THE EDGE

MAGAZINE
Vol. 4

CUSHMAN & WAKEFIELD

COVID-19 has changed our world. As a global community, we are learning the way forward, taking it one day at a time. The human ability to adjust behavior to a changing environment showcases our unwavering relentlessness.

We will not give up.

From a real estate perspective, we're seeing our world adapt at an exponential pace. From the workplace to warehouses and everything in between, there is no question that real estate is in the process of evolving.

While there are no easy answers to some very difficult questions, we will continue to offer our clients access to our best advice, and our best thinking to prepare for post-COVID-19 recovery and the eventual return to the workplace.

This volume of The Edge Magazine focuses on the future – how we will move forward and what it will potentially look like. In order to provide you with the most up-to-date content, we'll be sharing articles in real-time over the next several weeks. Be sure to subscribe to be notified as articles are released and added to The Edge Volume 4.

We're in this together. Stay safe and healthy.

Brad Kreiger
Chief Marketing & Communications Officer

Content Director and Editor: Gina Dardi

Creative Director: Senem Goctu

Digital Marketing Lead: Taylor Tomlinson

Copy Editor: Jamie Tetro

Designers: Chelsey Armstrong, Dann Morales, Sarah Knowles

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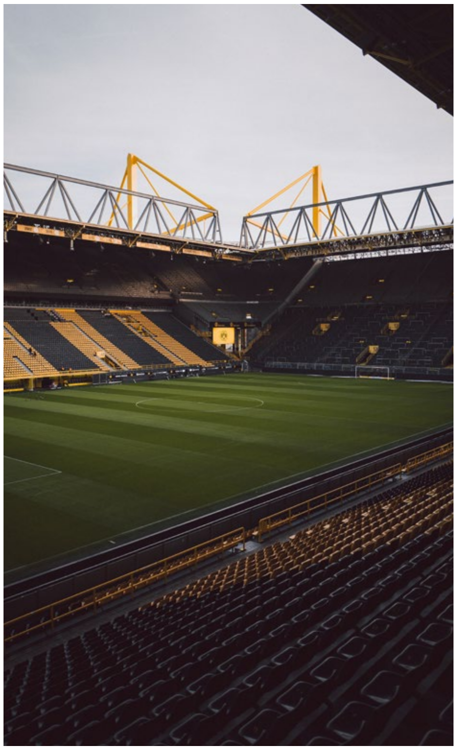
How do we move forward after a global pandemic changed the world?

Stay at home for weeks, even months. Work from home while children attempt to further their education on the other side of the table. Don't go anywhere, and don't visit anyone.

During 'normal' times, all of these points would seem to reflect a position held by a totalitarian state, an extraordinary imposition and restriction on the freedoms we hold so dearly. But these are clearly not normal times. The experience of a global pandemic has changed the way we operate, run our businesses, live our lives, educate our children and socialize with our friends.

ANDREW PHIPPS
Head of Business Development, EMEA & Local Markets, Global Futurist
andrew.phipps@cushwake.com



FROM PHYSICAL TO DIGITAL, SO MANY CHANGES

So many aspects of the physical world have been dramatically altered by the pandemic, including:

- Major sporting events completely canceled or suspended indefinitely
- The famous theaters of New York's Broadway and London's West End remain silent and bereft of their audience
- The Summer Olympics in Tokyo, originally scheduled to take place in August of 2020, now pushed back one full year to August 2021 (with no guarantees)
- Office buildings shifting from being 87 percent occupied globally in February 2020 to virtually empty in April 2020 (leased, but without tenants)
- Many hotels, bars and restaurants closed their doors and more importantly had their revenue stream cut off during the pandemic

Like the physical world, the digital world has also been tested by the global pandemic with the overall consensus that technology has been up to par, helping office-based individuals successfully operate from home while delivering vastly increased usage of video conferencing, cloud computing and general connectivity. Businesses with people working across myriad locations have seen greater levels of engagement across teams and countries. “We don’t feel as distant because we’re all working the same way” is one of many comments we’ve heard from people in our own business. But just because employees have the ability to work from home, doesn’t mean they necessarily prefer it. Some find it challenging and less productive and can’t wait to get back to the office.

Organizations should not confuse short-term, mid-crisis performance with blanket long-term preference. Many workers who are executing well with work-from-home policies by necessity will be glad to return to the office when it is safe to do so and they again have the choice. A Stanford University work-from-home study showed the significant productivity and savings gains possible when employees move to work-from-home structures. However, at the conclusion of the study half of participants returned to working from the office either because they personally struggled to perform in the home office environment and/or because they missed the community and connection of working alongside their colleagues.[1]

[1] Nicholas Bloom & James Liang & John Roberts & Zhichun Jenny Ying, 2015. "Does Working from Home Work? Evidence from a Chinese Experiment," The Quarterly Journal of Economics, Oxford University Press, vol. 130(1), pages 165-218.

TECHNOLOGY – NO LONGER AN OPTION

Whether you like working from home or not, using technology is no longer an option. Instead, people and businesses have been forced to embrace technology at both a faster and deeper rate than they may have planned. The extraordinary speed in which the move from office to working from home took place could only have been possible in a forced situation. If businesses could have planned to make this operational change, they would have done so by adhering to a carefully scheduled set of processes, trials and tests. This forced situation will ultimately provide a wealth of data which, in turn, will lead to invaluable insights for the future.

HAS THE OFFICE CHANGED FOREVER? (YES)

There is little doubt that the built environment will need to adapt as a result of these unfortunate circumstances. The bigger question is whether the office has changed forever or if we even need offices at all. The unequivocal answer to both questions is yes. Leaders that perhaps weren't historically on board with the idea of remote working have seen irrefutable evidence that individuals can be equally as effective while working away from the office. The simple fact that everyone has the same level of connection to one another has created an egalitarian environment for perhaps the first time in many people's working lives. Speaking to someone on the other side of the world, time difference notwithstanding, is as simple a task as speaking to the person you face in the office every day. Why would people want to go back to an insular approach to work, indeed to life?

The workplace and the chance to work from home are not one-size-fits-all solutions. Through Cushman & Wakefield's proprietary tool, Experience per Square Foot™ (XSF), our workplace specialists have captured more than 2.5 million data points from workers all over the globe in the pre-COVID-19 era and a further 1.7 million data points from more than 40,000 respondents in the current work from home environment to develop a report, The Future of Workplace. There is clear variance in how working from home is experienced by different departments and generations of employees. Not surprisingly, older workers are less comfortable with the current working situation (70 percent of Gen Z and 69 percent of Millennials report challenges in working from home, compared to 55 percent of Baby Boomers).

Many Millennials and Gen Z employees are pleased to work remotely, however their living situations—often in apartments or smaller homes in more dense parts of cities—can make it more difficult to execute work comfortably.

Going forward, the office of the future will become a place for connectivity, both virtual and physical. Businesses will need to create an environment that people will want to spend time in as opposed to seeing it as a daily chore, which will impact space layouts, amenities and location (given the pain of employee commutes). The considerations of social distancing will naturally lead to a horizon one and horizon two approach to change. Horizon one being the immediate return to work and recovery ready phase, evidenced as an example by the Six Feet Office concept developed by Cushman & Wakefield. With horizon two tailored to what happens once things return to some form of status quo – i.e., when we are in a position to make decisions based on normal business operations, as opposed to crisis-response.


Cushman & Wakefield's Six Feet Office

AN UNCERTAIN FUTURE AND REAL CHANGE IS COMING

To be at the center of a global crisis is to be part of an uncertain future. The change that is seen following a crisis is often a result of a collective will to evolve. Situations that seem life-altering while the experience is occurring often turn out to be mere blips in the evolution of society. Raging bull markets, fierce bear markets, changes in government, famine, natural disasters all trigger emotional responses as they happen, but rarely do they lead to recognizable ongoing global change. This event, however, does feel different. This time, the scale, the level of attention and the helplessness and impact on our daily lives, may indeed result in permanent change, a new normal.

