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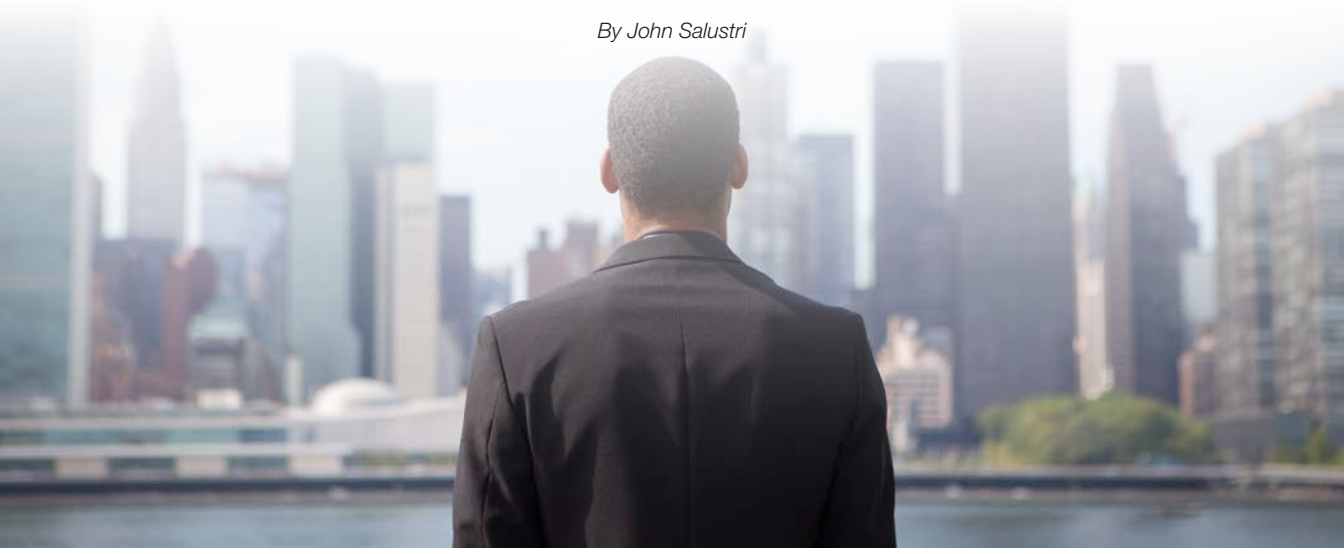
DEEP DIVE

The Office Building's Role in the Optimized City of the Future

An office asset must be more than technologically enabled to be considered connected in a post-pandemic world.

By John Salustri



THE OVERVIEW

When we speak about constituents in the property management industry, we are typically talking about our tenants and owners, with a possible expansion of the conversation to include investors, service providers and our management team members.

In actuality, our constituents extend far beyond that in the sense of the building's connectivity to the larger community. From both a technological and sustainability standpoint—and those two are often closely related—the constituents we cannot see far outnumber those we can. And yet, they rely on our buildings as much as the long-term corporate tenant. The differentiating factor is how.

In *Deep Dive No. 3: Health, Wellness and Sustainability Beyond COVID-19*, we explored the possibilities inherent in the office assets' post-pandemic future and how a greater connectivity between corporate tenant and property manager will advance those opportunities. And essentially, we stopped at the property line.

But a strong case can be made for the inclusion of the outside community for that connectivity to come to full flower, whether it is through a policy of local outreach—by the tenant or the property management team—or the availability of mobile apps that connect tenants to local restaurants and other places of interest. And, as you might have guessed, it can certainly be found in the building's sustainability practices.

"Your building is part of the community as much as management and ownership strive to make it part of the community. It takes work, but it's worth it."

– Randal Froebelius, Equity ICI Real Estate Services

There is a strong technological underpinning to this connectivity, not just for integration or ease of access, but also for monitoring and analyses. As many experts in this Deep Dive explain, we have only begun that journey. And if connectivity is the focus, then its natural progression will encompass not only the smart building, but indeed the smart *city*: A major leap forward from where we stand today, which is mostly just a collection of smart technologies within current frameworks.

But that then begs some important questions: Can a city be truly smart if its roads and bridges are deteriorating? Is a smart city also a sustainable city? And perhaps most important, can a city be truly smart if it does not provide equal access to all?

Are some of these questions beyond the reach of the property manager to answer? Of course. But do they all bear watching? You already know the answer.

