WORKPLACE ISSUES: ONE IN A SERIES

Reclaiming Buildings

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Steelcase

We must remember at the outset that every building serves two ends —

first, the practical purpose for which it is to be used; and second,

the gratification of the mind through the eye. The problem of the architect

is therefore to design a building which primarily shall fulfill its practical function,

and secondarily, be as beautiful as he is capable of making it.

Thomas Hastings, New York Library (1908)

Turning Old into New

Reclaiming "obsolete" buildings is a new art... a triumph of ingenuity and innovation over inflexible floorplates, intractable columns, and unyielding plenums.

Embrace the past and create the future

Aging high-rises can accommodate late-breaking technologies. Cavernous warehouses can support high-speed networks. Historical structures can house high-tech start-ups. Old buildings will never be the same.

The renovation of existing buildings can yield flexibility, timing, and cost advantages over new construction. While it's true that antiquated services, environmental hazards, and inadequate accessibility often plague older buildings, many newer buildings have similar functional limitations. Poor lighting, insufficient cabling infrastructures, and inadequate HVAC (heating, ventilating, air conditioning) systems are common afflictions in structures even less than 10 years old.

Any edifice not equipped to handle today's substantial requirements for technology infrastructures, IAQ (indoor air quality), and barrier-free accessibility is in danger of functional and financial obsolescence — whether it's eight, 80, or 180 years old. While the structural grids of some existing buildings may prevent cost-effective renovation, many "obsolete" buildings can be successfully upgraded for contemporary use.

With intelligent renovation and flexible build-out strategies, savvy design teams and building owners can cost-effectively return many outdated structures to thriving centers of work and commerce with state-of-the-art technological support.

Buildings 101

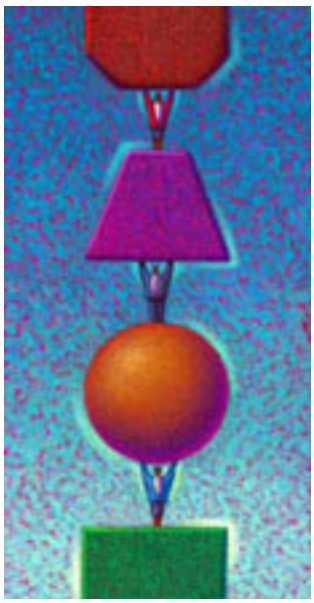
While many architects think exclusively in terms of space, another dimension of architecture is the evolution of buildings over years, decades, even centuries of use.

A six-layered system

In *How Buildings Learn*, author Stewart Brand argues that buildings shape, and are shaped by both space and time. Intelligent renovation is as much an art as original design, and working with existing buildings helps architects mature from artists of space to artists in time.

Brand looks at a building as a six-layered system, with each layer having distinct implications in time. Brand developed his model as an extension of a four-layered building model first conceived by Frank Duffy, cofounder of DEGW, and others. They distinguish four layers: shell, services, scenery and set.

Brand's view extends the model beyond the interior considerations and revises the terminology. Layers exist in space, from the outside in, and in time. Each layer is more short-lived than the last, with the final interior furnishings being the most temporary of all.