Real change is coming. We have been on the cusp of a behavioral revolution for a number of years and this may prove to be the final impetus needed to make this a reality. From a behavioral point of view, there is a strong sense this will lead to a generational change. People will begin to see life as more than a collection of working days, weekends and the rare vacation. People rightly will expect more from their lives. Materiality will no longer be the key focus of life, but rather, experiences and creating memories instead. Work-life balance, flexibility, family time and continued integration of lifelong learning are some of the takeaways and positive feelings that are already resulting from the crisis.

COVID-19 will force many sectors of the economy, including real estate, to adapt and evolve. This is inevitable – but the real estate industry is used to it. Consider what has occurred in the last 10-15 years: technological shifts, density trends, the rise of teleworking, millennials, coworking, the eCommerce revolution and the Great Financial Crisis, to name a few. The industry *will* rise to the occasion, but if it wants to continue to play an important role in the economy going forward, it will need to define its own 'new normal' in the process.

5G is here

WHY IT MATTERS AND HOW IT WILL PLAY A PART IN A POST-COVID-19 WORLD

5G is here and it couldn't have come at a better time. With working from home becoming the 'new normal' due to COVID-19 – at least in the short term – being better connected via this next generation of wireless technology has become crucial to organizations. To get a little more perspective on 5G and how it's expected to make an impact on the corporate world, The Edge Magazine sat down with 5G experts **Andy Brady**, Vice President, and **Arvin Singh**, Vice President of Connected Solutions, from Verizon and their partners **Adam Stanley,** CIO and Chief Digital Officer, and **Rob Franch**, Chief Technology Officer, from Cushman & Wakefield. They covered everything from why 5G matters to how it will impact the occupant experience to how it is expected to play a part in a post-COVID-19 world.

ADAM L. STANLEY
CIO & Chief Digital Officer
Cushman & Wakefield
adam.stanley@cushwake.com

ROB FRANCH
Chief Technology Officer
Cushman & Wakefield
rob.franch@cushwake.com

ANDY BRADY
Vice President
Verizon
andrew.brady@verizonwireless.com

ARVIN SINGH
Vice President of Connected Solutions, Verizon
arvin.singh@verizonwireless.com

WHAT IS 5G EXACTLY AND WHY DOES IT MATTER?

Arvin Singh, Verizon: 5G is the next generation of wireless technology. It's not intended to replace 4G, but rather, to enable a whole new set of possibilities. It was designed to usher in the "connected everything" era. 1G brought analog voice to the world, 2G brought digital voice and text messaging capabilities, 3G put our mobile devices on the web, 4G offered video streaming possibilities on the mobile device and it enabled new business models such as food delivery apps, and 5G was designed with the premise of delivering unprecedented evolution and transformation beyond our imagination.

Andy Brady, Verizon: With global mobile data traffic expected to grow eight times by the end of 2023, we knew we needed more efficient technology, higher data rates and spectrum utilization. With the speed and performance of 5G, you have a powerful, game-changing platform for innovation. From throughput to reliability, 5G can bring endless new opportunities for people, society and business.

HOW WILL 5G IMPACT CRE AND WHAT DO COMPANIES NEED TO KNOW?

Rob Franch, Cushman & Wakefield: As we learn more about 5G's capabilities, we are increasingly looking at opportunities within the Internet of Things (IoT) realm, especially as it pertains to sensors, buildings and our ability to monitor different data points around any given building. The sheer number of sensors and the amount of data is exponentially growing and 5G allows us to capture that data in real time so that we can build smarter analytics around it. The potential in this area is huge. Another area 5G will directly impact in a positive way is the smart city space. As more progressive cities like New York City, Amsterdam and Singapore start adopting 5G strategies going forward, generating vast quantities of data on an hourly basis, we should see shorter wait times at traffic lights, less water waste, drivers being guided to available parking spaces, bins that report when they need emptying and more. And these areas are only going to evolve and grow as 5G becomes more available across these municipalities.

Adam Stanley, Cushman & Wakefield: One of the drivers of true technological change will be 5G's ultra-low latency, which is the time it takes data to travel from the user to the central processor and back again, bringing data transit speed to many times less than the blink of an eye. All kinds of new applications become possible for companies like ours once you reach very low levels of latency, including robotics, autonomous vehicles, connected video, cognitive insights, immersive extended reality (XR) and combining augmented reality (AR), virtual reality (VR) and mixed reality (MR).

Andy Brady: E-learning provides an example. Training documents will be able to track where employees are in real time on their training journey. And from background check to logistics, onboarding a new employee could be seamless and totally interconnected. From the technology side, we know how we are building 5G, but how it's going to be implemented is dependent upon all of the great ideas of companies like yours. It's a great place to be right now. We don't even know what we don't know and that's exciting in and of itself.

HOW WILL 5G IMPACT THE OCCUPANT EXPERIENCE AND WORKPLACE PRODUCTIVITY?

Arvin Singh: Employees are getting used to and want the ability to work from anywhere. The next generation of buildings will require a very connected workplace wherein the user has the ability to move seamlessly while sustaining high-performance connectivity. That will just have to be the norm.

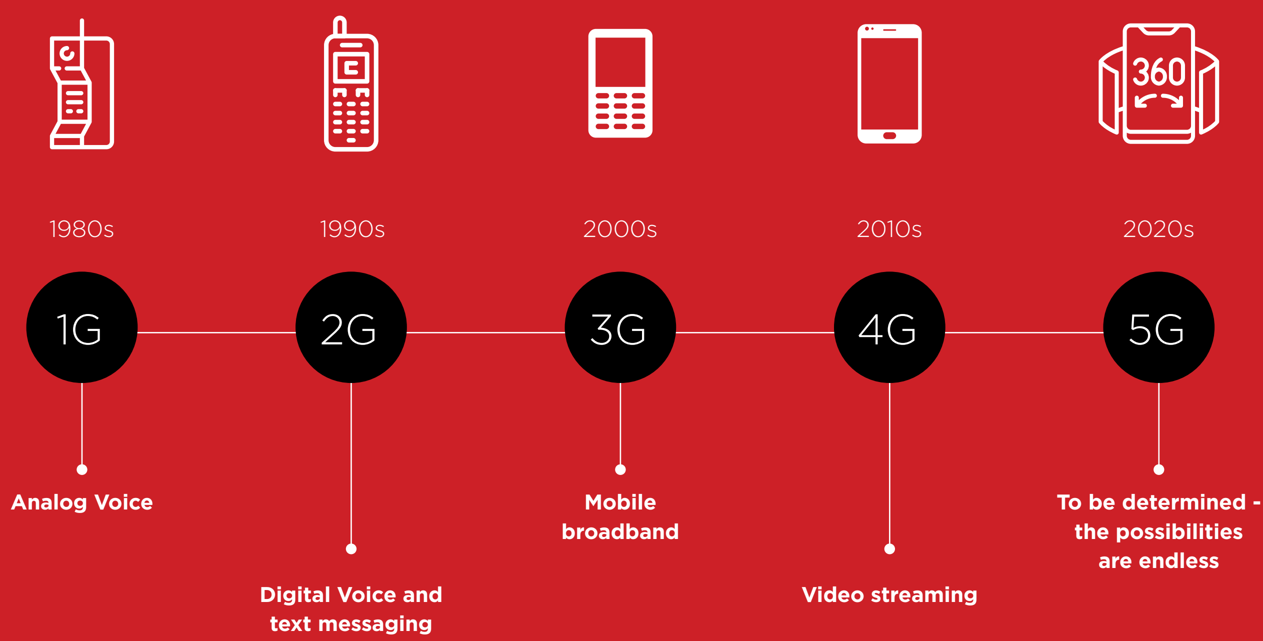
Adam Stanley: Online audio calls, video conferencing, cloud-based collaboration, and other activities that consume a lot of data should become much faster. And the resulting impact on the employee experience will be significant. In addition, 5G can make remote working more accessible than ever before. Today, there's always a risk of a glitch during a video call, an email getting delayed, or remote attendance tools malfunctioning due to poor network coverage. These issues should be less of an issue in the 5G era. Remote employees should feel more connected to their on-premise peers – and there will be an increase in the number of fully distributed workforces.

