In a shift from the midcentury trend of downtown abandonment and blight due to the rise of suburbs, adaptive reuse has been gaining ground—a shift The National Trust for Historic Preservation calls “reurbanism.”

Adaptive reuse differs from restoration or historic preservation because it fundamentally changes the purpose of a building to meet different occupant needs. It creates an opportunity to not only update the aesthetics of a structure, but to push the envelope in design and construction by transforming aging structures into high performing buildings.

Location is often a key factor, as downtown areas become more attractive for both industry and living space. Former industrial areas are morphing into trendy neighborhoods complete with loft housing, retail and office space, and good walkability scores that make these transit-oriented communities more desirable to consumers.

There are also significant schedule benefits to be had. A retrofit can be turned around to get a space back on the market and generating revenue much faster than with a tear down and new build. “Time is money for building owners. Interest carry and lost revenue can be mitigated with a shorter construction schedule,” says Matt O’Malley, a commercial core market leader at DPR Construction.
There are major benefits when it comes to the exterior envelope, as well. "Typically, the area where older buildings perform the worst with regard to energy and thermal comfort is the exterior wall," says O'Malley. The technology of the glazing and curtainwall industry has advanced significantly in the last 40 years, and this is a big driver for many office developers and owners.

Adaptive reuse is also credited with fostering a stronger sense of community. "Historic buildings provide a glimpse of our past while lending character and serving a new practical purpose in our modern societies. An old factory may become an apartment complex, a rundown church may find new life as a condominium, or an old office building may be transformed into a vibrant retail facility. In many ways, an adaptive re-use project can invigorate a community by meeting the changing needs of the population."2

Representing a bright spot in the construction industry, this revitalization of downtown areas by adapting existing building stock allows structures to retain their historic integrity while providing for modern needs. Of course, location and community aren't the only reasons for the shift. Adaptive reuse is often cited as being more cost-effective and energy efficient than building from the ground up, with proponents pointing to its ability to help create a more economically and environmentally sustainable city.

Adaptive Reuse Impacts the Bottom Line

By the Numbers

$92/sf
Average cost of new building construction

$37/sf
Average cost when rehabilitating an older building

40%
Approximate cost per square foot savings when renovating vs. new construction
By adapting older buildings for reuse, construction companies and their customers can alleviate the high costs associated with new construction and the purchase of new land, which are typically more in urban areas. In 2016, the National Trust’s Research & Policy Lab studied the revitalization of downtown areas and found that new commercial development costs about $92 per square foot, significantly higher than the $37 per square foot estimated for rehabilitating an older building. Further, with a structure already in place, little or no demolition is typically required. Many of the utilities and services required for the establishment of functioning buildings are already connected, as well.

Federal and state tax credits can also help alleviate costs for those who renovate rather than build new. Federal credits can be applied to projects that are historic in nature. “The Federal Historic Rehabilitation Tax Credit Program provides a 20-percent tax credit on applicable structures.” There are also local tax credits available when certain provisions are met, and some cities such as Los Angeles and Phoenix have instituted adaptive reuse programs that make it easier for business owners and developers to repurpose old spaces. There is a significant opportunity to do so: in 2012, there were 5.6 million existing commercial buildings, covering 87 billion square feet of floor space. The commercial building stock is still fairly old, with about half of all buildings constructed before 1980; the median age of buildings in 2012 was 32 years.

Renovating for Sustainability

Cost concerns aside, the revitalization of existing buildings can also play an integral part in the move toward greater sustainability, especially timely in light of growing concerns about climate change. *An estimated 72% of current buildings are more than 20 years old and...*
were built with little concern for energy savings. Reuse can dramatically lessen embodied carbon, the energy used in the production of construction materials, and can significantly cut down on construction waste where deployed. Adaptive reuse decreases the environmental impact of construction projects by reducing the amount of construction debris that would otherwise end up in landfills by instead taking advantage of energy already embodied in existing structures.

