chapter 4

THE CONNECTION BETWEEN SUSTAINABILITY AND ECONOMIC DEVELOPMENT

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For the first time in over a century, a connection between sustainability and economic development has evolved, and it is a response to the emergence of the knowledge economy. In the former industrial economy, which was dominant from the mid-19th century until the 1970s, that connection did not exist. In fact, unsustainable economic development practices were responsible for economic expansion. Smokestacks came to symbolize progress and job growth. We sacrificed quality of life and environmental protection to earn a living. The industrial-era tradition of total separation of land uses is reflected in today's sprawl, which is the most visible reminder of our outdated thinking. Today, we are having a difficult time accepting the notion that the connection between economic growth and sustainability is not only beneficial but also essential for both the environment and the bottom line.

The knowledge economy encourages recognition of the long-term value of development and distinctive developed places associated with sustainable natural surroundings. Workers in the knowledge economy value high-quality living and working environments; they are increasingly attracted to thriving urban neighborhoods and to business locations in revitalized employment centers. They and their families enjoy the benefits of conserved natural spaces. They pay greater attention to the cost effects of development—on natural resources, on public services such as transportation and utilities, and on social and economic interactions. To respond to these interests, we must cultivate economic paradigms that support sustainable forms of development, including approaches to financing private development that recognize the long-term value of development and public fiscal policies that reflect the cost differentials of delivering services to conventional versus sustainable development.

The Legacy of the Industrial Economy

To understand what changed when the method by which we earn our livings shifted from an industrial to a knowledge base, we need to consider the five ways that value is added in any economy—agricultural, industrial, or knowledge:

- the conversion of raw material, such as oil, iron, wheat, and so forth, to produce tangible goods;
- reliance on skilled and unskilled labor to manipulate raw materials;
- research and development to create and refine technologies that result in new products, either tangible or intangible;
- marketing and distribution to understand, create, enhance, or respond to consumer demand and to transport the product to the end user; and
- the management and financing of the enterprise.

In the industrial economy, raw material extraction and labor to manipulate that raw material added 60 to 80 percent of value to the final product. The produc-

tion of steel, the prototypical industrial product, required a huge investment in mines, the shipping of raw materials, and labor-intensive production processes, all of which accounted for about 70 percent of the cost structure of manufactured steel. Factories in the industrial era had no choice but to locate close to the source of raw material, particularly if the material was difficult to transport. The result was an explosion in economic and population growth in the resource-rich Midwest, particularly in cities with water transportation such as Detroit, Chicago, Pittsburgh, Cleveland, and Milwaukee. Water transportation allowed for inexpensive inbound shipment of raw materials and outbound shipment of finished products. While labor was demeaned and undervalued during the early years of the industrial era, the middle years of the 20th century saw the rise of labor unions, forcing management to recognize the value of labor's input. The power of unions allowed the real wages of skilled and unskilled workers to rise to middle-class levels for the first time in history.

The industrial era peaked just after World War II, when 45 percent of all jobs were in the manufacturing sector. Today, industrial jobs account for 16 percent of all jobs but, by 2010, they will likely represent 10 percent, according to forecasters. Despite the projected drop, industrial production as a percent of GDP hovers around 25 percent, as it has for decades; the reason is increased productivity.

The rapid decline in a basic sector of the economy is not without precedent. Before the industrial era, agriculture drove the economy. During the early 19th century, over 75 percent of the workforce was employed on farms. Today, the agricultural sector of the economy, which is one of the nation's most productive and most successful export sectors, employs less than 3 percent of the total workforce.

The industrial economy began at a time when resources and land were considered inexhaustible. The continent was so large and raw materials so plentiful, especially in view of the 19th century's small population base, that few Americans felt the need to conserve. The belief that the continent offered unlimited land and resources had its basis in the largest and least contentious transfer of land ever witnessed in history: the conquest of the Western Hemisphere by Europeans. Never has so much land been transferred from one group of peoples to another group with such relative ease.

By some estimates, approximately 40 million Native Americans populated North and northern South America in 1492. Large population centers of Native Americans dotted what is now the eastern United States, the Mississippi River Valley, the Southwest, central Mexico, and Peru. The early–19th century journals of the Lewis and Clark expedition describe the expedition's winter camp at the mouth of the Columbia River in Oregon as having what we would consider today's suburban densities. And in the Mississippi Valley, the Pueblo Indians of the Southwest, the Aztec civilization of central Mexico, and the Incas of Peru achieved significant urban-density concentrations. It was not until the mid-19th century that the population of European settlers reached the 15th-century level of the native populations.

After the arrival of the Europeans, however, over 90 percent of the native population was wiped out, primarily due to European diseases such as smallpox, measles, and tuberculosis. In fact, the European advantage in weaponry was of only secondary importance. Smallpox, probably brought by early French trappers even before significant European exploration took place, eliminated the Mississippi Valley culture. As for the Aztec nation, which was a militant civilization of about 20 million, an invading force of 600 under Hernán Cortes was responsible for a smallpox epidemic that, in a little less than a year, killed over half the population, including the emperor. The surviving Aztec defenders were disheartened that the deadly disease affected only them, not their Spanish conquerors. Within 100 years of conquest, the native population of Mexico had dropped to less than 2 million.

With less than 10 percent of the Native American population left to defend its land, the European invaders found the land takeover relatively easy. In fact, the land-starved European lower classes, which made up most of the immigrant population, claimed a gift of land and resources beyond any previous historical precedent. One can only speculate about the different scenario that would have played out if European germs were the equal of Native American germs, pitting the small groups of travel-weakened European invaders against 40 million well-entrenched defenders. The fight put up by the small remnant of native Americans inspired the heroic myths of the frontier while the inevitable outcome fueled the American sense of "manifest destiny."

In thrall to manifest destiny, early European settlers and their descendants assumed that the continent's natural resources and land were unlimited and free—or at least cheap. There was always another rich valley over the next hill. For example, the transformation of the upper Midwest during the late 19th century resulted in the destruction of one of the world's largest forests, the corporate-financed near-extinction of the buffalo, and the transformation of the prairie into the farmland we know today. Manifest destiny mentality was responsible for denuding what was a once an environmentally rich continent.

Writing in the January 1929 issue of *Harper's Magazine*, Malcolm Cowley, one of America's great essayists of the early 20th century, wrote about growing up in central Pennsylvania around 1915:

> There were no longer any deer in my country. The white pines, which once covered it, were reduced to a few weevily saplings. The trout had been poisoned by sawmills or sulphur from the mines. The young men were dispersing, the farms neglected, and soon my country would be a fire-blackened wilderness with a few old houses crumbling in the midst of overgrown fields.