DUE TO THE COVID-19 PANDEMIC, WORKING FROM HOME MAY BECOME A BEST PRACTICE – AT LEAST FOR THE FORESEEABLE FUTURE. HOW WILL 5G IMPACT THIS?

Andy Brady: Our infrastructure is designed to handle the 119 million customers we currently have, and we've seen a huge uptick in call volumes to date. In fact, calls have been lasting twice as long. Our 4G LTE is structurally sound enough to handle this new normal, and we are focused on building our 5G network to handle it that much better going forward. I'm confident that our 5G network will allow employees to extend their offices to their homes basically seamlessly in a post-COVID-19 world.

Rob Franch: In this new working-from-home world, connectivity is everything. We are always looking at ways to optimize our networks and to ensure our colleagues are as productive as they can be. 5G has the potential to be a more flexible option than the standard connectivity we've been reliant on for the last several years and we look forward to exploring all of our possibilities when it comes to this new technology.

The evolution of 5G



WHAT WILL HAPPEN IN THE NEXT FIVE YEARS?

Arvin Singh: 5G is here and becoming increasingly available. It's a purpose-built technology designed to enable those cases that really demand high speed, high capacity and low latency. Over the next five years, it should scale over time as industries transform due to new capabilities brought on by 5G. Examples include the ability to download a full-length HD movie in seconds, the quick reaction time to enable remote robotics, and battery lifetimes extending beyond 10 years for remote cellular devices.

HOW IS VERIZON AND CUSHMAN & WAKEFIELD WORKING TOGETHER TO SEAMLESSLY BRING 5G TO ITS CUSTOMERS?

Arvin Singh: Through our partnership, we are seeing potential for new business models as well. With high speed connected buildings in place, owners and investors could potentially be offering premium connectivity to tenants in buildings going forward. And some of the smart building enhancements like security monitoring could also lead to new offerings. These are the types of things that could change the economics of the investments you make in a traditional building, really adding long-term value.

Rob Franch: Our technology partners like Verizon help us find the best ways to drive value to our colleagues and our clients. In the 5G space, Verizon has built a strong network and they know what it is capable of doing. Our partnership allows us to strategize how to bring the art of the possible from Verizon 5G to our colleagues and our clients.

The eight currencies

There are eight performance attributes, or currencies, to be considered when evaluating whether a 5G network can deliver on its full potential.

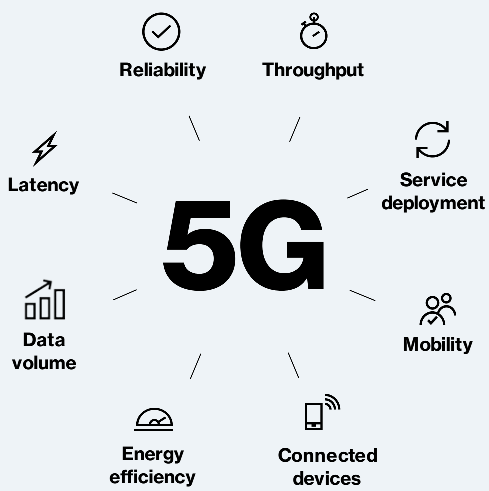
1 Throughput

5G has the potential to deliver speeds many times faster than today's 4G, powering uses such as intelligent video, remote diagnostics and mobile command centers for live audio and video.

5G networks will one day offer peak data rates of up to 10 Gbps. So far, Verizon 5G Home has seen typical download speeds around 300 Mbps and, depending on location, max speeds up to 1 Gbps*. (Sacramento max speeds up to 940 Mbps*)[1]

2 Service deployment

Network virtualization (i.e., using software to perform network functions) enables service and application deployment without having to install additional hardware. This should lead to a reduction in typical service deployment time from six months to 90 minutes. Faster deployment times means we can roll out new features and security improvements quickly.



3 Mobility

5G technology is designed to enable devices that are traveling up to 500 kph (310 mph) to stay connected to the network.[2] Verizon has tested 5G network handoff techniques to enable passengers in fast-moving vehicles and trains to stay connected while they are moving.

4 Connected devices

The number of connected devices is expected to be more than three times the global population by 2022.[3] 5G will be capable of supporting up to 1 M devices in a square kilometer.[4] Verizon 5G Ultra-Wideband will eventually handle 10 to 100 times more connected devices per square kilometer than 4G. This will allow cities to tap into the power of 5G for things like smart streetlights, remote security monitoring, intelligent rail and smart parking solutions.

5 Energy efficiency

Sustainability is one of Verizon's core values. 5G will have lower energy requirements for network operations (10 percent of current device consumption).

Also with 5G, complex functions could happen within the network, near the end user.[5] That means the end user's device will not need as much processing capability and will consume less energy.

6 Data volume

The 5G standard is designed to support up to 10 TB/s/km2.[6] This means that a 5G network can carry a massive amount of data for a large number of simultaneous users. So, users in high-density areas—like airports, stadiums and urban areas—will all experience the fast speeds and low latency of 5G service.

7 Latency

5G's rapid end-to-end latency (the time it takes for data to travel from the user, over the network to the central processor and back again) will bring data transit speed to many times less than the blink of an eye.

8 Reliability

Verizon offers the most reliable network in the nation; we've been #1 in overall network performance, network reliability, data performance, and call performance in the U.S. by RootMetrics 13 times in a row.[7] And we are bringing that same expertise and focus as we architect and build our 5G network.

[1] https://www.rcrwireless.com/20181002/test-and-measurement/rcr-exclusive-in-first-independent-testing-verizons-5g-network
[2] https://www.itu.int/md/R15-SG05-C-0040/en
[3] https://www.cisco.com/c/en/us/solutions/collateral/service-provider/visual-networking-index-vni/white-paper-c11-741490.html
[4] https://www.samsung.com/global/business/networks/insights/news/5g-is-now-part-1-2018-the-year-of-5g/
[5] https://www.verizon.com/about/our-company/5g/how-5g-will-pull-cloud-closer
[6] https://5g-ppp.eu/wp-content/uploads/2015/02/5G-Vision-Brochure-v1.pdf
[7] Based on RootMetrics® by IHS Markit's RootScore® Reports: 2H 2019. Tested with best commercially available smartphones on four national mobile networks across all available network types. Experiences may vary. RootMetrics awards are not an endorsement of Verizon. https://rootmetrics.com/en-US/content/us-state-of-the-mobile-union-2h-2019

5G built right

Not all 5G is created equal.
With ultra-fast speeds, ultra-low latency and massive capacity, Verizon 5G Ultra Wideband is more than 10x faster than some other 5G networks. And it's rolling out in cities across the country so people can experience the performance Ultra Wideband can deliver.

It won't just change what your phone can do. We're building it to change what cities, industries, and things we can't even imagine will do.

There's 5G.
Then there's Verizon 5G.

#5GBuiltRight

verizon

5G Ultra Wideband available only in parts of select cities.
Based on analysis by Ookla® of Speedtest Intelligence® data of T-Mobile and Verizon 5G (Beta) average download speed results for Q4 2019 nationally. Ookla trademarks used under license and reprinted with permission.

Up in the air: climate change uncertainty in an uncertain time

The impacts of the COVID-19 pandemic have been vast-reaching, affecting billions of individuals' daily lives and interactions with our communities. One major area being heavily impacted: greenhouse gas (GHG) emissions. With most of the world performing some form of social distancing, industrial productivity and commuting has declined immensely, resulting in fewer greenhouse gas emissions, a leading contributor to global climate change.

