



What Makes a Community Livable?

Livability

101



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Acknowledgments

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About the AIA – The American Institute of Architects

Since 1857, the AIA has represented the professional interests of America's architects. As AIA members, more than 75,000 licensed architects, emerging professionals, and allied partners express their commitment to excellence in design and livability in our nation's buildings and communities. Members adhere to a code of ethics and professional conduct that assures the client, the public, and colleagues of an AIA-member architect's dedication to the highest standards in professional practice.

About the AIA – Center for Communities by Design

The Center for Communities by Design is a catalyst, convener and source of information that helps AIA members work with citizens and other stakeholders to envision and create more sustainable, healthy, safe and livable communities.

To learn more about the AIA Center for Communities by Design, visit www.aia.org/livable

Livability 101 for Communities

Livability 101 offers communities the resources to develop a vision for the future and enables them to be engaged in a successful process with the expertise offered by the architectural profession. As designers of the built environment, architects play an important role in shaping our communities. Their design affects our safety, health, and the environment as well as the quality of life in our neighborhoods, towns, cities, and regions. This publication seeks to strengthen the relationship of citizens and architects by sharing a common vocabulary to create a sustainable framework for building more livable communities.

Livability 101 for Architects

Livability 101 engages architects as members of their communities, to use and share their knowledge, skill, and experience to participate in civic life. Architecture expresses the values of society and has the power to enrich the human spirit and ensure livability for this and future generations. Livability 101 provides architects with the necessary vocabulary and elements needed to empower communities and make decisions that will shape more livable communities.



Helene Combs Dreiling, FAIA, Hon. SDA,
Team Vice President, AIA Community

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Introduction

By Diane Georgopoulos, FAIA

What makes a community livable? There is no single answer to that question. In a country as large as the United States—with such a wide range of geographic and climatic conditions and with a culturally and economically diverse population that is distributed so unevenly in terms of density—*livability* is best defined at the local level. Broadly speaking, a livable community recognizes its own unique identity and places a high value on the planning processes that help manage growth and change to maintain and enhance its community character. *Livability 101: What Makes a Community Livable?* is designed by the American Institute of Architects' Center for Communities by Design to help public officials, and all others actively engaged in this civic dialogue, understand the basic elements of community design and take advantage of existing tools, strategies, and synergies at the policy, planning, and design levels so that their communities can reach their full potential in all respects.

Unique Identity

A livable community is keenly aware of its character. Its identity can be embodied in its physical features (from highly recognizable topography and climate-specific vegetation to public plazas and architectural styles) and in the actions of its residents (from public events to social programs).

These two components are linked: It's not uncommon for citizens to tackle more complicated social concerns (such as affordable housing for the working poor) once they have honed their problem-solving skills through improving physical elements of their environment. Leaders have a direct part to play in raising their constituents' awareness of their own community's character and working to create coalitions designed to preserve, celebrate, and enhance what exists as well as nurture a shared new vision for the future.

Managing Growth and Change

A livable community is not a static entity that merely maintains the status quo. On the contrary, such a community acknowledges where it is in its own life cycle and where it is going. Over time, new needs arise in addition to, or in place of, earlier ones. A livable community will provide support for its population and institutions as they grow and change in a manner that expands choices. By being aware of the specific attributes that create a sense of a place in their community, civic leaders can better determine what efforts will enhance livability in both the near and long term.

The Process

Good leadership recognizes the importance of cooperation and collaboration among the public sector, private institutions, and individual citizens to successfully plan for the future. Design initiatives under-

taken by public-private partnerships in communities across the country have demonstrated that such endeavors can yield benefits far beyond that of the physical environment. By engaging as a participant, a citizen develops the capacity to undertake new and perhaps broader initiatives. For example, in 2000, architects from the Boston Society of Architects (BSA), planners from the Massachusetts chapter of the American Planning Association, and many other regional civic, environmental, and professional organizations created a broad-based, grassroots effort known as the "Civic Initiative for a Livable New England." The goal was to address sprawl and ancillary issues through a program of public events and charrettes across eastern Massachusetts that would promote public dialogue and consensus-building on new ways to approach regional development.

The original BSA Civic Initiative spearheaded the two-year effort, which attracted more than 1,000 participants and led to the formation of a new coalition of housing, environmental, planning, and design organizations, called the "Massachusetts Smart Growth Alliance." This coalition continues to advocate for state-level policy initiatives that foster innovative ways for communities to grow while protecting New England's heritage and keeping its natural, human, and built resources in balance.

The Alliance has become an effective voice in raising public awareness and advocating for policies

that support smart growth. For example, because large-lot, single-family zoning has long been the single most difficult obstacle to creating affordable multifamily development in many New England towns, the Alliance supported new legislation to counter this trend. Referred to as “Chapter 40R,” or “smart growth zoning,” this legislation proposes to financially reward communities that create special districts within town centers and near transit hubs that stipulate densities above specified minimums and require at least 20 percent of the housing be produced for households with incomes less than 80 percent of the area’s median. This feature, along with other innovative incentives, creates a policy framework in which the production of affordable housing can be increased to meet the tremendous demand in an environmentally sustainable manner.

Essential Elements

Through the essays that follow, *Livability 101* offers eight fundamental planning and design principles that must be considered as communities evolve over time:

- **A Sense of Place:** By assessing and understanding a district’s unique combination of natural and man-made assets that distinguish it from other locales, civic leaders can develop an action plan to preserve, strengthen, or enhance those qualities that are most essential to the community.
- **Mixed-Use Development:** Purposefully including a variety of appropriate uses within walkable distances provides convenient access to services while creating a vibrant backdrop for commercial and social exchange.
- **Density:** Increasing the number of housing units per acre goes hand-in-hand with mixed-use development. Planners must carefully consider the densi-

ty required to foster lively main streets. Good design can be achieved at various levels of density.

- **Effective Planning for Regional Transportation:** Civic leaders from neighboring jurisdictions can improve the economic health of their region by working together to develop a coordinated network of viable public transit options, walkable paths, and bike trails, plus transit-oriented development.
- **Street-Savvy Design:** By designing a street completely and properly, planners create a pedestrian-friendly public realm that is not overpowered by vehicles and, therefore, offers a safe and attractive alternative to automobile travel.
- **Physical Health and Community Design:** The Centers for Disease Control has correlated the incidence of heart disease, diabetes, cancer, and stroke with physical inactivity. By encouraging walkable neighborhoods for children, teens, adults, and elders, we have the opportunity to reverse this trend and create healthy communities by design.
- **Public Safety, Personal Security:** Sensitive planning and design that takes advantage of sophisticated technology and proper operations allows civic leaders to improve public safety in the most unobtrusive ways.
- **A Sustainable Approach to Neighborhood and Regional Development:** Design directly influences our lives through economic, environmental, and social forces. As stewards of our resources, public officials must be keenly aware of how building processes contribute to or detract from the synergy among these three critical and interrelated sectors.

Although the above principles are, by necessity, discussed separately in the chapters that follow, they

overlap in many ways at the local level. In fact, one feature rarely exists in isolation from another. For example, transit stations or intermodal transit nodes generate the ebb and flow of pedestrian traffic that contributes to the vitality of an active commercial and residential district and the health of the population. Mixed-use development, appropriate density, and well-designed streets facilitate continuous natural surveillance that can augment technological innovations in security, resulting in greater public safety. And awareness of and respect for a region’s unique physical characteristics are valuable practices, whether viewed from the perspective of economy, ecology, or social welfare—the three facets of sustainable design. Although it can seem challenging at first to simultaneously consider these multiple connections, optimal solutions to vexing problems often benefit from the synergies inherent in these overlaps.

The Role of the Architect

As regions across the country face increasingly complex development issues, civic leaders can turn to architects, planners, and other design professionals for the talent and experience needed to foster livable communities. Architects are uniquely trained to assist civic leaders in identifying the distinctive features of a region, enhance these features by applying the aforementioned principles to a particular neighborhood or city, and develop a shared vision that enriches not only the community but also society at large. To learn more about successful planning and design strategies at the community level or to find out what specific services an architect can provide, please visit the AIA Center for Communities by Design at www.aia.org/livable.

Diane Georgopoulos is an architect with MassHousing in Boston.



A Sense of Place

By William A. Gilchrist, AIA

In the quest to improve conditions in urban, suburban, and rural communities, citizens are becoming ever more engaged with elected officials and government agencies in public processes. These lively forums, which weigh special interests against broader public concerns, often generate heated debate among permit applicants and the public officials charged with enforcing laws and synthesizing solutions.

One common thread that allows an effective discussion of such issues to occur is the shared interest among all stakeholders in the creation, conservation, or enhancement of a community's particular character. This character evolves from the weaving together of many elements to create a sense of comfort, function, and attractive appearance. Summarized below are five elements that help establish a community's unique sense of place.

Natural Features and Systems

In a sense, every city is simply an extension of the natural landscape upon which it is sited. This landscape is composed of watersheds, aquifers, and geologic formations, and may be part of a rich rain forest or an arid desert. Consideration of the natural setting is essential in every decision a community makes about how it should build.

In some cases, the natural setting is intrinsically linked to an area's community character and, in

fact, defines a key aspect of its economic vitality. This fundamental relationship is reflected in many of the country's most popular resort towns, such as Hilton Head, along the Atlantic Coast in South Carolina; Sedona, in the Arizona desert; and Vail, in the Rocky Mountains of Colorado.

In other cases, the protection of natural resources comes out of a planning process that identifies a range of assets that need to be protected or restored. In Portland, Oregon, for example, a participatory process led to the adoption, in 1981, of a comprehensive plan affirming that every citizen should have a view of Mount Hood. Having identified this major, natural feature as a community asset, the city established protective view corridors that, in turn, guided the heights of new buildings and shaped Portland's urban form.

The Public Domain

While natural features are the initial and often most compelling components of a community's character, the existing patterns of public circulation and assembly—which have typically developed in response to regional climate and topography—play a significant role in establishing a town's identity. This network of public spaces—from well-scaled streets for movement to public destinations such as parks, plazas, or waterfronts—sets the man-made framework for community character.

In terms of a place's physical elements, it is through streets, sidewalks, and public spaces that public



One of Savannah's famous squares

Courtesy Kathrin Moore, Assoc. AIA, AICP



A sidewalk in Savannah's historic district

Courtesy Kathrin Moore, Assoc. AIA, AICP

officials have the greatest opportunity to directly create and conserve the cityscape in a manner that contributes to a community's overall quality of life. A case in point is the historic district in Savannah, Georgia: Its urban grid, square, and sidewalk design are stellar examples of how a pedestrian-friendly city should work from front door to street edge. Streets are organized around a clear system of squares that create public destinations and unique identities within the historically rich districts. The sidewalks maintain one level for the public's movement and then shift up slightly to form a continuous landing for either stairs or street-level doors, thus



Millennium Park in downtown Chicago has become a popular destination for residents and tourists.

transitioning elegantly and effectively among public, semipublic, semiprivate, and private zones.

In addition, one of the best ways that the public sector can assist in the enhancement of a city's character is to strategically place and contextually develop its own building projects. Cities and counties have the opportunity to set the standard for public parks and public institutions, including libraries, schools, fire and police stations, and the public spaces that adjoin these structures. In all cases, the placement and design of such new elements should conserve and support the existing natural and historic features of the place.

Historic Preservation

In many U.S. cities, the first "urban design" policies ever enacted were those for historic preservation. Far from being an impediment to revitalization, historic preservation has proven to be one of the best tools given to public officials to preserve a neighborhood's sense of place and then to leverage that authenticity for new investment, tourism, and smart growth. Many cities have identified what is valuable about a particular place and have established development regulations, including those that restrict demolition and encourage sensitive rehabilitation, to



A sign identifies the Mount Vernon neighborhood in Washington, D.C., as a historic district.

ensure that place-defining buildings will be maintained for future generations.

While people often associate historic preservation with the rescue and restoration of a single landmark building, the broader application of historic designations over entire districts has been key to the successful urban revitalization of many cities. For example, historic designations of several districts in Charleston, South Carolina, which went into effect in the 1960s, not only preserved what has since evolved into one of the world's most engaging urban designs but also land-banked, or protected individual properties, until economic forces aligned to reinvest in this area.