Cowley spoke of old men remembering "when panthers skunk after white-tailed deer, when every creek was full of shadowy trout." Meanwhile, "the young men [of 1915] tramped off to Pittsburgh to look for work in the mills" and further denigrated the environment. But, with limited alternatives for economic growth, wealth creation, or the provision of family necessities, few voices questioned the tradeoff between economic necessity and environmental destruction.

With the advent of the knowledge economy in the 1970s, the economic rules began to change. Automation reduced labor inputs as the dirtiest and most dangerous jobs moved abroad to take advantage of lower labor costs and less stringent regulatory regimes (actions that are not without sustainability impacts). Tangible products became smaller and lighter, minimizing raw material inputs. Intangible products, such as professional services and software, now dominate the marketplace and account for the fastest-growing sectors of the economy. The R&D required to create smarter, tangible products is the only input into intangible products and therefore is of paramount importance. Understanding the consumer and even stimulating consumer desire in an increasingly wealthy society means the difference between product/service success and failure. Developing "smart" distribution systems to move products to consumers when and where they want them, in a "just-in-time" manner, has become a major component of corporate strategy. Finally, two areas of pursuit—managing the complex process of product/service R&D, marketing, and distribution and providing finances through a highly sophisticated worldwide network of investors and bankers—now account for the economy's most highly compensated activities.

Today, the value added by R&D, marketing, and distribution and by management and finance dwarfs the value of raw material and labor. The laptop computer used to create this text retailed for about $2,000. The actual cost of producing that computer—the plastic, metal, and battery—totaled less than $200, FOB. The rest of the cost paid for amortizing R&D, enticing the consumer through advertising, providing customer support through call centers, and financing and managing the enterprise.

So how has the agricultural- and industrial-era mentality influenced how we use the land and build the places where we live, work, and play?

Emerging Metropolitan Development Patterns

The few following factors define how the real estate industry and government have shaped development of the nation's metropolitan areas:

- through the location of executive housing concentrations, which tend to be in one general part of the metropolitan area, although a few of the largest metropolitan areas have two or three concentrations;
- through the location of local minority group concentrations, which tend to be in opposite directions from the executive housing concentration(s); and
- through the freeway system.

In other words, employment locations tend to be driven by proximity to executive housing (the bosses make employment location decisions) and by access to the regional freeway network. Where employment goes, metropolitan development follows. These factors have combined to push the metropolitan fringe farther and farther out, suburbanizing the rural countryside at an ever-increasing pace.

The last 50 years have witnessed a geometric expansion in the land area occupied by metropolitan development. Stated more precisely, the land area subject to development grew at least seven times as fast as the population during the second half of the 20th century, with 80 percent of the nation's population increase of 120 million settling in metropolitan areas. During the early to mid-1990s, in particular, the bounds of our metropolitan areas pushed outward even more rapidly than in previous decades. The edge cities of one decade become the inner suburbs of the next decade as new edge cities are built farther out. Commercial developments have exploded at the metropolitan fringe, such as toward the Alliance Airport area of Dallas/Fort Worth, toward north Scottsdale in Phoenix, and into Cobb and Gwinnett counties 40 miles north of downtown Atlanta.

In their choices of where to live and work, the executive decision makers in the knowledge economy are driving continued suburbanization. Highly educated and trained engineers, marketing specialists, finance professionals, scientists, investors, and managers constitute

the most important input into the knowledge economy—not raw materials or the skilled labor needed to manipulate raw materials. Knowledge workers are well-traveled and sophisticated and exercise great discretion. They have choices. Given their power to choose, they tend to live in high-quality-of-life places that offer unique environmental features. They select office and plant locations close to their homes that may even be their homes. They can locate their workplaces near their generally high-end housing because the knowledge economy is nearly pollution-free, except for the air, water, and noise pollution caused by lower-level workers' daily commute.

These factors have led to the emergence of the "favored quarter," where most new and relocating jobs settle and 70 to 80 percent of infrastructure dollars are spent. But the success of the new knowledge economy has not been paralleled by success in building workable metropolitan areas. Americans still operate with the pioneer belief in unlimited resources and land availability. After all, an airplane trip across the country reveals an abundance of seemingly unused land; indeed, we use only 5 percent of our land to house 80 percent of the population. And the current industrial-era interpretation of the American dream gives anyone the right to a large lot, privacy, and easy access to work by automobile. The vision of how we should be able to live is so strong that it is embedded in our zoning codes, financing mechanisms, and real estate strategies. As long as lower-level workers are closed out of the favored quarter, our metropolitan areas will continue to be plagued by long commutes, traffic congestion, loss of valued natural features, and air pollution. With all of us trying to live the same dream, the age-old phenomenon of the "tragedy of the commons" sets in.

The tragedy of the commons refers to the pre–17th century British countryside practice of making common pastureland available for the sheep farmers in a particular area. Anyone was free to graze sheep on the commonly owned pasture. However, because no one owned the land, no one took responsibility for preserving it in the face of mounting pressures for pasturage. If one farmer did not exploit the use of the pasture, the next one would; so why not strip the pasture of grass? Today, the tragedy of the commons is leading to the environmental degradation of American metropolitan areas as the scourge of air, water, and noise pollution and traffic congestion compromise our quality of life. With the indirect costs of suburban sprawl passed off to society as a whole, there is no incentive for any individual to conserve.

The other side of the tragedy of the commons is the monoculture we are creating by following the industrial-era version of the American dream. With few exceptions, American metropolitan areas have adopted a "one-size-fits-all" approach to real estate development. If you want an executive home, you can choose a single-family house or a single-family house. If you want to shop near your single-family house, you can go to a strip retail center or a strip retail center. For a nation that prides itself on offering the widest array of consumer options, we offer little choice in our living environments. As Tom Wolfe said in *A Man in Full*, when commenting on the infamous American commercial strip, "the only way you could tell you were leaving one community and entering another was when the franchises started repeating."

Conventional Formulas for the Built Environment. Our monoculture can now be boiled down to a few standard product types that the real estate industry, Wall Street, and institutional investors can easily finance, build, and sell. Perhaps the most common examples of "slam-dunk" products are:

- grocery store– and drugstore-anchored neighborhood centers of between 80,000 and 150,000 square feet, with surface parking, and designed to draw from the "neighborhood" within a two- to four-mile radius;
- two- and three-story rental apartment buildings of 100 to 500 units with surface parking, though more attached garages are expected;
- move-up detached housing on one-third-acre lots with houses between 1,800 and 3,000 square feet;
- two- and three-story office buildings between 50,000 and 100,000 square feet, with surface parking limited to outer-suburban areas;
- one-story 100,000-plus-square-foot warehouses with a minimum of a 22-foot clear-span height and laser-leveled floors to accommodate automatic storage and retrieval systems; and
- power centers comprising several big-box, category-killer retailers such as Circuit City and Home Depot, totaling between 200,000 and 400,000 square feet, with surface parking and drawing from a three- to five-mile radius.