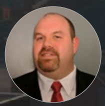
Climate change and COVID-19 are global problems with dire consequences, both on human health and economic stability. The World Health Organization (WHO) estimates that the effects of climate change may result in the death of 250,000 people annually between the years 2030 to 2050, for reasons including malnutrition, heat stress and more. If unchecked, global temperatures will rise by 4.5˚C and potentially impact nearly two dozen different sectors of the economy, and specifically, from a U.S. perspective, cost the country $520 billion* each year according to the National Bureau of Economic Research.

Both COVID-19 and climate change will require action to be taken by individuals in their daily lives, and perhaps more importantly, leadership by governments, corporations, and organizations worldwide to combat and minimize the effects.

*All currency amounts listed in USD


ERIC TILDEN, PE
Director
Energy & Sustainability Services
eric.tilden@cushwake.com


RACHEL SCHIFTAN
Senior Project Manager
Energy & Sustainability Services
rachel.schiftan@cushwake.com


RYAN EASTON, CEM
Senior Chief Engineer
Energy & Sustainability Services
ryan.easton@cushwake.com


LEE DUNFEE, CEM
Managing Director
Engineering Operations
lee.dunfee@cushwake.com

DESPITE THE OVERWHELMINGLY NEGATIVE IMPACT OF COVID-19, IT HAS PROVIDED A CLEAR EXAMPLE OF SCALE: ONE PERSON ADHERING TO SOCIAL DISTANCING HAS LITTLE IMPACT, BUT ONE MILLION PEOPLE CAN "FLATTEN THE CURVE." **EVERY EFFORT COUNTS, AND IT WILL TAKE ALL OF US TO MOVE THE NEEDLE.**

THE IMPACT ON GREENHOUSE GAS EMISSIONS: NOW AND LATER

According to China's Ministry of Ecology and Environment, January and March 2020 showed an 84.5 percent increase in days with good air quality across 337 cities. Overall, a 5.5-5.7 percent fall in carbon dioxide levels globally have been identified due to the pandemic by leading climate experts, including the Center for International Climate Research.

The U.S. has witnessed grid-wide declines in electricity usage, with some markets seeing a seven percent decrease compared to 2019. While residential use has increased, commercial and industrial demand has contracted, resulting in energy demand to be broadly down for most of 2020 to date. Since roughly 63 percent of electricity in the U.S. is generated from fossil fuels, this decline correlates to a drop in greenhouse gas emissions.

Overall, this is the first fall in global carbon emissions since 2008, and the largest amount since World War II. However, experts warn that without structural change, the emission declines caused by COVID-19 could be short-lived and have little impact on the concentrations of carbon that have accumulated in the atmosphere over decades.

For commercial buildings, data from Aquicore real-time energy meters across the Cushman & Wakefield U.S. portfolio tell a similar story. As office buildings have been sparsely populated, our building engineers have been provided guidance to bring buildings down to idle as much as possible and aggressively focus on limiting energy use. This has resulted in a nearly 24 percent decline nationally in energy use by our managed properties over the last month.

While in the short term, carbon emissions have declined as cars stay parked and industries remain offline, eventually an increasing amount will resume. With that, history tells us carbon emissions will pick up again. Emissions dropped during both the 1970s oil crisis and the 2008 financial crisis, but emissions bounced back as economies recovered. In fact, as China has worked to restart their economy over the past month, air pollution levels and carbon emissions all seem to be bouncing back to pre-COVID-19 levels, according to the Finland-based non-profit, Centre for Research on Energy and Clean.

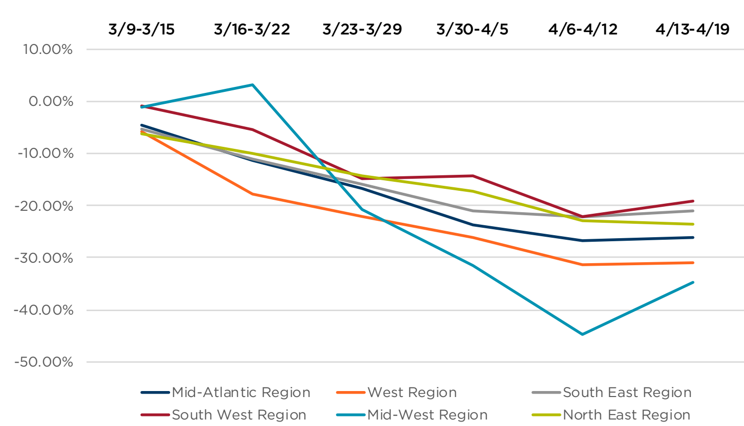
Additionally, the lower pricing of fossil fuels, partly due to COVID-19, can hurt long-time climate efforts, as cheaper energy often leads consumers to use it less efficiently. Furthermore, financing opportunities for solar, wind and electric grid projects are potentially reduced by financial pressures caused by the pandemic.

The Intergovernmental Panel on Climate Change (IPCC) reported that limiting global warming to 1.5°C would require "rapid, far-reaching and unprecedented changes in all aspects of society." This includes the immensely difficult goal of cutting global human-caused CO_2 emissions 45 percent from 2010 levels by 2030. However, COVID-19 has shown how we can work together globally to mitigate an immediate threat. While more difficult to direct this same determination and cooperation to a longer-term threat, it is a must as the potential consequences are not worth the risk of inaction.

"VISIBLE, POSITIVE IMPACTS – WHETHER THROUGH **IMPROVED AIR QUALITY OR REDUCED GREENHOUSE GAS EMISSIONS** – ARE BUT TEMPORARY, BECAUSE THEY COME ON THE BACK OF TRAGIC ECONOMIC SLOWDOWN AND HUMAN DISTRESS."

- INGER ANDERSEN, EXECUTIVE DIRECTOR OF THE UN ENVIRONMENT PROGRAMME

Commercial Office Energy Reductions By U.S. Regions (compared to 2019)



RECOVERY READINESS AND ENERGY EFFICIENCY

Reflecting on the impact of scale from COVID-19: one building focused on energy efficiency will do little – while one million can help reduce the effects of climate change for future generations. And in 2012, there were 5.6 million commercial office buildings in the U.S. alone, with an anticipated 36 percent increase by 2050.

As we prepare for cities and buildings to reopen, we must not lose focus on "flattening the curve" for energy use and greenhouse gas emissions. Minimizing operating costs will be essential as both owners and tenants will be facing financial hardships. As we begin to reoccupy buildings, we anticipate seeing energy use rising back up especially with the new recommended protocols of operating systems longer, increasing outside air ventilation rates and improving filtration. This could create additional strain to operating budgets already impacted by COVID-19, as well as increase GHG emissions.

Cushman & Wakefield released the "Recovery Readiness: A How-to Guide for Reopening your Workplace," a comprehensive guide for real estate tenants and landlords on reopening in workplaces as stay-at-home restrictions are lifted. It outlines some of the best thinking and practices for getting people back into their offices. This includes preparing the building for occupant safety with cleaning plans, pre-turn inspections and enhanced HVAC operating protocols and maintenance routines.

Every building is unique, and will each take a specific approach based on its design and operation to apply recovery readiness efforts. A common recommendation before re-occupancy will be building flush outs with outside air. After occupancy, at a minimum, buildings will be ventilating at higher rates where systems designs allow. If potential COVID-19 cases are identified, ASHRAE (The American Society of Heating, Refrigerating and Air-Conditioning Engineers) recommends increasing outdoor air ventilation, disabling demand-controlled ventilation and opening outdoor air dampers to 100 percent as conditions permit, keeping systems running longer, and bypassing energy recovery ventilation systems that leak potentially contaminated exhaust air back into the outdoor air supply.

WHAT'S NEXT?

As we emerge from our homes in the year ahead, we will be stepping into a new normal. Not only will social distancing and PPE be more common, but individuals, households, organizations, and financial institutions will be experiencing broad economic hardships. The World Bank notes that 2020 is on track to witness the deepest global recession on a scale not seen since The Great War, projecting GDP to contract in all developing regions.

This will be a time for governmental bodies to provide stimuli aimed at achieving financial and economic recovery. These actions can have long-lasting effects on economies, and some options may be better at long-term sustainable economic growth, poverty reduction, and environmental impact. "Thinking ahead, the urgent focus on short-term needs should not overlook opportunities to achieve other longer-term goals," says experts from the World Bank.