With those questions in mind, this Deep Dive will explore:

- The Community Revisited (and Why You Should Care)
- Sustainability for Everyone's Sake
- Of Grids, Roads and the Issues They Create
- Infrastructure and Social Justice
- From the Smart Building to the Smart City

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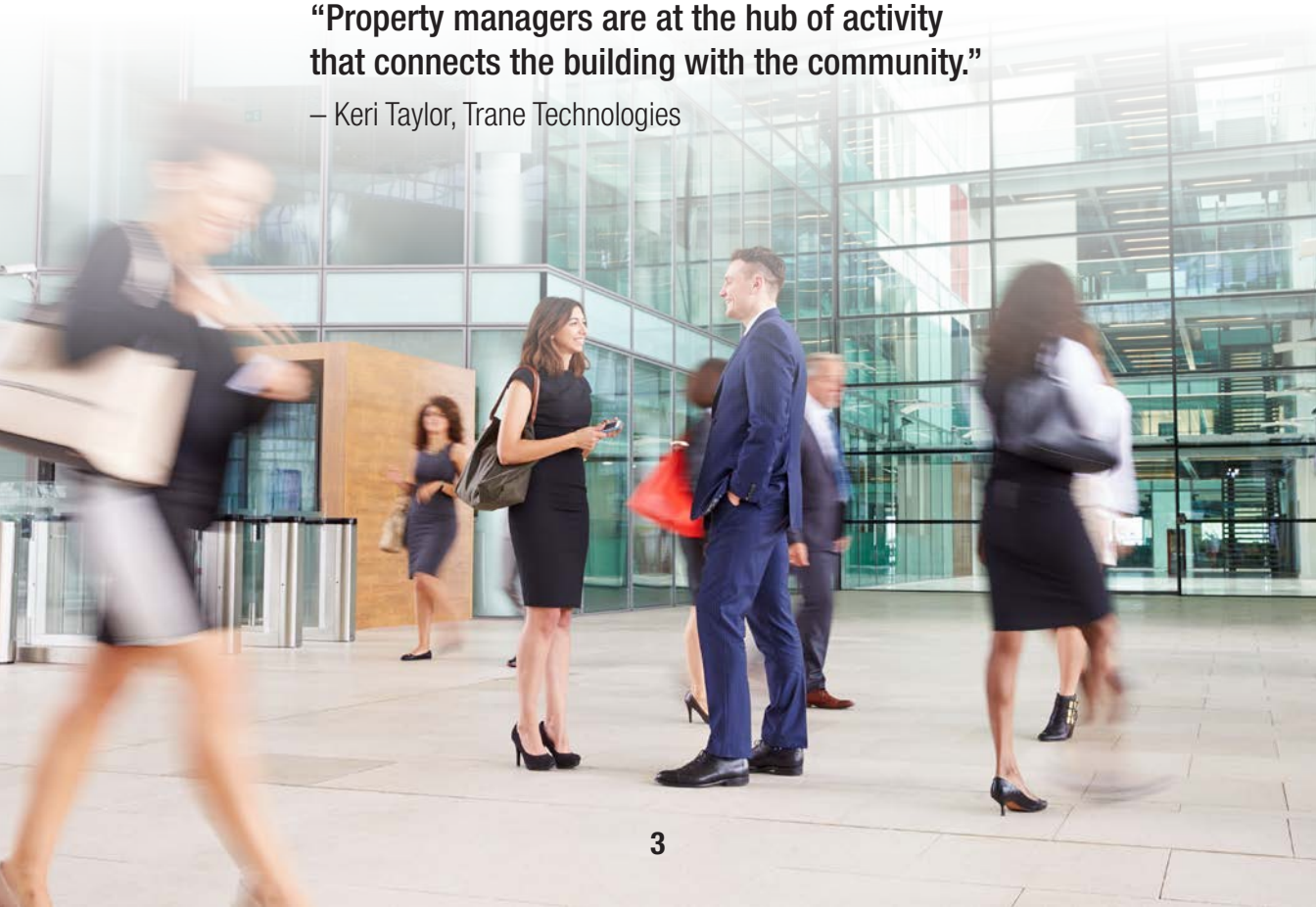
"Property managers are at the hub of activity that connects the building with the community."

– Keri Taylor, Trane Technologies



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THE COMMUNITY REVISITED (AND WHY YOU SHOULD CARE)

Does the property manager have a responsibility to the local community? That depends on whom you ask. "Responsibility might be too strong a word," says one property manager we spoke with, who would prefer the word "opportunity," as in: "It is more of an opportunity to connect the fabric of the building, its occupants and the visitors with the services and amenities within the community."

Responsibility or not, the connection is clear, if only for the sake of the corporate population, who might frequent the local shops during breaks and may even live close by. And for the sake of the local community members, who might enter the building to sample a lobby coffee shop or fitness center.