Pedestrian Scale

The use of the word scale simply addresses whether a built feature is sized appropriately for its location and how it will be experienced. From sidewalk widths to building heights, size does matter in the creation of places that make us feel comfortable. To appreciate this, consider the experience of walking along sidewalks that are too narrow to feel safe near zooming cars or along endless blocks of walls that generate unpleasant feelings because of their severe monotony.

Wherever pedestrian scale needs to be championed, its adversary is usually the automobile or, more appropriately, the typical design response often engendered by development regulations that place motorized vehicles at the top of the user hierarchy. As a rule, we should ensure that every pedestrian experience is a positive one, no matter the local climate. This can vary from tree-lined streets in a temperate zone to ample continuous-built canopies in an arid area. The guiding principle is that paths



These buildings and streets are exceedingly out of scale for pedestrians.



An engaging, pedestrian-scaled residential street



With places to play, rest, stroll, people watch, and eat, this sculpture garden provides a variety of activities for a range of users.





A sign to orient users of a riverfront trail

Courtesy www.pedbikeimages.org/ photographer: Dan Burden



Interpretive signage for a neighborhood heritage trail



Expressive, commercial signage along U Street in Washington, D.C.



along which people move—whether sidewalks, bike paths, or trails—should feel safe, engaging, and appropriate for the climate so that pedestrians feel comfortable along the route.

Another guiding principle for pedestrian scale is that the public places we create should be as comfortable for one person as for many. Parks, for example, should have spaces and paths that invite and functionally support multiple activities and audiences—from an individual sitting alone to hundreds attending a large event.

Signage

Even with the clearest design and most coherent development, signage is needed to direct people through their communities. Signs may be used on private commercial property to locate businesses or

to advertise the products and services they sell. Signs may also be used in the public domain to direct pedestrians, identify historic and entertainment districts, and point out cultural institutions. And, of course, there are always the basic signs of traffic management, from yielding rights of way to identifying parking spaces and garages.

Taken as a whole, these various signage components play as important a role as any other architectural or urban-design element. Signage scale, style, and sometimes even content should be guided by the local context. The neon billboards and 40-foot-tall signs that work so well along the strip in Las Vegas would not be fitting on Charles Street in Boston.

As public agencies grapple with enforcing codes while also encouraging quality development, it is

important to balance commercial interests with design guidelines that enhance the positive attributes of a place. In many instances, clever and innovative signage solutions are born of this tension. For example, in keeping with the character of Sedona, Arizona, a McDonald's restaurant in that southwestern city replaced its standard golden arches with turquoise ones.

Simply stated, signage must be seen as an integral design component and not as an after-the-fact add-on to a community's design.

William A. Gilchrist is director of the Department of Planning, Engineering and Permits for the City of Birmingham, Alabama.

Bethesda Row, in Maryland, is in the final phases of a 10-year master plan redevelopment.



Mixed-use Development

By James A. Moore, PhD, AIA

Throughout the ages and throughout the world, most people have lived in mixed-use environments where they could walk from one activity to another throughout their day. With the possible exception of farmers and ranchers, most Americans lived this way prior to World War II. The suburbanization that followed the war, fueled largely by the growth of motorized transport, allowed many Americans to set stakes far beyond their original, close-knit neighborhoods. While this process expanded our reach, it also eliminated many significant, time-tested benefits.

Mixed-use developments are now making a comeback across the nation, as individuals and communities try to reclaim these sorely missed advantages. The concept of incorporating a wide range of land uses into a single enclave is once again taking shape—whether in the form of a compact urban-infill residential development with ground-floor shops and restaurants or a multiacre, neotraditional neighborhood incorporating a range of residential types as well as retail, restaurant, hospitality, and even office space.

Smart Growth

After World War II, urban-planning theory and practice preached the separation of unrelated uses. In part, this could be seen as a response to the very real



Rigorously separated land uses in postwar suburban development. Pinellas County, Fla.
Courtesy Ignacio Correa-Ortiz, AIA



Mixed-use urban infill: new developments in downtown San Diego include condos and/or apartments above street-level retail and restaurants.

Photograph by James A. Moore, AIA

problems of overcrowding and urban deterioration that occurred in the preceding decades. In addition, it reflected a fascination with modernist ideas of diagrammatic clarity and perceived machine-age rationalism. In direct contrast, current ideas suggest that we should develop our communities essentially as we use them—in other words, as integrated, multidimensional environments that cater to a variety of everyday needs. As policy, this is often referred to as *smart growth*. In practice, it is often called *new urbanism*.

According to the Urban Land Institute, a nonprofit education and research institute based in Washington, D.C., mixed-use development has three primary characteristics: First, it includes three or more revenue-producing uses. Second, the entire project is built to an overriding master plan, even if it may take years or decades to complete. And third, the project is designed to be *walkable*, or completely accessible to pedestrians.

These criteria can be applied either to a single coherent development project or to an entire neighborhood comprising numerous, distinct elements that are nonetheless integrated physically and functionally. In either case, the key venues of daily life—places to live, shop, work, play, and learn—are within easy reach of one another. In addition, the means of accessing them are designed to be especially convenient, attractive, and inviting to those who do not travel by automobile.

Types of Mixed Use

Mixed-use projects can be *horizontally* or *vertically* mixed. Horizontally mixed-use projects are generally easier to finance and build than are vertical projects.

In a horizontally mixed project, a variety of uses sit adjacent to one another. At their simplest, as in a traditional or neotraditional neighborhood, a horizontally mixed project is essentially a collection of stand-alone, single-use buildings organized according to a coherent plan. For example, an enclave of residential units—which may consist of multifamily apartments or townhouses—sits adjacent to a grouping of buildings that contain retail, restaurant, and office functions. While the individual uses may be designed, developed, and built as separate projects, the grouping is built according to a common master plan that emphasizes accessibility and encourages pedestrian movement. Numerous late 19th- and early



Seaside, Fla., designed by Duany Plater-Zyberk, Inc. and developed by Robert Davis.

Courtesy Charles C. Bohl

20th-century suburbs, such as Chestnut Hill outside of Philadelphia or Oak Park outside of Chicago, exemplify this approach. A more recent example is the coastal resort town of Seaside, Florida, developed by Robert Davis and designed by the firm of Duany Plater-Zyberk in the early 1980s.

Increasing land prices causes a shift from horizontal to vertical integration. At a certain price-point, structured parking becomes financially feasible and, with it, the potential to vertically integrate some, if not all, functions. In a vertically mixed project, two or more uses are stacked on top of one another. A common typology found in both suburbs and urban areas comprises three to five floors of residential units (typically apartments or condominiums) sitting atop one or two floors of retail, restaurant, and office space that wraps around a multilevel parking deck. A much-heralded example of this type of development is Addison Circle, designed by RTKL Associates in the mid-1990s for a suburb of Dallas.



Rendering of Winnebago Village Center in Winnebago, Nebr., showing both vertically and horizontally mixed uses integrated into a single development.

Rendering by HDR/P. Knight Martorell.

Historic Barriers to Mixed Use

Many architects are instinctively drawn to mixed-use developments, possibly because of their inherent urbanity and possibly because of the logistical and architectural challenges they represent. Developers, however, have often been less eager to undertake them. This is largely due to regulatory policy, financial strategies, and highly efficient construction practices implemented after World War II.

On the regulatory front, many of the zoning codes adopted in the years following the war encouraged the balkanization of suburban communities. Retail uses tended to be isolated along arterial roadway corridors. Office development tended to be permitted as stand-alone projects, often in “campus” settings. And residential zones were categorized as either single-family

or multifamily. Even within the multifamily category, respective developments of 12 units, 24 units, and 40 units per acre were generally treated separately.

On the financial front, lenders who provided financing also encouraged the segmentation of the real estate industry because different investors funding different types of developments anticipated different levels of risk and reward. In the eyes of the financiers, mixing development types into a single project increased the risk of the development

because of the various lease-up, occupancy, and use-criteria associated with different types of tenants. This was particularly true for speculative projects where the marketing, tenanting, and operations of the different uses were all factors directly related to overall financial performance.

The building boom that followed World War II required building companies to develop ever-more efficient methods to keep pace with construction. Those who repeated tried-and-true formulas in these

market conditions were more highly rewarded due to economies of scale. The result was that contractors—followed by larger developers—increasingly focused on sharper distinctions, first between different types of uses and then between different strata within a single use. Thus, developers began to specialize not simply in residential development or even in the development of single-family houses, but in the creation of residences for a very specific economic sub-sector, such as “starter” or “move-up” homes. Rarely did developers in different sectors work together.



Addison Circle, outside of Dallas, incorporates street-level retail and restaurants with apartments above to create a lively civic environment.

Courtesy David Whitcomb, RTKL Associates Inc.

Changing Demographics and Priorities

More recently, however, mixed-use development has become more popular for a variety of reasons.

Demographic changes, for example, have helped push the demand for mixed-use. At the peak of the baby boom, the nuclear family represented 50 percent of U.S. households: two parents plus one or more children under the age of 18. Today, less than one-quarter of the households fit this description, and well over half include one or two adults living without children. These households often want convenience and connectivity instead of separation and private open space.

Time constraints have also supported the rise of mixed-use. If different uses are closer together, people spend less time moving from one use to another.

Health experts have also touted the benefits of mixed-use developments. In an age where over one-quarter of American adults are substantially overweight, projects that facilitate walking are seen as desirable. Initial studies indicate that people are more active and somewhat healthier in areas where proximity of functions and high-quality design make walking comfortable and rewarding.



The Town Center in Celebration, Fla., is both popular with and safe for children and teenagers.

Photograph by James A. Moore, AIA

Today's Key Challenges

Unfortunately, the regulatory, investment, and economic pressures that initially caused developers to shy away from mixed-use developments are still with us today to varying degrees. Zoning codes rarely anticipate the exact type of mixed-use that best meets current local market conditions. Developers can spend months, if not years, seeking to get property rezoned.

Lenders are often leery of unknown commodities and, at present, mixed-use projects are almost always one-of-a-kind developments. It is not unusual for a developer to need three or four separate sources of financing to get a single mixed-use project to work. In addition, market timing is critical. If the developer wrongly anticipates initial demands or has incorrectly judged the market for each of the components of the mixed-use project, he or she runs the risk of going bankrupt before the project is completed. This is not to say that the project cannot, ultimately, become a success; its success, however, may come at the expense of the first developer's profitability or reputation.

And mixed-use projects still tend to be somewhat more expensive to build than single-use projects because of the greater complexity of their multiple variables. Programming and adjacencies are critical because the nature, capacity, and timing of retail and commercial components will have a major impact on the success of the residential component. For example, while many people appreciate having a restaurant or coffee shop close to where they live, designers and developers must take into account the smells and noises that emanate from such uses, the hours of operation, and the volume of traffic generated.

Construction costs for horizontally mixed projects can be somewhat controlled, but issues of adjacency,



Mizner Park in Boca Raton, Fla., is one of the most successful mixed use, infill redevelopment projects in the United States.

Courtesy Charles C. Bohl

connectivity, and overall cohesiveness can still create additional expenses. Construction costs for vertically mixed projects are often much higher because of additional architectural and building code requirements.

Mixed-use developments, however, have a decided cost advantage in parking. By carefully programming the types of uses in a mixed-use project and then designing the project to optimize these differences, developers can be extremely efficient with the amount of parking they must provide.

The Bottom Line

Despite the remaining hurdles, the demand for mixed-use projects and neighborhoods will continue to grow, and the development profession will adapt to meet these demands. The past 20 years have witnessed an increasing number of successful mixed-use prototypes, and their success—coupled with the clear demand for these types of projects, particularly from powerful demographic cohorts such as empty nesters and young white-collar professionals—will help break down the resistance and obstacles to their creation. Communities across the country are beginning to recognize that their zoning and development codes generally don't facilitate these types of projects, and many are revising their codes accordingly. As the public sector indicates its support and demand for such projects, the private sector, particularly the financial and investment community, will begin to support them as well. All of this tends to predict the increasing heterogeneity of our neighborhoods, thereby bringing our physical environment in better alignment with the ways we actually live our lives.

James A. Moore is national director of community planning and urban design at HDR Inc., Tampa.



Grayfield redevelopment: Santana Row in San Jose, Calif., developed by Federal Realty, was an outdated mall that was transformed with residential and office uses above stores, shops, and restaurants.