A prime investment is the decarbonization of the global economy. There are diverse opportunities for investment that can boost job creation while generating sustainability and climate benefits, including investing in energy efficiency in the real estate sector. After all, buildings account for nearly 40 percent of energy-related global carbon dioxide emissions annually, according to the United Nations Environment Program. Here in the United States, residential and commercial buildings account for 40 percent of energy consumption, according to the U.S. Energy Information Administration.

LOOKING TO THE FUTURE

A few thoughts on how to continue keeping energy-usage in the forefront when we return to the workplace.

1 Communication with occupants is key

- Understanding specific schedules of tenants
- Adjusting start/stop times accordingly based on specific occupancy and weather forecast data
- Identifying parts of the building that may remain unoccupied or partially occupied
- Teleworking, 50/50 shifts, and having higher-risk individuals delayed in their return to normal routines

2 Continuing to relax setpoints in areas that have lower than usual occupancy (load)

3 Leveraging night-time walkthroughs to monitor baseloads with potential ventilation schedules running off-hours

4 Encourage returning occupants to commit to energy savings best practices:

- Using natural or task lighting where possible
- Ensuring plug loads are reduced at the end of the day
- Working with cleaning crew to verify
- Consolidating amenities that use energy where possible

5 Leveraging remote capabilities and technologies in the energy conservation effort, such as real-time energy metering and remote BAS access

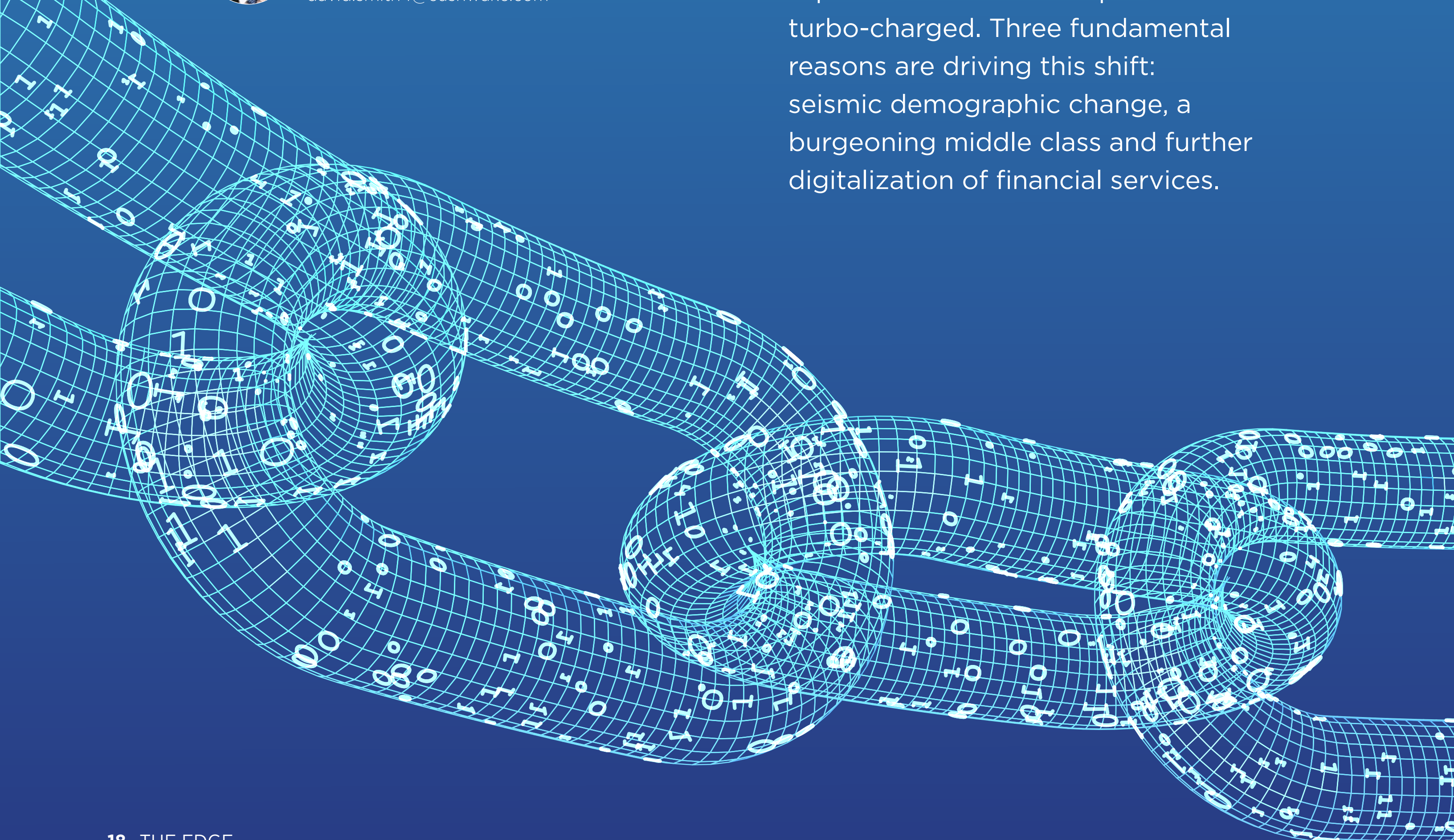
Are Millennials and Gen Z powering a fintech revolution?

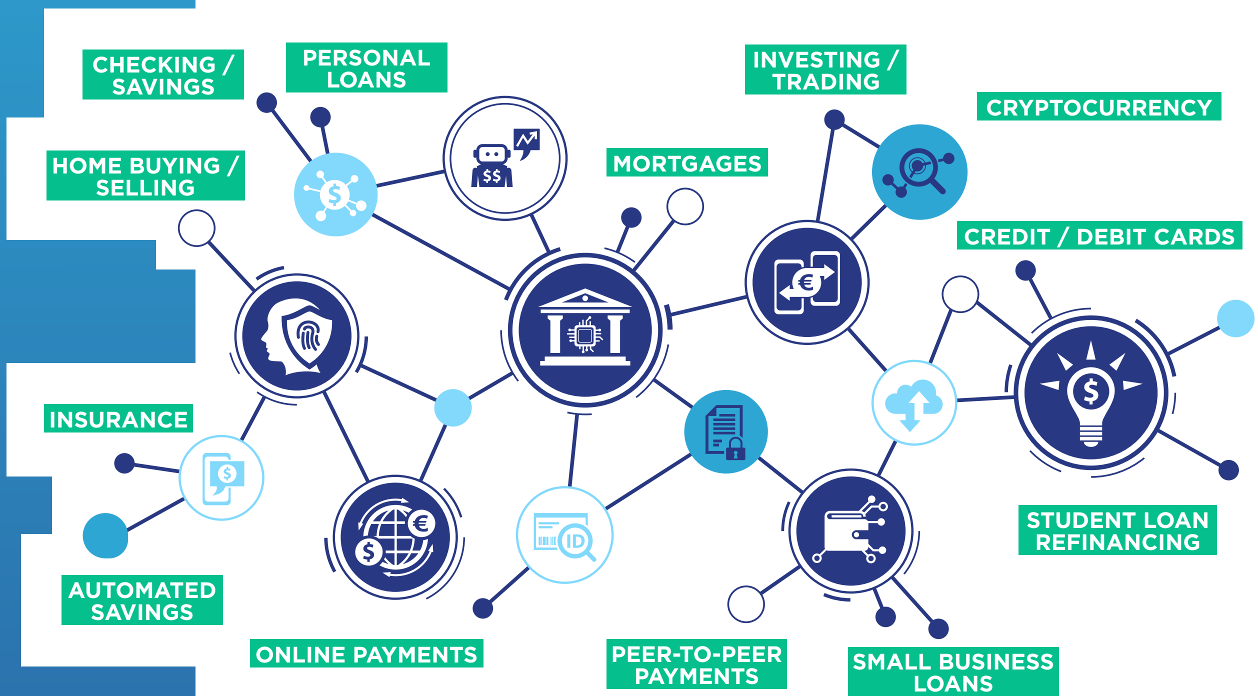
DR. DOMINIC BROWN
Head of Insight & Analysis, Asia Pacific
dominic.brown@cushwake.com

DAVID C. SMITH
Global Head of Occupier Insights
david.smith4@cushwake.com

Fintech has been around for decades, and while it isn't anything new, the relationship with the traditional banking system has moved from being largely symbiotic to increasingly disruptive and competitive.

