

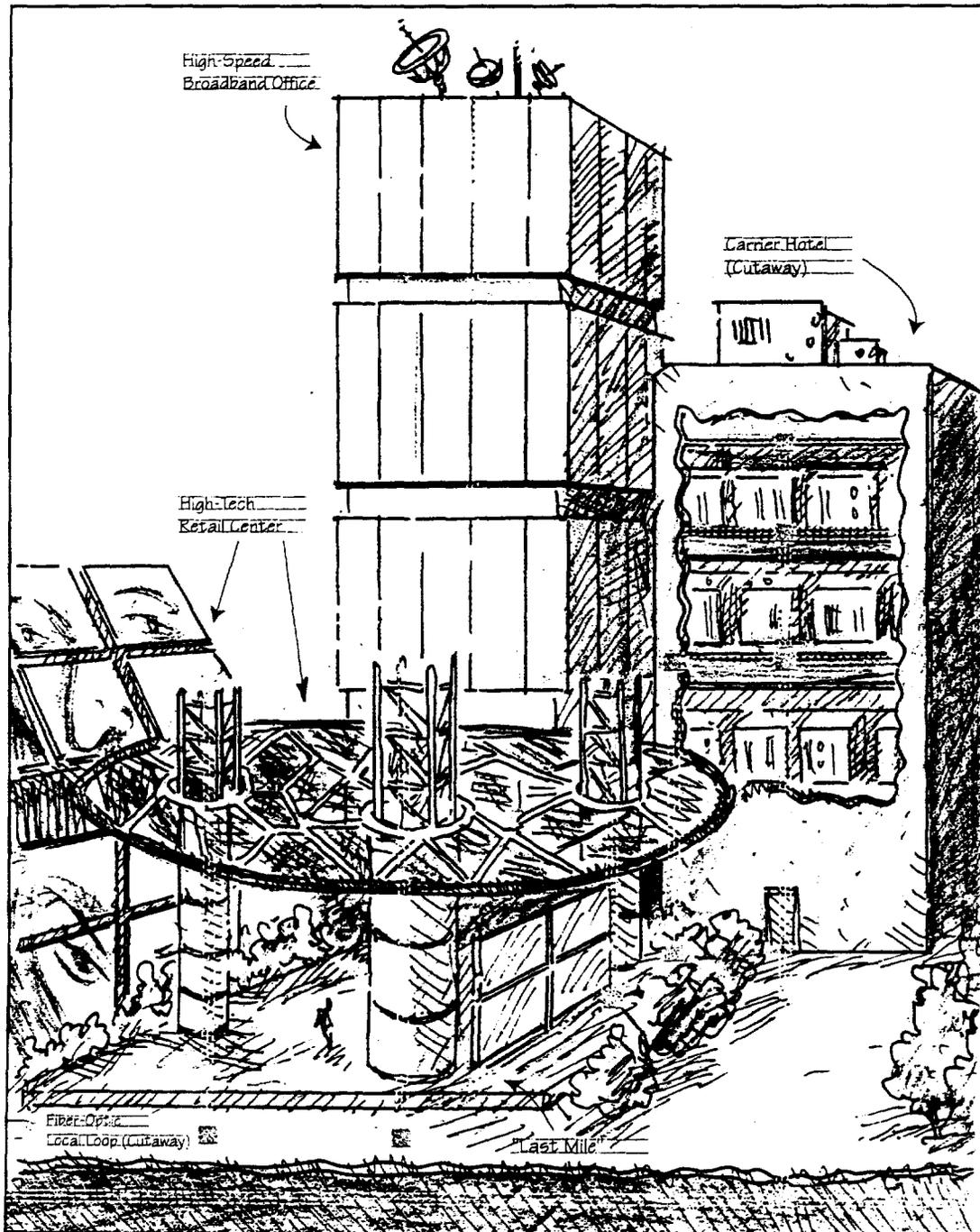


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Wired Real Estate: The Ultimate Portal

Valuing Real Estate Assets in the New Economy—As the Broadband Revolution Proceeds at Warp Speeds, Intangible Assets Will Be Awarded Even Higher Valuations in the Future

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"How you gather, manage and use information will determine whether you win or lose. There are more competitors. There is more information available about them and about the market, which is now global. The winners will be the ones who develop a world-class digital nervous system so that information can easily flow through their companies for maximum and constant learning."

William Gates, Chairman of Microsoft

"Business @ The Speed of Thought" p. 3

Executive Summary

If warp speed and intangible assets are the defining characteristics of the Knowledge Age and the Internet revolution, how does real estate fare as an industry and as an investment? On the surface, the real estate marketplace may appear to be the very contradiction of and the biggest loser in the New Economy, as development projects and transactions are inherently slow and inefficient and buildings are tangible. **An e-perspective is required.**

Real estate, in our opinion, may be one of the most significant beneficiaries of the New Economy. A change in mindset is in order as visions, executions and marketing of the e-enabled real estate industry are established. We believe that wired real estate is the ultimate portal. Everyone needs a place for shelter, to work, and to spend his/her leisure time. The fragmentation and inefficiencies that plague the industry offer the greatest opportunities. If the question is posed, "Is real estate losing its importance and thereby its value in the Knowledge Age?" we would argue absolutely not for those properties where the landlord is embracing the New Economy and staying attuned to the rapid changes that the Internet and technology are presenting. The Knowledge Age is also referred to as customer empowerment times. The Internet is not only changing the world at warp speed, giving knowledge the preeminent role, but also shaking up old business structures to adopt new ways of operating and serving the customer.

We believe the challenge for the real estate industry is to re-tool business models, to wire buildings for high-speed Internet access, to create and/or acquire e-services, and to market buildings as assets with value. Armed with knowledge about the people who enter and exit a building, real estate becomes the ultimate portal to be wired with high-speed access to the Internet. The real estate platform may then be leveraged to create intangible value, via New Economy services for its tenants and customers, and thereby its shareholders.

In this report, we have broken our discussion into four primary areas: 1) Entering the Knowledge Age, 2) Broadband Network Solutions, 3) e-Business Initiatives, and 4) The Convergence of Real Estate and Technology. We present the ideas and business models unfolding in the real estate industry, as companies move to re-tool business models.

"Entering the Knowledge Age" attempts to provide a brief retrospective of the past, providing our view on the future, and how a real estate company is to survive and increase in value in this Knowledge Age.

"Broadband Network Solutions" represents the backbone from which the real estate industry may create numerous B2B and B2C initiatives. As wiring buildings for high-speed access becomes more of an imperative, more management teams will support the best broadband service providers. Many revenue-sharing arrangements have been formed. As an adjunct to the world being wired, a demand for carrier hotels, which provides services such as Web hosting, virtual private networks, application hosting, e-data storage servers, Internet Service Provider hubs, has emerged.

"e-Business Initiatives" seeks to identify the exponential growth driver for the real estate industry. In terms of B2B, the e-opportunities to reduce cycle times are substantial, whether for development projects, acquisitions, dispositions, or leasing space. The time required to execute may be dramatically compressed, producing a substantial improvement in efficiencies, and benefiting the bottom-line. The potential B2C initiatives are literally limitless. Creativity and e-thinking will reign, and this entrepreneurial spirit will reinvigorate the real estate companies who jump on board, and higher stock valuations should follow.

"The Convergence of Real Estate and Technology" provides a more comprehensive look at the four major property sectors—multifamily, office, retail and industrial—concluding with a brief analysis on spinning off or retaining these initiatives. The early adopters who create efficiencies within their business model or who reward the customer with added values will lead the way.

We touch upon the risks relating to telecom regulatory and legislative issues as a precaution. We believe that management teams are carefully considering opportunities and not boldly investing substantial amounts of capital into highly speculative and unproven technologies. As speed is important, prudence is also crucial to advance and survive in this Knowledge Age.

Our conclusion is that the real estate industry, which is fragmented in nature, is the ultimate portal, offering incredible untapped potential. The inherent value in real estate may be capitalized upon to create material efficiencies and revenue-generating opportunities in addition to intangible assets, as real estate and technology converge. In our view, stock prices could climb for the companies that embrace the New Economy and firmly position themselves on the Internet speedway.

As the stock market has recently indicated, a pure e-model is not a long-term business solution. We also believe that a pure bricks and mortar model is not a viable solution for the future. In our view, Project Constellation represents a defining event for the real estate industry, as the founding members plan to collaborate their intellectual capital and skills to capture the potential in embracing technology, and in fact, we believe that they realize a high-tech discipline is vital for the future success of their companies. Significant wealth may be created in those real estate companies willing to move to the edge of the frontier and explore opportunities to converge real estate and technology. **Some companies are gradually re-tooling their business models in that direction: AMB Property, Apartment Investment and Management Company, Archstone Communities, AvalonBay Communities, BRE Properties, Equity Residential, Equity Office Properties, Kimco Realty, The Macerich Company, ProLogis, Reckson Associates, The Rouse Company, Simon Property Group, Spieker Properties, Taubman Centers, TrizecHahn, United Dominion, and Westfield America.**

We believe a core list of Real Estate Technology companies will emerge for shareholders to own. The real estate leaders are beginning to emerge, and we recommend swapping out of those companies that lag the industry as the pace of technological change is so rapid.

Entering the Knowledge Age

Through the passage of time, as economies have evolved and been reshaped, more of an emphasis has been placed on intangible assets. History may be traced from the Stone Age, to the Iron Age, the Agricultural Age, and then to the Industrial Age. The earlier times may be most notable for the importance ascribed the landlord in the hierarchy of society. Over time, the value of land to create wealth has become a smaller portion of total value for advanced societies, with technology gaining a more notable share, and more recently knowledge.

Since the economic boom years began in 1Q 1991, GDP has soared 33%, which coincidentally marks the advent of the Internet. Data suggest that over 70% of the improvement in productivity is credited to computers and the Internet. (*RECG Conference, "Development and Technology" panel, April 17, 2000*) Substantial wealth has been created for those companies selling the technologies, such as Microsoft, and utilizing technology, such as General Electric. As the Technology Age is being gradually supplanted by the Knowledge Age, the importance is shifting to information and toward connecting data and information to make decisions real-time and using digital processes.

In our view, more value and growth will be awarded to those companies providing the channels of communications, such as Internet infrastructure providers, and utilizing those data channels to improve operations. Information is growing exponentially in importance, with property representing a smaller piece of the pie.

"...the dynamics of the New Economy are substantially different than those of the old, because information-based goods are fundamentally different from physical goods. Like books or pharmaceuticals, they often involve large start-up costs to create, but only small or negligible costs to reproduce...the rewards in knowledge-based businesses go to companies that innovate quickly and then grab the largest possible market share...if investments in factories were the most important investments in the industrial age, the most important investments in an information age are surely investments in the human brain".

Lawrence Summers, Treasury Secretary

Wall Street Journal, May 10, 2000, p. A2

From our perspective, real estate companies must understand how technology can create value for real estate portfolios, transforming traditional bricks and mortar space into smart buildings with futuristic services that not only address tenants' needs today, but also their visions tomorrow. We do not advocate spending exorbitant sums of money on unproven technologies; investments should be prudent and visionary. Technology is revolutionizing Old Economy businesses and their infrastructures. John Tuccillo, the author of "Click & Close", notes that traditional roles are shifting, with the customer as king. The expectation is that as technology continues to infiltrate society,

the economy advances and becomes wealthier. As the United States leads the effort, productivity and wealth should continue to increase. Our real estate economist, Peter Muoio, recently echoed statements by Alan Greenspan. "As economists at the Federal Reserve and other institutions have finally begun to recognize, the massive investment in technology over the past 20 years is now surfacing as a substantial, sustained increase in U.S. productivity and trend growth. Recently, Federal Reserve Chairman Alan Greenspan stated, 'Indications that the extent of the application of existing technology is still far from complete, plus potential benefits derived from continuing synergies, support a distinct possibility that total productivity growth rates will remain high or even increase further.'" (Peter Muoio, *Real Estate in the New Economy*, April 26, 2000.) So what does that mean for the future value of real estate companies?

"Industries are being re-invented due to the importance of infrastructure with broadband solutions and content aggregation. Capital flows will become more and more disciplined, so the challenge is for bricks and mortar companies to get capital to form e-divisions."

Peter Zofra of E&Y Kenneth Leventhal Real Estate Group
RECG Conference, "Accountant's Perspective" panel, April 17, 2000

The Future: Real Estate Technology Companies

The real estate industry is moving rapidly into the New Economy, as evidenced by the formation of Project Constellation (please refer to p. 24-27), which we believe is a defining moment for the industry. In our view, all CEOs of public real estate companies need to be thinking about three primary objectives: 1. how to build-out a technology infrastructure, 2. how to integrate e-capabilities, and 3. how to create new innovations using e-infrastructure. In order for a property to increase in value in the New Economy, we believe management teams should be evaluating the steps to wire their properties for high-speed access and launching e-business initiatives.