Buildings 101

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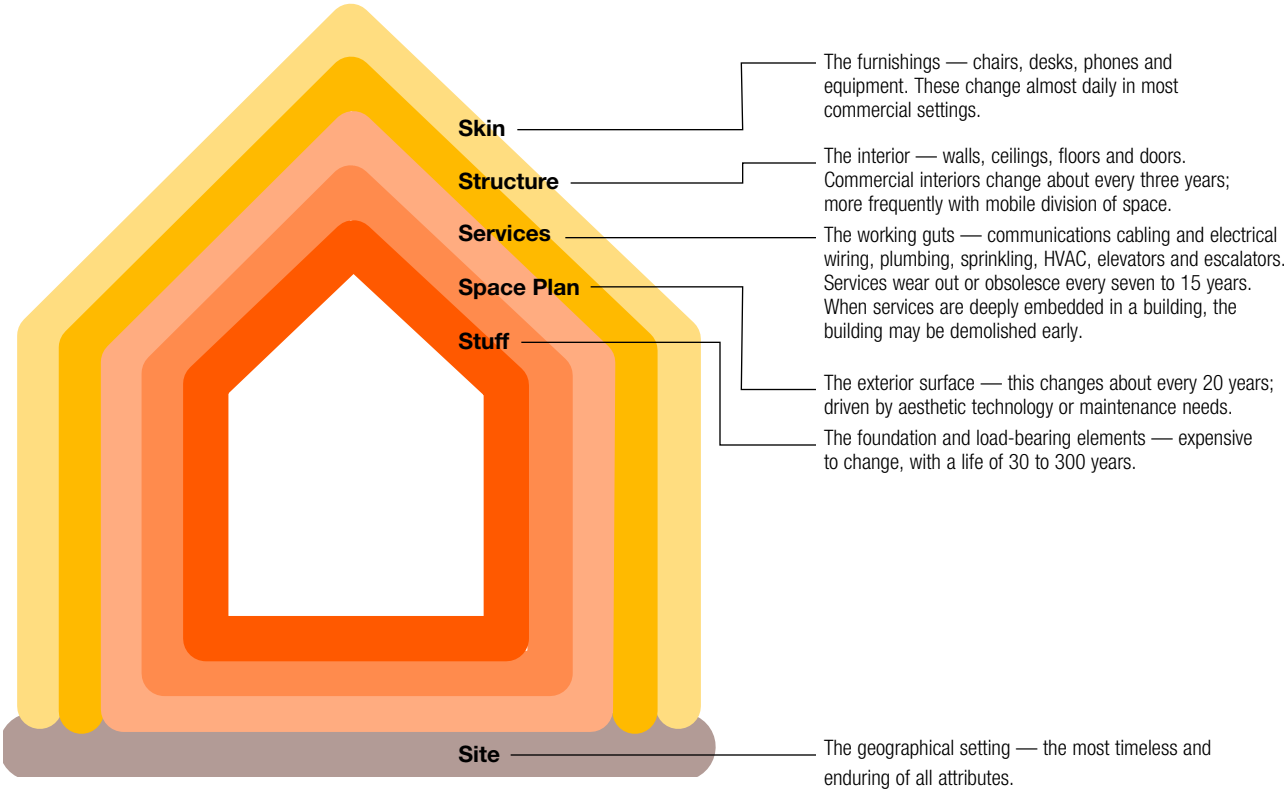
The six-layered system

The construction sequence is strictly in order," Brand writes. "Site preparation, then foundation and framing the structure, followed by skin to keep out the weather, installation of services, and finally space plan. Then the tenants truck in their stuff."



As one looks at reclaiming older buildings for modern use, in most cases three or four of the six layers will undergo dramatic transformation. Architects and designers must reach beyond the furnishings, past the space plan, and deep into the services to truly update and reclaim outdated buildings. But, if the structure is sound, with workable dimensions and proportions, and the site is appropriate, the site and the structure can endure.

Buildings 101

(continued)

How space can affect work

While all six attributes combined create the total workplace, the space exists only as the forum in which work is done. Space can, however, have a tremendous impact on the quality, function and speed of the work. It can also have a significant impact on the costs of supporting the work performed.

When planned and executed intelligently, space can influence new ways of working, support user control and comfort, and encourage the functionality of technology. Thoughtful space planning can affect simpler and faster change, leverage the value of real estate, and improve the financial profile of a business.

Renovation success story — BMG Direct.

BMG transformed an unaesthetic warehouse space into an attractive, comfortable, and functional space with a state-of-the-art zoned system of electrical data and communications wiring.

An evolutionary process

When intelligent space planning is applied, buildings evolve over time. The character of neighborhoods and business districts changes as decades unfold. Needs for different functions emerge as communities, businesses and technologies mature.

Buildings constructed as manufacturing plants become distribution centers. Warehouses evolve into research laboratories. Storefronts transform into financial service centers, and private office suites once furnished with roll-top desks and oil lamps move into the new century as digital communication centers for electronic commerce.

Aging commercial structures are converted into upscale residential condominiums, while vintage residences become office space. Towering office buildings that once housed one huge corporate tenant become a community of smaller businesses when the corporation moves on. And when a building has outlived its usefulness, when renovation is no longer cost effective, when the property value exceeds the building value, buildings are demolished, only to have the evolutionary process start again with new construction.

Only its site and its structure limit the use of a building, and even those can change.

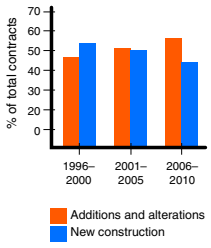
Why Renovation?

