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ON THE RISE: MEETING THE UNIQUE CHALLENGES OF HIGH-RISE HEALTHCARE CONSTRUCTION IN SEATTLE

High-rise healthcare towers like Providence/Swedish's $1.3B North Tower, under construction, and Harborview Medical Center's planned inpatient tower require complex coordination and collaboration under tight site constraints.

The increased demand for responsive and quality healthcare facilities combined with Seattle's constrained geography gives rise to more high-rise construction to serve a growing population.

Providence/Swedish's $1.3B North Tower is currently under construction. At 213-feet above grade with more than 40-feet of subterranean levels, it will be Seattle's first high-rise medical facility in nearly two decades when it opens in late 2027. Harborview Medical Center's new inpatient tower, part of a $1.7B bond funded expansion, aims to be the next. This is an exciting time for the healthcare design and construction communities as these expansions change the shape of the Seattle skyline.

BY TODD PARKE
PCS STRUCTURAL SOLUTIONS

WHAT MAKES HIGH-RISES UNIQUE AND CHALLENGING?

Planning, designing, and constructing high-rise buildings require large, complex project teams to address a variety of factors while achieving return on investment for Seattle's valuable urban real estate.

Site constraints: Because high-rises are designed to maximize space where little exists, teams often work in cramped conditions to execute major site work, such as demolishing existing buildings; executing mass subterranean excavations for parking and/or utilities; installing complex shoring at property edges and adjacent buildings; and working around large underground civil utilities, utility tunnels, and tunnels. Work also requires massive tower cranes to support building erection, the installation of which requires its own complex process.

Building sub-groups and tasks: Different micro-teams may be assigned to tackle specific aspects of the project, such as cladding and envelope; foundations; interiors; and/or sustainability measures to make work more manageable. While this enables focused work, it also requires collaboration to coordinate multiple large drawing sets, conduct peer reviews, and obtain multiple permits for each aspect of the building and its critical systems.

At 213 feet above grade, the Swedish North Tower will be the tallest all side-plate moment frame hospital tower in the United States.

PHOTO COURTESY OF MORTENSON

Structural design requirements: A lot rides on the structural integrity of any building, and it's even more critical in the high-rise environment as conditions within the earth, such as multiple soil strata and elevations, and in the air, such as wind, dramatically affect design decisions. Structural teams must deeply understand the unique environment to plan for and design effective and resilient foundations, lateral systems, and cladding systems that use the right materials.

For example, a high-rise building foundation typically requires deep piles or mats. Materials such as steel, rebar and concrete must be highest strength and non-combustible to meet fire and building code requirements.

Designers must effectively combine different lateral system options, such as core wall, moment frames, and braced frames, to meet different conditions and building uses. Cladding systems may require scaled testing and modeling to ensure they stand up to wind conditions hundreds of feet above grade.

ADDITIONAL COMPLEXITIES FOR HIGH-RISE HEALTHCARE

Healthcare facilities of any kind are already among the most challenging design and construction projects in the industry for several reasons:

Many healthcare facilities operate 24/7 with dozens — if not hundreds — of different departments. The larger the building, the more departments, each having their own specialized operational and programming requirements. Providence/Swedish's North Tower will include 24 advanced operating suites, a new emergency department, a 72-bed acuity-adaptable intensive care unit (ICU), and new centralized imaging facilities, along with underground parking, retail and green spaces, and shell space on several floors to accommodate future expansion.

At all levels, the project team is working closely with department leads to understand their unique requirements, both for current operations and future workflows that incorporate rapidly evolving medical practices and technology. Structurally, this variety of uses makes vertical coordination challenging as columns, walls, and braces must meet integrity requirements while minimizing impacts to program spaces and subterranean parking. The taller the building, the more challenging this gets.

Healthcare buildings often exist within campus environments. This requires interconnections that promote ease of way finding and maximized program efficiencies and patient safety. Such interconnectivity can't only exist at ground level, making skybridges and tunnels a key component in mid-rise and high-rise healthcare facilities.

The North Tower will connect to an existing tunnel and skybridge. The skybridge

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INSIDE

ON THE COVER

Exterior view of Chapter Building II, designed with flexible MEP systems and adaptable floorplates.

PHOTO BY ED SOZINHO

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DESIGNING FOR UNCERTAINTY: INTEGRATED TEAMS HELP NAVIGATE CHANGING CLIMATE REQUIREMENTS

Integrated teams bring architecture, engineering, cost estimating and construction insights together to help institutions meet internal climate commitments and external policy regulations.

BY DEVIN KLEINER & ANDREW CLINCH
PERKINS&WILL

Western Washington University's Zero Energy, Zero Carbon Kaiser Borsari Hall was built with mass timber and disconnected from the central steam plant.

PHOTO BY KEVIN SCOTT

Climate mandates and shifting market forces are no longer future threats — we've now reached the tipping point. As cities roll out stringent performance standards like Seattle's Building Emissions Performance Standards (BEPS) and Climate Action Plans (CAPs) take effect, organizations with aging infrastructure face hard decisions under short timelines.

These challenges can no longer be treated as siloed issues — climate compliance, deferred maintenance and capital planning demand integrated solutions rather than isolated one-off fixes. To succeed, institutions need strategic guidance from integrated teams that bring architecture, engineering, cost estimating, and construction insights together to support owners with lifecycle value decisions. These decisions help meet external policy regulations as well as internal climate commitments.

Healthcare and life science campuses are especially vulnerable to infrastructure risk, regulatory shifts and pressure to reduce carbon emissions. Their buildings often rely on outdated systems and typically consume three to five times the energy of a conventional office building.

A shift toward systems thinking, campus-scale decarbonization and collaborative delivery methods (like design-build) is allowing forward-looking institutions to proactively plan for — not just react to — uncertainty.

Drawing from real-world Perkins&Will project examples, this article explores how integrated teams help clients meet and exceed climate requirements, control long-term costs and transform risk into opportunity.

CAMPUS-SCALE DECARBONIZATION

Regardless of a project's scope, project teams should always evaluate decisions based on the campus-scale impact. An individual building design can set the course for future campus development. For example, the University of Washington's Life Sciences Building was the first building on campus to meet the 2030 Challenge, cutting energy use by more than 80%. It showed what's possible, helping pave the way for future campus projects.

Another example of scaling up impact from an individual building is Kaiser Borsari Hall at Western Washington University (WWU). This Zero Energy, Zero Carbon project was built with mass timber and disconnected from the central steam plant to avoid using combustion for heating and cooling.

Following the completion of this building, WWU is advocating for all future buildings on campus to consider Zero Energy and Zero Carbon certifications using mass timber. As the university plans to transition its central plant to geothermal energy, it's scaling up decarbonization efforts from one project to the entire campus.