In the 1990s, the transformation of real estate from private ownership to public shareholders was pioneered via the REIT public investment vehicle. We believe the 2000s will be about transforming some REITs into **Real Estate Technology** companies via the REIT Modernization Act's taxable subsidiaries and/or a combination of de-REITing. Management teams that are re-thinking their business models and are flexible to change in the Knowledge Age could witness significant share price appreciation. From our research and analysis, the Old Economy was REITs, and the New Economy is re-tooling REITs into **Real Estate Technology** companies.

Consider the transformations that have occurred among the many U.S. manufacturing companies, where the original equipment (OE) business has shrunk relative to the growth in "aftermarket" businesses and services. In our opinion, a similar transformation could occur for real estate companies, whereby the property's cash flow associated with rent for space becomes a smaller portion of the total, displaced by the growth in fees for services,

e-marketplaces, e-applications, and other B2C and B2B initiatives related to real estate. Technology and broadband access are rapidly changing businesses and what will be valuable in the future. Tangible assets are becoming less valuable in the New Economy. **We believe future wealth and profit growth will be recognized in those companies connected to information, possessing knowledge.** We believe that those companies are the most attractive for shareholders to own. Companies change as times demand they change. Stagnant companies that remain in the Old Economy may not show higher stock prices, nor might they be viewed as safe havens for investors.

Real estate companies present some of the greatest challenges as well as the greatest opportunities, depending on the vision of the CEOs. Considering the inefficiencies and fragmentation in the industry, significant wealth may be created in those real estate companies willing to move to the edge of the frontier and explore opportunities to converge real estate and technology. **Some companies are gradually re-tooling their business models in that direction: AMB Property, Apartment Investment and Management Company, Archstone Communities, AvalonBay Communities, BRE Properties, Equity Residential, Equity Office Properties, Kimco Realty, The Macerich Company, ProLogis, Reckson Associates, The Rouse Company, Simon Property Group, Spieker Properties, Taubman Centers, TrizecHahn, United Dominion, and Westfield America.**

We believe a core list of Real Estate Technology companies will emerge for shareholders to own. The real estate leaders are beginning to emerge, and we recommend swapping out of those companies that lag the industry as the pace of technological change is so rapid. We believe that there is an opportunity cost in not integrating technology into a company's business plan. In our view, staying abreast of these changes is critical as the real estate industry is moving rapidly into the New Economy. Stock selectivity will become increasingly important. Analysts must understand thoroughly the strategies and goals of each CEO and company, in order to distinguish between the real estate companies moving more to real estate technology companies, with the potential of capital appreciation, and those that remain tried and true to real estate, with the value as an income-oriented investment with dividend growth. The real estate industry is in a state of flux and investors need to be attuned to the transition in order to adhere to or adjust their investment risk and return objectives and to own the appropriate stocks. We believe the transformation is underway.

Based upon our research, we believe that the convergence of real estate and technology is the continuing catalyst that could serve to propel earnings in the event of a slowing in the real estate markets. We view BRE Properties' announcement on March 14 to spin off its tech initiative, VelocityHSI, as the positive catalyst for the REIT industry that has set our theme of the convergence of real estate and technology in motion. On April 4, TrizecHahn announced the investment of a one-third interest in Global Switch as a further validation of the convergence of real estate and technology. On May 4, Project Constellation was unveiled, which we believe is the watershed event for the real estate industry. And on May 19, six regional mall REITs announced the formation of MerchantWired, a company that will provide a

technology infrastructure for retail centers. These partnering arrangements are catalysts for the REIT industry.

Commercial real estate, in my opinion, will be changed for the better and more than most industries. The Internet may be noted for three things: 1). Creating the greatest business revolution, 2). Giving a boon to customers, and 3). Accelerating globalization and disintermediating the middlemen to create efficiencies. Considering that commercial real estate is one of the least efficient industries with slow and costly transactions, the industry could potentially have more to gain. According to my prognostications, within the next 12-24 months, many real estate transaction functions will move online. Every step, including inspections, escrows, contracts and financings, will become more efficient. As a consequence, the benefits for the buyers and tenants are multiple. Efficient market pricing will evolve between the landlord and buyer.

Kipling Hagopian, special limited partner of Brentwood Venture Capital

Keynote Speaker, RECG Conference, April 17, 2000

Future Catalysts

BRE Properties' spin off of VelocityHSI is expected to occur in June 2000.

Despite the volatility in the stock market for more speculative investments, VelocityHSI has the potential to grow at a faster rate than BRE Properties, so the spin off could result in a higher stock valuation being awarded to VelocityHSI. The spin off is expected to unlock value for shareholders, and we consider the move a positive as the viable companies that develop a track record show growing profitability and potentially become leaders in their respective niche markets. These investments could show higher stock prices over the intermediate and long-term.

The Rouse Company is kicking off the redevelopment of Fashion Show Mall in Las Vegas on May 22. This high-tech mall will bring its redevelopment into a multi-sensory experience featuring live fashion shows and multi-screen cybercasts. We are expecting a good turnout for this futuristic mall.

CEO to be announced for Project Constellation in June. The CEO will formulate a business plan and strategy to make this project seem more "real" to investors. We view the leader will be a visionary of future real estate technology opportunities.

AIMCO's launch of buyersaccess.com is expected to occur in August of 2000. Buyersaccess.com will be the largest online group purchasing organization for the multifamily industry.

We believe that real estate is a platform that will evolve into a business model using digitalized information, with B2B and B2C Internet applications launched to better serve tenants and customers. Improved information flow yields a better decision-making process. As a consequence, costs are

reduced and productivity is enhanced. Service applications can thrive as information flow improves and knowledge of tenants and customers increases. As we have stated in our "Wired Real Estate" report dated January 2000, many REIT management teams are focused on wiring their buildings, launching technology initiatives and new economy business strategies, showing that management teams are adding value. The formation of Project Constellation is evidence that the convergence is occurring and of the direction in which the real estate industry is headed. **Properties are the ultimate portals, and in our opinion, the embedded value in real estate is just beginning to be tapped.**

Please refer to Appendix I for the glossary and Appendix II for the detailed profiles on the companies providing technology solutions to real estate companies.

Broadband Network Solutions

Internet infrastructure and the Telecommunication Act of 1996 have had a profound effect on reshaping the competitive landscape in the telecommunications industry. The industry was essentially deregulated to allow open access and promote competition. The regional Bell operating companies (RBOCs) were required to allow other telecommunication carriers the ability to lease facilities, features and functions of the RBOCs' networks. RBOCs were able to provide long-distance service outside their service area once they offered open access to all service providers within their service area. As a result of this legislation, a proliferation of telecommunication service providers, including Competitive Local Exchange Carriers (CLEC) and Building-Centric Local Exchange Carriers (BLEC), has emerged. Free competition reigns. The debate regarding access is still ensuing, though allowing access in a building entitles the owner of the property to compensation in some form.

In the real estate industry, many revenue-generating arrangements have been formed between building owners and telecommunication service providers, especially broadband providers who wire buildings for high-speed access. In our opinion, the broadband revolution is occurring at warp speeds, essentially moving the world into the wired realm.

We plan to present the Internet infrastructure options provided by broadband service providers for real estate owners and to discuss an emerging demand for space, referred to as carrier hotels.

Internet Infrastructure

The most widely discussed technology initiative, especially among the office property owners, is wiring buildings for high-speed access, in other words providing customized broadband network solutions for each tenant/community. Broadband may be differentiated from narrowband in terms of the speed. Narrowband offers speeds up to 128 Kbps and is used for voice traffic using an analog modem, whereas broadband solutions range from 144 Kbps toward 100 Mbps. In the U.S., voice subscriptions total 350 million and are growing at a 29% rate, according to Richard Grimes, the director of wireless network services at AT&T Wireless. Broadband offers an "always on" high-speed connection to the Internet without the need to dial up using a modem. Other features include streaming audio and video, digital photos, video conferencing, video-on-demand, interactive applications, instant-messaging, IP telephony, multimedia e-mail and other enhanced user interfaces.

The backbone of the Internet is fiber, representing the primary route for data to travel. The backbone network providers include Level 3 Communications, Qwest Communications, AT&T, MCI/Worldcom, Global Crossing and Sprint. For data to move from the backbone network into a building, several paths may be utilized. Network channels, such as those owned by the RBOCs, are the traditional option, but the copper wires are typically narrowband. The narrowband architecture typically services circuit-switched networks, which

essentially means an uninterrupted connection on a network. The Internet transmits data in the form of Internet Protocol (IP) packets, a system which un-bundles data into packets and distributes the packets over the least trafficked data communication networks and re-bundles the data prior to arriving at the destination. Richard Grimes, the director of wireless network services at AT&T Wireless, stated that high-speed data communications and the demand for broadband are creating a strain on LANs and modems with 56 Kbps. Three growth drivers have emerged: 1). the Internet, 2). convergence of voice/data networks, with IP cheaper as packets are broken up versus voice that is circuit-switched with a continuous signal between two calls, and 3). deregulation of the telecom industry. With the demand for high-speed access due to the Internet, numerous broadband network providers are offering connectivity from the backbone network to buildings via local loops. Some providers, such as OnSite Access and Allied Riser, have been formed to compete for access into buildings.

The broadband solution providers consider the commercial multi-tenant market a significant revenue opportunity, ranging from \$50-\$100 billion, depending on the source. This substantial investment opportunity stems from tenants demanding higher bandwidth speeds in their respective locations, whether it is one of the 750,000 office buildings, retail centers and industrial facilities or 21 million multifamily units. Residential homes are also being connected at a rapid pace, but we are not addressing this potential market in this report. There are 100 million Internet users worldwide, and the expectation is that over 500 million users will be connected to the Internet over the next three to five years.

Based upon our research and conversations with Deutsche Banc Alex. Brown's wireless analyst, Bo Fifer, we believe there are three potential solutions for real estate companies, including Digital Subscriber Lines, or DSL, wireless and fiber optic cabling. Please refer to Figures 1 and 2 which diagram the broadband technology alternatives, ranging from copper-based DSL, on the low-speed, low-cost end, to fiber optic cables on the high-speed, most expensive end of the spectrum.

The DSL technology is essentially enhanced electronics on existing copper wires that transmit voice signals and are owned by local telephone companies. Real estate companies are working with companies such as Covad Communications, NorthPoint Communications and Rhythms NetConnections to enhance existing wire with DSL technologies in order to boost bandwidth speeds from an ISDN level of 144,000 bps toward a T1 option with speeds of 1.544Mbps and beyond T1 capabilities. Copper wires become degraded over time, and some experts consider DSL a bandaidd solution for addressing bandwidth needs. DSL has some distance limitations, considering distance beyond 17K yields slower bandwidth speed.

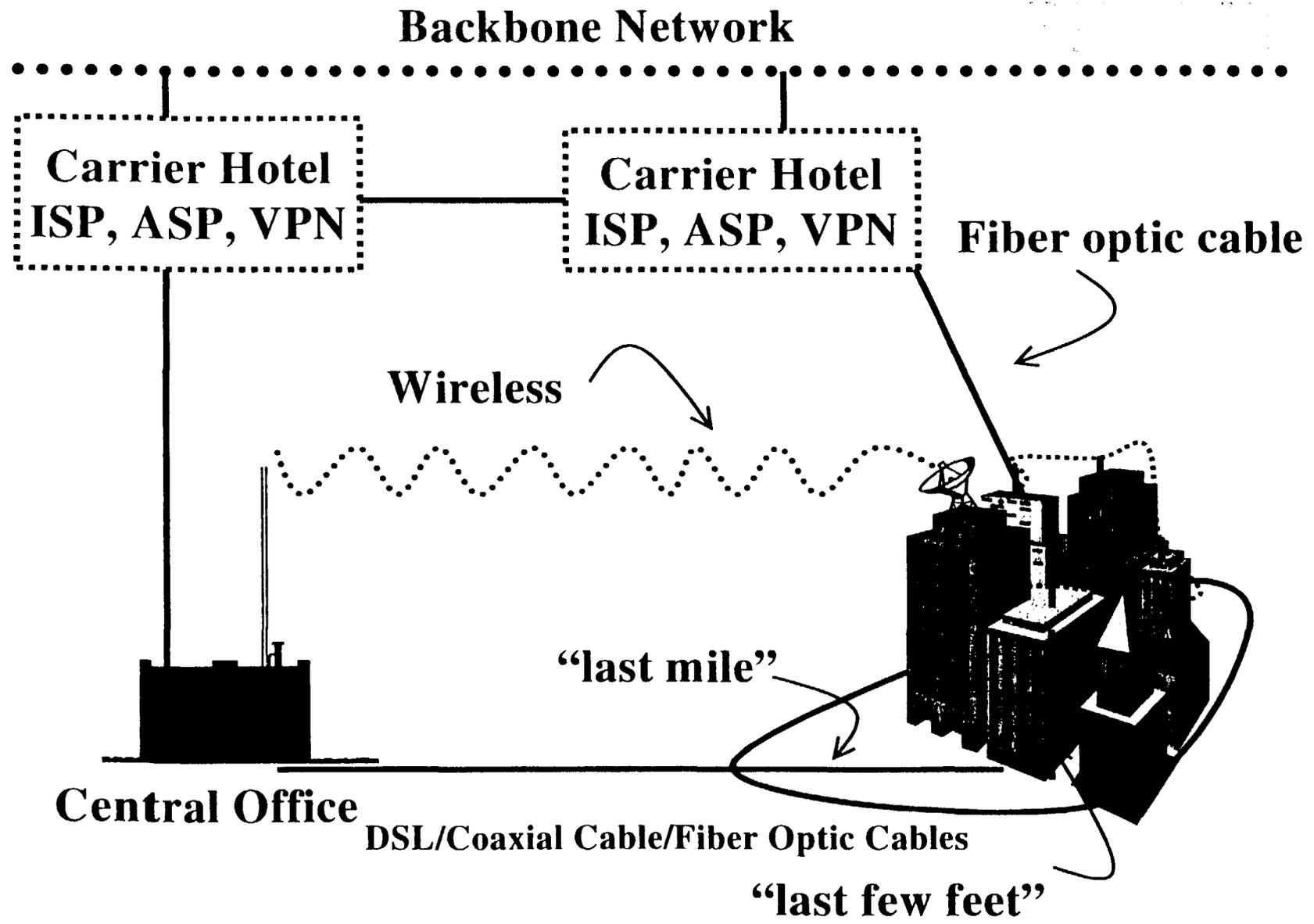
At the high end of the spectrum are high-speed fiber optic cables, which provide bandwidth speeds in excess of 3 Mbps and may attain speeds well in excess of 100 Mbps. (Fiber optics transmit voice, video and data as bits of light and include: 1. OC3 or 155 bps speeds, 2. OC48 or 2.5 Gbps-192 Gbps speeds, 3. long-distance fibers and 4. undersea fibers.) This solution is optimal, but is the most expensive broadband offering and used on a very selective basis, typically for very dense markets. According to the Federal