Figure 4-1 presents 19 standard products the real estate industry is accustomed to producing with ready acceptance by investors.

Even though supply and demand pressures ensure that the product formulas in figure 4-1 are not perfectly static, the formulas are nonetheless extremely limiting. The major land use implication of standardization is an acceleration of the trend toward a homogeneous built landscape. With the possible exception of superficial architectural details, an apartment building in Atlanta looks like one in Los Angeles; a housing sub-

19 Standardized Real Estate Products Acceptable to Investors and Regulators **4-1**

Income Products

Office
- Build-to-suit
- Speculative suburban low-rise

Industrial
- Build-to-suit
- Speculative warehouse
- (greater than 28-foot clear span)
- Research and development/flex

Retail
- Neighborhood (between 80,000 and 120,000 square feet)
- Power (between 120,000 and 400,000 square feet)
- Urban entertainment

Hotel
- Limited service
- Full-service business

Apartment
- Low-density suburban (over 150 units at 15 to 20 units per acre)
- High-density suburban (over 200 units at greater than 20 units per acre)

Miscellaneous
- Self-storage
- Assisted living

For-Sale Products

Residential
- Entry-level attached
- Entry-level detached
- Move-up/-down attached
- Move-up/-down detached
- Executive detached

Source: Robert Charles Lesser & Co.

division in Kansas City looks like one in Orlando. And the commercial strip is ubiquitous and probably the most significant American contribution to 20th century architecture. Standardization has led to biting commentaries over the past 30 years. In *The Geography of Nowhere,* James Kunstler refers to the American built landscape as a "hostile cartoon environment."

How are Americans reacting to the formula-driven environment that has been created across the country? "Visual preference surveys" by Anton Nelessen, a Princeton-based planner, yield a nearly universal conclusion: Conventional, formula-codified development is considered "an evil unleashed on the community." In what may appear to be a blinding flash of the obvious, Nelessen has consistently shown that Americans overwhelmingly and consistently prefer a pedestrian-oriented retail village versus eight lanes of traffic separating the local Wal-Mart from the McDonald's.

If such findings reflect antipathy toward current real estate industry development patterns, how can we explain the obvious acceptance of such patterns? Critics of conventional developments, such as Peter Calthorpe, one of the leaders of the new urbanism movement, would say that acceptance reflects the dearth of alternatives to today's cookie-cutter products. That observation is borne out by the protective behavior evidenced by the residents and patrons of many neighborhoods and commercial areas built before World War II. Examples include Country Club Plaza in Kansas City, the German Village neighborhood in Columbus, Ohio, and the upper east and west sides of Manhattan, places that violate the formulas of today's codified products. Elected officials or developers who attempt to change the character of these and other highly treasured places do so at huge risk.

However, a major reason for the success and consumer acceptance of the limited number of standardized products is that Americans have obviously traded off character for efficiency. In retailing, for instance, strip commercial development allows the average consumer to spend far less on food than consumers in the rest of the industrialized world. Wal-Mart is cheaper and offers a wider selection than the old five-and-dime store. And homes in the United States are far larger for the same or less cost than dwellings in other nations. Clearly, the standardization of our real estate has led to significant cost efficiencies, yet it has occurred at an environmental and societal cost that has been pushed off to society as a whole.

In the head-long rush to implement the industrial-era vision of the American dream, we were initially successful in having it all: privacy, automobile-based convenience, and environmental quality. But we pursued that dream before its unforeseen environmental consequences became evident. The real estate industry now provides only a few low-density standard options. And that is where the tragedy of the commons sets in. We end up loving to death the very environmental features that propelled us farther and farther to the fringes of our metropolitan areas.

Atlanta: The Epitome of Nonsustainability. Nowhere is the tragedy of the commons more evident than in 1990s Atlanta. Blessed with a Sunbelt location and unlimited land with few topographic barriers, Atlanta entered the 1990s as America's premier corporate location, according to every leading business magazine. Southern charm and Northern-financed economic growth combined to make Atlanta the fastest-growing metropolitan economy of the decade. In addition, the metropolis experienced the fastest rate of human settlement in history with respect to physical expansion. The Atlanta area started off the decade with a north/south commuter shed of 65 miles; it ended the decade with a 110-mile commuter shed. That growth has resulted in massive traffic congestion and some of the poorest air quality in the country—along with two unforeseen consequences. First, the federal government, recognizing that metropolitan Atlanta was in violation of EPA clean air standards, cut off all federal highway funds for the region. Second, Atlanta has dropped off the charts as a business location. In fact, Hewlett-Packard recently declined to move additional jobs to the region and may even start moving jobs out as a result of the declining quality of life.

Largely because Atlanta enjoys a history of extremely progressive business leadership, particularly in the real estate community, the leaders of the Atlanta metropolitan area and the state reacted rapidly to a deteriorating situation. John Williams, president of the chamber of commerce during the late 1990s and CEO of Post Properties, set the pace for a new direction when he shifted the strategy of his $2 billion REIT (real estate investment trust) from suburban apartment development to mixed-use urban complexes. In addition, Williams, along with others, recognized the cost of conventional development and even went so far as to oppose the construction of the proposed outer freeway loop, singling out the Atlanta chamber as the only chamber in the nation to disapprove of a freeway project. Moreover, the chamber and other business groups joined forces with the environmental community in a one-of-a-kind coalition to obtain the passage of legislation creating the unprecedented Georgia Regional Transportation Authority (GRETA). GRETA, authorized by the legislature in early 1999, was granted broad power to control sprawl in the 20-county metropolitan area, including the authority to veto the actions of the heretofore all-powerful Georgia Department of Transportation.

Atlanta has come to realize that conventional development promotes an ideal that is self-defeating; the image of privacy, open space, and freedom of movement is illusory. As more people try to achieve the ideal, the more the ideal is unachievable for all. The ultimate irony is that the sale of every additional house often erodes the value of the conventional housing project or master-planned community. The evidence is most pronounced among homeowners' associations that fight the next phase of construction in their own communities. As many homebuilders have come to realize, the sale of every house means opposition to further development.

The Fiscal "Bottom Line" of Conventional Development

During the 1980s, local governments took advantage of a new methodology for measuring the fiscal impact of new economic and real estate development. Fiscal impact analysis helped government officials determine the costs and benefits of a new industrial location or other forms of real estate development. Since the advent of fiscal impact analysis, several accepted conclusions have emerged, including the following:

- Providing tax breaks for corporate relocations, particularly relocations that employ unskilled or semiskilled labor, is a give-away that most times is never paid back over the short or mid-term and possibly never.