Photograph by James A. Moore, AIA

The Assembly Square mixed-use project in Somerville, Mass., includes retail, housing, and parking at 100 units per acre.

Master plan by Goody Clancy & Associates for the Sturtevant Partnership. Courtesy Goody Clancy & Associates



Density

By David D. Dixon, FAIA

Ten years ago, San Diego's downtown and other centrally located neighborhoods were losing population and vitality to sprawling suburbs: Stores and restaurants were closing and office jobs were leaving for remote office parks. Feeling like it was losing its urban soul, the City of San Diego decided it was time to reverse the trend. A decade and 14,000 housing units later, the city's urban core once again vibrates with life and excitement. People are now living downtown in housing far denser than any envisioned in San Diego since before World War II. And this new residential population is helping to support the resurgence of retail businesses that draw office workers, tourists, convention-goers, and many others to downtown.



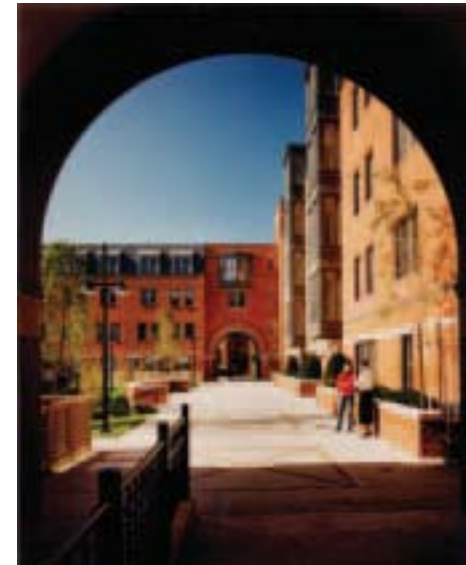
San Diego's Little Italy Neighborhood Development consists of 16 row homes, 12 affordable rental lofts, and 37 low and moderate income apartments.

Photograph by John Durant. Courtesy Rob Quigley Architects

Residential density—generally measured as the number of housing units per acre—is undergoing a major reevaluation. In the years following World War II, the term “density” came to be popularly associated with quality-of-life issues such as crowding, traffic congestion, and concentrated poverty, largely as a result of overcrowded slums described by the press during the early 20th century. Many architects at the time pointed with pride to projects that lowered prevailing densities. In recent years, however, the American Institute of Architects (AIA), the Urban Land Institute (ULI), the Boston Society of Architects (BSA), urban think tanks, housing organizations, and many other civic groups have called for a reexamination of attitudes toward density as an essential step in fighting sprawl and enhancing the quality of life and economic opportunity for large and small communities across America.

Exploring Increased Densities

The BSA's September 2003 national conference, “Density: Myth and Reality,” co-sponsored by the AIA, attracted close to 400 architects, planners, developers, public officials, environmentalists, community leaders, and others from every region of the country to reconsider density in a way that enables communities to make rational decisions about enhanced livability. Case studies from San Diego and nine other very diverse communities—Arlington, Virginia; Birmingham, Alabama; Boston; Chicago; Houston; Miami; New York City; and



Langham Court in Boston's South End is a mixed-income rental housing development that combines a midrise elevator building and stacked townhouses to produce density at 80 units per acre.

Architecture by Goody Clancy & Associates. Developed by Four Corners Development Corporation. Courtesy Goody Clancy & Associates

Portland, Oregon—focused on a wide range of examples in which communities chose to follow San Diego's lead. They initiated higher-density development to support newly revitalized and walkable main streets, fund new parks, build a greater range of housing types in response to changing demographics, and provide other community-building benefits.

Why examine density . . . and why now?

Fundamental demographic, social, and political changes have made it imperative to look for opportunities to increase density.

■ **The nature of housing demand is shifting dramatically toward higher-density housing types—for the first time in more than four decades.** The ULI reports that after more than 40 years during which families with children dominated American housing markets, demand is shifting to a much more dispersed pattern in which no single demographic group dominates. The ULI argues that it is critical to examine “greater density” because “there will be an increase in the U.S. population of more than 60 million over the next 20 years and . . . smaller (one- to two-person) households will become the majority during that time.” ULI Senior Resident Fellow John K. McIlwain notes that “at least one-half of the development needed to respond to population growth [by 2025] has yet to be built. . . . Now is the time to meet . . . changing housing needs . . . and the changing form of metropolitan areas.”

■ **The public sector can no longer afford to subsidize lower-density, sprawl-dominated development.** The Lincoln Institute for Land Policy commissioned a 2003 study that found that states in the northeast could save more than \$40 billion by pursuing more compact, higher-density forms of development rather than continuing to build and repair new roads, schools, utilities, and other infrastructure of sprawl. More important, as states and cities face increasingly strained budgets, they cannot afford to spend this \$40 billion.

■ **Higher densities are essential to halting escalating traffic congestion and offering people greater options.** Sprawl is the chief culprit in clogging local streets:

for example, total vehicle-miles driven in the Boston region have increased 15 times faster than population since 1970. Moreover, gasoline consumption rises in direct proportion to decreased density among American cities. The *Boston Globe* recently reported that more than 80 percent of respondents to a national survey said that reducing commuting time was a primary factor in choosing where to live—an unprecedented level of concern over traffic congestion.

■ **Higher densities are critical to creating mixed-income housing and diverse neighborhoods in the face of shrinking public financial resources.**



Auburn Court in Cambridge, Mass., is a mixed-income residential project at 30 units per acre.

Master plan by Goody Clancy & Associates for Homeowner's Rehabilitation Inc.
Courtesy Goody Clancy & Associates

As public dollars for affordable housing shrink, higher densities can help fill the gap by providing opportunities to use more expensive units to subsidize lower-cost units in the same development or neighborhood. In addition, increased densities can provide the resources to pay for parks, schools, and other amenities essential to building livable neighborhoods. Reese Fayde, president of Living Cities, a coalition of major national foundations investing in urban America, has noted that “the fog of density” makes it far easier for people of sharply different incomes to share a neighborhood in a society increasingly fragmented by growing disparities among rich, middle-class, and poor households.

What densities are desirable?

When discussing residential density, it is important to clarify how this measurement is being defined: gross density includes streets, parks, and other public areas and open spaces; net density includes only the site area devoted to housing. The focus here is on net densities. Although no single formula is readily available to determine appropriate densities, the approaches outlined below can be helpful in projecting a reasonable range.

■ **What are traditional community densities?** Most communities support a surprisingly wide range of densities. It is, therefore, useful to observe the quality of life people associate with various densities and to measure the densities in popular neighborhoods. Beloved urban neighborhoods often accommodate densities ranging from 40 to more than 100 units per acre, with a broad mix of housing types and heights. Boston’s historic Back Bay, widely admired for its intact Victorian character, has a net

density of more than 80 units per acre and includes row houses and apartment buildings ranging in height from 35 feet to more than 125 feet.

■ **What densities are required to create lively neighborhood main streets?** Higher densities represent one of the most effective ways to create walkable, mixed-use districts. Goody Clancy & Associates developed a series of calculations to determine the approximate amount of housing required within roughly a 10-minute walk (a half mile) to support a desired amount of retail. According to these calculations, about 1,500 to 3,000 units of housing representing a mix of single-family, row-house, and multifamily options—at roughly 20 to 40 units per acre after subtracting land for streets, parks, and other public areas—would be required to support a block of main street, which was estimated to include roughly 30,000 square feet of shops, cafés, and restaurants.

■ **What densities are required to create a high-quality public realm?** Creating a new neighborhood of choice, as opposed to infill development, entails significant costs. Establishing a walkable suburban community—with high-quality sidewalks and streetscape, parks and squares, lighting, and similar amenities that will attract a diverse population—can add up to \$2 million or more per acre to the cost of development. Densities of 15 to 50 or more units per acre are often required to absorb these costs. Keep in mind, however, that densities greater than 20 units per acre and mixed-use development must be planned and designed to achieve an even higher compensating value because they often require more costly structured parking and more expensive forms of construction.



The Cabrini Green master plan will transform derelict public housing into an urban, mixed-income neighborhood for more than 5,000 residents.

Master plan by Goody Clancy & Associates for the City of Chicago. Courtesy Goody Clancy & Associates



The massing study for Cabrini Green illustrates site plan options for 30, 40, and 50 development units per acre.

Design versus Density

The kind of design that builds a community is not a function of density. In truth, one can find both good and bad examples of architecture and planning at various levels of density. Consider the following:

- **8 to 12 units per acre** can represent ranch houses crowded together with a wall of garages facing a street, or early 20th-century and more recent New Urbanism neighborhoods of two- and three-story houses with porches.

- **15 to 25 units per acre** can represent an anonymous apartment complex with buildings and sur-

face parking crowded together, or a beloved neighborhood such as Dupont Circle in Washington, D.C., which mixes a wide variety of housing types.

- **30 to 50 units per acre** can represent undifferentiated apartment slabs or the Victorian town houses found in cities across the country.

- **50 to 100+ units per acre** can represent isolated towers or the kinds of vibrant historic neighborhoods widely admired in cities like San Francisco, Chicago, and Boston, and the equally vibrant new urban neighborhoods being built in cities like Seattle and Portland, Oregon.

In terms of building community, the most critical test of design quality is whether a new development enriches and enlivens the public realm. In existing neighborhoods and downtown districts, new buildings should emphasize continuity with existing neighborhood fabric, including similar materials; continuity along the street; and massing that establishes a sense of respect for nearby buildings. This does not mean that new buildings must be carbon copies of the old: Seattle and Vancouver, Canada, for example, have permitted a series of highly successful taller buildings in older urban neighborhoods. Their scale and massing convey a sense of variety, and they often step down toward nearby lower buildings. Seattle, in fact, has removed height limits in downtown and some nearby neighborhood centers, but requires high-quality design in return.

For any new construction, the street level should be designed to engage pedestrians, with lively retail uses wherever possible and facades that feature multiple doorways and avoid blank walls. Larger-scale developments should line the street with town houses if the market won't support retail. Buildings should use handsome, durable materials, particularly at and near street level, that convey a sense of commitment to being a good neighbor for years to come.

David D. Dixon is principal in charge of planning and design at Goody Clancy & Associates, Boston.



The Riverview Hope VI Redevelopment Plan for the Cuyahoga Metropolitan Housing Authority in Cleveland creates 573 units of mixed-income housing and retail on a 20-acre site, achieving a density of 55 units per acre.

Courtesy Goody Clancy & Associates



At this famous location, a full block, mixed-use project has been designed to support urban living through the adaptive reuse of ABC Television's original headquarters and the innovative integration of signage. The Sunset & Vine project has created a new downtown Hollywood with 300 housing units (100 residential apartments per acre), 110,000 SF of retail, integrated signage, and a 700-car garage.

Urban Planning, Design Architect for Entitlements and Façade Design by Roschen Van Cleve Architects of Hollywood. Developed by Bond Companies. Photographed by Eric Koyama.

Salt Lake City is located on the southeastern shore of the Great Salt Lake and to the west of the Wasatch Mountains. The Envision Utah planning process created a quality growth strategy for the entire region.

Courtesy NASA Landsat 7 Science Team and USGS Eros Data Center. From visibleearth.nasa.gov, accessed July 19, 2005.



Effective Planning for Regional Transportation

By Søren D. Simonsen, AIA, AICP, LEED AP

Along with those inalienable rights of life, liberty, and the pursuit of happiness, most Americans consider mobility to be one of their most basic and precious freedoms. This is understandable, as transportation systems support almost every aspect of our lives, from work to recreation.

With the proliferation of the private automobile and the construction of a virtually ubiquitous network of roads and highways during the last century, residential and business developments gradually and easily spread out across the country. Yet, the problems and limitations inherent to this kind of car-based development—commonly referred to as *sprawl*—are now taking their toll through increased traffic congestion, environmental degradation, escalated health risks, and mobility challenges for the young, the old, the poor, and the disabled—or about one-fourth of our population.