Things to Consider

Of course, there are many factors that govern the process of adaptive reuse. It's essential to research zoning requirements early in the process to ensure that the intended use of the renovated structure is permissible. For historic structures, the Secretary of the Interior has designated Standards for Rehabilitation that must be followed to meet eligibility criteria for federal tax credits. These standards must be applied to the interior, exterior and surrounding environment. There are also guidelines available that outline recommended methods and treatments.

After assessing the condition of the structure, a thorough analysis should be performed by the owner, a design professional and the contractor tasked with renovating the building. This can help mitigate unforeseen and costly problems that would otherwise catch the team by surprise, as well as determine how elements of the building will be adapted. A more accurate plan of how to manipulate the structural footprint, as well as what to do with the building envelope, can then be put in place.

When DPR opens a new office, it aims to forge a new path for sustainability, creating “living labs” to show what is possible in green and healthy workplace design.

High-Performing Reuse

DPR has embraced adaptive reuse on multiple projects, working closely with designers to push the limits of sustainable design not just by renovating aging buildings, but by transforming them into high performing structures. When DPR opens a new office, it aims to forge a new path for sustainability, creating “living labs” to show what is possible in green and healthy workplace design. The Living Labs also serve as proof points that the existing building stock can be renovated to high levels of performance for roughly the same cost as a baseline building and considerably less than building new.
When designing its new office in Sacramento, DPR chose to show its commitment to sustainability by adapting an existing structure, originally built in 1940, to high performance. This was accomplished in part through the use of an innovative building material never before used for a building's structure in the city: cross-laminated timber (CLT) panels. A renewable resource, mass timber can be an integral part of a low-carbon development; for this project, it was vital in allowing DPR to meet its goals for sustainable design, as well as to achieve LEED® Platinum and WELL™ certification standards.
The decision to purchase an existing property for reuse itself demonstrated the “reduce, reuse and recycle” mantra of conservation. DPR worked closely with SmithGroup to design and transform the building into its new Sacramento home, with the existing 28,833-sq.-ft. midtown property’s two buildings targeting Zero Energy Certification (ZNE) from the International Living Future Institute. To achieve ZNE, the office will offset its energy use via on-site photovoltaic solar energy generation and ban the use of any combustibles, relying on electrical energy alone.

The upgrades to the two existing buildings—in terms of both energy performance and the use of mass timber—shed light on the possibilities for the region’s aging building stock. This showcases how incorporating wood in an exciting, sustainable manner can benefit commercial projects.

**Wood Elements Deliver Strength, Resiliency While Reducing Carbon Footprint**

From a structural perspective, CLT and mass timber elements provide high-strength, resilient systems capable of long spans and significant wind and seismic force resistance. At the time of design review, Sacramento building codes did not yet recognize these systems for use as lateral force-resisting elements, so design teams reached beyond existing codes to demonstrate equivalent or superior performance with CLT.

They made use of the many years of research and testing conducted by organizations such as WoodWorks, FP Innovations, ANSI/APA and Structurlam to navigate code, design and construction issues. The project became the first multi-story shear wall application of CLT in the State of California. It is proof positive that, while government regulations exist, dialogue can create new possibilities for the built environment. A proactive approach backed by good data can change entire markets.
Mass timber contributes from a sustainability perspective, as well. Because of its use in this structure, the embodied carbon is estimated to be lower by 170 metric tons than comparable structures using traditional materials. Further, it is estimated that US & Canadian forests grow enough wood for this project in 12 seconds, highlighting the current availability of wood product.

The building also utilizes mechanical, electrical and plumbing systems to reduce energy use vs. baseline by 45%, with 424 photovoltaic panels for an annual production of 265,178 kWh/year. In California’s sunny Central Valley, this is projected to yield 107% of onsite energy needs annually. A 9.8 kWh battery backup system is included for added resiliency during system outages and to serve as a community hub in the event of natural disaster.

Exposed Timber Provides Unique Connection to Nature

While exposed timber meets the goal of environmental stewardship, it also imbues the structure with a high-end, modern office feel. Wood elements have the unique ability to connect people to the natural environment. This combination of attributes provides advantages not offered by other building systems. The challenge was to make full use of these benefits in a manner most compatible with the existing concrete and masonry structure. It is here that CLT framing became the clear choice.