- Residential development, particularly entry-level and move-up projects aimed at the family market, pays about 70 percent of the costs of the services provided by local government; the shortfall is attributable to the cost of public education.

- Assuming no subsidies, office and industrial development tends to pay its own way through the various taxes imposed on it.

- Retail development almost always pays for itself if local governments participate in the distribution of sales tax revenues.

Recent work conducted by Myron Orfield has shown that the metropolitan development patterns discussed above have evolved in part due to the great disparity in where infrastructure dollars are spent. Based on the results of surveys in many of the nation's major metropolitan areas, Orfield has determined that the largest share of new infrastructure spending is concentrated in the favored quarter. Given that most of the taxes levied to pay for new roads and sewer and water line extensions are collected from throughout a region, middle- and lower-income households frequently subsidize the areas where well-to-do executive households tend to locate. This imbalance obviously needs to be addressed. The favored quarter is probably not interested in additional highway lanes and the associated sprawl while the three-quarters of the metropolitan area that lies outside the favored quarter—and typically embraces a region's older areas—would appreciate the infrastructure improvements.

Components of Sustainable Economic Development

In the long run, conventional development is unsustainable in many respects, from fiscal subsidies to environmental damage. Ultimately, though, it hurts business, especially given that business decisions are increasingly driven by quality-of-life considerations. And more than ever, high quality of life means environmental sustainability. Eventually, communities will arrive at the conclusion that investing in education, parks, and pedestrian-oriented places is a far better economic development decision than subsidizing sprawl and the relocation of companies. No one provides subsidies to attract new companies to Seattle, Portland, Austin, or the Silicon Valley.

So what is the new model that will allow for sustainable development? The new model must contain a variety of elements that are environmentally sustainable, financially sustainable at the project level, and fiscally sustainable for local governments. The model must also appeal to a rapidly changing market and provide business with a place that draws knowledge workers and in turn attracts corporate investment. What results from a sustainable development model is an upward spiral of self-reinforcing elements that are both synergistic and self-sustaining.

We can see elements of the model in changes occurring today in the marketplace. During the late 1990s, as the nation's economic recovery continued to set records and the expectation of further sprawl fueled community and political opposition, something unexpected may have begun. Based on anecdotal evidence, the late 1990s may have signaled the beginning of the end of sprawl. Of course, expansion at the metropolitan fringe will continue and suburban subdivisions will rise on former farmland. Huge build-to-suit offices and plants will still be sited on greenfield parcels 40 to 60 miles from central-city downtowns.

It appears, nonetheless, that a small but significant shift is occurring in the location of selected types of new development, namely, more infill and downtown sites. Atlanta may not expand into Tennessee as most observers have predicted, and the New York metropolitan area may not make Philadelphia a suburb, but something different from the past half-century is happening and may portend a structural shift in how we build metropolitan areas and how Americans want to live. And while a change in public policy might accelerate the end of sprawl, what is at work seems to be a market shift that no amount of government intervention can fundamentally alter. This trend offers hope that sustainable forms of development are starting to take hold.

For real estate firms, sustainable development starts with identifying and taking environmental *and* financial responsibility for the development product. The ideal development combines responsible environmental conservation with the least long-term (ten-year-plus time horizon) cost. Each of these elements is explored below in greater depth.

The Economics of Environmental Sustainability. In much of today's development, environmental damage stems from the basic components of infrastructure needed by a household or business, including transportation, energy (electricity, heating oil, and natural gas), water, and sewer service/refuse removal. By far, the most important infrastructure need is transportation. Responsible for over 20 percent of the typical family budget, transportation is also the major contributor to environmental degradation. More than 90 percent of all household trips and business shipments (number of shipments, not shipments by weight) take place by automobile or truck, generating the largest share of airborne, runoff-related, and noise pollution.

By working at home or relying on transit, walking, and/or cycling, at least one household member can contribute to important energy savings and a decline in pollution. Reduced reliance on the automobile gives the metropolitan area a more urban character and further enhances the market appeal of its neighborhoods. Environmental sustainability is a logical byproduct of the market's growing acceptance of and preference for urban lifestyles, as discussed below.

Business transportation also must face up to long-term needs for reducing the environmental degradation that will result from the nation's gradual shift from a tangible product economy to a more intangible product–based economy. Obviously, tangible products, from soap to shoes to turbines, will continue to be a part of the economy. But, as services and high knowledge–based products account for a larger share of GDP, the shift in value added to R&D, marketing and distribution, and management and finance will account for a relative reduction in the percent of business transport of tangible products.

For many basic services, pricing mechanisms mask real costs as well as the full range of environmental effects. For example, 80 percent of the country's light bulbs waste half the electricity they use. Upgrading bulbs and fixtures has a three-year payback, but the short-term bias in our capital allocation system and a business and consumer energy management system that hides energy costs from the ultimate bill payer works against the longer view and forecloses opportunities for conserving energy. In particular, property managers and building owners typically pay for fixtures and bulbs out of their capital and operating budgets and thus often pass energy operating costs on to

unknowing tenants through common area maintenance charges.

A similar issue arises with water supply. In the near future, a water shortage will likely occur in various parts of the country, particularly west of the 100th meridian. The shortage will result from the illogical pricing system now in place and, consequently, the inefficient means by which we use water. Water delivery is incredibly capital-intensive and usually handled by government agencies or government-regulated private companies. In either case, the amortized cost of capital is inadequately valued; pricing is set in accordance with variable operating costs, which tend to be low relative to capital costs.

The solution is obvious; at a minimum, utilities must charge for water based on the total unit cost of delivery, including operating and capital costs. Pricing based on actual costs will particularly affect development at the low-density fringe but, in any event, should be introduced over a number of years so that households and businesses can more easily adjust to it. At the same time, pricing based on actual cost would encourage the introduction of a series of sustainable practices that are well known but not technologically sophisticated. The most significant practice relates to the biological treatment of sewage, which permits the reuse of water time and time again. As described in detail in chapter 6, decentralized marsh-based wastewater treatment systems are well understood, less costly to install than centralized sewage treatment systems, and relatively inexpensive to maintain. In addition, they provide an odor-free natural amenity for a community. The reason for their current lack of acceptance is merely bureaucratic resistance to a better-known technology. For example, efforts in the Southwest a few years ago to convince a municipal water and sewer district to allow a marsh treatment process for a master-planned community spurred the following response from the water district: "You do not buy water from us, you rent it . . . and you can only use it once then you must send it to our new sewage treatment plant."

