

EXHIBIT 3

PROPOSED AMENDMENT TO THE BROWARD COUNTY COMPREHENSIVE
PLAN (SUPPORT DOCUMENT)

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I. INTRODUCTION

- A. General. The purpose of the Urban Design Element (UDE) is to provide guidance on appropriate urban design that is context sensitive and sustainable while creating a greater sense of place.

Broward County is expected to grow significantly in the next 25 years. Currently, Broward County is close to built out with little vacant land available for new construction. It has a congested traffic system and conditions of urban sprawl that have acted to reduce community identity and sense of place. In order to accommodate the projected growth, given its current situation, Broward County will need to consider Higher Density Mixed-Use Development. Development that will need to address:

- Required densities for viable transit along transportation corridors, so that transit can alleviate traffic congestion.
- Housing that accommodates growth while supporting transit densities, so that affordable and variable alternatives are available in live, work, and play neighborhoods.
- Reducing infrastructure costs, commuting times and carbon footprints while helping to create community identity.
- Neighborhood design that creates easily walkable communities with the dynamic public amenities and parks and open space needed to build a strong sense of place and to attract the increasing demographic categories of childless couples, single parents and empty nesters.

However, the past has taught us that a program of strong Urban Design is crucial for successful higher density development. To address this crucial role, and to respond and plan for the future need for higher density development, Broward County has created an Urban Design Element for the County's Comprehensive Plan.

The plans and policies of the element address government activities and provide direction and assistance to the efforts of the private sector. The UDE Support Documents provide data and analysis used as the basis for the goal, objectives, and policies included in the UDE.

- B. Service Area. The planning service area for the UDE is all of Broward County. The regulatory service area is generally confined to the Unincorporated Area; however, for programs involving County Buildings, or County project involvement, municipalities may be included.
- C. Planning Horizon. For the purposes of the UDE, the short-term planning horizon is 2013, while the long-term planning horizon is 2018.
- D. Definitions. The following definitions are provided to assist in interpreting the UDE.

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Context Sensitive Design: Considers the needs of the users, surrounding areas and the environment to integrate a project into the context or setting of the area. It responds to the particular characteristics of a project and includes early involvement of the stakeholders and consideration of the natural, social, economic and cultural environment.

Crime Prevention Through Environmental Design (CPTED): a system of design and effective use of the built environment that can lead to a reduction in the incidence of crime. CPTED strategies rely upon influencing decisions before a criminal act is committed.

Functional Aspects of Design: how well a design functions is based on how well it fulfills its purpose. In the case of urban design it might be how well a mixed-use development creates an attractive and popular live, work and play environment.

Green Certification Programs: apply criteria and standards to the design and construction of buildings that conserve and protect the environment, increase profitability through energy efficiency and create healthier places to live, work and play.

Greenhouse Gas Emissions: the Earth's surface absorbs the Sun's energy and radiates this energy as heat. Greenhouse gases in the atmosphere absorb this radiated heat and in turn emit it in all directions, warming the atmosphere and causing global warming. One major greenhouse gas is carbon dioxide. Combustion of all fuels containing carbon (gasoline, natural gas, coal, diesel, wood, and propane) yield carbon dioxide which in turn absorbs and emits heat in the atmosphere causing global warming.

Mixed-Use Development: is the practice of allowing more than one type of use in a development area. In land use and zoning terms, this can mean some combination of residential, commercial, industrial, office, institutional, or other uses.

NatureScape Broward: is a strategy of landscaping that encourages the use of native plants to create Florida friendly green spaces that conserve water, protect water quality, and create wildlife habitat. Native species are uniquely adapted to South Florida and require little watering and are naturally pest resistant.

Overlay Zones: are land use zoning districts that define boundaries and overlay existing zones/boundaries to create specific areas with specific codes and regulations requiring specific treatment and control.

Parking Ratios: Is a standard that establishes the number of parking spaces required for a certain type of development use. Typically, for residential use this is given in spaces per dwelling unit, and for office or retail it is given in spaces per unit of square feet.

