DESIGN QUAR-TERLY

ISSUE 21

Stantec

ADAPTIVE REUSE

New life for buildings

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THOUGHTS, TRENDS AND INNOVATION FROM THE STANTEC BUILDINGS GROUP.

The Stantec Design Quarterly tells stories that showcase thoughtful, forward-looking approaches to design that build community.

ISSUE 21:

ADAPTIVE REUSE

New life for buildings

As the building industry refocuses its sustainability efforts on embodied carbon in buildings, building reuse is having a moment in the spotlight. While reducing emissions is a good justification for keeping that foundation and steel frame, it's not the whole story. The architectural character and materiality of older buildings is in high demand. In settings from business districts to malls, finding new uses for 20th century buildings is critical to reinvigorating these places for our age. We can't achieve all of this without understanding the financial hurdles to reuse.

In this issue, we look at office tower repositioning, the financial challenges to repositioning, a vision for Houston's Astrodome, heritage and decarbonization as drivers for reuse, and what revamped malls need to succeed.

GROWN IN THE Astrodome

PUSHING THE FRONTIER OF NET ZERO DESIGN

Six big ideas that drove our design competition concept to reuse an iconic stadium

BY DANIEL MASSARO AND SAMIRA ZARE MOHAZABIEH

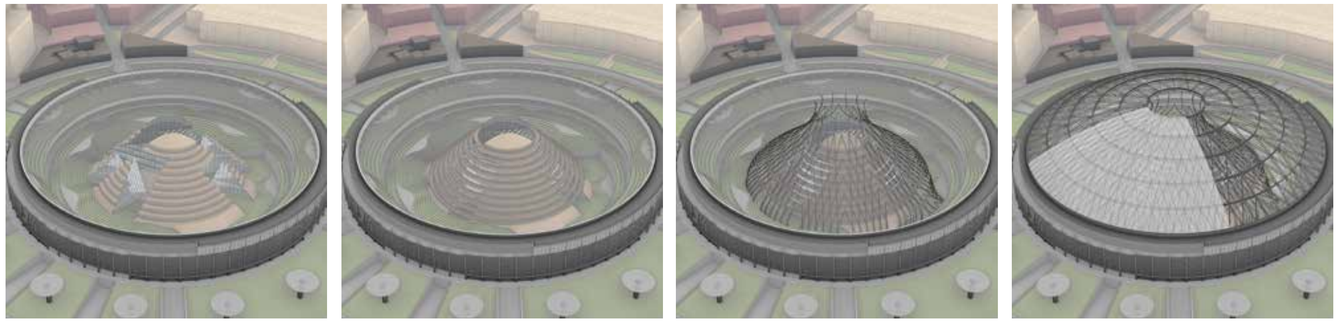
STANTEC'S LOWDOWN SHOWDOWN TEAM, THE CO2 CREW:
MICHAEL BANMAN, JAMES BERERTON, KYLE BOYKO, BRADLEY COWAN, AMIR FIROOZI, BEN JAVATE, WILLIAM KETCHAM, RUSSEL LAVITT, ANDERS MACGREGOR, DANIEL MASSARO, SAMIRA ZARE MOHAZABIEH, COREY LEB, CHINMAYEE PATIL, AADITYA PATEL, ADITYA POFIPIREDDI, KAT POLISCHUK, PETER SHARMA, AND AMIR TABADKANI

What if the Astrodome could be repurposed as a net zero agricultural center for a food scarce area?

Competition projects stretch our design thinking, show what's possible, and make room for innovation. They give us a chance to apply our designs, critical thinking, and collaboration to pressing issues facing society. They also give our designers a chance to collaborate across borders. ASHRAE, the organization which creates the standards for heating, cooling, and thermal comfort in buildings in the United States, holds a LowDown Showdown competition every year. In 2023, the challenge was to repurpose the famed Houston Astrodome.

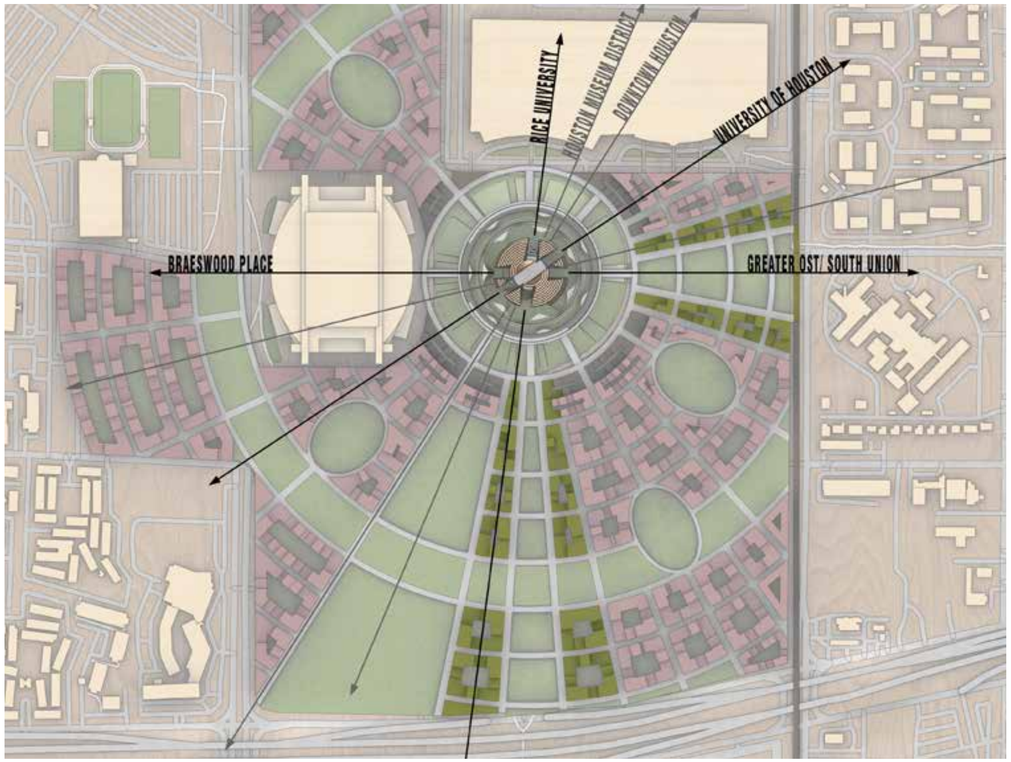
When it came to envisioning a new purpose for Houston's iconic Astrodome for a competition, we thought big, but realistic.

A design product of the space age, the Houston Astrodome represented an optimistic vision for architectural innovation when it opened in 1965. It was the world's first multi-purpose domed sports stadium. Its state-of-the-art systems could air condition 1 million SF of total floor area.



9.5 acres

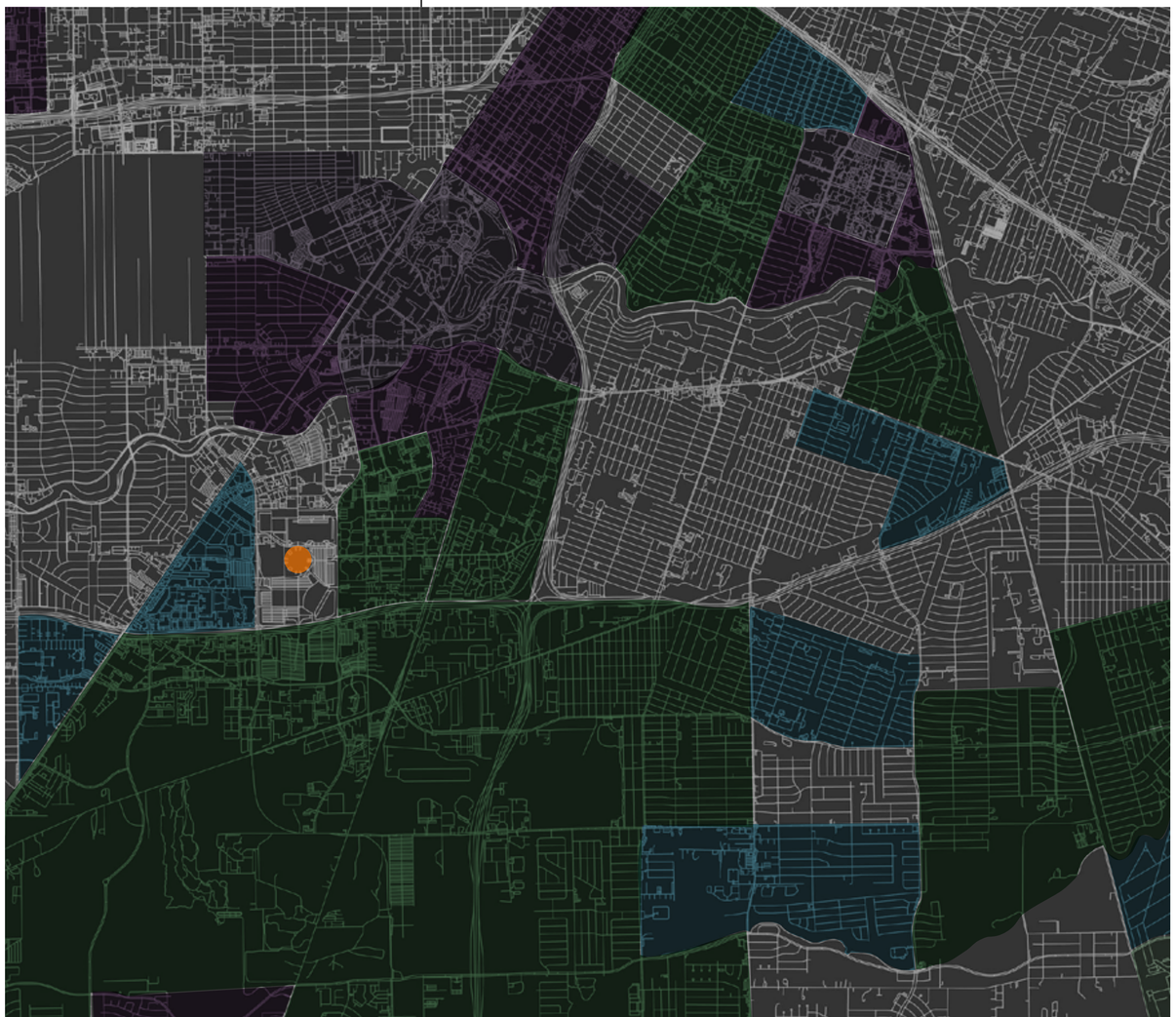
This Houston icon sits on a 9.5-acre site, but it hasn't been used since 2008 due to code violations.



