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# A constructive view on real estate
Real Estate Predictions 2019

Welcome to the 2019 edition of Deloitte's predictions for the real estate industry. Curious to see which changes lie ahead? Discover the Real Estate trends for 2019 that will impact your business. Read about circularity , blockchain, cybersecurity, and more.

# Introduction

# Have a glimpse into the future of real estate

The Real Estate and Construction market has been changing over the past few years. With all these changes going on, Deloitte Real Estate is releasing the Real Estate Predictions 2019. We hope the predictions enhance your understanding of the opportunities within the real estate industry. Have an interesting read!

### 1. Data driven business models
As technology keeps developing and becomes more affordable—for both new and existing structures—and collaboration platforms, sensors, and smart devices continue to advance, the amount of data produced by buildings is increasing exponentially. This data can give real estate market participants (investors, asset managers, property managers, and tenants) a competitive advantage and help them avoid disruption if they use it effectively to develop data-driven services and new business models focused on the specific needs of users, owners, or the property itself. But only a joint effort among all real estate stakeholders (constructors, investors, owners, tenants, and service providers) can optimize data to create insights that improve performance and profitability.

### 2. Digital twins in real estate
As technology becomes more pervasive and smart buildings and precincts are being developed, real estate companies will look to create digital versions of their physical assets. The potential benefits include the ability to run and manage buildings centrally, obtain real-time data as to how tenants are using the building and provide value-add services, perform predictive maintenance based on data from sensors to reduce cost and downtime, and enhance the overall tenant experience.

### 3. Industrial property: ugly duckling no more
Not long ago, the industrial property market was considered the "ugly duckling" of the real estate industry. In the last couple of years, however, industrial warehouses and distribution centers, have emerged as the most desirable assets within commercial property, generating higher rental growth and returns than other main commercial sectors – all thanks to the rise of e-commerce.

### 4. Circularity in real estate
All around the world, governments, companies, and NGOs have committed to minimizing raw material usage in the real estate and construction industry. In the Netherlands, for example, it was recently agreed that by 2030 a 50 percent reduction of raw materials usage needed to be realized. Read about the barriers in creating a circular economy, and what opportunities pave the way towards it.

### 5.1 Cybersecurity issue 1: Securing the enterprise
As extensive technology advancements reshape the traditional commercial real estate (CRE) business model, owners and operators must contend with new forms of risk, including cyberattacks information security, and data privacy. For example, the growing use of IoT technologies such as sensor-enabled building management systems could broaden the attack surface for CRE firms, increasing access to sensitive data that can cause financial and reputational damage to owners/operators and tenants. The question is, then, are CRE companies ready to handle cyber risks?

### 5.2 Cybersecurity issue 2: Cyber risk in the building lifecycle
With modern buildings depending more and more on technology and becoming more and more interconnected, numerous questions are arising about their resistance to cyber risk. Real estate companies need to understand their business risk profile and threat landscape.

### 6. Blockchain in real estate matures
We are now encountering a push toward a more practical blockchain approach. This approach is fueled by the significant work that still needs to be done in the fields of privacy, data ownership, exchange of data based on internationally agreed standards, and improvements in the quality of data for the adoption of blockchain technology in the real estate industry.

### 7. Building flexibility into real estate management
The real estate business is currently experiencing a shift in demand away from the traditional business operating model to more flexible solutions. Technological advancements and digitization, the quest for sustainability, and changes in user lifestyles are all factors that are demanding a greater level of adaptability in real estate strategic management and value creation.

### 8. The Future of Work is changing
The world of work is changing. Clients in every industry are now facing the challenges and opportunities presented by this disruption, with much thought going into how work will be completed and by whom in the years to come.

The real estate industry is no different, with a significant impact on the physical workplace anticipated that occupiers, developers, and investors will need to carefully consider. Drawing on major disruptors identified by Deloitte – ranging from automation and replacement of jobs to diversity and generational change – we have identified four key trends we predict the industry will need to respond to in 2019.
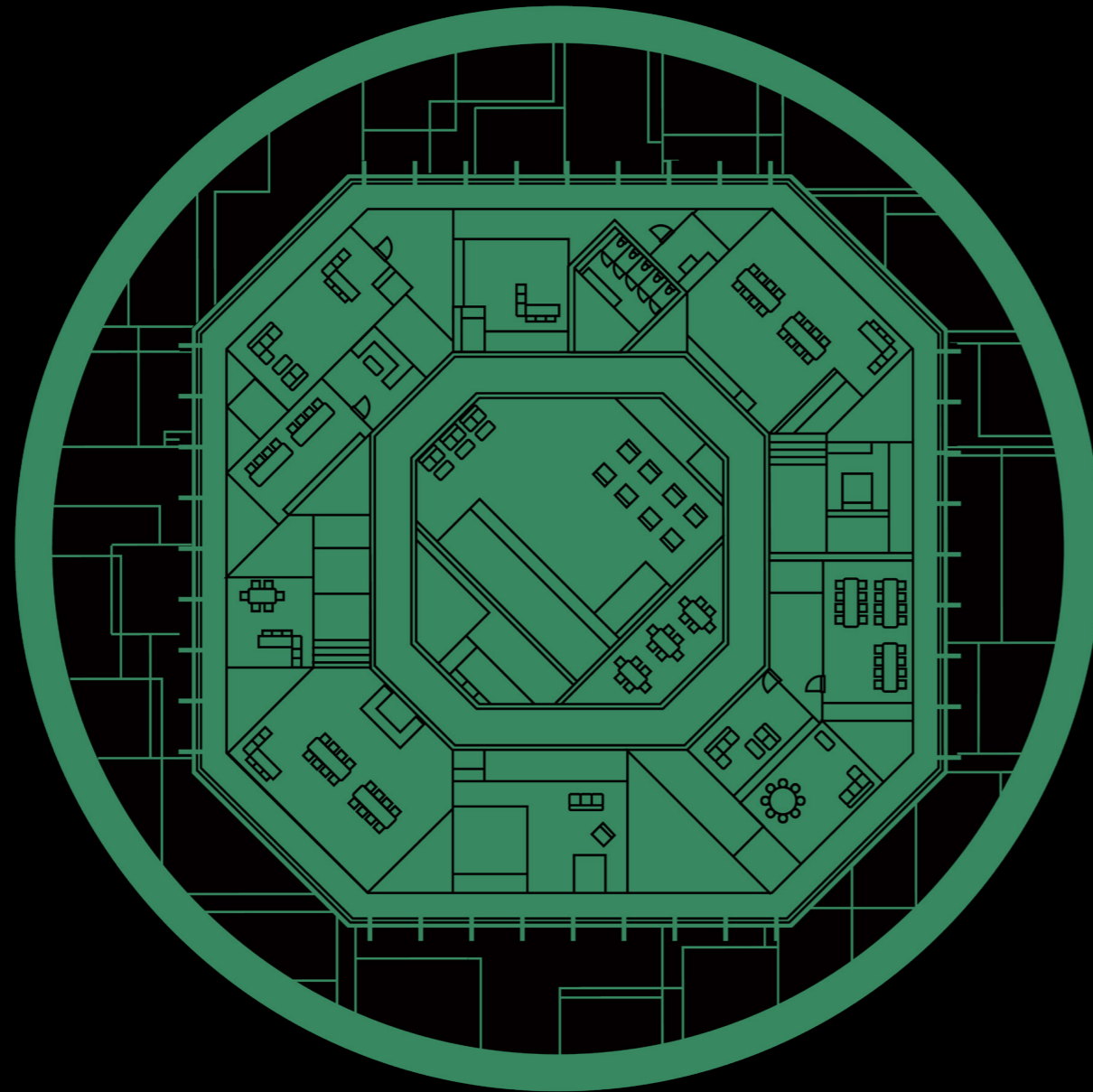
### 9. Proptechs: Propelling digital real estate
Commercial real estate (CRE) companies haven't yet figured out how to deal with the relatively recent emergence of real estate technology startups, known as "proptechs." While most of the broader financial services field have made the shift to a partnership mentality, CREs continue to view proptechs as a disruptor rather than as a potential source of collaboration.

### 10. The future of urbanization and transit-oriented development
The next generation of urban mobility presents unique opportunities for cities around the globe. Autonomous vehicles, ride-sharing services, and wide-ranging technology adoption are set to change the transportation ecosystem and with it, the urban landscape. Tomorrow's smart cities will operate with increasing levels of connectivity, creative collaboration, and networked communities along with intricate and substantially enhanced transportation ecosystems.

# Data driven business models will change the real estate industry

As technology keeps developing and be-comes more affordable—for both new and existing structures—and collaboration plat-forms, sensors, and smart devices continue to advance, the amount of data produced
by buildings is increasing exponentially.
This data can give real estate market par-ticipants (investors, asset managers, prop-erty managers, and tenants) a competitive advantage and help them avoid disruption
if they use it effectively to develop da-ta-driven services and new business models focused on the specific needs of users, own-ers, or the property itself. But only a joint effort among all real estate stakeholders (constructors, investors, owners, tenants, and service providers) can optimize data to create insights that improve performance and profitability.



In the day-to-day business of asset and property management, the increasing amount of data avail-able offers a range of opportu-nities. For example, big data can help automate due diligence as the technical records and current conditions of building components can now be generated real-time and reliably (with such technolo-gies as building information mod-eling (BIM) and blockchain playing a role).

Predictive analytics is also be-coming the standard sooner than many might have expected. This includes activities such as using in-formation from the past to predict when technical components might need maintenance or repairs. Service providers that tackle these opportunities faster will become more efficient and provide better services. Business models based on success fees will be more com-mon for those digital servicers, which will increase their margins. This development can change the landscape of service providers and consequently lead to market elimination and/or consolidation in that sector.

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Predictive analytics for the tenan-cy-side of the building will proba-bly take more time to develop but offers additional potential and will be even more relevant in the light of co-working spaces. If investors and asset managers can assess the optimal usage of a rental space for tenants based on data collected (e.g., utilization and services used), a perfect win-win-win situation can emerge for all three parties.

Looking ahead, the emergence of artificial intelligence and machine learning can also have an impact. For example, these technologies can address some of today's ques-tions in regards to cybersecurity and enable additional analytics and benefits which will be used in many aspects.

To generate these digital benefits, real estate stakeholders will need to find different ways to collabo-rate. Instead of discussing who has to pay for technical enablement and what data belongs to whom, real estate players should recog-nize that digitization means inte-gration and networking. Success in big data will come with breaking up existing data silos.

Decision making based on com-bined data from inside and out-side the building (technical, ten-ancy, service, and market level) provided by different stakeholders will create the competitive edge. In particular, a "digital twin" of the real estate asset that encompass-es all the benefits outlined above (and more) has to use a collabora-tive platform to ensure acceptance of the data, transparency, and mu-tual involvement. In short, tenants, investors, and servicers have to be strategic partners in the future.

Given the huge business potential, new market entries from the tech-nology sector will most likely try to take their share of this real estate data market. Drawing on their own business models for the profitable use of data, those financially and well-equipped technology leaders can offer standardized global ser-vice strategies that could disrupt real estate investment managers and service providers. To avoid this competition, real estate stake-holders will need to move quickly and make themselves familiar with the potential of big data and how to convert it into smart data—no matter if investor, asset manager, or property manager.

Similarly, for a tenant, big data can help define future target real estate locations, required space, and needed technology. This not only enables tenants to compete in the war for talent but also generate the benefits from cost efficient future real estate assets. And just as with other real estate stakeholders, tenants must em-brace collaboration with landlords and servicers.

# Digital twins in real estate - Humanizing buildings in the age of Industry 4.0

In a time when technology-laden smart buildings have become an industry standard, "digital twins" are poised to deliver the next stage of real estate innovation. A digital twin is the digital representation of a physical asset, process, or system that allows for predictive modelling in order to deliver proactive adjustments for assets. This technologically-enabled process can deliver greater strategic value for the real estate industry as a whole. But while digital twins are similar to smart buildings in that they optimize operations and improve the customer experience, a twin can also deliver benefits across the full lifecycle of a building by simulating complex scenarios.