Looking towards the future, there is potential for this disruption to be turbo-charged. Three fundamental reasons are driving this shift: seismic demographic change, a burgeoning middle class and further digitalization of financial services.





FROM SYMBIOTIC TO COMPETITIVE

The global fintech industry has grown significantly, with estimates suggesting that **more than $70 billion in venture capital has been raised to support the industry in the past two years alone**.[1] This trend is expected to continue with forecasts of growth ranging from eight percent to more than 20 percent per annum by 2025. The pace of technological development, the willingness to fund that development and the rapid adoption of this technology, especially by younger generations, have been key drivers.

Fintech has evolved from complementing existing services offered by banks, such as ATMs and online banking, to a situation where they are in direct competition with one another. For example, the fintech sector surpassed traditional banks' global share of unsecured loans in 2015, and was the leading source of personal loans in the U.S. in 2018. As a result, banks are starting to feel increased pressure on services such as payments, checking, savings, lending and investment management.

Unfortunately for banks, it doesn't stop there. For many, when thinking about fintech, the likes of Apple, Google, Amazon, PayPal or even peer-to-peer payment transfer platforms such as Venmo come to mind. While these are high-profile companies with huge user-bases, there are other lesser-known giants in the fintech world, with many focusing on third-party payment platforms. These include Ant Financial, originating from Alipay (part of the Alibaba group), which is valued at around $150 billion, as well as Adyen and Stripe. In addition, eight new fintech unicorns were created in the past six months alone. It is becoming clear the market is more competitive than ever before.

[1] CB Insights 2019 “State of Fintech: Investment & Sector Trends to Watch”

* All currency amounts listed in USD

SEISMIC DEMOGRAPHIC SHIFTS

While the rise of technology has been part of the story, seismic demographic and cultural shifts have also played a role, none more so than the rise of Millennials. The generation born between 1980-1995 have collectively had a profound impact on society, bringing with them a thirst for technology, immediate gratification, flexibility, authenticity and transparency. Their impact on the financial sector goes beyond this as they make up about 40 percent of the world's working population. As their spending power increases, they are becoming even more influential consumers.[1]

While the majority of Millennials have visited a bank, they are predominantly mobile-oriented, with around 94% actively using online banking services.[2]

They use online banking services regularly at a rate three times that of older generations. These statistics, combined with the increased use of contactless payment methods and a declining reliance on cash, have been key considerations in the rationalization of retail bank branch and ATM networks over much of the western world. England has been especially hard hit as an estimated 30 percent of bank branches have shuttered in the past three years.

It remains to be seen whether the effects of COVID-19 will further accelerate this trend, though early reports suggest that as social distancing has become more universally adopted, there has been strong growth in digital financial services.[3]

To compound matters, nearly half of Millennials do not think their bank communicates to them through the right channels.[4] Consequently, this generation has little affinity to existing bank brands. Among those surveyed, 73 percent of Millennials said they would be more receptive to financial services from tech companies such as Google, Apple and PayPal than their current bank.

Additionally, 33% believe that banks will not exist within five years.[5]

While that may be overly pessimistic, it does point to Millennials' lesser loyalty to traditional banking service providers.

Hot on the heels of Millennials is Gen Z, born between 1996-2012. While they are still in the early days of their banking experience and professional careers, there are already some indicators of their intent. This is the first generation exclusively born into the digital age, making them more tech-savvy, but also more cautious about money having grown up during the 2008 Global Financial Crisis.

As a result, they tend to gravitate to brands they know, trust and that provide them with a highly personalized experience, which is likely to be increasingly found in the digital world. In support of this, Morgan Stanley research estimates that 50 percent to 80 percent of smartphone-owning members of Gen Z are already using mobile banking.[6] However, they are far from a homogenous generation with a UK study finding that 45 percent of Gen Z would not open an account with an online-only bank (the other 55 percent would use an online-only bank). The majority of these respondents cited a lack of physical presence as a key reason.[7] This underlines their more cautious approach to finance as well as the "phigital lens" that Gen Z brings – the experience that all of life is both physical and digital.

Just as retailers with both physical stores and eCommerce capabilities have thrived over the past few years, fintech and traditional banks will need to respond accordingly and focus on customers' digital *and* physical needs.

2 For more analysis of the ways Millennials, Gen Z and Baby Boomers are all changing the future of commercial real estate, download Cushman & Wakefield's report, Demographic Shifts: The World in 2030 (https://www.cushmanwakefield.com/en/insights/demographic-shifts-the-world-in-2030).
3 https://thefinancialbrand.com/53662/building-banking-relationships-with-digital-millennials/
4 Beyond COVID-19: New opportunities for fintech companies, accessed via https://www2.deloitte.com/us/en/pages/financial-services/articles/beyond-covid-19-new-opportunities-for-fintech-companies.html
5 Millennial Banking Insights and Opportunities www.fico.com
6 https://www.bbva.com/wp-content/uploads/2015/08/millenials.pdf
7 https://www.morganstanley.com/ideas/millennial-gen-z-loan-growth
8 Unidays Gen Z Insights: Gen Z and Money: What you need to know

ASIA PACIFIC AND THE RISE OF THE SUPER-APP

For a look at what could be next, attention turns to Asia Pacific, the latest hotbed of fintech activity. Over the past two years, Asia Pacific has accounted for 40 percent, around $30 billion, of fintech venture capital raised – broadly on par with the 42 percent invested in North America.[8] At the national level, it also has some of the highest adoption rates with penetration in China and India nearing 90 percent. By comparison, the UK's adoption rate is 71 percent and the U.S. is just 46 percent.[9] There is no doubt the globally leading levels of smartphone usage in China and India are playing a role. As a result, we see a more holistic adoption of fintech than perhaps seen in other geographic regions.

Couple this with the world's largest share of Millennial and Gen Z populations along with a burgeoning middle class and it is little wonder that fintech firms have such a focus on the Asia Pacific region.

What may be surprising though is that a large proportion of the region is still either unbanked or underbanked – i.e., they have no bank account or seldom use it. The World Bank estimates that two-thirds of Indonesia's population is unbanked, while half of India's bank accounts are inactive.[10] Both of these countries offer great potential for fintech with their sizeable populations, increasing wealth and lack of relation to any existing financial organizations. For these reasons, Asia Pacific has seen the rise of the "super-app."

In simple terms, a super-app is many apps under an umbrella app or an "all-in-one" experience. It is a predominantly Asian and, more specifically, South East Asian phenomenon. Within fintech circles, Grab is considered a leader. What started as a ridesharing app in Malaysia in 2012, has quickly grown to become a behemoth in the South East Asia region. Grab is active in 196 cities across eight countries and has extended its services; offering a wider range of ride-hailing services, delivery services and — more importantly in this context – fintech. Through three subsidiaries – Grab Financial, GrabPay and GrabRewards — services such as lending, insurance, peer-to-peer fund transfers and South East Asia's largest loyalty program are now part of its arsenal.

Through its lending services, Grab is already directly targeting business customers using its payment platforms to help them expand. Targeting SMEs, loans are typically small, but numerous given Grab's geographic coverage. Interest in these loans is fuelled by low-interest rates, no requirement for security deposits and fast approval times – three factors that traditional banks often cannot deliver simultaneously. While there may seem to be an elevated risk in this type of lending, Grab already has insights into the business through the cash flow from its payment platform and can see levels and variability in trade, thereby helping to mitigate their lending risk.