Natural swings in the commercial real estate market, the unprecedented explosion of information technology in recent decades, and the pervasive trend of corporate restructuring have combined to make renovation of existing buildings a desirable option for many businesses.

Economic cycles

The availability of commercial space fluctuates in cycles. Marked changes in the economy, tax legislation, and corporate strategies drive alternating shortages and surpluses of commercial space. After World War II, a booming economy fostered two decades of continuous growth in the United States. The energy crisis of the 1970s hampered expansion. Many of the buildings constructed in that era reflected the national interest in energy efficiency and economy.

In 1981, major tax cuts freed millions of investment dollars in an effort to bolster the U.S. economy. In the wake of that reform, developers and business owners built millions of square feet of new office space. By 1986, the U.S. Bureau of the Census reported that spending on new construction of private office facilities totaled $24.5 billion; in 1989, $23 billion. By 1992, new construction spending had dropped to $9.1 billion annually. The plethora of speculative buildings constructed in the 1980s created surplus commercial space in many urban centers for nearly a decade.



The American Institute of Architects projects that by 2010 the market for work on existing buildings will be even larger than for new construction.

By 1996, purchase prices of existing buildings within most Central Business Districts remained well below replacement costs, but the surplus of commercial space was diminishing. Between 1996 and 1997, surpluses became shortages in many regions, and construction rates soared. In its 1997 Mid-Year Market Report, ONCOR International reported that during the first six months, 305 commercial office buildings were under construction.

More and more businesses are exploring the advantages of occupying older buildings. While existing buildings may require major renovations of services, space plan, and furnishings, it is frequently more cost-effective and time-efficient to renovate than to build.

Kermit Baker, chief economist with The American Institute of Architects, sees renovation as the biggest opportunity zone for architects and builders for the next 15 years. According to a government survey, the stock of five million nonresidential buildings increases by 100,000 each year. The average age of these buildings is 30 years. Over the next 15 years, Baker writes, a growing portion of construction spending will be earmarked for improving the aging stock.

Why Renovation?

(continued)

Information explosion

The stunning growth of information technology and the resulting demands on a building's infrastructure challenge the functionality of countless existing buildings, both old and new. Power capacity and quality, vertical and horizontal cable pathways, and HVAC systems are all strained as multiple computers, servers, networks and peripherals are added.

Did You Know …

Cabling: More computers and more equipment mean more cables. According to *Fortune Magazine*, the U.S. work world has added 25 million computers since 1983. Since 1987, homes and offices have added 10 million fax machines.

Power: Since 1980, the demand for electricity has soared from two watts to seven watts per square foot. For new buildings, Con Edison recommends 12 watts per square foot in anticipation of future growth.

Chicago's Sears Tower, built in 1972, is a prime example. By 1990, the Tower was 40 percent empty, with inadequate heating, cooling and ventilation systems to meet the needs driven by technology. Once hailed as an advanced architectural wonder, the building was functionally and financially obsolete in less than 20 years. The Advanced Building System Integration Consortium reports that the investment required to increase occupancy would have driven rents 43 percent higher than the market would bear. In 1996, after staggering losses and costly retrofitting, occupancy had climbed back up to 90 percent.

Buildings once thought to have a life cycle of 50, 75 or 100 years may be rendered functionally obsolete in less than a decade because of technology demands. The financial feasibility of retrofitting depends on three things: the flexibility of the building infrastructure, the value of the existing investment, and the cost of alternative building options.

Building infrastructure. Many buildings built before the advent of electric lighting and mechanized ventilating systems in the 1930s are excellent candidates for renovation. Because they relied on windows for illumination and ventilation, these buildings have more daylight, smaller floorplates and greater floor-to-floor heights than many modern structures. In addition, mechanized HVAC services were added as retrofits, so these services are not deeply embedded in the building structure, making renovations easier.

Conversely, some younger buildings may pose challenges for cost-effective renovation. Built for economic and energy efficiency, many are too tightly constructed — with huge floorplates, deeply imbedded services that prevent adequate air exchange (in extreme cases, causing sick building syndrome), and minimal floor-to-floor heights that make it difficult to accommodate today's need for massive telecommunication cabling.

Why Renovation?