BUILDING EMISSIONS PERFORMANCE STANDARDS

The Building Emissions Performance Standards (BEPS) is a policy that mandates existing buildings to meet greenhouse gas (GHG) reductions with targets that become more stringent over time. While this policy for non-residential and multifamily buildings larger than 20,000 square feet is specific to Seattle, other cities such as Washington D.C., Boston and New York City have implemented similar standards—signaling a nationwide shift toward regulatory climate accountability in the built environment.

The BEPS policy allows compliance at either the individual building or campus level. Our analyses on past projects have shown that the campus scale can be more cost effective when seen holistically.

By analyzing the percentage of total campus GHG emissions for each building, along with its anticipated costs for deferred maintenance, institutions can phase their renovations and new construction replacements through data-informed decision making — overlaying phased policy compliance with life-cycle costs at the campus scale.

CLIMATE COMMITMENT ACT

In 2021, Washington state passed the Climate Commitment Act (CCA) creating a Cap-and-Invest Program to fund projects that reduce GHG emissions, develop clean energy and improve air quality. In the 2023-2025 biennium, the state Legislature appropriated $3.2 billion with 16% dedicated to building decarbonization. Among the many recipients, universities are receiving $136 million of this funding for decarbonization projects, incentivizing institutions to capitalize on this regulatory response to our changing climate.

DEFERRED MAINTENANCE, ADAPTIVE TRANSFORMATION

There are non-regulatory requirements that are also catalysts for climate action. Many institutions have been experiencing a growing burden to address their increasing costs for deferred maintenance of aging systems.

For example, the University of Washington is evaluating aging mechanical, electrical, plumbing and structural systems for Bagley Hall, a 1935 chemistry building at the core of its Seattle campus. An integrated team approach to analyzing various alternatives for renovation scope provides institutions with a detailed analysis of existing and potential systems, construction phasing, and near-term and long-term cost estimates.

Another catalyst for change in our local market is adaptive transformation of existing buildings. By repurposing underutilized buildings — instead of demolishing and rebuilding them — owners reduce embodied carbon emissions tied to construction rather than just focusing on operational emissions from heating, cooling and power use after occupancy. As campuses electrify and power grids get cleaner, embodied emissions make up a bigger part of the carbon footprint. Adaptive transfor-

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The University of Washington's Life Sciences Building was the first building on campus to meet the 2030 Challenge, cutting energy use by more than 80%.

PHOTO BY KEVIN SCOTT

A NEW BLUEPRINT FOR BEHAVIORAL HEALTH

Compass Health's three-phase Broadway Campus Redevelopment in Everett is designed to house a spectrum of care under one roof.


BY ADAM SMITH & MARK RONISH
BNBUILDERS

As the demand for behavioral health services continues to rise across the country, there is a growing need to rethink how and where care is delivered. For decades, behavioral health treatment has existed outside the core of the medical system, often separated from general hospitals and disconnected from other care providers.

This is beginning to change through a new approach to facility design — one that brings treatment, housing and related support services into a single, coordinated space.

A great example of this approach is currently underway in Everett, where Compass Health is building the Marc Healing Center, a 70,000 square foot facility designed to support the full continuum of behavioral health care. While the facility is still under construction, its design reflects a broader shift in how care is being reimagined, with a greater focus on integration, access and purpose-built environments that meet client needs.

On Everett's Broadway Avenue, The Marc Healing Center includes outpatient and inpatient services, a pharmacy, and sobering care.

PHOTO BY NIGEL POLL, BNBUILDERS

A SYSTEM UNDER STRAIN

Behavioral health crises have long placed a significant burden on emergency rooms, law enforcement and first responders. These professionals are essential to public safety and health, but they are not always trained or equipped to manage complex mental health or substance use issues. As a result, people in crisis often end up in jail cells or hospital emergency departments, where they may wait hours before seeing a behavioral health provider, if one is available at all.

This gap in appropriate care creates delays and adds strain to already overburdened systems. In contrast, specialized treatment facili-

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DESIGNING FOR TOMORROW: WHY FLEXIBLE LIFE SCIENCE SPACES ARE CRITICAL TO SEATTLE'S FUTURE

Integrating adaptability and resilience into lab spaces empowers innovation, marketability and relevance in a shifting landscape.


BY JOE WORKMAN & KRISTINA RIVERA
COLLINSWOERMAN

Seattle's life science sector stands at a pivotal crossroads as the city continues to evolve as a national hub for innovation. Rapid scientific breakthroughs, shifting funding landscapes and new modes of working are redefining what research and development environments need today and years from now.

In 2025, the market is no longer asking for static lab space; it's demanding flexibility, adaptability, and resilience.

Designing for change is a necessity. It's crucial to prioritize spaces that can shift with scientific needs, scale with emerging technologies, and accommodate future unknowns. Seattle's long-term success in life science will depend on how well we future-proof our built environment today.

CollinsWoerman has completed dozens of life science projects in the Pacific Northwest over the past 37 years. In that time, we've seen how rapidly market needs and research priorities shift. Flexibility is a strategic imperative to build more resilient spaces.

Here are four core considerations for designing buildings that can adapt as the sector evolves:

1 Invest in infrastructure up front

Building flexibility into lab infrastructure at the outset is far more cost-effective than retrofitting later. The ability to accommodate diverse tenants and lab types without extensive modifications significantly reduces long-term operational costs and increases market competitiveness.

Buildings that offer inherent adaptability are more attractive to potential tenants due to increasing demand for lab-ready space. They also provide a buffer against market fluctuations, positioning owners and developers to weather economic shifts and evolving tenant needs.

A prime example of this investment strategy is 428 Westlake in South Lake Union, a CollinsWoerman-designed project that was built during a market slump with lab use. Its lab-capable specifications included higher floor-to-floor heights, open configurations, redundant emergency power systems, floor loading and vibration control, and flexible planning zones for mechanical, electrical, and plumbing.

Tenants found it more cost-effective to lease 428 Westlake than to remodel the existing space, highlighting the competitive advantage of upfront flexibility. The building sold for a near market record a decade later, illustrating that designing infrastructure with resilience and adaptability up front supports tenants' needs and generates long-term value for owners and investors.

2 Design with virtual lab space in mind

Traditional wet lab setups remain essential, but with emerging technology and the rise of AI means dry lab and virtual research space are equally important. Creating flexible environments that can easily accommodate higher technology capable spaces or reconfigured into wet lab bench space enables tenants to shift focus without major renovations.

This kind of modularity allows for seamless adaptation, whether it's changing the research function of a single bench or pivoting an entire floor to meet urgent public health needs, as many companies did during the pandemic. Flexibility in lab design empowers innovation and resilience.

Building system certifications like WiredScore offer a standardized way to evaluate a building's technology infrastructure and digital user experience. By incorporating elements of this framework like redundant electrical and data systems into the shell and core of a building, developers can ensure their spaces are adaptable to future technology demands and better equipped to support evolving virtual lab requirements.

Exterior view of Chapter Building II, designed with flexible MEP systems and adaptable floorplates.

