

Real Estate Today: A Market Transformation



Executive Summary

Responsiveness. Innovation. Agility. Adaptability. All organizations must possess these qualities in order to thrive in today's highly competitive global economy. Until recently, corporate real estate was not considered a strategic advantage to help companies reach these goals, and commercial real estate had not yet fully embraced the concepts and technologies available to further optimize shareholder value.

Today, that is changing. The world's built environment supports 6 billion people—a number that is expected to grow by 4 billion in the next 40 years. Research shows that we currently possess only about 25 percent of the real estate that is functional to support the world population by 2030. This shortfall must be addressed with new, enhanced buildings that provide a flexible foundation for growth. In addition to the need for new development, existing buildings must be updated with connectivity to improve building operations and usage. As well, according to Harbour Research and Forrester Research, by 2010 more than 14 billion devices will be connected to the Internet. Most of these devices will be in buildings, operating as controllers, sensors, servers, and microprocessors.

The real estate marketplace recognizes the need to transform buildings to better house future populations, connect systems, and empower existing building users. This recognition is causing a transformation of the entire real estate sector, in which stakeholders—from owners to developers and investors, landlords, tenants, and users—are demanding more from their properties. These stakeholders now view real estate as a strategic instrument that supports increased profitability and efficiency and a transformed experience.

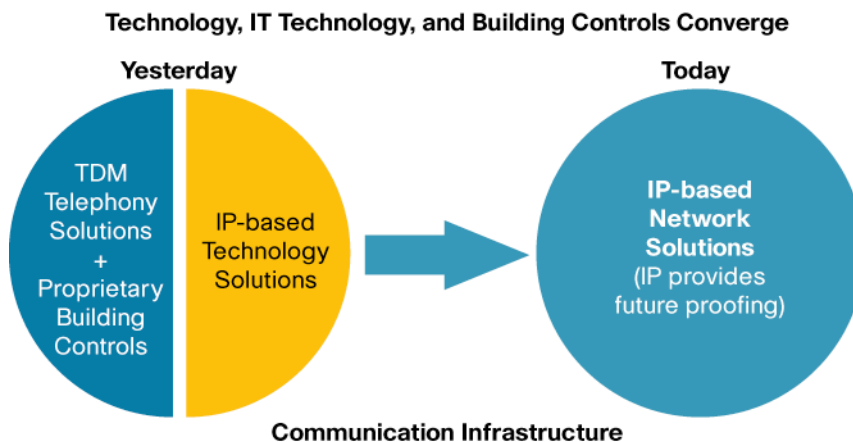
A Connected Building for the Future

The real estate transformation that is currently under way is based on a new vision—one in which buildings will be controlled, managed, and connected to the Internet in a way that goes beyond simply "lighting up" IP services. Instead, the building of the future will be intertwined with Internet technologies from its inception, transforming the process of design, construction, operation, and usage. The Internet is becoming part of the DNA of tomorrow's buildings, providing innovative and responsive environments for all stakeholders.

The building of the future will rely on connectivity to improve the occupant experience, maximize building performance, preserve existing investments, and conserve the increasingly scarce

resources required to build and operate a property. Real estate stakeholders will create the vision of a connected building, based on their need for flexible, customizable spaces to live, work, and play. Connectivity will be built into the fabric of every building, new and existing, allowing all properties to take advantage of the huge opportunities created by the Internet revolution.

Figure 1. Building and Technology Solutions Are Merging Telephony, IT Technology, and Building Controls into a Single Communications Infrastructure.



With the network as the platform for transformation, connected buildings will become a real-time element of the enterprises they house and the functions they serve—such as shopping in a mall, leisure activities in hotels, learning in universities, and healing in hospitals. Connected buildings will be able to adapt to the constantly changing needs of all stakeholders. This strategic approach to real estate considers future requirements and builds in the capabilities for enhanced space allocation, security, regulatory constraints, privacy, conservation, cost management, scalability, and safety. These building capabilities have one fundamental element in common—they all use the network as the platform for delivering information, services, business processes, and assets to a diverse and dynamic set of real estate stakeholders.

The business value of connected buildings can be defined in three key categories:

Performance: Improve building operations

- Better utilize valuable resources to cut costs and manage capital expenditures
- Optimize building operations and reduce operating expenses
- Improve space optimization with flexible and simplified resource management
- Reduce energy consumption and optimize the use of natural resources
- Improve the building environment, heightening building comfort

Purpose: Real estate as a business “instrument”

- Generate new revenue by offering differentiated services, rather than the typical “square footage real estate” or “computer services” offerings
- Enable new business models that offer the opportunity to increase market share and profits
- Increase property value
- Improve the productivity of the workforce with mobility, unified communications, and collaboration tools

Experience: Enhance the user experience

- Improve the user and tenant experience
- Attract and retain a skilled and loyal workforce
- Create real estate environments that are comfortable, productive, and entertaining
- Offer an improved experience to differentiate organizations and their buildings.

A Roadmap for Success

In this white paper, you will learn how Connected Real Estate from Cisco® can deliver value to all key stakeholders in business and real estate. Connected Real Estate is the model of the future. It can increase the profitability of real estate developments and provide new, differentiated business opportunities with the potential for incremental revenue. Connected Real Estate will also enhance the well-being of employees and individuals by improving the comfort, safety, and health environment of every property.