AgriDome concept by Stantec's CO_2 Crew
Houston, TX

HOUSTON ASTRODOME FOOD DESERT

- **Astrodome**
- Low income and low access using a vehicle more than 1 mile away
- Low income and low access without vehicle access more than 1/2 mile away
- Low access using a vehicle more than 1 mile away
- Low access without vehicle access more than 1/2 mile away



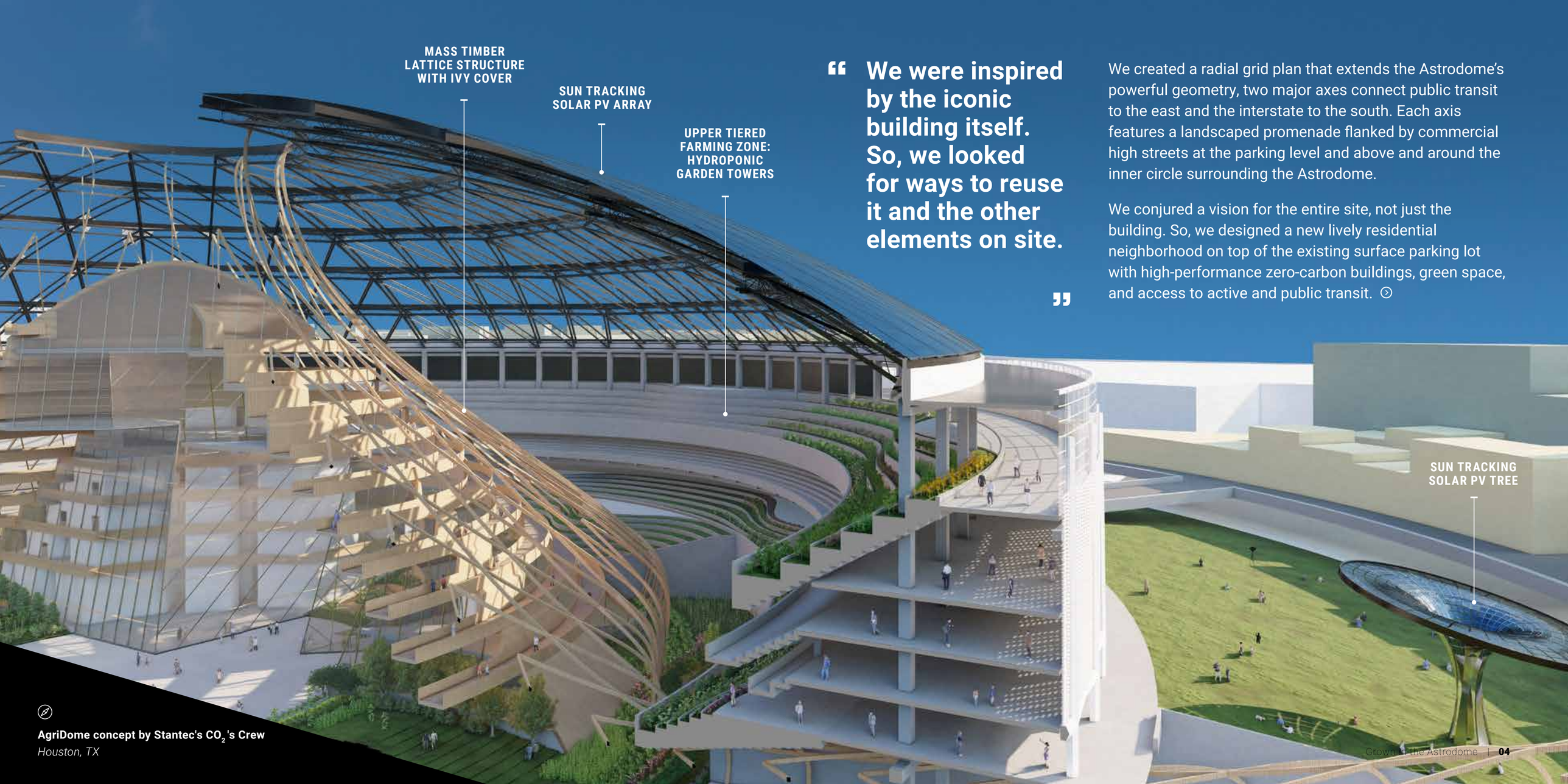
Excited by the scale of the challenge, our team, the CO_2 Crew, embarked on a mission: to craft an efficient structure that harmonized the stadium with its surrounding communities. Our vision evolved into repurposing the domed stadium into a terraced urban farm, featuring an education center and a community farmers market on site, plus new low-carbon residential buildings—a net zero community.

Our design for the competition reminds us how we can think big about design and execute innovative projects. We've streamlined our approach to six ideas that drove our design and can be applied to any project.

Draw inspiration from the wider context

When we looked closely at the neighborhood around the Astrodome, we saw a variety of needs that inspired us. In the area near the Astrodome, food security, affordable housing, and transportation are major issues. The site sits atop one of Southern Houston's largest food deserts. 500,000 homes are more than a mile away from a sustainable food source where they can get healthy food.

We looked for solutions to increase the overall resiliency of this community. Knowing that produce travels a long way in the U.S., we looked at programming the space to reduce food miles and increase access to fresh produce. That led us to look at the possibility of a large urban farm.



AgriDome concept by Stantec's CO_2's Crew
Houston, TX

> **We were inspired by the iconic building itself. So, we looked for ways to reuse it and the other elements on site.**

We created a radial grid plan that extends the Astrodome's powerful geometry, two major axes connect public transit to the east and the interstate to the south. Each axis features a landscaped promenade flanked by commercial high streets at the parking level and above and around the inner circle surrounding the Astrodome.

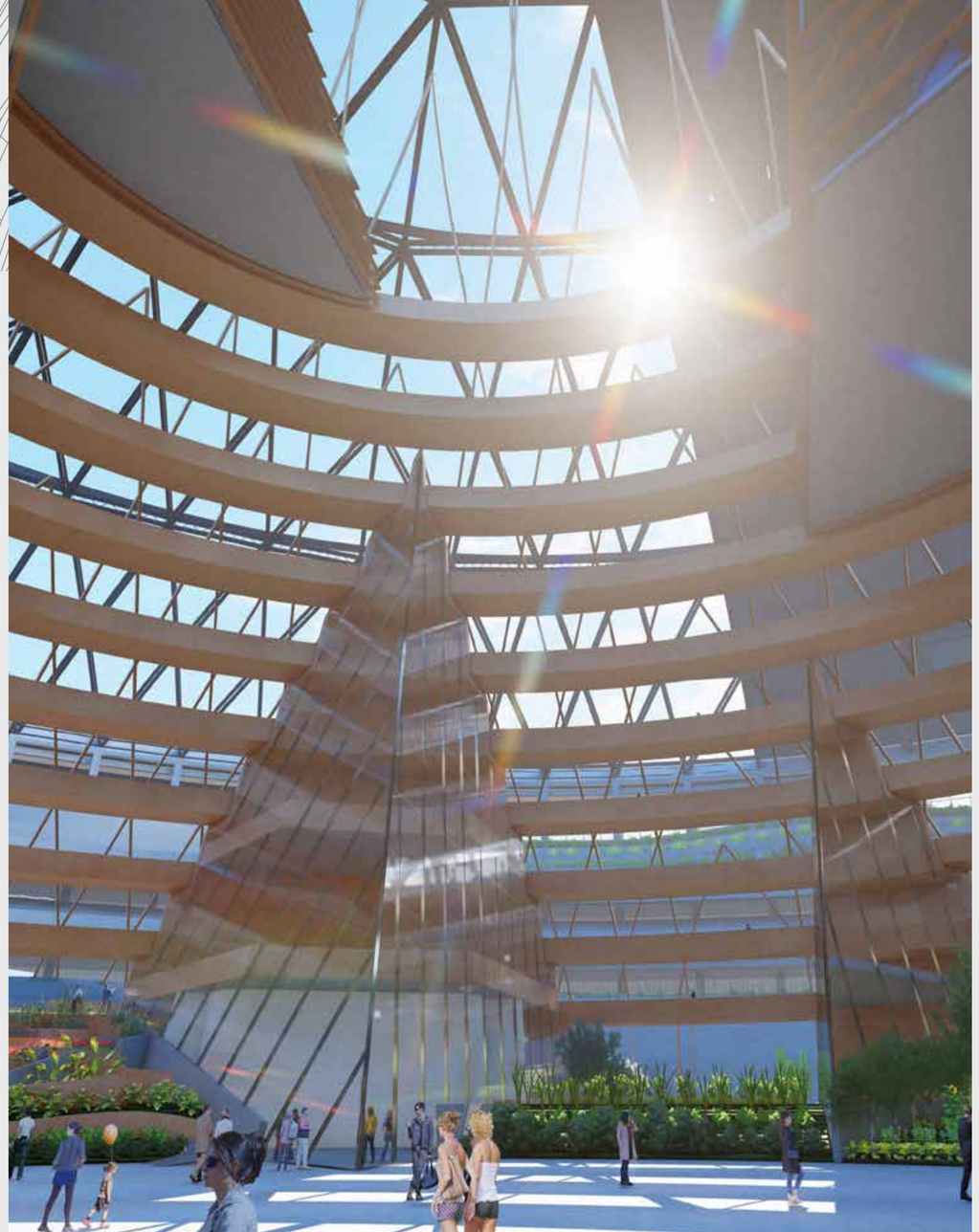
We conjured a vision for the entire site, not just the building. So, we designed a new lively residential neighborhood on top of the existing surface parking lot with high-performance zero-carbon buildings, green space, and access to active and public transit.

Social equity and wellness

The repurposed Astrodome can make a difference in social equity and wellness—offering healthy food, jobs, and housing in an area where many current residents face challenges.

We gave the Astrodome several new identities, each of which becomes a community asset: a terraced urban farm, an education center, and a community farmers market.

The urban farm provides the community with immediate access to fresh sustainable produce. Repurposing the stadium as an agricultural facility gave us 4.5 acres of farmland.



In addition to traditional forms of farming, we added zip-grow towers that quadruple the yield.

The education pyramid supports learning, sustainable community development, and commerce. It features classrooms, research and exhibition spaces, a library, bike storage, two theaters, a café, and a restaurant. These amenities are all contained within a pyramid shape which lines up with some of Houston's prominent landmarks. The public plaza at the heart of the education center acts as a community hub activated by a farmers' market and cultural events.

Climate resiliency and sustainability

Flooding is a major issue here. Houston has been called America's rainfall flooding capital. Our agricultural project and community requires water. What kind of strategies can we employ to prevent flooding, conserve and use rainwater, and irrigate the farm?

We raised the new neighborhood on a plinth above the existing parking lot to make it flood resilient. Inside the Astrodome, our grow towers not only exponentially increase the volume of food the farm can produce, the misting they require creates beneficial microclimates. Additionally, these grow towers offer shade and cooling while improving air quality.

Water was a prime consideration. We incorporated rain gardens and green roofs to filter stormwater with porous pavement areas to mitigate storm water runoff. We proposed an integrated rainwater runoff system to recover rainwater and store it for flushing, farming, and irrigation. We calculated rainfall against time of use to optimize storage tank sizing. The rainwater and grey water recovery and storage we envision will eliminate 96% of typical freshwater use each year.