### Buildings are more than assets

As complex, high-value assets with an equally complex lifecycle, buildings present an ideal opportunity for realizing the benefits of a digital twin. But buildings are so much more than just a physical asset. They are the environment in which people live and work, they facilitate social interactions, foster communities, and have the opportunity to improve individual outcomes, drive loyalty, build brand, and create healthier, happier, and more productive people.

When creating a digital twin, approaching it from a perspective that encompasses the entirety of a building ecosystem allows you to optimize far more than such straightforward activities as energy usage. It allows you to completely reimagine such key aspects as air quality, temperature control, furnishings, and facilities in a way that responds to human sensitivities and personas.

### Breaking down the digital twin

Creating a complete digital twin that can do this is a complex journey. Rather, it is better to break down a project into smaller, modular "digital twins" that can eventually be integrated together over time. This allows the development of the twin to progress faster, prioritizing use cases in a way that builds momentum, realizes short-term value, and creates the roadmap to create a complete digital twin of a building across its entire lifecycle. Eventually, the process can even create a digital twin of the entire property portfolio

For example, choosing to optimize the HVAC and lighting may not be the use case that redefines the industry, but strategically it makes sense. In the average commercial office building, about 10 to 15 percent of operating costs are due to electricity, of which almost 70 percent is associated with HVAC and lighting.

These are substantial costs largely driven by tenant use of a building. Digital twins will enable better visibility of how tenants use a building, and, in time, the ability to simulate and forecast how tenants will move and interact. This will allow for more efficient HVAC and lighting management as well as a more optimal cleaning roster while still maintaining tenant expectations. In this way, it is a use case that will drive immediate and sustained cost savings—building confidence in the digital twin—and pave the way for more complex use cases.

### A digital twin-enabled future

A digital twin expands as it incorporates each new simulation and use case. The twin can slowly build to a complete view of the entire structure across its lifecycle and integrate any disparate systems to create a centralized repository for all data and decision-making, often referred to as the digital thread. With a digital thread and digital twin in place, the real industry shift can begin.

Entirely new ways of designing buildings will start to emerge as designers access complex simulations that can provide a sandbox environment in which to test designs.

The full construction process can be planned, visualized, and optimized before ground is even broken. Construction sites can be managed more effectively, with the ability to predict exactly how delays and decisions will impact the overall construction. And the ability to monitor safety and compliance in real time can save lives by predicting emergency situations before they occur

Self-maintaining buildings will become more commonplace as the digital twin can predict when something will fail, book a contractor, guide them to the asset to be fixed, provide specifications and historical information, and then generate an invoice once the job is done. Workplaces will take advantage of simulations to redefine the way spaces are structured and dynamically reorganized, with a shift to bespoke spaces and multimodal workstations that can respond in near-real time to the unique needs of different teams. Retail will take advantage of simulations to test new store layouts and design spaces that engage consumers in a more meaningful way. The health sector will use simulations of staff and patients to minimize friction and bottlenecks, allocate medical supplies more efficiently throughout the space, and optimize the rostering of staff to meet the current and predicted needs of patients.

### The next industry-wide disruption

Though real estate assets have been getting progressively "smarter" across industries, the digital twin represents the next major driver of change due to its powerful predictive capabilities. Given the complexities involved with creating a complete digital twin, the industry is currently focused on delivering value for smaller, more specific digital twin use cases. And while these aren't big enough to completely disrupt the industry, as use cases slowly combine into a complete digital twin, companies will be able to optimize entire buildings, precincts, and portfolios in every stage of the lifecycle.

As the way spaces are designed and built is redefined, new business models and market offerings will emerge. Buildings will become more human, with an understanding of human sensitivities and the capability to nurture rich ecosystems. It will no longer be sufficient to just design, build, and lease a space. The space will need to think for itself and react to the world around it. And these large-scale changes, enabled by the predictive capabilities of a digital twin, will be the drivers behind a dramatic disruption of the real estate industry in the years to come.

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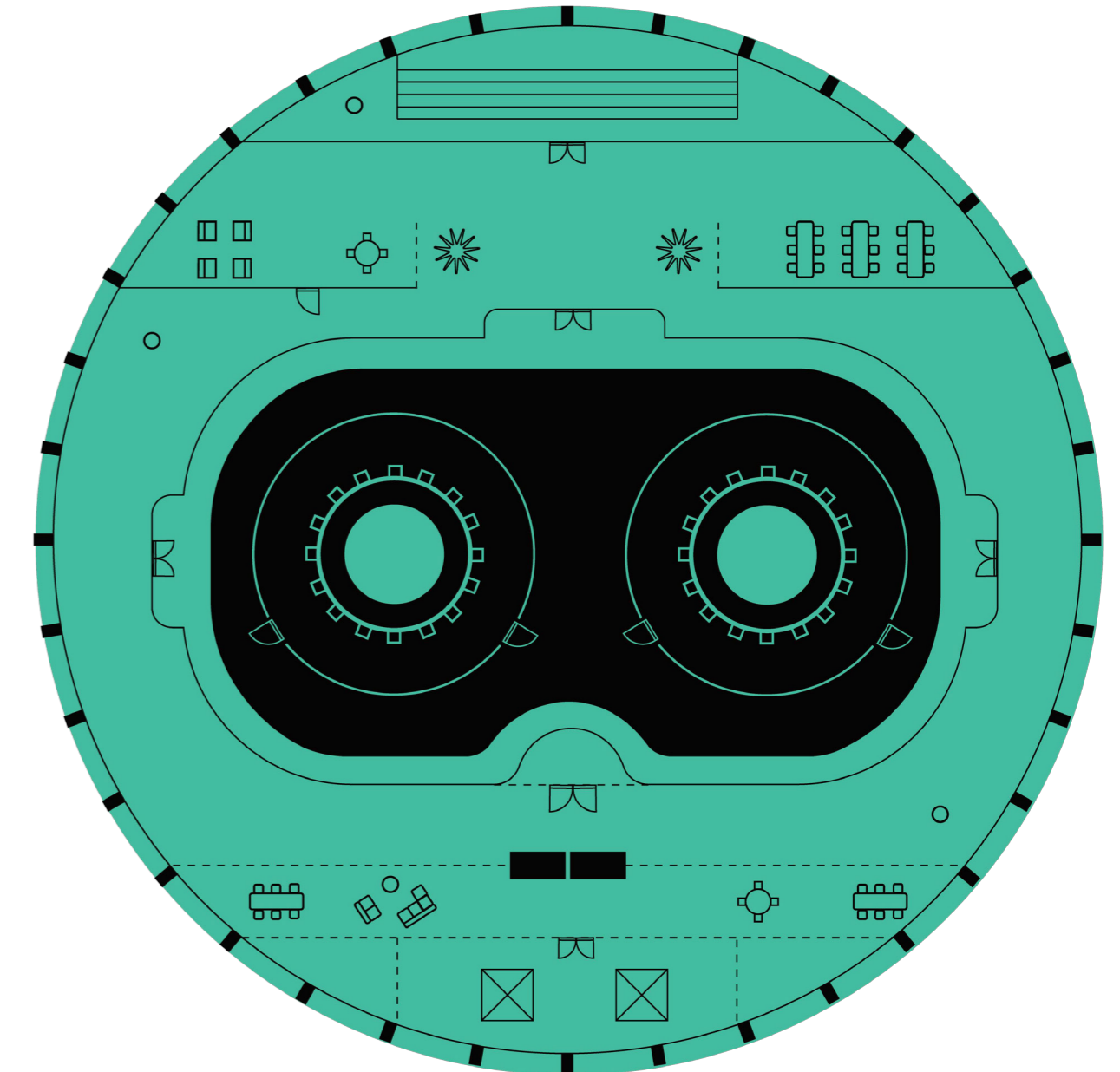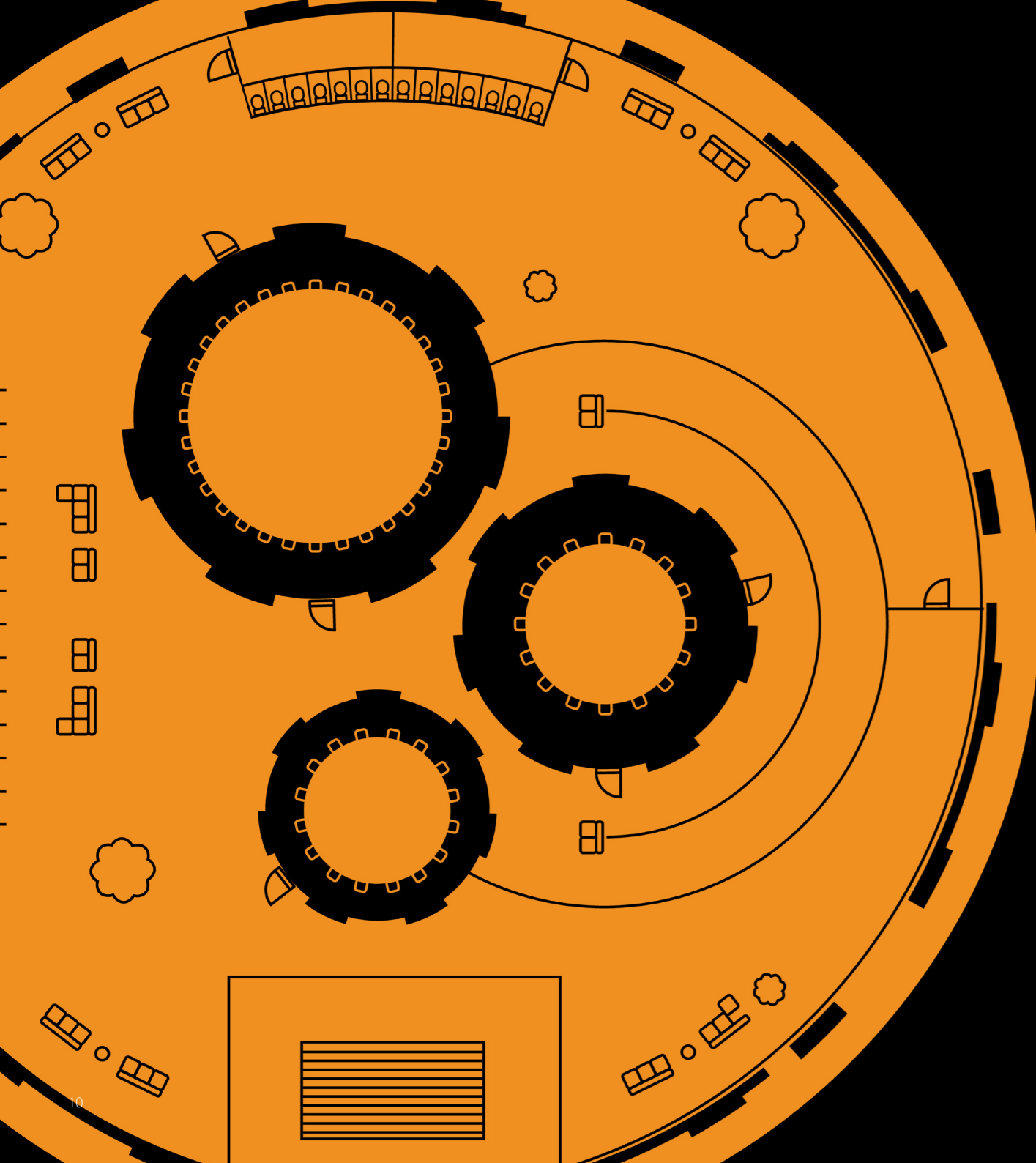
# Industrial Property: ugly duckling no more

Not long ago, the industrial property market was considered the "ugly duckling" of the real estate industry. In the last couple of years, however, industrial warehouses and distribution centers, have emerged as the most desirable assets within commercial property, generating higher rental growth and returns than other main commercial sectors – all thanks to the rise of e-commerce.