"The building I'm in right now is currently running a vaccination clinic," says one manager, explaining that the service, coordinated with the local hospital, started with healthcare and other frontline workers, then expanded to the elderly and currently assists a "broader cross-section of the population. It's a touching place to be right now."

Another manager refers to the building's role as "interwoven connectivity," exemplified by an owner who does an annual end-of-summer school supply drive with their tenants. Such activities contribute to both the outer and inner communities (if they are indeed separate), the latter group gaining by coming to work for the experience, that all-important consideration of setting the workplace uniquely apart from working at home.

"Having a strong alliance with the community helps to improve and identify services and social needs," says one source. "It also provides opportunities for cooperative exchanges that create value and lead to healthier working, political and social climates." We will have more on that in a subsequent section.

The more straightforward—if not easier—task, as one property manager stated, would be to "just build a 500,000-square-foot building, collect rent and keep up with technology. But is that the right thing to do?"

This is an especially important question in the current age of growing environmental, social and governance (ESG) investing, which Bloomberg Professional Services puts on track to break through the $53 trillion mark by 2025, exceeding a third of projected total assets under management. The implication there, of course, is for solvency beyond the power of rent collections.

"Is it just bricks and mortar?" asks the source, and if not, then "what is the purpose of the asset?"

SUSTAINABILITY FOR EVERYONE'S SAKE

The most immediate answer to that question would be the safe and healthful housing of corporate tenants and visitors. Previous Deep Dives documented the nature of health and wellness throughout the pandemic, as tenants begin returning to the office now and as we pivot toward the future. Curiously, through this lens, if the property manager does take care of their brick-and-mortar, they will, at least to a point, be taking care of the larger community. "The people at the forefront of the healthy building movement are the same as those at the forefront of sustainability," says one source, "and they see it as a logical progression to look at the planet's health."

But again, as that previously quoted expert asks, is that enough? "We're making our buildings more sustainable. But it's nowhere near enough to solve the bigger problems."

In "The Role of Cities in Defining Our Environmental Future," Cushman & Wakefield makes it clear that owners, managers and developers can shoulder more of the burden of "ensuring our environments are as people-friendly as possible" and, by extension, "improving our environment and making our cities as attractive as possible."

But that burden does not rest with our industry alone, and the report goes on to mention the other stakeholders who must pick up their share of the heavy lifting, including the national and local governments, urban planners, architects, investors, occupiers and "people who live in and visit the spaces under review."

And a heavy lift it is. But, to state the obvious, even if the response of owners and managers starts and stops with buildings alone, they would "benefit the community, because as we decarbonize more, we produce more sustainable environments as a whole," says a source. Indoor air quality (IAQ) doesn't exist for its own sake, for instance, but for the health of our people. And ensuring clean air to breathe is part and parcel of the journey to buildings becoming part of the solution.

"From a people's perspective, how do you have the greatest impact on the greatest number of people?" asks one contributor. "A building impacts the community at large just like it impacts the people within it."

If property managers take care of their brick-and-mortar buildings, they will, at least to a point, be taking care of the larger community, too.

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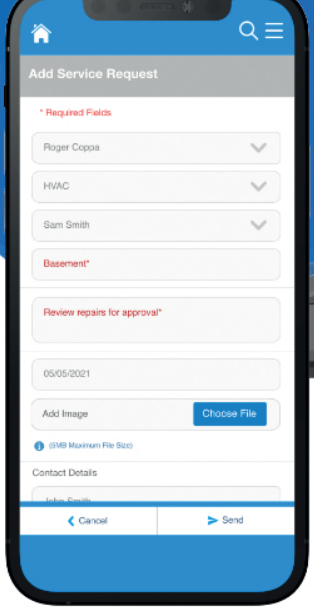
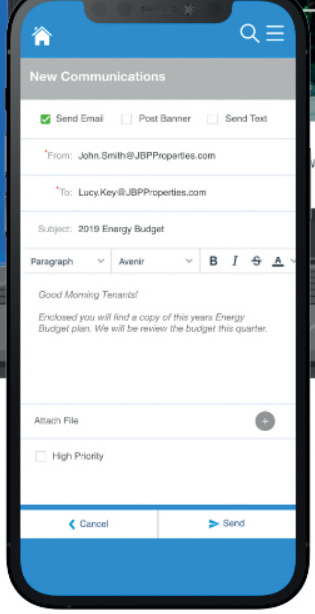
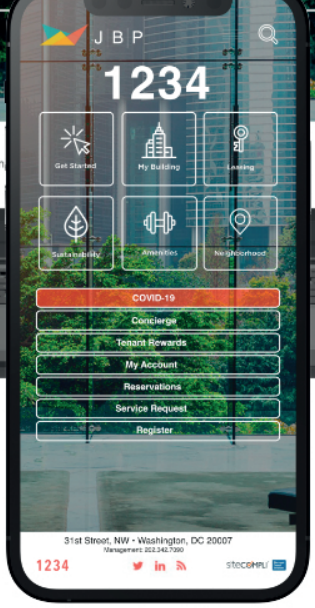






