Cold Storage

A Fragmented Market Ripe for Consolidation

- + The Cold Storage sector remains highly fragmented with the top 2 providers accounting for just over 40% of the U.S. market and many smaller players making up the rest.



Source: Americold, June 2021.

2020 IARW North American Top 25 List (June 2020), per GCCA website. U.S. only. Total capacity from 2020 GCCA Global Cold Storage Capacity Report (August 2020). Americold portfolio figures provided by the Company as of 30 June 2021.

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A view forward

The Cold Storage space remains a highly specialized business with:

- + A need for significant operational expertise
- + Sticky, long-lasting client relationships
- + Strong demand tailwinds
- + A fragmented competitive landscape that provides both consolidation and strong external growth opportunities

These factors create significant opportunities for both public and private investors to identify best-in-class operators to access this growing sector.



Source: CenterSquare.



Tech disruption and real estate opportunities

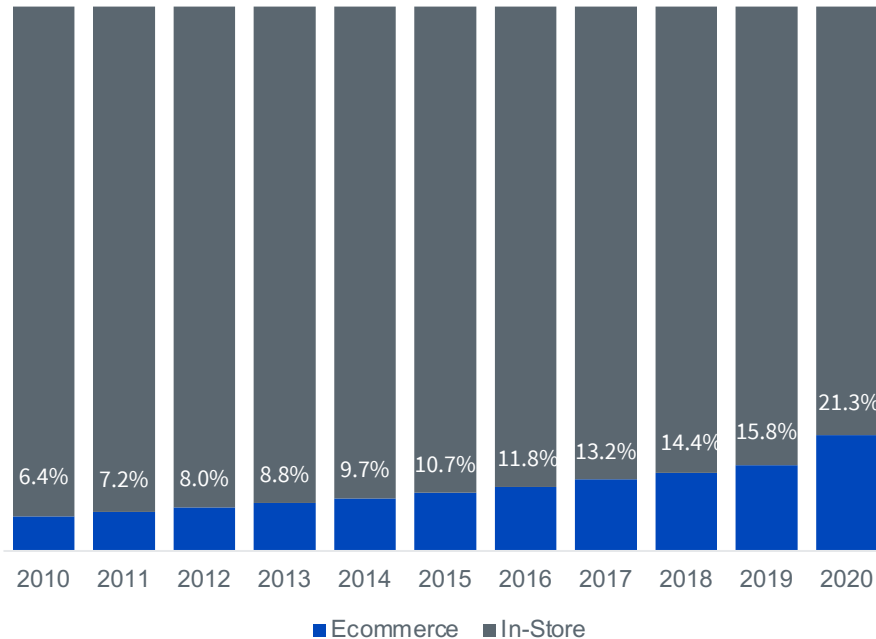
Solving Last Mile Distribution

COVID-19 Acceleration of Secular Trends: Where We Shop

- + The COVID-19 pandemic accelerated the growth of online shopping in unprecedented ways, favoring those with omnichannel distribution already in place and compelling others to get in the game.

U.S. E-commerce Penetration

Online and in-store sales as % of total retail spend*



U.S. Leaders

Ranked by projected 2020 web sales

2021 Rank**	Retailer	2020 Web Sales	2020 Rank
1	Amazon	●	1
2	Walmart	●	3
3	Apple	●	2
4	Dell	●	4
5	Best Buy	●	6
6	Home Depot	●	5
7	Target	●	12
8	Wayfair	●	6
9	Kroger	●	13
10	Staples	●	8

Source: **Exhibit 1:** Digital Commerce 360 Analysis of US Dept of Commerce data, January 2021. **Exhibit 2:** Digital Commerce 360. Data as of January 2021.