Communications Commission (FCC), about 82% of customers are linked with copper wire to the first switching office with only 18% connected to higher access providers. In 1990, only 3% of users had fiber connections compared with 97% with copper wire solutions. (*Trends in Telephone Service, March 2000, Industry Analysis Division of the Federal Communications Commission, p. 18-2.*)

Addressing the range of speeds between 400,000bps and fiber optic speeds is the rapidly growing wireless market. According to AT&T Wireless, wireless voice traffic represents 3% of the total telecom minutes of use is expected to grow to 20% over the next five years. Wireless offers high-speed access via microwaves to satellite earth stations on building rooftops and primarily offers high speed at a reasonable cost. The wireless signal is transmitted from a distribution tower to a receiver, such as a satellite dish on a rooftop. There is a limit to point-to-point wireless transmission since the signal may only be distributed over a maximum distance of three miles. The most active participants in this industry include Nextlink, WinStar Communications and Teligent. Once the signal is received on the rooftop, the signal is typically transferred to wired technologies within the riser of the building. Deutsche Banc Alex. Brown's telecommunication analysts, Jeff Hines and Bo Fifer, believe that fixed wireless solutions have very positive prospects. Both analysts believe fixed wireless technology will play a key role in the pending boom in data demand and the development of new computing paradigms such as the application server provider (ASP) model and virtual private network applications (VPN). (*Fixed Wireless Stocks Come Full Circle, April 18, 2000, First Call Note.*) Fixed wireless technology, or "wireless CLECs", is preferred "because of the ubiquitous reach of wireless in a market. The fixed wireless players are also in a strong position to offer virtual private network services that reach all of a customer's branches, vendors/suppliers, and customers. The application server provider (ASP) model may in large part DEPEND on wireless to drive significant bandwidth to the mass market to connect users with their files and applications." (*Telecom Stocks Show Solid 13% Gain in 1Q 2000 Vs 2% Rise For S&P500, March 31, 2000, p. 11.*) From the information we have gathered, both suburban and urban property owners are opting for the fixed wireless broadband solution. Over time, the integrity of the wireless signal is expected to improve.

Please refer to Figure 2 for an illustration of the spectrum of solutions provided by broadband companies. The gray area in the picture alludes to the fact that each technology is encroaching on the other, as DSL offers faster bandwidth and fiber offers even lower price points. Of note, 80% of a wireless network's cost is in technology. The price of equipment is falling rapidly as speeds are increasing, so higher speeds push into fiber territory and lower costs push into DSL territory.

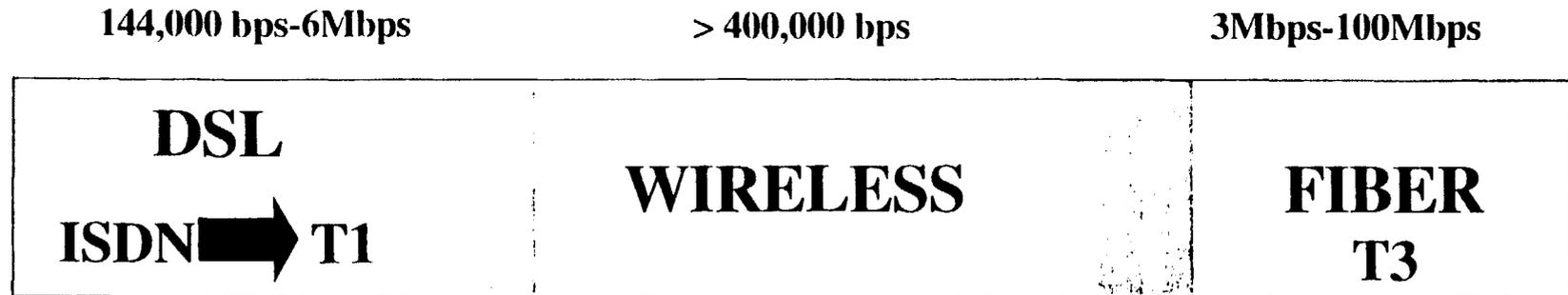
Figure 1: The Spectrum of Broadband Network Solutions For Real Estate Companies



Source: Deutsche Banc Alex. Brown, company information

Figure 2: The Spectrum of Broadband Network Solutions for Real Estate Companies

The Spectrum of Broadband Network Solutions For Real Estate Companies



Enhanced Existing Copper Wires

Covad Communications (COVD)
 NorthPoint Communications (NPNT)
 Rhythms NetConnections (RTHM)
 DSL.net (DSLN)

High Speed Access Via Microwave/Satellite Earth Stations on Building Rooftops

Advanced Radio Telecom (ARTT)
 NEXTLINK Comm. (NXLK)
 Teligent Inc. (TGNT)
 Winstar Communications (WCII)

High Speed Fiber-Optic Cabling

BLECs
 Allied Riser Comm. (ARCC)
 Cypress Communications (CYCO)
 OnSite Access (OSAX)
 Broadband Office

Cable-based Service Providers: Excite@Home (ATHM), RCN Telecom Services (RCNC), Road Runner

Source: Deutsche Banc Alex. Brown, company information

Figure 2 depicts the broadband providers divided by DSL, wireless, fiber and cable and the speeds for the various technology offerings. As far as industrial and suburban retail properties are concerned, DSL and wireless are the most logical options. In contrast, many office real estate companies, which are located in dense urban markets, are deploying high-speed fiber optic cabling, in addition to DSL and wireless, to meet the demands of their varying tenant bases. A number of building-centric providers, or B-LECs, have emerged, such as Allied Riser, Cypress Communications and OnSite Access, to provide in-building solutions for high rises. Broadband Office, a consortium of office REITs and a venture capital firm, Kleiner Perkins Caulfield, was created when the real estate companies realized the cash flow potential of the business (please refer to p. 89 for details). An independent entity was formed to compete with these B-LECs, and Broadband Office is proving to be a viable competitor. These broadband providers wire "the last few inches" from the tenant, through the riser system in the office building, to the base station in the basement. The option of fiber can make economic sense for vertical, or multi-story office buildings with multiple tenants. These B-LECs are attempting to provide the entire spectrum of broadband solutions for each wired office building. IPOs, spinoffs and capital infusions from technology companies are likely due to the financial resources required to install these expensive networks.

Onsite Access is building new infrastructure solutions with a combination of digital copper wires and fiber optic cables. Broadband service arrangements are typically signed with building owners in the form of license agreements and revenue-sharing plans. OnSite Access views these agreements as partnerships with landlords. The revenue-sharing plans depend on the non-exclusive preference provider status, usually up to 6% of gross revenues of voice and data service. If the landlord opts for several carriers, the percentage moves down to 4%, and if access is open to any provider, OnSite's agreement drops to 2% of revenues (very few in this category). According to OnSite Access, landlords want the best solutions for tenants in order to attract and retain tenants.

Carlos Sanson, vice president and general manager of OnSite Access

RECG Conference, Telecommunications, April 17, 2000

The coaxial cable technology is another option but primarily used for video transmission. Coaxial cable connects most televisions. The residential and multifamily locations are interweaving the services of cable-based modem providers that use coaxial cable as well as the other broadband solutions. Excite@Home and RCN are two providers of coaxial cable technologies that offer voice, data and video. Competition remains fairly fierce for cable modems versus DSL access for residential use. A more recent user of this technology is expected to be retail centers, with the formation of MerchantWired (please see p. 69-70), which involves six regional mall REITs that plan to deploy coaxial cable as the backbone infrastructure in the interior of the retail centers, with multiple T1 lines running from the mall to the collocation facility. MerchantWired selected coaxial cable as opposed to fiber optic cables due to the growing need by retailers for video for cybercasts and

multimedia events. The high-speed downstream transmission by coaxial cable is optimal for video services; however, fiber-optic cables provide a higher transmission speed for data and voice transmission from the store to the co-location facility, or for upstream transmission. We believe that the costs of rolling out the fiber optic technology may be too costly, but in the future, a better and less costly solution for transmitting voice, video and data upstream and downstream may develop.

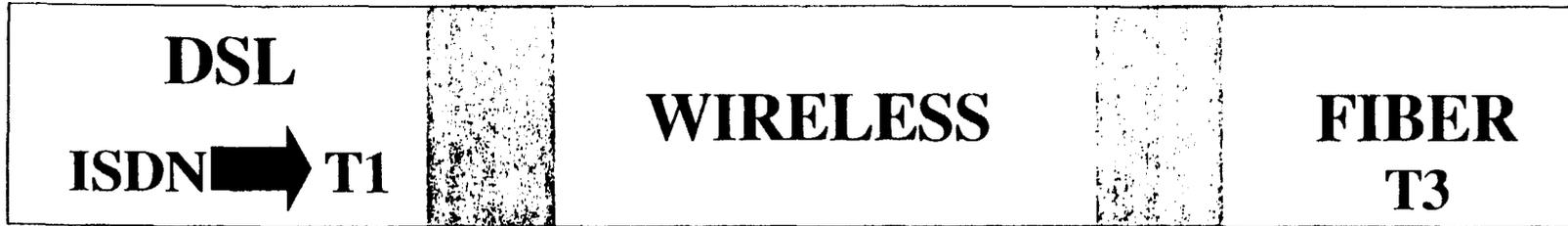
With a general perspective on the broadband network options, we will turn to the merits of each solution and what would be the most reasonable investment for a given property type. The primary factors which drive the decision to deploy one type of broadband solution versus another are the speed demanded by tenants and the costs that the tenant is willing to incur. AT&T states the broadband deployment is dependent on user demands. Last year, \$2 billion was spent to deploy broadband solutions by AT&T Wireless, and in 2000, the forecast is for \$4 billion to be invested. Many real estate companies are in the process of determining which technology to deploy based upon this cost/speed relationship. Figure 3 provides an indication of what broadband solution we think may be selected for each property type. In terms of suburban properties, regional malls, strips, office and multifamily, the most probable solution will be either DSL or wireless, or a combination thereof. DSL is the lowest-cost option with T1 speeds, which is reasonable; however, technology risk exists because at some future point the tenants' needs may outstrip the available bandwidth offered by DSL solution providers. Fiber optic wires, which provide the highest quality and speed and scalability, are too expensive to rationalize for many companies at this juncture. Wireless is the best compromise if high-speed access is critical, with the caveat that the quality is dependent on the weather.

In densely populated urban markets, such as Manhattan or San Francisco, real estate properties will more than likely offer the highest speeds with a fiber option due to the demand by tenants and the close proximity to the installed fiber ring underneath the city. **The fiber optic infrastructure is optimal for dense urban areas where the building is close to the local fiber ring**, making the costs not prohibitively expensive in wiring the "last mile", just expensive in terms of wiring the building.