(continued)

Existing investment. The financial feasibility of renovation depends on the existing investment in a building. Depreciation schedules, debt ratios, operating costs, revenues, and tax liabilities are all part of the equation. For example, the tax implications of renovation costs vary widely; most investments in capital improvements follow a 39 1/2-year depreciation schedule. Investments in personal property improvements, however, depreciate in only seven years. When renovations are planned to minimize capital improvement costs, shifting more to personal property costs, tremendous tax savings result. Even older, vacant structures that cannot be profitably renovated and leased may be candidates for reclamation as new interior fit-out strategies emerge.

Alternative options. Available alternatives are also major factors in deciding whether to renovate or build. In one case, a business elected to renovate existing warehouse space into office space because a move would have displaced half the trained workforce. The dual costs of construction and replacing the workers were greater than the cost of renovating existing space.

Why Renovation?

(continued)

Corporate restructuring

Businesses have moved toward increased worker density. In a pervasive trend of downsizing, cost cutting, and reengineering, increasing numbers of businesses have cut real estate costs by putting more people in less space.

From 1990 to 1994, the size of the average office decreased 9.8 percent, according to the Building Owners and Managers Association. One example, cited by the San Francisco Business Times, is PacBell. Over five years, PacBell will reduce its administrative office space 28 percent, from 9.5 to 6.8 million square feet. By cutting space requirements from 322 to 150 square feet per employee, including common areas, PacBell expects a 25 percent drop in occupancy costs.

While architects, designers and furniture manufacturers have responded to this trend with creative solutions that optimize space, the increased density of workers has exacerbated the effects of increased technology. HVAC systems may no longer provide adequate thermal control. Parking capacity may be strained; elevators may be insufficient to handle rush hour flows. Even restroom and cafeteria facilities may be inadequate for the needs of increased numbers of workers.

With the shortage of available space, the need for more sophisticated infrastructures, and the never-ending quest for prime locations, the propensity to reinvest is understandable. More businesses are finding the benefits of renovation far outweigh the costs.

What to Consider before Renovating

When considering renovation, investors and prospective building owners should undertake a careful examination of business needs, a thorough analysis of location costs and benefits, and a comprehensive valuation of any building prospects.

Business needs

What types of business needs drive facility decisions? Here are some examples. A manufacturer entering international markets may need multiple Internet connections within 90 days to secure pending contracts. A direct-mail distributor may need to speed up order fulfillment and cut costs to remain competitive. A fast-growing software development firm may want to shed its start-up look to attract more substantial clients. A bank seeking to boost retail accounts may require retail space with heavy traffic. A thoughtful review of timing, cost, image, and location requirements will provide valuable insight on the suitability of renovation for specific business profiles.

What to Consider before Renovating

(continued)

Business needs

Timing. Frequently, timing is the most compelling reason to renovate. In the time it takes to secure land, complete a site analysis, and develop preliminary architectural plans for a new facility, an entire building renovation can be completed. Renovation is often the most time efficient alternative when it comes to local zoning issues. Considerable delays often accompany the process of obtaining zoning approvals, particularly if appeals are involved. And if demolition of existing structures must precede construction, the time advantage of renovation is even greater.

Image. There is a prestige associated with occupying prime landmark buildings, historic structures, or waterfront warehouse conversions that affects corporate image, public relations, and good will. Intelligent renovation decisions favor the environment, support the community, and value history.

Cost. In terms of design and construction expenditures, it can cost as much to renovate a building as it does to build a new one. When other factors are considered, however, renovation may have cost advantages. With phased interior construction, businesses may be able to occupy space as it is renovated, resulting in net occupancy cost savings. Additionally, renovating inexpensive multi-use or light commercial space and converting it to quality office spaces will command rents that are four to five times higher. Local governments may offer tax abatements or cash incentives to businesses willing to renovate buildings in sections of the city targeted for revitalization.

What to Consider before Renovating

(continued)

Location

While business needs can influence the location decision, an in-depth comparative real estate analysis will show strengths and weaknesses of various alternatives. Proximity to customers, workers, vendors, distributors, or transportation are often primary considerations. Important factors to consider include:

Transportation Infrastructure
When Canary Wharf was initially developed in London, the public transportation system and roadways were simply insufficient to move the necessary numbers of workers to the office buildings. Without transportation for workers, businesses could not function in the district.

