

Hudson Yards: The Digital Vision

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Technologically speaking, that's all part of the vision for the Hudson Yards mixed-used complex under construction on Manhattan's West Side. It's a massive \$25 billion project, considered the nation's largest private development, creating a new neighborhood out of what was long a barren portion of the city.

By 2025, when the project is expected to be completely finished, an estimated 125,000 people a day will work in, visit or call Hudson Yards their home. There will be five commercial office towers, 4,000 residences, one million square feet of retail and restaurant space including the city's first Neiman Marcus, several upscale restaurants curated by chef Thomas Keller, The Shed for cultural events, 14 acres of public open space, a public school and an Equinox branded luxury hotel.

With all that, there's a singular opportunity to deliver the latest in technology leading to energy conservation, cost reductions and a higher quality of life for workers, residents and visitors to Hudson Yards.

The temporary stair tower at the base of 35 Hudson Yards, the site's only mixed-use tower. Photo courtesy of Joshua Scott

"We are looking at a digital city, a digital neighborhood, embodying a degree of connectivity that allows you to interact with the environment in different ways," said Jay Cross, president of Related Hudson Yards, who is leading the development of the 28-acre site and brings a special perspective to the project, having been a driving force behind the MetLife Stadium in New Jersey, the American Airlines Arena in Miami and the Air

Canada Centre, and once president of the New York Jets.

“We are building so much mass that you think of it in terms of a small city — a neighborhood from scratch,” Cross said. “What makes it unique is that it is all brand new. It’s not like we are renovating buildings. We are not like the Navy Yards in

Brooklyn, where you are building a whole neighborhood, too, but basically converting an industrial zone to a new use. We are creating something that didn’t exist. What’s interesting is that it is not a homogeneous campus. It’s not all office buildings. It’s not all apartment buildings. It’s not all retail. It is all of the above. And that makes for a pretty complex interaction of buildings.”

“It’s about having a combination of the latest, cutting-edge technology, an information flow, connectivity, but we want you to get into the physical experience around you — the restaurants, the food hall, the retail stores, the special services, everything,” said Ken Himmel, president and chief executive officer of Related Urban. “Put your devices down and experience what you physically encounter.”

Himmel said Marigay McKee, former Saks Fifth Avenue president and Harrods chief merchant and a consultant, will help Hudson Yards devise new kinds of experiences, ranging from on demand car sharing services that transcends Uber to iPad-equipped “roving ambassadors” through the retail-restaurant complex who act like concierges. “Let’s give it that human element, like a luxury hotel,” Himmel said.

While Himmel has been focusing on the retail and restaurant experience, and pulling together the right assemblage of tenants, Cross has been focusing on technology — what it will mean and what forms it will take. “We are building now a technology team,” which will include network operations and design staff, a chief digital officer, members of the existing technology group at Related, and with participation from Intersection, a technology and media company, and Sidewalk Labs, which develops “smart” solutions to urban problems. Intersection and Sidewalk Labs are both tenants at Hudson Yards.

In a “dumb city” as opposed to a “smart city,” Cross explained, concerns center on getting power and utilities to each building. “The challenge that we have is that expectations today in a new environment are different than they once were. We have all these mix of uses and 50 percent of open space, so when people enter the campus, be they a resident, office worker, a ceo, a visitor, shopper or a retailer, they have certain expectations as to what technology should be available to them.” Scores of user experiences for visitors and residents, for greater control over environments in terms of energy consumption, custom solutions and special content are being developed, as varied as gaining building access to ordering food, or getting directions or



getting a Citi Bike, or being notified about events, retail promotions and restaurant specials.

Cross emphasized finding “common sense ways of knitting the technologies together. We are finding that there are really very few, if any, examples that we can look to for guidance.”

A key objective is to technologically link different buildings and their operations “so they can talk to each other....If you look at the building industry, there are a lot of technologies embedded in structures — building management tools that turn the air-conditioning on and off that are unique to the control system that manages the building. Security technology that is unique to the turnstiles. Elevator technology that is unique to each elevator manufacturer. If you really want to understand where people are in a building at any given time, you want security to talk to elevators, to talk to the cameras,

to talk to the building management system. You want the building to do more for people than simply having these silos of technology that don’t communicate with each other. So that’s the biggest challenge....We want the buildings to be able to communicate with each other so, for instance, you don’t [need] six engineering centers in six buildings. We can have two that control the six buildings.

“When we talk technology, it’s not so much apps,” Cross noted. “It’s more like networks. We are building networks into the whole campus and the one that people refer to most commonly is Wi-Fi. If I walk into a public space, I need to have a lot of Wi-Fi available. People want more and more capacity. So that if we

have 3,000 people gathered in a public space on New Year’s Eve and we put on a spectacular event, they are all going to be uploading video. We have to have the capability to manage that, which is typical of what you would find in a stadium or an arena condition, but not normally in a public space. So the question becomes once they wander from a public space into a proprietary space, does the public sector Wi-Fi drop off? Do they go onto someone else’s Wi-Fi?”



