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REAL ESTATE & CONSTRUCTION MONITOR

MISSION CRITICAL INFRASTRUCTURE: CYBER THREATS SHAKE THE NATION'S FOUNDATION

By Eric Chuang and Ian Shapiro

Increasing infrastructure spending to the tune of $1 trillion was a core pillar of Donald Trump's campaign for office, and a welcome refrain for the construction industry.

Whether the new administration will deliver on this promise remains to be seen. Despite some cuts to the Department of Transportation in the administration's first budget blueprint for fiscal year 2018, the White House reaffirmed a commitment to support the nation's critical infrastructure in subsequent proposals.

With infrastructure investment still on the president's agenda, one vital consideration remains largely absent from the conversation: cybersecurity vulnerabilities in critical infrastructure.

WHAT ARE THE CYBER RISKS?

Cybersecurity risks associated with infrastructure projects have recently received attention at the federal level. In March of 2017, the Department of Homeland Security (DHS) issued a cybersecurity alert for critical infrastructure owners and operators outlining top cyber threats. DHS asserted that "any sector

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that uses industrial control systems (ICS)"—ranging from energy to manufacturing to technology—could be susceptible to cyber attacks. ICS automates industrial distribution and processes, and comprises hardware and software components integrated via the Internet of Things (IoT).

Critical infrastructure encompasses 16 sectors—several of which are within the scope of the construction industry, including transportation systems, government and commercial facilities, energy and defense industrial bases. A cyber attack on firms involved in the construction of critical infrastructure, sensitive government facilities, or even facilities for emergency management, public health or medical providers, could jeopardize those services. Hackers could glean potentially vulnerable information housed in construction firms' databases, including proprietary employee data, sensitive client data, tenant personally identifiable information and non-public material information. Construction firms also house computer-aided design drawings and blue prints to sensitive buildings, which hackers can exploit to inflict physical damage.

TRIPLE THREAT: IoT, DDoS AND PDoS

Cybersecurity vulnerabilities in the construction industry are compounded by growing industry adoption of cloud computing and the IoT. Smart buildings technology, such as sensor-enabled heating and cooling systems, can be physically compromised or provide an entry point to the larger corporate network. With increased connectivity, the security (or lack thereof) of each individual device impacts the whole system's integrity. And because IoT devices fall outside the traditional scope of IT, they are often overlooked.

The top threats specific to physical infrastructure are distributed denial of service (DDoS) and the emerging threat of permanent denial of service (PDoS) attacks. DDoS and PDoS attacks aim to temporarily disable or permanently destroy technology—such as power grids, heating and cooling systems and internet providers—by overwhelming the targeted system with traffic, thereby disrupting the distribution and delivery of a service.

And then there is ransomware, another type of denial of service (DoS) attack that uses encryption malware, generally downloaded via phishing emails, to block user access to computer files, potentially permanently if the victim is unable or unwilling to pay the ransom for the encryption key. Ransomware attacks quadrupled in 2016 with an average of 4,000 per day, according to data from the U.S. Justice Department. The problem from a critical infrastructure perspective? Ransomware could infect operational technology, disrupting essential processes or taking entire systems offline.

The NotPetya "wiper-ware" in June of 2017 demonstrated the next level of sophistication of malwares that did not require the use of phishing emails to infect and propagate across the victims' networks, and the non-reversible encryption of the victims' hard drives have every indication that it was intended to be a PDoS attack and not for ransom.

Although DoS-style threats emerged nearly two decades ago, hackers have leveraged IoT to carry out much more sophisticated attacks in recent years. For example, the October 2016 attack against Domain Name System provider Dyn, used IoT and a Mirai botnet to increase the attack's scope and impact. Mirai botnets are a strain of malware that infects internet-connected devices and corrals them into an IoT "army" to overwhelm a target's servers with malicious traffic, shutting down highly trafficked websites for several hours. While the Dyn attack caused arguably little more than inconvenience, it spurred speculation about the chaos and physical harm a DDoS—or worse PDoS—attack of that scale, or bigger, on the nation's infrastructure could potentially cause.