Pricing that recognizes environmental risks is particularly important for reducing and recycling solid waste. Indeed, waste reduction/recycling is entirely feasible if the will exists to raise prices to their full cost. Besides, properly sealed dumps can be considered temporary storage locations for products not worth salvaging today. Undoubtedly, the economic value of the things we "throw away" will change; for example, plastics will eventually be worth relatively more in the future. As a result, landfills will be "mined" some day for the treasures they contain.

Financial Sustainability at the Project Level. Modifying the method of evaluating capital investment decisions is probably the most important "soft" technology for promoting sustainable development. In making capital allocation decisions, the private sector uses a methodology whose unintended short-term bias discourages innovative investments in sustainable development as well as in smart growth and new urbanism projects.

By necessity, the financial markets are conservative. As a result, the lack of a track record for projects comparable to newly conceived and proposed alternative developments means that the latter will experience difficulty in obtaining equity and debt financing. In addition, alternative projects appear to perform financially in a fundamentally different way than conventional developments. Applying conventional financing techniques to alternative projects is not only difficult but also compromises the ability of the projects to demonstrate that they meet the social, environmental, market, and, ultimately, financial goals of their sponsors.

Clearly, conventional financing poses barriers to innovative developments and ignores a rich source of financial return that would be highly valued by appropriate investors. Unfortunately, these investors lack the methodological means to evaluate alternative development opportunities; they are blinded by methodologies and a mindset that was created for—and therefore encourages and rewards—conventional development. For example, for the past 40 years, business schools have been teaching discounted cash flow (DCF) methodologies as a means of comparing alternative investments. DCF and its various derivatives, such as net present value (NPV) and internal rate of return (IRR), are measures by which different projected cash flows over time can be easily compared with one another to select the highest-yielding alternative.

The assumption behind DCF calculations is that a dollar tomorrow is worth less than a dollar today. The amount that a current investment dollar falls in value over time is a factor of the "discount rate," a rate (expressed as a percent) determined by the cost of capital (the interest rate charged by lenders) and an investor's expectations of financial return. A common discount rate employed by real estate investors is 15 percent; it assumes an interest rate on borrowed funds of 7 to 8 percent and an expected profit of 7 to 8 percent. The discount rate permits an evaluation of the projected cash flow of a potential investment. For example, with a 15 percent discount rate, a dollar received one year from now is $.85 in "current" dollars, $.44 after five years, and only $.20 after ten years. The rate is a means of measuring the risk of an investment; the higher the discount rate, the higher is the probable risk.

Internal rate of return is a DCF methodology for determining a specific value of a projected cash flow (expressed as a percent). The IRR is the discount rate

at which the cash flow would be equal to the initial investment in current dollars. It is the most common method of evaluating a real estate investment. For a real estate development of moderate risk, the acceptable range for the IRR is between 15 and 20 percent per year. For riskier investments, the IRR can rise to 35 percent. As the perceived risk of an investment increases, so does the IRR expectation. Most conventional types of projects, for example, have a long and well-documented track record and therefore need a relatively low expected IRR to obtain financing. A project with less of a track record would need a higher IRR; the resultant higher cost of capital could make the project infeasible.

Figure 4-2 shows two different types of projected cash flows evaluated by IRR. Figures for each year represent cash inflows or outflows for different hypothetical projects; the figure for the final year includes the cash flow for that year plus the sales price, estimated at ten times the annual cash flow. The first project is a short-term investment that sells after seven years while the second project is a mid-term investment that sells after 15 years. The amount of each initial investment is the same, but the short-term example shows more immediate cash flow. The mid-term example, in contrast, shows less attractive returns in the first few years followed by significantly improved returns after the seventh year.

The short-term investment has a higher IRR than the mid-term investment and would be the choice of most investors because the mid-term return, when converted to current dollars, represents only a fraction of its value in year ten and beyond; the $23 income projected in year ten is worth only $4.53 in current dollars. Investors therefore have an incentive to favor projects that produce short-term cash flow regardless of the impact on mid-term cash flow.

Short-term bias has had an immense impact on the character and quality of America's built environment. We marvel at the architectural design and quality of construction in the great retail emporiums built before World War II. We treat those structures as if their builders were unknowable "ancients" blessed with immensely more wealth than we claim. In reality, of course, the country's per capita gross domestic product is three times higher today in real terms than in the 1920s. The difference is that real estate projects undertaken in the era before the widespread use of discounted cash flow were generally built for the ages and not for short-term returns.

By contrast, primarily because it views the world through DCF lenses, Wal-Mart is willing to enter a new market by constructing a 60,000-square-foot building with a predetermined expected life span of five years. After the market is "primed," Wal-Mart then constructs a 110,000-square-foot building down the street and abandons the "old" building whose roof and mechanical systems are approaching the end of their useful life. Similarly, investors encourage developers to build retail centers with the cheapest available systems and simple, repeatable designs unrelated to the local architectural style. This short-term bias is somewhat baffling in that the Internal Revenue Service requires most real estate investments to depreciate over 39 years, hardly a short-term time frame.

Examples abound of projects, both prewar and more recent, that represent real estate investment aimed at mid- and long-term returns. Prewar projects such as Country Club Plaza in Kansas City, Lake Forest and Riverside in the Chicago metropolitan area, and Nassau Square in Princeton demonstrate that tremendous value can be created and sustained by following what is now referred to as new urbanism design concepts.

Recent projects have also created and sustained value in excess of the competition's value, though the projects'

Short- and Long-Term Investment Income and Resulting Internal Rates of Return (IRR) 4-2

	Initial Investment	Year															IRR
	(000)s	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
Example #1	100	0	8	11	13	14	15	176									15.1%
(short-term investment																	
Example #2	100	-5	-5	0	5	11	13	14	17	20	23	25	27	28	29	330	13.7%
(mid-term investment)																	

short-term performance was sometimes inferior to nearby conventional development. Examples include Mizner Park in Fort Lauderdale, Hyde Park in Tampa, Valencia Town Center north of Los Angeles, The Avenue northeast of Baltimore, Harbor Town in Memphis, and Seaside in Florida. Generally, they were all slow in generating the critical mass necessary to ensure success. Once they did, however, their returns increased impressively.