This paper explores these principles in detail and demonstrates how Connected Real Estate is delivering significant financial and operational advantages to the construction, real estate, and property services industries and their customers. Connected Real Estate addresses the needs of all properties, including hospitality properties; hotels, resorts, and casinos; residential developments; multiplexed and multi-tenant retail outlets; corporate real estate; commercial multi-tenant office buildings; healthcare; education; retail banking; and more. It is transforming the business model for the entire real estate market, from one based on creating and offering space to a model in which facilities and IT become services provided to the businesses and functions that take place within the built environment.

This new approach looks at the building lifecycle—from concept, design, and construction to maintenance and operation. A converged IP network is at the heart of this new strategy and is incorporated as a key element in the early planning process. Forward-thinking real estate companies have already found success by using the Connected Real Estate model, and they are building this network-centric approach into their future properties.

“After four years of market research, it was time to renovate our business model. Our strategy was to differentiate this building and all our assets in an already saturated market. One of the methods to achieve this goal was the creation of a unique communications network that would connect Adgar Tower with all our buildings in Canada and Europe. The Cisco Connected Real Estate initiative matched our aims.”

— Roy Gadish, CEO, Adgar Investment and Developments, Tel Aviv, Israel

Chapter 1

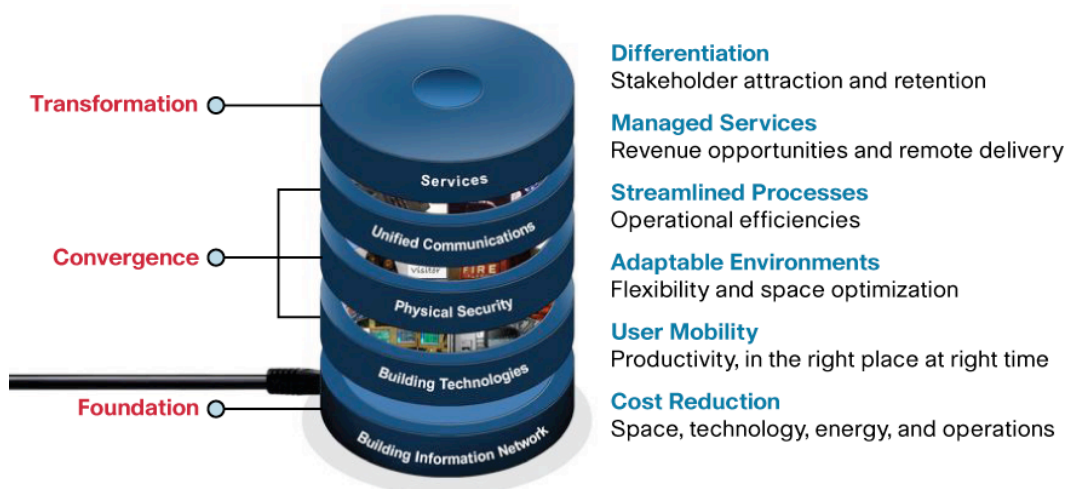
Delivering Building Information Networks: The Network as Information Utility

When **the network is the platform**, the resulting framework changes the traditional role of communications and information networks in built environments. This approach positions the network as an information utility that delivers critical data and new services to stakeholders throughout the building. The network becomes a platform that facilitates new opportunities and transforms real estate projects by reducing costs, increasing revenue, and creating differentiating experiences.

Plumbing, wiring, and piping provide essential water, electricity, heating, and cooling to users of buildings. Today, however, a new infrastructure needs to be included in basic building design to provide what could be the most important utility: information and connectivity. However, unlike traditional utilities, the provision of communications and information networks is currently left to tenants.

Consequently, in multi-occupancy buildings, multiple parallel networks are likely to be installed on a piecemeal basis, with tenants responsible for meeting their own requirements. Additionally, a real estate developer must install multiple networks to support the many different systems that ensure building performance. Examples include heating, ventilation, air-conditioning; lighting; access control; security; fire alarms; vertical transportation; parking systems; and in some cases, digital signage. This disparate approach is inefficient, costly, and difficult to manage. Historically, the construction industry has spent the least of any industry on technology: a meager 2 percent of total building construction dollars. However, technology spending is increasing rapidly as tenants demand buildings that include an infrastructure for basic connectivity, and that are more responsive to their needs. The challenge is to be smart about this spending, and to reallocate the investment from disparate systems into one well-planned utility that will serve many and benefit all.

Figure 2. The Connected Real Estate Value Foundation.