Balancing Our Transportation Systems

Clearly frustrating—if not detrimental—to individuals and extremely challenging to local leaders, these problems are a growing concern for the larger business community as well. Trade associations and private companies in major metropolitan areas are increasingly recognizing that a region's economic health depends on a balanced transportation infrastructure. In 1995, for example, the Bank of

America prepared a landmark study that identified the effects of suburbanization, congestion, and transportation problems on business activity and economic development. Although focused primarily on California communities, the study's general conclusions are applicable to any metropolitan region:

- Road-weary commuters spend more time traveling to work and other destinations because of increased vehicle-miles traveled, leading to fatigue and loss of productivity.
- Many workers cannot compete in the job market because transportation alternatives do not provide access to remote job centers.
- The costs of new infrastructure along the urban edge and of mitigating environmental impacts from transportation projects are passed on to businesses and citizens who receive little or no benefit from the new construction.
- The flight of formerly urban businesses to the suburbs, often subsidized by taxpayers, weakens urban central business districts and the entire region.

In addition to this study's highlight of economic concerns, more than two dozen community-health studies undertaken since 1987 have linked air pollution—predominantly unhealthy particulate matter from vehicle emissions—to an increase in urgent

medical care and premature death. The health risks and economic costs of pollution and environmental degradation are staggering.

Working Together to Find Solutions

It is difficult to define a balanced transportation system. Each community and region must recognize its own opportunities and constraints. Most important, community leaders—political, business, and institutional—must work together to achieve the desired health and economic benefits. What is clear, however, is that most communities must vastly increase their efforts to include public transit, bicycle, and pedestrian facilities in order to reach a proper balance.

Fortunately, the public and private sectors in many forward-thinking communities are finding ways to take the incremental steps necessary to develop viable, multimodal regional transportation systems. For example, when the Denver region faced a large shortfall in transportation funds in 2001, the Denver Metro Chamber of Commerce courageously advocated numerous increases in taxes and fees on various products, assets, and services—including gasoline, personal property, drivers' licenses, motor vehicle registration, and toll roads—to build needed public transportation projects (rail transit and highways) over a shorter period, to greatly increase other public transit systems and services, to improve efficiency of highway construction and

maintenance, and to improve transportation-demand management through increased public awareness. They even went so far as to propose the creation of a tax on vehicle-miles traveled. They took such action because they recognized that the consequences of this shortfall in transportation funds—decreases in both quality of life and global-market competitiveness—were far more severe than the effect of the increased taxes.

In the late 1990s, faced with regional road congestion and air-quality problems, the Metro Atlanta Chamber of Commerce formed the Metropolitan Atlanta Transportation Initiative (MATI). In 1998 MATI successfully lobbied the Georgia legislature and state governor to create a regional agency responsible for planning and allocating resources for highway and transit projects within the purview of the Georgia Regional Transportation Authority.

More recently, the Metro Atlanta Chamber of Commerce issued a resolution that (1) identified transportation corridors with unacceptable levels of congestion, and (2) advocated the *flex trolley*—a bus rapid-transit system operating in dedicated corridors within existing roadways that can serve as a cost-effective interim step to providing expanded rail networks. These recommendations by the business community have increased the political capital that local and state policymakers need to make the tough appropriation decisions that, in turn, will result in the implementation of more suitable regional transportation initiatives.



Denver's business community has been a recent champion of transportation improvements, especially public transit. The 16th Street Transit Mall has become a major character-defining feature of the downtown over the past two decades.

Courtesy Jim Leggitt, FAIA

Implementing a Region-wide Approach

In addition to establishing alliances between the public and private sectors, civic leaders must coordinate with neighboring political jurisdictions when developing regional transportation plans. This is particularly true for large metropolitan areas where adjacent jurisdictions inextricably share both the opportunities and problems associated with transportation systems.

“Envision Utah,” a grassroots regional planning initiative in the Salt Lake City metropolitan region, illustrates some of the positive outcomes of such a broadly coordinated effort. This large-scale visioning process was launched in 1997 by a coalition of business, civic, and political leaders. Their purpose was to study the long-term effects of growth based on uncoordinated local planning efforts over a 10-county metropolitan region, and recommend policy changes that would preserve and enhance the region's quality of life. Issues of particular concern included prosperity of business and industry; conservation of natural, recreational, and agricultural open space; improvement of air quality; better



Residents, business owners, and city officials in Layton, Utah, gather to discuss a community vision for transit oriented development near a proposed commuter rail station. The workshop was sponsored by Envision Utah, as part of a region-wide campaign.

Courtesy Cooper Roberts Simonsen Architecture



Stakeholders from the Salt Lake metropolitan area gather to discuss values and choices for future growth. This regional planning workshop, sponsored by Envision Utah in 1999, focused on strategies to integrate land-use planning with transportation and public transit system improvements.

Courtesy Cooper Roberts Simonsen Architecture

delivery and more efficient use of water, energy, and other vital resources; and appropriate housing and transportation choices for a rapidly growing and changing population.

Business leaders, elected officials, executives and staff from state and local agencies, and numerous community stakeholders—totaling more than 17,000 in all—took part in a visioning and strategic-planning process over a two-year period. Through initial surveys and town meetings, they explored the effects of various transportation and land-use decisions based on models of current planning trends and of alternative growth-management approaches. Later, participants helped evaluate specific strategies for the implementation of a preferred growth scenario, including identification of the types of public and private cooperation that would be most effective in executing the recommendations.

The coalition’s report, “Envision Utah Quality Growth Strategy,” unveiled in January 2000, identified specific planning measures, including:

- Promote the development of a region-wide transit system (including public and private buses, light rail, and commuter rail, among other options) that is effective and convenient.
- Foster transit-oriented housing and commercial development that incorporate and encourage various forms of public transportation.
- Encourage both new and existing developments to include a mix of uses in a pedestrian-friendly design so that walking is an attractive option.
- Support the development of a network of bike-ways and trails for recreation and commuting.



Envision Utah conducted a region-wide, grass-roots planning initiative to allow public input into choices for future growth and development in the Salt Lake City metropolitan area. The three scenarios pictured here illustrate the relative impacts of planning choices on quality of life values such as transportation, open space conservation, housing, and infrastructure costs.

Illustrations courtesy Envision Utah

According to the report's transportation modeling, such recommendations could result in a projected reduction of 2.4 million vehicle-miles traveled per day by 2020, as compared to the status-quo baseline scenario. At the same time, average speeds would increase by 12.5 percent, commute times would decline by 5.2 percent, and transit trips would increase by 37.5 percent. These systemic improvements came with a proposed reduction in road spending of approximately \$3.5 billion and an increase in transit spending of \$1.5 billion, for a net savings of

\$2.0 billion. And, over the next 20 years, 171 square miles of land would be saved from development.

Since the *Quality Growth Strategy* was released, a new light-rail system opened in 2000 and was expanded in 2002 and 2003. As a result, the region has already seen a major increase in transit spending. With the support of "Envision Utah" stakeholders, and the overwhelming success of the early phases of the light-rail system, more than 100 miles of major rail and bus rapid-transit projects

are now in the works. In addition, over 200 miles of regional, nonmotorized trails for commuting and recreational use by bicyclists and pedestrians have been planned, substantial portions of which are now in development or have been completed. Even more important, many communities have adopted updated general plans and zoning ordinances that offer more compact development alternatives to support and enhance these transportation systems, and address other health, safety, and quality-of-life issues for area residents.



Salt Lake City residents and business owners created a vision for transforming a poorly designed highway corridor near a new light rail station, into a vibrant and inviting business and residential transit oriented development district.

Photo simulations courtesy Cooper Roberts Simonsen Architecture and © Steve Price



Choices we make about urban design and transportation systems can have far-reaching effects. Salt Lake City's Main Street in the early 20th century is very similar to today's Main Street.

Historic photo © Utah Historical Society; Current photo courtesy Cooper Roberts Simonsen Architecture

A Model for Others

The broad coalition of support for and participation in “Envision Utah”—by businesses, residents, and state and local officials—has significantly and positively affected the approach to transportation planning in this region. This process of integrating transportation and land-use planning through meaningful involvement of stakeholders continues to guide major transportation planning efforts in the Salt Lake region. And the grassroots coalition and public process developed by “Envision Utah” is now being used as a guide for similar regional planning measures in Chicago, Los Angeles, Austin, and other major metropolitan areas. As regions recognize the tremendous need and compelling reasons for a multimodal transportation network of streets, transit, trails, and highways, and utilize a broad coalition of business and political leadership to implement systems that provide balanced transportation options, the mobility needs of all can be met while ensuring the health and well being of communities and regions for generations to come.

Søren D. Simonsen is a principal of Cooper Roberts Simonsen Architecture, Salt Lake City.

Innovative Efforts to Curb Car Use

By Ellen Vanderslice, AIA

While embarking on long-range planning for regional transportation, civic leaders can also take smaller steps now to help mitigate some of the traffic problems already in their neighborhoods. For example, *car-sharing*—pioneered in Europe in the 1980s—has now become a viable service in nearly two dozen U.S. cities, from Boston to Los Angeles. Car-share vehicles are parked all around a city, and members of the service can rent them for hourly intervals as needed, making a reservation by phone or the Internet. People who join a car-sharing service tend to drive less and use other transportation options more than they did when they owned a car. Car-sharing makes sense: those who use Zipcar, for example, report that they save over \$400 per month when compared to



car ownership and drive approximately 80% less than they did before using car-sharing.

TravelSmart, another program developed in Europe and Australia in the 1980s and 90s, starts with brief telephone surveys to identify people willing to try changing a few trips, and then provides them with information about their particular transportation options. This simple but effective program—now being piloted in several U.S. cities, including Cleveland and Sacramento—has resulted in switching about one out of every seven driver-only car trips to another mode.



Barracks Row, in the heart of Washington, D.C.'s Capitol Hill neighborhood, has flourished as the result of an \$8.5 million streetscape improvement project.



Street-Savvy Design

By Ellen Vanderslice, AIA

Cities and towns allow people to exchange goods, services, and ideas. Historically, public streets have been fundamental to this process, as it has been along these corridors that people have had the opportunity to mingle. Yet, for much of the last century, American streets have been designed primarily for the movement of cars from one point to another, rather than for public exchange along the way.

As the automobile prevailed, other modes of transportation that are more conducive to face-to-face interaction—such as walking, bicycling, and public transit—gradually declined. The speed of automo-



The streetcar is one of many options for travel in Portland, Ore.
Courtesy Portland Office of Transportation

bile travel brought about the need for larger signs and signals, and a demand for convenient parking. The result is that many American thoroughfares were eventually reduced to anonymous ribbons of asphalt lined by parking lots and giant illuminated signboards. Replicated over and over across America, this pattern of development lacked any sense of place and fostered a feeling of estrangement among the citizenry.

Fortunately, today's urban planners and city leaders have learned from the experience of the last century. People, by nature, are drawn to vibrant, sociable venues. To ensure a healthy neighborhood, this dynamic must begin at the level of the street. Today, there is a growing movement to reclaim our streets from the tyranny of the car—and the isolation it generates—by offering more transportation choices and making roads more friendly to people.

Consider, for example, Portland, Oregon. In the early 1970s the city initiated a plan to combat the flight of downtown businesses by making the core a vital place that attracts people. In the 1980s, to protect inner-city neighborhoods from increasing traffic, the city implemented a comprehensive traffic-calming program and used federal funds to construct a new light-rail system instead of a freeway. The 1990s brought bicycling and pedestrian programs and the adoption of master plans. Aided by Oregon's land-use controls, the result is a com-



RiverPlace is a development of housing, shops, and cafes along a pedestrian riverfront esplanade. The development replaced an old, limited-access highway.
Courtesy Portland Office of Transportation

pact, livable city where walking, bicycling, and taking transit are real choices.

In recent years, many other communities, large and small, have implemented a variety of simple street-design strategies to rekindle civic life. Some of the most successful techniques are described below.

Design for Multiple Transportation Options

Start with appropriate land use and urban form

How easily people can travel without a car depends on many factors. By establishing the right number of people (density) and a variety of building types



Washington's Capital Crescent trail accommodates walking and cycling and connects several neighborhoods in the region.

and services (mixed use), community planners set the stage for people to have good reasons to walk, bicycle, or take convenient public transit. An interconnected network of streets makes it possible for people to reach destinations by the shortest possible trip. In contrast, street systems with many cul-de-sacs discourage walking and biking and create unnecessary traffic. Connectivity is important for good transit as well. Transit networks that offer frequent service over a widely connected network draw more riders than those with limited service and out-of-direction routes.