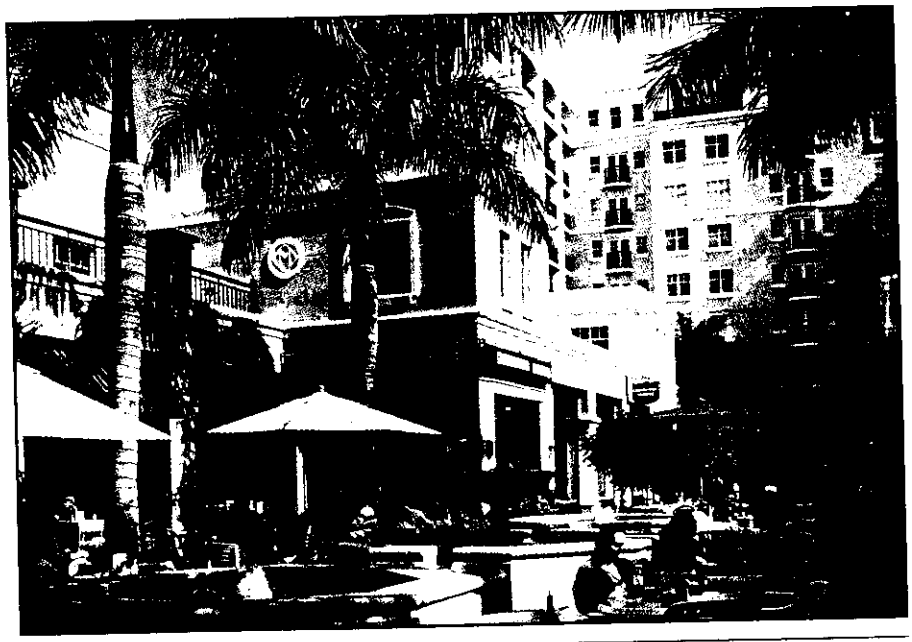
For example, Seaside began selling its one-eighth-acre lots in 1982 for $15,000 and sold only 20 of them in the first two years. However, as the human-scale streetscape of houses emerged in combination with retail uses located within walking distance of the homes, potential buyers could see the value of what was being created. When Seaside reached its critical mass around 1985, the new community appeared to be heading for success; accordingly, the sales pace and prices escalated. The last lot of the 300-lot town sold for $500,000 in 1999 while the downtown was appraised for $60 million in 1998. Given that the Seaside property was originally worth only a million dollars and that it is located on the so-called Redneck Riviera, the current value of the community's downtown is testament to the appeal of new urbanist development. Seaside is perhaps one of the most financially successful resort projects ever developed, and the reason for its success is undoubtedly its innovativeness. Yet, even today, obtaining financing for a Seaside would face significant obstacles. Conventional underwriters have little interest in the mid- to long-term value created by a community.

Fortunately, though, there are many different types of real estate investors with many different needs. For example, banks look to make construction loans for a short period of time or to package permanent loans for immediate resale to the secondary loan market. Publicly traded real estate investment trusts have a short-, mid-, and long-term need for sustainable cash flow. Foundations, university endowments, insurance companies, and pension funds—collectively the largest single category of real estate investor—have well-defined, predictable, mid- and long-term forecasts of their cash flow needs. Yet, each one of these investor types and its business school–trained real estate advisers use the same DCF methodology and same list of "conforming" products to evaluate investments for their long-term potential.

The goal, then, is to match appropriate investors with the appropriate investment. One possible solution borrows a concept from the commercial mortgage-backed securities (CMBS) industry, a multihundred-billion-dollar secondary market for commercial loans. In the CMBS industry, various "pieces" of the debt of an individual project, so-called tranches, are divided according to the risk associated with each. For instance, the first-position loan (the A tranche) is the loan to be paid off before all others. It carries the lowest yield and hence the lowest price because of its relative lack of risk. The mezzanine piece (the B tranche) is paid off next. It carries higher risk and is therefore priced with a higher yield.

As shown in figure 4-3, time tranches could be introduced to match investors with different investment horizons to the appropriate "piece" of an investment. Specifically, the various cost elements of a project are divided into three categories: building development (the vertical piece), land development and parking (the horizontal piece), and land. Each piece has a different cost associated with it and is itself associated with a different investment time frame.

Investors in the first tranche who want to get in and out within five years, for example, receive the bulk of the cash flow during a project's first five years. Given that they employ DCF methodologies, they probably do not value mid- to long-term cash flows. The percent of projected cash flow is determined by the amount required to achieve, for instance, a 20 percent IRR on invested equity.



Mizner Park. A new mode of successful investment modeled on old patterns of development.

Example of New Urbanist Time Tranche Cash Flow Distribution

4-3

	Cash Flow Distribution		
Cost Elements	**1–5 Years**	**6–10 Years**	**11+ Years**
Building Development (65%)	**90%**	**20%**	**10%**
Land Development and Parking (25%)	**10%**	**70%**	**45%**
Land (10%)	**0%**	**10%**	**45%**

Division of cash flow into early-, mid-, and long-term segments offers options for investment returns.

Source: Arcadia Land Company.

The advantage from an urban design perspective is that only 65 percent of the costs of a project are amortized over the first five years. As a result, a much higher-quality project can be built. The second time tranche pays off land development costs; mid-term investors receive most of the cash flow from year six and beyond. Finally, long-term investors, who are responsible for the land investment, receive most of their returns after the eleventh year.

The difficulty in evaluating mid- and long-term investments cannot be minimized; however, a current cash flow (CCF) analysis is feasible. Though requiring more judgment, such an analysis evaluates projected cash flows on a current dollar basis and accommodates cost and revenue increases driven by market forces when critical mass is achieved. Adding current—positive and negative—cash flows year by year to see the aggregate totals and judging whether the timing of the cash flows fits investor needs should be the criteria for evaluating one investment as superior to another.

Time tranches allow for an approximation of the method that the "ancients" used. Pre-DCF investors expected to subsidize a real estate investment during its first few years and then reap the benefits for decades. Historically, many of the great real estate fortunes were built this way, and today's private investors generally follow the same model. That approach also offers the financial stability that investors need to ride out the inevitable industry downturns. Clearly, time tranches reduce development risk and increase the quality of what is built.

Much needs to be done to gain access to financing for alternative developments. Tasks include more research into the performance of existing, innovative projects and the definition of a much broader array of standard product types. Most important, however, is helping investors with a natural need for mid- and long-term cash flows recognize that the conventional methods of evaluating real estate investment are not appropriate for them.