Passive Survivability: is a building's ability to maintain critical life-support conditions in the event of extended loss of power, heating fuel, or water, or in the event of extraordinary periods of extreme heat. Passive survivability includes features such as cooling-load avoidance, natural ventilation, a highly efficient building envelope, passive solar heating, natural day lighting, and onsite water collection and storage.

Sense of Place: The term sense of place is defined in different ways by different people. Generally, it is a feeling or perception of the characteristics of a place that make it special or unique, feelings that foster a sense of authentic human attachment and belonging.

Shared Parking: using a parking structure to serve more than one type of use, taking advantage of different use patterns to even out peak demand.

United States Green Building Council Leadership in Energy and Environmental Design (LEED): Rating system for green building design requiring a minimum of twenty-six points for a minimum LEED certification. Points are received for meeting different design criteria and standards. Categories considered are: sustainable sites, water efficiency, energy and atmosphere, materials and resources, indoor environmental quality, and innovation and design process.

II. DATA AND ANALYSIS REQUIREMENTS

During a 2002 Broward County Commission Goal Setting Session, it was determined that building a stronger sense of place was a priority goal for Broward County. To address this, funds were dedicated to creating a County-Wide Community Design Guidebook. The UDE is the result of condensing the Guidebook into some of the most important concepts and using them to form a written set of Urban Design priorities for Broward County.

Part II begins by addressing the Goal of the Element: Creating a stronger "Sense of Place" and community identity in Broward County through improved aesthetic and functional design. It then covers the categories of the four objectives of the Element.

- A. Sense of Place. The idea of what sense of place is and how design relates to sense of place is covered in Sections 5.1 through 5.13 of the County-Wide Community Design Guidebook (see Attachment 18-1Preface – Sense of Place) and provides the

basis for why utility, function, and form, together affect the quality of the built and natural environment and how five design categories constitute the plans of action that can connect us with a stronger sense of place. These five categories provide the basis for the four objectives of the UDE. The objective categories are as follows: Objective 18.1: Urban Design, Objective 18.2: Architectural Design, Objective 18.3: Landscape /Open and Green Space Design, 18.4: Transportation Design and Environmental Graphic Design.

- B. Urban Design. The concepts and principles of Urban Design are covered in Sections 3.1 through 3.34 of the County-Wide Community Design Guidebook (see Attachment 18-2 Design Principles – Urban Design). Topics covered include; density transitions, proportions and massing conducive to public space, context-based development patterns, pedestrian and transit oriented compact mixed-use development, and the principles of Crime Prevention through Environmental Design (CPTED). More information on CPTED can be found in Attachment 18-8, An Overview of Crime Prevention through Environmental Design.
- C. Architectural Design. The concepts and principles of Architectural Design are covered in Sections 5.1 through 5.20 of the County-Wide Community Design Guidebook (see Attachment 18-3 Design Principles – Architecture). Topics covered include; architecture that responds to the climate and character of an area, pedestrian and transit oriented design, and green design certification programs. More information on green certification programs are contained in Attachment 18-7, An Overview of Building Green. Information on the United States Green Building Council's Leadership in Energy and Environmental Design (LEED) can be found by visiting www.usgbc.org.
- D. Landscape/Open and Green Space Design. The concepts and principles of Open and Green Space Design are covered in Sections 4.1 through 4.17 of the County-Wide Community Design Guidebook (see Attachment 18-4 Design Principles – Landscape Architecture). Topics covered include; landscaping that defines urban space, protects the environment, conserves water, and creates sense of place by using species that are iconic symbols of the area. The encouragement of the principles of NatureScape Broward are also covered. More information on NatureScape Broward can be found at www.broward.org/naturescape/welcome.htm.
- E. Transportation Design and Environmental Graphic Design. The concepts and principles of Transportation and Graphic Design are covered in Sections 2.1 through 2.33 and 6.1 through 6.17 of the County-Wide Community Design Guidebook (see Attachment 18-5 Design Principles – Transportation and Attachment 18-6 Design Principles – Environmental Graphics). Transportation Design Topics covered include; multimodal transportation systems, road systems designed for pedestrian and bicycle safety, corridor section drawings, transit stops designed for the climate, and context driven corridor design. Environmental Graphic Design Topics covered

include; wayfinding systems that are legible, context sensitive, pedestrian friendly and that create community identity and help promote sense of place. Further principles of wayfinding systems are contained in the document titled Broward County County-Wide Wayfinding Report and can be found at www.broward.org/planningservices/wayfindingreport.pdf.