We should note that a combination of technologies is evident everywhere as some tenants in urban locations, especially multinational corporations, require high-speed fiber access. This compares to local New York City tenants that only need DSL service. In the suburban markets, an affluent home owner may opt to pay the price for high-speed access with fiber while the suburban office building with local and regional tenants utilize wireless or fixed wireless technologies. **The need for landlords to provide an Internet infrastructure to tenants is becoming more widespread, as companies move into the digital and wired world.** Wired real estate will become customary, in our opinion.

Figure 3: The Spectrum of Broadband Network Solutions for Real Estate Companies

The Spectrum of Broadband Network Solutions For Real Estate Companies



Low Cost
Medium Speed
Low Scalability
Quality Depends on Capacity
1-3 Miles from Hub to User

Medium Cost
High Speed
High Scalability
Quality Depends on Weather
3 Miles from Hub to User

High Cost
High Speed
High Scalability
High Quality
1/4 Mile from Hub to User

Suburban
Malls, Strips,
Office and
Multifamily
Properties

Class A Office
Urban Malls
Urban
Multifamily

Source: Deutsche Banc Alex. Brown, company information

Carrier Hotels: It's All About ISPs, ASPs & VPNs

With more and more tenants demanding high-speed Internet connectivity, a growing demand for carrier hotels has emerged. These high-tech facilities that provide services such as shared and dedicated Web hosting, virtual private networks (VPN), application hosting, secure remote access, Internet connectivity, e-commerce services, Web server management, and e-data storage. There has been a burgeoning growth in Internet Service Providers, and Web hosting and e-commerce services are booming. Forrester Research estimates that the Internet service market could grow to \$56.6 billion in 2003 from \$7.7 billion in 1999. The Web hosting market is expected to grow to \$14.7 billion in 2003 from \$2 billion in 1999. Both dedicated and shared Web hosting are rapidly growing. Deutsche Banc Alex. Brown's Telecommunication Services—Wireline Analyst, Michael Bowen, states that "shared Web hosting is one of the most attractive net-centric services providers' segments. According to International Data Corporation (IDC), it is expected to grow to \$5 billion in 2003 from \$256 million in 1998." (*Net-Centric Services Providers/e-Telecom Report, April 4, 2000, p. 3.*) The demand from small and medium sized businesses to be connected to the Internet is fueling this growth. Many of the ISPs and providers of Web hosting services have grown, while building a proprietary network infrastructure. The next phase of growth, we believe, is the demand for virtual private networks, replacing private WANs, and application hosting. Virtual private networks (VPN) are an online way of sharing e-information from different locations via a secure, highly reliable private network. VPNs are expected to grow exponentially as more information is off-loaded from the desktop to remote servers housed in carrier hotels, providing security encryption and high bandwidth capabilities. Application services providers (ASP) deploy, host and manage access to software applications from data center facilities (or carrier hotels). Forrester Research predicts that the application hosting market could jump to \$11.3 billion in 2003 from \$90 million in 1999. With the growth in Web hosting, Internet services, virtual private networks (VPN) and application services via ASPs, and as the world becomes connected, the demand for carrier hotels is expected to accelerate.

The highly reliable carrier hotels offer telecommunication service providers, Internet Service Providers (ISP), and other broadband service providers direct access to the Internet via equipment and space for lease as tenants. These mission-critical facilities are very high tech, providing the most advanced security systems, fire suppression systems, powerful air conditioning systems and the most intensive power systems and redundant power capabilities to ensure reliability. The carrier hotels are required to offer high-performance, 24/7 services, quality environments with high safety standards. No interruptions are tolerated, thus these carrier hotels are considered mission critical facilities.

The carrier hotels are creating new demands for space. Two types of carrier hotels exist, proprietary data center facilities and neutral co-location facilities. A proprietary data facility is owned or leased by one of the following: an Internet service provider company, a telecommunications provider, a broadband provider, a Web hosting company etc. The carrier neutral co-location facilities refer to a facility where different telecommunications and

Internet service providers lease space and equipment. ISPs benefit from leasing space from one carrier hotel company that provides a global solution, as all the regulatory approvals are received by the owner of the carrier hotel company, assisting the ISPs in rolling out international service platforms. As a number of telecom and Internet providers may occupy space in one co-location facility, a diverse tenant base reduces risk for the property owner. Tenants include ISPs, traditional telecoms, international fiber carriers, and ASPs. **The benefit to businesses using the services is the neutral co-location facility provides one-stop shopping for all telecommunication and Internet needs.** Technology continues to offer more advanced services, eventually shifting the need to be not only connected to the Internet but also to transfer WANs to very secure and reliable VPNs. As a result, the multiple services offered in a neutral co-location facility could better serve businesses than multiple service providers located in various locations functioning independently and perhaps not in coordination. This burgeoning area of demand is showing explosive growth, with a market size estimated to reach approximately \$30 billion in 2003.

In terms of the impact on real estate owners, in the forefront of this movement is TrizecHahn and Chelsfield plc, which have jointly invested in Global Switch. With TrizecHahn's and Chelsfield plc's real estate expertise being integrated with Global Switch's facilities management capabilities, a leader could be emerging in the neutral co-location industry. Co-location facilities house computer and network systems from various carriers and companies in one location. Other neutral co-location competitors in the European marketplace include Telehouse Europe and in the U.S. include Verio, Digiplex, and Switch & Data Facilities Co. The market is very fragmented with many players but no true consolidator has emerged. The typical tenants in a carrier hotel would include Level 3 Communications, MCI/Worldcom, Global Crossing, a multitude of ISPs, in addition to Colo.com, CO Space, Inc. and Equinix. Their demands for space are growing rapidly. Global Switch is working with some of these tenants to help serve their carrier hotel needs on a global basis. Of note, some of these telecom carriers may be considered not only tenants, but in some instances, a competitor. The carrier hotel concept is built around the notion that one company may not provide all of the telecom, Internet, and broadband service solutions needed by a business. Consequently, the carrier hotel houses many service providers in one location to address the needs of businesses, including: shared and dedicated Web hosting, virtual private networks (VPN), application hosting, secure remote access, Internet connectivity, e-commerce services, Web server management, and e-data storage, using one or more service providers.

We detail the Global Switch transaction and provide a brief snapshot of the other neutral co-location providers.

TrizecHahn Corporation
Chelsfield plc
Global Switch

On April 4, TrizecHahn announced a \$160 million commitment to invest in Global Switch International (www.global-switch.com), a telecom operations center company based in London. The \$160 million commitment includes a one-third interest and the funding requirements to complete the existing projects. Chelsfield plc, a London-based property company, also acquired a one-third interest, while Andrew Ruhan, CEO, will retain the remaining one-third and continue as CEO. Global Switch facilities offer "telehousing" or

state-of-the-art facilities for leading telecommunication companies, such as telecom companies, international fiber carriers, Internet service providers, and application service providers. Global Switch provides facilities management expertise including security, air conditioning, power management and high-tech mission-critical services. As a number of telecommunication companies are housed in one state-of-the-art location, the facility is referred to as a carrier hotel. **Carrier hotels provide connectivity, linking the fiber-optic backbone network to the local communications infrastructure.**

Network of Facilities

In early 2000, a facility was opened in the Canary Wharf area of London where Global Crossing located its worldwide network operations. Facilities in Paris and Amsterdam are scheduled to open in 2000. Further expansion is planned in Europe, Latin America and Asia. Additionally, TrizecHahn plans to add 151 Front Street Center in Toronto to the Global Switch international network. TrizecHahn provides facilities management expertise at this site as well as two properties for Bell Canada in Ontario and Quebec.

Competitive Advantages of Global Switch

The TrizecHahn/Global Switch/Chelsfield entity offers Web hosting, networking management services and connectivity in a neutral facility, wherein the telecom and Internet-based businesses gain access to superior network and facility resources, and Internet service providers may choose among the carriers and networks. The space is engineered to conform to the telecom standards of high performance, quality, environmental control and safety. Global Switch operates world-class facilities for mission-critical communications equipment to serve the Internet, telecommunications, and data markets. The company provides the following services:

- 1). secure, environmentally controlled facilities that are specifically configured to meet the growing demand needs of network equipment;
- 2). access to major networks serving the geographic area in which their facilities are located, with no minimum service or purchase requirements;
- 3). a comprehensive suite of technical operation services to assist their customers with their installation, network, and ongoing operational needs; and
- 4). nationwide facilities and services that are consistently operated across markets.

Global Switch's centers offer a dependable platform that supports customer choices (flexible space), a cost-effective solution and a secure environment, monitored 24/7. TrizecHahn's investment strengthens Global Switch's position as TrizecHahn has a strong capital base, experience in developing in both North America and Europe, expertise in managing carrier hotels, and extensive global contacts.

The combination of TrizecHahn's and Global Switch's facilities management and real estate expertise creates a venture that has emerged as the leading supplier of these carrier hotels. Richard Steets, who is the EVP of Corporate Development at TrizecHahn, is spearheading TrizecHahn's strategy associated with this investment. With the contribution of TrizecHahn's Toronto property,

the combined entity will own approximately one million square feet of carrier hotels, firmly positioning the entity to build upon its global network of these high performance technological facilities and to provide the most comprehensive service offerings.

Telehouse Europe

Telehouse Europe (www.telehouse.net) has built three highly sophisticated international telecommunication hubs in Europe, in London, Paris and Geneva. Telehouse Europe is a provider of neutral, secure and power-oriented co-location facilities for telecommunications carriers, financial institutions, Internet service providers, Web hosting companies, content providers, broadband providers, and other telecommunications systems. The company provides expertise on network dependent systems in highly secure environments, offering services such as cable management and installation, rack provisions, equipment installations, network monitoring and a choice of carriers. Telehouse offers 24/7 monitoring, high-powered air conditioning and generators, sophisticated alarm systems in order to create minimal interruptions in Telehouse's facilities. In September 1999, the first facility was open in Docklands, London, serving as a hub for many network carriers to enable switching of networks. In October 1999, in a partnership with Services Industriels de Geneve (SIG), the local utility provider, the third facility opened in Geneva, Switzerland. The company is actively building these data centers to meet the demand, with seven to eight under construction. Telecom Europe houses the leading telecommunication carriers and Internet Service Providers (ISP) in its facilities.

DigiPlex

DigiPlex (www.hubco.com, formerly HubCo S.A.) owns and operates a pan-European network of carrier and service-neutral data centers designed to provide telecommunications carriers, Internet service providers, and multinational and technology corporations with a quick, cost-effective route into the expanding European telecom markets. The company offers a network of 22 high-end carrier centers throughout Europe ranging from 100,000 to 600,000 square feet in size. DigiPlex's centers are carrier and network neutral facilities, offering state-of-the-art infrastructure and security, where customers can operate business under their guidelines and choose services from any provider. DigiPlex plans to have a network of facilities in 22 cities in major European business centers by the end of 2001. DigiPlex acquired facilities in Frankfurt, Oslo and Geneva.

Equinix

Equinix (www.equinix.com), which was founded in 1998, provides co-location sites for content providers, application service providers (ASPs) and e-commerce companies. Al Avery, president and CEO, and Jay Adelson, CTO, founded the company after building, managing and operating the Palo Alto Internet Exchange (PAIX) for Digital Equipment Corp. The company has received \$315 million in financing in the form of equity investments from America Online, Marc Andreessen, Artemis, Benchmark Capital, Carlyle Group, Cisco Systems, Comdisco, Dell, Enron, e-trade, Microsoft, Northpoint, Cyberworks, and Reuters Group. Equinix has strategic partnerships with Bechtel, MCI WorldCom, NorthPoint Communications, InterNAP and Level 3 to ensure delivery of quality service for their customers. By the end of 2000, Equinix intends to build over one million square feet of centers in operation and plans on building at least 30 centers around the world over the next four years. Customers include Akamai, Cable & Wireless, Enron, Excite@Home, Level3, MCI/Worldcomm, Northpoint Communications, Teleglobe, and

Universal Access. Equinix and Bechtel Corp. formed a strategic alliance to execute \$1.2 billion in Internet development projects to build open-environment Equinix centers. The first facility was built in Silicon Valley for Cable & Wireless, Enron and Excite@Home.

Switch & Data Facilities Co.

Switch & Data Facilities (www.switchfacilities.com), which was founded in 1997, provides co-location facilities that are carrier neutral, telco-grade and offer shared infrastructure to spread high costs, a nationwide footprint, flexible space arrangements, and self-management. Switch & Data also offers data mirroring locations, which are replicas of the operating facilities that would resume operation in case of a problem with the original facility. The company has 10 operating facilities ranging from 10,000 to 20,000 square feet and plans on opening 7 facilities in 2Q 2000, 10 facilities in 3Q 2000, 1 facility in 4Q 2000 and 16 sites are pending. Customers include MCI/Worldcom, Qwest, GTE, Cable & Wireless, Nextlink, SBC, Teligent, Winstar, MFS, BellSouth, FiberNet, PacBell, Level3, Sprint, Frontier and Williams.

Verio Inc.