Of course, each building is unique, and things like the nuts-and-bolts energy outcomes depend on a slew of variables, the age of the building and capital budget restraints included. "There aren't a lot of strong generalities we can make around cost or results," she says. "But some degree of decarbonization techniques is available to everyone. We can all take a step forward."

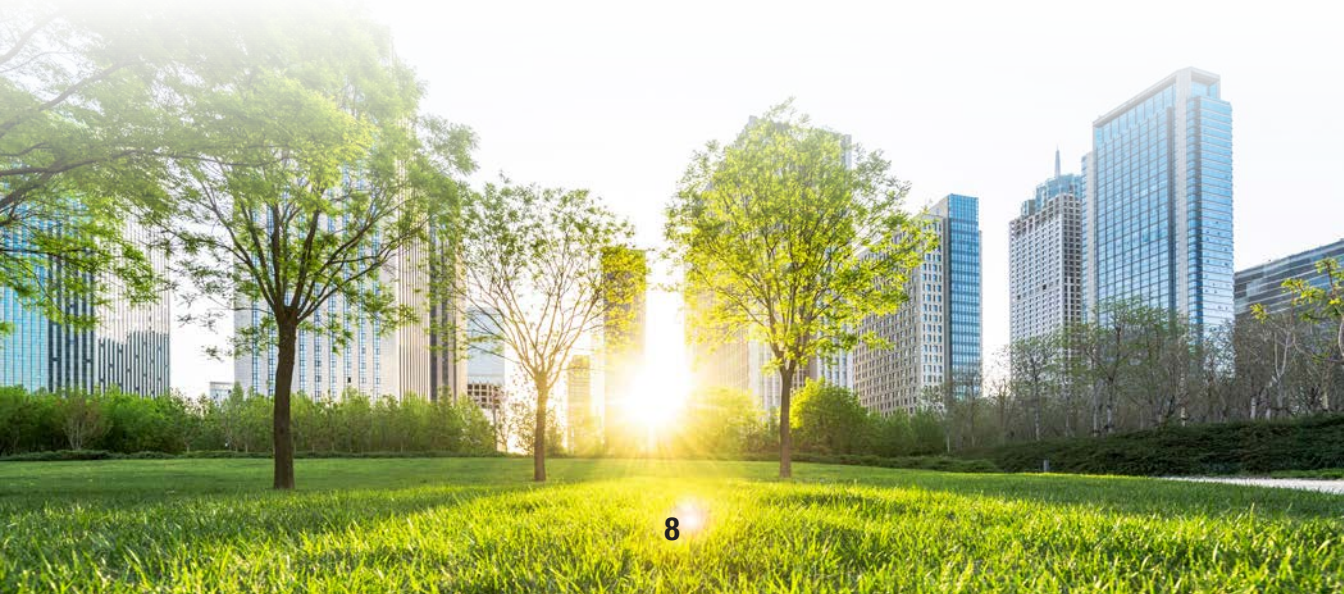
To keep those steps lively, federal, state and local governments are increasingly stepping in. Most recently, in April 2021, President Joe Biden set new targets for greenhouse gas (GHG) reductions at 50 to 52 percent by 2030.

Drilling down, as of March 2021, 24 states and the District of Columbia have established some sort of GHG emission standards, complete with deadlines for compliance and penalties for missing them. And around the globe, thousands of cities are doing the same. (The possibility was raised by one source that we could see a rush to compliance as the deadlines approach.)

"At a macro level," says one property manager, "cities that are progressive are enacting regulations that are pretty strict drivers. You have to be responsive to what is occurring at the local level."

Which means being responsive to what the municipality and people at the local level expect. As one source explains, tenants seek built environments with such features as "access to natural light, common areas with accessibility to outdoor spaces and building amenities that include fitness facilities and vending or restaurants with nutritional food options." In terms of the local community, they are simply "demanding that buildings reduce their carbon footprint," exceeding the already-impressive strides taken by commercial property teams in recent decades.