AgriDome Concept *Houston, TX*

Adaptive reuse and low carbon

Someone once said the greenest building is the one already built and so it goes many times over for the Astrodome. In our adaptive reuse of the existing large-scale structure, we avoided huge, embodied carbon emissions associated with demolition and building new. We chose lower carbon materials for our primary structure (mass timber) and specified lower carbon concrete and recycled steel for rebars. And we looked at Carbon Cure technology and a ***Mycelium-based product*** as a low carbon alternative to geofoam for insulation.

We optimized the landscape design with recycled foamed glass aggregate for backfilling. This lightweight material has a high recycled content and doesn't add significant structural load requirements. The above strategies cut our CO_2e by 33,281 tCO_2e, or 98% compared to baseline scenarios.

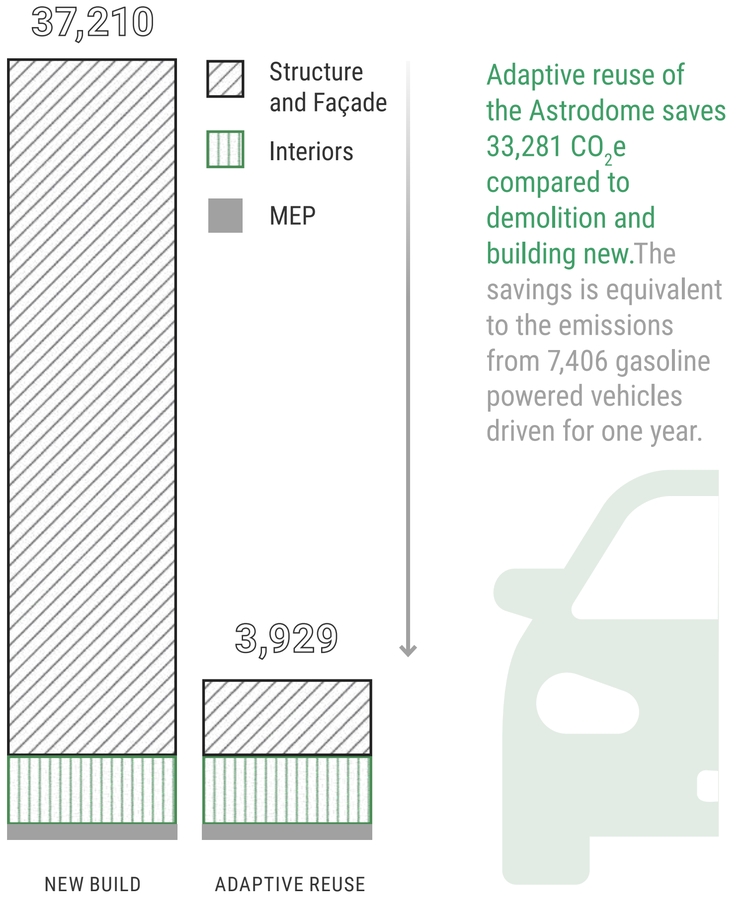
Optimized building envelope and glazing combined with the high-performance displacement ventilation system results in buildings with very low energy consumption. We applied a variety of engineering solutions to reduce energy use intensity in the new buildings, including borehole thermal storage. We designed this reuse project as a 100% electric building. And design offsets operational carbon needs using on-site renewable energy generation, mainly photovoltaics located on the Astrodome windows and in the surrounding perimeter greenspace. The PV array reduces operational carbon emissions by approximately 803 tCO_2e per year, achieving net zero carbon.

The raised carbon-neutral concrete plinth significantly lowers the heat-island effect created by the vast sea of asphalt parking, while increasing the diversity of site activity.

Exploring and demonstrating possibilities

We explored design solutions that respond to the needs of the community, incorporating domestically available materials and highly efficient off-the-shelf mechanical and electrical systems. Everything we proposed is buildable and realistic from a high-level cost analysis perspective. In this way, our design proposal for the Astrodome serves as a demonstration of what is possible in community development from a design for reuse perspective.

Embodied carbon footprint (CO_2e)



Adaptive reuse of the Astrodome saves 33,281 CO_2e compared to demolition and building new. The savings is equivalent to the emissions from 7,406 gasoline powered vehicles driven for one year.

Using parametric design applications, we created more than a hundred possible design iterations. We considered external wall insulation, glass thermal and optical performance, horizontal shade depth and distance, and ventilation mode (hybrid vs. full air conditioned). We prioritized the energy use intensity (EUI), daylight autonomy (DA), discomfort glare risk, and indoor thermal comfort in evaluating designs.

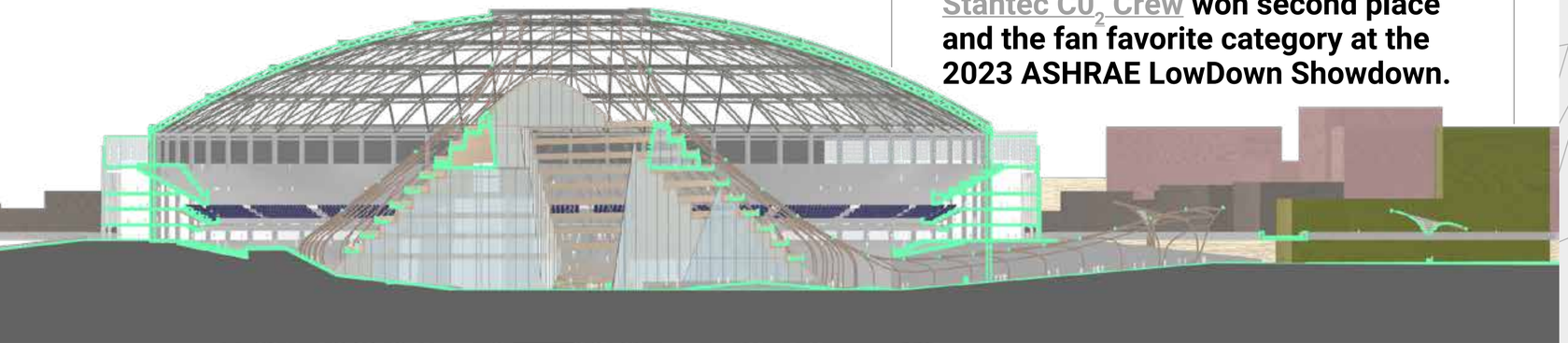
Many of the ideas that we explored didn't fit, of course. But the abandoned ideas are just as important as the ones we incorporated, because we can see how they might be used elsewhere. We looked at creating thermal comfort through natural ventilation, but it would have had a minimal impact on total energy use that didn't justify its cost and complexity. We examined ⊙

the need for high efficiency glass but found that a louver system to provide shading on the pyramid structure worked well at lower cost. We thought about incorporating wind generation and sail turbines, but we couldn't justify it.

(including borehole thermal storage) to a project in Boulder, CO with stringent low carbon requirements. So, while our AgriDome project itself may never take flight, the innovative approaches to net zero design we employed will live on in the next generation of our designs.

Using what we learned

Competitions can be exercises in imagination—concepts that may never be built. The question is, how can we make that fantasy a reality? In this case, we're already taking what we learned from the LowDown Showdown idea and applying it to real buildings that we're designing. We recently brought in some of the engineering innovations applied on the Astrodome competition entry



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MORE SUSTAINABLE BUILDINGS

Based in Chicago, IL designer **Daniel Massaro** is a member of our Digital Practice support team and the Chicago Digital Delivery team. His work combines an expertise in computational design, advanced BIM workflows, advanced 3D modeling and visualization. Sr. Sustainable Building Specialist and Carbon Impact team regional lead for Colorado and US Mountain region **Samira Zare Mohazabieh** is based in Denver, CO. She is committed to promoting integrated sustainable design and advocating for the business case behind sustainable development and resilience in the built environment.

Stantec CO_2 Crew won second place and the fan favorite category at the 2023 ASHRAE LowDown Showdown.

Reducing Energy Intensity

Before turning to photovoltaics, we applied a variety of engineering innovations to achieve operational carbon efficiency, resulting in buildings with low appetites for energy. Our approaches included:

GLAZING AND AIR

We optimized the building envelope and window placement to avoid solar gain, and used a displacement ventilation system.

LIQUID DESICCANT LATENT SUB-COOLING

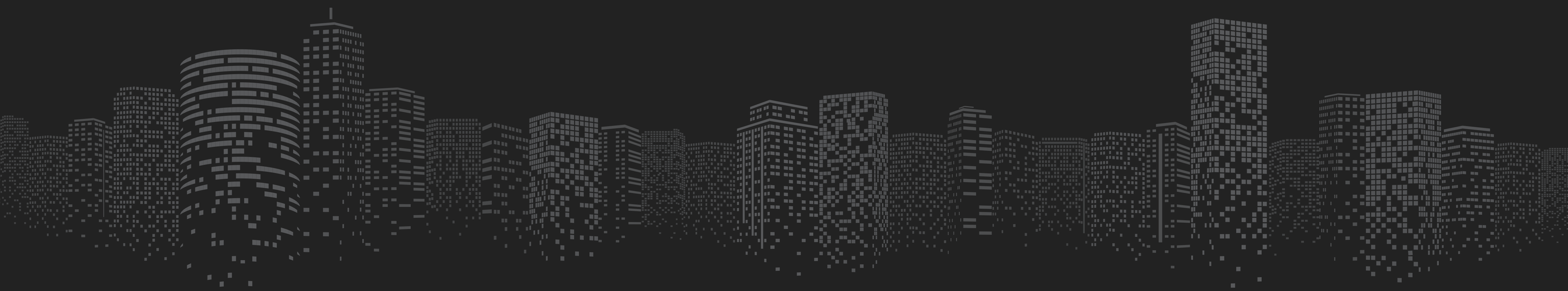
Making the air extra dry via a liquid desiccant allows for direct evaporative cooling.

NIGHT SKY RADIATIVE PASSIVE COOLING

The PV/thermal array radiates heat to the night sky. This can generate passive cooling -12 to -6°C (10-20°F) cooler than the ambient air temperature. This improves chiller performance.

BOREHOLE THERMAL STORAGE

We can generate cold energy during the winter and store it in the borehole thermal energy field.



PREPARING FOR BUILDING PERFORMANCE STANDARDS IN CITIES

What can building owners and tenants do to adjust to decarbonization's new green building policies?

BY KATIE FORMOSO AND BETH TOMLINSON

American cities are targeting carbon emissions in new building performance standards. Property owners, developers, and tenants should prepare themselves for these green building policies.

They can look to the example of New York City, where emission limits take effect this year. But they'll need to be aware of local particularities in the new green policies to understand how they will affect their portfolios. Many will need to get started with a decarbonization strategy.
On the double.

WHAT'S HAPPENING WITH GREEN BUILDING POLICIES?

America's cities are taking on building decarbonization. They are targeting emissions reductions in buildings in this decade and the next with new reporting requirements and regulations for building owners. These laws, often known as building emissions performance standards (BEPS), vary from city to city in scope, timeline, targets, incentives, and enforcement mechanism. Some cities are adding laws to regulate embodied carbon, in addition to those for operational emissions. We have experience helping building owner clients in New York City adjust to new reporting and regulations. And we have some insights on what the changing mandates for building decarbonization mean for building owners in other cities across America. ›

WHAT KIND OF **BUILDING PERFORMANCE STANDARDS** ARE CITIES IMPLEMENTING?