Trails and paths are not a substitute for on-street facilities, since most destinations and transit methods lie on the street system, but they can provide shortcuts or alternate routes of interest. Trails or paths through parks or along waterways can add to the quality of a trip as well as shorten it.

Complete the streets

If sidewalk space and bicycle lanes are missing or inadequate, they should be added or enlarged. Some cities have successfully eliminated travel lanes on multilane roadways, thereby gaining more space for

sidewalks and bicycle lanes without seriously affecting traffic flow. An example from Portland is the NE Broadway and Weidler couplet. In the 1990s these one-way streets were changed from three to two traffic lanes, bike lanes were added, and the sidewalks were widened from 9 to 14 feet. Since then, business has boomed and cafés have bloomed.

Design for Walking and Taking Public Transit

Well-planned sidewalks

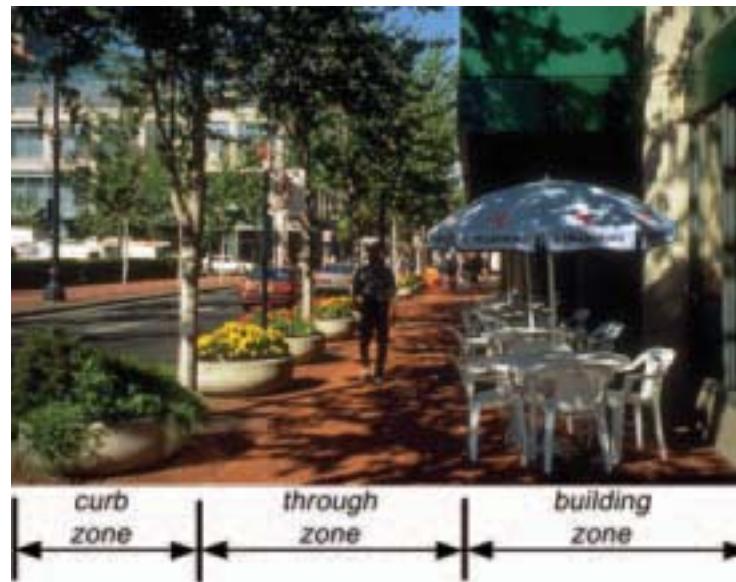
Sidewalks should provide a walking path that is safely separated from motorized vehicles. Good sidewalks are made up of at least three distinct zones: a *through zone*, a *curb zone*, and a *building zone*.

The *through zone* in residential areas should be wide enough to accommodate two people walking

together with room for a third to pass, which amounts to a minimum of 6 feet. This zone should be wider in commercial districts and other areas with high pedestrian traffic. Just how wide will depend on the pedestrian demand and the scale of the street. In large cities, the through zone can be as wide as 20 feet. No obstructions should be allowed within this circulation path.

The *curb zone* serves as a buffer between walkers and the roadway. It may be landscaped or paved. This is the place for street trees and furnishings, such as pedestrian-scaled streetlights, signs, utility poles, bike racks, and parking meters.

The *building zone* is the area where storefront activities can spill onto the sidewalk without



Typical sidewalk zones
Courtesy Portland Office of Transportation



Curb extensions

Courtesy Portland Office of Transportation



A median refuge island

Courtesy Portland Office of Transportation



Street corners must be designed to make crossing safer for pedestrians.

impeding passersby, whether on foot, in wheelchairs, or moving with some other means of assistance. This zone plays a particularly strong role in luring people onto the public streets and engaging them with their community.

Street crossings

Walking isn't convenient unless it is safe and easy to cross the streets. Shortening the crossing distance and slowing the approaching traffic are the two most important ways to ensure this. The location of crossing areas must also be considered, and, of course, curbs must be accessible to people of all abilities.

■ **Shortening the crossing distance** Curbs that extend the sidewalk or corner area into the roadway, usually the full width of the parking lane, shorten the crossing distance and allow walkers to see and be seen before beginning to cross. *Curb extensions* also keep cars from parking too close to the crosswalk.

A median refuge island also effectively shortens the overall crossing distance and protects pedestri-

ans once they reach the middle of the street. It also allows people to traverse one direction of traffic at a time, which usually reduces the waiting time to cross.

■ **Slowing the approaching traffic** *Curb extensions* and *refuge islands* narrow the roadway at crosswalks, which helps to reduce the speed of traffic. Small *traffic circles* or *speed humps* also help slow down traffic.

■ **Locating crosswalks** Sometimes the middle of the block is the safest place for a crosswalk because walkers do not have to compete here with turning cars. At midblock, crosswalks should be marked on the pavement. For additional safety on multilane streets with very high traffic volumes, *marked crosswalks* should also get *curb extensions*, *median refuge islands*, and possibly even *pedestrian-activated signals*.

■ **Making curbs accessible** Access must be provided from sidewalk to roadway for those with disabilities. A separate *curb ramp* for each crosswalk is preferred, with ramps aligned in the direction of

travel. Be sure to include a *detectable warning surface* at the bottom of each ramp.

Street corners

A street corner serves many functions: It is where walkers congregate and then cross the street, and it is the logical location for traffic hardware such as street-name signs, traffic signals, and utility poles. Corners are also the place where conflicts occur between walkers and vehicles. Sidewalk street corners, therefore, must be designed with plenty of room to ensure the safety of pedestrians.

Unfortunately, engineers have often favored vehicles over pedestrians by designing curbs with large radii. From the perspective of a driver, such a curb allows for faster and easier turning movements by cutting away more of the street corner. From the viewpoint of a pedestrian, however, this means less room on the corner and a longer distance to cross the street. Create adequate space for pedestrians with curb radii of 10 feet or less or with curb extensions.



Street-oriented retail and benches make for a lively sidewalk.

Courtesy www.pedbikeimages.org/ photographer: Dan Burden

Transit curb extensions

Consider building long curb extensions at bus stops so that buses can stop in the travel lane instead of having to pull over to the curb. Such an extension helps keep buses on schedule while at the same time providing more room for a bus shelter without obstructing the through zone of the sidewalk.

Pedestrian districts

Many communities have established pedestrian districts, which allow for special standards that improve walkability. Pedestrian districts are usually designated in relatively dense, mixed-use areas with access to frequent transit service. Districts may be established through the local area plan or zoning or through transportation classifications.

Zoning in a pedestrian district may require that buildings be oriented to the street and built to the property line, instead of being set back behind a parking lot. Wider through zones are appropriate for sidewalks here, since more people are walking. Additional amenities, such as special sidewalk and crosswalk paving, pedestrian-scaled streetlights, and benches, are also desirable.

Some cities have experimented with creating *pedestrian malls*, or streets where no traffic is allowed. Some, such as the Pearl Street Mall in Boulder, Colorado, have been highly successful. Others have not: The downtown mall in Eugene, Oregon, which was closed to cars in the 1960s, was reopened to traffic in 2002. Some urban theorists contend that completely closing a street to automobiles can drain it of needed vitality.

Design for Bicycling

Bicycle lanes and boulevards

Bicycle lanes define a space to ride and make it clear that bicyclists are expected on the roadway. Bicycle lanes should be located between curbside parking (if present) and the travel lanes. They should be one-way in the same direction as traffic. They are usually 5 or 6 feet wide, although this can vary. It is common for the bike lane to shift to the left where there is a right-turn lane for cars. If there is not enough space for a bike lane, consider providing a wide (at least 14 feet) outside lane for motorists and bicyclists to share safely.

Bicycle boulevards, typically located on streets with modest volumes of traffic, are designed to encourage bicycle travel. The bicycle boulevard is given priority at minor intersections, and may have signals or other treatment where it crosses major streets. There may also be special signage.

Bicycle parking and use on public transit

Safe and convenient bicycle parking is essential. Many cities now provide simple *hitching post bicycle racks* as part of standard street furniture. Development regulations should also require new buildings to provide both long- and short-term parking for bicycles.

Transportation options are increased greatly when bicyclists can also use the transit system. Many cities now have bicycle racks on buses, and some cities allow bikes on rail transit.

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Typical bicycle lanes
Courtesy Portland Office of Transportation




Bicycle boulevards may include traffic calming devices like traffic circles.
Courtesy Portland Office of Transportation



Buses can accommodate bicycles.
Courtesy www.pedbikeimages.org/ photographer: Dan Burden



A hitching post bicycle rack



Physical activity is increasingly becoming "exercise" instead of a part of people's daily lives.

Courtesy www.pedbikeimages.org/ photographer: Dan Burden

Physical Health and Community Design

By David Allison, AIA, ACHA, and Dina Battisto, PhD

A majority of Americans today live in suburban settings that have been designed, albeit unintentionally, to discourage active, healthy lifestyles. The prevalence of single-use zoning and sprawl requires most of us to spend ever-increasing amounts of time driving from place to place in automobiles rather than walking to at least some of our daily destinations. And most of the routes we travel along daily—between home and work, school, stores, and recreational venues—are not designed for safe walking or biking, even for those who happen to live close enough that they could, at least in theory, leave their cars at home. The lengthy distances to our daily destinations mean that many people spend a greater part of their day in their car, which leaves less time for engaging in the minimum recommended amount of regular physical activity. As a result, physical activity is no longer an integral part of daily life for all but instead is a distinct, programmed event for only those who are both highly motivated *and* have the time.

The Health Problem

Unfortunately, this common phenomenon is far from insignificant to our society: There is growing evidence that our physical health is directly tied to our physical activity. According to an annual survey in 2000 by the Behavioral Risk Factor Surveillance

System, only 26.2 percent of adults met the recommended requirements for physical activity. A surge of studies presented in public health journals and conferences, plus increased funding for research into links between physical activity and health, indicates the growing interest in the health professions in how the design of the built environment influences health. The September 2003 issues of both the *American Journal of Public Health* and the *American Journal of Health Promotion*, for example, focused on the role of the built environment on health outcomes.

Following the 1996 publication of “Physical Activity and Health: A Report of the Surgeon General,” the Centers for Disease Control and Prevention (CDC) identified physical inactivity as one of the top three risk factors—along with smoking and poor nutrition—for premature death. Based on numerous studies, the CDC concluded that physical inactivity plays a significant role in the onset of four main chronic diseases: heart disease, cancer, diabetes, and strokes. Chronic diseases account for 70 percent of all deaths in the U.S., and the costs of health care for people with chronic diseases account for 75 percent of the nation’s total health care costs. Everyone pays for these social costs because the financial burden is ultimately carried by individuals, families, employers, local communities, and government agencies.



Sprawl makes it hard to reach daily destinations without an automobile.

Image from the Metropolitan Design Center Image Bank. © Regents of the University of Minnesota. All rights reserved. Used with permission.



Car-oriented environments are one of the many barriers to safe pedestrian movement.

Courtesy David Allison



Safe, engaging places to play encourage children to be more active.

Although people of all ages suffer from an environment that is poorly designed for physical activity and mobility, the young and the old, and those who care for them, bear the brunt of the problem. Childhood activity today is mostly a scheduled and transported event that limits spontaneous and sustained physical activity and places a special burden on single-parent households and families in which both parents must work full time outside the home. Consequently, children are more physically isolated and inactive than those of previous generations and are suffering in larger numbers from obesity and other chronic health conditions related to the lack of physical activity. And the very old, who typically lose their ability to drive, are left with options that drastically diminish the quality of their lives: They either remain homebound and isolated, or must move out of their homes and communities for unfamiliar age-segregated retirement communities or institutions. These settings remove them from lifelong social networks, which can greatly affect their mental and social health.

Design Solutions

To overcome these problems, it is incumbent on civic leaders to encourage their respective communities to be planned and designed in ways that provide incentives for spending more time walking and less time in automobiles, thereby increasing opportunities to seamlessly reintegrate healthful physical activity into the normal course of daily life. The three most significant design strategies to facilitate physical health and active living in a community are:

- Implementing planning guidelines and zoning regulations that promote the close proximity of daily-living activities, services, and settings so that walking to work, school, shopping, and recreation is both possible and convenient.

- Providing connected networks of pedestrian-friendly pathways (sidewalks, jogging trails, footpaths, bike-ways) that link residential neighborhoods to each other, residential neighborhoods with community services, and community services with each other.