PHOTO BY ED SOZINHO

The exterior of 428 Westlake, whose open configurations and flexible planning zones made it marketable during a lab-buying slump.

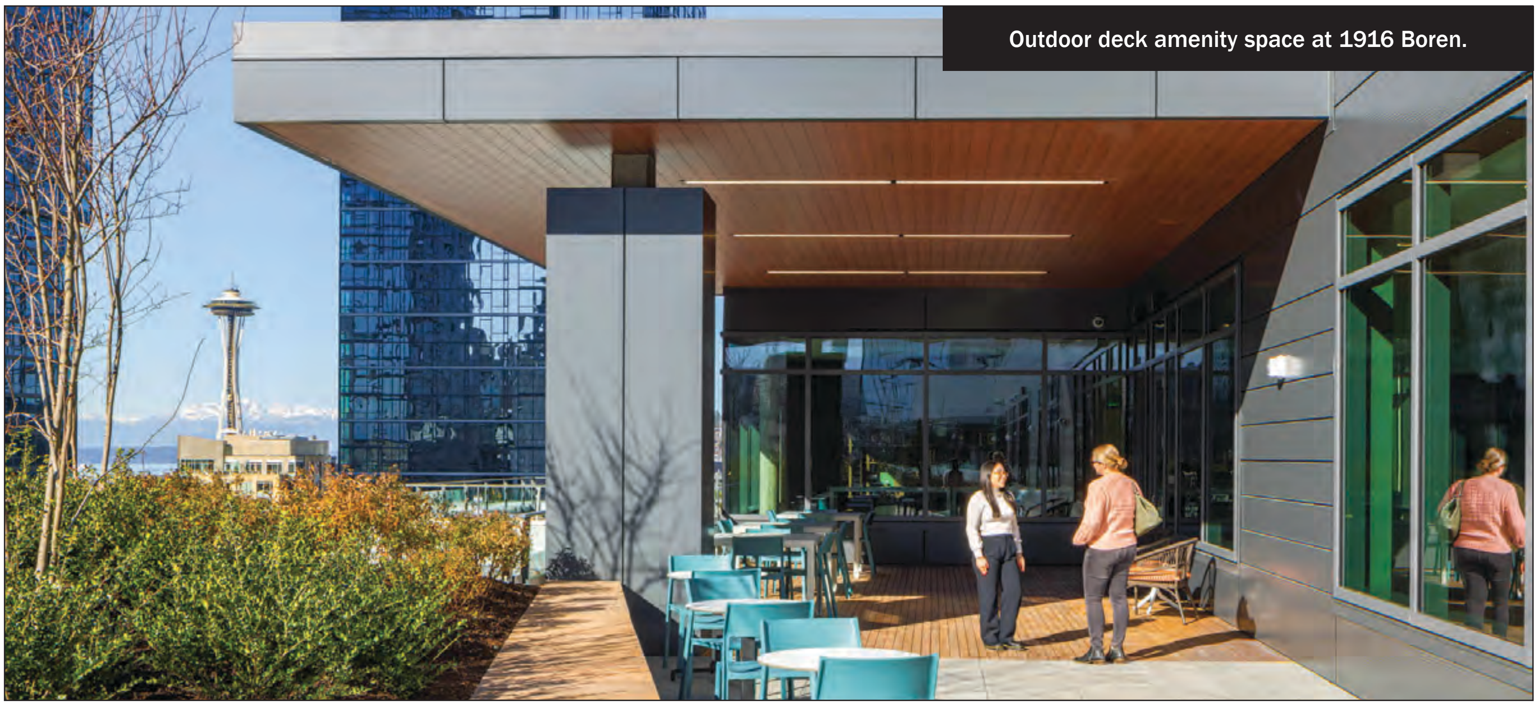
PHOTO BY BEN BENSCHNEIDER

3 Accommodate smaller tenants and incubator models

Seattle's life science ecosystem is no longer dominated by large institutions alone; startups and smaller research groups are fueling growth. Designing buildings that can be rented out into smaller, fully equipped lab suites makes a project more viable for a wider range of tenants.

Flexible MEP systems and adaptable floorplates allow developers to meet the needs of incubator programs and growing companies, so future tenants can scale without needing to relocate.

We consistently test fit buildings to accommodate the flexibility of single or multi-tenant opportunities to accommodate market demands. This flexibility was critical when CollinsWoerman designed Chapter Building II in the University District.



Outdoor deck amenity space at 1916 Boren.

PHOTO BY ED SOZINHO

4 Design thoughtful amenity spaces

Seattle's quality of life has been a big draw for life science companies. Life science professionals increasingly desire workplaces that support well-being and collaboration. Thoughtfully designed amenity spaces to promote collaboration, both interior and exterior, enhance the user experience and contribute to a building's long-term value through attracting and keeping talented and smart people.

Amenities like indoor/outdoor areas, rooftop decks, shared lounges, fitness areas and flexible meeting spaces not only appeal to life science tenants but also keep the building versatile for a variety of future tenants beyond life science.

At the newly constructed 1916 Boren, CollinsWoerman prioritized wellness and connection by incorporating indoor/outdoor gathering areas on every floor. These flexible spaces support meetings, casual conversations, or provide a break from work.

The building also features large common areas, a rooftop with landscaped outdoor zones, a breakout room, a spinning facility, and an exercise room to create a holistic work environment that supports productivity and quality of life.

Amenity-rich environments like 1916 Boren appeal to a wide range of users, from life science and tech companies to hybrid workplaces. Spaces designed for comfort, collaboration, and wellness are increasingly becoming a differentiator for companies.

LOOKING TOWARD THE FUTURE

CollinsWoerman has dedicated over 30 years to supporting the growth of the life science sector in the Pacific Northwest. We've delivered spaces that enable research, discovery and innovation. As we look ahead, we remain committed to advancing design strategies rooted in flexibility, adaptability and long-term resilience.

Seattle's potential as a life science powerhouse depends on how well we prepare for change. We can meet today's demand while building capacity for the future by designing flexible, resilient, and tenant-ready buildings. The future of life science in Seattle won't be defined by a single building or project, but by how thoughtfully and intentionally we design for what's next.

Joe Workman is associate principal – market leader at CollinsWoerman. Kristina Rivera is the marketing coordinator at CollinsWoerman.

TRANSLATIONAL MEDICINE: CLOSING THE DISTANCE BETWEEN DISCOVERY AND CARE

Designing laboratories and clinics in shared facilities allows discoveries to reach patients sooner and clinicians to return real-time insight to scientists.

BY DAN SENG & BLAKE WEBBER
HOK

Emory University's Health Science Research Building II in Atlanta was designed to be a collaborative environment where interdisciplinary teams can take on the toughest scientific challenges.

PHOTO BY CHRISTOPHER PAYNE/ESTO

American healthcare is in flux. Systems keep consolidating, costs keep rising, and research funding is shrinking. The paradox is impossible to ignore.