CITY: New York City

POLICY: Local Law 97 (LL97)

BUILDINGS: 25,000 SF and above

COMPLIANCE: This law sets carbon limits that tighten every five years and creates a series of annual fines for exceeding those limits. New York begins enforcing compliance in 2024. It phases in stricter limits in 2030 and 2035. LL97 imposes fines for buildings that exceed carbon emission limits.

GOAL: **40% reduction in aggregate greenhouse gas emissions from buildings by 2030**

CITY: Seattle

POLICY: Building Emissions Performance Standard (BEPS) Policy

BUILDINGS: 20,000 SF and above

COMPLIANCE: Beginning in 2027, they must document their performance. And in 2031-2035, they must meet greenhouse gas intensity targets. Seattle phases in more intense targets in 5-year increments through 2050.

GOAL: **Reduce buildings emissions by 40% by 2030 and hit net-zero carbon emissions by 2050.**

CITY: Boston

POLICY: Building Emissions Reduction and Disclosure Ordinance (BERDO)

BUILDINGS: Large existing buildings (residential buildings with 15 or more units and non-residential buildings that are 20,000 SF or larger)

COMPLIANCE: Building owners need to report the total energy and water use every year and get third-party verification in certain years. Compliance begins in 2025 or 2030, depending on building size. Building owners can make Alternative Compliance Payments (ACPs) for buildings exceeding their emissions limit.

GOAL: **Net zero emissions for all buildings by 2050**

CITY: Denver

POLICY: Energize Denver

BUILDINGS: 25,000 SF or larger

COMPLIANCE: Buildings must meet an EUI (energy use intensity) target by 2030, with interim targets in 2024 and 2027. Existing buildings must submit annual performance data and meet the city's energy use targets.

GOAL: **65% emissions reduction by 2030 and 80% by 2040, compared with a 2019 baseline.**

CITY: Washington, D.C.

POLICY: Washington, D.C.'s Building Energy Performance Standard (BEPS)

BUILDINGS: Phasing in benchmarking for all privately-owned buildings larger than 10,000 SF. Phasing in compliance for private buildings larger than 50,000 SF.

COMPLIANCE: Starting in 2024, all buildings over 25,000 SF require energy and water benchmarking, with third-party verification. It offers five pathways for compliance with penalties for non-compliance based on building size.

GOAL: **Reduce greenhouse gas emissions and energy consumption by 50% by 2032, compared with a 2006 baseline.**

CITY: Chicago

POLICY: The Chicago Energy Benchmarking Ordinance passed in 2013.

BUILDINGS: All existing commercial, institutional, and residential buildings larger than 50,000 SF

COMPLIANCE: Large buildings report their annual energy use and require verification every 3 years.

GOAL: **Reduce greenhouse gas emissions by 26-28% by 2025, compared with a 2005 baseline.**

Los Angeles is following the state-level mandate of California. The state has set ambitious goals for carbon neutrality by 2045. It is providing resources for building owners and tenants to improve their energy efficiency and reduce their carbon footprint.

Cities such as Milwaukee, Minneapolis, and Philadelphia are not far behind. All are considering or have passed stringent code regulations for buildings.

WHAT SHOULD BUILDING OWNERS AND TENANTS DO TO ADJUST TO NEW BUILDING PERFORMANCE STANDARDS?

Know the deadlines and implications for the new laws. In New York, we're often helping clients understand how and when Local Laws 97 and 88 will affect them and what fines that might incur if they don't meet code. For some, we provide education and guidance, and for others we're engaging in studies to inform their capital investment plans.

Look at the influence Local Law 97 is having in New York City. New York is the first major American city to implement fines for buildings that exceed carbon emission limits. Building owners are asking for help, and they are looking for strategic decarbonization plans which will provide them with a positive return on investments and help avoid fines. But there's a lot of complexity to how the regulations are playing out in today's marketplace they need to understand as well.

Consider how regulations will reshape the market. What will be the impact of the regulations on leasing, selling, and repositioning buildings in your city?

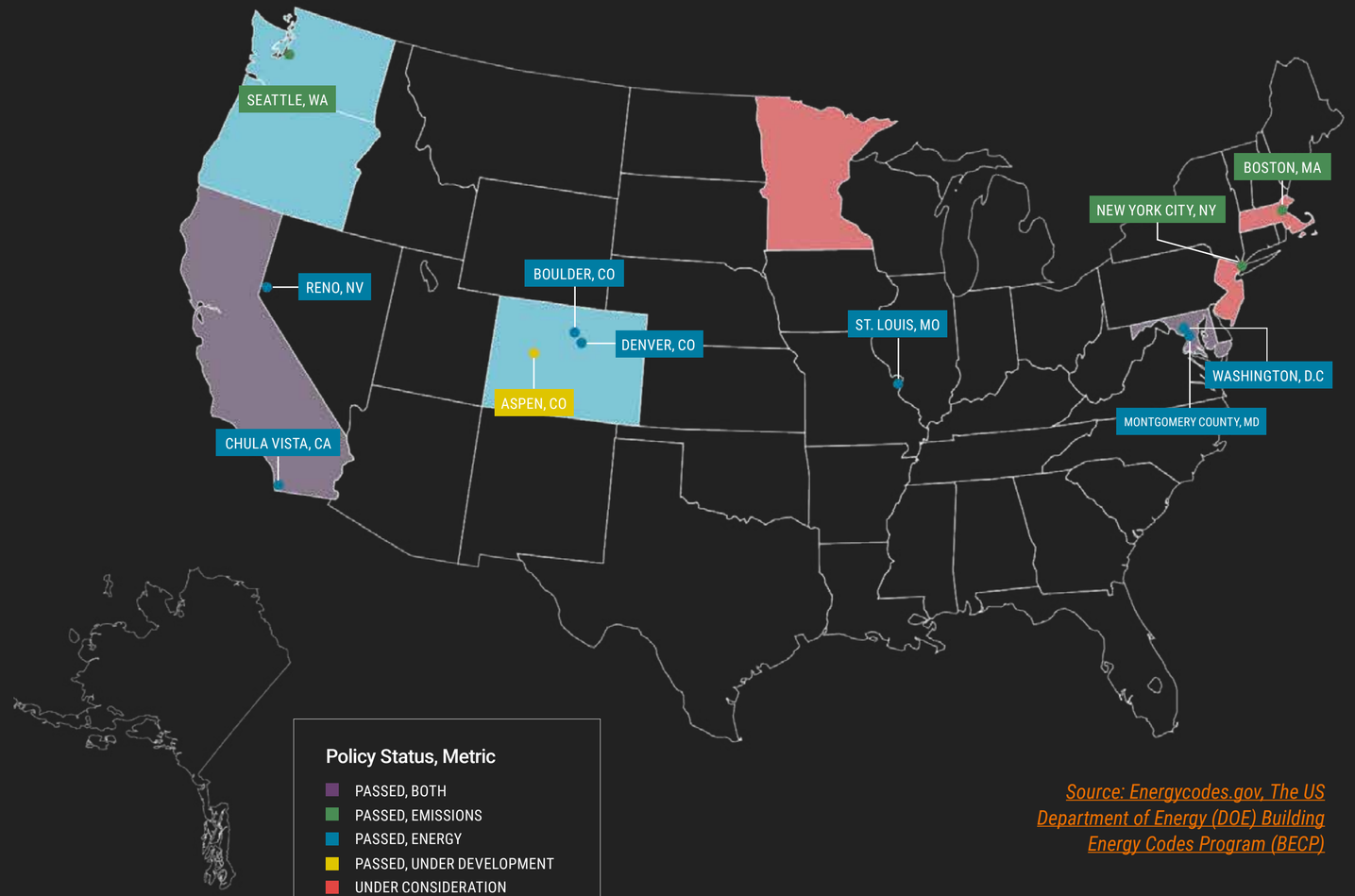
In New York, the law is influencing leasing. Clients who are looking to lease space in buildings are seeing verbiage in their lease that says the fines incurred from LL97 will be passed on to them. So, while landlords are competing to lease their spaces, they're also dropping in language about the fines from LL97. This is something that brokers and tenants need to know.

Also in New York, we can already see assets that are well positioned for the new code are highly desirable in the market. Tenants are gravitating toward the greenest buildings, those that have already been built or retrofitted for low emissions. This compounds the market advantage for greener buildings or retrofitted buildings, which are less likely to incur fines. Those that don't meet standards will be downgraded and risk becoming stranded assets. What do you do with aging buildings that are not performing well? LL97's effects will be felt for many years.

Monitor your energy consumption and greenhouse gas emissions using tools like Energy Star Portfolio Manager. City governments usually require several years of tracking and reporting from building owners before they begin to enforce compliance. An owner can install submeters for their tenants, which can help clarify demand ownership.

Building Performance Standards

Building Performance Standards (BPS) require and incentivize existing buildings to meet energy and/or greenhouse gas emissions-based performance targets over time. BPS policies and laws, when combined with building codes regulating new construction, are a powerful tool for state and local governments to reduce the carbon impact of the built environment. The US Department of Energy (DOE) Building Energy Codes Program (BECP) supports building energy code adoption and implementation.



Source: Energycodes.gov, The US Department of Energy (DOE) Building Energy Codes Program (BECP)

Consider the low-hanging fruit. Implement lower cost measures to improve building energy efficiency and meet standards; upgrade your lighting to LED, install occupancy sensors, and add insulation where needed. Consider replacing systems nearing their end of life with new, efficient, electricity-ready models. Take advantage of planned capital expenditures to improve return on investment.

Some of our tech industry clients in NYC have already taken action to reduce their emissions with updated systems and lighting as part of a multi-year phased approach to decarbonization. Others are engaged in more intensive retrofitting and energy transition as part of a comprehensive decarbonization strategy.

Seek financial incentives and resources from state-level green banks, federal agencies, or city-level programs. These resources can help offset the cost of retrofitting or repositioning your buildings. Denver provides funding for small, minority, and women-owned businesses to become more sustainable, for example. Boston offers funding for energy assessments for income-restricted residential buildings. And New York has a state-sponsored NY Green Bank tasked with filling the financing gaps in sustainable infrastructure and energy markets. Federal tax credits are available for some HVAC and energy system changes.

Start developing a comprehensive building decarbonization strategy today. You will want to craft a strategy that can respond not only to emerging regulations, but to your organizational goals, long-term strategy, and local market direction.

You can start with an energy audit. We've conducted green audits for clients, looking at all their facilities across the nation and identifying ECMs (energy conservation measures), associated costs and payback. A recent audit for a national client showed that recommended implementation would result in a 49% reduction in utility costs and a 48% reduction in overall building energy use with a payback of about 11 years.

Building owners and operators in other cities might be asking, what about us? Now is a good time to get familiar with the building decarbonization programs your city or state is considering. You can track municipal energy codes at the government's Energy Codes website. Chances are good that there are more performance standards coming soon.