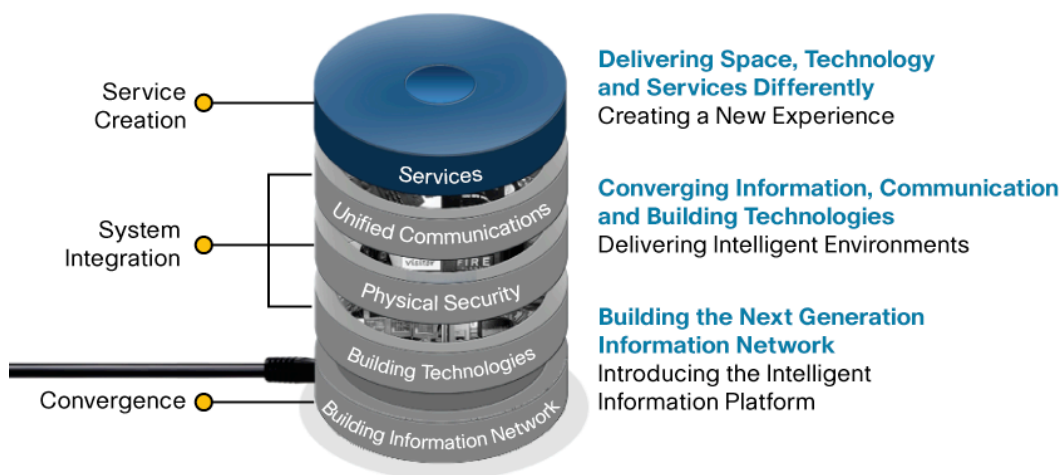
The demand for connectivity and intelligent, “green” buildings creates new business opportunities for owners, landlords, and developers. The network can act as a delivery channel for new services and features supplied to tenants and users. In fact, the network becomes an information utility, as fundamental as water, light, heating, and cooling.

Such an information utility can reduce a property’s costs and operational complexity by replacing disparate communications, security, and building systems with one simplified, flexible, and scalable

IP network. In addition, a single network is proven to reduce design and engineering time, limit costs with simplified installation, and minimize the requirement for cabling, cable trays, and riser management.

A single network also allows real estate developments to centralize building management and administration—within a single property or between buildings—and deploy a more streamlined and effective building information network.

Figure 3. Framework for Connected Real Estate



The stages of using the network as the building information network include the following:

- Providing new services and differentiation: Generate new services, improved experiences, and increased revenue opportunities with fee-based or complimentary services to attract and retain tenants and stakeholders, providing differentiation, revenue opportunities, and new experiences.
- Integrating real estate services and building systems:
 - Communications technologies (unified communications): Deploy IP telephony, video conferencing, rich media, collaboration, and productivity tools
 - Physical security: Deliver converged security applications, including video surveillance, access control and visitor management, and fire safety
 - Building technologies: Integrate building automation systems; monitor and administer heating, ventilation, and air conditioning (HVAC), lighting, transportation, and energy management, providing operational efficiencies, cost savings, and energy reduction
- Offering connectivity or a building information network: Equip each property with a flexible network backbone as the foundation for all systems integration and services delivery, providing basic connectivity and a utility for information.

By providing this network infrastructure as part of the building's "DNA" or fabric, owners, operators, and developers can offer competitive differentiation to retain and attract prospective tenants, optimize building performance and operations, and deliver unprecedented experiences. This strategy applies to all types of real estate, including commercial office, shopping centers, hotels, and residential developments. Connected Real Estate is the source of user-oriented service creation and delivery that will transform the real estate business model from a space-based paradigm to a service-based operation.

Chapter 2

Systems Integration: Placing IT and Building Systems on a Common IP Network

“The move towards increasing enterprise integration enhances the need for advanced BAS [Building Automation Systems]. Companies across all vertical building markets are striving to increase integration across the entire enterprise to improve information management and optimize the strategic decision-making process. As BAS increasingly adopt IT standards, they are increasingly converging with traditional IT infrastructures. Adoption of IT standards in the BAS industry, and the inherent cost savings regarding BAS integration, is causing many building owners to rethink the value proposition of integrated BAS.”

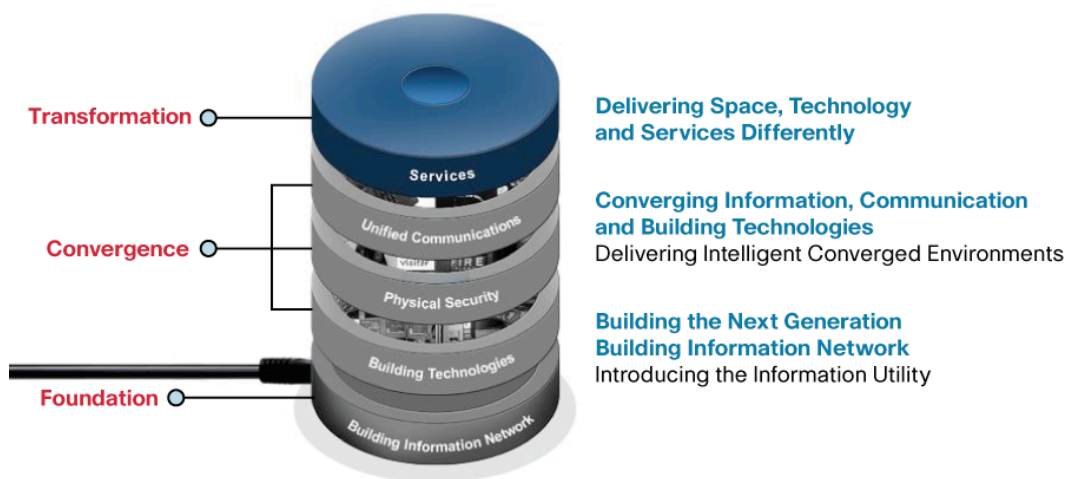
Building Automation Systems Worldwide Outlook, Market Analysis and Forecast Through 2009

A key characteristic of the Connected Real Estate framework is the integration of information technology, communications, security, and building systems onto a single IP network. All systems, sensors, and devices in a building must be connected and able to communicate in order to achieve benefits outside of their existence as separate silos of information. This connectivity will enable the creation and delivery of new, innovative building and tenant services. This next wave of convergence will help to manage costs and improve efficiencies, and will create opportunities for key stakeholders in the building value chain.