Cyber attacks to date on critical infrastructure have largely targeted power grids and the electrical sector. In 2016, ransomware and DDoS attacks of that nature stole headlines worldwide. In Finland, a DDoS attack targeted computerized heating distribution centers, disabling heat to apartment buildings. In December 2016, a cyber attack on the Ukrainian capitol's power grid caused a power outage in various areas of the city. The attack has roots in malware—employees at Ukrainian power companies received infected emails, which allowed the hackers to seize control over their computers and carry out the attack. In June, 2017, the NotPetya wiper-ware infected the Chernobyl power plant's radiation monitoring system, but this time, the attack was believed to have originated via the MEDoc accounting software's update service, and no phishing email was used. Beyond the technical semantics of the attack, it appears both acts might have been cyber warfare. Multiple security and media sources reported that Russia was likely tied to both attacks, motivated by the war in Eastern Ukraine. With these incidents in mind, securing the U.S.'s critical infrastructure against cyber attacks becomes a matter of national security.

WHAT ROLE CAN CONTRACTORS PLAY IN HEDGING AGAINST CYBER WARFARE?

From a business perspective, construction companies would be wise to shore up their cybersecurity. Construction firms looking to win federal or state government contracts under the much-anticipated infrastructure spend will be held to stringent cybersecurity standards. The U.S. government produces, collects, consumes and disseminates huge volumes of data and entrusts sensitive information to federal contractors. At the federal level, the Federal Acquisition Regulation (FAR) requires basic safeguarding of contractor information systems that process, store or transmit federal contract information, and contractors can face fines or contract termination if there are levels of cyber negligence.

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Construction companies contracting with the government must also consider their subcontractor's cybersecurity standards: Any weak cyber link can create a vulnerability.

While the construction industry looks forward to the promise of financial boon from new infrastructure projects, cybersecurity should remain top-of-mind. Too often, contractors may have basic cyber defenses in place but don't prepare any real coordinated response plan until after an incident occurs. Cybersecurity controls addressing current threats are essential, but with the rapidly emerging swath of risks, contractors need to set their sights on the future and invest in monitoring, responding to and mitigating the next big threat.

*This article originally appeared in **Construction Today**.*

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BRICK & MORTAR LIFE EXPECTANCY ISN'T WHAT IT USED TO BE: HERE'S HOW TO FIGHT OBSOLESCENCE

By Dennis Duffy, MAI

Buyers, owners, investors and developers of real estate are facing questions regarding how properties are valued in the current market, especially where there are problems appraising a property's highest and best use. More specifically, this question focuses on reversion value.

MULTIPLE CASES

Recent Class B or lower valuation projects (as well as some lower level Class A properties) have presented serious, widespread questions from a valuation standpoint. The main question is simple: What should be done with "obsolete" buildings?

Historically, such a question became pertinent only after 50-100 years. Buildings were "built to last," and most were designed to be updated over time. Part of the reason for that long horizon was that ample land was available for expansion. Another was that zoning was very prescriptive and clearly defined in many ways. Lastly, fixed real estate was a capital-intensive asset class.

In the past five years alone, that question, however, is now being asked about buildings that are only 20 to 30 years old. Many buildings that have been constructed in the last 30 years or so, like suburban office buildings and parks, retail centers and malls, some well-located industrial parks and even sports stadiums, now face the wrecking ball because they are, effectively, obsolete. Some investors report that many U.S. submarkets, for a variety of uses, are "under-demolished."

WHAT HAS DRIVEN THIS?

The short answer is technology. The longer answer is human interaction with technology.

Historically, most companies had fairly simple operations and spatial needs, so real estate decisions were driven by location and/or resources, with physical building changes limited

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by cost and location. The current digital revolution, however, is changing that—literally at the speed of light. Locations are not as "fixed" as they were previously, and businesses' physical space needs tend to change quickly due to technological shifts. *Flexibility* will be the key to long-term survival in all industries, including real estate.