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The perception of industrial real estate, once synonymous with noisy trucks and dirty yards, is now changing as automation, robotics, and other technological advances further reshape the sector.

### The rise and rise of e-commerce
Online retail growth shows no signs of slowing due to several factors, namely convenience, price, and free delivery. In the United Kingdom, which has been at the forefront of online shopping, e-commerce will represent 20 percent of all retail sales by 2020, an equivalent of almost US$23 billion. This year alone, more than half of online sales were made on a smartphone, suggesting that mobile apps, including social media, are having growing impact on retail transactions.

Retailers, therefore, will be investing not only in websites and apps but also in e-fulfilment centers and logistics facilities holding inventory, rather than in physical shops. As an estimated US$1 billion of online sales translates into 100 million square feet of industrial space, retailers are likely to seek even more warehousing space going forward.

### Fewer shops, more urban logistics?
Changing shopping habits and rapid population growth in major conurbations is fueling demand for logistics space. However, having lost swathes of industrial land to other uses in the past few decades, warehousing supply levels are struggling to meet the demand. Will the solution lie in the retail sector? Redundant retail space could provide that opportunity, given that the retail market is currently facing large-scale store closures as costs—including business rates and wages—rise while sales in physical stores continue to fall. By its very nature, the retail sector is well positioned for servicing customers whereas the logistics sector is not.

### Urban logistics close to the customer
Logistics space supporting last mile delivery is ever more crucial as customers expect shipments within two days, with some retailers even guaranteeing one-hour delivery. Last mile logistics are often the most costly and inefficient and, therefore, online retailers will look for new solutions to optimize them. This will result in ever more complex supply chains—something we've have already witnessed as the customer enjoys a more seamless omni-channel experience. Urban warehouses are likely to be more compact and efficient with limited inventories that can be modified using predictive analytics and supplemented with 3D printing.

### Intensification of land use
The limited industrial space in urban areas will likely lead to further intensification of land use. This includes utilizing underground facilities such as car parks, developing more multi-story warehouses as well as mixed use schemes with a light industrial and residential component or so called "beds and sheds." Industrial tenants are also likely to move to a shared service model and look to consolidate their deliveries alongside other firms, similar to how third-party logistics consolidate packages today.

### Automation and robotics
New technology is already having a profound impact on industrial real estate but the potential disruption cannot be underestimated. Automation is fast changing the way industrial facilities are designed and utilized, as seen in fully automated warehouses and fulfilment centers. This includes the use of robotics to move goods between trucks, manage inventory, and pick items off shelves without the need for human labor. As warehouses become more sophisticated, developers will increasingly need to deliver a product that is designed to support advanced technology.

While the potential of automation, robotics, augmented reality, and the Internet of Things are immense, the adoption of such technologies might take time and will not be universal. Those firms that invest in and adopt technology quicker will have the competitive advantage. We have already seen how early adoption of leading-edge technologies is driving operations of some of the largest online retailers. Industrial real estate will be no different as the greater use of data and analytics significantly boosts efficiency, increases business intelligence, and, ultimately, improves the customer experience.

# Creating a better world: circularity in real estate and construction

All around the world, governments, companies, and NGOs have committed to minimizing raw material usage in the real estate and construction industry. In the Netherlands, for example, it was recently agreed that by 2030 a 50 percent reduction of raw materials usage needed to be realized.

Actions like these dictate a fast transition toward a circular economy—that is an economy where resources and energy are renewable and regenerative and cycled back into supply chains. Though the transition to circularity faces several barriers, there are also opportunities. One of the opportunities being explored is the possibility of "activating" materials in financial reporting.

Use cases have shown that real estate owners are often unaware of or underestimate the financial value of the materials in their real estate assets. These use cases show that upon demolition of a real estate asset, substantial financial value—adjusted for demolition, transport, and re-usage costs—can be captured. This untapped value can impact financial reporting, prompting the financial incentive needed to transition the real estate and construction sectors to a circular economy.

### Facilitating the transition to circularity
The potential positive impact of applying circular ways of working in the real estate and construction industry is huge: research shows that buildings consume approximately 40 percent of all energy and approximately 40 percent of all primary raw materials. And while circularity can be achieved through a combination of material reuse and efficiency improvements, only strict regulation and/or financial incentives can achieve the desired radical change circularity can accomplish.

Promoting circularity in buildings via regulation, however, ultimately comes down to political will—which is not expected to emerge any time soon. And current circularity financial incentives are not as clear and straight-forward as a circular office building's impact on brand. As such, not all stakeholders are motivated to support the transition toward circularity, with many waiting for hands-on tools.
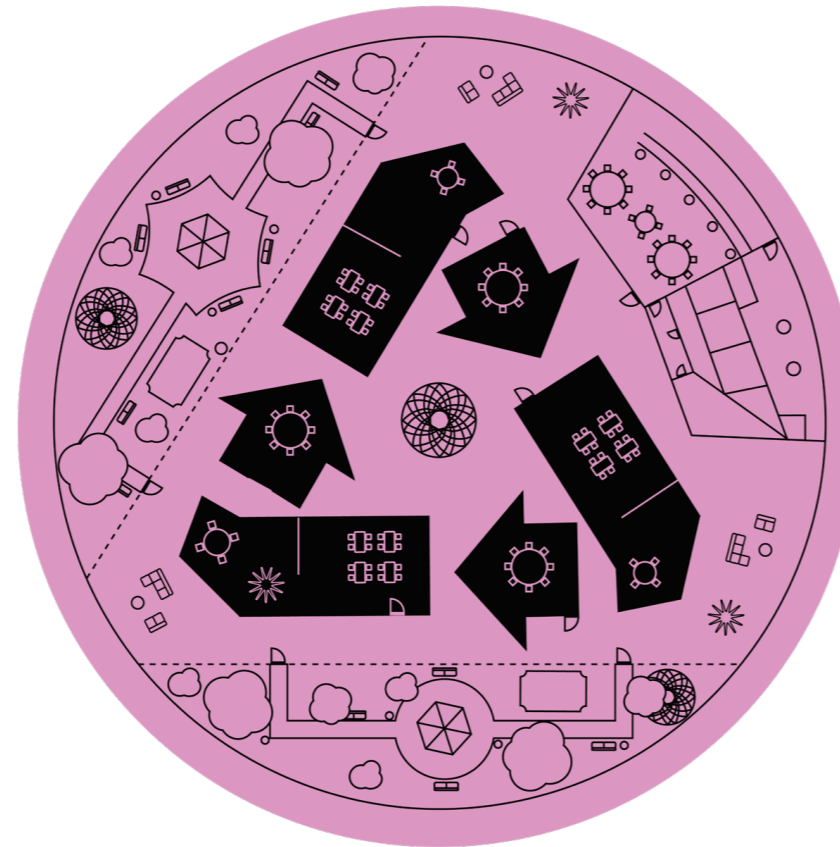


### Financial incentives of a circular economy
There are several avenues of financial incentives that can be pursued to achieve a circular way of working in the real estate and construction industry. One example is increasing the adaptability of buildings. If buildings can be easily adapted to changing needs over time that can translate into lower costs. This also creates an increased expectancy of real estate usage as the building can be used for a longer period of time with decreased renovation costs and perhaps lower periodic maintenance.

This approach is particularly apt for real estate with high maintenance, such as schools, care facilities and offices, with reversible building design having the potential to lower periodic in-use costs. While this definitely applies to new construction, can it be done for existing buildings? A possible solution lies in applying a materials passport and, by extension, giving financial meaning to materials.
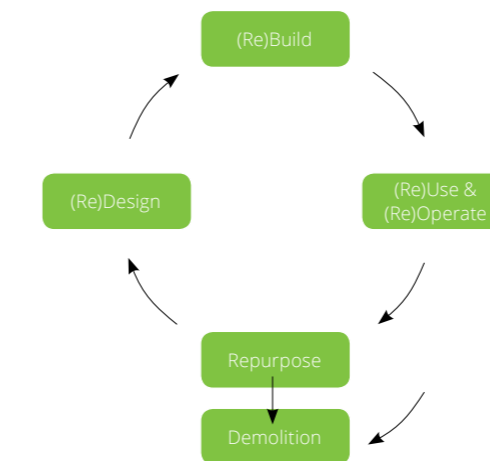


Building phases from a circular perspective (Sander et al. 2016)

### The possibilities of a materials passport
A materials passport provides materials with an identity, stimulating reuse of products, preventing material destruction, and making it easier to eliminate waste. A materials passport is designed as an online library of materials in the built environment, providing one central repository of all real estate data. This data includes all relevant information during the planning and execution phases of building administration and maintenance. The documentation and data can be useful for designing tenders for renovation, demolition, or new developments as well as for certification and sales/lease purposes. One of the leading organizations in this approach is the Madaster Foundation, with its materials passport fast becoming the global standard. For example, one of the world's largest tech companies recently announced it will be working with the Madaster materials passport and support the foundation wherever it can.

A real estate materials passport can also lead to a new way of viewing the financial value of materials. One possibility that is being researched is how to incorporate the raw materials identified in a material passport into financial reporting—that is, financially activating the identity of these materials. The idea is simple: based on global price benchmarks and corrected for demolition, transport, and re-usage costs, the residual value of the materials is identified. This way, the value of real estate assets is calculated more precisely. Of course, the impact will differ among segments due to varying rules on the valuation and depreciation of real estate assets.

### Moving materials value forward
In the Netherlands, research into the financial activation of materials and its impact on the balance sheet and financial reporting is being spearheaded by well-known architect Thomas Rau and the "Circular Seven" (C7)—a group of seven of the most prominent organizations in different segments of the real estate and construction industry that is seeking to be a frontrunner in the transition to circularity. The reasoning for the C7's range of stakeholders is two-fold. First, the financial activation of materials will differ per segment based on regulations, such as the different rules for real estate valuation and depreciation. Secondly, the C7 can each share segment-specific insights and best practices, providing a more comprehensive view of materials valuation within real estate.

The C7 research will be published in Q2 2019 and available worldwide. The first of many steps toward a resource-efficient, low-carbon economy with sustainable growth, it is research that may very well change the potential for circularity in real estate and construction.

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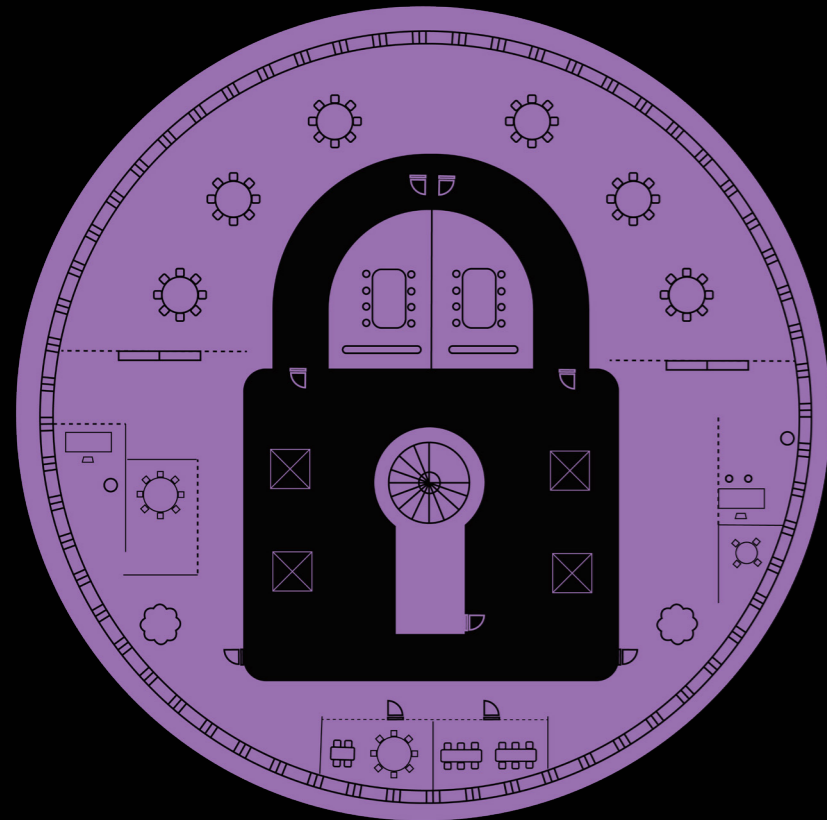
# Securing the enterprise: Assessing cyber risk in commercial real estate

### Evolving technologies, business models, and risks

As extensive technology advancements reshape the traditional commercial real estate (CRE) business model, owners and operators must contend with new forms of risk, including cyberattacks, information security, and data privacy. For example, the growing use of IoT technologies such as sensor-enabled building management systems could broaden the attack surface for CRE firms, increasing access to sensitive data that can cause financial and reputational damage to owners/operators and tenants. The question is, then, are CRE companies ready to handle cyber risks?