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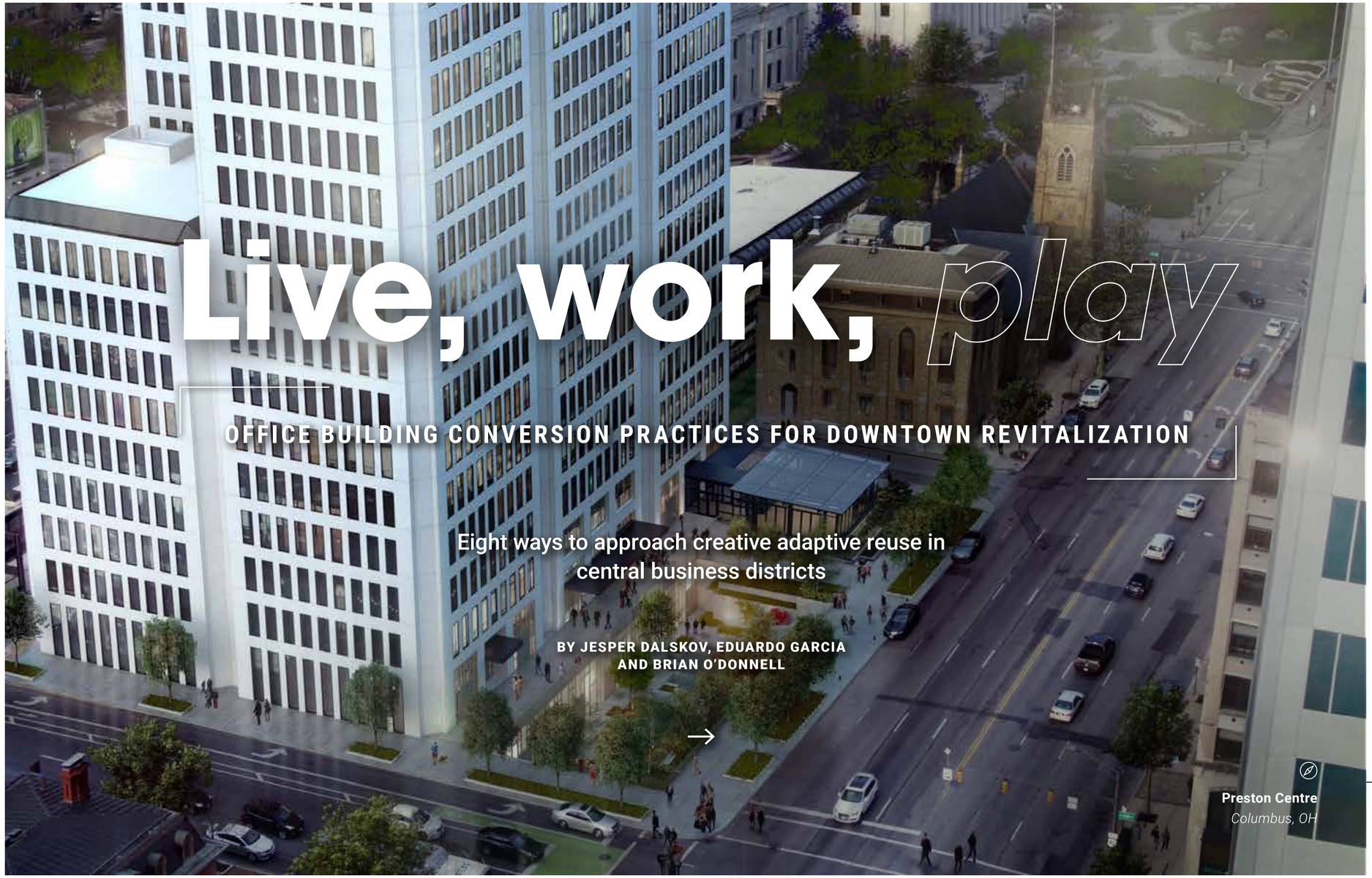
MORE DECARBONIZATION

Based in New York City, **Katie Formoso** is Stantec's Workplace & Office Repositioning Market Lead. Stantec's Carbon and Climate Discipline Leader **Beth Tomlinson** is based in Minneapolis.



Live, work, *play*

OFFICE BUILDING CONVERSION PRACTICES FOR DOWNTOWN REVITALIZATION

Eight ways to approach creative adaptive reuse in central business districts

BY JESPER DALSKOV, EDUARDO GARCIA AND BRIAN O'DONNELL

Preston Centre
Columbus, OH

Downtown business districts in North America no longer get the 9-to-5 traffic they once did.

The emergence of hybrid and remote work, aging 20th century office building stock, and relocation of previously stalwart tenants to newer confines has resulted in an activity drain in central business districts. Many older office buildings are experiencing declining occupancy. This leaves building owners with the question of what to do with an excess of available space -- and city planners and developers looking for solutions to invigorate these districts.

Meanwhile, housing affordability is a persistent issue, especially in urban cores. There is, however, a popular desire to experience authentic places with history and culture that these districts can leverage.

Monroe Hotel & Residences
Chicago, IL
Project renderings courtesy of Prime/ Capri

Can we repurpose these buildings to serve the city's changing needs? Under the right conditions, yes. The answer lies in thoughtful and creative adaptive reuse.

In Chicago, we are designing the 740,000 SF Monroe Hotel and Residences in the former BMO Harris Bank headquarters, a 24-story landmark in the heart of the LaSalle Street Historic District. Our recent work in Chicago's Loop exemplifies the possibility of design for transforming downtowns. And in Columbus, Ohio, we have designed a mixed occupancy conversion of a 24-story modernist office tower at 155 E Broad Street called Preston Centre.

With these experiences in mind, here are eight best practices we endorse for taking on downtown building repositioning.

Embrace authenticity.

For the Monroe Hotel and Residences, we were given two historic towers to work with—the classical, original 1910 Harris Bank & Trust building and a 1958 stainless steel and glass addition in the style of Mies Van Der Rohe. Our design needed to celebrate these buildings and connect the new uses of the buildings to the public's passion for Chicago's architectural heritage.

The result is a design that preserves and celebrates the towers' facades, while incorporating contemporary features and suitable amenities. New programming accents the building's attractive heritage. The Monroe Club, formerly a mid-century private club, is reimagined on the penthouse floor and hotel guests will enter through the Harris Bank's spectacular, century-old lobby.

In Columbus, the client's admiration for the 1970's tower's Italian travertine-cladding and passion for the city itself inspired the office tower reuse project. The client and team prioritized the building's architectural character and presence in Columbus' urban core. Its façade was not to be altered or penetrated. And we evaluated project updates on how they celebrated the building ⊙

The authenticity of historic buildings is something that you can't replicate.

and fostered a connection to the street level. Preston Centre will include 105 residential units, 170,000 SF of office space, plus ground-floor retail. Neighboring the historic Trinity Episcopal Church, this mixed-used project is intended to bring vibrancy to the city's downtown.

Pivot to new uses that meet demand.

North American cities are struggling to meet the demand for affordable housing. And downtown workers often face long commutes from the places they can afford. Cities are responding. As one example, Austin, Texas plans to create 60,000 units of housing for those making less than 80% of the median family income.

Our original idea for the former financial services office building in Chicago was to combine new residential floors with renovated office spaces in a multipurpose building. But the market conditions showed our client that a better fit would be a residential and hotel combination.

Affordable apartments on or near LaSalle within Chicago's Loop are scarce. Designing for the whole building allowed us more freedom to approach design for the combined towers. We designed the Monroe Hotel and Residences with 345 apartments on its upper floors, of which 105 apartments will be set aside as affordable for tenants with income at an average of 60% of the area median. The Monroe offers downtown workers a short commute and immediate access to a walkable urban lifestyle.

But the building is simply too big to be 100% residential. With our client's experience in hospitality, a hotel emerged as the best option for reuse of the lower portion of the building. An approximately 300-room hotel will occupy the first 11 floors with a ground level fine dining restaurant plus a rooftop bar with swimming pool.

MONROE HOTEL & RESIDENCES

TO LIVE

345 units
105 affordable

TO STAY

300-room hotel

Early concept rendering for courtyard at Monroe Hotel & Residences *Chicago, IL*

Revitalize downtown areas.

Office vacancies in the U.S. reached a record-breaking 19.6% at the end of 2023, according to Moody's Analytics. The ongoing decline in office space occupancy initiated by "flight to quality," and accelerated by the pandemic and advanced by work from home, has left many older central business districts (CBDs) with shuttering restaurants and struggling retail.

Converting aging, run-down office buildings to residential apartments offers new life to these districts. And the economic ripple effects of infusing CBDs with new residents should extend beyond the 9-to-5 workday, a potential boon to retail and services and downtown economies in general.

Ideally, the greater residential density will be followed by public amenities (schools and parks) and commercial uses (grocery stores). This allows people to live, work, and eventually play in the same neighborhood.

For many downtowns, converting surplus office space to meet the need for residential apartments in business districts through adaptive reuse is a natural fit. It's catching on. The number of office-to-apartment conversions in major cities has risen from 12,100 in 2021 to more than 55,000 scheduled for this year, according to ***BisNow***.

Turn physical challenges into opportunities.

We know from experience that surprises sometimes lurk inside older buildings—in their materials, obsolete systems, and inefficient layouts. But they also offer us space to program and create the dynamic, mixed-use environments that today's cities need.

At the Monroe Hotel and Residences, the reimagined building will get upgraded, high-efficiency systems for cooling and heating. These new compact systems will leave us with superfluous mechanical spaces that we can repurpose as amenities. For example, we are transforming the former mechanical penthouse from the bank headquarters into a lounge with an outdoor deck and pool for hotel guests. And we repurposed two entire former mechanical floors for apartments.

Our design solution for the Chicago conversion also takes advantage of three levels below the building for adaptive reuse with 130 valet parking spaces for residents and guests.

Elsewhere, the building's character offers aesthetic opportunities in reuse that would be cost prohibitive in a new building. The stunning midcentury building offers full-height glass and spectacular views for residences.

Be bold and visionary.