Environmental Impact
Have financial analysts review the costs associated with current regulations on indoor air quality, hazardous waste disposal (often a major cost in old building renovation), and exterior refurbishing processes.

Zoning and Land Use
A thorough review of current, planned and potential zoning strategies enables businesses to evaluate projected shifts in land use, traffic patterns, and demographics.

Comprehensive valuation

The benchmark for any building renovation is how the potential quality and performance of the building compares to new construction. Regardless of charm, character, or other aesthetic riches, the building must support the goals and objectives of the company, its people, and their work. Adequate thermal and IAQ (indoor air quality) control, sufficient electrical capacity and quality, and ample telecommunications connections far outweigh the value of image.

A Checklist

In addition to all the location and site considerations, a complete property analysis is needed to assess whether the building meets the basic structural requirements and whether services can be upgraded to meet current needs.

Limiting factors for occupancy density per floor

- ☑ **Floor loading/structural limits.** The building must be able to bear the weight of any structural changes, as well as the occupancy load.
- ☑ **Floor-to-floor heights.** Interior ceiling heights of 9.5 feet are optimum for lighting, acoustics, and thermal control. Floor-to-floor heights, minus the required ceiling plenum, determine interior ceiling heights.
- ☑ **Column density.** Column grids determine the flexibility of the space. For interior planning, columns are obstructions that can create unusable, wasted space.
- ☑ **Egress limits.** Current codes for safety, such as adequate fire exits, must be met.
- ☑ **Elevator capacity.** In buildings of more than three stories, elevators must be able to accommodate people and equipment without lengthy delays.

HVAC infrastructure issues

- ☑ **HVAC.** Zones should be small enough, with ample thermostats and diffuser density, to provide thermal comfort and air quality. Assess typical cooling load costs or BTU costs per square feet. Assess distance from core to window wall to evaluate lengths of runs.
- ☑ **Diffuser density.** Smaller zones for heating and cooling diffusers increases thermal comfort.
- ☑ **Ventilation capacity.** Standards for air exchange rates must be met.

Network infrastructure issues

- ☑ **Electrical power capacity.** Adequate service for HVAC, elevators, lighting, computers, and more must be available. Evaluate current and future needs to determine the watts and outlets required per square foot.
- ☑ **Network support.** Telecommunications systems require significant vertical and horizontal channels for cabling; the structure and space must accommodate the anticipated volume and change rate. Will the plenum be required for cabling? If so, is space adequate for anticipated and changing volumes?
- ☑ **Density of data, power, and voice outlets.** Evaluate current and future needs to determine the telecommunications outlets required per square foot.
- ☑ **UPS (uninterruptible power supply) support.** What degree of protection will be required?
- ☑ **Data cabling.** What is the required speed of data transfer per workstation? What phone system will be specified? How will cabling support these requirements?

Lighting infrastructure issues

- ☑ **Light fixture density.** The type and density of fixtures should match the functions in the workplace.
- ☑ **Lighting quality.** Individual task lighting should maintain consistent foot-candles on worksurfaces without glare, according to Illumination Engineering Society standards.
- ☑ **Lighting zone size.** Smaller zones with more controllers enhance the quality of light for the maximum number of workers. Assess typical lighting load cost or wattage costs per square feet.
- ☑ **Daylight.** Evaluate the percentage of rental square feet within 20 feet of a window.
- ☑ **Control.** Assess the degree of user control over light levels using off/on switches and dimmers. Consider occupancy sensors for energy savings.

Facility management issues

- ☑ **Costs.** Assess amount spent per year as percentage of current plant value.
- ☑ **Ratio.** Evaluate number of FTE (full-time equivalent) workers to square feet.
- ☑ **Change** Assess anticipated churn rate of FTE workers.

"Clearly all buildings are not created equal in terms of their floor plates, structural bays, efficiency or fenestration. A vintage building must make modern tenants feel effective, efficient and comfortable to be economically viable."

Robert Cioppa, Fellow American Institute of Architects (FAIA)

Strategies for Interiors

Once business needs are clearly defined and a building has been selected for renovation, decision-makers should develop design and facility objectives. Then, it's time to focus on options for building out the interior.

Know your objectives

The "interior fit-out" stage includes improvements to the inner three layers of the building: **services**, **space**, and **stuff**.

Steelcase University Learning Center

Steelcase transformed a dormant manufacturing plant into a high-tech, high-flex environment flooded with natural light.