To better answer this, Deloitte conducted a global survey in 2018 of 500 institutional investors. The survey revealed that only 25 percent of respondents are very satisfied with CRE companies' cyber risk preparedness, though the rates do vary by geography (see figure 1). Given this assessment, CRE companies should probably consider how to better balance their investments in technology with their ability to manage growing cyber risks.

**Figure 1: The investor pulse: Cyber risk management**



**Only one-fourth investors are very satisfied with CRE companies' cyber risk preparedness**

Percentage of respondents

| | |
|---|---|
| Very dissatisfied | 1% |
| Somewhat dissatisfied | 9% |
| Somewhat satisfied | 66% |
| Very satisfied | 25% |

**Investors consider reputational damage, financial theft, and theft of PII as top three impacts of cybersecurity breaches**

Percentage of respondents

| | |
|---|---|
| Damage to reputation | 41% |
| Financial theft/fraud | 37% |
| Theft of personally identifiable information | 35% |
| Business disruption | 34% |
| Theft of intellectual property | 33% |
| Decline in property/company valuation | 30% |
| Destruction of critical infrastructure | 30% |
| Tenant relationship damage | 30% |
| Threats to life/safety | 29% |
| Other | 1% |

| Category | Top respondent types for reputational damage | % |
|---|---|---|
| Geographic focus | Japan | 70% |
| Assets under management | AUM above US $30 billion | 48% |
| Investor category | Mutual Fund | 59% |
| Property focus | Hospitality | 48% |

**Regular audits, making cyber a strategic priority, and cyber risk assessment are the top steps CRE companies can take to prepare for cyberattacks**

Percentage of respondents

| | |
|---|---|
| Regular cybersecurity audits of investee companies | 35% |
| Make cybersecurity a strategic business priority | 32% |
| Conduct cyber risk assessment to evaluate susceptibility to potential attacks | 31% |
| Appoint a cybersecurity officer | 25% |
| Run cyber risk awareness campaigns | 24% |
| Frame cybersecurity policy | 24% |
| Invest in cybersecurity firms | 22% |
| Other | 1% |

**Investors consider rapid IT changes and rising complexities as top challenge for managing cybersecurity at CRE companies**

| | |
|---|---|
| Rapid IT changes and rising complexities | 53% |
| Lack of detailed response by management of CRE companies | 38% |
| Ineffective security solutions due to functionality and interoperability issues | 37% |
| Poor understanding of cyber risks and security | 36% |
| Unavailability of skilled cyber professionals | 35% |

| Category | Top respondent types for IT changes and rising complexities | % |
|---|---|---|
| Geographic focus | Japan | 77% |
| Assets under management | US $20.1 billion – US $30 billion | 72% |
| Investor category | Pension funds | 65% |
| Property focus | Industrial | 58% |

Note: The categories highlighted in the graphic tables suggest the following about the survey respondents:
**Property focus:** Property specialization of investors;
**Geographic focus:** Home country of the investor;
**Assets under management:** Investor size

### Navigating cyber risks

With the heightened threat from cyber risks, surveyed investors expect investee companies to make cyber security a leadership-driven business priority, perform regular cyber risk assessments, and conduct awareness campaigns to evaluate susceptibility to potential attacks. It is imperative that CRE companies take a proactive approach to determine appropriate responses to cyber risks and be more secure, vigilant, and resilient.

### Make cybersecurity a leadership-driven business priority

Involvement and engagement of senior management and the board is crucial to making cybersecurity a strategic business priority and maintaining it. The SEC's updated cybersecurity disclosure guidelines emphasize that the board of directors take ownership and responsibility for developing and supervising cyber risk mitigation controls and procedures. [1]As such, CRE senior management and boards should be deeply involved in developing policies; framing the cybersecurity policy, roles, and responsibilities; assigning budgets; and tracking overall progress to establish and maintain accountability. The board and senior management should strongly consider appointing a cybersecurity officer—who should be an accountable cyber risk strategist and advisor along with senior management—to design, execute, and align their cyber risk strategy with a central mandate. To do this, the CRE board and senior management must work together rather than in silos.

### Perform regular cyber risk assessments

A detailed scenario planning and cyber risk assessment would allow companies to evaluate susceptibility to cyberattacks and identify appropriate responses. Companies should develop a cyber risk assessment framework that offers guidelines to evaluate the threat landscape and align appropriate resources to manage the risk[2]. Bearing in mind that it is not possible to eliminate risk, CRE companies should deploy advanced detection technologies such as artificial intelligence to sense potential threats and use analytics to devise appropriate response management tactics.[3] It is important to not treat cyber risk assessment as a singular activity but rather a regular and ongoing part of the company's cybersecurity policy and framework.

### Conduct awareness campaigns

CRE companies should evaluate employees for their exposure to cyber risks. They should conduct trainings to help employees understand the potential threat and implications of various types of risks, especially cybercrimes, to themselves and to the company. CRE companies may also need to train or hire appropriate cyber risk talent in their organization. Finally, companies should drive behavioral change to instill the responsibility and mutual accountability for risk management among all employees.

### The bottom line: Change the mindset

Clearly, CRE boards and senior managements need to reassess their current risk prioritization. Some of the key questions they should consider are:

- Are you broadening the risk management agenda to include newer ones such as cyber risk?

- Is the CRE board and senior management ready to assume responsibility and accountability for managing these new risks?

- Are you considering a centralized or decentralized approach to risk management?

To learn more about other factors that are likely to influence institutional investors' CRE investment decisions over the next 18 months, see the Deloitte report, 2019 Commercial Real Estate Outlook: Agility is key to winning in the digital era.

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"CRE companies should evaluate employees for their exposure to cyber risks".

[1] "Commission Statement and Guidance on Public Company Cybersecurity Disclosures", Securities and Exchange Commission, February 26, 2018.

[2] "3 types of cybersecurity assessments," threatsketch. com, May 16, 2018.
[3] Carlos Molina, "Next-generation cyber attacks call for next-generation solutions," CUNA Mutual Group, accessed on September 3, 2018.

# Cyber risk in the building lifecycle: Smarter buildings will know more about us

With modern buildings depending more and more on technology and becoming more and more interconnected, numerous questions are arising about their resistance to cyber risks. To optimize management and increase cost-efficiency while ensuring access to adaptable and comfortable living and working space, buildings are collecting and processing information not just about the structure itself, but about us – including such technical and private data as names, IDs, photos, and videos. Protecting this data – from generation to storage to disposal – must be a critical part of the new, smarter building management systems. To do this, real estate companies, third-party suppliers, and IT companies must embed *secure by design* and *privacy by design* rules into their building development lifecycle.

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## Threat landscape
In their strategic planning, real estate companies need to understand their business risk profile and threat landscape. Smart buildings and building management interfaces may be exposed on the Internet, attracting not only the attention of the occasional hackers who may only "check" if systems are vulnerable (not necessarily knowing if they cause any disruption) but also of financially motivated criminal groups that act to extort money. They could simply change the way the building operates, making it unavailable to tenants, visitors, or third parties, or even affect health and safety. Including a threat intelligence and risk analysis in strategic planning will be fundamental for real estate companies in recognizing such threats and in responding to them through the development and adaptation of their security perimeters.

## Cloud security
Traditional on-premise systems like CRM, ERP, sales, finance, budgeting, or reporting are all being transitioned to cloud, which can improve long-term forecasting and planning processes. But while the cloud offers numerous advantages—such as centralized management, scalability, reliable data storage, and enhanced automatic processing—the transition can pose cyber risks. A cloud security analysis should be part of the cloud transition strategy, and a security risk analysis should be performed in case of any major changes in the business or in the supporting technology.

## Interconnectivity
New buildings may incorporate standard protocols that will facilitate data exchange with other smart buildings, smart city ecosystems, third parties, suppliers, or even tenants, extending the potential attack surface. This clearly raises questions about how this information is protected in transit, how the connected systems or interfaces are protected, or even whether the connected suppliers increase the risk profile. Tenants and suppliers alike will need to adhere to specific security requirements to be connected so that real estate companies are capable of managing their risks throughout the contract lifecycle. What is more, real estate companies will need to develop mature capabilities and cooperate with third parties and tenants not only to prevent but also to detect and respond to cyberattacks.

## Cyber resilience
Buildings will know not only what we do but how and when we do it. We will be recognized by the building every time we appear in the office (facial biometric recognition for commercial and office space is now a fact). The question is, what happens if a visitor is not recognized by the building? Would anyone be able to control the way the building reacts to specific people? How can tenants be sure the building is resilient to cyberattacks?

To respond to these real concerns real estate companies will have to adopt security practices that until now have mainly only been followed by the financial industry and other risk-sensitive sectors. Activities such as red teaming or cyberattack simulations can help real estate companies verify whether they are resistant to cyberattacks and whether their personnel is alert to such threats, properly trained, and capable of responding effectively.

# Blockchain in real estate matures: From use cases to practical applications

This year's real estate prediction about blockchain—our fourth—marks a healthy shift in perception of the technology's impact. In our 2016 prediction, we highlighted the great potential of blockchain for the real estate market.[1] In 2017, we predicted a year in which first generation applications would be built— borne out by the number of proofs of concept that were conducted.[2] In last year's prediction, we called for realistic expectations around blockchain technology, noting that several steps needed to be taken in order to implement a solution, go to production, and integrate it into the daily operations of real estate companies.[3]