III. IMPLEMENTATION

A. Authority. This section briefly describes the legal authority and responsibilities for those County agencies charged with implementing the Urban Design Element.

1. The Broward County Planning and Redevelopment Division (PRD). The PRD was established by Section 8.30 of the Broward County Administrative Code and is responsible for implementation of the objectives and policies of the UDE. Several redevelopment programs conducted by the PRD will be used as vehicles of implementation, including the Transit and Housing Oriented Redevelopment Program (THOR) and the Urban Design Center. A UDE interdepartmental implementation team will also be established to carry out the objectives and policies of the UDE.
2. The Broward County Metropolitan Planning Organization (MPO). The MPO was established by Section 8.17 of the Broward County Administrative Code and is responsible for providing transportation short and long range plans that will help shape the implementation of the UDE. The MPO will also partner with the PRD as an active member of the implementation team and to help develop design concepts for transit infrastructure.
3. The Broward County Transportation Department (TD). The TD was established by Section 15.1 of the Broward County Administrative Code and is responsible for partnering with the PRD and MPO as an active member of the implementation team and to help develop design concepts for transit infrastructure.

B. Programs. This section discusses programs being carried out by the Broward County Planning and Redevelopment Division that will act as vehicles to implement the objectives and policies of the UDE in the following ways.

The PRD will establish, by December 2009, an UDE implementation team represented by the Broward County MPO, Broward Transportation Department, and other pertinent County Departments and Divisions. This team, among other things, will coordinate the efforts of various government agencies to carry out specific interdepartmental element policies, such as, an implementation program for pedestrian friendly intermodal transit infrastructure.

The team will also be responsible for compiling a list of developers and municipal contacts to be used in establishing a series of meetings or workshops to address the creation of design review criteria and checklists that can be used as aides and guides for the review of development design and proposals. These meetings will also discuss the creation of incentives and bonuses that will be effective in obtaining voluntary design review participation. The incentives, bonuses and review criteria will also address Green Certification and the implementation of NatureScape Broward. The team will establish recommendations for design review criteria and incentives by December 2010, with determination on adoption of recommendations by December 2012.

The following PRD programs will provide real life examples to apply the principles and gage the effectiveness of the implementation of the UDE objectives and policies.

Transit and Housing Oriented Redevelopment Program: THOR is an initiative to address quality of life concerns. It is a multi-disciplinary strategy to create vibrant, livable transit corridors throughout Broward County. The THOR team will develop planning strategies to improve transit, increase housing options, and encourage redevelopment along transit corridors. The team will conduct studies, identify opportunities, and develop and implement corridor plans. The development and implementation of these plans will provide an avenue for the implementation of the objectives and policies of the UDE.

Urban Design Center: the urban design center offers a broad range of services designed to develop and assess potential development sites and scenarios. As develop sites are designed, urban and architectural design principles to be established as part of the UDE, will be used to review the quality and effectiveness of the design.

As projects are developed and reviewed by the County or municipalities; in the County's instance, primarily through the THOR program or the Urban Design Center, the soon to be established review criteria will be used to evaluate proposals, make recommendations and check the design in regard to development codes, ordinances, regulations, green certification, and NatureScape Broward principles. Findings of non-compliance will then be evaluated versus desired design outcomes with the following alternatives considered:

- Amendments to code.

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- Land use and zoning amendments, with consideration given to mixed-use zoning and land use categories that are in-line with the principles and priorities being encouraged by the element.
- Variances to code.

Upon determination of the best alternative, implementation of the amendment or variance process will be considered.

The THOR and Urban Design Center plan development and implementation process will also be used to:

- Explore incentives that would encourage design review participation.
- Implement urban design priorities, such as, development along transportation corridors that is compact, mixed-use, context sensitive and pedestrian friendly.
- Further design and implement multi-modal pedestrian friendly transit infrastructure while addressing other roadside design issues.
- Promote NatureScape Broward principles and construction that is certified green.
- Further integrate land use, transportation planning and way-finding information systems.