Locating all services above a dropped ceiling and drywall construction for walls is the traditional method that has been in use for decades. At the other end of the spectrum, emerging solutions for flexible interior fit-out strategies — such as modular plenums and adjustable raised floors — are still in their infancy. In between are various evolutionary methods that attempt to achieve flexibility using traditional construction methods and tried-and-true products such as demountable walls and powered furniture panels.

Business and design objectives should drive the strategy and methods for interior fit-out. Flexibility, speed, and costs of the renovation project are often key objectives. If, for example, the developer intends to lease space after renovation, long-term flexibility may be the top priority. If the renovator is hoping to occupy the space to meet business deadlines, the speed in which the renovation can be completed may drive the fit-out strategy. If the renovator is also the sole tenant of the building, tax considerations and the environment may be key concerns.

Strategies for Interiors

(continued)

Flexibility

As we look to the future, change is the only constant, the only certainty. As business and building owners approach a renovation project they might want to consider the following:

- How might our business change over time?
- What deliverables might we produce now and years from now?
- How much space will we need?
- How will space support the technology?
- Can the infrastructure support increases and decreases in the workforce?
- Will workforce needs change?
- What are tax liabilities likely to include?
- Will depreciation limitations prevent efficient renewal?

Clear facility objectives will emerge from the answers to these questions. Steelcase believes that flexible interiors, combined with a high degree of user control, will deliver the most function and value over the long term. A range of innovative interior fit-out strategies will support long-term environmental, technical, and physical needs while accommodating rapid change.

Speed

Modular interior fit-out strategies expedite renovation and project completion. With thorough planning and design, and off-site manufacturing of architectural elements, the construction phase is much like a sophisticated assembly project. Unlike traditional construction methods, this approach minimizes the time involved in on-site renovation. Major phases are completed in quality-controlled, cost-efficient factories.

The modular approach does not, however, eliminate the need for professional guidance and skilled labor. Projects can involve all or most of the traditional players: architect, general contractor, interior designer, carpenters, plumbers, technicians, painters.

Strategies for Interiors

(continued)

Cost

Financial implications play a key role in selecting interior fit-out strategies and methods. Because of U.S. tax codes, flexible and modular solutions have clear advantages over traditional interior build-out construction approaches.

In a major renovation, improvements to the site, structure, and skin are considered capital improvements. For example, new roads, building additions, new skylights and doors, and a new facade will still require a 39 1/2-year depreciation cycle. Some improvements to services, such as new HVAC and new plumbing, are also capital improvements.

But in the interior fit-out phase, many improvements to services and the space plan can be accomplished with modular elements that qualify as moveable personal property. The plenum housing, if designed to be mounted, removed, and remounted elsewhere, becomes eligible for a seven-year depreciation. The floor, wiring and carpeting, if designed to be installed, moved and reinstalled in another wing, becomes a seven-year write-down. The walls, lights and other interior trim, if designed to be positioned, adjusted and repositioned, can be fully depreciated in just seven years. And if a business relocates, all the moveable elements can go along.

In addition, personal property is typically assessed at a much lower rate than capital property, if it is taxed at all. Codes and circumstances vary, but in almost every U.S. state, the ability to eliminate major portions of interior architecture from the property assessment and annual taxes can be a tremendous financial advantage.

Traditionally, building owners evaluate many criteria in choosing one of two building investment strategies: first costs or life cycle costs. Focusing on first costs offers a lower initial purchase price to free cash for other initiatives. Focusing on life cycle costs offers a lower cost over the life of an investment, considering maintenance, reconfiguration, and depreciation rates. While modular interiors are competitive with the first costs of traditional construction, significant benefits and savings are realized over the life of the installation.

A Quick Summary

Despite functional limitations, existing buildings of all ages can see new life.

With thorough analysis, careful planning, and design strategies that incorporate flexibility, even century-old buildings can become state-of-the-art workplaces that readily adapt to organizational and technological changes.

Old buildings can provide barrier-free accessibility, ample telecommunications infrastructures, and enhanced indoor air quality. They can feature cost-effective, reconfigurable, expandable, and integrated building infrastructures that will support the offices of the future.

Traditional methods will continue to meet the needs and design objectives of many businesses. However, emerging strategies and solutions for the interior fit-out of a building carry potential advantages in flexibility, timing, and costs.

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