We are now encountering this new realism every day. And that's why this year we'll see a welcoming push toward a more practical blockchain approach. That approach is fueled by the significant work that still needs to be done in the fields of privacy, data ownership, exchange of data based on internationally agreed standards, and improvements in the quality of data for the adoption of blockchain technology in the real estate industry.
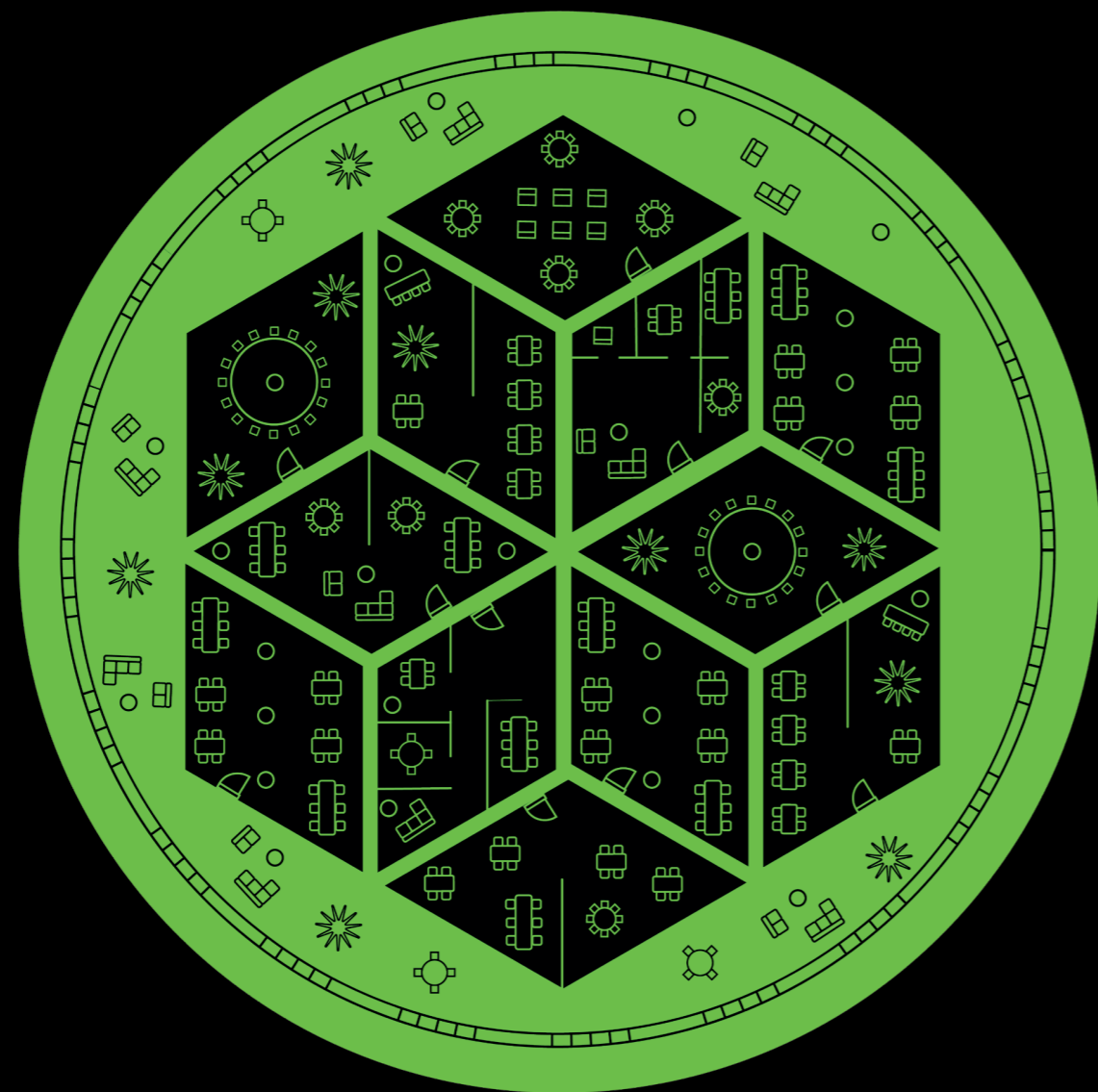
1  2016: next game changer for real estate?
2  2017: done talking start building
3  2018: Rome wasn't built in a day



### Industry adoption is about to take off
It's clear that blockchain is an ecosystem play. The upcoming year will be all about ecosystem innovation, with the exchange of knowledge between industry leaders, blockchain experts, and stakeholders essential. And while adjustments and improvements of the technology are needed—and must not be underestimated—this is not the most critical factor in blockchain's success in the real estate industry. Rather, it will be the ability to take a wide-lens perspective on your blockchain strategy that goes beyond your own innovation to create alignment among partners who must work together.

Innovators and early adopters of blockchain have already investigated the technique, learned valuable lessons from proofs of concept, and have drawn conclusions about the usability of the technology for the years to come. There are good and bad examples for the real estate industry to learn from as we enter the next phase in the evolution of blockchain for real estate.

### Practical applications will take the stage
One outcome of the gained insights and lessons learned is that blockchain will not be an end in and of itself anymore. That is, the industry is moving beyond the hype. For some use cases, the conclusion might even be that blockchain is not necessarily the best solution for the problem they're trying to solve.

More and more there is consensus among early adopters about the steps that need to be taken in the years to come to reap the benefits of blockchain. The myriad use cases about blockchain will also be replaced by practical applications that solve specific challenges. The notion that blockchain is more evolution than revolution will become more mainstream within the industry.

And while big real estate companies and ecosystem players are now showing signs of broad adoption, blockchain is continuing to be researched. Institutes that are part of the established order, such as OSCRE and RICS, have blockchain on their radar and are taking a position about its use for the industry as a whole. One of the main themes to be discussed at the upcoming 2019 World Built Environment Forum Summit in New York is the impact of blockchain in real estate investment and transactions.

Other movements such as the IEEE Blockchain Initiative are also relevant for the real estate industry.[4] And new initiatives like FIBREE[5] with a dedicated focus on blockchain for real estate, is beneficial for the industry.

Changing perceptions about blockchain's application isn't going to be easy and some players will be disappointed about its progress in the years to come. But that disillusionment is a healthy—even welcome—part of any innovation lifecycle. If you don't fail, you don't learn.

### Principles to keep in mind
As the next wave of blockchain solutions get underway, industry players should be aware of and apply a few key principles and guidelines.

• Govern the sharing of data across myriad stakeholders

• Verify data once and re-use often—not the other way around

• Obtain data directly from its source regardless of the systems that hold it

• Digitize reliable verification processes of data by certified professionals

• Create one single source of trusted real estate data throughout the entire lifecycle of a building

• Make migration of property data throughout the lifecycle as easy as possible

• Use blockchain technology for the exchange and verification of data

• Focus on the portability of real estate data between applications and user groups with the owner in control of the data and its sharing

These recommendations should be taken into account in the years to come as new solutions are designed and implemented.

Written by:

**Jan-Willem Santing (NL)**
**Tinus Bang Christensen (DK)**

4   https://blockchain.ieee.org/standards

5   https://fibree.org/

# Building flexibility into real estate management

The real estate business is currently experiencing a shift in demand away from the traditional business operating model to more flexible solutions. Technological advancements and digitization, the quest for sustainability, and changes in user lifestyles are all factors that are demanding a greater level of adaptability in real estate strategic management and value creation.

Written by :
**Jean Pierre Lequeux**
**Francois Guiot**
**(LU)**

### Real estate, wellbeing, and talent

Today's employees are becoming more demanding when it comes to wellbeing, requesting greater flexibility and healthier, more sustainable working environments. The creative use of real estate can help employers meet these demands, thus giving them an edge when it comes to hiring and retaining talent.

Co-working spaces is a real estate operating model that has been growing in popularity in recent years. The idea is to use space to create "a community of people" who share similar needs and interests but not necessarily the same employer. The concept of co-working has arisen from the fundamental changes in today's employee lifestyle and ways of working. Most notably, co-working spaces have been used to great effect by startups and small-to-medium enterprises (SMEs) and such independent workforces as freelancers, contract workers, and remote workers.

Studies show that co-working is a win-win arrangement for both employer and employee. Working remotely, professionals co-working with other professionals in a space, especially one that is modern and innovative, fosters the productivity and creativity of employees. From a corporate RE management perspective, memberships in co-working spaces allow for flexibility in RE commitment (less office space rented on a fixed term), therefore reducing costs as well as an increase in the efficiency of lettable area, thus lowering the square meter per employee.

However, from a risk management perspective, a co-working business model can be vulnerable to an economic downturn as its main users can be less stable (startups, SMEs, and freelancers). In addition, operators of this business model usually have a weaker covenant than traditional commercial real estate. A high fixed cost and variable income business model requires greater scale for an operator to be profitable and sustainable. As a result, there is a trend toward vertical consolidation among co-working operators, with bigger scale/multiple location operators proving more successful.

### Sustainability in real estate

Encouraging sustainability has many positive impacts in creating long-term value for communities, businesses, and stakeholders. It helps companies attract and keep talented employees as well as promotes brand reputation. Moreover, thanks to the new concept of "green-financing", sustainable practices help companies widen their access to capital. Considering the fact that over one-third of carbon emissions in the world come from buildings, more and more companies are implementing sustainability practices for their real estate. Smart buildings can also effectively collect, control, and analyze data that can help solve inefficiency problems in a building.

Building a smart, green building is actually easier than it sounds considering the technological and innovative solutions now available in the market. An example is the Deloitte Amsterdam office building—The Edge—which was named the greenest and smartest building in the world by the BREEAM authority. The building utilizes such space efficiency practices as a "hot-desk" policy, which provides space depending on individual schedules on a particular day. The Edge hosts the same number of employees with half the desks and space as used in Deloitte's previous office—and provides a better quality working environment.

### Asset/Portfolio optimization

With the recent developments in digital technology, companies can now extract more value from their real estate portfolio management. Value creation in RE comes from two sources: increasing income and reducing costs. Optimizing the trade-off between these two sources requires analysis and expertise. An important consideration in choosing among the different RE portfolio management approaches is whether the investor has the necessary knowledge, skills, time, and incentives to effectively manage all aspects of the portfolio. Before making an investment decision, there also needs to be proper due diligence and post transaction, efficient property and tenant management to optimize value.

Digital technologies can now help make this entire process more efficient and effective. A range of portfolio management tools— from standardized reporting solutions to cloud-based platforms—are accessible from anywhere in the world. Naturally, moving away from manual processes to fully digital will take time, but a flexible approach will help ease the transition.