(By the way, buildings can—and have—become carbon neutral "within days," reports Cushman & Wakefield, by their owners simply purchasing renewable energy credits, or RECs. Some work at actually reducing the building's carbon footprint first; others buy the credits and then fulfill the promise. Without the added effort, however, simply purchasing the credits has been likened to a celebrity buying their kids' admission to a prestigious college.)



Electrification could be just one way to respond to that demand, and property owners and managers are listening. (See *"Current Trends: Advances in Building Electrification,"* below.)

CURRENT TRENDS: ADVANCES IN BUILDING ELECTRIFICATION

As our industry strives to reduce its carbon footprint, the Urban Land Institute (ULI) sets an industry vision in *Electrify: The Movement to All-Electric Buildings*. And interestingly, it is not a solution meant only for new builds, although retrofit costs will demand "significant planning and coordination" for the technologies to pencil out.

But the benefits lie in the outcomes, as the paper states: "Electrification across new and existing buildings is improving real estate's bottom line, future-proofing portfolios, attracting high-quality tenants, lowering building emissions and improving the health of building occupants."

Obviously, the earlier the call to go all-electric is made, the more cost-effective it becomes. In fact, ULI reports that some developers are incurring no upfront costs.

The essential difference in all-electric facilities is that they can do away with on-site gas-combustion or fossil fuels, and therein lies the connection between the building and its impact on the greater community as well as its tenants.

The paper cites as an example Kaiser Permanente's LEED Platinum medical office building in Santa Rosa, California, which "estimates saving $1 million in HVAC first-costs by using thermodynamically zoned heat pumps." Electrochromic glazed glass and solar panels in the parking lot help seal the decarbonization deal at the facility.

On the retrofit side, a 10-year payback on the electrification of floor space is achievable in the 27 percent of U.S. commercial buildings currently heating with fossil fuels, the report states. If there is a downside to this solution, it comes in the mismatch with most investors' hold strategies, which typically run short of the 10-year mark.

With cities' increasing movement toward carbon-zero, ULI states that electrification can provide building alignment with those goals, and test cases are already in place. "The Building Electrification Institute is helping 11 cities, such as San Jose, [California]; Salt Lake City; and Boston pilot strategies to scale up the electrification of building heating and cooling systems in a way that supports local market development, regional partnerships and an equitable transition."

It is also an effective interface with the electric grid—both current power distribution systems and those of the smart variety, since "communicating with the utility grid to support demand response, and actively managing peak loads are all strategies electric buildings can incorporate to further reduce energy costs and optimize efficiencies."

Not surprisingly, there are barriers, beyond first costs for retrofits, that can prevent electrification from being an across-the-board solution. These include conflicting building codes and utility infrastructure.

There is also a social justice component to consider. "Because of the upfront costs of retrofitting existing assets to all-electric, targeted investment and empowered communities are needed to support an equitable transition," the report explains. Taking a hopeful stance, ULI states that, "many companies and stakeholders are already identifying strategies to overcome these hurdles."

As we have seen with smart buildings and smart cities, we are now just on the threshold of all-electric as a widespread viability. But the is future filled with promise.

OF GRIDS, ROADS AND THE ISSUES THEY CREATE

Just as it is with sustainability, the connections between buildings and the community are not the responsibility of the building teams alone. There is a very real, very physical dynamic to such outreach, found in the infrastructure of our cities. As we discovered throughout the pandemic, people are craving in-person interaction, and they can do so only when the roads, bridges and transit systems are in working order. If connection is the goal, the infrastructure of our cities is the connective tissue.

But we have not left the sustainability issue yet, and that infrastructure—in the form of the electrical grid in particular—also plays a major part. As we move to achieve greater energy efficiency, utilities are working to re-invent power distribution in the so-called smart grid. A rudimentary definition of the smart grid is a system to distribute power when and where it is needed in just the amounts needed, hence a more efficient use of electricity. For the record, the utility companies see the smart grid as an overlay to current power-distribution systems rather than an out-and-out replacement.

The essential issue is that electricity, once generated, has to be stored or used or it dissipates. And while there is much talk about battery storage these days, "current technology is focused on kilowatts (Kw) of storage in a home or electric vehicle," says one source, "not the megawatt (Mw) loads we're discussing." In short, use it or lose it.

So, with a smart grid managing energy delivered to the asset, "the building interface will need to know when to draw the electricity and what types of equipment it should be running, such as off-peak air-conditioning," he says.

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"In central business district locations, infrastructure is critical for connecting your property to the greater community just because of the density constraints of an urban environment."