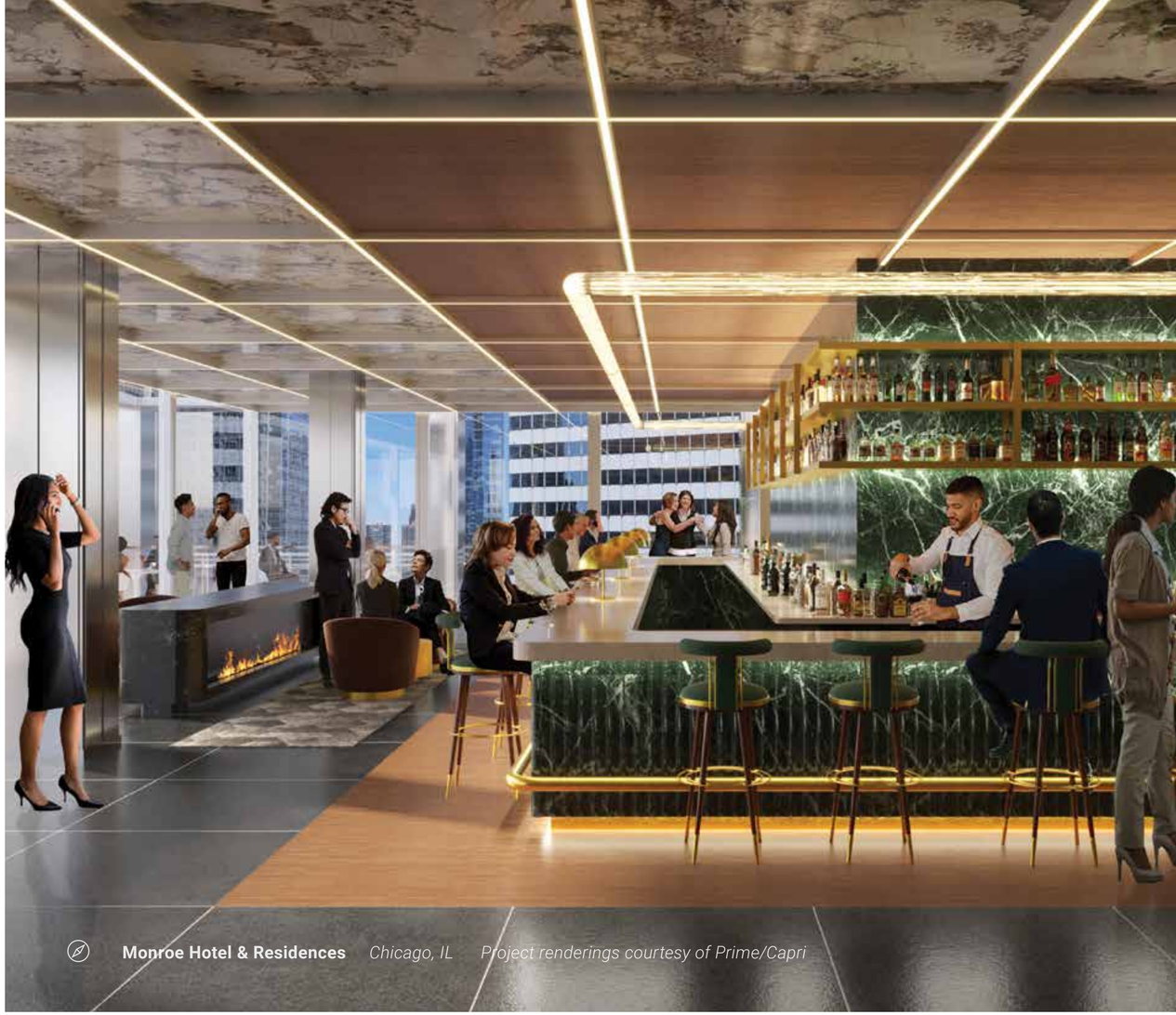
Adaptive reuse designs should do more than meet basic market requirements, they should inspire.

In Columbus, our collaboration with the client resulted in a design which reaches out to the streetscape with a landscaped plaza featuring a Japanese-inspired sunken garden, waterfall, and pond that will be open to the public daily. The new mixed-use building will feature a glass-enclosed fine dining destination.

These details are designed to enhance the character of the neighborhood and bring new dynamism to the city's downtown. Preston Centre will eventually connect to a large-scale redevelopment of downtown Columbus that includes a park inspired by New York's High Line.

Throughout the interview and design process for the Monroe project, the client responded to the strength of our vision for the building and the district itself. We envisioned a building where life happens, a place for live/work/play, in a district that has all the elements of a 24-hour city. Our design activates the rooftop deck and atrium spaces as new destinations for the public.

One challenge was reconciling the building's previous use with its new role. While office interiors don't require windows in every room, residential units do—for light and ventilation. We created a courtyard within the building to deal with the large floor plates and bring natural light and ventilation to the center of the building. Our design carves a 60x70-foot courtyard, 19 stories tall, with a full-height feature wall into the



Monroe Hotel & Residences *Chicago, IL* *Project renderings courtesy of Prime/Capri*

building without altering street-facing facades. The new apartments and hotel rooms have access to fresh air and daylight and views into the verdant interior courtyard.

Select the right building.

Building repositioning projects are a complex endeavor in today's environment. To succeed, a project must make financial sense and offer space that meets market needs in an appropriate location. It must offer return on investment.

Some buildings make better candidates than others, usually those where little modification is required. Look for buildings with windows on four sides, smaller manageable floor plates, well placed stairs and elevators, and façades that won't require significant renovation. For older buildings, historic landmark status can provide tax credits. And the architectural beauty and character of a historic building has a charm that is difficult to replicate.

For the Monroe Hotel and Residences, we had to design apartments with the dimensions and amenities that were appropriate to Chicago's residential market. We laid out the residential floors efficiently with units sized so they could be priced attractively.

Suburban office properties are stressed as well, often vacated, or left with extremely low occupancy. Unfortunately, these properties don't have the inherent walkability, neighborhood amenities, and access to public transit found in CBDs. Thus, their value for conversion to residential rarely makes financial sense.

Minimize carbon emissions.

By its nature, a large-scale building reuse project has fewer associated carbon emissions than a conventional new building with demolition. Additionally, CBDs have excellent access to public transit, reducing the need for parking, and creating more housing within walking distance of areas with the highest density of jobs. The walkable nature of these conversions reduces emissions, too.

At the Monroe Hotel and Residences, we are saving a vast quantity of the embodied carbon spent on the materials and construction for the two towers, in their glass, their steel, their masonry, and their foundations. We didn't take the project's sustainability for granted. Whenever possible, we continued that low carbon approach throughout the design for reuse.

Embrace incentives for adaptive reuse.

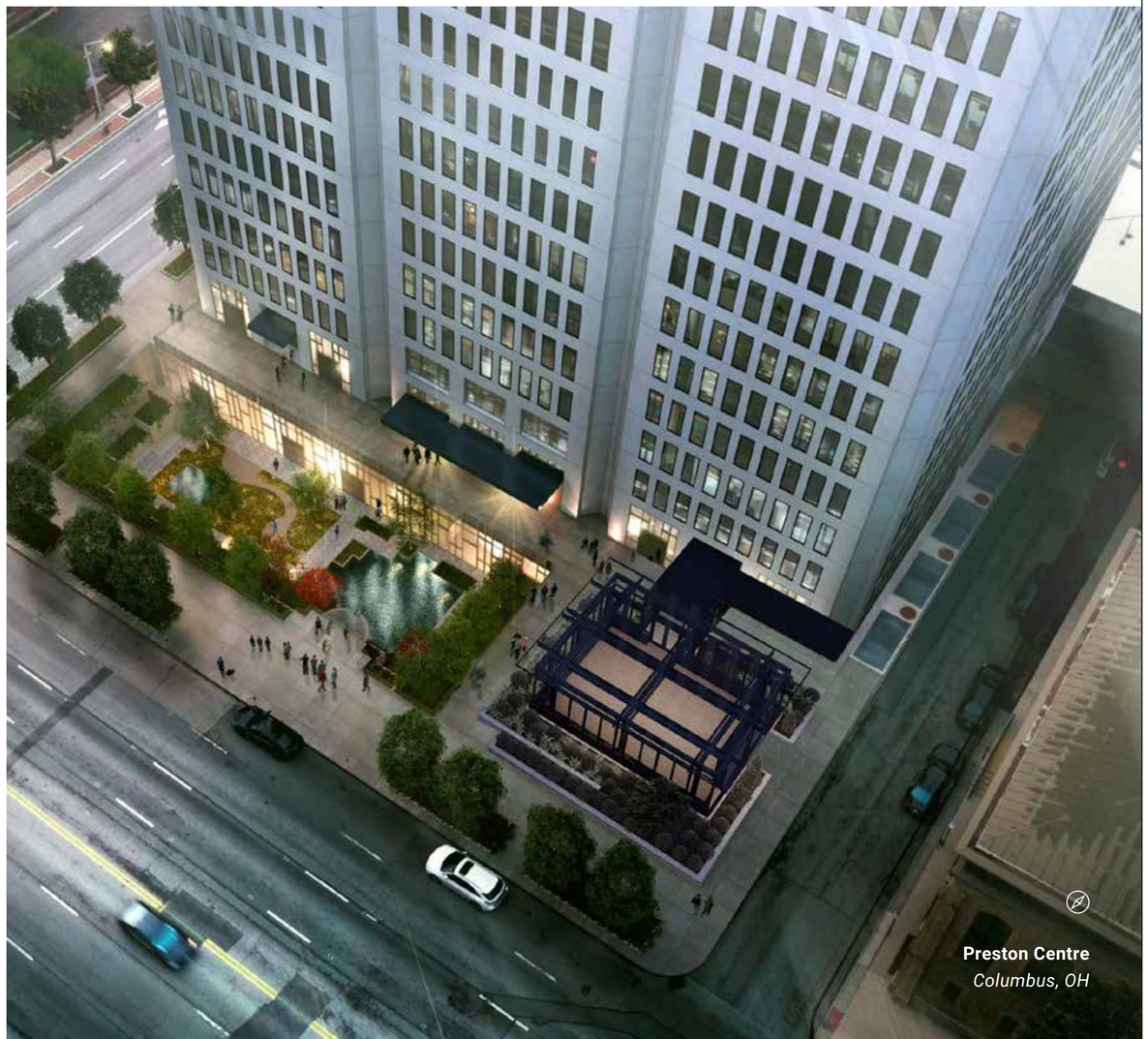
The significant costs associated with most conversion projects necessitate incentives and/or subsidies to help developers pencil out their proformas.

Few North American cities are incentivizing the office conversion. Calgary's Downtown Calgary Development Incentive Program offered grants of up to $15 million per project for office to residential, hotel, school, and performing arts center conversions.

At the Monroe Residences, we assisted the client in seeking financial incentives the City of Chicago made available to ›

Preston Centre *Columbus, OH*

33% **of all U.S. office leases expire by 2026.**



Preston Centre
Columbus, OH

promote creative conversion of office buildings through its LaSalle Street Reimagined program. The program offers financing to qualifying residential projects consisting of 30% affordable units. Some cities are resorting to fast-track entitlements and other support hoping to pave an easier path for developers.

In mature downtown areas, zoning and entitlements can present lengthy and challenging obstacles for reuse projects. New York City, for example, has age restrictions on buildings changing use from office to residential. Cities like Chicago, however, have inherently flexible zoning codes based on high density mixed-use to speed approval.

Adaptive reuse of an aging office building is a delicate balancing act. If we can design them for new purposes that resonate with the marketplace, we can give these important places a second life. Twentieth-century buildings can meaningfully contribute to the revitalization of our downtown neighborhoods.

Monroe Hotel & Residences *Chicago, IL*
Project renderings courtesy of Prime/Capri

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MORE MIXED-USE DEVELOPMENT

Based in Stantec's Chicago design studio, Jesper leverages his expertise in planning, programming, conceptual design, and construction drawings to create vibrant and livable spaces that reflect the needs and aspirations of the surrounding communities we serve. From Stantec's Denver office, Brian has led large, complex projects that prioritize health and well-being for occupants sustainable resilient design. Based in our San Antonio office, Eduardo looks to fully understand the needs of his client to design noteworthy projects inspired by culture and community.