### Conclusion

Given these changes in the marketplace, we expect the real estate business model to become even more disrupted. Many companies will need to adjust to this new environment in order to sustain their position. But though these market trends may seem complex, they do create new opportunities and can be rewarding for the market players that are willing to adapt.
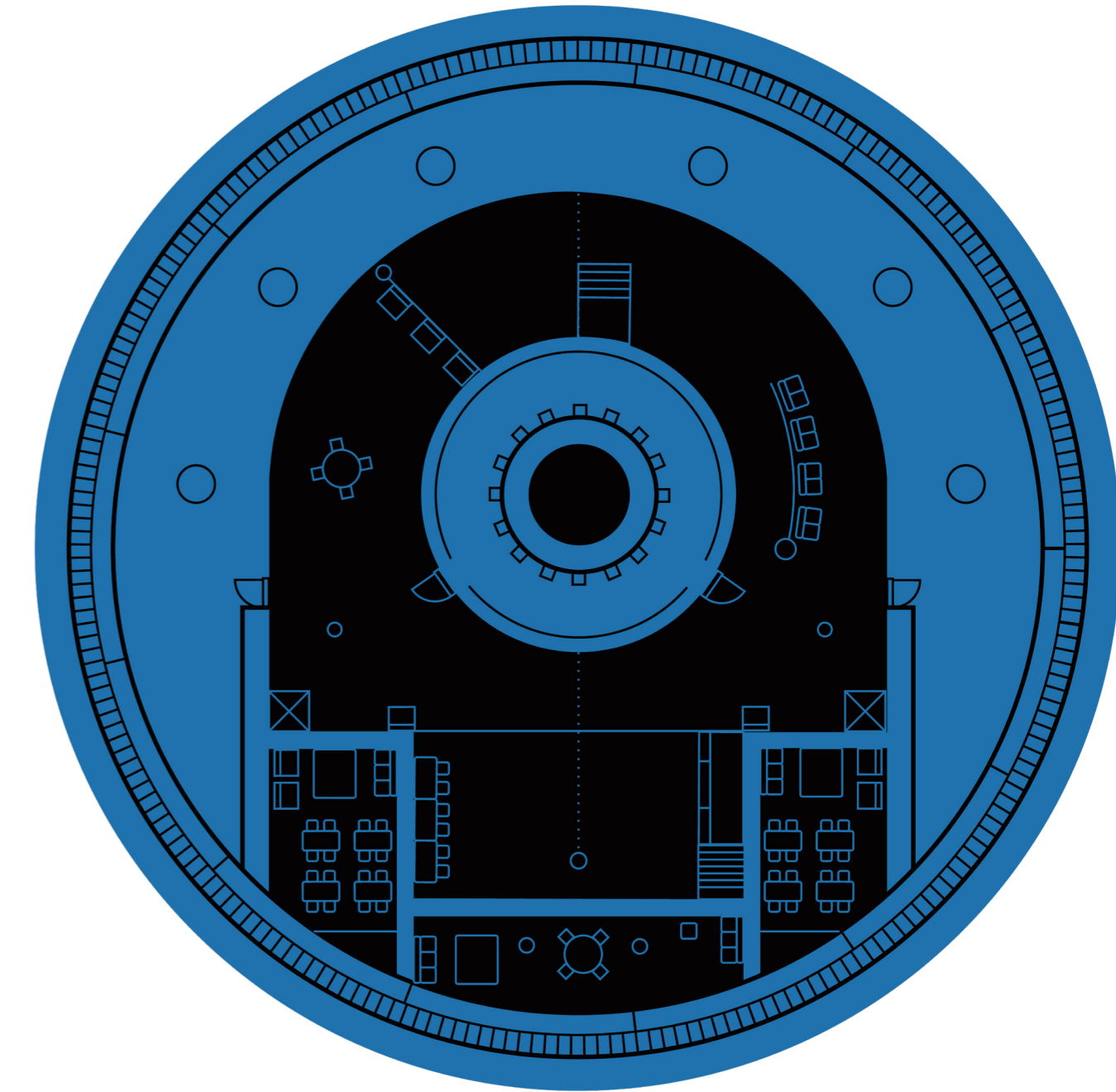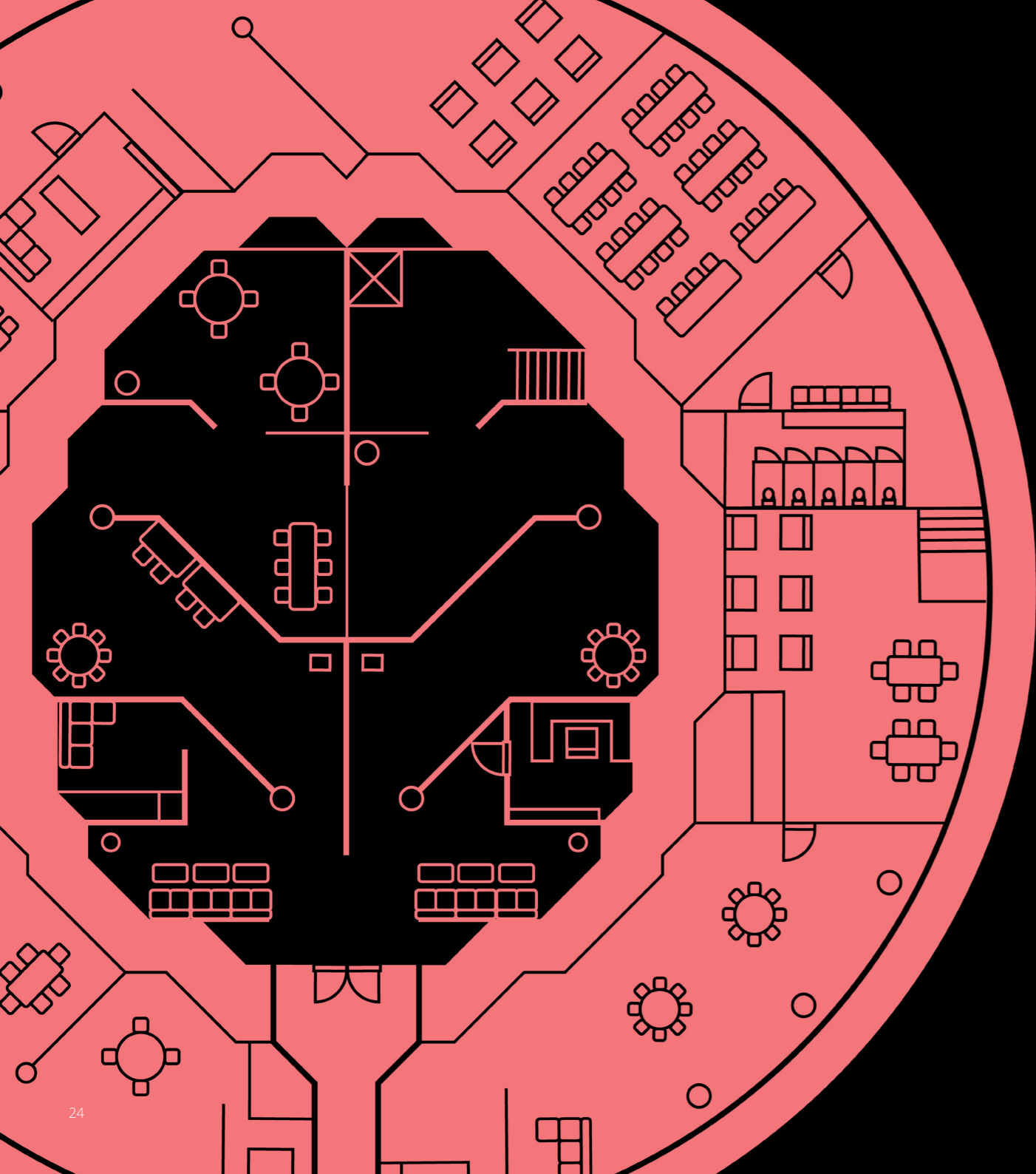
# The Future of Work is changing: real estate needs to change too

The world of work is changing. Clients in every industry are now facing the challenges and opportunities presented by this disruption, with much thought going into how work will be completed and by whom in the years to come.

The real estate industry is no different, with a significant impact on the physical workplace anticipated that occupiers, developers, and investors will need to carefully consider. Drawing on major disruptors identified by Deloitte—ranging from automation and replacement of jobs to diversity and generational change—we have identified four key trends we predict the industry will need to respond to in 2019.

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### Location strategy is key
Location strategies have never been more important, whether driven by the need to access skilled talent pools, improve financial performance by moving to lower cost locations, or the need to respond to geo-political events. In the past, these were often developed in a reactive ad hoc manner. In the future, occupiers need to keep these under constant review to ensure the footprint is optimized and future requirements are anticipated, planned for, and executed on at pace.

For developers and investors, it is essential they understand the emerging location hotspots and deliver the real estate required into them. This may create additional risks if it involves investing in markets that are still emerging but offers the opportunity to capture demand as it grows.

### Real estate must be seen as a value driver
For many organizations, real estate is still seen as a cost that has to be managed.  In the future, real estate must be seen as a driver of value.  It will do this by providing a physical environment that has the employee experience at its heart and is designed to promote purpose, engagement, collaboration, and innovation. These are all key in helping the organization of the future respond to the rapidly changing demands of this technology-enabled world.

To achieve this, corporate occupiers must be able to articulate and track the value that the workplace will deliver.  For developers and investors, the challenge is to supply the market with buildings that have the features occupiers will value rather than just looking to optimize short-term financial returns.

### The way people use space will change
In the past, remote working was promoted to reduce cost.  Today, it is staff who are demanding agile working. Both trends drive down the amount of traditional office space required. But as traditional office space decreases, we predict the amount of non-traditional space—space that supports teaming, collaboration, and co-working—will increase significantly.

Occupiers need to develop a greater understanding of how they actually use the space. Sensors and other building technologies can help provide insight as to how different types of space are used, which in turn allows buildings to be operated at higher levels of utilization.

In addition, occupiers need to adopt fit out and furniture solutions that can evolve in a cost-effective manner.  This will require a move away from traditional, often rigid, corporate standards.

For developers and investors, the challenge is to deliver buildings that have the flexibility in the base build to accommodate a wider range of configurations and anticipate the demand for intelligent building data and analytics.

### Flexible office space will become part of the strategic solution
Serviced office space has long had a place in the corporate portfolio, where it has often been used as a tactical solution to accommodate project or overspill space.  However, as the flexible office market has become more sophisticated, occupiers are now looking to use this space strategically—such as accommodating high-growth digital businesses.

As organizations become more dynamic and the future becomes more uncertain, it is likely that flexible space will play an ever-greater role within the corporate portfolio. The challenge for occupiers is to justify the additional flexibility and increased amenity offered by the space against the cost premium over traditional long-term space.  For landlords and investors, it poses a question as to how to capture the premium that occupiers are willing to pay, with many considering a move to shorter flexible lease terms and/or developing their own flexible office brands.

### Conclusions
Real estate is an industry where decisions are expensive, committed, and long-lasting. Concepts such as innovation and "failing fast" do not sit comfortably with multimillion dollar construction contracts, multi-asset global portfolios, or investor demand for security and longevity of tenure.

However, the Future of Work is coming.  And it's clear that it will impact more than just the commercial office market—whether its automation transforming the operating models of manufacturers or retailers using sensors to gather and harness consumer data in their stores.

For developers and investors, we predict the Future of Work means buildings where the talent of tomorrow will be based. The building of the future needs to be designed around what the occupier will value. And it must be flexible and fully enabled for the technology that is needed to manage the workplace of the future.

For occupiers, the focus must be on maximizing the value that real estate contributes to the organization. This can be achieved through the continual optimizing of strategic locations, the balancing of long- and short-term leases, the aligning of the physical and virtual workplace, and the placing of the user experience at the heart of workplace design.
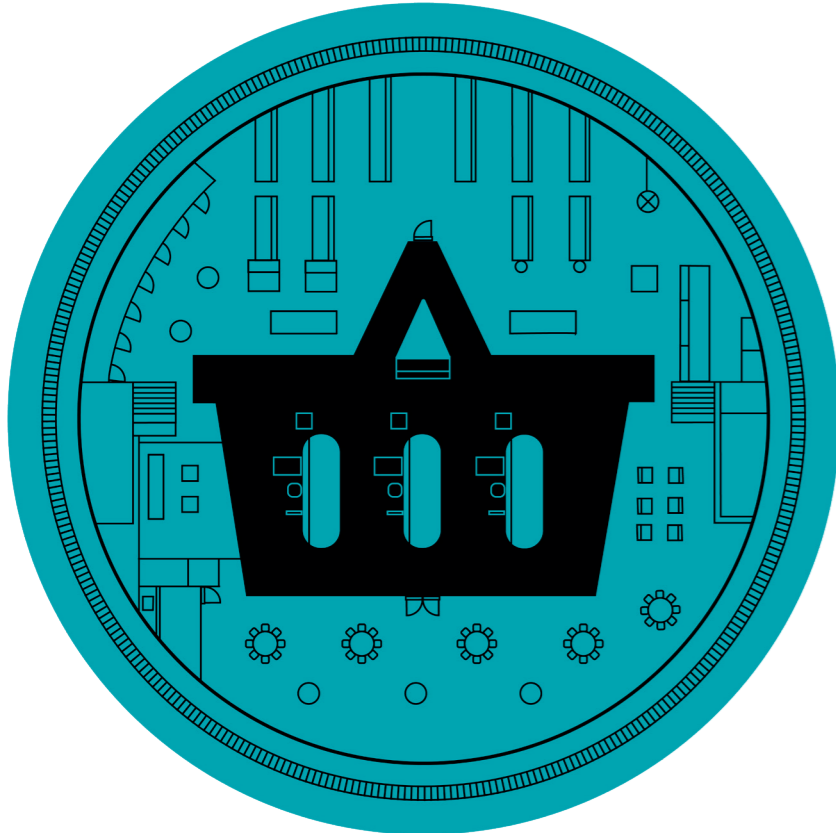
# Proptechs: Propelling digital real estate

Commercial real estate (CRE) companies haven't yet figured out how to deal with the relatively recent emergence of real estate technology startups, known as "proptechs." While most of the broader financial services field have made the shift to a partnership mentality[1], CREs continue to view proptechs as a disruptor rather than as a potential source of collaboration[2].

In contrast, institutional investors clearly see the value in proptechs. In our survey of 500 global CRE institutional investors, nearly 90 percent of respondents believe proptechs will have a moderate to significant influence on the CRE industry (see figure 1)[3]. Investors plan to commit an average of 14 percent of CRE capital to

proptechs globally, with unique new investments increasing from $3 billion in 2014 to $18 billion in 2018 – even as new proptech launches declined sharply (see figure 2)[4].