– James Whalen, Boston Properties

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The problem is that the software needed to manage those decisions will take training—and money—and older buildings may not be able to accommodate the installation. "In terms of technology and infrastructure, it doesn't do us any good to have a smart grid if the building isn't compatible," he adds. "You need to do the building upgrades and you have to have the trained people to understand how it all works together." He adds that there is federal legislation currently being worked through Congress, but the call for training in the bill "remains vague" and does not adequately emphasize the expansion of the renewable portfolio.

In terms of the physical infrastructure, it is, in the words of one expert, simply "critical to have efficient roads to bring people back into the city centers." It also hobbles our competitive stance on the global playing field if "we can't get in and out with ease."

The ill-repair of our roads and bridges has been an issue, and a political football, for literally decades. They continue to be so. According to a White House Fact Sheet, "The United States of America is the wealthiest country in the world, yet we rank 13th when it comes to the overall quality of our infrastructure." The recently released *American Jobs Plan* calls for an expenditure of $2 trillion this decade to repair the crumbling infrastructure. It includes $621 billion for transit upgrades.

The plan, which is currently under negotiation in Washington, also earmarks $20 billion to "reconnect neighborhoods cut off by historic investments and ensure new projects increase opportunity, advance racial equity and environmental justice and promote affordable access."

That statement has major implications for our businesses, our society and our cities far beyond traditional definitions of infrastructure advancement, especially as a bipartisan compromise on an infrastructure plan has yet to be finalized as of our publication date.

"Prior to COVID-19, we already were seeing the boundaries blur between the building and the surrounding community, due in part to our increased focus on human engagement with the built environment."

– Steve Weikal, MIT Center for Real Estate

INFRASTRUCTURE AND SOCIAL JUSTICE

"People are looking for cities where commercial, residential, institutional and humanitarian real estate are in the same districts and neighborhoods," Gensler Co-CEO Diane Hoskins wrote recently. "This trend is the driving idea behind the 20-minute neighborhood in the U.S. (or, similarly, the 15-minute city concept in Paris) and is gaining attention around the idea that cities need to provide easy access to places and experiences."

"If you want a viable and economically stable community, it must succumb to the redevelopment model," adds one expert. "As a compromise, communities need to be prepared to support services that assist people who are marginalized. One way to change the socio-economic plight of a segment of the community is to embrace diversity, equity and inclusion."

There is no debate in her mind over the responsibility issue. "As commercial real estate professionals, it's our duty to create an environment that's welcoming and unbiased" and facilitates a positive experience for the whole community in new and inventive ways. She poses a question she believes all property professional should consider: "How do we help our community thrive when a part of that community is not thriving?"

The pandemic laid bare major inequalities in our society, explained one source. Certain individuals and groups were hit harder by the COVID-19 pandemic than others, especially those involved in frontline, essential work who did not have the ability or luxury to isolate even when stay-at-home mandates were in place. And this reality did not disappear with the roll-out of vaccines. In fact, major issues surrounding the accessibility of vaccinations remain now, making the commercial property mentioned earlier that is serving as a vaccination site all the more crucial for its surrounding community.

It is not surprising that the property managers we spoke with were passionate about this issue. The most effective way for a property manager to respond to the social justice question is to "reflect the fabric of your community—which is diverse in its nature—in whatever engagement you do," says one professional.

Another expert poses an interesting challenge: "As buildings get smarter, as tech makes everyone's life easier and jobs get done more efficiently, does that give us more time to give back to those that don't have enough equity in the social economy?"

That question, however, puts a lot of confidence in our degree of technology.

Can a city be truly smart if it does not provide equal access to all?