*Total retail figures exclude sales of items not normally purchased online such as spending at restaurants, bars, automobile dealers, gas stations and fuel dealers

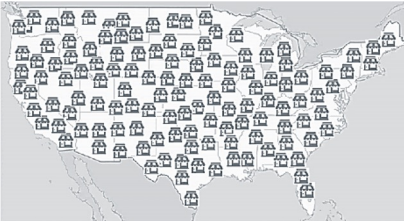
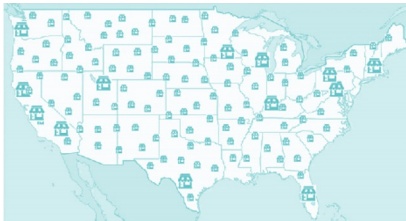
**Projected 2021 Top 1000 Rank.

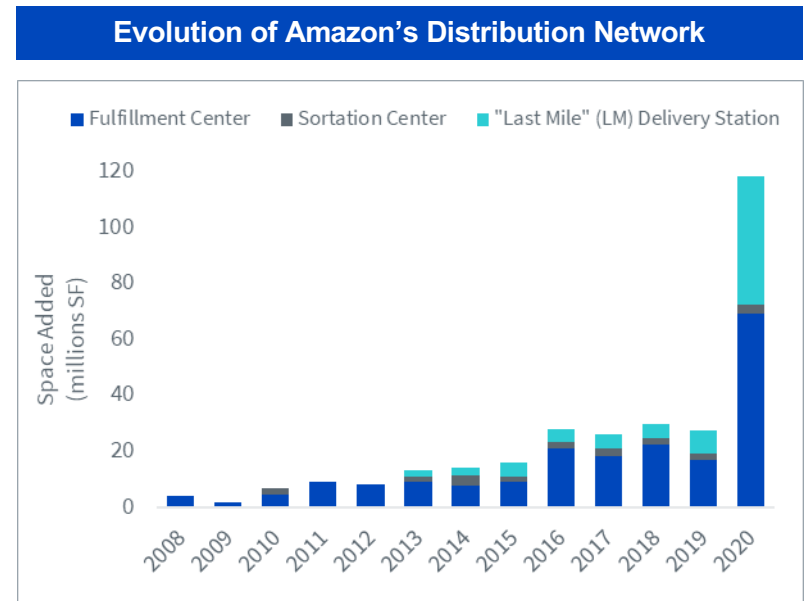
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COVID-19 Acceleration of Secular Trends: Where We Shop

- + The growth in online shopping and need for a new type of seamless customer experience has reduced the need for aesthetically pleasing store fronts and increased the need for quick and reliable delivery of goods.
- + The ability for retailers to meet consumer expectations relies on a redefined logistics solution that fulfills customer needs anytime, anywhere.
- + Transportation costs are the largest within a supply chain accounting for 45-55%, compelling many retailers to follow Amazon's lead in developing a distribution network with infill locations closer to customers.

Today's store footprint = costly and inefficient	Tomorrow's store footprint = omni-channel enabled
	
<p>Many full-size stores with comprehensive inventory assortments</p>	<p>Smaller format store w/ BOPUS (Buy Online, Pick Up in Stores) capabilities complemented by online sales</p>
<ul style="list-style-type: none"> + Large size + High occupancy expense + Carry full inventory assortments + High # of sales associates 	<ul style="list-style-type: none"> + Lower occupancy, associate and inventory expense + Access all inventory/easy returns + Browse/impulse shop



Source: Duke Realty, December 2020; Evercore ISI Research, May 2020.

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A view forward

Is the Last Mile Premium Sustainable?

- + E-Commerce tailwinds show no signs of slowing.
- + Retailers and brands need to respond to customer delivery demands.
- + Supply and demand dynamics are driving up rents, especially in infill markets.
- + Adaptive reuse is a winning strategy to offer last-mile opportunities.



Source: CenterSquare.



Tech disruption and real estate opportunities

Is Office the Next Retail?

A Flight to Quality.. And Downsizing

- + We can predict a change in demand for office space in terms of size and quality, favoring newer buildings.