This doesn't mean investors are just blindly following the latest tech trend, however. Investors are channeling their resources toward more mature proptechs: late-stage funding, essentially Series C and above, formed 71 percent of the total capital raised by proptechs in 2018. And nearly a third of those surveyed acknowledged that an incumbents' collaboration with a proptech will influence their future investment decisions.[5]

1  Sam Friedman, Michelle Canaan, "Closing the gap in fintech collaboration: Overcoming obstacles to a symbiotic relationship", Deloitte Center for Financial Services, October 2018.

2  Audrey Baverel, "PropTech & The Disruption of Real Estate," Silicon Luxembourg, May 17, 2018.
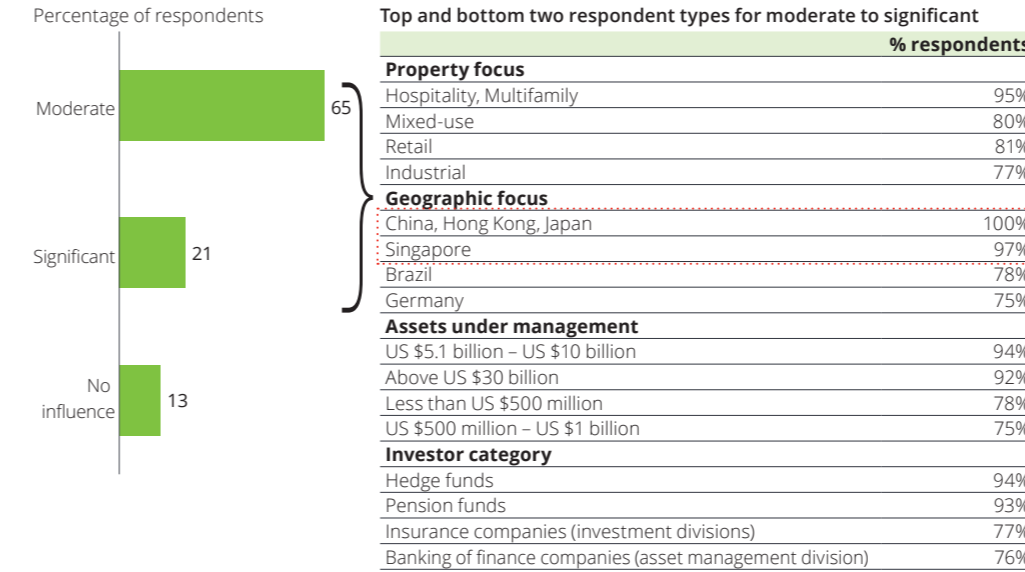
3  Surabhi Kejriwal, Saurabh Mahajan, "2019 Commercial Real Estate Outlook: Agility is key to winning in the digital era", Deloitte Center for Financial Services, October 2018.

4  Venture Scanner database, December 31, 2018.

5  Ibid.

## Figure 1: Investors are optimistic of proptech influence on CRE

**Investors expect moderate to significant influence of proptechs on CRE**

Percentage of respondents



Moderate — 65
Significant — 21
No influence — 13

**Top and bottom two respondent types for moderate to significant**

| | % respondents |
|---|---|
| **Property focus** | |
| Hospitality, Multifamily | 95% |
| Mixed-use | 80% |
| Retail | 81% |
| Industrial | 77% |
| **Geographic focus** | |
| China, Hong Kong, Japan | 100% |
| Singapore | 97% |
| Brazil | 78% |
| Germany | 75% |
| **Assets under management** | |
| US $5.1 billion – US $10 billion | 94% |
| Above US $30 billion | 92% |
| Less than US $500 million | 78% |
| US $500 million – US $1 billion | 75% |
| **Investor category** | |
| Hedge funds | 94% |
| Pension funds | 93% |
| Insurance companies (investment divisions) | 77% |
| Banking of finance companies (asset management division) | 76% |

**On an average, investors plan to commit 14 percent of CRE capital to proptechs**

Percentage of respondents



Commitment as a % of CRE portfolio

26 to 30% — 5%
21 to 25% — 11%
16 to 20% — 15%
11 to 15% — 36%
6 to 10% — 26%
1 to 5% — 4%
0 — 3%

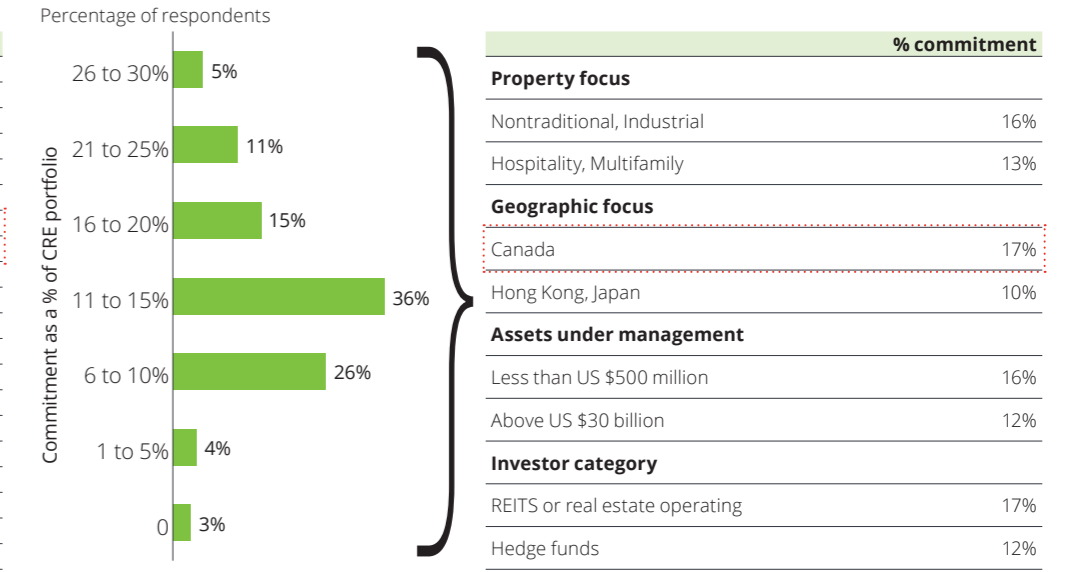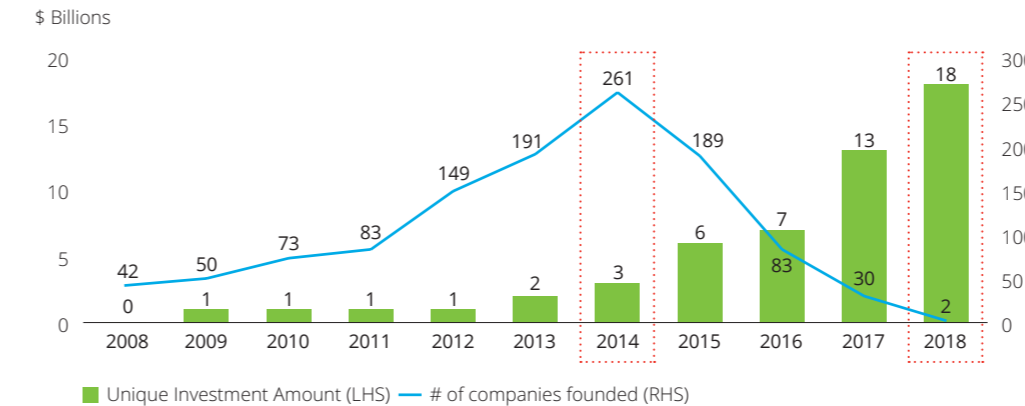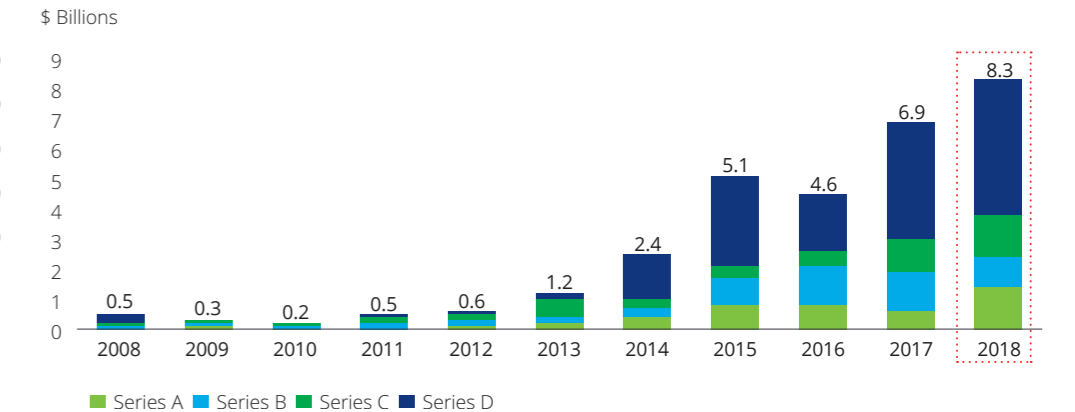| | % commitment |
|---|---|
| **Property focus** | |
| Nontraditional, Industrial | 16% |
| Hospitality, Multifamily | 13% |
| **Geographic focus** | |
| Canada | 17% |
| Hong Kong, Japan | 10% |
| **Assets under management** | |
| Less than US $500 million | 16% |
| Above US $30 billion | 12% |
| **Investor category** | |
| REITS or real estate operating | 17% |
| Hedge funds | 12% |

Source: Deloitte Center for Financial Services analysis.

## Figure 2: Investors prefer more mature proptechs

**Proptech Fundraising continues to rise even as new launches decline sharply**

$ Billions



Unique Investment Amount (LHS): 0(2008), 1(2009), 1(2010), 1(2011), 1(2012), 2(2013), 3(2014), 6(2015), 7(2016), 13(2017), 18(2018)

# of companies founded (RHS): 42(2008), 50(2009), 73(2010), 83(2011), 149(2012), 191(2013), 261(2014), 189(2015), 83(2016), 30(2017), 2(2018)

■ Unique Investment Amount (LHS) — # of companies founded (RHS)

Source: Venture Scanner database, as of December 31, 2018.

**Venture Capital investors allocating investments to more mature proptechs***

$ Billions



0.5(2008), 0.3(2009), 0.2(2010), 0.5(2011), 0.6(2012), 1.2(2013), 2.4(2014), 5.1(2015), 4.6(2016), 6.9(2017), 8.3(2018)

■ Series A ■ Series B ■ Series C ■ Series D

* Excludes the number from undisclosed categories

### What is driving the growing investor preference for proptechs?

Proptechs' use of existing and evolving technologies to nurture new, innovative ideas are most likely a key factor in their attractiveness to investors. Proptechs are using technology to not only enhance transparency and operational efficiency but also to improve tenant experience and information flow. Ultimately, this improves both property profitability and investor return.

Take the case of Open Box, which promises automation services to real estate companies with a robots-as-a-service (RaaS) model[6]. The company's real estate automation engine provides automated data transfer from budgeting function to valuation, saving hours of monotonous and manual work[7]. Another example is Leverton, a company that uses deep learning algorithms to provide real estate document abstraction services[8]. Leverton's platform uses natural language processing and other machine learning capabilities to extract and structure relevant information from complicated documents related to purchase-sale, lease, title insurance, and mortgage transactions[9].

Many proptechs are also redefining the business by positioning the CRE asset as not just a physical space but as a service hub.

Acting as change agents, proptechs typically retain the core ethos of the real estate business – location, location, location – while changing perceptions about how the physical space is used. For instance, WeWork is clearly looking to achieve more than just a functional experience by providing a vibrant ambience, varied open-seating options, amenities, and networking opportunities for an on-the-go workforce[10].

Proptechs also approach the business with a different view of talent. Unlike traditional CRE companies, they tend to have a larger proportion of employees with either a data science or technology background who can develop technology-based solutions at a more rapid pace than incumbents. And proptechs are leaner and faster decision-makers than their more traditional CRE counterparts.