- Designing the pedestrian and bicycle pathways that make up these networks so that they are both safe and inviting.

Proximity between daily activities

Mixed-use development enhances human health because it locates the various activities of daily living within closer proximity to each other, thus providing greater incentives for people to walk or bike to them. Communities should not only allow but actively encourage the development of compatible and sensitively designed small-scale businesses, workplaces, schools, civic institutions, parks, and other open areas within walking and biking distance of residential neighborhoods.

Planners and designers can locate small-scale civic uses (such as libraries, recreation centers, parks, and greenways) in ways that appropriately buffer residential development from large-scale, higher density commercial elements.

Smaller public schools, particularly those for the primary grades, should be located within safe walking distance of residential neighborhoods, especially those that offer a high proportion of affordable housing for young families. By designing these facilities as “community” schools, they can be used for community meetings, to house community libraries and learning resource centers, and for sports and other outdoor public recreation. This form of cross-programming helps ensure that every tax dollar has the greatest total impact on the health and well-being of the community.

When planners increase residential density and decrease lot size, a greater range of community services can be located within walking or biking distance of residential neighborhoods. As a result, a greater number of people, young and old, can more easily access these services without a car. Such close proximity minimizes infrastructure costs for roads, sidewalks, bike paths, and utilities, while at the same time helping commercial and civic organizations thrive.

It is important to note, however, that the integration of compatible nonresidential uses within or near residential neighborhoods requires that planning officials and designers sensitively address residents’ legitimate concerns regarding such uses—for example, increased vehicular traffic, late-night disturbances, and noise and light pollution—which originally led to single-use zoning. Otherwise, the public may resist mixed-use development for fear of these potentially noxious factors.

Networks of pedestrian-friendly pathways

Provide networks of limited-traffic residential streets, sidewalks, bike paths, and greenways that connect adjacent residential neighborhoods to each other and to nearby commercial and civic services so that pedestrians can avoid busy connector and arterial streets. Consider, for example, the following approaches:

- Prohibit new “cul-de-sac” neighborhoods where the only access is from arterial streets or roads. Cul-de-sac neighborhoods force people to move along busier arterial streets in order to leave the neighborhood.

- Require that new residential developments link to existing adjacent neighborhoods internally or be designed so that connections can be made to future residential developments.



This pathway at the College of Charleston, S.C., forms part of a broad pedestrian network.

Courtesy David Allison



This school is connected to the neighborhood by a series of paths.

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A mixed-use, pedestrian friendly street

Courtesy David Allison



Buffers can vary according to urban condition, vehicular speed, and traffic volume.
Courtesy of David Allison

- Require that new residential and commercial developments include sidewalks along all public streets fronting the development and along new streets within the development.
- Local governments should implement a phased plan of creating sidewalks and bike paths on existing streets where traffic is heavy and speeds are higher than 25 mph. All residential streets should have sidewalks on at least one side. Residential streets that extend for more than one block or connect two or more residential neighborhoods should have sidewalks on both sides. All arterial and connecting streets should have sidewalks and bike lanes on both sides. And the annual budget should include monies for repairing, upgrading, and maintaining existing sidewalks.
- Provide greenways, bike paths, and jogging trails within floodplains and utility rights-of-way between existing, isolated neighborhoods.

Well-designed sidewalks and bike paths

Provide incentives for using these pathways by designing them to be both pleasurable and safe. For example:

- Except in urban conditions, a landscape buffer should separate sidewalks and bike lanes from vehicular traffic on all streets. This buffer should provide greater separation from vehicular traffic as the traffic density of the street increases.
- Provide deciduous street trees between the road and sidewalks to make walking more pleasant and tolerable in hot and cool weather. Street trees can also provide pedestrians with a real and perceived sense of security and separation from vehicular traffic.



Sidewalk with canopies, benches, and street trees
Courtesy David Allison

- Provide canopies on commercial storefronts for sun and rain protection.
- Provide adequate lighting of pedestrian pathways to ensure safety and security at night. Lighting should be designed to avoid light pollution in residential areas.
- Reduce front-yard setbacks and require usable front porches on residences to encourage walking as a form of social interaction and allow for casual surveillance between residents and passersby.
- Footpaths, jogging trails, and bicycle paths that are not adjacent to public roads should be designed to optimize safety by locating them in a way that maximizes casual observation from adjoining residential areas and other active uses and by limiting dense understory planting alongside them.

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A safe and inviting sidewalk with shade trees and benches that serve as buffers from vehicular traffic

Pennsylvania Avenue in front of the White House has visible security through retractable bollards and guard houses.



Public Safety, Personal Security

By Barbara A. Nadel, FAIA

From natural disasters and terrorism to power outages, biochemical hazards, workplace violence, and crime, every community must be prepared to address emergencies and disasters on short notice. Public safety and personal security are essential to attracting and retaining businesses, jobs, and residents to communities and urban centers. Safe and vibrant streets keep economies strong, stabilize property values, and enhance the quality of life.

Since the events of September 11, 2001, civic leaders have become increasingly aware of the need to implement cost-effective security policies to protect public health, safety, and welfare. In the post-9/11 era, organizations, agencies, and building owners that fail to develop such security measures risk significant liability if a disaster or terrorist event were to occur.

Every community and facility has unique safety and security issues. Lessons learned from reviewing the circumstances surrounding previous acts of terrorism and natural disasters can be useful in determining what went wrong, why, and how future occurrences can be prevented. The purpose of this chapter is to provide a greater awareness and overview of security concerns for decision makers, civic leaders, and building owners, rather than to provide specific solutions.

Security Planning

Security programs address safety needs for a community, site, or facility. Long-term goals should include preventing fatalities, minimizing injuries, protecting critical assets, maintaining daily operations, and deterring crime and terrorism.

Security planning is a team effort, requiring collaboration among various stakeholders, including government agencies, private organizations, businesses, property owners, residents, and local law-enforcement representatives. Facility managers, especially at government buildings, hospitals, schools, and civic institutions, should consider including in-house and consulting architecture, engineering, and security professionals in addition to key fiscal and administrative personnel in security discussions to ensure that plans can be readily implemented.

Security Planning Elements

A security plan examines three fundamental elements: *design*, *technology*, and *daily operations*. Although each element can be addressed alone, decision makers will achieve greater efficiency and more effective use of limited resources when these elements are considered and implemented together at the earliest stages of project planning or funding cycles.

■ *Design* includes site planning, landscaping, and architectural, interior, and engineering design, espe-

cially as they pertain to applicable life-safety codes and standards.

- *Technology* covers various electronic devices, such as closed-circuit television cameras and monitors, card-access systems, alarms, metal detectors, and biometric devices that identify individuals.
- *Daily operations* consist of the policies and procedures for emergency response and disaster planning that are developed by public agencies, building owners, and landlords. For example, regularly scheduled training and fire drills will ensure that employees and building occupants are familiar with emergency procedures.



An exterior surveillance camera mounted on a post contoured to blend with nearby streetlights eliminates the need to penetrate or visually alter the facade. The camera's globe housing and post have been patinated to read as a single assembly.

Threat Analysis and Vulnerability Assessment

Developing a security plan requires conducting a threat analysis and vulnerability assessment. These studies are often best performed by security consultants, in-house security personnel, or local law enforcement, in combination or alone. Civic leaders, building owners, facility managers, end-user groups, and design professionals should provide input.

Understanding potential threats against a community, site, or building is an important factor when planning future strategies because they point to areas needing protection. Potential threats include terrorism, such as vehicle bombs and the release of biochemical hazards in public places; natural disasters, such as earthquakes, floods, hurricanes, tornadoes, tsunamis, and wildfires; emergencies, including widespread power outages and chemical spills; crime; and workplace violence.

A threat analysis identifies the past, perceived, current, and potential threats against facilities, sites,

landmarks, individuals, public events, and critical infrastructure that may be targets of opportunity. The probability of each scenario varies, and will be a factor in determining costs and acceptable risks and losses. Civic buildings in the United States—such as courthouses, federal offices, and historic landmarks—are typically considered potential terrorist targets because they are seen as symbols of democracy.

A vulnerability assessment reviews potential weaknesses that may fail to protect an asset from potential threats. Examples of vulnerabilities include a public building's lack of setbacks, or *standoff distance*, from roads to minimize damage from vehicle bombs (a design issue); absence of visitor screening or metal detectors in the lobbies of government or office buildings (a technology concern); and failure to conduct regular fire drills from high-rise towers to ensure that occupants are familiar with egress routes (an operational procedure).



Concrete barrier limits vehicles at Federal Plaza, Duane Street, Lower Manhattan, N.Y.

Photograph by Mark Ginsberg, AIA.

Security Design Issues

When security planning has identified threats, vulnerabilities, and risks, a series of security responses can be developed based on the various types of threats that apply to a community and the series of events that could occur after each scenario. Decision makers should prioritize assets to be protected and create a program that will be adequately funded and supported. Security approaches typically include capital projects for strengthening buildings and infrastructure, purchasing equipment, and allocating operational funds and personnel for related activities.

The following are selected highlights of planning and design issues that often merit further attention by building owners, based on security planning assessments. Decision makers are urged to work with licensed architects, engineers, and landscape architects who are familiar with security design, applicable codes, and industry standards. Local law enforcement is another resource. Requirements vary in each jurisdiction, by building type, public agency, and the nature of potential threats.

Visible and Invisible Security

Some kinds of security measures, such as concrete barriers, are very visible while others are less obvious or intrusive. *Transparent security*—a term often used by the U.S. General Services Administration (GSA) to describe one of several design goals for new federal buildings completed in the Design Excellence Program—is invisible to the public eye and can be achieved by applying planning criteria, design strategies, and building operations appropriate to each situation.

Visible and invisible security measures serve respective purposes. Concrete barriers installed in front of buildings may deter vehicular bomb threats, but they



The perimeter around the New Executive Office Building in Washington, D.C., includes transparent security in the form of street furniture and landscaping.



Integrating public art with perimeter security. “Pangea Fence,” at Townsend Harris High School, Flushing, Queens, New York.

Artist: Fred Wilson. Architect: HOK. Client: NYC Board of Education and Percent for Art Program. Courtesy the Art Commission of the City of New York.



Historic properties often cannot meet setback requirements. Limiting street access by using appropriately designed concrete barricades is one solution for medium- or high-risk buildings located close to sidewalks. The Madison House is located close enough to the White House to require more extraordinary security measures than other historic properties.

will not necessarily ensure safety within and around a building unless other criteria are addressed, nor do they enhance the streetscape. Yet, visible security measures may be desirable at certain times and places. Public- and private-sector building owners, facility managers, and local law enforcement are generally best suited to choose the most appropriate type of security measures because they are aware of the potential threats, are most often responsible for ensuring public safety, and may be held liable for damages in the event of a problem.

Site Planning and Landscaping

- In suburban residential and commercial areas, trimmed shrubs and low plantings allow roving patrol cars to see what is happening in and around a building or storefront.

- For government buildings, landmarks, and offices with high-profile tenants, standoff areas will minimize potential damage from vehicular bombs. In urban areas where setbacks are not possible, alternative solutions should be considered, such as installing curbside bollards engineered to resist fast-moving vehicles and reviewing ways to reinforce building materials and glazing on street-front facades.

- Standoff areas can be landscaped, paved, and designed with public art and street furniture. GSA has developed many examples for new federal courthouses and office buildings across the country.

- Security lighting is an important element, especially at schools, shopping centers, parking garages, and large parking lots. The Illuminating Engineering Society (IES) publishes criteria for lighting levels and fixtures.

Architectural Design: Glazing

Window systems, especially for public buildings and those housing high-risk tenants, should be evaluated to determine whether the type of glazing is appropriate for security, energy conservation, and wind loads. For example, laminated glass, which shatters in place rather than flying around during a blast, provides a greater level of safety for building occupants and passersby, especially at federal facilities and buildings, which may be targeted for bomb threats.

In regions prone to earthquakes, high winds, tornadoes, and hurricanes, design professionals should review the latest local codes and glazing products available to resist these forces and meet specific criteria. The Florida Building Code, for example, has evolved over the years to address hurricane forces, building materials, and construction techniques. The Institute for Disaster Research, Wind Science and Engineering Research Center, at Texas Tech University, in Lubbock, Texas, is another good resource when designing for high-wind conditions and tornadoes.