Most real estate developments today are constructed with multiple proprietary networks that support separate systems for HVAC, security and access controls, lighting, fire, and safety. In addition, most buildings have separate voice, video, and data communications networks. This lack of integration makes properties complex to operate, with high installation and maintenance costs and substandard functionality.

A Connected Real Estate solution unites these disparate networks and systems over a single IP network that allows all communications, security, and building systems to be monitored and managed centrally. Ultimately, this integration offers new opportunities to reduce the total cost of ownership (TCO), enhance performance, and deliver new services to property occupants and users.

Figure 4. Developing Building Infrastructure.



A Shared Network Architecture for Interoperability

The Connected Real Estate approach applies the same level of oversight and control to all property and communications systems within one building or, with a remote, managed service offering, across geographically dispersed facilities that might be remote buildings and campus environments. The same network architecture that is used for communications and information sharing is also used to distribute data about building performance to any point on the network.

Building Systems Integration

In addition to integrating communications technologies, a converged IP network can act as the foundation for building automation systems (BAS). Integrating voice, video, mobility, and data with building information from BAS offers benefits to owners, operators, and users. This BAS and IP integration gives users control over their environment with access to room controls, such as lighting, heat, and communications services. For owners and operators, BAS IP integration offers centralized management of building wide functions, such as lighting, security, and energy consumption. These functions become a part of the overall building performance and an integral element of the user experience.

Energy management over an intelligent network provides constant visibility and monitoring of temperature and energy consumption, and ensures that HVAC and lighting systems are adjusted to suit user demands. Because systems are constantly monitored, reaction times to unexpected developments—such as energy surges or loss of power—are significantly improved. In addition, centralized energy management eases the increasing regulatory pressures to comply with the stringent environmental standards under which buildings must currently operate. An intelligent network ensures that the risks of noncompliance can be managed effectively with a preventive, rather than reactive, approach.

Centralized Operations

Shared network architecture gives property operators access to all building functions, data, and operations. Gaining access to all information within a building—or across multiple properties—can have a direct impact on the ongoing costs of operation and maintenance.

For example, owners can manage the operations of a single building or multiple buildings from a single system in one location, allowing them to drastically reduce the operational cost per facility. In this scenario, each building or property has its own IP-enabled node in the campus, community, city, or portfolio fabric. A centralized operations center can accept feeds from these nodes to manage and control operations and services.

Connected Real Estate solves many problems associated with campus environments, where independent systems are usually monitored and managed on-site, on a per-building basis. An IP foundation uses the Internet to link geographically dispersed locations and centralize administration. This technique permits real estate assets spread across a wide geographical area to benefit from centralized administration, with the ability to control building systems that would otherwise have to work independently. Similarly, campuses with multiple buildings in one physical location can derive considerable operational and financial benefits from adopting this new approach to building control.

Pharmaceutical company Pfizer operates 4 million square feet of R&D and manufacturing facilities on its site in the United Kingdom. More than 70 active buildings were operating using multiple building systems, creating inconsistent and unwieldy controls and administration. Pfizer made the decision to link the building control network to its corporate IT network. The company now has

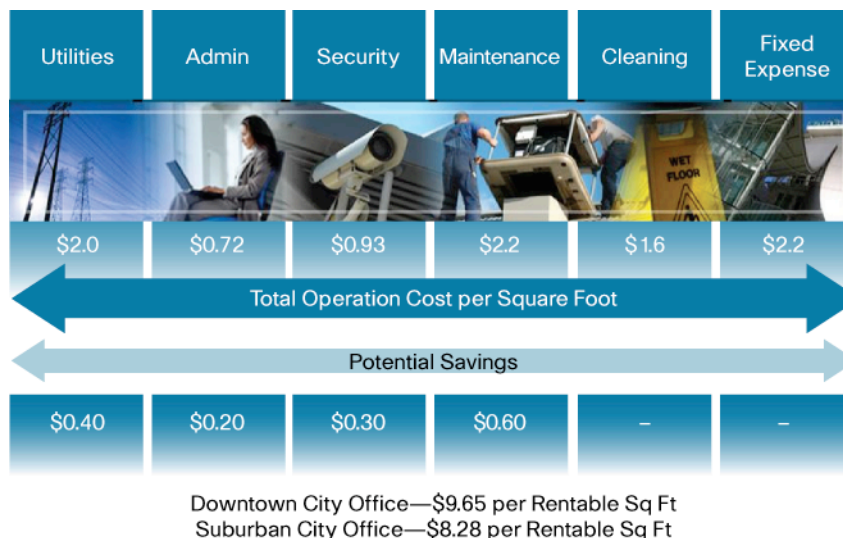
consistent control from more than 70,000 data points over one IP network and the Internet. Pfizer has realized considerable savings, reducing annual energy costs by 5 percent, or 8.6 million euros, and lowering annual maintenance costs by 15 percent. In addition, business continuity in mission-critical areas has been enhanced, facilities have far less downtime, and overall control of the entire real estate property has been considerably improved.