Mass timber also renders the application of interior finish materials unnecessary, helping to limit the amount of toxic materials present. Exposed wood brings nature into the space by creating a tactile experience and a healthy indoor air quality. The sense of biophilia, the connections humans subconsciously seek with the rest of life, is reinforced by natural
daylighting fixtures on the roof that bring daylight to the core of the building, operable windows that make use of the local Delta Breeze, and material finishes with familiar patterns and textures, such as wood, stone, hexagons, bubbles and wool. The second story terrace engages with the community in the “City of Trees” that is Sacramento and can be accessed through a communicating stair from Level 1 to Level 2. The stair uses a CLT landing and old growth Douglas Fir treads and risers.

A Continued Commitment to Sustainable Design

The adaptive reuse of this structure is part of DPR’s larger strategy to commit itself to green building and sustainable design. The space features an open office layout with an active/addressable seating plan, open areas to foster collaboration, lounge spaces and other special use areas. The design also allows DPR to provide leasing opportunities on the ground level, a move that will not only activate J Street but will also connect DPR to the community at large—another benefit of reurbanism.

Exposed wood brings nature into the space by creating a tactile experience and a healthy indoor air quality. Courtesy of Chad Davies

This office is the latest example of how DPR was able to create a modern workplace in a space that others might have chosen to demolish and build new. The endeavor was built on a foundation of experience gained from embracing adaptive reuse for its San Diego, Phoenix, San Francisco and Reston offices.
Optimist Hall: Turn-of-the-century textile mill begins new life

While many think of energy conservation first and foremost when considering renovation to high performance, the term encompasses much more. Upgrading workspaces and surroundings also results in improved employee engagement, overall experience and productivity. In Charlotte, North Carolina, DPR completed one such adaptive reuse that marries the city’s industrial heritage with modern trends of urban renewal and sustainability. The aging structure, known as Optimist Hall, is a turn-of-the-century textile mill dating from the early 20th century that houses 150,000-sq.ft. of office, restaurant and retail space. DPR’s scope included the building out of 83,000-sq.ft. of creative office space.

Originally owned by Highland Park Manufacturing Company, the cotton mill was once one of the largest gingham factories in the country and later produced hosiery. The exterior of the mill was renovated concurrently, with the project seeking historical landmark status. In a town with a strong sense of community, the building pays homage to its residents’ love of food by including the city’s first food hall. It sits in view of Uptown Charlotte and is within walking distance of the LYNX light rail, with Scaleybark Station less than half a mile away. There is also a walking trail/greenway nearby.

In the center of the structure is an elevated courtyard/gathering space surrounded on three sides by the restaurant areas, retail space and food hall. It serves as an anchor to tie them...
together. The developers chose to retain a number of original elements, including hardwood floors that still show the original metal markings from mill equipment, 14-foot ceilings, original light fixtures found in a crawlspace and various industrial features. Inside the food hall, a wide, mint green band of color runs around the perimeter. This color was part of the original space, an effort to disguise the dirt that was an inevitable byproduct of the millwork. While these elements linger, the smell of the cottonseed oil used to lubricate the mill’s machines has been replaced by the smells of tacos, pork buns and coffee wafting from the open-air stalls that make up the food hall.

“Designed by Gensler, DPR built out the office space within Optimist Hall as an agile, activity-based workspace intended to attract, retain and inspire a modern workforce.”