Traditionally, real estate has been a fixed asset acquired at high prices compared to most assets. Such requirements mandated long lead times, high fixed costs, significant capital resources, segregation of uses, long-term contracts (i.e., leases and mortgages) and zoning. The industry faces the challenge of adapting fixed physical space needs, and all that goes along with it, to meet the new reality of demand for change at the snap of a finger, and how to underwrite office or other spaces that will likely shift to "creative space" when re-financed (at lower rents, not higher).

WHAT ARE POSSIBLE SOLUTIONS?

From a valuation standpoint, there are two traditional factors: zoning/legal issues and physical utility. To maintain real estate flexibility, underwriters, analysts, municipalities and all industries will have to consider:

1. **Revised zoning codes that stress density/form over use.** The economic lives of buildings are getting shorter and it may be necessary to re-configure space more quickly. This change, however, often runs afoul of local zoning ordinances, minimally, as it relates to uses. If structures in the future are more generic in form, site-specific codes may have to be revised to reflect *multiple* future uses. By "pre-coding" such code requirements, one of the major impediments to re-development (generically, all permitting costs) can be streamlined for material cost savings and faster re-use. Urban areas already have an advantage in this regard due to greater densities and uses. Suburban areas will need to adapt this concept, or face an even stronger "back to the city" trend than currently in the market. Otherwise, suburban office parks and similar "obsolete concepts" could risk vacancy. All jurisdictions, in order to retain and attract industry—their tax base—will have to re-write zoning laws to allow rapid flexibility.

2. **In terms of physical utility, architects and engineers will have to design buildings that can be quickly adapted to alternate uses at a reasonable cost.** Aesthetics will still be important. Those who are able to successfully design and build the most flexible buildings first will fare the best. Prime locations will also continue to have great importance. These locations, however, will not be limited strictly to traditional site selection parameters. The key will be how *flexible* the site and/or building improvements are perceived to be for needed changes due to technological shifts that dramatically alter market demand for that space.

The combination of these elements will require a shorter-term view, and investors and municipalities should incorporate some level of alternate use analysis, *even from the original construction date.* Underwriters would then have the benefit of downside underwriting (to consider future conversion costs)—on a current basis.

For many years, zoning and functional utility have simply been boxes to check during the valuation process. Moving forward, and given the rapid clip of technological change, it is now time to remove it from a box and think about a real exit strategy beyond the end of a lease or mortgage term.

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DID YOU KNOW...

Detroit has the highest commercial property tax rate among U.S. cities at 4.09 percent, National Real Estate Investor reported.

A recent Trepp report shows that large banks are growing their CRE lending faster than community and medium-sized banks. Large banks increased their CRE loan portfolio by 2.56 percent in the second quarter.

The construction industry created 28,000 net new jobs in August, bringing industry unemployment down to 4.7 percent, according to the Associated Builder and Contractors trade association.

In the last 12 months, bank lenders increased real estate construction loans by $30.4 billion, or 10.31 percent, compared to the previous year, National Real Estate Investor reported.

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SUSTAINABILITY IN REAL ESTATE: IS IT EASY TO BE GREEN?

By Sebastian Stevens and Sjoerd Hubregtse

With sustainability a key trend in real estate and construction, BDO International asks, what are the key drivers of this trend, and what are the results?

Every year seems to bring with it more news of natural disasters around the world: hurricanes, forest fires, flooding and typhoons to name a few. Trump's recent decision to back out of the Paris climate accord was swiftly followed by massive floods in the state of Missouri, so the battle against climate change is certainly a hot-button issue. In the global real estate and construction (REC) sector, green targets and environmental policies have far-reaching impact on the world around us and sustainability remains a key trend, worldwide.

Although sustainable or neutral building is widespread, the end results differ from country to country, driven often by profitability and the availability of space. It is easier and cheaper to build a new energy-efficient building than it is to retrofit an old one. In the U.S. or Australia, space is an accessible commodity but, in Europe, space is at a premium, particularly in its ancient cities.