Reducing Operating Expenses

An IP network provides a technology foundation for streamlining building operation and improving building performance, ultimately reducing operating expenses. This strategy provides the following benefits:

- Reduced tenant operating costs
- More productive work environments
- Improved flexibility and start-up
- Enhanced user/landlord responsiveness
- Around-the-clock availability, using a contact center
- Optimized building and tenant management

Figure 5. Savings Possible with an Integrated IP Network in Urban Office Buildings (in U.S. Dollars).



Integrating communications, security, and management systems over a single network allows property managers to cut costs by gaining real-time visibility to the performance of their real estate portfolio through improved access to information. For example, Boston Properties, a real estate investment company (REIT), owns and operates 120 properties in major centers in the United States, covering more than 40 million square feet. Boston Properties uses an integrated network approach to property management that connects all of its building systems with a single, converged network infrastructure.

With this approach, Boston Properties can monitor all systems, including energy management, security, ventilation, and access control, around the clock from a single control center. This reduces the cost and complexity of property management and improves visibility into real estate operations. Figure 4 shows a breakdown of the potential savings for city office buildings.

In another example, in the state of Missouri, more than 1,000 public buildings were run by a multitude of building control systems, covering 28 million square feet. The existing Cisco infrastructure was used to integrate maintenance, security, energy, and supply chain business applications, aggregating more than 9,000 separate utility bills. This consolidation saved the state a total of \$20 million per year in energy savings and delivered a return on investment within 18 months. Figure 5 summarizes the approach taken and the benefits achieved.

Figure 6. Results of Missouri's Integration of Its Building Control Systems.

Case Study: State of Missouri, USA



Situation	Solution	Benefits
<ul style="list-style-type: none"> • 1000 public buildings • 28M sq ft space • Multitude of building control systems • Existing Cisco Infrastructure 	<ul style="list-style-type: none"> • Installed an interoperability layer • Integrated with maintenance, security, energy, and supply chain business applications • Aggregated 9000 utility bills 	<ul style="list-style-type: none"> • \$0.27–\$1 sq ft annual cost savings across the portfolio • Funded from energy savings • \$20M saving per annum purely on ENERGY

Converging Safety, Security, and IT

The convergence of IT networks and building systems creates safer environments for building owners, operators, users, and assets. Video surveillance and analytics, access control, and asset management over an IP network can be used to achieve more sophisticated and comprehensive physical security.

For example, security can be monitored and controlled over the Internet, across a building portfolio from a single, centralized location. Furthermore, security cameras can use the IP network, eliminating the need for a separate security cabling scheme. IP-based security also offers an easy and cost-effective way to add, replace, and move IP cameras between locations.

Connected Real Estate provides a secure platform for consistent, real-time communication of emergency status and instructions via data, voice, and video to multiple devices, including PCs, IP phones, information displays, and public address systems. This allows for the rapid communication of emergency information to occupants, visitors, and employees. For example, an IP telephony application allows security personnel to quickly inform building occupants of security breaches that may require building evacuation through integrated paging or by e-mailing a security alert from a mobile device.

Connected Real Estate also enables state-of-the-art access control for buildings and parking lots, using a variety of recognition technologies. This allows close control of people and physical assets, such as the workforce, parking lot, and equipment, and lets building owners regulate access to buildings or areas. For example, property managers can deny access to personnel who are on vacation or sick leave and to employees who might be victims of identity theft.

IP-enabled closed circuit TV (CCTV) is proven to reduce vandalism and other forms of lawlessness. For example, the local education authority in Newport, Wales, installed IP-enabled CCTV to monitor school premises that had a high incidence of vandalism. By using CCTV over an IP network, the education authority has been able to drastically reduce the incidence of vandalism while reporting considerable cost savings and conservation of teachers' time. The end result is a safer, happier, and more productive school environment, where teachers can focus on teaching rather than dealing with the aftermath of vandalism.

The flexibility of an IP network allows security staff to monitor clear images at any distance and to initiate action instantly. Digital storage of IP CCTV recordings enables archived images to be recalled easily without the need to search through videotapes.

Cisco's corporate real estate department (Workplace Resources) has implemented a worldwide security system, using an IP network to provide video surveillance, security monitoring, and access control in 388 sites around the world. Each site is centrally monitored from a location in the United Kingdom, the United States, or Australia. Not only does CCTV over IP provide real-time monitoring and instantaneous reaction, it also visually tracks other operational elements, such as temperature control, leak detection, and uninterruptible power supply (UPS) failures. Potentially harmful changes to the physical environment in sensitive areas can be spotted and controlled, and the right reaction can be initiated before long-term damage is done. With integrated, centralized operations, Cisco reduces the cost of managing the safety and security of staff and assets. The return on investment for this integrated security system is US\$10 million (8 million euros) per year.