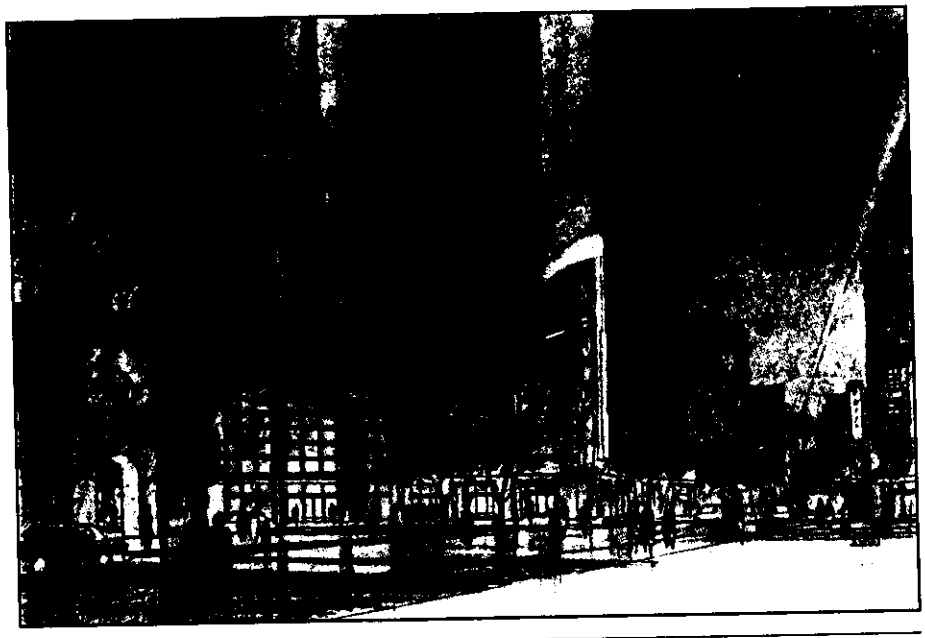
The investors most likely to reevaluate their approach to real estate investment are charitable foundations. Motivated by the environmental and social impacts of sprawl, many of the country's largest foundations, including MacArthur, Rockefeller, Surdna, Packard, Hewlett, Mellon, and Hines, are now focusing on the new urbanism, smart growth, and sustainable development. By bridging the gap between their money-making side and the programmatic side of grant making, foundations can make innovative real estate investments from their asset base. That is not to say that bridging the two sides of a foundation is not without its difficulties. However, instead of investing their assets in conventional development—that is, to earn short-term returns that are then invested in various smart growth initiatives, which, in turn, attempt to curb conventional development—foundations could make investments that are congruent with their mission. In essence, foundations can do well by doing good even as they earn superior mid- to long-term returns.

The above model is more than theoretical. Arcadia Land Company, for example, is involved in the redevelopment of downtown Albuquerque. Arcadia knew it needed mid-term investors, and it recognized that a minimum of three to five years would be necessary to achieve the critical mass that would make downtown Albuquerque viable. It turned to the McCune Charitable Foundation, the largest New Mexico–based foundation. As supporters of smart growth under the auspices of the foundation, both the executive director and board decided to invest $5 million of equity in the down-

town Albuquerque effort, fully expecting to receive superior returns after year five. As a side benefit, the foundation began to redirect some of its grant making to organizations that support smart growth and downtown revitalization, such as 1,000 Friends of New Mexico. These grants will support the foundation's investment and are completely consistent with its programmatic mission.

Long-term financing, therefore, is a vital component of sustainable development. The initial conceptualization of sustainable development, smart growth, and new urbanism gave little heed to how the three development alternatives might be financed. It has now become evident that if these development paradigms are to succeed at the daunting task of changing how America builds, they must also fundamentally change how we finance real estate. In the end, alternative developments must provide mid- and long-term returns that exceed those generated by conventional development. Only then will investors take the risk of trying something different.

An Example of Time Tranche Application: The Downtown Albuquerque Plan **4-4**



Planned development will be assisted by "patient" investments by the McCune Charitable Foundation, which expects long-term benefits rather than immediate returns.

Source: Used by permission of Moule & Polyzoides, Architects and Urbanists, Pasadena, California.

Fiscal Sustainability for Government Entities and Utilities. Now that the costs of sprawl are better understood, the entities that subsidized sprawl in the past are questioning why they should continue their old practices. When revenues and costs were buried in mounds of undifferentiated public cash flows, decision makers had little ability or incentive to allocate them properly. Such was especially the case with elected officials, who might ideologically and politically believe that all growth, no matter what form it took, was good. But when the ongoing operating costs of maintaining new streets and paying for new schools came due, it was not clear what forces led to cost increases; and, in any case, the elected officials who made the decisions that occasioned sprawl often were no longer in office and thus could not be held accountable. Clearly, no system built on subsidies can be maintained forever.

Several regions are now evaluating the long-term fiscal effects of development as part of their strategic planning efforts, using methodologies unavailable until a decade or two ago and determining what future metropolitan form will lead to the most cost-efficient infrastructure delivery. For example, the Salt Lake City region considered two scenarios for its infrastructure requirements for the years between 2000 and 2020: the first is a continuation of sprawl-oriented development; the second is a cluster development option. The resulting cost difference was nearly 2:1 between conventional development versus cluster options. The difference involves literally billions of dollars and thus easily captured the attention of public officials.

Unfortunately, when confronted with the type of fiscal results that came out of the Salt Lake City exercise, the real estate community, which has long been the beneficiary of public development subsidies, tends to react ideologically. To some in the development industry, the issue comes down to growth versus no-growth, which just obfuscates the discussion. And given that the development industry tends to be the largest contributor to election campaigns at the local level, the ideological views of the very beneficiaries of public subsidies are often the views considered by elected officials. Thus, the Urban Land Institute's recent cosponsorship of "smart growth" conferences and workshops is a major step forward in the debate. In fact, the issue of fiscal sustainability has nothing to do with the issue of growth versus no growth, but it has everything to do with eliminating

sprawl-inducing capital subsidies that local municipalities cannot afford.

There is yet another force on the horizon that will not allow the continuation of public subsidies in support of sprawl. Specifically, utility deregulation will encourage analysis of the actual cost of the delivery of electricity and natural gas to different parts of metropolitan areas. At present, virtually all households or businesses pay the same rate regardless of the actual cost of delivery as determined by location. In Chicago, however, preliminary cost analysis by Consolidated Edison shows that it costs three times as much to deliver electricity to the suburban fringe than to existing urbanized areas. As with publicly provided water, sewer, and road infrastructure, it is easy to understand that construction and operation of an electrical or natural gas system at a density of 20 dwelling units to the acre will be less expensive per household than at a density of two dwelling units to the acre. Certainly, the capital and maintenance costs of the system will be the same, but, in the case of sprawl development, they must be amortized over fewer homes. With profit-making utilities now entering a competitive world for the first time, the political arguments and campaign contributions of the real estate industry will have far less effect on development patterns than in the past.