A hurricane-damaged roof in Orlando is temporarily repaired with a blue "FEMA tarp" provided by the Federal Emergency Management Agency.

Mechanical, Electrical, Plumbing, and Fire Protection

- Consult a licensed engineer to ensure facilities are code-compliant, inspections are current, and systems equipment is properly designed and maintained.

- Review access points—where building systems enter a building—to ensure that connections are secure and not prone to tampering and vandalism.

- Ensure that all emergency systems remain functional, especially those needed for emergency exiting from a building.

- Provide redundant, or backup, systems for power, water, and other critical building systems so that they remain operational even if one source becomes unavailable.

Crime Prevention Through Environmental Design

In his 1971 book, *Crime Prevention Through Environmental Design*, criminologist Dr. C. Ray Jeffrey, of Florida State University, coined the term CPTED (pronounced “sep-ted”). He defined the term as “the proper design and effective use of the built environment that can lead to a reduction in the fear and incidence of crime, and the improvement of the quality of life.”

CPTED is a low-tech approach to crime prevention, suitable for residential neighborhoods and commercial districts. It relies on active participation of community-based groups, local law enforcement, and public agencies. CPTED-based solutions may be appropriate to address such problems as vandalism, graffiti, drug-dealing zones, petty theft, and other crimes of opportunity that affect property values and quality of life.

CPTED strategies have been successfully applied in many U.S. cities. Case studies are available from the National Crime Prevention Council in Washington, D.C.

Basic CPTED Principles

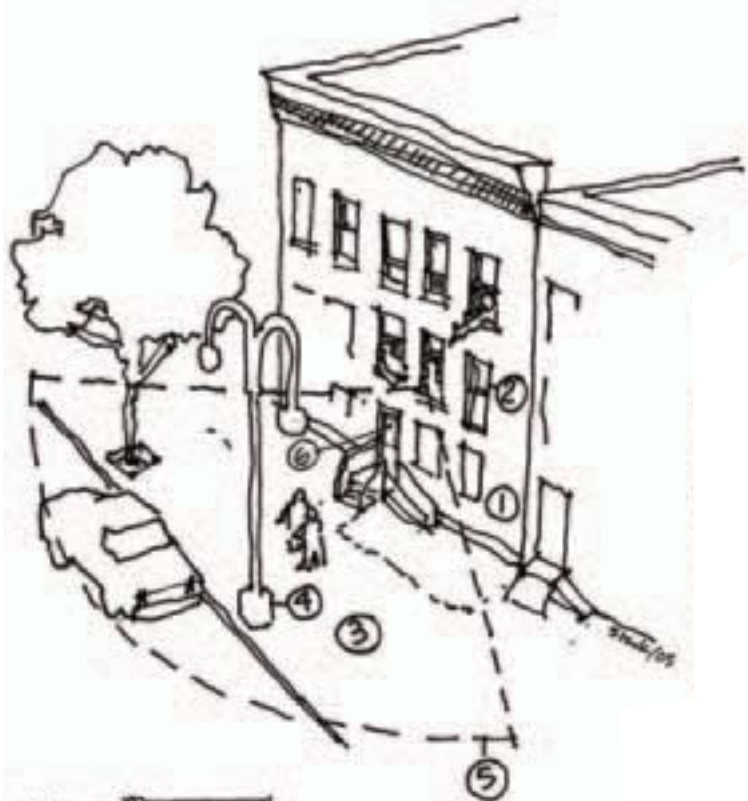
- Neighborhood surveillance calls for everyone who lives, works, and goes to school in an area to observe activities and street life, and report anything suspicious to local law enforcement.

- Community watch groups and local law enforcement can work together, often with the help of designated liaisons and local leaders, to identify problems and propose solutions.

- Access control is an important element for buildings, neighborhoods, schools, and other potential problem zones. Determining who comes and goes can reduce crime.

- Territorial reinforcement techniques, such as landscaping, good lighting levels, and street furniture designed to prevent loitering and trespassing, can define public and private zones.

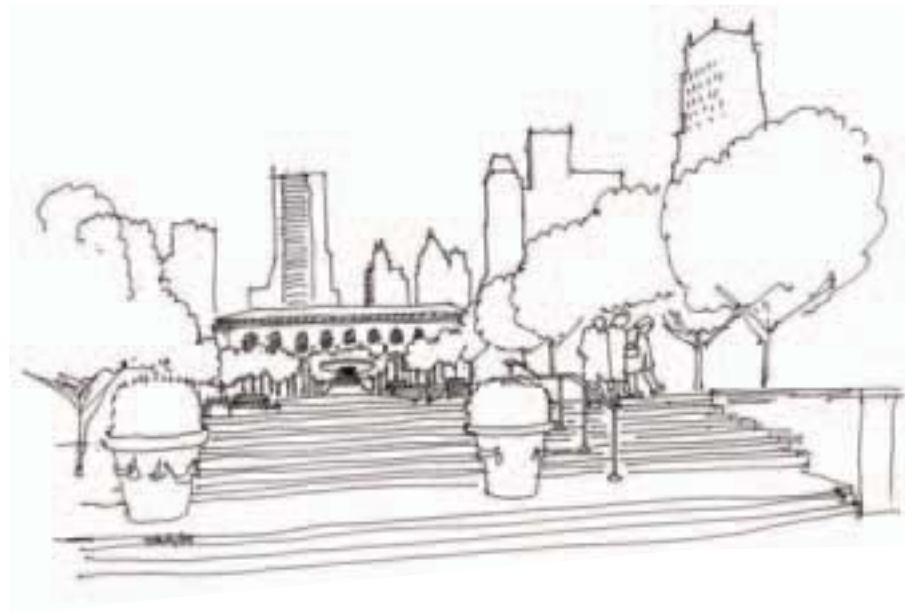
Barbara A. Nadel is principal of Barbara Nadel Architect, Forest Hills, New York. This chapter is summarized and adapted from her book Building Security: Handbook for Architectural Planning and Design (New York: McGraw-Hill, 2004).



Eyes on the Street: Using Crime Prevention Through Environmental Design to enhance public safety.

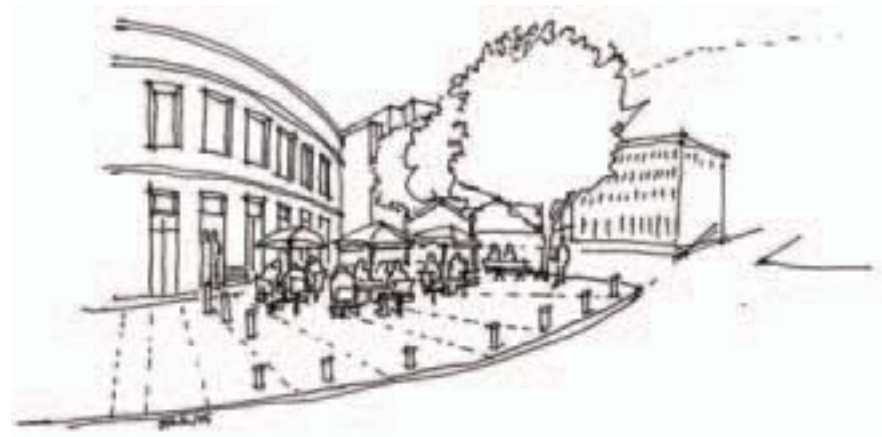
1. Low scale, modest, flush façade, no nooks and crannies or places for intruders to hide.
2. Big windows provide good visibility for monitoring the street.
3. Open and clear street front.
4. Good street lighting is essential.
5. Keep shrubs and trees trimmed for good wide angle views.
6. Transparent, visible entries with visible but protected communication and surveillance technology (closed circuit TV and intercom call panel).

Drawing by Stanley Stark, FAIA.



Bryant Park in New York City is located between 5th and 6th Avenues and 42nd Street. Urban design enhancements have improved public safety at this widely used park. Paths and walkways are accessible and visible from the street, and activities occur throughout the park.

Drawing by Stanley Stark, FAIA.



CPTED in Birmingham, Alabama's Five Points South District. Commercial revitalization of a historic area where activity and open space form the security zone.

Drawing by Stanley Stark, FAIA.

For the Buckman Heights Apartments in Portland, OR, Murase Associates created two large planting beds in the main courtyard that are designed as swales to absorb storm water from the building's downspouts. This, along with other on-site bioswales and dry wells, makes it unnecessary to connect the site to the City's storm sewer system.

Photograph by Scott Murase.



A Sustainable Approach to Neighborhood and Regional Development

By Daniel Williams, FAIA

In recent years, *sustainability* has become an important issue in the field of architecture and planning. The word itself suggests a state in which a system or process can successfully continue over a long period of time. Civic leaders and citizens alike are increasingly coming to the realization that the pattern of growth in much of the United States during the past 50 years has been largely unsustainable.

Since World War II, more and more Americans have migrated out of cities and into suburbia. In this process of expansion and resettlement, emphasis has been placed, for the most part, on the production of housing units rather than the creation of



A typical suburban neighborhood: low density housing arranged around cul-de-sacs without sidewalks.

Image from the Metropolitan Design Center Image Bank. © Regents of the University of Minnesota. All rights reserved. Used with permission.

communities. In its flight to the suburbs, society lost sight of the hidden costs of the auto-dependent and fractured pattern of development now referred to as *sprawl*. This singular-purpose approach has led to environmental problems, undue hardship on social and cultural structures, and financial burdens on individuals and public coffers. It is hard to imagine how such unbridled development could go on indefinitely without further eroding the quality of life for current and future Americans.

The sustainable movement reaches far beyond what its name alone would imply. This blueprint for growth encourages thoughtful development that not only maintains but also improves the quality of community life—from restoring critical ecosystems and supporting local labor forces to taking advantage of the cost-saving efficiencies offered by natural processes. By applying the general principles and specific strategies of sustainable design, community leaders can achieve a better future for their constituents.

To appreciate the full potential of sustainable thought, public officials must understand one of its basic tenets: *interdependence*. In essence, systems must be viewed *holistically*, rather than dissected into discrete parts. By recognizing the connections among a system's various processes, designers can maximize desired goals and minimize unwanted effects. In fact, by capitalizing on these interrelationships and the free



Sustainable design begins with a regional development plan that considers development, transportation, preservation and environmental stewardship. These plans will result in more efficient land use and a higher quality of life.

Drawing by Daniel Williams Architect



A project of Minnesota's Chain of Lakes Clean Water Partnership, the Lake Calhoun constructed wetlands and ponds in Minneapolis improve water quality by intercepting storm water runoff and filtering out pollutants and sediment.

Image from the Metropolitan Design Center Image Bank. © Regents of the University of Minnesota. All rights reserved. Used with permission.

gifts of nature—such as sunlight for warmth, breezes for cooling, and rainwater for irrigation—planners can simultaneously, effectively, and efficiently solve multiple problems at minimal cost.

Neighborhoods as Systems

Neighborhoods and regions are complex physical, social, and economic systems. The elements that make up a community—land and structures, people and their sociocultural activities, business and educational institutions—are all vital and interconnected. These components, therefore, must be considered simultaneously so that improvements to one will enhance the others. What good is it to solve an economic problem if it causes environmental degradation that will require additional funds for clean up? And what good is a solution to an environmental crisis if it wracks economic havoc on its citizens? In either case, the community—the system as a whole—suffers.

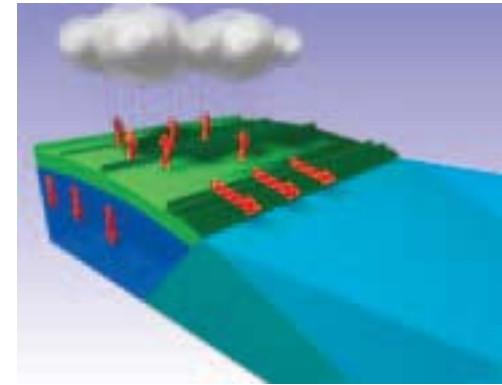


Public places, like markets, invite people to share daily activities.