Heritage, space, and carbon

There are three big reasons for building reuse, but hundreds of possibilities.

BY KURT KARNATZ

Repurposing buildings is having a new moment in the sun. As designers with sustainability in mind we believe there are always good reasons to take a serious look at building reuse on your next project. But there's something happening today that suggests more urgency to this consideration.

Upside Foods
Emeryville, CA

What’s happening to make building reuse so attractive?

There’s a growing desire for cities to preserve their cultural capital and develop it. City planners have seen how successful this can be and they want to activate neighborhoods and drive development in their own backyards. Similarly, there’s a growing desire for companies to locate their offices in buildings with a story to tell—to build their brand and attract talent. Building reuse is a low carbon choice they wisely want to align with their brand.

A crisis in housing, especially affordable housing, in North America has given developers a reason to take a closer look at existing buildings (such as office buildings and malls) to repurpose as housing or for healthcare services. And cities such as Chicago and Los Angeles have actively promoted adaptive reuse of existing buildings, including downtown office buildings, for apartments. Building reuse is key to their strategy for revitalizing neighborhoods.

Concerns and regulations about the emissions from the building industry, particularly the new emphasis on embodied carbon (the greenhouse gas emissions associated with building materials production, transportation, and construction) are increasing. Corporate ESG (economic, social, governance) commitments and reporting encourage organizations to minimize their emissions. From an embodied carbon perspective, it makes sense to reuse buildings and make them more efficient rather than tear down and build new.

The drivers and challenges to building repurposing can vary significantly from region to region. But three of the chief drivers making building reuse projects possible today are heritage, demand for space, and decarbonization. But each building reuse project presents a unique set of circumstances for designing and engineering.

1111 Brickell Bay Drive
Miami, FL

1

Preserve history and heritage…

People love the look and feel of older buildings. Many have been built with durable materials that are meant to last, some of which are prohibitively expensive today. And some capture architectural styles that still speak to us today, whether that is classical ornamentation, sublime modernism, or industrial utility. So, why not reuse aspects of the places we like? Through adaptive reuse we can maintain elements of the original design, our cultural heritage, and recognize the historic significance of the built environment.

…by honoring a baseball landmark.

Wrigley Field needed significant work—from structural improvements to new locker rooms, while preserving important historical elements of the famed Chicago Cubs ballpark such as the ivy on the outfield wall and historic buildings such as its groundskeeper's house.

…giving a historic government new purpose.

The Dallas Municipal Building is known as the location for the arrest, jailing, and eventual assassination of Lee Harvey Oswald in 1963. The 6-story Beaux-Art structure is both a National Historic Landmark and a Texas Historic Landmark. Our team was able to preserve the building's historic aspects, while modernizing it, making it more efficient to serve its new mission as home to the University of North Texas Dallas Law School.

…adding some soul to the center of a new development.

The Armory in Boulder, CO is an adaptive reuse of an old armory building as a new amenity space for a larger housing development. Our team sought to preserve and celebrate the history and character of the building, while creating a modern and comfortable environment for the residents. Stantec worked in conjunction with Mulhern, the architect of record, who oversaw the landmarks process and the envelope component of the project.

Wrigley Field Renovations *Chicago, IL*

The Armory *Boulder, CO*

2

Southline *Boston, MA*

Meet demand for space…

Roughly 80% of the buildings we have today will exist in 2050. The kind of spaces we need, however, is always changing. Today, these acute needs include housing, student housing, research laboratories, and manufacturing. To meet our evolving needs for space we will need to retrofit many buildings. Adaptive reuse allows us to maximize existing resources, minimize waste, and create sustainable spaces with minimal carbon investment.

…and transform a historic asset into an innovation hive.

The battle for talent continues. Companies competing for the creative, innovative professionals are looking for special places to call home. Cities are looking for ways to repurpose some of their largest built assets from the 20th century. With Southline in Boston and the Walgreens offices in The Old Post Office in Chicago, reuse projects transformed large scale, disused assets into new gems. At Walgreens, our design organized the huge floorplate of a former mail distribution center around “neighborhoods” that reference Chicago’s geography and vibrant culture. Southline, a reuse of a 700,000 SF former warehouse space for the Boston Globe, is designed to inspire life science researchers cultivating next-generation technologies and therapeutics.

…and provide much needed student housing.

The demand for student housing outstrips supply in many regions. We took the outdated and underutilized arts building at Eastern Connecticut State University (ECSU) campus, saved it from demolition and designed it for reuse as a student dormitory. Student-led focus groups helped us create a studio-style space. The adaptive reuse project brought the 1946 building up to code and made the residential complex one of the most popular on campus.

Eastern Connecticut State University (ECSU)
Shafer Hall *Willimantic, CT*

3

Reduce emissions…

Building new buildings has a carbon price tag—the emissions from new building materials contribute to the greenhouse effect and climate change. Construction is directly or indirectly responsible for almost 40 percent of global CO_2 emissions from fuel combustion and 25 percent of GHG emissions overall. The process of demolishing and constructing new buildings consumes significant energy and resources. Reusing building elements, even just a concrete foundation and steel frame, reduces the emissions associated with a project. To meet 2050 targets for greenhouse gas emissions, however, we must also revisit the buildings we have and retrofit as many as we can with efficient systems that bring their daily energy use as close to zero as possible. Adaptive reuse and retrofitting align with efforts to drive society's emissions toward net zero.

…by updating the systems in a heritage building.

As Canada rehabilitates its federal buildings, it has the opportunity to replace aging mechanical systems with new carbon-neutral solutions. This isn't always easy on a heritage structure. Postal Station B, a 75-year-old building, is the central postal facility for downtown Ottawa and includes a workplace for the Privy Council Office. On this project, our engineers had to implement new systems while preserving character-defining elements such as its vintage ornate radiant heating cabinets. They got creative—using storage spaces for the new systems and zone-specific heating and cooling—to preserve the historic details.

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MORE COMMERCIAL BUILDINGS

Based in Chicago, **Kurt Karnatz** is Stantec's Commercial Sector Leader.

Eastern Connecticut State University (ECSU) Shafer Hall *Willimantic, CT*

WHAT TO LOOK FOR IN

ASSET REPOSITIONING

In a challenging market, what does it take to turn around an aging office building?

BY JOHN LAPROCIDO

Lobby renovation, 33 Arch Street
Boston, MA

Our updated design maximized light, texture, and elements from nature to rejuvenate one of Boston's premier office towers.

It's a challenging time for asset repositioning, but there are still ways to maximize the value of office buildings.

Asset holders in commercial office buildings are facing financial pressure and uncertainty. The occupancy of their office spaces destabilized because of the widespread work cultural change accelerated by the pandemic. The emergence of remote and hybrid work has rendered a lot of older office spaces superfluous. According to the Mortgage Bankers Association, an estimated $1.2 trillion of commercial real estate debt in the United States is maturing in the next two years, and roughly 25 percent of those loans are to the office and retail segments. But commercial real estate prices are down in many cities. Buildings are selling at massive discounts. *Researchers estimate that the national office market lost $664B from 2019 to 2022.*

It might look like pivoting away from office buildings and investing in a mixed-use occupancy scenario is a natural step for these owners. Rebalancing their dependence on office space to include residential, retail, and entertainment sounds very wise. And it may be for some if the conditions are right. But redesigning and repositioning for mixed use is full of complications. Such projects require the owner and designer to address zoning, construction codes, complex infrastructure enhancement, and high construction costs. Moreover, the debt underwriting necessary to get such projects off the ground can be difficult to secure in the current macroeconomic environment unless investors can show potential for a strong return on investment.

These assets are often in dense urban areas where space is in high demand. It might appear that owners can invest in repositioning and design and find the market later—the "build it and they will come" model. But in today's environment (with high interest rates), these owners can't afford the potential risk of forward-looking returns. They are content to wait for the office market to change direction or, in some cases, accept that the asset moves into receivership and move on.

So, what should owners look for? Which assets are better poised for repositioning projects?

The most difficult scenario for owners occurs when the assets are partially stabilized—they are still being used for workplaces, for example. Repositioning with mixed-use occupancy is challenging with a host of complications that can make it prohibitively expensive. An owner's prime opportunities for repositioning are in assets that are 100% destabilized. They're a blank slate to a certain extent. They can be easily analyzed

Lobby Repositioning and Expansion, 10 South Wacker Drive, *Chicago, IL*
Joint Venture / Association / Collaboration: Tishman Speyer. Architect of Record: Krueck Sexton Partners.

Capital Center *Indianapolis, IN*

and converted to different uses, such as S&T (science and technology), institutional, or residential.

What uses should they look at for aging office buildings?

What about the science and technology market? Aren't labs in high demand in northeastern cities? They have been and may still be. So, it's worth looking at S&T for reuse projects. But one should keep a few things in mind: S&T laboratory spaces have special demands that require specialized spaces. These labs need higher floor to floor heights, specialized infrastructure for mechanical, electrical, and plumbing systems, structural and vibration considerations, and zoning considerations as they may not make especially good neighbors with residences, hotels, or other uses. The market for specialized use projects such as S&T labs can be narrow and competitive.

What kind of locations are best?

The greatest potential for repositioning commercial assets to mixed-use or residential lies in buildings that are in great locations. What makes a great location? Close proximity to transportation, desirable retail, and cultural and recreational amenities like parks and gyms helps.

Both the Monroe Hotel and Residences and the Preston Centre office tower repositioning projects are well-located in vibrant downtowns. They're meant to excite further diverse development in downtown Chicago and Columbus, respectively.

Location can determine the business case. For examples of financial viability, we can look to mall redevelopment projects. Places like the Amazing Brentwood in the greater Vancouver, British Columbia area, where we redesigned a former mid-century mall as a vibrant new mixed-use community, work because they are in highly desirable locations where the land is valuable. The addition of new mass transit nearby has made that location even more attractive.

Suburban office parks may or may not have potential for repositioning. Are they in a great location with some of those desirable amenities nearby? Are they well positioned in terms of transit, parking, and highways? Are they on valuable real estate? Do they qualify for investment in asset repositioning or are they better suited as candidates for an upgrade? That depends on local market demand.

Nearly $1.5 trillion in U.S. commercial real estate debt comes due for repayment by 2025.

Source: Bloomberg

4000 Connecticut Avenue NW
Washington, DC

What can our clients do to make sure they're undertaking a sound repositioning strategy?

KNOW THEIR ASSETS AND LOCAL CONDITIONS.

The more our clients understand the challenges and opportunities in their assets, the better prepared they are to look at the possibilities for reuse. This starts with examining the existing state of the asset, topics such as the structural system, utility infrastructure and capacities, occupancy classification and capacity, the debt obligations, and the zoning on the property, along with other considerations. Additionally, if a change of use could help respond to local market conditions it is advisable to meet with local regulatory officials to understand the flexibility of the local ordinances for repositioning.

LaSalle Street Historic District: Chicago's LaSalle Street Initiative is revitalizing the financial district buildings in Chicago's Loop.