Moreover, it is the older buildings that are often the root of environmental damage. In the U.K., for example, commercial properties account for 18 percent of the country's carbon emissions. And by 2050, roughly six out of 10 commercial buildings will be more than 40 years old, according to research from the Building Research Establishment. In order to meet green targets, older buildings must be retrofitted, yet this will come with a significant cost.

ENVIRONMENTAL LEGISLATION

In order to combat global warming, EU-member countries have taken on binding national targets, with the goal of increasing production and use of renewable energy by 2020. These measures have had considerable impact on the REC sector. In the Netherlands, the Dutch government has sought to encourage the production of renewable energy, and the reduction of energy consumption, by subsidizing and giving tax benefits to those that opt for renewable energy.

Although the share of renewable energy has increased significantly, the Netherlands has yet to meet its 2020 goals. Consequently, yet more legislation has come into force in recent years, which obligates companies to reduce their energy consumption. Larger firms are now legally required to regularly investigate new potential methods of boosting energy efficiency. And, from 2023, Dutch office buildings will be required to have an energy label with at least a C-rating; buildings with a D-rating or below will no longer be allowed to be used as offices. By imposing a minimum level of energy efficiency for office buildings, the Dutch government aims to drastically reduce the country's carbon footprint. As a

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SUSTAINABILITY

result, we are seeing significant investment in the renovation of commercial properties.

PROFITABILITY AND COST EFFECTIVENESS

In addition to legislation, another key driver of sustainability initiatives in the global REC sector is interest in profit and cost effectiveness. In Australia, "green," new-building property construction is on the rise. These properties run on renewable energy and often use smart technology to monitor and reduce water consumption - an expensive commodity in Australia. In Sydney, a residential development has recently been built in which all the properties use Tesla Powerwalls, which store electricity for solar self-consumption, backup power and off-the-grid use. These green buildings are sometimes more expensive to build but are considerably less expensive to run long term.

In the Netherlands, companies that demonstrate efforts to improve energy efficiency or produce renewable energy can benefit from subsidies or tax benefits. These projects are therefore planned carefully to maximize tax benefits. Conversely, companies that choose not to implement green policies must consider the consequences: government legislation influences property value and investor decisions, not to mention tenants. Sustainability can thus affect all real estate owners and tenants, be it positively or negatively.

For REC businesses interested in cost-effective construction and building management, the durability of a building will have considerable impact. Companies worldwide are increasingly looking to use building materials that require minimal maintenance and need replacing less frequently. For example, Powerhouse Kjorbo in Oslo, Norway, is constructed with fire-treated wood, which is both fire and insect resistant; the material is extremely durable thanks to its low reactivity, and is expected to last 80 years. Durable materials generate cost savings, whilst also being more green than standard building materials, like concrete.

Often, the motivation for sustainability initiatives is pecuniary - but the results are inarguably positive. For example, smart monitoring is increasingly popular in Australia, where some businesses are now using smart-meter technology across multiple buildings. This means that energy usage can be monitored and, importantly, redistributed across a cluster of properties, depending on requirements, thus reducing waste, not just in individual buildings, but across an entire community or even city.

CONCLUSIONS

Of course, more immediate concerns are also driving environmental efforts. In Australia, increasing population density has resulted in legislation that requires buildings to have minimal impact on the local area in terms of traffic, air and noise pollution. Meanwhile, in Europe, gas extraction from one of the largest natural gas fields in Europe has caused a number of earthquakes in the Netherlands. To curb demand on gas and reduce tremors, the Dutch government has set a new target to have no houses heated by gas by 2050.

Looking to the future, legislation will continue to demand that the property industry shift away from traditional methods of construction and property maintenance, and employ clean, green technologies. To its clients, BDO Global would suggest that REC companies embrace this legislation, as environmental initiatives are, more often than not, highly cost effective; whilst ignoring legislation could later be costly. And, with the importance of BREEAM sustainability ratings and similar environmental assessments on the rise, green buildings can be seen as an asset and an accolade.

This article originally appeared on the BDO Global Real Estate & Construction blog. View the original post **here**.