We see a similar situation replicated at the individual level. The high-level of mobile smartphone penetration represents opportunity. Initial exposure to the brand is often through basic services such as ridesharing or food delivery, all paid for through the payment platform. It is then not a large step for this customer base to use peer-to-peer money transfer and seek higher-level financial services such as lending and insurance. All the while, discounts and offers are available across other services offered by the app as a reward for this loyalty. Indeed, 60 percent of fintech adopters prefer to view all their financial products through a single platform.[11]

[8] CB Insights 2019 "State of Fintech: Investment & Sector Trends to Watch"
[9] EY Global FinTech Adoption Index 2019
[10] https://globalfindex.worldbank.org/sites/globalfindex/files/chapters/2017%20Findex%20full%20report_chapter2.pdf
[11] EY Global FinTech Adoption Index 2019

Source: United National World Population Prospects 2019 revision

ANATOMY OF A SUPER-APP[13]

FINTECH

- Loans and lending services to unbanked and underbanked consumers, micro-entrepreneurs and small businesses.
- Peer-to-peer fund transfers.
- In-app mobile payments for seamless transactions.
- QR-code enabled payments with merchants.
- Loyalty reward programs.
- Insurance options.

RIDE-HAILING

GET A VEHICLE

- E-hailing solves safety and price certainty issues associated with traditional taxis.
- Car rental with economy and premium options.
- Bike sharing, one of the fastest growing transportation services, is popular in markets like Greater Jakarta, which is 60 percent larger than Beijing.

SHARE A RIDE

- On-demand carpooling service for passengers to share a ride. Passengers enjoy cheaper rides with short detours; drivers earn more with two passenger bookings in one trip.
- Social carpooling allowing passengers to hitch a ride with drivers who are going the same way.
- Pre-book a shuttle bus seat for an affordable commute.
- Charter different-sized vehicles to move large groups of people.

MARKETPLACE

- On-demand delivery services for food and parcels. Addresses local challenges of last-mile delivery especially through congested cities.
- Accessibility to multiple personal mobility partners, from bikes to eScooters, in a single marketplace.

[13] Based upon services provided by Grab and other super-apps.

The unbanked are also more likely to turn to these types of financial instruments as they seemingly have a greater level of trust. What takes days and requires significant paperwork in a traditional bank can be achieved in minutes online.

Tie this with the growth prospects in the region and it is easy to understand how many Asian fintech companies are commanding such high valuations.

WHAT'S NEXT?

Asia Pacific is now considered the global leader in fintech having developed rapidly in recent years, but it is on the cusp of being turbo-charged. The combination of high demand for mobile services together with large, young and increasingly wealthy populations makes the financial system ripe for continued disruption.

It is almost certain that the sector will continue to grow and evolve at a rapid pace across the region, with fintech dipping into more complex financial services that have traditionally remained the remit of the incumbent banks. In the future, there is potential that we will see a return to a somewhat more collaborative approach between banks and fintech – the former bringing the physical experience while the latter focuses on the digital experience – to fully address the user requirements of younger generations. With Asian fintech paving the way, it is only a matter of time before the U.S. and Europe follow suit.

Coronavirus and supply chain disruption: prepare for impact

BETHANY CLARK
Senior Managing Director
Industrial Strategy & Operations, Americas
bethany.clark@cushwake.com

TONY SU
National Industrial Head
APAC
tony.zy.su@cushwake.com

ROB HALL
International Partner &
Sector Lead
Industrial and Logistics, EMEA
robert.a.hall@cushwake.com

TIM CRIGHTON
Partner
Logistics & Retail, EMEA
tim.crighton@cushwake.com

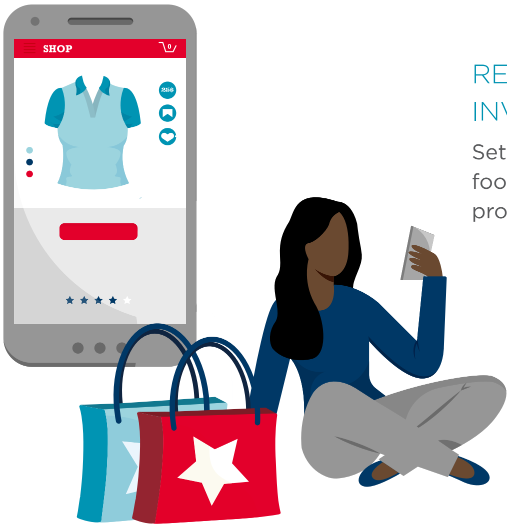
CAROLYN SALZER
Director
Americas Head of Logistics & Industrial Research
carolyn.salzer@cushwake.com

In a modern-day update to the proverb, "Necessity is the mother of invention," one could now say that "Necessity is the mother of acceleration." As the world adjusts to life during the COVID-19 pandemic, we are seeing a marked acceleration in the adoption or improvement of supply chain innovations, and an opportunity to address some pain points that had been lower on the priority list for many industries.

By some estimates, we're already seeing, or will see, accelerated adoption of some trends to take place in a mere 10 weeks when they could have otherwise taken 10 years. Some trends, and the changes they bring, will stick. Others may change processes or behaviors temporarily to solve for the 'here and now,' but will provide an opportunity for businesses to innovate or improve on longer-term solutions that will yield productivity, efficiency and customer service well beyond the pandemic.

There are a multitude of supply chain opportunities the pandemic has magnified or highlighted, and many more that will become clear in the not too distant future. Several prominent acceleration needs have emerged and persisted already, and suppliers, manufacturers and distributors in a myriad of sectors should consider these opportunities for ways to drive business success and real estate solutions forward in this challenging time.

FAST FORWARD TRENDS

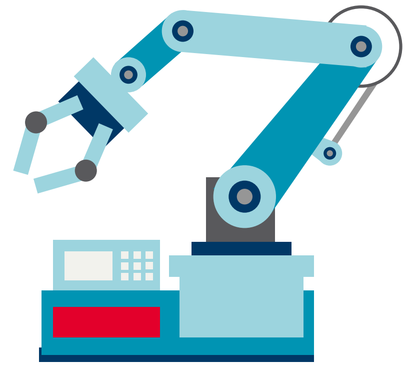


MEETING THE CUSTOMER WHERE THEY ARE THROUGH ONLINE SHOPPING

Whether driven by 'shelter in place' mandates across the globe, current consumer sentiment around venturing out into stores, or constraints around the number of shoppers allowed in stores for social distancing, online shopping has seen a dramatic increase in recent weeks, especially for categories like grocery, that were finding their way to customer adoption before the pandemic. Consumers are challenging companies to step up their digital capabilities, and to answer diverse needs for delivery of orders, ranging from traditional 'at-home' parcel delivery to curbside pick-up to contactless delivery of perishable goods, and everything in between. The lines between how the customer shops in-store and via direct distribution are increasingly blurred, and successful companies will find new ways to leverage processes, diversify building and space types, and inventories for a seamless customer experience.

REVISITING THE INVENTORY CHALLENGE

Setting aside 'panic buying' of certain food items, toilet paper and cleaning products, the pandemic is raising questions and challenges around managing inventories. Beyond the immediate actions to sell through current seasonal inventories online, sometimes using closed stores as distribution points for 'ship from store,' retailers and manufacturers are already contemplating longer-term changes to inventory 'days of supply' to avoid disruptions wrought by upstream supply chain points being shuttered or severely reduced in production capacity. Just-in-time inventory management may need new buffers throughout the supply chain, and some sectors are considering supply chain diversity to rebalance their reliance on some geographies, especially those with longer transit times.