Verio (www.verio.net) offers secure technology solutions for critical business communication needs. The company focuses on serving small and medium-size enterprises. Verio's co-location centers offer Internet connectivity, shared and dedicated Web hosting, virtual private networks, secure remote access and scalable solutions. The objective is to offer customers enhanced value Internet services housed in high performance, highly secure facilities. Verio has a network of co-location facilities, operating on a global scale. In January 2000, Verio announced plans to expand its Web hosting and co-location facilities, spending \$200 million to expand the data centers where hosting services and other co-location services are housed and \$50 million on network equipment.

Summary

The penetration of broadband networks is expected to grow dramatically, creating a paradigm shift in information sharing and conglomeration. Michael Bowen states "as more companies move to e-commerce and applications outsourcing, high-speed Internet access and Web-hosting services are becoming essential elements of computing and communications." (*Net-centric Services Providers/e-Telecom, April 4, 2000, p. 2.*) As a result of these trends, a need for facilities, such as carrier hotels, to house multiple telecommunications carriers and Internet companies and their equipment is emerging. **We foresee the demand for high-speed broadband access escalating as real estate becomes wired, and the demand for carrier hotels is projected to show a corresponding growth rate.** The market is very fragmented with small players, and no leader. Combining the facilities management and the real estate expertise has yet to emerge. **The New Economy is creating new demands for space, and we believe that the growth in carrier hotels is one area in which a real estate company, with its bricks and mortar expertise, may add value.** TrizecHahn is the first mover, leading the way in converging this use of real estate with technology.

Broadband Network Solutions For Real Estate

In our opinion, a primary area of concentration in the REIT industry is evaluating which broadband network solution meets the tenants' demands. Both cost and speed must be considered and are related to tenant demands as well as the property type and location. As the trend to wire buildings becomes more pervasive, touching all property types, the location of the property and the cost to wire will become more evident considerations. Infill-located properties that are in close proximity to the fiber ring will be able to wire with fiber at a lower cost than a property situated in a remote area. **If the importance of location was ever underestimated in real estate, wiring properties will differentiate the prime buildings from the others. In our opinion, location and bandwidth will become the mantras of the real estate industry.** Connectivity to the Internet will become increasingly important in the Knowledge Age.

Kicking off the wired real estate race were the office real estate companies, which clearly experienced intense demand from global and national tenants for high-speed access. Broadband Office was formed in late 1999, with a number of office companies announcing revenue-sharing arrangements with BLECs and other broadband telecom providers. The domino effect is occurring, as multifamily companies, especially those situated in high-tech corridors, are wiring apartments for Internet access. BRE plans to spin off of VelocityHSI, which is an entity wiring multifamily communities. Retail is just in the nascent stages, with the formation of a MerchantWired. Industrial properties could soon follow as logistic systems require global access at high speeds to facilitate just-in-time delivery demands by customers. Our prediction is that wired buildings will become a basic service, similar to utility and phone connections, for tenants. Similar to the broadband revolution, the services a building provides will grow in value. **The New Economy, in our opinion, is about knowing customers and adding services to strengthen relationships and loyalty, or stickiness.** Please refer to pages 49 through 99 for details of each sector's broadband initiatives.

Summary

With more and more tenants demanding higher-speed access to the Internet, a growing demand has emerged for carrier hotels, or high-tech facilities that provide services such as VPNs, ASPs, Web hosting, switches, Web server management, and e-data storage. We expect the demand for high-speed broadband access to escalate as real estate becomes wired, and the demand for carrier hotels is projected to show a corresponding growth rate. From our perspective, the broadband network decisions are critical for many U.S. real estate companies because of the cost/speed relationship and determining what *solution meets tenants' needs today and what addresses their future needs*. Wired properties, with an Internet infrastructure, not only help move tenants into the New Economy and the digital information flow, but also enable many real estate companies to initiate B2B and B2C services, relating to the convergence with technology.

e-Business Initiatives

As the New Economy moves the real estate industry into a more efficient, transparent and technologically advanced marketplace, a multitude of B2B and B2C initiatives are being and could be launched by real estate companies and start-ups. Clearly, wiring buildings for high-speed access is an important step to connect businesses to the Internet and information flow. Wired real estate also provides owners of real estate the framework from which to build upon value-enhancing technology initiatives, such as Captivate Networks. From our vantage point, we believe that revenue-enhancing and cost-reducing opportunities exist for all real estate owners to capitalize upon. We believe that real estate transaction structures are being revolutionized by the Internet and New Economy services are emerging in the real estate industry. Based upon our analysis, e-business initiatives incorporate both transaction structures, or e-applications, and services. The recent announcement of Project Constellation creates an e-business initiatives venture fund and operating company and represents a radical move to steer the real estate industry into the New Economy.

Before presenting the details of Project Constellation and the other emerging e-business initiatives, we wanted to highlight the presentation of Bret Arsenault, Chief Technology Officer at the eBusiness Solutions Group of Microsoft Corp., who was a keynote speaker at the Real Estate Conference Group meeting in Los Angeles, California on April 17. Mr. Arsenault provided his views on the future and how technology will reshape it. His first comment was that the real estate industry is a laggard in the Internet revolution, as the Internet's inflection point was hit in 1998/1999, in terms of becoming an expectation of doing business, and the real estate industry is behind the curve. As a point of reference, at Microsoft, when new information is made on a Web site, within one hour the information is translated into 36 languages to become a global site. Mr. Arsenault believes that the convergence of digital devices, cell phones and PDA devices could occur in 2002/2003, as the over-riding theme is ANY time, ANY where, ANY one, and ANY device. In Mr. Arsenault's estimation, less than 50% of the PCs will be connected to the Internet, with the majority connected via TV and wireless PDA devices. Microsoft is spending \$4 billion on R&D for high-speed connectivity to these future devices and the interface capabilities.

Mr. Arsenault foresees several trends: 1). profits, not just revenues, count in B2C transactions; 2). standard software and integrated systems are becoming paramount; 3). B2B is empowering employees, providing same access to information, with the only segregation in hierarchy being the decision-making process; 4). partnerships are being created, which is the name of the game; and 5). products are being eclipsed by services. He concluded by stating that in the future, in order to make money, a service must be provided. We agree with the trends occurring to converge real estate and technology, similar to the pattern in other industries.

We have divided our e-business initiatives into three areas: Project Constellation; how real estate transaction structures are being revolutionized by the Internet; and new economy services.

Project Constellation

A Defining Moment for the Real Estate Industry

On May 4, the real estate industry announced that 11 companies have joined together to form Project Constellation, an entity whose collaborative skills and intellectual capital will be used to converge real estate and technology.

Profile of Project Constellation

On May 4, 11 companies—five REITS, one home builder, three R.E. service companies, a private real estate fund and a venture capital shop—announced the formation of Project Constellation (based in San Francisco), an entity that plans to use technology to create, operate and acquire B2B and B2C opportunities in this New Economy, tapping the value inherent in the \$250 billion of real estate owned by these companies.

The entity may acquire small and medium-sized enterprises (SMEs) that offer e-applications, e-services and/or products to the real estate industry, plus Project Constellation may create its own B2B and B2C companies—combining an Internet incubator fund with an operating company. Some B2B and B2C examples include loyalty programs, e-marketplaces, e-tailing, fulfillment, broadband, an industry portal, enterprise software, online procurement, online leasing and online lending. As we have stated previously, in our view, **real estate is the ultimate portal.**

The companies involved in Project Constellation are the following:

1. Simon Property Group with 100 million shoppers
2. Equity Office Properties with 320,000 people who work in their buildings every day
3. Equity Residential with 1 million contacts at its communities each year
4. AMB Property
5. Spieker Properties
6. Kaufman & Broad Home, the large home builder
7. Three real estate services companies, or Project Octane*: CB Richard Ellis Services, Jones Lang LaSalle, Trammell Crow
8. A private real estate fund of Morgan Stanley
9. Venture capital firm Chase H&Q Capital Partners

*Note, Project Octane represents one founding member, though it is comprised of three companies

Project Constellation is expected to be funded with \$135 million from these nine founding members, each contributing \$15 million for an 11% interest. Each of the nine founding members has representation on the board and on the management/investment committee.

Our Interpretation

In our opinion, this positive news is a continuing catalyst for the real estate industry. Though some analysts/investors may be skeptical about the prospects for this entity due to the challenge of making decisions among the founding members, we believe that Project Constellation is reflective of the New Economy, which is all about strategic partnerships, relationships, team building and collaborative thinking. Businesses are inundated with information today, and the need to form partnerships has never been greater. We believe Project Constellation represents a defining moment in the real

estate industry, reflecting not only the changing mindset of some of the leaders in the industry but also how business models have been dramatically reshaped as technology infiltrates the industry.

The vision is clear, and the potential is limitless, given the enormous fragmentation and inefficiencies of this \$4 trillion industry. At present, more than 200 enterprises have been launched to potentially capitalize upon the convergence of real estate and technology. James Watson, the president of eDevelopment.com, stated that two years ago, venture capital firms sank \$7 billion in IT companies, and last year, the number skyrocketed to \$40 billion. (*Real Estate Conference Group, "Development and Technology" panel, April 17, 2000.*) Rather than foster further fragmentation of the real estate industry with more start-ups that only duplicate and splinter efforts, Project Constellation could become the real estate technology venture capital firm and operating company through its efforts to converge and consolidate revenue-enhancing opportunities and cost-reducing e-applications for the benefit of the owners of real estate. The participants in Project Constellation plan to create or acquire the de facto e-initiatives, technologies and transaction management systems to be utilized by the entire real estate industry. As the collaboration involves the four major property types, in our view, more B2B initiatives may be created and acquired than B2C. Not only the investors in Project Constellation, but also the owners of real estate could benefit, translating into more productive assets, flowing to higher net asset values and stock prices.

"Companies in every industry must learn to harness the power of the Internet to improve customer satisfaction, employee productivity and business operations."

John Chambers, President and CEO of Cisco Systems

Mission and Strategy

Since a CEO has not been announced, the details of the company, its strategy and business plan, are a bit fuzzy. Within a 60-day time frame, a CEO is expected to be announced. The mission of Project Constellation is taking the vision, finding a CEO, and building upon the commitment and skills of the 11 companies involved to create a company that will execute on converging real estate and technology. When a CEO has been announced, we believe that a strategy will be articulated, and goals will be defined, with steps to achieve them.

Redefining Net Asset Value

The idea behind Project Constellation is to use technology to enhance the value inherent in real estate. The intellectual capital of this collaboration is enormous, with the potential to actually create intangible value via real estate owners' tangible assets. **The creation of intangible value is the convergence of Real Estate and Technology in this New Economy.**

In our opinion, Project Constellation could redefine the real estate industry and how real estate companies are valued. In the Old Economy, net asset value (NAV) is defined as the underlying value of the real estate assets. We believe that a 5%-10% premium to NAV is the approximate range in which the

stocks should trade due to the liquidity of the REIT marketplace. Value-added management teams also may enhance the premium. **In the New Economy, we believe that real estate companies have the opportunity to create intangible value---services, brands, partnerships---that warrant an additional value to the NAV.** In our view, the mindset of the real estate industry is changing and moving into the New Economy, using technology to enhance the underlying value of the real estate. From our analysis, the real estate industry is being revolutionized, and Project Constellation may lead the way.

We view this as very positive news for the companies involved and for the REIT industry. We view real estate as the ultimate portal, considering the millions of people who enter and exit buildings every week, and the futuristic buildings will be smart buildings that know the tenants and people who enter and exit them and how best to serve them.

Profile of Founding Members

AMB PROPERTY (AMB) is an owner and operator of industrial real estate. As of March 31, 2000, AMB owned and managed 67.5 million square feet and 734 buildings and centers in 26 U.S. metropolitan markets, including 5.2 million square feet and 95 industrial buildings owned with institutional investors. In a joint venture, AMB owns 36 buildings with 4.0 million square feet in Chicago. AMB manages 4.5 million square feet for third parties.

EQUITY OFFICE PROPERTIES (EOP) is the nation's largest publicly traded owner and manager of office properties with 294 buildings comprising 77 million square feet in 23 states and D.C. On February 11, 2000, EOP announced a merger agreement with Cornerstone Properties (CPP) which owns 86 Class A office properties and other real estate comprising 18.5 million square feet.

EQUITY RESIDENTIAL PROPERTIES (EQR) is one of the nation's largest publicly traded apartment company. EQR owns or has an interest in 1,050 properties comprising 223,490 apartment units.

KAUFMAN & BROAD HOME (KBH) is one of the largest home builders in the U.S. The company has operating divisions in AZ, CA, CO, NV, NM, and TX. Its subsidiary is one of the largest home builders in France.

SIMON PROPERTY GROUP (SPG) owns or has an interest in 257 properties comprising 184 million square feet of GLA in 36 states and five assets in Europe. With its management company, Simon owns or manages approximately 189 million square feet of GLA in retail and mixed-use properties.

SPIEKER PROPERTIES (SPK) owns and operates over 40 million square feet of commercial real estate in California and the Pacific Northwest.