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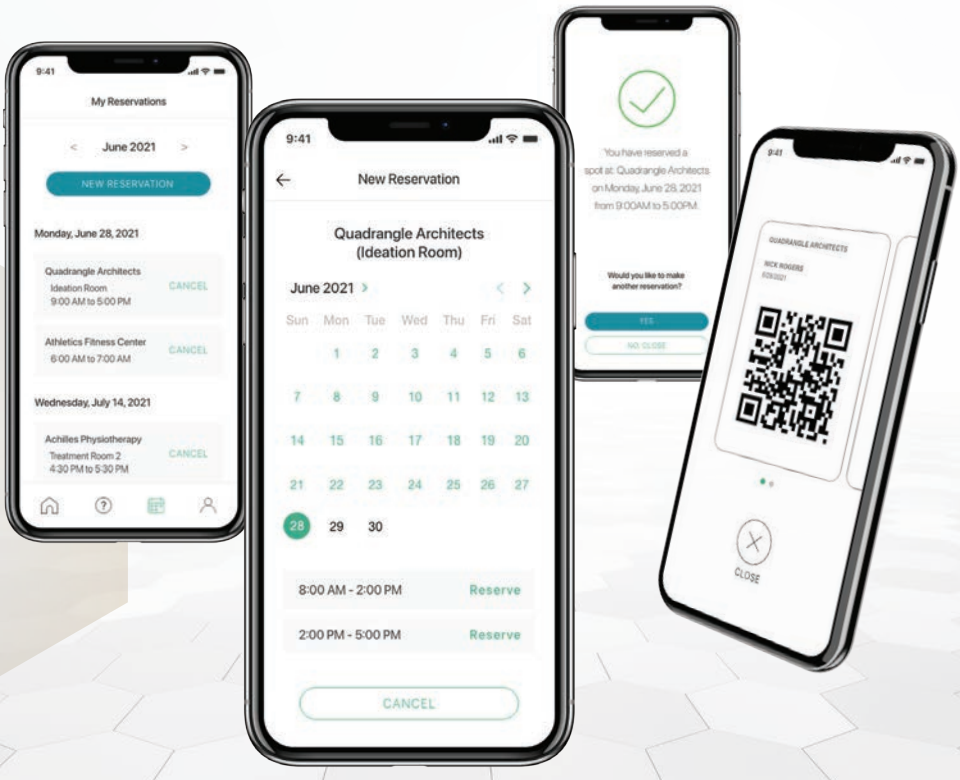

FROM THE SMART BUILDING TO THE SMART CITY

Smart applications are at work right now in office buildings across the globe, for the comfort, health and convenience of tenants, staff and visitors, as well as for the promise of linking the building to the greater community. In fact, integrated systems, informed by Internet of Things (IoT) sensors and designed to bring workers from their cars through security, up the elevators to their mobile desks and then through their days—seamlessly and without interruption—have been around for years. The Edge in Amsterdam, once hailed by Bloomberg as "the greenest, smartest building in the world," is just one example. (It also boasts robotic security.) And this Class A asset is now pushing seven years old, or middle age if measured in tech years.

But, as one source speculates, what if two otherwise competitive property owners were to build on that and decided that their neighboring assets should "talk" to each other, and they start sharing information so traffic can be handled better? Then they wonder if they can hook up to the city's systems to better coordinate trash pickup and the processing of paperwork. That, he says, is something that begins to look like a smart city.

As one property technology (or PropTech) veteran shared with BOMA International in late 2019, another example of such shared data communications (which one might consider a riff on the smart grid) involves "a building with a solar roof communicating to other buildings in the community that it has excess power, allowing it to shift energy to a building that needs it." Shared data can also lead to competitors learning from one another "to improve their operations."

Diversity drives innovation, innovation drives visionary leadership and visionary leadership champions growth."

– Sandrena Robinson, LBA Realty

There are two questions that lie before the full realization of that connectedness. First is the case of the haves-and-have-nots. That once again includes both the condition of the owner's budget (not all buildings are Class A, after all, or owned by institutions) and the age of the asset.

Consumer apps alone will not define how smart a building is.

"Seventy-five percent of the built environment is 50 years old," one source states. "So, few of us will have the luxury of starting from scratch and building the smartest building on the planet." With this in mind, the challenge then becomes: How we make what we do have smarter?

To that end, every building has its unique profile, and "You have to look for opportunities to curate this connectedness," says one source who dislikes the *haves-and have-nots* framing. "It doesn't begin with technology. It begins with a commitment to connecting and a commitment to staffing." The technology then becomes the enabler. "It's not unattainable, and many owners and managers are taking a serious look at the technologies they can apply to help them differentiate—even in Class B and C properties."

But, as more than one expert states, a collection of smart applications does not qualify a building as smart, and truly smart is still a long way off for most of that aging stock. Ditto the smart city.

Even nailing down the definition of a smart building (or city) is in itself a daunting task. "Where do you start?" asks one manager. "Are you building the smartest building? The most sustainable or the healthiest building? Each of those would dictate different technologies that you could embed in the solution of achieving a goal." And while some gadgets and gizmos might be welcomed luxuries that help to elevate the occupant experience, "A consumer app that will allow you to find a restaurant or a garage space doesn't define smart."

In a recent article, JLL took a healthy stab at defining a smart building as one that fosters "outstanding outcomes for all users through digital technology." It then boils those outcomes down to four essentials, expressed in terms broad enough to include older assets:

1. Inspirational experience;
2. Sustainability;
3. Operational cost-efficiency; and
4. Future-proof by design.

It is the fourth element that allows for connectivity to technologies being applied at the city level in order to make municipalities smarter. "Certain systems are starting to get smarter," says one contributor. "Transit is getting smarter, so are lighting systems and even sewers. The engagement of people with agencies and processing paperwork is getting smarter, and so is the electrical grid."