To visualize this play of interdependent forces, consider the relatively simple example of storm-water runoff, which has the potential to cause flooding. Such a mishap can be minimized or avoided if wetlands are maintained or created to receive, filter, and hold this excess water until it can be recharged into the groundwater supply, thereby increasing the available amount of potable water. In this way, three common community concerns—flooding, sufficient clean water, and open space—can all be addressed simultaneously with the same funding. Note that the primary natural forces and conditions relied upon in this strategy, gravity and porosity, occur without the need to expend fossil fuel. This solution is inexpensive, sustainable, and adds real value to a neighborhood.

Implementing Sustainable Practices

Considerable work has been done in the past decade to identify and measure the basic components of sustainable design. The AIA Committee on the Environment (COTE) has identified 10 measures, with supporting metrics, that outline COTE's theory of sustainable design and serve as the foundation for the committee's Top Ten Green Projects, an annual awards program established in 1997. Although the criteria were originally developed for buildings, COTE is now working to apply them at both the community and regional scale. In addition, the U.S. Green Building Council (USGBC), the developer of the rating system known as Leadership in Energy and Environmental Design, or LEED™, is working on its own rating system for neighborhood developments, which will look beyond individual buildings to the issues of community infrastructure.



Sustainable development practices can contribute to re-establishing natural processes. Rainwater recovery systems "keep water local" by storing storm water that can later be used for watering lawns, for example. This reduces demand on water supplies for irrigation, curbs discharges of polluted storm water, and enhances aquifer storage.

Drawing by Daniel Williams Architect.



The Environmental Service Building for Pierce County, Wash., by the Miller/Hull Partnership, is an AIA/COTE 2004 Top 10 Green Project. Interpretive exhibits throughout the site detail the many environmentally sustainable features of this project.

The Miller/Hull Partnership. Photograph by Susan Kelley for Eckert & Eckert, Inc.

COTE's 10 sustainable measures as applied to neighborhood and regional planning and design are briefly discussed below:

1. Land use describes the site and its context. It measures the portion of land used for buildings and parking. With regard to urban development, choosing a development site within an existing community—even if it is a brownfield that requires remediation—is the most beneficial land-use strategy. This approach minimizes commuting and encourages the best use of existing infrastructure and services, such as police, roads, transit, sewer, water, schools, and libraries.

2. Community design and connection refers to efforts to promote community, including respect for its historic attributes and support of optimal transportation strategies. The next most beneficial land-use strategy, after the selection of a site within existing community boundaries, is the provision for good transit. According to recent research data from the



Infill development takes advantage of existing infrastructure and helps to curb sprawl.

Drawing by Daniel Williams Architect

Centers for Disease Control and Prevention, walkable communities are healthier than sprawl.

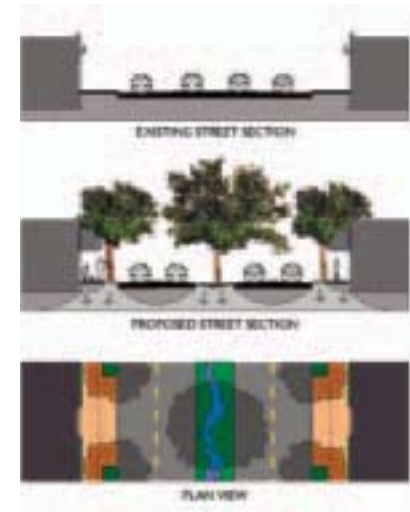
3. Site ecology considers how the design and footprint of a community fit into the regional ecosystem. Among other issues, this measure addresses storm-water management and air quality.

4. Water use addresses water management and conservation. It is measured by potable water use and wastewater reuse. From a neighborhood perspective, this category would consider, among other elements, the types of planting along a public thoroughfare. Walkable streets should be landscaped with local species that can survive in draught conditions, thereby eliminating the need for expensive irrigation systems. For occasional watering needs, runoff can be harvested from the roofs of civic and community buildings.

5. Energy performance describes energy-efficiency strategies that capitalize on the local climate. These efforts range from standard approaches such as improving local energy codes, to creative options such as establishing alternative green power.

6. Energy security highlights those issues that directly affect national energy independence, including the use of renewable energy and the ability of buildings to function under emergency conditions. All communities should address how they will continue to function if they lose temporary access to the utility grid, which is a distinct possibility as blackouts have been occurring with greater frequency in recent years.

7. Materials and construction encourages the selection of healthy and environmentally safe building materials during the design phase as well as appropriate



Drawing by Daniel Williams Architect



Reducing the amount of impervious surfaces, as in this landscaped road, is an economical and attractive way to restore natural systems and can be paid for with funds targeted for storm water projects.

Courtesy Daniel Williams Architect

strategies for reuse and recycling during the construction and occupancy phases. Communities should look to local businesses for the supply and servicing of these materials, equipment, and systems. In this way, a neighborhood helps to retain its unique character, encourage renewable building resources, and support its local labor force.

8. Light and air addresses indoor environmental quality, including daylighting and natural ventilation. Through sustainable zoning and building codes, planners can ensure adequate natural light and fresh air in every building. Of course, by supporting public transit and other measures that protect outdoor air, city leaders can go a long way toward improving the quality of indoor air.

9. Bioclimatic design describes how the design should be appropriate to its region and climate. The orientation of streets and buildings to maximize natural heating and cooling processes, the selection and location of landscaping to provide shade, drainage, and visual interest, and the celebration of unique natural features are all examples of strategies that are relatively inexpensive to implement yet yield highly valuable results to the community at many different levels.

10. Long life, loose fit advocates design flexibility. Communities should be planned and constructed to allow for dynamic adaptation of buildings and streets as new opportunities and needs arise.

Forward-Thinking Solutions

As stewards of the public good, elected officials and appointed community members are in a position to thoughtfully and carefully forge their community's future. It is the duty of these representatives to educate their constituents on the fundamental principles



Urban parks should draw inspiration from their city's distinct natural and cultural history. Landscaping can be designed to not only to engage people but also to protect, sustain and restore natural systems.

of sustainable design, align public processes and regulations with sustainable strategies, and encourage forward-thinking solutions that reconnect to regional climatic conditions and natural resources.

The ultimate goal of sustainable design is to create communities that work as efficiently and elegantly as biological systems in order to achieve and maintain, with minimal capital, a high quality of life

well into the future. The results of this effort will not only be safer drinking water, cleaner air, and healthier habitats, but also a stronger economic base and—most important—a more empowered and engaged citizenry.

Daniel Williams specializes in architecture and urban and regional design at his firm, Daniel Williams Architect, in Seattle.

AIA's 10 Principles for Livable Communities

1. Design on a Human Scale

Compact, pedestrian-friendly communities allow residents to walk to shops, services, cultural resources, and jobs and can reduce traffic congestion and benefit people's health.



Good sidewalks create an environment where people feel comfortable walking.

2. Provide Choices

People want variety in housing, shopping, recreation, transportation, and employment. Variety creates lively neighborhoods and accommodates residents in different stages of their lives.



Farmers' markets bring a community together, provide healthy food, and support the local economy.

3. Encourage Mixed-Use Development

Integrating different land uses and varied building types creates vibrant, pedestrian-friendly, diverse communities.



First-floor retail and commercial uses, like this restaurant at the base of an office building, contribute to street life.

4. Preserve Urban Centers

Restoring, revitalizing, and infilling urban centers take advantage of existing streets, services, and buildings and avoid the need for new infrastructure. This helps to curb sprawl and promote stability for city neighborhoods.



A former auto shop is converted to a neighborhood supermarket.

5. Vary Transportation Options

Giving people the option of walking, biking, and using public transit, in addition to driving, reduces traffic congestion, protects the environment, and encourages physical activity.



Bike lanes and sidewalks are important elements of transportation infrastructure.

6. Build Vibrant Public Spaces

Citizens need welcoming, well-defined public places to stimulate face-to-face interaction, collectively celebrate and mourn, encourage civic participation, admire public art, and gather for public events.



A small canal flows through the Lurie Garden at Chicago's Millennium Park.

7. Create a Neighborhood Identity

A “sense of place” gives neighborhoods a unique character, enhances the walking environment, and creates pride in the community.



The arch in Washington Square Park in New York City makes this an instantly recognizable place.

8. Protect Environmental Resources

A well-designed balance of nature and development preserves natural systems, protects waterways from pollution, reduces air pollution, and protects property values.



Wetlands help control storm water runoff in Ladera Ranch, California.

9. Conserve Landscapes

Open space, farms, and wildlife habitat are essential for environmental, recreational, and cultural reasons.



The Bay Trail waterfront promenade along Chrissy Field in San Francisco.

10. Design Matters

Design excellence is the foundation of successful and healthy communities.



Frank Gehry's amphitheater at Chicago's Millennium Park.

References and Resources

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AIA Regional/ Urban Design Assistance Team, www.aia.org/liv_rudat
Main Street Program, www.mainstreet.org
Mayor's Institute on City Design, www.archfoundation.org/micd
National Trust for Historic Preservation, www.nationaltrust.org
Project for Public Spaces, www.pps.org
The Townscape Institute, www.townscape.org

Mixed-Use Development

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Effective Planning for Regional Transportation

Atlanta Friends of the Beltline, www.beltline.org
Brookings Institution Metropolitan Policy Program, www.brook.edu/metro/
Car sharing: Flexcar, www.flexcar.com, and Zipcar, www.zipcar.com
Envision Utah, www.envisionutah.org
Smart Growth Network, www.smartgrowth.org
Texas Transportation Institute Urban Mobility Studies, mobility.tamu.edu/ums/
U.S. Environmental Protection Agency's Smart Growth Program, www.epa.gov/smartgrowth

Street-Saavy Design

Bikeability checklist, www.bicyclinginfo.org/cps/checklist.htm
Context Sensitive Solutions, www.contextsensitivesolutions.org
Pedestrian and Bicycle Information Center, www.pedbikeinfo.org
Walkability checklist, www.walkinginfo.org/cps/checklist.htm
Walkable Communities, www.walkable.org

Public Health and the Built Environment

Active Living By Design, www.activelivingbydesign.org
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Public Safety, Personal Security

AIA Disaster Assistance Program, www.aia.org/liv_disaster

The American Institute of Architects. *Handbook for Disaster Assistance Programs*. Washington, D.C.: American Institute of Architects, 1999. www.aia.org/SiteObjects/files/DAHHandbook.pdf

The American Institute of Architects. *Security Planning and Design: A Guide for Architects and Building Design Professionals*. Edited by Joseph A. Demkin. New York: John Wiley & Sons, 2003.

Federal Emergency Management Agency (FEMA), www.fema.gov

Florida Building Code (includes hurricane, glazing, and high-wind criteria), www.floridabuilding.org

The Illuminating Engineering Society of North America, www.iesna.org
Institute for Disaster Research, Wind Science and Engineering Research Center (Texas Tech University, Lubbock, Texas), <http://www.wind.ttu.edu/>
International Codes Council, www.iccsafe.org

Lower Manhattan Development Corporation (Urban Design Solutions for Lower Manhattan and Ground Zero), www.renewnyc.com

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National Crime Prevention Council, www.npcp.org

National Memorial Institute for the Prevention of Terrorism, www.mipt.org

National Institute of Standards and Technology, www.nist.org

New York City Local Law 26 of 2004 (addresses post-9/11 lessons learned for high-rise construction), www.nyc.gov/html/dob/html/code_update.html

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U.S. Department of Homeland Security, www.ready.gov

U.S. General Services Administration (See Public Buildings Service, Design and Construction), www.gsa.gov

A Sustainable Approach to Urban and Regional Development

AIA Committee on the Environment (COTE), www.aia.org/cote

AIA/COTE Top Ten Green Projects, www.aiatopten.org

AIA Roundtables on Sustainability, www.aia.org/liv_partnerships

AIA Sustainable Design Assessment Program, www.aia.org/liv_sdat

Beatley, Timothy. *Green Urbanism: Learning from European Cities*. Washington, DC: Island Press, 2000.

The Enterprise Foundation Green Communities, www.enterprisefoundation.org/resources/green

Green Infrastructure, www.greeninfrastructure.net

James, Sarah, and Torbjörn Lahti. *The Natural Step for Communities: How Cities and Towns can Change to Sustainable Practices*. New Society Publishers, 2004.

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Natural Resources Defense Council Cities & Green Living, www.nrdc.org/cities

U.S. Department of Energy, Smart Communities Network, www.sustainable.doe.gov

U.S. Green Building Council/LEED, www.usgbc.org

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