Hudson Yards has been talking to major telecommunications providers to set a higher standard than is typical for public spaces and buildings with Wi-Fi and DAS connectivity. “It will be more than anybody needs for the foreseeable future,” Cross assured. “We will have a gazillion miles of fiber connectivity so there should be no challenges to be able to adapt to any new technology that comes along.”

There’s another side to the story. “It’s big technology — big infrastructure,” Cross said, citing the Hudson Yards co-gen plant that generates hot and cold water and serves as a backup if Consolidated Edison goes down. Technology enables environmental control, meaning monitoring building air quality, temperatures, traffic flow, people flow, public

events and deliveries, to expeditiously trigger adaptations for increased comfort, cost savings and so things run smoothly.

Hudson Yards is being built for resiliency. It's set on two huge concrete and steel platforms above the rail yards feeding trains into Penn Station, so the ground floor is high — 40 feet above the Hudson River — greatly reducing the risk of flooding. Only a few basements exist and each is “submarined” with big doors that shut tight and elevator shafts that are sealed off to reduce damage.

With the landscaping technology, there are challenges. Greenery is expected to be created where there could be very little soil due to the platform construction. The team must learn which plant species can adapt to this.

Also, Hudson Yards is mindful of the heat — up to 150 degrees Fahrenheit from the trains below, with their air-conditioning equipment — overheating and drying out the plants and soil. A network of tubing will circulate cooling water from the co-gen plant to protect the plants' roots and there will be a ventilation system powered by 15 fans, like

jet engine fans, that will supply fresh air to the tracks below. Hudson Yards will each year harvest about 10 million gallons of rainwater from building roofs and public plazas, which will be filtered for drinking and reused in the irrigation system for the plant life and for mechanical systems.

A central pneumatic vacuuming garbage system is being considered for the western half of the complex where there will be a majority of residential buildings. “The reason why that is attractive is many of these buildings are sitting over tracks, so we don't have basements with garbage rooms,” Cross said. “So how do we manage the day-to-day garbage? We have some loading docks, but we've got a lot of limitations. It lends itself to a centralized waste management system. We have 14 buildings. You don't want to have 14 dumpsters lying around if you can centralize. These will be big buildings [generating] a lot of waste.” Grinders, dehydrators and bioreactors will convert food-service organic waste to dry fertilizer.

Cross breaks down the approach to technology to five basic applications: connectivity, recognition, location, sensing and the integration of all of the above.

- Connectivity refers to Wi-Fi, DAS, the ability to connect to the world through handheld devices, and a “fiber loop” of utility trenches in the plaza to connect every building.
- Recognition is about identifying devices that can provide secure and speedier access to buildings.
- Location involves creating systems to track trucks and deliveries, geo-fencing, interactive mapping of the campus, monitoring social feeds and informing people of events.
- Sensing involves using cameras, beacons and sensors to monitor environmental conditions like air quality and temperature so buildings can adjust for greater comfort and cost savings, as well as understanding the flow of people to alleviate logjams or somehow encourage different traffic patterns.
- Integration is the result of the first four taken together to create solutions. An example would be a pass system in an office building for easier access, requiring phone recognition software to talk to building security software to talk to individual tenant security software, to talk to turnstile operating software, to talk to elevator dispatch software.
- “A lot of these systems are designed to only talk to themselves, not to each other,” Cross noted. “So creating an ‘integration bus’ is one of the big tasks. Think of it as a loop, an information highway, where data gets dumped into this bus, stored in the cloud and then gets pulled out in unique and different ways.”

On the security front: “We are planning to rely to a large degree on technology — cybersecurity, visual security, CCTV [closed circuit television] security, integrated security and our ability to track intelligence, if you will, and monitor social sites. Basically, it's about being proactive — managing what you think could be

threats or security situations, both in terms of preparing in advance and having a response. We

are going to have lots of major gatherings of people. They always present their own security challenges.” It’s a “robust” strategy for security in the works that can be noticeable to the public to a degree. “But you don’t want to be an armed camp, either. There is a fine line.”

Cross recalled that in the early days of developing Hudson Yards, “You sort of made generalized statements, like if the Con Ed grid goes down, we are going to be powered up, and you didn’t really know what you are saying. It took us three years to understand the co-gen business, what’s the regulatory environment we have to build it into, how do we design it, how big is it, and where is it going to go.” It’s situated on top of the retail-restaurant center. “Then we had to figure out how do we finance it.”

Cross is particularly excited about the potential to develop a “technology blueprint” in concert with retailers that would involve a high degree of shared information.

“A lot of mall operators are trying to monitor foot traffic and use technology to track people movement, shopping habits, things of that nature,” he observed. “We have a unique opportunity because people are going to be here for so many different reasons....There is a way in which we can use the data that is beneficial to everybody and it’s not proprietary or competitive. We will have more data than you would get typically.”

Asked if Hudson Yards might take beacon technology up a notch, Cross said, “That’s something we intend to do. Beacon technology is still in its infancy and it’s not necessarily clear how you use it well. It goes back to sensing, in signage kiosks we will develop with Intersection, there will be beacons. There will be air-quality sensors developed in partnership with NYU CUSP [Center for Urban Science and Progress]. There is going to be Wi-Fi. You are going to have a whole array of antenna and devices that we can use in different ways.”