According to the American Medical Association, the U.S. spent $4.9 trillion on healthcare in 2023 — $14,570 per person — but life expectancy remains low at 78.4 years. In comparison, other high-income countries with similarly advanced healthcare systems average 82.5 years.

The effort to break this pattern began with exploring the connection between research and organizational outcomes. A landmark review of more than 200,000 colorectal cancer cases, published in the journal Gut in 2017, found that hospitals with sustained participation in clinical research saw significantly better outcomes. This included a 3.8% increase in five-year survival and a 1.5% drop in postoperative mortality compared to hospitals with no research activity.

Translational medicine puts that principle into practice. When laboratories and clinics share an address, discoveries reach patients sooner and clinicians can return real-time insight to scientists. Institutions from Mayo Clinic and Fred Hutchinson Cancer Center to Johns Hopkins have adopted the model, but the strongest evidence lives in the buildings that make it work.

WHERE ARCHITECTURE ACCELERATES SCIENCE

The strongest examples of translational medicine are being shaped not only by programs and people — but by buildings purpose-built to support them.

London's Francis Crick Institute —completed in 2016 — offers a rare, decade-long case study in how building design can accelerate research. Conceived by the HOK-PLP Architecture team to break down institutional silos, the nearly 1 million-square-foot translational research center in the heart of London houses 1,500 scientists from six organizations under one roof, all connected by a daylit atrium and transparent lab neighborhoods.

Since opening, the Crick has tripled its research funding to £1.5 billion, tripled its publications, and launched more than 10 spinout companies advancing breakthroughs in cell therapy, vaccines, med tech, and small-molecule therapeutics. With 600 postdocs and 32 new group leaders recruited, it's one of the clearest architectural examples of the benefits co-located translational research can deliver.

Emory University's Health Sciences Research Building II in Atlanta connects oncology, neuroscience and biomedical engineering teams together with flexible lab bays and shared core platforms.

PHOTO BY CHRISTOPHER PAYNE/ESTO

In Atlanta, Emory University's Health Sciences Research Building II stitches oncology, neuroscience, and biomedical engineering teams together with flexible lab bays and shared core platforms. Combined with the new Emory Empathetic AI for Health Institute (AI Health), the building harnesses the power of machine learning and big data to transform how healthcare systems prevent, diagnose, treat, and cure diseases. Designed to catalyze bold advances in biomedical research and human health, the HRSB II supports Emory's vision of a collaborative environment where interdisciplinary teams can take on the toughest scientific challenges. A ground floor start-up accelerator helps move discoveries to therapies.

Design also transforms the patient experience. At the Jack & Sheryl Morris Cancer Center at Rutgers Cancer Institute and RWJBarnabas Health — New Jersey's first and only freestanding cancer hospital — research and treatment are connected.

Imaging suites and infusion bays are floors away from labs studying immunotherapy, cellular therapy and other basic research. Infrastructure for clinical trial area administration and faculty offices are steps away, enabling collaboration between researchers and patients. This layout supports an improved patient experience and better access to experimental therapies informed by real-time research.

USF Health's Morsani College of Medicine and Heart Institute in Tampa demonstrates how design can advance both education and translational research. The 13-story tower combines College of Medicine and Pharmacy teaching spaces, and four floors of flexible biomedical research space.

Since the facility was announced, medical school applications have surged 40%, making USF the most selective medical school in Florida. Located within a mile of Tampa General Hospital, the school's main teaching partner, the building accelerates discovery and learning by encouraging daily interaction among students, researchers, and physicians.

The 200-acre Cortex Innovation Community in midtown St. Louis shows how academic health centers can partner with private industry to move research discoveries more quickly to patients.

Cortex gives founding members including Washington University in St. Louis, Saint Louis University, and BJC HealthCare access to flexible office and lab space, shared research cores, and connections to investors. At the 4340 Duncan Avenue building (below), startups, developing firms, and bioscience incubator anchor tenants share lab and office space. This mix of companies at every stage of development shortens the path from discovery to implementation.

Following the completion of two other HOK-designed translational facilities at academic medical centers, outcomes reported by each institution demonstrate how co-locating research and care can drive results. After the Ceders-Sinai Medical Center opened its Advanced Health Sciences Pavilion in 2013, research projects and publications more than doubled and NIH funding jumped from $50 million to $158 million between 2015 and 2025. The University of Wisconsin saw similar gains following the completion of the first phase of its Institutes for Medical Research in Madison. There, NIH funding doubled in 10 years, and both the number of patents and publications tripled.

DESIGNING FOR WHAT'S NEXT

Translational medicine is changing fast. It's shifting from treating disease to predicting it, from targeting organs to reading genes. These buildings need to keep pace. The best ones adapt to make room for new ideas, unite different disciplines, adopt scientific core technologies and blend innovation into everyday activities.

The key is to incorporate this flexibility from the start. Design teams can now model different research scenarios years ahead. Instead of forcing scientists into rigid layouts, we can create modular lab components and infrastructure systems that can be rearranged as needs change. Teams get the space they need when they need it.

HOK Director of Science + Technology Chirag Mistry has helped shape the planning approach for many of HOK's translational research facilities. According to Mistry, "Recent advances in AI, machine learning, and big data have made it essential to integrate scientific core technologies from the outset, alongside flexible wet and dry lab spaces, for the next generation of these facilities."

As medicine shifts toward prediction and patient involvement, architecture needs to reflect openness and compassion. Natural light, clear pathways, and spaces where education, research and care visibly connect don't just help people find their way — they show what the building stands for.

These facilities don't stay static after opening, either. Through post-occupancy reviews and building data, institutions can monitor how spaces perform and adapt to keep pace with advancing science.

When a translational research building's design makes its purpose clear, breaks down obstacles, and sparks curiosity, it draws in talent and forms a test bed for ideas that shape the future.

Dan Seng is practice leader of Science + Technology, and Blake Webber is a project manager in HOK's Seattle studio.

London's Francis Crick Institute connects 1,500 scientists from six organizations through transparent lab neighborhoods and a daylit atrium.

PHOTO BY PAUL GRUNDY

BUILDING CRITICAL CONNECTIONS IN OCCUPIED FACILITIES

The fragile, essential work of building connections between old and new – for patient care, for staff workflows, and for all of the infrastructure systems that keep the hospital functional – all while keeping the doors open for patients.

The waiting room at Seattle Children's Hospital Building Care. The architect on the project was ZGF Architects.

PHOTO BY BEN BENSCHNEIDER

Remember a time when you were anxiously waiting in a hospital emergency room to get care for a loved one, or when you yourself were the patient about to be wheeled into surgery? Most often it is not something we planned for, but we find ourselves in these facilities and we take for granted that the doors will be open and the facility operational when we need it.

BY MAUREEN D. JACKSON
STANTEC

Hospitals are essential facilities that operate 24/7 and can't be shut down for a week or a month to make repairs to systems or tie in new buildings on the campus. Work on these systems has to be stitched together like a quilt, with no noticeable interruption to the patients, families, or staff in the building. It's an intricate puzzle that takes months or years to design and plan, and a strong team to implement.