ATTACHMENT 18-1

Preface – Sense of Place.

Chapter A-5, Broward County County-Wide Community Design Guidebook

Attachment 18-1 can be found on the attached disk.

What is sense of place?



The sign on this big box retail store on State Road 7 encourages customers to shop on-line. The placelessness of the highway culture ultimately moves into cyberspace.

Defining sense of place is difficult because of its intangible nature. It has more to do with perception, memory, associations and recollections -- all of which we receive through our senses -- than with images, styles, or hard fact. You typically “know it” when you see it, or sense it. Paris, New Orleans, or Taos, New Mexico are all known for having a strong sense of place, primarily because of the intense identity each city evokes, though it’s hard to put the essence of each into words.

Different experts define sense of place in different ways. Author and urban theorist Kevin Lynch correlates “sense of place” with “identity” stating that sense of place is “the extent to which a person can recognize or recall a place as being distinct from other places” and possesses “a character of its own.”

J.B. Jackson, a pioneer in the field of landscape studies believes that a sense of place is something that we ourselves create in the course of time.

And Edward Relph, author of *Place and Placelessness*, says “Place is a form of awareness of space perception,” and further calls it “a product of the lived-world experience.”

As Broward County embarks on its mission of creating a unique sense of place through new development and redevelopment efforts, this Guidebook will attempt to provide criteria for aiding the designers in their efforts. And through these endeavors, and in the ‘course of time,’ create a powerful county-wide identity and, in doing so, a true sense of place.

How does design relate to a sense of place

Creating a sense of place makes a distinction between style and design. It’s not about giving something motif, using a certain color pallet or building in a specific genre. A local sense of place emerges when designers take their cues from the climate, the weather, the environment, and the human culture of a place.



Details are important at the slow pace and scale of the pedestrian. The use of polystyrene plastic foam in places where people come into contact with buildings promotes a false impression and does not hold up well.



More attention to detail is needed for successful pedestrian environments, such as this pavement detail in Berlin, Germany. Authentic materials provide a tangible sense of quality.

A sense of place is connected to design in the way we create environments over time, through convention or invention. In the broadest sense there are two general categories of place: local and global. While both natural and man-made environments are manipulated to serve the needs of the community, the natural and man-made conditions peculiar to a specific region or community can be emphasized, sublimated, or eliminated by design. Consider the difference between experiencing the driving through a town on the highway, versus the experience of going through an authentic town street or square on foot. Consider your perception of the local franchise outlet architecture, versus architecture of a building adapted to the local climate. The global place is determined by convention: national and international standards that tend toward uniformity and predictability, while the local place is determined by invention: adaptations informed by deeper understanding of the local context tend toward creative solutions and diversity of responses to a common set of conditions.

How does a sense of place relate to design? There are various approaches to how we might set about designing the built environment, whether building for public or private investment. There are various impulses that guide this process. Some designers lead through invention and innovation by pulling these diverse streams together toward some objective or use. Others are guided by conventions and strategies that take into account only the information needed to address a specified set of requirements.

The design process is, by its very nature, dependent on a broad set of diverse streams of information, ultimately converging to form an ordered framework of responses. The process typically begins with what appears to be a chaotic mix of information and insights out of which organizing principles or ideas emerge. In the best scenario, the information resources are broad and inclusive, from historical precedent, program, and community goals and desires; to functional criteria, knowledge of materials, physical site data, codes and standards. The visionary component of the design process lies within the ability to imaginatively see the value of untapped resources and the possible combinations or intersections of many streams of information.

“A great city has two hallmarks: tolerance for strangers and intolerance for mediocrity.’These...also happen to be qualities conducive to innovation, risk-taking and the formation of new businesses.”

-Bonnie Menes Kahn,
Cosmopolitan Culture: The Gilt Edged Dream of a Tolerant City. (Florida, 227)



Native oolitic limestone is used on this site wall, capturing a sense of place.

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The connection between our need for a sense of place and identity and the design of the built environment requires design to be viewed as a creative process. There are three contexts that must be considered when designing to achieve a unique sense of place:

- the environment (climate and land)
- the transportation systems
- the community (history, culture, people)

Tie the three contexts together, and the built environment will take on a much stronger identity and sense of place.