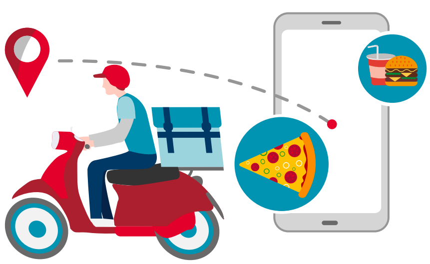


LEVERAGING ROBOTICS AND AUTONOMOUS VEHICLES

While a potentially expensive solution, COVID-19 may act as an accelerator to many efforts already underway in this space. Robotics in the warehouse may help limit contact among team members receiving goods, picking orders and shipping them out. Autonomous vehicles may help to offset driver shortages to meet the increased demand for shipments to consumers, and to expedite the shipment of critical goods to rural or remote geographies with fewer transit options and with immunocompromised populations. As an example, Automatic Guided Vehicles (AGVs), which are portable robots used to transport heavy materials around large industrial buildings, will be especially important to operators worldwide in a wide range of industries such as manufacturing and product assembly, military and defense, aerospace, warehouse, material handling, food and beverage, automotive assembly, plastics and metal, and goods packaging. AGVs can be used to improve workflow, lower costs or carry out specific tasks like product and pallets loading or unloading, assembling parts, moving materials between conveyor belts and towing equipment. Using AGVs will help provide a social distance solution in industrial facilities and further accelerate the robotics trend that had begun to emerge across the globe over the past several years.

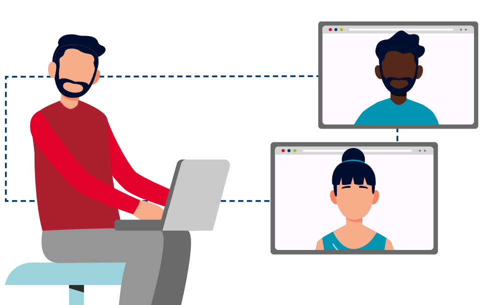
IMPLEMENTING CONTACTLESS 'EVERYTHING'

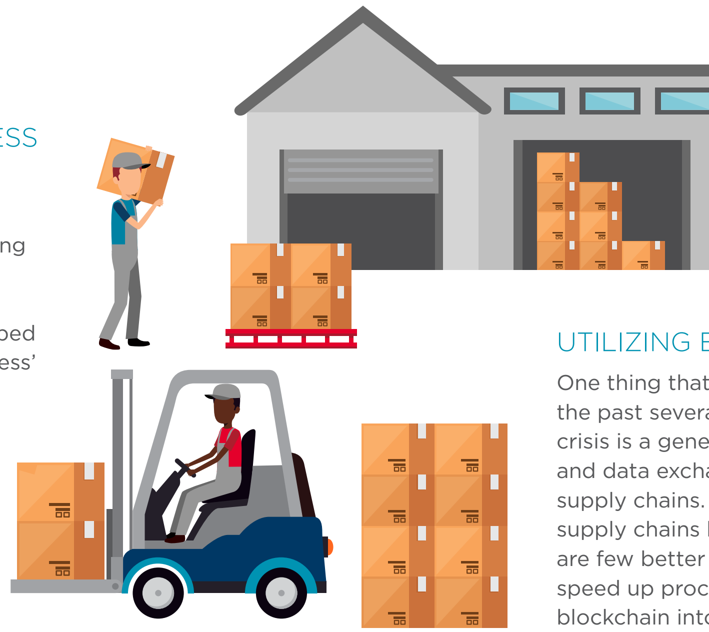
Concerns over virus transmissions through contact proximity or touching of common surfaces has already changed the customer delivery experience, with food delivery dropped at the front door using the 'contactless' option, and no interaction with the person delivering. COVID-19 has amplified awareness of other needs for contactless technology far beyond payment and delivery solutions used by sellers and consumers. Both optical and voice-enabled technology, automation, and robotics will find new adopters in warehouse MHE (material handling equipment), order pick technology, and shipping/receiving processes.



DEPENDING ON DATA CENTERS

The pandemic has boosted demand for many online services – like Microsoft Teams, Zoom or Hangouts - as tools for video collaboration. As we move to using new social distancing practices in the workplace, technologies that provide safer meeting solutions and alternatives to travel are becoming increasingly in demand. Google, for example, operates one of the world's largest digital infrastructure platforms, with 19 data center campuses around the globe, including 11 in the United States, five in Europe, two in Asia Pacific and one in South America. Their cloud campuses house multiple buildings,





each approximately twice the size of a big-box retail facility and filled with servers and storage to manage data. Companies' data centers will continue to expand as the need for digital data storage grows, especially with the introduction of 5G infrastructure (see article on page 8, "5G is here. Why it matters and how it will play a part in a post-COVID-19 world").

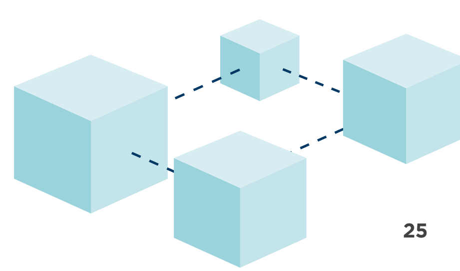
EXPLORING COLD STORAGE AND FOOD PROCESSING SOLUTIONS

One of the most active property types in industrial real estate is cold storage. With online grocery more popular than ever before, restaurants and farmers forced to adjust their food supply chain, and the shutdown of processing plants despite being "essential," the need for cold storage warehouse space is growing like never before. China, the UK and the U.S. are all seeing companies looking for new cold storage warehouses, opportunities to expand their existing space, infill properties to better serve eCommerce consumer needs, or ways to modernize facilities to make their supply chains more adaptable. This is also making investment opportunities on cold storage facilities extremely appealing.

UTILIZING BLOCKCHAIN

One thing that has become clear over the past several months of the COVID-19 crisis is a general lack of connectivity and data exchange built into our global supply chains. As the need to optimize supply chains becomes more vital, there are few better solutions to helping speed up processes than implementing blockchain into a company's network. Suppliers can use blockchain to record the origins of materials that they have purchased, and track them around the world. Some of these excellent and timely examples of there are pharmaceuticals and Personal Protective Equipment (PPE). Globally, blockchain is supporting efforts to combat the virus. This technology can help ship medicine and PPE globally to areas of the world most affected by COVID-19. This time last year, Deloitte surveyed 1,000 companies across seven countries about integrating blockchain into their business operations. Their survey found that 34 percent already had a blockchain system in production today, while another 41 percent expected to deploy a blockchain application within the next 12 months. In addition, nearly 40 percent of the surveyed companies reported they would invest $5 million* or more in blockchain in the coming year. It is safe to assume, with the pandemic shaking up the supply chain, these numbers are likely to increase because the more information about every firm in the chain, the better. Being in touch with a customer's customer's customer, you can see ahead of time what's coming your way and start finding alternative suppliers if needed.

*All currency amounts listed in USD



THE WAY FORWARD

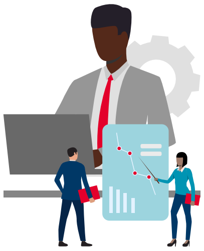
This pandemic has challenged businesses and leaders to quickly respond to critical needs, and to ensure supply chains have the raw materials and finished goods to support manufacturing, distribution, and, ultimately, the consumer, for priority needs. In the process, it has pushed innovation and solutions forward quickly. Companies and leaders can take the following steps to navigate the path ahead.

LOOK AND LISTEN

Assess the business for continuous improvement in process and protocols; hear what employees, suppliers and customers are asking for; and innovate to deliver those needs.

LEARN

Scan the landscape to see how processes and innovations in other sectors and industries may be applied to the business. Where possible, pilot or test solutions for iterative improvement with quick feedback from users.



LEAD

Communicate, communicate, communicate. Instill confidence in the team to innovate and provide feedback. Encourage teams to collaborate, and course-correct when evidence of silos is found.

The pandemic is a unique event, and moment in time, for supply chain innovators and operators to survey the landscape; learn from consumers, partners, and other industries; and to install new practices, processes and products that will differentiate their business for the future. Partnerships among the supply chain, inventory management, human resources, store operations, finance and information technology teams within an organization, and across external partners used, will be a competitive advantage to moving quickly.

About Cushman & Wakefield

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