PIECES OF A PUZZLE

Most hospital campuses contain multiple buildings that have been pieced together over time – an original building from the 1970's that has had multiple additions and hundreds of renovations over the last 50+ years. Finally, the facility can afford a new building that will house state-of-the-art patient care spaces.

It's a dream come true for many administrators and staff, but now the design team needs to figure out how to weave this new element into the campus. There will need to be connections between old and new – for patient care, for staff workflows, and for all of the infrastructure systems that keep the hospital functional, and the doors open for patients.

PLANNING FOR THE FUTURE ON TODAY'S BUDGET

Although many see this new addition as the way to fix all the problems on campus with aging infrastructure, the design team must strike a balance between reasonably planning for the future and staying within the project budget.

This may mean that a new generator plant in the addition can back-feed the existing buildings so that the existing 50-year-old generators can be taken out of service. This would be an operational savings for the facility as the costs of maintaining/repairing the old generators are typically high. But it may be that this interconnection can't fit within the project budget now, so we must look at making provisions for a future connection when additional funding is available. How can the team provision for this to make it as seamless as possible in the future?

BALANCING ACT

When we are designing for a future connection, there are many things we need to consider:

- Establishing a physical path from a new to existing building will be much easier and less costly in the initial construction, so that would be the first thing to try to fit into the budget. This pathway through the new building can be coordinated and straightforward, however the path through the existing building is often much more complicated. The team needs to work through what is feasible given all the other infrastructure above the ceilings that is typical in a 50+ year facility.
- Next up would be the breakers to connect new to old for the back-feed. Installing breakers in switchgear as part of the initial construction will be less costly than if they are purchased in the future. And including them in the initial construction means that the switchgear would not have to be shut down in the future for breaker installation. But these are not free – can the project afford them?
- If we want to avoid all future shutdowns of the switchgear when this tie-in is made, we need to also install the conductors that will land on those breakers. These are additional costs that must be quantified and weighed against the future costs of a shutdown.

For a hospital, there is no time when it can be without power. Shutting switchgear down to make a tie-in means dollars must be spent to provide temporary power to the affected parts of the building. Every decision becomes a balancing act of first costs versus future costs.

The Swedish First Hill North Tower project currently in construction in First Hill is an example of this type of balancing act. The new North Tower building will have a new generator plant that will eventually back-feed parts of the existing campus, allowing for the elimination of aging generators. Stantec, VECA, and Swedish Facilities have worked together to find a way to make the connections in the future and strategize on the most cost-effective way to provision the facility today for that future connection.

THE DAY FINALLY COMES

While patients and staff eagerly anticipate the unveiling of a new hospital wing with its state-of-the-art care facilities, the facilities team often celebrates something less visible but just as vital—funding for infrastructure upgrades.

That's when the real challenge begins, figuring out how to keep the hospital fully operational while replacing the electrical distribution systems that power it. Much like the buildings themselves, the new equipment must be carefully integrated—stitched into the existing system one piece at a time. Temporary power solutions are put in place to ensure that not a single patient or staff member feels the impact of the work.

At Providence Everett's Colby Campus, a long-awaited project to replace electrical distribution equipment installed in the 1960's gave Stantec, VECA, and the hospital an opportunity to collaborate and achieve success. The project won the 2022 ASHE Vista Award for Infrastructure as an example of teams working together to solve complex challenges in healthcare facilities. Cody Leckner, VECA's Project Superintendent, was quoted in Healthcare Facilities Management's April 2022 article on the award, "Communication was consistent throughout the project, which eliminated missed steps. When we ran into unforeseen issues, we stopped, communicated and adapted the plan to eliminate reactionary mistakes."

Maureen Jackson is a principal at Stantec.

New code-compliant ATS at Providence Regional Medical Center's A-Wing.

PHOTO BY JEFFREY FONG PHOTOGRAPHY

MORE WATTS, MORE SCIENCE: DEXTER YARD'S HIGH-DENSITY MEP INFRASTRUCTURE

Dexter Yard provides 20 watts per square foot, N+1 standby generators, and two central plants, giving life science and technology tenants mission-critical infrastructure to accelerate innovation.

BY GRACE CALHOUN
TURNER CONSTRUCTION

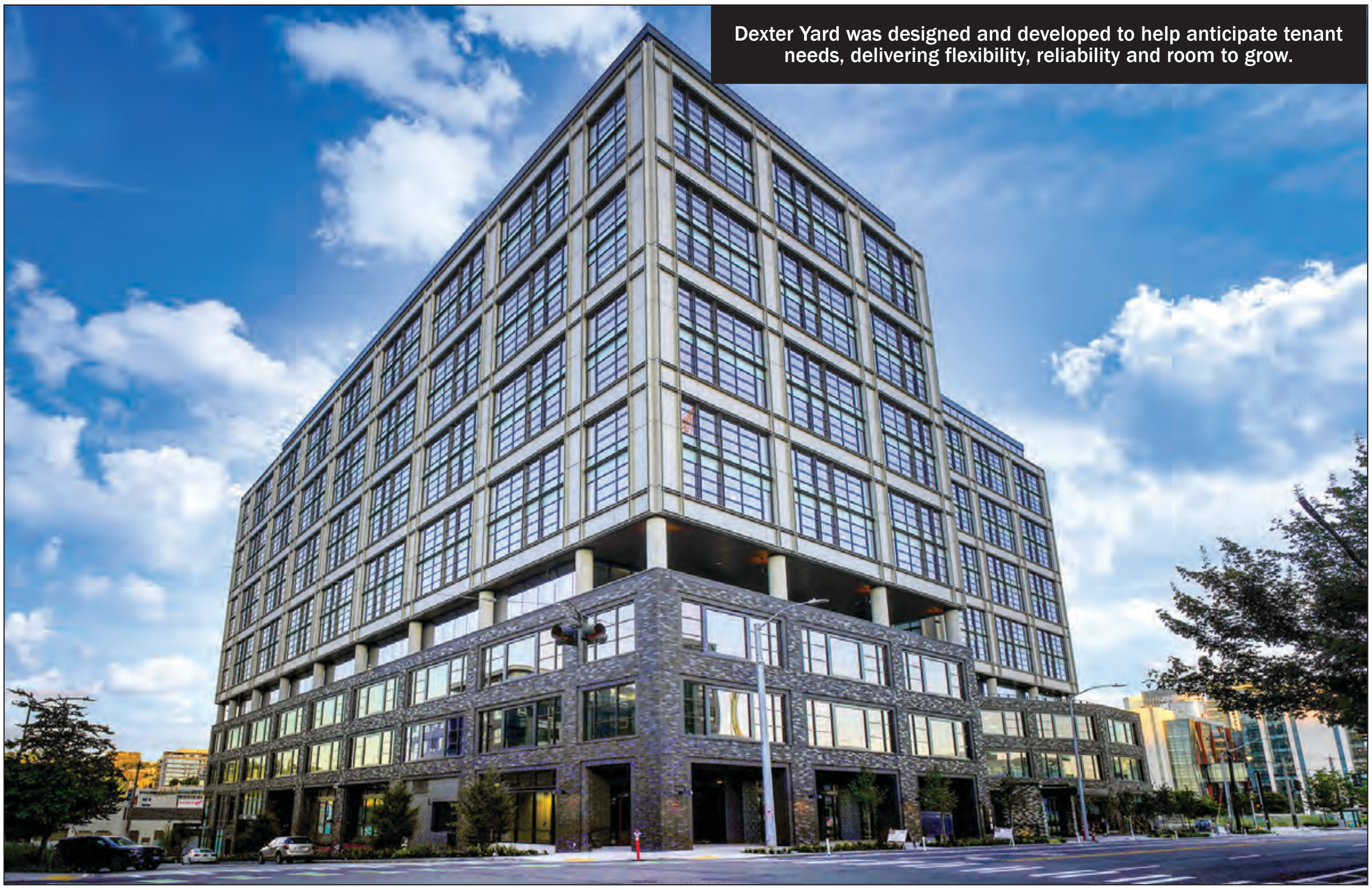
Beginning with the initial design charrettes in 2017, BioMed Realty, Turner Construction, and architects SKB and KHA collaborated to engineer the twin 15-story towers of Dexter Yard to meet the demands of customers for research-grade utilities. The design process included enhancements to the electrical distribution system infrastructure, expanded utility shafts and reinforced roof steel.