EXPLORE THE POSSIBILITIES BASED ON LOCAL MARKET CONDITIONS.

Evaluate the potential reuse options for their assets, such as life sciences, institutional, residential, or mixed-use. Analyze the market demand, the going rate for leasable space and the return on investment for each option. Understand what makes the neighborhood desirable.

CREATE VISUALS.

If due diligence indicates an asset is a good candidate for repositioning, a client may be ready to test the waters. They might even consider developing visuals (branding or architectural renderings, for example) to demonstrate a design vision for the property's new use.

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MORE MIXED-USE

Based in Philadelphia, **John LaProcido** has years of experience in architecture, interiors, and planning design. John collaborates with clients on strategic aspects of design and financial oversight for large-scale research and development (R&D), office, multi-use, and repositioning projects.

LOOK FOR FINANCIAL INCENTIVES FOR BUILDING REUSE.

City and municipal governments are interested in encouraging development in their business districts for a variety of reasons—a shortage of affordable housing or the desire for more walkable neighborhoods. For those reasons and as a response to a flight of tenants to high quality new buildings elsewhere, Chicago has unlocked financing for repositioning projects in its LaSalle Street Historic District. The city wants to encourage dynamic adaptive reuse. Other cities may follow suit.

Some investors see value in the down market. One of New York City's biggest developers has teamed with an investment manager to buy $1B in distressed, high-quality office properties. With some help in the form of fresh capital or debt restructuring, these class-A properties can compete with new, modern towers.

KEEP AN EYE ON CHANGING CONDITIONS.

The outlook for asset repositioning could change. Markets for office space can differ wildly from location to location. Everything from materials pricing to interest rates can fluctuate and change the metrics for your project.

Current conditions for asset repositioning are challenging, but there are bright spots for those paying attention. The savvy commercial building owner who does their due diligence has the chance to bring new life and revenue to their property. ®

mall revival

BY SHANNON JONES

Consider ten hidden things that matter in retail redevelopment to bring new life to malls.

Mitikah
Mexico City, Mexico
Architect of Record:
Pelli Clarke & Partners

Retail has been shaken up over the last decade, first by online shopping, then by the COVID-19 pandemic. In many places, malls have lost their anchor tenants, while others have shuttered completely. And yet, many are still special places with an important social function. How can mall owners, developers, designers, and operators adapt to the changing needs and preferences of consumers? How can we create malls that are vibrant, experiential, and sustainable places for shopping and socializing?

These and other questions were addressed by a panel of professionals in urban places, development, and retail design in Stantec's "Mall of the Future" webinar series.

As a principal in the Visioning, Brands, and Experiences group in the Stantec Boulder office, I offered our design perspective on malls. And reminded the panel and guests of the (sometimes invisible) elements that we need to put in place to make retail redevelopments succeed. If we're going to reuse and redesign malls, we need to keep the following ideas at the forefront.

Cherry Creek North *Denver, CO* *Stantec: landscape architecture, experiential graphic design, placemaking, conceptual design, master planning, signage and wayfinding*
Architect of Record: Design Workshop

1

Storytelling is incredibly important to these projects, especially connecting with the brand promise.

Fox Valley Mall in Illinois wanted to integrate a narrative into the project to build up a brand association—to create a visual connection between the name and the place. So, we created playful fox sculptures that live within the interior landscape of the mall. They are critical in telling the story of Fox Valley and are a central piece of the new public gathering area with green space, seating, and other amenities to help activate the central courts of the mall.

Fox Valley Mall *Aurora, IL*

2

Create a place with powers of ten.

This idea, inspired by the Charles and Ray Eames' "Powers of Ten" films, relates to layered activation, in particular, scale. It's about making sure that a place is activated at all scales, and that the visual storytelling connects just as well from a distance as in the details. The design should support the narrative of the place from close-up—a sign that's integrated into the architecture or a pattern inlaid into the brick—to far away, such as the entire streetscape.

Retail sales at malls grew more than 11% in 2022 to nearly $819 billion.

SOURCE: Source: Coresight Research, The State of the American Mal

3

Hospitality, and its relationship to customer experience, is critical.

Traditionally, malls were about retail transactions—a selection, a purchase, or a return. But today, we want to look at how people use the space and how they feel. They should feel recognized, taken care of, and welcomed, to varying degrees, whether they're visiting an outlet mall or a high fashion destination. A hospitality approach gives design an opportunity to provide a memorable experience that encourages repeat shoppers.

At VIA Outlets in Europe, we blended hospitality-inspired seating and graphics in settings that invite visitors to take their time.

4 Sustainability and what that means in a retail environment

We know the mall interior needs to be refreshed every 5 to 10 years to look current and stay attractive in the marketplace. That's a quick turnaround. Recognizing that any redesign has an associated embodied carbon bill, but that necessary improvements and updates are inevitable, how can we design responsibly? How can we create environments that don't need to be ripped out every single time the mall is updated?

At Northpoint Mall, we started with a minimal and natural palette with museum-like qualities, and simple tone on tone graphics, white walls, and black accents. This allows us to change out surface elements easily: couches, furniture, plantings, signage, graphics, and art. We can quickly refresh interior retail spaces as needed, say before a Black Friday event. But we can keep the base finishes much longer, creating a more sustainable development.

5 Social success leads to economic success.

Placemaking that creates a buzz is increasingly key to retail success. If people have the chance to see a fantastic place, they can connect with it before they've even visited. Spaces that make a splash on social media have the potential to become more popular and vibrant. And draw more people. That can increase the foot fall and linger time. In some places, creating that buzz might be as simple as setting the stage for Instagram-worthy moments. At others, it might be about creating a welcoming streetscape, or blending natural elements and public art. At Victory Park, we designed the lively and colorful streetscape to be activated in a way that would appeal to and excite social media, creating an extra buzz. Whereas the beautiful architectural "trees" at Hillsdale Shopping Center act as great place makers that entice visitors to linger longer.

6 Memory and prophecy

We want to simultaneously tap into a connection with the past and optimism about the future. McGregor Square is adjacent to Denver's Major League ballpark where they use a lot of traditional materials, brick, and metalwork. We made sure that the new development's retail podium spoke a similar language but was also ready for the future with an open plaza that could accommodate a dynamic range of uses and events. The plaza now hosts world-class events that work symbiotically with the retail, dining, and entertainment uses.

7 The generational bridge means there needs to be something for everyone at the mall.

We design spaces where multi-generational groups activate the space collectively. Integrating multi-generational elements in a thoughtful way was important to us at Hawthorne Mall. Fun, interactive pebbles for kids are adjacent to areas where adults can socialize, have coffee, and take a break.

We can create a durable, long-lasting background that allows for layering, and refresh the layers that need it.

Victory Park
Dallas, TX
Architect of Record: RTKL Architects and Halff Associates

8 Innovation

Our designs must be current and creatively use the latest technology to amplify and enrich the experience. We can look to projects such as the Colorado Rockies Hall of Fame where we interweave the latest technology as design elements to create an experience like no other. Visitors can experience big league baseball—throwing, running, and swinging—through virtual reality technology and interactive games, and see the Rockies' data analyzed in the sports science exhibit.

9 Content

To succeed, malls need to give people more reasons to visit. Programming that connects people is important. At Chandler Fashion Center, we explored various types of activations for the space, such as adult gaming areas, a kids play zone, and an events stage. To make activations work, designers need to think about the infrastructure, circulation, and capacity that is well-suited for the kinds of events a mall will be hosting.

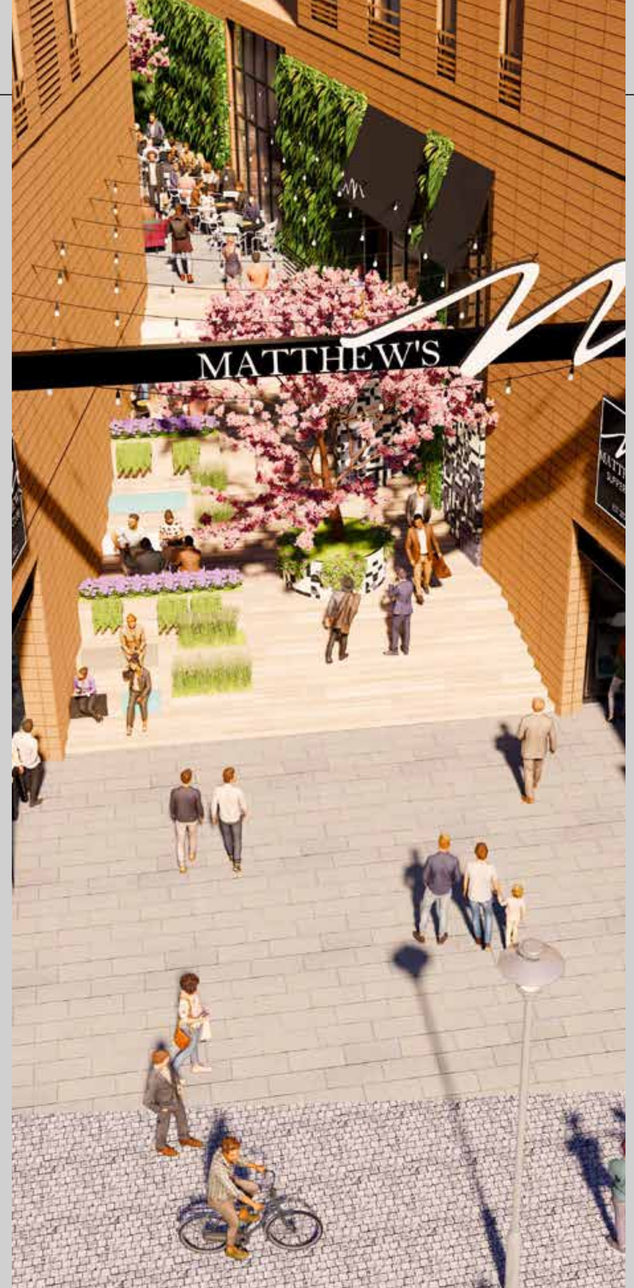
From project inception, we need to envision and collaborate on ideas for the content, the events, the interactions, and the activity that will fill these spaces.

10 Iconic

Malls were originally conceived as new town centers. And in many places, they've served a special role beyond being places for shopping. We want to take this idea further when reinvigorating malls and make them centers for community. Their design and programming should celebrate the local and natural culture of their communities. We want to create iconic moments within the design that generate lasting memories.

At Mitikah in Mexico City and Potsdamer Platz in Berlin, we designed malls that combine dining, fashion and events in high profile culturally significant places.

Potsdamer Platz Arkaden
Berlin, Germany
Architect of Record: ECE Group Services GmbH & Co. KG



The mall can be much more than a place where shopping and returns take place. We have an incredible opportunity to reimagine and reinvigorate the mall. In a time when the public is looking for connection, experience, community, and an accessible place to live , malls offer some if not all the solutions.

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MORE RETAIL, HOSPITALITY AND MIXED-USE

Architect **Shannon Jones** works in Stantec's Boulder, CO studio as the market lead for ViBE (Visioning, Brands and Experiences).

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