The new amenities Post COVID-19 check list

Spacious layout

Air quality

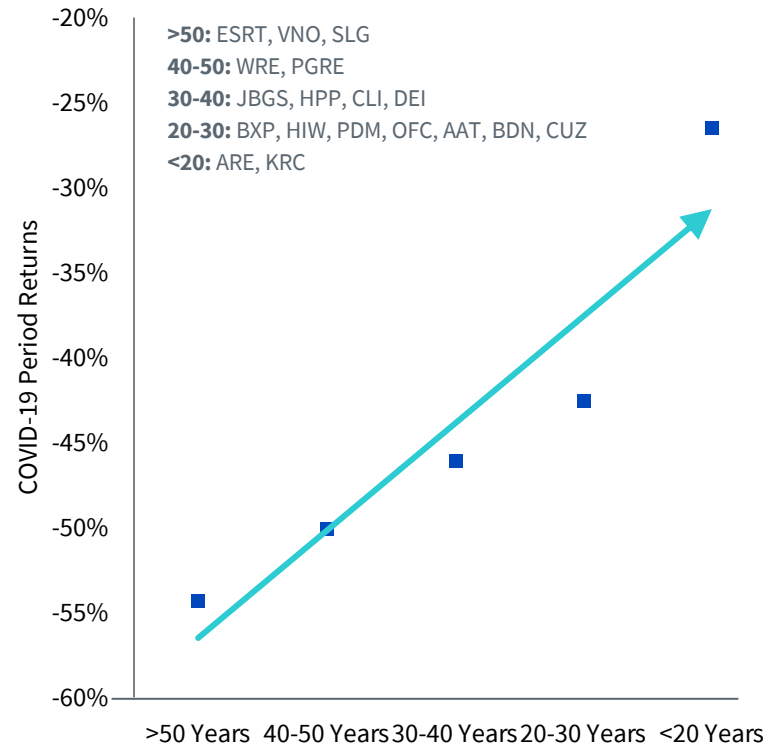
Outdoor space

Touchless entry

Technology-enabled

Redundant power

COVID Office Returns vs Building Age



Source: CenterSquare, Bloomberg and REIT company filings as of 31 December 2020. COVID Period returns are from 29 February 2020 to 31 December 2020.

ESRT = Empire State Realty Trust, Inc.; VNO = Vornado Realty Trust; SLG = SL Green Realty Corp; WRE = Washington Real Estate Investment Trust; PGRE = Paramount Group, Inc.; JBGS = JBG SMITH Properties; HPP = Hudson Pacific Properties, Inc.; CLI = CapitalLand Investment Limited; DEI = Douglas Emmett, Inc.; BXP = Boston Properties, Inc.; HIW = Highwoods Properties, Inc.; PDM = Piedmont Office Realty Trust, Inc.; OFC = Corporate Office Properties Trust; AAT = American Assets Trust, Inc.; BDN = Brandywine Realty Trust; CUZ = Cousins Properties, Inc.; ARE = Alexandria Real Estate Equities, Inc.; KRC = Kilroy Realty Corporation.

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A view forward

Is Office the Next Retail?
Yes... but Office is not dead.



Nothing will ever completely replace the benefits of collaboration, competition, spontaneous interaction and in-person learning that comes with being in an office.

The Office sector is in the process of being significantly disrupted in similar fashion to the Retail sector:



- ✓ Exogenous forces create significantly changing demand patterns which will evolve over time.
- ✓ Technology drives the demise of specific assets within a sector and survival of others.
- ✓ Dynamics reflected in REIT pricing long before valuations adjusted in the private market.

The REIT market today is directionally correct about the changes in valuation for office assets.



The private market has underreacted but will catch up, creating areas of price dislocation.

Investors would be wise to consider the office market as not just one sector, but several sub-sectors with varying degrees of considerable opportunity as well as permanent distress.

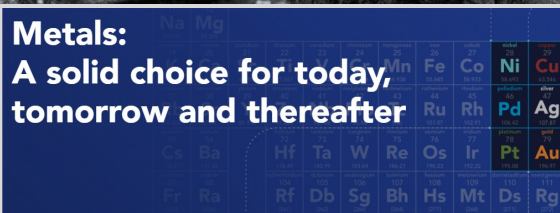
Source: CenterSquare.

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