Reducing Capital Expenditures

Using a single, converged technology infrastructure as the basis for a building information network can have a significant impact on the capital expenditures for new facilities, or on retrofitting existing buildings. Builders and owners can realize the following benefits:

- Simplified and streamlined design and engineering
- Cost reduction due to less need for materials, such as cabling; fewer cabling ducts; and less riser space
- Accelerated completion time

Industry research, supported by a growing number of real-life examples worldwide, shows significant savings in infrastructure cost. These examples have shown that consolidating similar yet disparate network infrastructures can save 15 to 25 percent in these costs. The following are some examples of these savings:

- Remove redundant networks and cabling: Typically, 50 percent of cabling costs are labor. Consolidating cabling contractors can achieve labor savings of 25 to 40 percent. This equates to a savings of 12 to 20 percent in cabling contract consolidation. Thirty percent of a typical building system (e.g. lighting systems) installation relates to cabling; therefore, these savings equate to a 4 to 6 percent savings on all systems.
- Consolidate cable pathways: If multiple cable pathways are consolidated significant labor savings can be achieved. Depending on density and space, the labor saving can range between 15 and 60 percent. Using the same methodology as the cabling, a modest saving of 4 to 6 percent can be gained on the cable pathways.
- Reduce project management costs: Fewer contractors and subcontractors means less need for management. Typically, 30 percent of the project management cost can be eliminated

through convergence. If project management is estimated to be 8 percent of the total cost of all systems, an estimated saving of 2 to 3 percent can be achieved.

Typical capital expenditure savings of 15 to 20 percent can be achieved, but these savings are very dependent on market dynamics, labor costs, and building size. Hard savings are listed in the three areas above; however, many soft savings can also be realized through improved efficiency and processes.

Another benefit of Connected Real Estate related to capital expenditures is that the functions of siloed and disparate building systems can be intelligently shared for other related functions. Consider the replacement of an intercom system with a combination and interoperability of video surveillance and telephony devices—two common investments in most properties. A thorough, integrated design process can achieve synergies between investments in typically isolated systems, reducing the need for more systems and devices.

Saving Energy

Buildings consume more than half of the world's energy production. With the rapid growth of the world population and the subsequent growing need for space, there are not enough natural resources available to keep up with the demand. Energy production is already lagging behind the ever-growing need for power.

Utility companies are looking for a way to preserve and minimize peak loads to avoid the need for new and expensive energy plants. Technologies are available today that can result in energy savings of 20 percent and more. Ultimately, it all boils down to “visibility,” and managing and controlling the right information. Today, real estate owners have little insight into their energy consumption at any given point in time. The most accurate accounting they have is in their monthly utility bill, showing complex calculations and averages from previous periods.

Access to accurate, real-time information would allow owners and operators to offset peak loads and renegotiated energy rates. Intelligent buildings can automatically decide when to turn off lights and when to turn down the cooling. All this depends on the activity within the space, the surrounding environmental conditions, and the consequent settings of control systems.

Most organizations could save between 10 and 15 percent on their energy bills by gaining a better understanding of where energy is being used. Simple actions can reduce energy use by 10 to 20 percent, providing quick returns. For many businesses, a 20 percent reduction in energy has the same impact on profitability as a 5 percent increase in sales in many businesses. It is all about information and how the user—and building—can intelligently respond to it.

Chapter 3

Transforming the Real Estate Environment: Redefining Space and Technology Delivery

“The great agent of change which makes new ways of working inevitable is, of course, information technology, the power, reliability, and robustness of which are already evident in their impact not only on work processes within the office but on every train, in every airport lounge, at every street corner, in every classroom, library, and café. Office work, no longer confined to office buildings, is everywhere.”

Frank Duffy, Reinventing the Workplace

The transformation occurring in real estate is changing how properties are used. Today, real estate is not about square footage, walls, and views—it is about the services, functionality, and

experiences that allow people to choose what they do, and when and where they do it. With building transformation, form does not follow function—instead form and function become one.

Connected Real Estate will play a leading role in the transformation of physical environments that must adapt to these changing needs. Buildings need to be able to accommodate mobility, collaboration, and flexible life and work styles—with spaces that support the needs of diverse individuals with unique requirements. With Connected Real Estate, the property and technology are integrated, as instruments of a human network that can advance and optimize the way people live, work, and play.

Improving the efficiency and design of physical spaces also improves utilization and results in reductions in rent and operational costs while enhancing workforce productivity. In addition to controlling costs, these improvements allow operators to use the same integrated, converged network to create and deliver exciting new services to building users—whether they are hotel guests, mall shoppers, office workers, college students, or hospital patients. The ultimate achievement of Connected Real Estate is to create and deliver those services to transform the experience, and to create new and incremental revenue opportunities for the building owners and operators.

New Services for Occupants, Revenue Possibilities for Operators

In the real estate marketplace, property owners and operators have had limited opportunities to generate additional revenue from tenants, buyers, and users. Generally, the only way to compete has been through location and lease rates. In short, traditionally, landlords sell only space.

However, tenants today have new expectations for property functionality. The spaces they lease or acquire must become a part of their business models and practices. The environment must be efficient, safe, productive, inviting, and “green.” Space needs to be flexible, personalized, and customizable. In this competitive marketplace, real estate owners and operators must move away from simply selling space to providing services that differentiate their offering, while cutting costs and managing expenditures.