By the time of the topping-out milestone in late 2021, the structure was already equipped to deliver up to 20 watts per square foot in laboratory areas and was able to accommodate a 1.6-megawatt optional standby generator plant.

"Dexter Yard is the product of deep collaboration between teams who understand the complexity of life science infrastructure from day one," said John Moshy, BioMed Realty Senior Vice President, Development. "Together, we developed a platform that anticipates tenant needs, delivering flexibility, reliability, and room to grow in one of Seattle's most dynamic innovation hubs."

By embedding extra electrical and HVAC capacity during core construction and then staging subsequent upgrades in deliberate sequence, Dexter Yard was designed and developed to be capable of absorbing volatile scientific workloads without multi-month shut-downs.

Also within Dexter Yard are BioMed Realty's Velocity Labs, which provide flexible, move-in ready lab and office spaces designed by Boulder Associates. The Velocity Labs are purpose-built down to the detailed industry requirements for plumbing, power, and ventilation, enabling tenants to conduct research effectively and efficiently, from day one.



Dexter Yard was designed and developed to help anticipate tenant needs, delivering flexibility, reliability and room to grow.

PHOTOS COURTESY OF TURNER CONSTRUCTION

Flexibility at Dexter Yard begins with concrete and steel. During the preconstruction phase in 2019, the design team widened every utility shaft by approximately 40 percent compared to the minimum requirements for a standard office tower. They also arranged the mechanical penthouse around a modular equipment grid.

The North Tower chiller yard was designed to accommodate four chillers, with three being installed during the initial construction phase and the fourth added during the Lab Warm-Up 1.0 project. Additionally, the electrical rooms were sized to allow for extra panels and feeder routing as more tenants moved into the building.

Trade partners adopted a similar long-term perspective. Cochran electricians installed additional block outs in the concrete deck, allowing future feeders to run upward without the need for core drilling. MacDonald-Miller pipefitters capped branch connections off the chilled water mains on every level, providing flexibility for new tenants.

The property is equipped with a 1.6-megawatt optional standby generator plant.

This foresight proved beneficial when Dexter Yard completed the build-out of spaces for new laboratory tenants that emerged after the shell and core project was finished.

"We made sure to thoughtfully future proof the building for tenants that would move into Dexter in the future," said Grace Calhoun from Turner.

Lewie Thomson of MacDonald-Miller added, "Our goal was to anticipate future tenant needs and work as an integrated team to design pathways and infrastructure to support tenants regardless of the research that materialized."

Phase 1.0, completed in Spring 2023, introduced two generators that added 1.6 MW of capacity to the existing plant. Six months later, Phase 2.0 was launched, and MacDonald-Miller commissioned two 240 ton chilled-water plants with all-electric heat pump heating systems to expand the lab readiness of the building's HVAC capacity.

Cochran added a fourth generator and replaced legacy breakers with solid-state transfer switches. These improvements increased Dexter Yard's standby capacity to 2.4 megawatts.

"Through the phased infrastructure upgrades in Phase One and Two, the team successfully positioned the building to offer prospective tenants maximum flexibility in meeting their programmatic requirements," said Bryce Hesselgrave with Cochran.

High density doesn't have to equate to high carbon emissions. Mechanical contractor MacDonald-Miller's Heat Recovery Chiller, along with a (2) 4.5million BTU condensing boilers, enables Dexter Yard to reduce its annual fossil gas consumption by approximately 40 percent. The mix of heat pump heating and efficient condensing boiler technology represents a practical approach to reducing carbon emissions. With the heat recovery chiller acting as the first stage of heating, the design intends to curb the use of natural gas as the heating source.

"The heat recovery chiller is an essential tool for us to share energy between spaces," said Lewie Thomson of MacDonald-Miller. We work to reduce energy demand first and then leverage the heat recovery chiller to reuse energy instead of wasting heat."

The speed of delivery is a key factor that sets this project apart. Every Tuesday, the shell and core team

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Phase 2.0 incorporated 240 ton chilled-water plants with all-electric heat pump heating systems to expand the lab readiness of the building's HVAC capacity.

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HOW PROVIDENCE ST. PETER HOSPITAL IS PIONEERING DECARBONIZATION FOR HEALTH SYSTEMS

A phased, 15-year roadmap toward full electrification and carbon neutrality for the 1971 building shows hospital decarbonization is about more than mechanical systems – it requires rethinking operations across every aspect of care delivery.

BY STEPHEN WICKLINE, DAVID THOMSEN AND BETH SCHENK
PROVIDENCE SWEDISH

Recommendations for the 1971 building include replacing aging boilers in stages, optimizing equipment lifecycles and spreading capital costs over time.

PHOTO COURTESY OF ST. PETER HOSPITAL

As climate change intensifies, the need for healthcare systems to decarbonize has become increasingly urgent. According to an article in the journal, Health Affairs, the U.S. healthcare sector is responsible for approximately 8.5% of U.S. carbon emissions, with hospitals responsible for a significant share of that footprint. While much of the focus has been on reducing emissions in new construction, the most significant challenge and opportunity lies in retrofitting existing hospitals, with most – if not nearly all – built using natural gas as the primary energy source for heating, and energy efficiency not being prioritized.