Designed by Gensler, DPR built out the office space within Optimist Hall as an agile, activity-based workspace intended to attract, retain and inspire a modern workforce. Workplace strategies drove the design, with efforts taken to maximize end-user satisfaction. It primarily includes open workstations with collaboration areas to promote enhanced problem solving. Modern workplace design mingles with the original historic architecture. Brick walls, wood floors and painted heart-of-pine columns are juxtaposed with glass walls for transparency and a modern floor plan that encourages communication and transparency between workers and multidisciplinary teams. A variety of space types, writable surfaces to inspire spontaneous collaboration and integrated technology support creative work. Throughout the space, there are huddle, conference, team rooms and reconfigurable work areas known as scrum spaces to support collaboration.
The space also includes a townhall area with stadium seating for presentations. There is a larger conferencing and workshop space that supports group problem solving and noisy collaboration, as well as a loft that serves as a quiet space for thought and independent discovery. With the workspace being fully wireless, employees are empowered to work from anywhere, including outdoor terrace spaces, and there are two cafes and a gaming space that offer alternate work/play spots. Not bad for a century-old building.

Behr Paint Company: Newly branded headquarters showcases company’s unique culture
When conceptualizing a space for its new headquarters, a key objective for Behr Paint Company was to create a space that would physically immerse the entire organization into its strong culture and brand. With a design crafted by H. Hendy Associates, Behr accomplished this goal in 2018 by completing renovations to 230,000 sq. ft. of existing office space, bringing five separate facilities into a single corporate headquarters to unite the organization and improve collaboration opportunities across departments. The project was also created with sustainability in mind, following the California Green Code, using concepts that reduce negative impacts and promote principles that have a positive environmental impact.

Located at 1801 E. St. Andrew Place in Santa Ana, California, the building was originally constructed in 1989. Branded office space, built by DPR, created a new home for roughly 600 Behr employees with an activity-based working environment that allows employees to choose where to work based on tasks and working styles. The building also includes 30,000 sq. ft. of state-of-the-art research and development lab space built according to Lean Six Sigma principles of team collaboration aimed at improving performance.

Various branding elements were incorporated as a nod to Behr’s history and culture. One of the most unique features is the use of wide walkways patterned after two historic roads—Pacific Coast Highway and Route 66—that connect two break areas known as the Cub Den and Kilz Corner. These roads symbolize Behr’s California roots and Kilz’s origins in St. Louis, Missouri. With coffee stations, snacks and varied seating arrangements, these paths link employees across brands and departments, encouraging them to connect. There’s also a functional entrance with a garage-like structure—a nod to Behr’s origins in a family garage—and a replica of the 1941 Woody that was once used to transport Behr’s products from the garage to customers.
The overall space is made up of a variety of unique, urban spaces such as formal meeting, training and war rooms, ad-hoc work stations to foster teamwork, and data and innovation centers. An indoor-outdoor space with a large patio and tiered seating—the Behr Den—easily fits 500 people and can be used as an event space. Circulation paths were implemented in the design to encourage walking meetings, as well. Rounding out the space are a fitness center, yoga room, juice bar, outdoor patio with BBQ and fire pit, and an outdoor game area. High exposed ceilings, natural light, a Zen garden-like atmosphere and walking paths to boost employee well-being.

Adaptive Reuse as the New Norm

With the nation’s billions of square feet of existing office space, there is significant potential for customers across the commercial market to find new uses for buildings once considered obsolete. Ever-advancing technologies to increase efficiency and record data on as-built conditions, make renovations and retrofitting a better bet than they once were. Facility owners also have the potential to increase the value of their properties and their lease rates by bringing older buildings to the leading edge of what’s possible.
As the reurbanism and renovation to high performance trends continue, and as research and time bear out their economic, environmental and community benefits, adaptive reuse is on track to become the new norm. And as the NTHP found in its research, “commercial and mixed-use areas with buildings constructed in different periods, including new buildings, scored higher on many measures of economic, social and environmental performance.” This finding suggests that “balancing conservation and new infill construction” is a best practice going forward.\(^9\) With increased understanding of the urban built environment, code reform to facilitate building reuse, and investment in districts of older, smaller, mixed-age buildings the benefits of retaining urban assets will be better understood and embraced.

REFERENCES


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About DPR

DPR CONSTRUCTION is a unique technical builder with a passion for results. Consistently ranked in the top 50 general contractors in the country over the last 15 years, DPR is a national commercial contractor and construction manager specializing in technically challenging and sustainable projects—of all sizes and complexities—for the advanced technology, healthcare, life science and corporate office markets.