Sustainability of the Real Estate Market. The 1990s seemed to mark a fundamental shift in consumer preferences. The evidence is only anecdotal as is always the case when basic, social change is just unfolding. It appears, however, as if the downside of the industrial version of the American dream is beginning to catch up with those who experience the daily traffic congestion, pollution, and diminished quality of life produced by conventional development. Like all markets that are not satisfied, consumers seem to be voting for change with their pocketbooks.

The first and most obvious piece of evidence is the apparent comeback of many American downtowns. Nearly half of our downtowns are viable or in the process of becoming viable; in other words, office rents are at or above replacement levels, a resale market for housing has materialized, and a critical mass of retail has brought people to the streets. Twenty years ago, only midtown Manhattan, San Francisco, Boston, and Chicago had viable downtowns. By the end of the 1990s, the number of viable downtowns extended to San Diego, Denver, Seattle, and Portland, among others. Even more impressive is the list of downtowns that are in the middle of the comeback process: San Jose, Phoenix, Dallas, Houston, Austin, San Antonio, Boise, Minneapolis, Memphis, Chattanooga, Nashville, Charlotte, Atlanta, Providence, Cleveland, Columbus, and Cincinnati, among many others. It is not unreasonable to say that, by 2010, most if not all American downtowns will be in the process of becoming or will already have become viable real estate markets.

The emergence of viable urban-density real estate markets is not confined to downtowns. Many of the "third-generation" metropolitan cores have begun to urbanize. These edge cities, which emerged in the 1970s but today are miles from the edge owing to continued sprawl, include West Los Angeles, Century City, Bellevue (Seattle), Buckhead (Atlanta), and the profusion of urbanizing suburban metropolitan cores around Washington, D.C., that emerged or reemerged with expansion of the Metro transit system (e.g., Bethesda, Chevy Chase, Ballston, and Court House).

Throughout the country, evidence points to pent-up demand for more urban and urbane housing. Surveys conducted by Robert Charles Lesser & Co. in Atlanta, Chattanooga, and Albuquerque asked consumers a series of tradeoff questions regarding lifestyle preferences. The results organized consumers into one of three preferred housing markets: semirural, suburban, or urban. In all three surveys, over 30 percent of respondents preferred urban housing that would allow them to walk to restaurants, services, and work, even though they would have to accept smaller dwelling units and little or no lot. Interestingly, none of the surveyed metropolitan areas has a recent urban housing tradition; in other words, respondents who preferred an urban lifestyle did not refer to a local example.

The underlying reason for the shift in housing preferences is probably the aging of the baby boom generation. As they approach age 50, the baby boomers are becoming empty nesters, and many seem to be questioning why they should remain in suburban isolation. An urban lifestyle, according to the above research, may be just the alternative for boomers who expect to lead a far more active life than their parents. Even some Gen Xers prefer to live in an urban setting.

Throughout the country, the past few years have seen a relative price appreciation in homes located in the favored-quarter inner suburbs. Since the mid-1990s, housing prices in favored-quarter inner suburbs such as Bethesda, Buckhead, Bellevue, Palo Alto, and the Park Cities in Dallas have increased between 10 and 20 percent per year. In contrast, the price appreciation of the new housing built at the fringe of the favored quarter has barely kept up with inflation. People are voting with their pocketbooks; to avoid traffic congestion, they are locating in close-in neighborhoods renowned for their character as well as in third-generation metropolitan cores.

With the bosses just beginning to move back downtown and favored-quarter inner suburbs enjoying a renaissance, it is only a matter of time until jobs begin to

return as well. In Seattle, many Gen X software developers who chose to live downtown likewise decided to move their places of business downtown. The emergence of households willing to pay $200 per square foot for a downtown loft in LoDo in Denver has created demand for office space, driving up commercial rents to over $30 per square foot. In addition, bosses in the traditional suburban executive housing concentrations now face traffic congestion whether they commute toward downtown or out to the fringe. Ten years ago, locating a place of business on the edge of the metropolitan area meant a reverse commute with little traffic congestion. Now, bumper-to-bumper freeway traffic in both directions is becoming the norm. In a perverse way, the end of reverse commuting has leveled the playing field for downtown and infill business locations.

What appears to be emerging is a more diverse version of the American dream, one that results in a greater range of choices for the consumer. Those choices include more pedestrian-oriented development types that require fewer automobile trips and less mileage traveled. As mentioned, reducing automobile trips may be the most productive means by which to produce more sustainable development. A new image of what constitutes desirable places to work, live, and play and that is inherently environmentally friendly is the best means for creating a sustainable future.

Business Sustainability to Attract Knowledge Workers. Knowledge workers, particularly Gen Xers, are demanding a high quality of life. No longer willing to put up with long commutes, knowledge workers are voting with their feet to work closer to where they live, possibly even in their homes. As a result, many large companies find themselves in a quandary. For example, General Motors is trying to make its Warren Tech Center more pedestrian-oriented to encourage more creative interaction between engineers and scientists. In what is a difficult challenge for a firm with a stodgy reputation in a metropolitan area not known for high-tech innovation, GM is attempting to attract more high-tech Gen Xers to the center. The final irony is that the Warren Tech Center was designed by Eero Saarinen, the well-regarded mid-century architect who conceived of the facility as the prototypical automobile-oriented business park. By today's standards, the place is sterile; its buildings are not within walking distance of one another; its image is that of an outdated version of the future. As a result, GM is redesigning the center to include pedestrian-scale mixed uses and improved circulation, possibly even a rail system, to encourage human interaction and to attract the new generation of knowledge workers.

Perhaps the most important issue for knowledge workers is how to capture more time. The loss of time to commuting is one of the most irksome issues for many knowledge workers. Conventional sprawl development is the antithesis of what more and more knowledge workers want, though most metropolitan areas offer only a few, albeit a growing number of, alternatives. Added to the demand of knowledge workers is the number of baby boomers entering the empty-nester stage. They are looking to take advantage of the flexibility offered by the next stage of life, and, for many, that means a return to downtown. Clearly, the market for households demanding a shorter commute in a more exciting, pedestrian-oriented environment is growing, growing, growing.

Conclusions

Sustainability is not just an environmental term that implies a better place for bunnies and birds, though that is certainly an important part of the picture. It is also about evaluating capital allocation in a manner that rewards real estate investors with mid- and long-term returns, not just short-term returns. It is about fiscally sound local governments that are not addicted to a heretofore hidden system of capital and operating subsidies that cannot be sustained. It is about providing for a more sophisticated consumer—as soon as the real estate industry expands its vision beyond a formulaic approach to development. And, finally, it is about providing public investments in education, open space, and urbane places to live and work.

Implementing sustainable development is the most efficient and effective means of economic development. There is no longer a tradeoff. What is good for the environment in the knowledge economy is good for the economy.