The future lies in the convergence of real estate and technology solutions, creating an intelligent building that acts as a foundation for next-generation communications, physical security, and building management systems. Real estate developers and building owners and operators have the opportunity to become building and tenant service providers, creating services that add value and that are relevant to the businesses leasing the space.

As an example, the owner of One America Plaza in San Diego provides its tenants with secure access to communications and data networks as part of its real estate offering, delivering connectivity that tenants would otherwise have to acquire and maintain on their own. For the owners, providing the network as a utility is a competitive differentiation in the property market, resulting in occupancy rates of 95 percent, significantly higher than the 88 percent average in the San Diego market. One America Plaza tenants are able to connect to the network almost instantly, and at a far lower cost than if they sourced their networking independently. In comparison, a business trying to secure data access would experience an average 30-day wait when ordering from an Internet service provider. In addition, One America Plaza has deployed a wireless network, offering wireless connectivity throughout the building and allowing tenants the mobility and flexibility that characterize business today.

All property types and building owners can benefit from an information utility in the form of an integrated IP network that offers tenants instant access to a range of tenant services, including

connectivity, security, Internet access, wireless, media, and telephony. For example, the \$1.3 billion Greenfield on Amwaj Island, a major, mixed-use development in the Arabian Gulf, provides residential, commercial, and hospitality tenants immediate access to a range of communications and data services. These services are delivered over a single IP network backbone, providing connectivity to every home, business, and hotel guest on the island. Amwaj Island can deploy improved security and services to tenants—including video on demand for apartments and hotels and digital signage in retail and hospitality facilities. This capability offers an opportunity to increase the revenue potential for landlords and operators and provides enhanced services at a lower cost for tenants.

Other new and exciting technologies offer revenue opportunities. Digital signage can be used in a retail development or public spaces to broadcast promotional messaging, with content tailored for the unique requirements of a particular retailer and buyer. These location-based services have proven to be very successful at increasing sales and revenue for local merchants and have made digital signage a valuable source of advertising dollars for building owners.

Transforming the Workplace

Mobility has changed office workers' habits and office space utilization. With the rise of the Internet and the mobile worker, dedicated offices and cubicle spaces are left empty, and meeting spaces and common areas are unused. In fact, often, up to 60 percent of office space is underutilized and remains vacant on a daily basis.

Dynamic workspaces can be created through a converged voice, video, and data network that is integrated with advanced services and environmental comfort management solutions. Such a network can deliver the flexibility and personalization needed to improve workplace utilization and facilitate productivity, collaboration, and mobility. This transformed workplace can help attract and retain workers who want to work in a building that supports their unique, changing needs. Building owners must rethink the design of interior space and view it as a strategic differentiator, providing more accommodating alternative spaces in their building portfolios.

For example, unified communications, wireless access, and virtual private networks (VPNs) create flexible work environments that support employee mobility, telecommuting, and remote working initiatives. A converged network allows secure collaboration, using communications methods such as e-mail, voicemail, conference calls, video conferencing, knowledge management, intranets, and instant messaging. These solutions enable new work practices while reducing overall real estate requirements. The network also supports new technological trends, such as hot-desking and VPN-based remote offices. These practices allow owners to achieve greater operational gains from more flexible and efficient usage of their existing space, while using the network to get more from their assets.

An IP Network Delivers Flexible, Optimized Space Utilization

Connected Real Estate has had a positive impact on the workplace of the Hillingdon Borough Council in the United Kingdom, an organization where 70 percent of the staff is able to work remotely. Staff members now have access to the information, services, and applications they need, at any time and wherever they are—whether working from home or on the road. The council saves more than 4.3 million euros annually in office costs by eliminating unnecessary office space.

In another example, British Telecom (BT), the United Kingdom's largest telecommunications service provider, has recognized significant savings and productivity improvements from rethinking space usage. Today, about 9,500 BT staff members are contractually employed to work from

home. More than 63,000 others are able to work independently, from any location, at any time. BT now saves some 6.5 million euros annually on property costs, absenteeism has fallen by 63 percent, and staff retention has increased dramatically.

Connected Real Estate in the workplace leads to:

- A 40 percent increase in office space utilization
- A 22 percent reduction in the number of IT devices per employee
- A 44 percent reduction in total IT equipment wattage per employee
- A 54 percent reduction in IT cabling
- Reduced greenhouse gas emissions
- Reduced consumption of materials and eventual e-waste

Service Creation and Delivery

Improved Services

In addition to delivering savings and efficiencies due to a more intelligent and responsive building, the network can also offer new and innovative services to the users of the space, improving property differentiation; and provides opportunities for new and innovative business models. These services fall into three categories: in-building services (from owner/investor through the operator to the tenant), shared services (provided to users of the building), and tenant services (provided to tenants and end users).

In-building services may include Web-based maintenance orders for tenants, room-control applications, delivered over IP phones, which provide customized comfort settings; security access and surveillance management; and smart bathrooms that can notify facilities managers when supplies run short. These services all increase the level of service provided to building users. An in-building service package can improve the comfort, safety, and security of the users. Operators can charge for these in-building services, although typically, services are included as line items in lease amounts or service fees.