PROJECT OCTANE is comprised of three real estate service companies—CB Richard Ellis, Jones Lang LaSalle and Trammell Crow Company—

- ◆ CB Richard Ellis (CBG) serves real estate owners, investors and occupiers through 250 offices in 36 countries. Services include property sales and leasing, property management, corporate services and

facilities management, mortgage banking, investment management, capital markets, appraisal/valuation, research and consulting.

- ◆ Jones Lang LaSalle (JLL) operates in more than 100 markets on five continents as the world's leading real estate services and investment management firm. The company provides property and corporate facility management (with 700 million square feet under management worldwide), transaction services and investment management core services to owners, occupiers and investors.
- ◆ Trammell Crow Company (TCC) offers real estate services such as project and property management, transaction, and development. The portfolio is comprised of 520 million square feet of managed or leased space, including 157 million square feet of corporate facilities and 10 million square feet of regional malls. Trammell Crow provides facilities management services of 25,000 properties.

CHASE CAPITAL PARTNERS (CCP)—CCP is a global private equity partnership with over \$15 billion under management. Since 1998, CCP has invested more than \$450 million of equity in the acquisition of approximately \$2 billion of real estate investments. Chase H&Q Capital Partners is a strategic affiliate of CCP and a leading investor in the technology sector.

MORGAN STANLEY REAL ESTATE PRIVATE EQUITY FUND—Since inception in 1991, funds managed by Morgan Stanley Real Estate Private Equity have invested over \$3 billion of equity in almost \$17 billion of assets and companies around the world. Morgan Stanley Real Estate Private Equity manages a group of funds that invest in real estate assets, public and private real estate operating companies and other real estate related opportunities.

Real Estate Transaction Structures Are Being Revolutionized by the Internet

Project Constellation is attempting to consolidate some of the B2B initiatives that have been launched and to refine these e-applications into the best of the best for all property sectors in the industry. More and more real estate technology start-ups are coming to the fore to be the first movers, attempting to battle the established real estate companies head-on. Considering over 200 start-ups have come into existence to reshape the real estate industry, radical changes are unfolding. Forrester Research estimates that U.S. B2B e-commerce will grow to \$2.7 trillion in 2004 from \$406 billion in 2000. Global B2B e-commerce is expected to hit \$6.9 trillion in 2004, capturing 8.6% of the world's sales of goods and services. The real estate industry accounts for a portion of the B2B market. **Cost savings and reduced cycle times are necessary in the real estate transaction processes, and Project Constellation and many other enterprises are moving to capitalize on the potential of B2B e-applications.** According to James Young, the president of The Jameson Group, in order for businesses to succeed as this massive paradigm shift continues, technology tools must be embraced or those businesses will be disintermediated. (*Real Estate Conference Group, "The Impact of Technology" panel, April 17, 2000.*) We believe this outcome could be validated over time. The mindset of real estate companies must shift whereby management teams realize that technology is strategic and critical

for the success of their business plan. Many IT projects have been generally perceived as cost centers, but IT departments are now becoming defining and strategic areas of a company's competitive advantage. James Young stated that efficiencies will slowly migrate through the real estate transaction system, and in his view the aggregate value of commercial real estate should increase. We concur. The real estate companies whose management teams are comprised of knowledge leaders that are attuned to the changes occurring in the New Economy will reduce transaction costs by moving online and collapsing cycle times for procurement, leasing, financing, inspections, titles and appraisals, to name a few. The result for the real estate owner could be lower costs, more liquid transactions, and better service to the tenants, translating into a more valuable property due to the lower transaction costs and value-added services. The companies enjoying such property portfolios could show higher stock prices.

Some of the B2B opportunities which have emerged include: 1). Web-based management applications, 2). online leasing, 3). e-governments, 4). e-lending, 5). e-appraisals, 6). e-title companies, and 7) other e-services such as supplies/material e-procurement.

Real Estate Owners' Web-Based Management Applications

Web-based management applications are being used by some real estate companies, and we believe their usage will be widespread over the next couple of years. Opportunities exist to develop proprietary software systems or to acquire e-applications to handle raw material purchases, landscaping and maintenance costs, customer profiling, and supply chain management systems, to name a few. Many of the labor-intensive and paper and time intensive processes are moving online as e-applications, resulting in lower expenses and enhanced productivity.

Multifamily Complexes

The multifamily companies have been very active in developing Web-based management applications, such as, AvalonBay's and United Dominion's Javalon/Trillium project, Equity Residential's WIZ system and an initiative being undertaken by Archstone expected for rollout in 2H 2000. Javalon/Trillum comprises both a back office or Internet-based general ledger system with the capability of tracking maintenance, online rent payment as well as a user interface complete with stand alone kiosks located at leasing offices to process prospects. The system should be completely operational by year-end 2000 and include an instant credit scoring feature and remote online leasing capability. This partnership between AVB and UDR has recently broadened to include Post Properties. EQR's WIZ system is focused on revenue management and maximization, lease rollover exposure and data collection that could provide unique insights into its resident base. Archstone is currently working on a Web-enabled system that will include all aspects of leasing an apartment including real-time pricing, real-time availability, credit checks, deposit processing, lease renewals, transfers and maintenance requests. AIMCO has developed its own product dubbed Horizon. Its system includes many of the same features of its competitors.

In addition to its Horizon System, AIMCO is in the process of placing its catalog-based Buyers Access business, a maintenance and repair product procurement business with over a 15-year history, online. The company is evaluating the best way of monetizing this initiative.

Retail Centers

In the regional mall sector, no notable proprietary applications have been marketed as exceptional, as of yet. However, we believe that a Web-based database application that handles customer profiling would be a very valuable asset, especially for regional mall owners and retailers. Multiple B2B applications could be utilized to streamline virtually every operation.

In terms of strip centers, Kimco again is at the forefront in terms of re-thinking its business processes. In Kimco Realty's 1999 Annual Report, Michael Flynn outlines the areas being considered for future B2B e-applications. The areas include: 1). national leasing and national multiple listing services, 2). daily site plan updates and occupancy statistics, 3). immediate access for retailers to Kimco's property information, 4). property sales, 5). participation in purchasing consortiums, 6). online service contract bidding, 7). financing and 8). other applications. Kimco is already alert to the opportunities presented by the Internet as it relates to real estate. Significant time, labor and money may be saved in moving many processes online, expediting the decision-making process.

Weingarten stated it is working on strategic partnerships, especially on the B2B side where the leasing process could become more efficient. The company is evaluating a strategic partnership with Storetrax.com for leasing transactions online. Initially, we believe that Weingarten will be more active using technology to reduce operating costs on the B2B side.

Office Buildings

In the office sector, e-applications have not been widely discussed and the technology focus has been on wiring buildings for high-speed access.

Industrial Facilities

In the industrial sector, the focus is on B2C with the booming demand in e-commerce fulfillment centers and advanced distribution and logistic systems. In our opinion, the opportunities to add services are weighted toward the B2C markets rather than improving real estate transaction process on the B2B side.

Clearly, real estate is a very fragmented and inefficient industry where technology may create more liquidity, cost savings and efficiencies in back offices. This movement of workflow processes online was noted by Fritz Schindelbeck, a senior manager at Deloitte & Touche, who views the Internet in terms of what technologies can be implemented to either reduce costs to be more efficient or to enhance value to the customers. **Investing in knowledge databases and Web-based management applications will become more critical over time.** Opportunities exist for REITs and real estate companies to tap the potential of their workforce to develop proprietary software applications to improve inefficiencies, such as AIMCO, AvalonBay and Equity Residential have done. Other opportunities may present

themselves to acquire management applications, and Project Constellation could be active in this area.

The three primary areas where Fritz Schindelbeck, a senior manager at Deloitte & Touche, considers the most changes will occur are: 1). Data entry and reporting will become Internet-enabled using Windows technologies. 2). Workflow processes will become more efficient with event-trigger notifications. 3). e-documents will decrease the amount of paper and improve transaction processing.

Fritz Schindelbeck, a senior manager at Deloitte & Touche
RECG Conference, "Accountant's Perspective" panel, April 17, 2000

The Emergence of e-Realty Companies and the Advent of the Cyberbrokers

We expect the real estate service industry to become more standardized, creating efficiencies and compressing the cycle times, resulting in cost savings and a more liquid real estate market. The entire brokerage process is being re-engineered, which will impact the cycle times and move a lot of the execution to an e-model. Transactions are becoming commodities, where value is added on the services offered.

In the real estate services business, the barriers to entry are low so a lot of competition is expected. William Millichap, the president of Marcus & Millichap, stated that roughly 250 companies are characterized as 'for sale and for lease' aggregators, and approximately 83,000 real estate listing Web sites exist. As evident, consolidation and convergence are expected. The top commercial real estate brokerage bricks and mortar firms include CB Richard Ellis; Insignia Financial Services; Jones Lang Lasalle; Trammell Crow; Cushman Wakefield; and Grubb & Ellis could converge with some of the Web aggregators and content providers, such as Comro.com, PropertyFirst, CoStar, and LoopNet Ventures.

According to William Millichap, there are seven trends occurring as leasing moves online: 1. national licensing, 2. transparency of services by rating agencies and brokers, 3. fewer brokers but must add value, 4. independent brokers to work the tertiary markets, 5. real estate portals are collecting advertising fees and grabbing a share of the transaction fees, 6. more efficient and more liquid market, and 7. knowledge (the most important) as it relates to products, processes, and people. To summarize, the real estate broker function will change, similar to stockbrokers, where the position will become more value-additive, and the composition of the brokerage group will be altered to become value-added while embracing online leasing and the comprehensive information offered via the Internet. Properties marketed on the Internet could provide descriptions, history of buildings, construction information, features, demographic profiles, tenant services and other sites of interest. A divergence could occur in commission, where online leasing is a cost-effective solution whereas a broker becomes a value-additive solution.

We provide a brief summary of the viewpoints that were presented at the Real Estate Conference Group in Los Angeles on April 17, 2000, of several commercial real estate brokerage firms and the online leasing start-ups.

Trammell Crow Company's Perspective

Thomas Bak, managing director of Trammell Crow Company, stated that everyone is becoming connected to each other via an ERP (Enterprise Relationship Platform). Loopnet should survive due to the volume of small deals executed online, but higher-profile deals will not be transacted over the Net. The Internet is a cluttered array of information, so the broker adds value to the process in packaging and customizing the information for the client. Online leasing complements, rather than substitutes for the need for live brokers. Online leasing also brings liquidity and efficiency to the process, resulting in a greater number of transactions.

Insignia/ESG's Perspective

John Combs, the president of U.S. property services at Insignia/ESG, discussed Insignia's \$10 million investment in EdificeRex, offers building-specific Internet portals, with plans to spend \$60,000/day marketing the online service and a total of \$36 million to roll out the product. Other investments include \$15 million in strategic investments in Loopnet and PropertyFirst and \$15-\$75 million on other investments. One investment is GraniteSquare.com which is a service for contractors providing bids on a daily basis. Mycontracts.com is another service that provides contracts managements, notifying recipients when a contract expiration is approaching. Investments include PropertyFirst, LoopNet, Siteline, OnSite Access, Granite Square Inc, EdificeRex, Wireless Inc., Cubitz.com, Concrete Media, Inc., Homestore.com and HVS1, Inc. Mr. Combs stated that the evolution of the online brokers could make the leasing transaction process 20%-30% more efficient. Shifting to his views on the property management model, Mr. Combs suggests that the focus is changing to track a building's population and using systems such as EdificeRex to enable bills to be paid online and maintenance staff to be contacted online. Property managers are not just gatekeepers to tenants, but many property owners are evolving into a more value-added provider of services. Relative to the phenomenon of dot.coms leasing space, over 85% of the companies will fail, so Mr. Combs asks, why agree to more than three year leases? Of the 370 Internet stocks, 74% are showing negative cash flows, which is why lease protection via tenant improvements and security deposits is essential.

CB Richard Ellis's Perspective

Craig Stevens, the senior vice president at CB Richard Ellis, commented on CB Ellis's nine-pronged e-business strategies. The primary focus is Webbing the front and back office of the brokerage firm to empower not only the clients but also the brokers. CB Ellis expects to realize 15%-20% in efficiencies over the next 12-18 months. More and more information will shift to the online channel, with brokers evolving into advisors/consultants and adding value. **Bandwidth and data are the future. The key on the Web is data integrity, so the content is valuable. The Internet connects the world, capturing and improving information flow.** Processes become more efficient. Mr. Stevens views CoStar's information as fairly accurate and timely, considering it contacts CB Ellis brokers for data. New technologies and efficiencies could depress commission rates, particularly on the low end with the emergence of a Goldman Sachs' online realty company, e-space.com and Tenantwise.com. In summary, although there are many cyberbrokers in existence today, Mr. Stevens thinks the evolution is toward fewer, but high-

end, brokers. These brokers will survive and be well-equipped and attuned to the Internet.

