

PREDICTING URBAN EVOLUTION

Institutional real-estate investors are mining smart-city data to understand the opportunities created by new patterns of movement, improved energy efficiency and future climate change.



- Smart buildings will be key to tackling global warming
- Data are reshaping the real-estate investment industry
- Today's most advanced smart cities started modestly, adding new capabilities gradually rather than trying to build from the ground up

"Investing in real estate," says Tim Bellman, head of global research at Invesco Real Estate, "used to be a really simple thing. You looked at supply and demand."

Now it's much more sophisticated, he adds. Data-driven buildings allow investors to make better informed decisions and monitor their properties more closely, as well as potentially creating new data-related revenue streams.

On top of that, highly efficient buildings not only reduce expenses but also help to address environmental challenges, an important consideration for investors guided by environmental, social and governance (ESG) issues such as climate change and human rights.

SMART AND SUSTAINABLE

According to Mr Bellman, the green shoots of smart-city real estate are already visible. "If you just look at the number of people walking around cities with smartphones, those effectively smart individuals are interacting with smart buildings," he says, connecting with those buildings' WiFi networks or having their presence detected by sensors in a building's walls and floors. And once they are in, buildings can use those data to adjust services, such as heating and air conditioning.

"When you walk into a building," he explains, "your movements are measured, and in some of our buildings systems measure the number of people coming in and out and automatically adjust and regulate temperatures."

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This, of course, lowers costs by improving energy consumption. Cities are triumphs of real estate—the most efficient use of land on the planet—but large buildings are big consumers of power, needed primarily to light, heat and cool large internal areas that are disconnected from the outside world. Making them more energy-efficient, says Darin Turner, managing director and portfolio manager for Invesco Real Estate and Mr Bellman's colleague in Dallas, Texas, is a key part of smart-city planning.

As an example he points to Prisma Tower, an Invesco-backed development in the La Défense business district of Paris, where heating, cooling and telecommunications are provided by an external facility shared with a number of buildings.

"That's a type of approach that has been around for generations," he says, "but its use of modern technology makes it unusual. The building doesn't have to utilise space for those purposes. We buy in those services at a cost-effective rate, and that means the building is more efficient."

It is also what makes real estate more sustainable in the long term.

"When you are trying to understand sustainability, you have to have some key design principles," notes Mr Turner, "things like resilience, flexibility and safety. But the other element is the impact of climate change—understanding how you need to be thinking about not just expectations for today but expectations 15-25 years from now."

INVESTING IS CHANGING, TOO

These principles are already influencing how institutional investors assess real-estate opportunities.

"Over the last decade or so," says Mr Bellman, "environmental and social-governance principles have become a very important part of investing generally, and we have found that doing the right thing for the environment was also a smart commercial decision. It made our buildings more attractive to tenants and it cost us less to run them."

City "smartness" has also, he adds, increased the complexity of real-estate investing, turning it into a much more finely tuned data-driven search for higher potential returns.

"At a very high level, a real-estate investment strategy relies on two things: signs of growth or change," he says, "and smart cities are leading to changes in the patterns of movement within cities and the intensity of use of individual buildings. So this is an exciting area for us to try to identify new patterns of value that will show outperformance in the varied buildings we can invest in."

Those patterns, he explains, can be found in the huge amount of data that smart cities now generate. "It's much more fine-grained. We can go down to street blocks and corners. We can come down to the

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number of restaurant bookings in an area or the number of people who have been observed parking in a particular location. And we can use data mining to try to understand where value is being created.”

A KEY ROLE FOR CITY HALL

Good-quality data depend on the presence of sensors—although, as Mr Bellman points out, smartphones are already generating a large amount of that information, and while individual smart buildings can play their part, much depends on the commitment of the city as a whole to building a digital infrastructure.

“The key to being able to make this transition to a smart city is having that ability for overall connectedness,” says Mr Turner, “mostly driven by your overall internet capability, but then also by your devices around that internet capability. So areas that we have seen that are the most advanced [in becoming smart cities]—places like Amsterdam, New York, Seoul, Singapore—very much have that initial layer of telecommunications infrastructure in place. It’s mostly places in Africa, India, Latin America that are very far behind in installing that base layer of sensors that are really needed to make a smart-city environment.”



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However, he says, that lack of infrastructure could be to the advantage of developing countries. “In the developed world, you are not only trying to plan for the future but also attacking what’s currently on the ground. You have to incorporate planning around what is existing, and that can slow you down.”

By contrast, developing countries get to build from scratch. “They have the ability to really leap forward on technology,” he says

A GLOBAL PHENOMENON

That opportunity has not gone unnoticed, particularly by China, which is investing heavily in smart-city developments, including significant commercial and residential real-estate projects both within its borders and across its Belt and Road Initiative.¹

Internally, China has partnered with four of its biggest technology companies—Ping An, Alibaba, Tencent and Huawei—to create what it calls the PATH to Smart Cities initiative (the name is an acronym of the companies’ initial letters), developing smart-city capabilities in 500 cities across the country. And it is involved in a number of overseas smart-city projects, including a partnership with the Philippines government to build from scratch a 407-hectare smart city, the City of Pearl, on reclaimed land in Manila Bay.

Other countries, including India, the United Arab Emirates and Saudi Arabia, are following China’s lead and are unveiling strategies to drive smart-city development. India is planning to upgrade 99 of its cities from 2022 onwards under the country’s Smart Cities Mission, and Saudi Arabia has plans for a brand new smart city, Neom, which will cover 26,000 sq km of what is currently desert land.

TURNING SMART DREAMS INTO SMARTER REALITY

Developments such as these are not short of ambition, but Abhi Gami, senior investment analyst at Invesco, advises caution.

“The huge projects that people have been dreaming up for years have mostly fizzled out because they require people to accommodate technology,” he says, “instead of technology organically accommodating how people live.”

He cites as an example Songdo in South Korea, a smart city which has been built from scratch and has many smart-city innovations, including a central pneumatic waste-disposal system, but which has failed to attract residents. It is currently home to about 70,000 people, far short of the 300,000 it has been designed to accommodate.

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“The cities that are most advanced share the fact that they started modestly and slowly added new capabilities”, notes Mr Gami.

Early phases of the City of Pearl are expected to open in 2024, but according to Nicholas Ho of Hong Kong-based Ho & Partners Architects, the project’s lead designers, the development will probably take “two decades” to complete.

By then we will need many more smart cities to house and service the world’s growing population, nearly 70% of whom will be living in cities by 2050, according to UN estimates. And that is exciting the conventional world of real-estate investment.

“We are talking about investing in areas that are new,” says Mr Turner. “Just from understanding the potential impact [of smart cities] and what that means for our quality of life, it’s an exciting time to be a real-estate investor.”

Mr Bellman agrees.

“That interconnection of smart buildings with smart cities,” he notes, “creates the potential for us to generate additional value from our investments.”



¹Belt and Road refers to a large-scale infrastructure and investment initiative by the Chinese government focused on countries in Europe, Asia and Africa. “Belt” is a reference to overland routes and “road” refers to the sea routes.



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