Shared services are services that touch all users of the facility, both tenants and guests, affecting their experience as they use or move through the building environment. These services may include high-speed wireless access for visitors, digital media and digital signage, entertainment services, and remote and virtual reception services. Investing in these services is like using top-quality building materials in the lobby and public spaces—doing so will attract and retain visitors and tenants by enhancing the physical design and overall experience. Operators can charge for shared services, which are usually billed as a periodic service charge to the tenants or rolled into the lease.

Lastly, there is an opportunity to provide tenant services. These go beyond typical voice and broadband services and include video, such as telepresence, video conferencing, data, environmental, security, and other building services. Any combination of these services—and many more services—allows real estate developers to further differentiate their property from that of competitors, who may not offer the advanced technology that tenants demand. Tenant services can be billed on a per-use or monthly basis and provide an opportunity to generate incremental revenues above and beyond the provision of space.

Chapter 4

Cisco Connected Real Estate: Supporting the Convergence of Building and Network Architecture

Innovative thinking about network deployment in real estate ventures has created a wide range of exciting possibilities. New business models for the real estate value chain have been developed that will transform the way buildings are designed, built, operated, and used.

For building transformation to become mainstream and benefit all stakeholders—as well as the environment—IT network design must be a priority in the property development planning process. While the water, electricity, and heating/cooling infrastructure is designed and evaluated in the very early stages of a property's conception, network and communications needs are rarely given the same early attention. The network must be considered in the planning stages for it to have an optimal impact on building functionality and experience.

A Connected Real Estate framework will improve functional building usage and design and support the transformation of space and businesses. By including an IP network in the building design process and installing it early in the construction phase, building owners can realize immediate gains.

Having a single IP network reduces capital costs in several ways. First, infrastructure can be laid more easily during the construction phase, eliminating the cost and disruption of retrofitting. In addition, a single open-standard cabling infrastructure reduces the need for multiple closed proprietary networks and the associated costs of installation. Finally, by installing the network during initial construction, building owners can extract value from the network over a longer period of time, increasing overall return on investment.

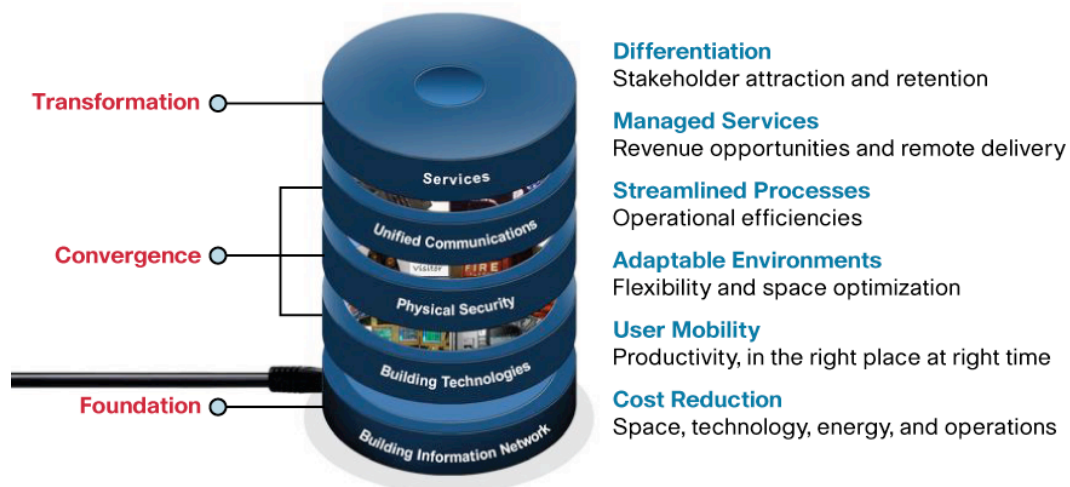
Connected Real Estate from Cisco helps lower operating expenses over the building's lifecycle. A building infrastructure based on open standards supports a centralized approach to the monitoring, maintenance, and control of the building environment.

The Connected Real Estate IP framework features embedded technologies that guarantee quality of service and high levels of security and resilience, further reducing maintenance and repair costs. Furthermore, all components of the network are built entirely on open standards. Hardware, software, and services are designed using roadmaps that anticipate and support constantly changing business requirements.

Transforming the Future: Connected Real Estate

Connected Real Estate addresses the needs of today's changing marketplace by harnessing the power of a converged IP network and integrating it into the fabric of every building. Connected Real Estate is based on three fundamental principles related to real estate and network interactions:

Figure 7. The Three Principles of the Connected Real Estate Solution.



The goal: Transformation of the services, IT, and physical environment in a way that enhances the experience, provides new services with the possibility of generating new revenues, optimizes space utilization, and introduces new ways of working and living. Real estate and IT become more relevant and strategic for all businesses, and greater value is created for the owners.

The strategy: Integration of information and communication building systems, and safety and security systems into a common IP network, reducing operating expenses and capital expenditures while optimizing building management operations and performance.

The foundation: Creation of a “building information network” for ubiquitous connectivity—a flexible and scalable network foundation as the facility’s information utility.

These three principles form the flexible foundation of the Connected Real Estate solution. Connected Real Estate is about creating new environments, improving the building experience, and meeting the changing demands of users today—and tomorrow. With Connected Real Estate, operators can realize new business and revenue opportunities while cutting costs and delivering on the promise of buildings that are both high performance and sustainable.



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