Cresa Partners' Perspective

David Toomey, at Cresa Partners (founded in 1994), believes the future for real estate lies in the wireless documents. Cresa provides corporate real estate services to major corporations, offering real estate advisory and tenant representation services. According to Mr. Toomey, he thinks that Web-based applications will enable more collaboration with Cresa's corporate clients. He also thinks that broadband access is a key tool for every business. With the Internet, cultural issues and flexible systems require 24 hour/7 days a week service. His thoughts regarding online leasing were that brokers must become more strategic with a greater understanding of the industry, becoming more specialized to be more successful. As far as leasing to dot.com companies are concerned, Mr. Toomey thinks these enterprises want the flexibility offered by short-term leases, and lines of credit are a good way to secure the lease and reduce the credit risk profile.

Comro.com's Perspective

Kevin Travers, president and CEO of Comro.com (founded in 1995), presented his thoughts on the emergence of online leasing. Comro.com, which is a commercial real estate service online for office, industrial and retail, uses the Internet to enable leasing transactions to become more efficient. The properties were primarily in Chicago, but deals have been signed with TrizecHahn, RREEF, Arden Realty, Great Lakes REIT and SL Green. Access to the Web site is free, but the property owners pay an annual subscription fee to list a building. Comro.com is hyperlinked to selective community Web sites. Comro.com makes money via primarily via the landlord subscription business where a fee is paid to find and fill space online. Comro.com attempts to create a sense of community at its Web site and is moving to be a service provider of brokers, contractors, architects, office supplies and equipment. Roughly 4,000 properties with over 500 million square feet of space are online. Mr. Travers views brokers as critical to the process since brokers gather information from Comro.com for analytical and documentation purposes. The benefit of the online service is that online leasing offers owners real-time pricing that is accurate with integrity. Online leasing enables occupancy and vacancy to be tracked, but Comro.com provides no details on transactions.

PropertyFirst.com's Perspective

John Stanfill, president and CEO of PropertyFirst.com (launched in June 1999), presented similar thoughts on online leasing. PropertyFirst is an Internet service company providing information on "for sale and for lease" commercial properties, which is essentially an electronic marketplace of listings. Brokers find buyers, landlords find tenants and sellers find buyers. The service tracks completed sales and leases with details on how the property sold and other selected data fields. PropertyFirst's focus is on the Fortune 1000 companies to provide information that facilitates a real estate transaction, saving money. PropertyFirst's goal is to provide connectivity for a transaction with a focus on quality. PropertyFirst is a membership and subscription business. The revenue model is based upon brokerage services using PropertyFirst as a suite of Internet services with a number of useful tools. PropertyFirst is also a service provider to lenders and appraisers. Mr. Stanfill considers Goldman Sachs' online leasing enterprise as a clear validation of what PropertyFirst and other dot.coms are doing.

CoStar Group's Perspective

Michael Potter, regional vice president of CoStar Group, provided a glimpse of CoStar's growth and its model. CoStar's IPO occurred in July 1998. In 1998, CoStar helped facilitate 100,000 commercial lease and sales transactions aggregating over \$100 billion in value. CoStar is an exchange or a content provider and a subscription business, offering a comprehensive, proprietary database of properties with leasing tools, data on market conditions, competitive property analysis, and multimedia presentations. CoStar makes money via subscriptions with a plan to be profitable in mid-2001. CoStar tracks over 310,000 tenants in 23 U.S. markets and provides late-breaking news such as major deals signed, acquisitions and ground breakings. CoStar plans to be entirely Web-based by year-end 2000, listing 700,000 properties in the top 50 markets and tracking \$600 billion in transactional sales activity. The momentum is building.

LoopNet Venture's Perspective

Dennis DeAndre, president of LoopNet Ventures, presented how LoopNet fits into the online leasing model. Both Marcus & Millichap, Grubb & Ellis and Insignia ESG have investment interests in LoopNet. With 100,000 real estate professionals using the LoopNet service, this is an efficient and cost effective multi-listing service for commercial real estate. For a fee, LoopNet searches for a property solution. Money is made as an application service provider, where other Web sites pay fees to LoopNet. In fact, 900 top Web sites use LoopNet. The other means to generate revenues is via the e-commerce marketplace, charging a fee. For commercial loan origination, a monthly fee is collected from the lender for every closed deal. Mr. DeAndre thinks that brokers will become valuable in knowing and understanding trends in marketplace. Brokers will be handling due diligence and know where the discounts are. Given that top 10 brokerage firms represent less than 20% of the market, the field is very fragmented with data considered proprietary. More transparency will evolve and more transactions are expected to occur. LoopNet is focusing its resources in three primary areas: 1. marketing/searching or filtering and sorting the tenant requirements, 2. analytical information in terms of demographic and marketing reports, environmental and tax reports, and 3. transactional services for current loan programs and financial services involving insurance, environmental, and appraisal areas. To conclude, Mr. DeAndre states that information is becoming more of a commodity with function and price as the distinguishing marks of the winners.

Summary

Real estate brokerage service companies are being re-engineered at a rapid pace with the emergence of the cyberbrokers. Online leasing is transforming the real estate brokerage process into a more transparent and efficient one. **In our view, real estate assets could become more liquid as properties and space are marketed globally and transaction times are collapsed.** We believe a divergence will occur between the discount service firms and the full-service firms where the real estate brokers add value via knowledge. **e-documents are reducing cycle times for leasing properties.** We believe that real estate service companies and real estate companies should be gathering information on the various lengths of time to lease space or broker a transaction. With this information, the companies can analyze the data and set objectives such as quantifying how much online leasing will reduce cycle times. This knowledge adds value. As Bill Gates stated in *Business @ The Speed of Thought*, "Once you have customers interacting with you, you have

an incredible ability to build on that relationship to offer a broader set of products...You want to move pure transactions to the Internet, use online communication for information sharing and routine communication, and reserve face-to-face interaction for the activities that add the most value" (p. 70 and 109). **As leasing moves online and an e-model emerges, significant value may be tapped in analyzing patterns and knowing customer preferences even better.**

Other Real Estate e-Processes

The layers of costs involving other real estate transactional processes, such as new development and redevelopment projects, offer the potential for enormous inefficiencies to be improved. Forrester Research projects that the construction industry will see B2B e-marketplaces emerging which will move \$6.3 billion online in 2000, growing to \$141 billion by 2004. Each real estate project, whether a new development or redevelopment, involves multiple entities to complete the process. Some real estate companies have the expertise internally for many facets of the process and are vertically integrated, whereas, other companies outsource some of the process to experts. In either instance, architects, engineers, governments, financial institutions, appraisers, title companies, general contractors and subcontractors, suppliers and the actual owner and the developer of the property must collaborate to execute a successful project. As these teams of individuals interact, much time, labor and paper slow the process and increase the costs. We believe that a multitude of e-processes will continue to evolve to expedite the development and redevelopment process.

One example is Buzzsaw.com, which recently received \$75 million in venture financing to provide online solutions to the \$3 trillion building design and construction management industries. As an article in the April 17 *IPO Reporter* stated, "Construction projects are fraught with complications, from architectural designs, engineering complexities, changes in building specifications, and managing quote estimates to purchases of material goods." **With the invention of e-documents and e-pads, the entire process is being digitized, offering the potential to reduce layers of the costs and work toward collaboration. From our perspective, some of the development and redevelopment experts in the real estate industry, whether retail, multifamily, industrial or office, may develop proprietary systems that may e-link the entities involved in the process.** e-hubs, or e-marketplaces, are being developed where information is exchanged. These e-marketplaces require re-thinking about existing structures and creating a virtual hub where information is gathered and e-disseminated to other relevant parties on a real-time basis, reducing the intense time and labor required of the process. **As information flows become more synchronized and all links in the process are connected, the opportunity exists to shake out layers of costs.** We believe more collaborative thinking will occur as e-documents and e-pads emerge and become commonplace. Real estate companies must know their resources and the knowledge base of their employees to empower their workers to think out of the box and move real estate companies into the Knowledge Age. Potential value may be unlocked with the talent in an organization, which will prove to be more and more powerful as we move into the future.

The following section provides a glimpse into some of the initiatives that entities involved in the development and redevelopment process are working on. We highlight government, lenders, appraisers and title companies, but these entities are just beginning to tap the potential that exists in speeding up the process and eliminating layers of the costs.

Government Moves Online

In the Old Economy, entitlements required much work. In the New Economy, development occurs online with designs, RFPs, redevelopment incentives, notification and postings online. e-citydeals.com is a B2B company that is working to move municipalities online and the entire city government infrastructure onto the virtual realm to improve processes. As governments move online and decision-making processes become less time consuming, projects may be developed and redeveloped at a more rapid and perhaps less costly pace. e-citydeals.com is creating the intersection between public and private enterprises as an e-marketplace. Quantifying the amount of time involved in working on agreements and contracts with governments and showing the reduction in time due to online capabilities should be an objective set forth by many real estate companies. We would emphasize that the entitlement process is very time intensive, and a couple of years of data will not illustrate the efficiencies being gained by moving the entitlement process online. Over a five to ten-year period, we believe that the difference could be more illustrative of the benefits of moving to an e-model.

E-Lending

The commercial mortgage market is extremely fragmented and in need of standardization. For lenders, this online process is a re-tooling of business models to streamline workflows, provide real-time access to information, provide instant responses, offer multiple quotes, and provide organized communication and resources. Linda Vance, vice president of multifamily systems development at Fannie Mae, outlined three goals that Fannie Mae is working diligently toward: 1. reduce cycle time from receiving loan and funding to initiating to 15 days from 90 days; 2. streamline data and reduce underwriting costs 15% through expediting waivers and creating e-underwriting tools, and 3. servicing loans to reduce costs by 25% allowing easy and less costly by automating interface. The stretch goals could prove challenging by linking all the players involved in the transaction real-time, but the quantification is key because the improvement may be measured. We believe Fannie Mae's goals should serve as a model for real estate companies. Fannie Mae clearly articulated that its technology vision provides solutions that are value-additive. The goal is to link all the players involved in the transaction in real-time. Fannie Mae would like to offer a lender tool box to streamline the underwriting process and to do pre-screening for digital legal documents. Fannie Mae also has three primary focus areas: product, profitability (to lower cost of doing business) and platform (an open architecture that is non-proprietary). As evident, Fannie Mae has a very established position in the marketplace whose track record and experience enable the company to re-think business strategies and re-tool business models to adapt to changes occurring in the New Economy.

Other online lending services include redbricks.com, capitalengine.com, capitalthinking.com, and mortgage selector.com. Redbricks.com provides access to preliminary loan quotes on a competitive basis, mortgage financing

and other services. The company has over 20 participating lenders. Capitalengine.com (founded in December 1999 by the partners of Greenwich Group International) is an on-line real estate investment banking firm that provides value-added capital raising services, such as finding loan programs and expediting loan process, to customers. Capitalthinking.com delivers quality preliminary underwriting, backed up by sophisticated databases to meet lender specifications, creating more capital sources for brokers. Brokers have real-time access to tailored loan rates. Mortgageselector.com, which provides proprietary tools and resources, is an Internet mortgage placement system created for the 500 lending institutions and 20,000 commercial mortgage agents in the real estate industry. Participating lenders include ARCS Commercial Mortgage Co., Bloomfield Capital Lease Funding, CIBC World Markets, Deutsche Bank, GE Capital Real Estate, GMAC Commercial Mortgage, Key Corp, LaSalle and others. Mr. Millichap commented that he viewed dot.com mortgage loan enterprises for consumers such as lendingtree.com and e-loan.com as likely to fail due to the tremendous acquisition costs per customer. There is no stickiness as a customer gets a quote online and moves offline for the loan.

e-Appraisers

Another part of the real estate transaction process is appraisers. Moving this process online via e-documents is approaching and could produce information that is real-time, lessening the time to complete the transaction. Douglas Haney, MAI, president of appraisal services at CB Richard Ellis, stated that the Internet is enabling information to be exchanged faster, more accurately and less expensively. Appraisal documents are evolving into e-documents with digital fields which may be seamlessly transferred to other pertinent documents, thereby shortening the cycle time. (*Real Estate Conference Group, "Appraisers' Perspective" panel, April 17, 2000.*) Similar statements were made by Matt Marschall, MAI, principal of Integra Realty Resources. He agreed that the e-documents were very effective. (*RECG Conference, "Appraisers' Perspective" panel, April 17, 2000.*) Sending PDF files saved lots of time and could include digital signatures, maps, and photos. Videoconferencing and digital tools were other effective tools. Internet tools are becoming faster and better with consolidation and integration as key. But Mr. Marschall noted that high-speed bandwidth is critical for these advanced tools and files. Standardizing files are also an important part of the process. These experts are predicting that e-pads will become more widespread among appraisers who can measure buildings, take photos, and incorporate voice recognition technology to provide digital data real-time. The appraisal companies will use technology to better serve clients and add value. Technology-enabling applications are bringing new entrants to the field, and further consolidation of mom&pop shops is expected. The highly skilled professionals will be the survivors.

e-Title Companies

Infrastructure is being retooled into centralized backoffice processing centers which will increase the need and demand for standardization for title companies. According to John Hollenbeck, the National Title Processing Director of First American Title Insurance, when performing a title search, the typical time to assemble a package of information is 2-3 days, but with IT systems, the time may be reduced to 10 minutes. (*RECG Conference, "Title*

Company's Perspective" panel, April 17, 2000.) Cycle times will collapse and correspondingly costs will decline.