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HOW LOW CAN YOU GO? CMBS MARKET IN LIMBO

By Stuart Eisenberg

A mountain of maturing CMBS loans hung overhead at the start of 2017, with legacy loans issued during the heart of the lending boom set to come due.

An estimated $65.5 billion in CMBS debt reached maturity in the first half of the year and an additional $17.04 billion is expected to mature before year's end, according to *Trepp* and *Morningstar*.

Despite early anxieties about the influx of maturing CMBS loans, the commercial real estate markets demonstrated resilience in the first half of the year. Delinquencies increased, but at lower rates than anticipated. In June, the delinquency rate rose 28 basis points to hit 5.75 percent, according to Trepp's June CMBS Delinquency Report.

Midway through 2017, rising delinquency rates are no longer the chief concern. Instead, the CMBS market worries about the sustained slowdown in issuances. U.S. CMBS loans totaling $55.4 billion were issued through August and the market is expected to end the year with more than $70 billion issuances. While the forecast annual total is on pace to surpass 2016 numbers, it is far below historical levels. At the height of the CMBS market in 2007, *Commercial Mortgage Alert* reports a total of $228.56 billion loans were issued.

WHAT'S CAUSING THE SLOWDOWN?

The Dodd-Frank risk retention rules that went into effect last December are a contributing factor to the subdued state of the CMBS market. Under that regulation, lenders—or a third-party—are required to keep 5 percent of securities created in a transaction on their books for a period of 10 years. For lenders, this capital requirement poses a considerable barrier to increasing the volume of CMBS originations.

Shifting investor interest is also contributing to the slowdown. The CMBS market all but halted during the recession, as investors pulled out of the securities. While confidence in CMBS has recovered considerably, investors are still buying CMBS loans at less aggressive rates.

PRIVATE EQUITY, REITS & OTHER ALTERNATIVE LENDERS FILL THE GAP

CMBS accounted for about 23 percent of the trillion-dollar loan market at its height, but currently holds a 16 percent share, according to *Trepp*. During a year where CMBS loans reached maturity at such a rapid clip, the low issuance rate is even more striking.

In addition to traditional balance sheet lenders, alternative lenders, including private equity firms and REITs, which are not subject to risk retention rules, are increasingly stepping in to fund commercial real estate loans. Alternative lenders' presence in the debt markets is not new, but is poised to grow and is likely to be at the expense of CMBS's market share.

WHAT LIES AHEAD FOR CMBS?

The dynamics of the debt market are shifting, creating more channels for borrowers to obtain funds. While CMBS issuers appear to have addressed many of the regulatory concerns, they now find themselves facing a new hurdle: increased competition. As many new players provide financing, including first mortgage loans, mezzanine loans and bridge loans, CMBS issuers could see their slice of the debt financing pie shrink.

This article originally appeared in Commercial Property Executive.

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MARK YOUR CALENDARS

The following is a list of upcoming conferences and seminars of interest for real estate and construction executives:

OCTOBER

Oct. 4
Bisnow's Hurricane Harvey Construction and Development Benefit
The Westin Oaks Houston, Houston

Oct. 4-6
Expo Real: International Trade Fair for Property and Investment*
Messe München, Munich, Germany

Oct. 19
Denver's Investment, Development & Construction Forum
Denver

NOVEMBER

Nov. 1-3
CFMA / AGC Construction Financial Management Conference*
Caesar's Palace, Las Vegas

Nov. 8-9
PERE New York Summit
Convene Conference Center, New York

Nov. 14-16
REITWorld®: NAREIT's Annual Convention
Hilton Anatole, Dallas

DECEMBER

Dec. 7-8
AICPA (American Institute of CPAs) National Construction & Real Estate Industry Conference*
Bellagio, Las Vegas

Dec. 11
Catalyst Cap Real Estate Fund Investing
Capital Grille – Wall Street, New York

Dec. 14
Bisnow's Silicon Valley: Hot Projects
Silicon Valley, Calif.

** indicates BDO is hosting or attending this event*

For more information on BDO USA's service offerings to this industry, please contact one of the following regional practice leaders:

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