Providence St. Peter Hospital, in Olympia, recently became a national case study in how health systems can tackle this problem. In collaboration with the American Society for Health Care Engineering (ASHE), a professional membership group of the American Hospital Association (AHA), Providence pursued an ambitious technical and financial feasibility study to electrify its natural gas-fueled central steam heating plant — one of the most complex and carbon-intensive elements of legacy hospital infrastructure.

This project began with a straightforward question: What would it take to decarbonize an existing hospital while delivering care for the communities it serves?

Providence St. Peter was chosen in part because it represented the typical U.S. hospital built during the Hill-Burton era, a time when natural gas-fired steam boilers powered everything from sterilization to space heating. These systems are notoriously difficult to electrify.

However, St. Peter had a few key advantages: a knowledgeable facilities team, clear internal sustainability commitments, and a long track record of monitoring and improving its energy use. The relatively mild climate in Western Washington also made it an ideal pilot location for this study.

Unlike new hospital builds, where designers can minimize or eliminate fossil fuels from the outset, retrofitting older facilities has been considered too disruptive, too costly, and too technically complex. That is largely because of how heating systems in legacy hospitals were designed. For example, most older hospitals use high-temperature, steam-based systems that require extensive infrastructure changes to work with modern low-temperature alternatives — like electric heat pumps.

Replacing these systems often means upgrading miles of piping and air-handling units, a task that has traditionally been viewed as both cost-prohibitive and opera-

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HIGH-RISE HEALTHCARE

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was extended and floor slope added to align with the first floor, integrating it into the campus circulation. The building will also include a new connector tunnel for material transport.

The campus environment also requires teams to be cognizant of impacts on ongoing operations and adjacent buildings. This includes backfilling programs before, during, and after construction, and construction methods and schedules that minimize noise, vibration and overall disruption. Vibration control is especially important in sensitive areas like the OR and ICU, but nearly all high-rise hospital programs require floor vibrational design exceeding that of a typical high-rise office or residential building.

Healthcare facilities require intensive mechanical, electrical, plumbing, IT, and other specialized infrastructure and systems. Floor-to-floor heights are typically 14-feet to 20-feet to accommodate routing and distribution for many systems. On the North Tower, these increased floor-to-floor heights imposed greater demands on the special moment frames as they must accommodate larger lateral displacements and satisfy code drift requirements.

Hospitals must remain operational with minimal damage and downtime after major earthquakes and natural disasters. High-rise hospital teams must understand and meet elevated design standards beyond a typical high-rise building to support resilience in the wake of disaster. This was accomplished for the Providence/Swedish North Tower project with the application of Performance-Based Design, enabling the structural design to withstand and recover from extreme seismic events through targeted performance-driven structural strategies.

THE VALUE OF THE RIGHT TEAM

At nearly one million gross square feet, including about 250K square feet of make-ready renovations and tenant improvements, Providence/Swedish's North Tower is a major undertaking made that much more complex by being a high-rise in the congested First Hill neighborhood. When it opens, it will join a host of other high-rise hospitals in the United States: Jefferson Health's Honickman Center in Philadelphia is 19-stories; Tower A and the M&D Tower at Memorial Sloan Kettering Cancer Center in NYC are 24- and 25-stories respectively; and the Herman Tower at Memorial City Medical Center in Houston is 33-stories.

Uniquely, however, Swedish North Tower will be the tallest all side-plate moment frame hospital tower in the United States.

Because tackling a high-rise healthcare project is high risk, teams must bring both specialized expertise and the ability to work in close collaboration to be creative while minimizing risk, ensuring safety during construction, and maximizing the building's long-term performance.

Building a new tower in an interconnected campus environment required the North Tower team to be highly aware of impacts to ongoing operations and adjacent buildings.

IMAGE COURTESY OF PERKINS & WILL

"The North Tower project team exemplifies true teamwork, determination and innovative problem-solving. They have remained steadfast in their commitment to putting patients and caregivers first," said Rachel Jenner, Providence/Swedish's executive director of planning & design. "Despite tremendous external challenges over the past decade, we now watch with pride as this transformational building rises out of the ground."

Keys to success include clear communication lines across the team to minimize redundant meetings and improve collaboration, extensive onsite review and validation of existing drawings, efficient coordination methods that included intensive 3D modeling, early user engagement and detailed integration to vertically cross-coordinate different programs, and patience to sustain a project of this magnitude over years or even decades.

A team that can flourish during the highs and persist and build trust during the lows will be able to rise to the occasion of successfully delivering high-rise healthcare construction. The health of our community depends on it.

Todd Parke is president of PCS Structural Solutions, and has spent his career leading cutting-edge structural design for major healthcare systems.

UNCERTAINTY

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mation will continue to grow as a critical strategy for building owners to respond to our changing climate.

INTEGRATED DELIVERY AND SYSTEMS THINKING

Deeply integrated teams with expertise in low-carbon design, life-cycle cost analysis, and holistic systems thinking are critical to successfully navigating these new climate-driven opportunities. Conventional project delivery methods and siloed team dynamics will intensify as a limiting factor as climate regulations grow. Integrated delivery and systems thinking have shown their value over the past decade and will become essential over the next decade to adequately respond to our growing climate challenges.

Climate change isn't a singular challenge — it's a systems challenge. Institutions that embrace integrated, future-ready partnerships are better positioned to meet their climate goals, protect capital investments and strengthen community trust. By moving beyond traditional service models, the design and construction industry can deliver what clients actually need: certainty in an uncertain world.

Devin Kleiner is a principal and director of Regenerative Design at Perkins&Will. Andrew Clinch is a managing principal at Perkins&Will.

DEXTER YARD

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BMR, Turner, SKB, KHA, Cochran, and MacDonald-Miller meet in a virtual design coordination (VDC) model to clash-test the fabrication drawings for the upcoming week. This process has allowed us to cut nearly a month off the schedule and eliminate 200 field RFIs by addressing issues before installation begins.

This workflow has been successfully replicated and is currently being integrated into additional BioMed Realty projects. Currently, there is approximately 60,000 square feet of space available for tenants in Velocity Labs, which can be customized within a six-month timeframe.

As Dexter Yard transitions into full operation, its oversized infrastructure and phased upgrades deliver unprecedented plug-and-play capability for Seattle's life science market. By embedding extra electrical feeders, chilled-water capacity, and standby generation into the shell and widening utility shafts, modularizing penthouses, and pre-capping mechanical connections, the twin towers can support the most power-intensive research without lengthy shutdowns.

With six megawatts of backup power, a heat-recovery chiller that cuts carbon emissions by 40 percent, and a Virtual Design and Construction process that shaved weeks off schedule, Dexter Yard stands as a resilient, sustainable property engineered to accelerate scientific discovery well into the future.

Grace Calhoun, SPD Project Manager at Turner Construction, has 10 years of industry experience and dual degrees in Construction Management and Architecture from Washington State University.

BEHAVIORAL HEALTH

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ties offer a more appropriate and timely response. At these centers, clients can be evaluated within minutes by trained behavioral health professionals and directed to services that meet their needs. This results in faster, more effective care, and a better experience for both clients and providers.