Despite these advantages, many proptechs struggle to survive due to lack of industry knowledge, incumbents' slow adoption of technology, and non-availability of timely financing.

### How can CRE companies and proptechs work together to drive digital real estate?

CRE companies investing in proptechs need to get more comfortable with enhancing their risk appetite and adopting a fail-fast approach, as every proptech investment may not generate the desired returns[11].

Companies should also consider looking at a more mature partnership with proptechs that move beyond just a strategic investment.

It is also key that investors establish quantitative and qualitative metrics to measure return on investment from proptech investments. CRE companies may consider firm revenue and cost-saving targets along with market penetration[12]. Alternately, qualitative measures may include incremental change in tenant experience, transparency and efficiency, or levels of innovation.

To learn more about investor preferences for proptechs and the global fintech ecosystem, read Deloitte's reports, 2019 Commercial Real Estate Outlook: Agility is key to winning in the digital era and Fintech by the numbers.

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**(US)**

6  Open Box website, accessed August 15, 2018.

7  Ibid.

8  Leverton website, accessed August 15, 2018.

9  Ibid..

10  Surabhi Kejriwal, Saurabh Mahajan, "2019 Commercial Real Estate Outlook: Agility is key to winning in the digital era", Deloitte Center for Financial Services, October 2018.

11  Ibid.

12  Ibid.

"Acting as change agents, proptechs typically retain the core ethos of the real estate business – location, location, location – while changing perceptions about how the physical space is used."

# The future of urbanization and transit-oriented development

The next generation of urban mobility presents unique opportunities for cities around the globe.

Autonomous vehicles, ride-sharing services, and wide-ranging technology adoption is set to change the transportation ecosystem and with it, the urban landscape. Tomorrow's smart cities will operate with increasing levels of connectivity, creative collaboration, and networked communities along with intricate and substantially enhanced transportation ecosystems.

And yet, even as the future unfolds, today's average urban commuter still spends hours stuck in traffic, sustainable community building remains a challenge, and cities struggle with the cost of transportation infrastructure. Unlocking the high value of land and real estate can be a key ingredient toward transportation affordability and adoption. In this context, are there innovative paradigms that can unlock value for citizens, communities, and cities alike? The answer may lie in re-imagining transit hubs in our urban centers through transit-oriented development (TOD).

### TOD and the urban future

Modern cities are evolving at a rapid pace and exponential advancements in technology have changed the way we live, work, and play. A new generation of workers not only prefer to live close to work but actively seek to live closer to work. At the same time, cities around the world have seen a rise in the use of public transport by nearly 20 percent between 2000 and 2015. In Canada, for example, 70 percent of public transport ridership comes from the three largest metropolitan areas: Toronto, Montreal, and Vancouver.

This presents an incredible opportunity for cities as they plan their future transit hubs—those key points of convergence, such as train stations, and mobility hubs. Maximizing this opportunity requires strategic thinking to incorporate the vision of a sustainable urban future. Careful design of TODs could mean revitalized neighborhoods and highly connected communities.

### So, what are TODs?

TODs are a type of community development that integrates mixed use development, including housing, office, retail, and potentially other amenities into a walkable neighborhood, preferably located within a kilometer of a quality public transportation node. TODs are ecosystems unto themselves and propose mutual benefits across the spectrum of participants. Commuters enjoy better facilities at transit nodes, retail businesses benefit from foot traffic, connected businesses have a ready pool of talent that can walk to work, and residents benefit through a highly vibrant connected community with low pollution levels and potential for high-value growth. Overall, the city benefits from a high-intensity value generating neighborhood and land value capture. TODs have the potential to accelerate true city-building and Smart Cities for the benefit of all.

TODs provide an array of benefits ranging from lifestyle to environmental to economic, including:

**For citizens:**

- Reduction in drive times and hence increased productivity

- Opportunity to gain back commute times and focus on quality of life (that is, live, work, and play)

- Expanded mobility choices at lower costs, freeing up disposable income

- Walkable communities that accommodate more healthy and active lifestyles

**For communities:**

- Long-term sustainable development of neighborhoods

- Reduction in automobile air pollution and greenhouse gas emissions

- Improved property valuations in the community catchment areas

**For cities:**

- Increased ridership and fare revenue

- Increased urban intensity and hence land value capture

- Improved economic opportunity and access

### The TOD opportunity

The question is, how can cities leverage and maximize the TOD opportunity?

One of the immediate options is to transform surface and structured parking areas at stations into high-density, mixed-use developments. Often joint ventures between the public and private sector can help finance the costly infrastructure investments required. With the advent of ride-sharing and autonomous vehicles, the relevance of parking is fast declining—potentially reducing parking areas around stations and opening them up for alternate uses. This however requires careful and strategic planning. Singapore MRT and Hong Kong MTR have effectively influenced planning and zoning to advance transit-oriented development projects.

Value release through sale of air rights above tunnels and yards, in the case of underground railway or subway systems, presents another opportunity. New York's largest development in the past generation is Manhattan's Hudson Yards, where the vacant rail yard site—owned by the Metropolitan Transportation Authority (MTA)—in the far West Side of Manhattan is being turned into a hub of development and of commercial activity. Leasing their air rights over the yards, the MTA has entered into a long-term arrangement with The Related Companies and Canada's Oxford Properties to develop over a million square meters of office, retail, and residential space along with a new cultural facility.
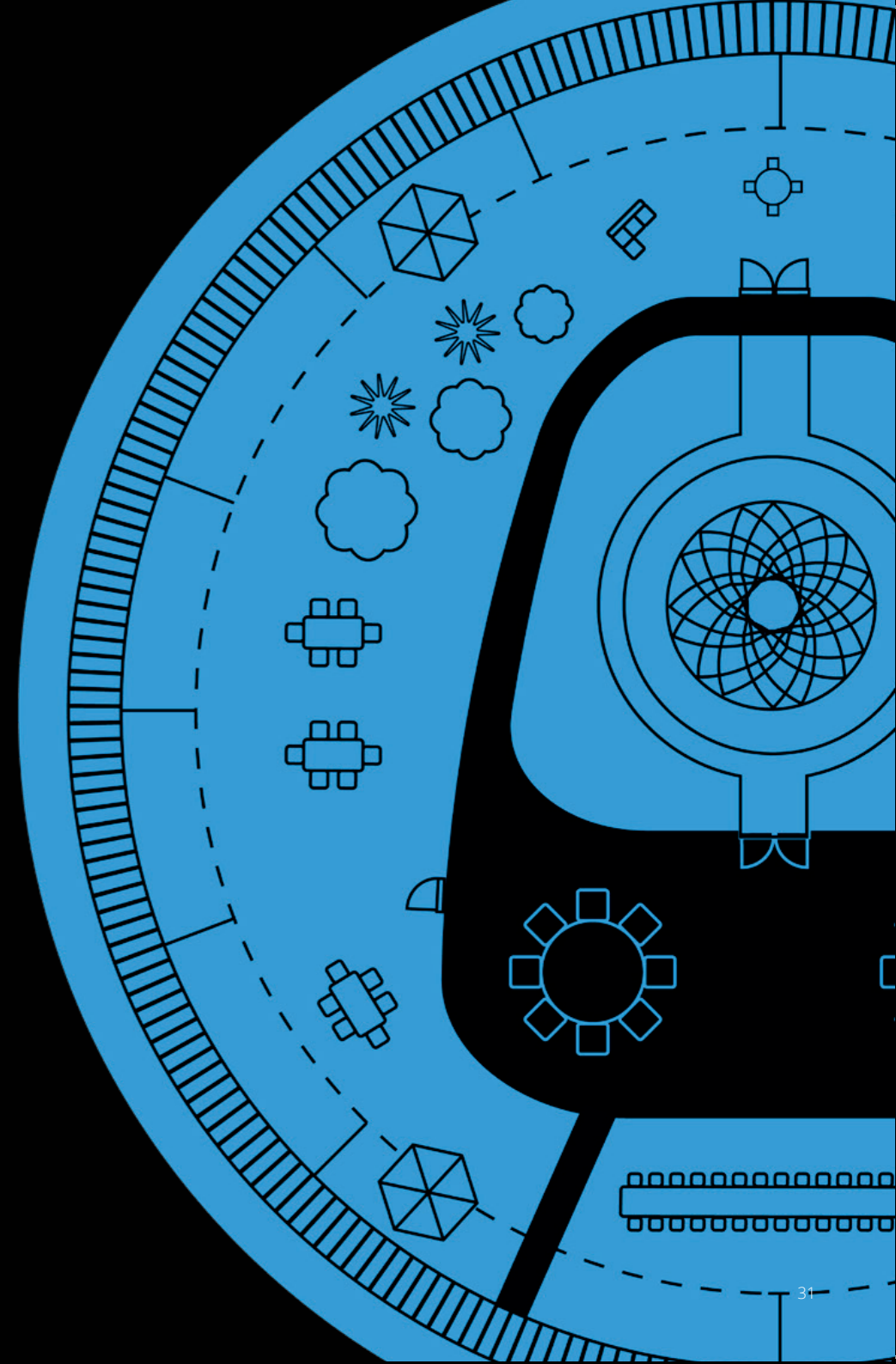
Another prime example of value capture through TOD is Bond Street Station in London. In this case, two booking halls to the underground station were redesigned to accommodate new, highly valued development above one of the world's most expensive real estate catchment locations. The revenue from this opportunity has made a significant contribution to the governing authorities and supported financing of transport schemes.

The environmental benefits that TODs enable through reduced dependence on vehicular transit and resulting reduced air pollution is one of the major factors in the increasing interest in this concept. Tianfu, a city in China, is an example of a TOD that propagates high-density, mixed-use urban environments with easy access to mass transit as a basis for green sustainable development. With such incredible and wide-ranging benefits, governments have begun to recognize the value of TODs through policies that encourage densification of economic activity in proximity to key transit hubs.

### Successful TOD planning

It is clear that successful TOD projects are able to achieve a range of results from reduced carbon emissions to socio--economic benefits intrinsic to sustainable and livable cities. But successful TOD implementation requires careful planning, strategic finance, and marketing along with site design. So what are the key factors to the success of TODs? According to an Institute for Transportation and Development Policy (ITDP) report, government intervention and land potential are two critical factors.

What matters most to a TOD's success is government intervention and promotion. When local governments did not effectively promote a TOD, a new transit line generated only a nominal amount of economic investment. For example, the south and west busways in the U.S. city Pittsburgh had weak support and produced limited TOD investment, but the city's moderately supported east busway produced US$903 million.

The second most important factor in TOD success is land potential, that is, regional market strength, expected real estate growth, corridor quality, proximity to desirable catchment areas etc. According to the ITDP Report, land potential does not have to play a direct role in TOD success—even locations with modest land potential could still succeed if the local government supported the development and played a lead role in marketing and promoting the project.

In addition to these two critical aspects, the TOD Standard 3.0 outlines eight elements that could be included in the planning and design of the development in order to deliver projects that maximize benefits.

- **Walk**: Develop neighborhoods that promote walking

- **Cycle**: Prioritize non-motorized transport networks

- **Connect**: Create dense networks of streets and paths

- **Transit**: Locate development near high-quality public transport

- **Mix**: Plan for mixed use

- **Densify**: Optimize density and transit capacity

- **Compact**: Create regions with short commutes

- **Shift**: Increase mobility by regulating parking and road use

### TODs: a catalyst for economic growth

The dizzying pace of change for our cities and urban mobility will likely only accelerate. What is most exciting about TODs is that they bring together a spectrum of solutions to help build vibrant, people-focused communities.

With global cities set to venture into this new era of urban mobility and Smart City frameworks, they will face a completely new set of challenges. With local government intervention, smart strategic planning, and policy definition, TODs offer a chance to act as a catalyst for growth into a sustainable future.

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**Ram Srinivasan (CA)**

"The question is, how can cities leverage and maximize the TOD opportunity? ".

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