Summary

As is evident, technology is beginning to transform all of the components of the real estate transaction process. The move to broadband solutions and connecting companies to the Internet to exchange information real-time is expected to dramatically alter the real estate industry. The industry has layers of costs as each link in the process is added, resulting in a compounding of costs and very expensive projects. The fragmentation and the inefficiencies of the \$4 trillion industry create opportunities for substantial re-tooling and re-thinking about business models and strategies. The structural changes could result in lower overall costs and improved productivity as the entire process move online in a collaborative workplace environment, providing real-time information flow via e-documents.

As an example, a \$200 million development of a regional mall involves layers of costs that may be digitalized whereby the information flow and the time are dramatically reduced to result in a lower-costing project. Taubman Centers, one of the leading mall developers, has a vertically integrated development discipline that offers the potential for additional efficiencies to be realized as cycle times are collapsed and the transaction processes move online. The product development team, the market research team, the architectural team that oversees the technical aspects of planning, architectural design, civil engineering and traffic engineering, the construction management group which includes the general contractor as well as sub-contractors and suppliers, the store planning and design team that interfaces with the future tenants and the residual land development team all are distinctive divisions that are involved in one development project. These teams are subsets of the development process which also includes the owner of the property, governments, appraisers, title companies, financial institutions, to name a few. As evident, this fragmentation creates tremendous opportunities.

We believe that one of the first priorities is quantifying the potential for improvement, which begins with gathering the data, analyzing it and proposing a plan to cut the cycle times for each component of the real estate transaction process. Knowledge becomes critical and a valuable means of differentiating companies that will be winners and the ones in which to invest. **Those companies that quantify the inefficiencies or costs that may be eliminated over time, set goals to reduce cycle times, and achieve them will become more valuable investments.** For instance, reducing any step is progress whether it is the time to design a project, the costs of supplies, the time to begin construction once an entitlement is received, etc. Knowing the benchmark for each step in the process and consistently achieving each goal set forth will result in a more efficient, streamlined company. These quantified goals should be the objective of every real estate company, to know the cycle times and to show that e-processes bring improvements with less inefficiencies, fragmentation, labor intensity, and time requirements. The end result is not only a successful development or redevelopment project, but the company becomes a more valuable investment.

Technology is reshaping all industries, as e-marketplaces are being created. As David Carlquist states, the transformation occurring is giving connectivity power. "We are seeing exponential growth as knowledge and information converge...Barriers are being eliminated in terms of space, time, distance and borders...Technology is not only transforming space but the use of space...Infrastructure becomes intelligent as bricks and clicks converge...The network economy is lifestyle-centric with flexible locations, offering mobility, 24/7 operations, IT partners, and services (venture capital, consulting, accounting, legal, technology, human resources and training)." The three goals for any company in the New Economy should be:

1. Chart a vision
2. Know skills of workers/company
3. Select partners with which to build a future

David Carlquist, vice president of Net Generations Business division at IBM

Keynote Speaker, RECG Conference, April 17, 2000



New Economy e-Services

Similar to B2B e-applications, many B2C or B2T (business-to-tenant) initiatives have been launched by real estate companies, and we expect the number to multiply as properties become wired with high-speed broadband access and information-flow improves the relationship with the customer or tenant. Rather than providing details of the e-platforms emerging by sector, we simply highlight the most prominent New Economy e-services by sector, with a more comprehensive analysis of each initiative provided on p. 42 through 98.

Multifamily

Multifamily companies are creating interactive, content-rich community Web pages, alongside online management applications, to advance their competitive edge and to capitalize on revenue-sharing and royalties. BRE's spin off of VelocityHSI is at the forefront in terms of providing a gateway to the Internet for renters. It is providing a suite of Internet applications to provide the infrastructure for smart apartments of the future.

Retail

Retail real estate companies are developing clicks and mortar strategies to capitalize on the untapped value at existing properties. Simon Property Group launched clixnmortar.com and Taubman invested in fashionmall.com and plans to roll out Centerlink kiosks in its regional malls. These two companies are leading the way at their productive and well-located malls. Other multimedia cybercasts, hand-held PDA devices, virtual malls, online coupons and promotions to be used offline, and Eversave.com are emerging concepts.

Industrial

Industrial companies are addressing the demand for space as it relates to fulfillment centers and e-commerce distribution facilities. Strict underwriting criteria are adhered to in order to reduce the credit risk profile of leasing space to dot.com companies. AMB Properties has formed an Internet incubator fund, investing in start-up enterprises that provide AMB insight into the front-end and back-end of the fulfillment process.

Office

Office companies are forming alliances with B-LECs, or business-centric local exchange carriers. Revenue-sharing agreements and equity investments in broadband service providers are the rage. In June 1998, Reckson Associates was on the cutting edge with the spin-off of FrontLine Capital. In 1999, Equity Office Properties, along with seven real estate companies, formed Broadband Office, an entity that plans to wire office buildings for high-speed access and offer other B2B and B2C services. Services such as Captivate Networks, which is a provider of flat panel screens offering news, stock quotes and weather in elevators, are in high demand by office real estate owners. Carrier hotels, which are state-of-the-art facilities providing mission-critical facilities, is another avenue of addressing tenants' needs, especially the telecommunications service providers.

Futuristic Buildings

Based on the e-services launched and the ones being formulated thus far, we believe that technology may cause some buildings to become obsolete. In Table 1, we have highlighted the properties that could be winners and losers as the digital revolution continues.

Table 1: Futuristic Buildings

Winners	Losers
High Tech Locations	Remote Locations
CBD Markets Wired With Fiber	Distribution Centers Situated Far From Transport Hubs
High Through-Put Fulfillment Centers	"C" Quality Regional Malls
Carrier Hotels	Power Centers
Wired Multifamily Complexes	Tertiary Strip Centers In Less Densely Populated Areas
Multifamily Complexes in High-Barrier/24-hour Locations	Buildings Which Lag In Integrating Technology
"A" Quality Regional Malls	Storage Space For Paper Archives
The Experiential Malls	
Wired Futuristic Malls	
In-Fill Grocery-Anchored Strip Centers	
Strip Centers in Densely Populated Areas	
Wired Buildings	

Source: Deutsche Banc Alex. Brown estimates

The high-technology locations create a clustering of multifamily, office, retail and industrial buildings to accommodate the burgeoning demand. Many mixed-use projects are being built to serve the community in all its needs, a place to work, a place to live and a place to spend leisure time. As available time declines, more convenient lifestyles are being demanded. Lifestyle-centric cities could prosper. The CBD markets where buildings may be wired with fiber optic cables could be more valuable due to their close proximity to the fiber local loop. Wired retail centers providing multimedia cybercasts from Milan and Paris could be highly productive. Experiential malls that tap the tourist market and become destination sites could be viewed as winners. Wired multifamily complexes could perform well, as real estate owners analyze tenant data to know who rents and what services they need and want. We believe apartment communities will become more lifestyle-oriented, offering movie theaters, conference room space, technology rooms, health club facilities, doctors' offices, concierge services and more. High through-put fulfillment centers providing advanced logistics systems could experience strong demand. As the demand for high-speed broadband access grows exponentially, the demand for carrier hotels could be very strong. Grocery-anchored strip shopping centers in densely populated areas could record healthy demand due to the convenience and accessibility. These buildings could be the winners in the New Economy, with wired properties being demanded by more and more tenants as the New Economy unfolds.

In terms of the lackluster performers in the New Economy, we believe several building types could be vulnerable. Remote buildings, far from high-speed broadband access, even DSL, could suffer in terms of tenant demand. Distribution centers situated far from transport hubs that serviced Old Economy companies could be highly susceptible due to the just-in-time delivery expected in the future. Power centers could be vulnerable as fewer

category killers have been created and the future reconfiguration of space for the New Economy companies could result in unused space and dampen power centers' prospects. Regional malls with low productivity (sales per square foot below \$300) and poorly positioned competitively could face declining sales and occupancy rates. Tertiary strip centers are at risk where fulfillment centers located nearby provide the same products for delivery at a cheaper price. We also think buildings that lag in integrating technology and high-speed access could be at risk. It is hard to catch up in the New Economy, as the pace of change is so rapid. Finally, storage space for paper archives for businesses could report weakening demand as e-data storage centers heighten the demand for carrier hotels. As property owners know their tenants better, services may be targeted with more effectiveness and stickiness. Due to the nature of lease contracts, the property owner has the option to provide additional services to the customer when moving into or out of space, which may offer more sustainability to a service provider. The subscriber base increases while the risk profile declines. For this reason, we anticipate that the services a property owner offers a tenant will grow as knowledge of tenants improves.

In conclusion, based on our analysis, we believe investors should be cognizant of the changes in demand for space and adjusting real estate company investment holdings accordingly. At present, as all real estate stocks were hammered in 1999, some short-term opportunities exist in holding and owning shares in the companies where the property type is vulnerable, as all stocks are beginning to rebound from historical low levels. Caution is necessary, as some risk exists over time in owning stock in the more vulnerable property types. Convergence is evolving with shareholder value expected to increase for many real estate companies. **Some companies are gradually re-tooling their business models in that direction, such as AMB Property, Apartment Investment and Management Company, Archstone Communities, AvalonBay Communities, BRE Properties, Equity Residential, Equity Office Properties, Kimco Realty, The Macerich Company, ProLogis, Reckson Associates, The Rouse Company, Simon Property Group, Spieker Properties, Taubman Centers, TrizecHahn, United Dominion, and Westfield America.**

We believe a core list of Real Estate Technology companies will emerge for shareholders to own. The real estate leaders are beginning to emerge. We recommend swapping out of stocks where the properties are less optimally positioned and purchasing those real estate companies that are working to create smart buildings of the future.

Convergence of Real Estate and Technology

Since the beginning of the year, we have witnessed signs of a sector rotation with money flowing to the REIT industry out of highly speculative investments. (Please refer to Figure 4 and Table 2.) As of the week ending May 3, REIT net mutual fund flows recorded a positive inflow of \$185 million, which is the largest weekly inflow year-to-date. As of May 10, the week reported \$21 million of inflows. A bit of realism is filtering into the stock market, as profitability does count and positive cash flow is important. Real estate companies have been overlooked for the past 18 months, but we believe investor interest is re-emerging.

REIT Stock Valuations

Despite a rebound in the stock prices of 7.9%, based on the Deutsche Banc Alex. Brown REIT Index as of May 12, 2000, compared with a 3.3% drop in the S&P 500 Index, we consider that REIT stock valuations remain extremely attractive. Stock prices are trading slightly above historical and cyclical lows in terms of both a **Net Asset Value** (NAV) basis and a **P/FFOPS** (12-month forward) basis. We believe more upside exists in the stock prices. One of the valuation measures that we calculate quarterly and use extensively is NAV. The premium or discount at which the stock is trading relative to our calculation of the REIT's net asset value indicates buying and selling opportunities. The share prices versus the net assets of the REITs are trading at steep discounts of 21%, suggesting buying opportunities. Even though stocks have rebounded year to date, the valuations are still very low. Across all sectors, the stocks are trading at discounts to NAV, with the most notable discounts among the retail REITs. Mall stocks are trading at 30% discounts, on average, to NAV, while Strips are trading at 26%. In our view, there are many compelling investment opportunities in these two sectors. Similarly, Office REITs are trading at 19% discounts to net asset value and are attractive for purchase.

Another valuation measure we use is P/FFOPS multiples. We analyze where the REIT industry is trading on a price-to-FFOPS (12-month forward) basis. The stocks are trading at a 8.4x multiple relative to their historical 10-11x level. This compares with the forward S&P500 P/E multiple of 24x and its historical average of 17x-18x. REITs are trading at historical and cyclical lows. As a point of reference, REITs traded at valuations of 8x in the late 1990/early 1991 period when the United States was amid the S&L debacle, when \$2 trillion of real estate was unloaded into the marketplace, and vacancies were in the 20% territory. Fundamentals were extremely weak.

In contrast, today, fundamentals remain very strong—on average, vacancies are roughly 5%-10%, rental rate growth is healthy, and new construction activity remains constrained, resulting in supply and demand very much in balance. Although some investors thought the real estate markets had peaked and were headed for a collapse, this scenario has not unfolded. Looking at the FFO per share growth expected from the REIT industry, our forecast is for a 7.2% average gain in 2000 followed by an 8.6% gain in 2001. Such growth exceeds the average historical rate of 6%-7%, which is why we