COMPLEX CARE, COMPLEX FUNDING

One of the major challenges in behavioral health is that services are often fragmented based on how they are funded. Programs may receive money from different sources, such as Medicaid, Medicare, private insurance, or local government grants, and those funding streams often determine who can be treated, for how long, and in what setting.

This means that a single facility may only serve adults or only serve children. It may provide inpatient care but not outpatient counseling, or it may lack services for people experiencing homelessness or in need of short-term sobering care. As a result, individuals may have to visit multiple locations to receive the care they need, adding stress and confusion to an already difficult situation.

Efforts to co-locate services are becoming more common, as facilities aim to reduce these barriers. In the case of the Marc Healing Center, for example, the facility is designed to house a spectrum of care under one roof, including outpatient and inpatient services, a pharmacy, and sobering care.

As part of Compass Health's three-phase Broadway Campus Redevelopment, the center is located next door Phase I, Andy's Place, which provides 82 units of permanent supportive housing to formerly homeless individuals who are living with chronic behavioral health challenges. Once complete, Phase III will further expand the continuum of care by integrating behavioral health services with a primary care clinic. Having all these services in one place makes it easier for clients to access varying levels of care, and transitions between services are smoother and more coordinated.

DESIGNING FOR A CONTINUUM OF CARE

Constructing facilities that support the entire continuum of behavioral health care presents unique design challenges. These buildings must accommodate a wide range of services and needs, while also creating a safe, dignified and therapeutic environment.

Inpatient units typically include anti-ligature features, access to daylight, and connection to outdoor areas that help with calming and recovery. These spaces are designed with durability in mind, using materials that are easy to maintain and reduce the risk of harm.

Outpatient consultation rooms are also carefully designed. While these spaces must be safe and secure, they also prioritize patient comfort and privacy. Most outpatient facilities are staffed continuously, allowing them to manage risk primarily through trained personnel rather than relying solely on architectural controls.

Additional design considerations include:

- **Secure ambulance drop-off areas,** which maintain patient confidentiality and reduce community visibility during the intake process.
- **Community and staff spaces,** such as lounges and group rooms, that support both client interaction and staff wellbeing.
- **Integrated pharmacy services,** which make it easier for clients to start medications quickly and maintain consistent treatment.
- **Short-term sobering centers,** which provide care for individuals in acute distress who do not require full inpatient admission. These centers often include reclining chairs and are designed for stays under 24 hours.

Supportive housing is another key feature in many new behavioral health projects. When clients are ready to leave treatment, a lack of stable housing can lead to a return to crisis. By having housing support close to the care facility, clients have a better chance of maintaining stability and avoiding reentry into emergency services.

LOOKING AHEAD

The future of behavioral health care will rely on better integration across services, and on facilities designed specifically to meet the needs of clients, providers, and communities. Projects like the Marc Healing Center demonstrate that it is possible to build spaces that reduce fragmentation, improve response times, and provide more compassionate and appropriate care.

While the work is ongoing, the lessons are already clear. Behavioral health treatment cannot be an afterthought in our healthcare infrastructure. It requires dedicated space, trained staff, and systems that are designed to respond quickly and holistically to people in need.

As public funding increasingly supports whole-person care, the need for thoughtfully designed, full-service behavioral health campuses will continue to grow.

Adam Smith is a Senior Project Manager at BNBuilders, with 22 years of construction experience leading teams delivering complex behavioral health, life sciences, and tech facilities. Mark Ronish is a project executive with BNBuilders, leading projects across K-12, tech, behavioral healthcare, and affordable housing, while also serving on the company's regional leadership team.

PROVIDENCE

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tionally risky. The Providence-ASHE study aimed to test that assumption and prove feasibility of concept for others to consider.

One of the key lessons the case study found is that the electrification of an older building is feasible, but only if energy demand is drastically reduced first.

For St. Peter, this meant implementing strategies like:

- Upgrading to variable air volume systems for better airflow control
- Replacing outdated air-handling systems that used 100% outside air with more efficient systems that recirculate and recover heat
- Improving the building envelope – including windows, insulation, and air sealing
- Deploying advanced building automation to control humidity, air flow, and temperature settings – especially during nights and weekends

Reducing energy demand will help shrink the heating demand load enough to make a path to full electrification technically and financially viable. Essentially, Providence learned they would need to 'right size' the hospital's heating needs before transitioning to an electrified supply.

Study insights helped lay out a phased, 15-year roadmap model toward full electrification and carbon neutrality for St. Peter. This outline calls for replacing aging boilers in stages, optimizing equipment lifecycles and spreading capital costs over time.

In the meantime, Providence has already begun implementing related sustainability initiatives across the system, including:

- Transitioning its fleet to electric vehicles
- Reducing the use of high-emission anesthetic gases – like nitrous oxide – by upgrading and sealing delivery systems; and, where viable, decommissioning piped nitrous oxide systems in favor of transitioning to a cylinders-only workflow
- Digitizing building controls to improve energy efficiency in HVAC operations
- Implementing waste stream optimization and sustainable food procurement strategies
- Building envelope capital improvements
- Hydronics heat exchangers and other heat-recovery systems
- Transitioning to 100% LED lighting
- Capital investment focused on meeting Washington State Department of Commerce energy use intensity (EUI) reduction requirements

This comprehensive approach highlights that hospital decarbonization is about more than mechanical systems – it requires rethinking operations across every aspect of care delivery.

An inadvertent benefit to not lose sight of is that while pursuing decarbonization, many high-value milestones can be realized within all phases of the journey. In our experience, this has been the case, even where full electrification was not necessarily the target.

ASHE commissioned this study because they recognized a significant gap in the market: while there are toolkits for building new net-zero hospitals, there is very little guidance for existing facilities — especially on the technical and financial tradeoffs of deep retrofits.

This case study provides a much-needed starting point. In parallel, the AHA has developed a companion guide to help hospitals across the nation assess their own electrification potential and begin long-term planning.

While individual health systems like Providence are leading the way, scaling this kind of work nationally will require policy support. States like Washington with building performance standards are helping push the envelope, but most regions still lack clear mandates or funding mechanisms.

That is where the AHA and ASHE are focused next: helping members navigate emerging regulations, access technical guidance and build the internal business case for decarbonization.

Providence's work at St. Peter, in partnership with ASHE and their state affiliate chapter – the Washington State Society for Healthcare Engineering – proves that retrofitting older hospitals for a zero-carbon future is possible, even within the constraints of 24/7 patient care.

It is not easy, and it will not be fast, but it is necessary, replicable, and ultimately aligned with the mission of every healthcare provider — to improve health outcomes.

Stephen Wickline is senior manager of facilities at Providence St. Peter Hospital. David Thomsen is director of infrastructure and environmental stewardship for Providence. Beth Schenk is chief environmental stewardship officer for Providence.