But, he adds, as is the case at both the city and building level, smart tech adoption is nothing more than a collection of apps if the strategic integration piece is missing. And it is that integration "that was the promise of the smart city 20 years ago from the vendors trying to sell the story."

While certain institutional owners are making headway with 5G, a fully enabled, ubiquitous 5G network is still as far out as 10 years.

Another promise yet to be fulfilled is that of 5G. Here, as Cushman & Wakefield's Chief Technology Officer Robert Franch writes, is both the promise and the hidden hang-up of 5G: "Landlords and investors are increasingly viewing 5G as a 'must-have' versus a 'nice-to-have' amenity. After all, the technology is key to marketing space effectively—especially in a post-COVID-19 era when employees will need a reason to return to work." He says the firm has been directing clients to "make sure they have the technological infrastructure in place to enable 5G."

Taking the broader view of the citywide application of 5G, the report points out the introduction of sensors to collect and "monitor traffic, infrastructure, crime and environmental data to improve the quality of life for residents and visitors." With the addition of mobile-edge computing (or MEC, which the report describes as the practice of capturing, processing and analyzing data near where it is created), all that information can be sent to a nearby data center, "enabling near real-time insights that can drive better, more cost-effective decision-making."

Back at the property level, while certain institutional owners are making headway in the 5G arena, the report indicates that a fully enabled, ubiquitous 5G network is still a ways off, and some of our sources put that as far out as 10 years. But when it is here, it will be a game-changer: "We can't fully understand yet what that increase in bandwidth will enable us to do." We can get a hint from a simple and homespun analogy he provides: "Under 4G, downloading a movie might take six minutes. Under 5G, it takes six seconds."

But, not surprisingly, there are potential issues—having to do neither with deep pockets nor building age. Increasingly, explains one expert, internet access is being viewed as a right rather than a privilege. "If it's declared a public utility," he says, "then, the providers have the potential to say they

have an easement and no longer have to honor a lease agreement or the fact that the building is private property."

The same can be said for the future of charging stations, by the way. If the general public gains access as a right rather than a service, then how will that change the building owner's business model? "Property rights need to be considered and respected," he states.

Whether or not 5G (or any other tech application) is deemed a right, social justice issues are again at the forefront. "Who can and cannot afford it?" asks one contributor. In addition, she notes that, in her travels, she has not seen much 5G access—at least to date—in the farm fields of the Midwest. Will 5G be an urban specialty—and then only in select communities? Or will it, along with high-speed broadband internet access, be a part of a broader push to modernize our infrastructure—and the way we define infrastructure itself?

Clearly, just as with smart buildings, smart cities have a long way to go. "We're just in the first innings of smart buildings," says one manager. "We have buildings with smart technologies, but not many smart buildings. It's the same thing with cities. It's going to be a very long journey."

It is hoped that the journey will lead to an environment that is even more sustainable, to a community that has complete and equitable access to all amenities and opportunities and to office buildings that are truly an integral part of the progress toward those goals.

That may ultimately define what a smart building—and a smart city—is. ■

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Research work contributing to this paper includes:

- From Bloomberg:
  - "ESG Assets May Hit $53 Trillion by 2025, a Third of Global AUM."
  - "The Smartest Building in the World."
- From BOMA International: "Next Tech Steps: Smart Integration Is Coming to a City Near You."
- From the Center for Climate and Energy Solutions: "U.S. State Greenhouse Gas Emissions Targets."
- From Cushman & Wakefield:
  - "The Role of Cities in Redefining Our Environmental Future."
  - "Why 5G Is More Important Than Ever."
- From Gensler Research Institute: "Real Estate Must Offer Human Experiences, As We Escape Virtual Lockdown Living."
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- From the International Energy Agency: "Global Status Report for Buildings and Construction, 2019."
- From JLL: "New Smart Building Standard Sets the Bar for Digital Workplaces."
- From the National Center for Biotechnology Information: "Coronavirus Infections and Deaths by Poverty Status: The Effects of Social Distancing."
- From the Urban Land Institute: "Electrify: The Movement to All-Electric Real Estate."
- From the White House:
  - "Fact Sheet: President Biden Sets 2030 Greenhouse Gas Reduction Target Aimed at Creating Good Paying Union Jobs and Securing U.S. Leadership on Clean Energy Technologies."
  - "Fact Sheet: The American Jobs Plan."