The connection with the environment

Between sawgrass and seagrass, the natural environment and the built environment provide the setting for our lives in Broward County. Several dominant characteristics of our natural environment are associated uniquely with our area: the extensive network of waterways; the ocean and the river of grass that define our latitudinal boundaries; our luxuriant and pervasive vegetation; our dramatic cloud formations and sunsets; and the presence of abundant and intense sunlight. Our subtle seasonal changes and cycles of hurricanes also demand specific design responses and adaptations. Not only do we identify these natural characteristics with Broward County, they become fertile resources for developing new ideas and opportunities for design, culture, and commerce.

Most of the built environment of Broward has lost a connection to the natural environment and to evoking a sense of identity. As the history shows, our landscapes have been taken over by wider roadways, by strip shopping centers that house “big box” stores that can be found anywhere. Or they’re built with generic plans that can work anywhere, and the asphalt parking lots and endless row of strip malls all start blending together and result in only “placeless” areas. This type of built environment is all a reaction to the prevalence of an auto-centric society, and the lack of connecting back to the environment.

On the other hand, the relatively few places we have left that are considered ‘authentic’,

“The structure of a human settlement rests on a three-legged stool of politics, economics, and transportation...of these transportation is the most visible and active. It’s a simple rule: How we get around determines how we live.”

– Alex Marshall



The distant views above the tree canopy are one aspect of our sense of place in the environment.

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especially our historic buildings and established older neighborhoods, have now grown in value. We have a stronger connection with these areas, feel a stronger identity and, therefore, place a higher premium on their value to us. Authenticity is also felt in places where local culture thrives: venues for the local music and art scene, local cafés and bookshops, restaurants, bakeries, and local stores that are not associated with national chains or franchises. A sense of place is keenly felt, for example, at some of Broward’s landmarks including the Bonnet House, Stranahan House, Everglades Holiday Park, and Cap’s Place.

There can be an analogous relationship between the built and natural environment. The great beauty of the Everglades is in its subtlety. To be sure the dramatic vista of a vast sky and endless horizon is one aspect of the experience, but there is another view more intimate and as intensely beautiful: in and among the low-lying vegetation and beneath the canopy of the cypress forest. Here the subtle beauty of South Florida’s natural environment emerges, with wild orchids reflected in the mirror-flat waters. There is a deliberate, slow pace of movement in this environment and the surprising effects of a flash of sunlight, or coming upon a dry, shaded refuge in the swamp are definitive indications of place in the natural environment.

Similarly in the built environment, the drama of an urban skyline and the distant views above the tree canopy are one aspect. The other aspect, more subtle, but perhaps more crucial to our everyday experience, is the notion of the small-scale, in-between spaces, characterized by shaded refuge and contrasted with sunlit courtyards, explosions of color, and intimate places created around a single banyan tree, or situated along the edge of a waterway or canal. The deliberate, slow pace of movement is natural to hot-humid environments, therefore the attention to detail and the small scale are essential to the task of local design.

The transportation connection

Transportation is perhaps not the first thing one thinks about when describing a sense of place. Yet it is the quality of access, diversity and interaction between people that can make a community stimulating and alive. The vibrant life of the street and the public realm is



East Las Olas Boulevard in Fort Lauderdale accommodates pedestrians, cars, and buses within a narrow street section.

one where arts, music, commerce, culture and people from all walks of life converge. It is fundamentally reliant on orientation, access, navigation, and a sense of control afforded by optimized pedestrian mobility. We are most at ease and natural in our movement from place to place as pedestrians. Throughout Broward County the sidewalk must be viewed in its full complexity, as a vital access way to support commerce and exchange as well as an extension of the park, providing a necessary link to the natural landscape. In areas that are rural or suburban in character, the environment of transition between vehicles and places deserves greater attention.

Broward County is rich in diversity and has been historically and advantageously tolerant to newcomers. The indigenous character of multiuse urban neighborhoods relies on a viable transportation network, including high-quality pedestrian and transit options serving a diversity of exchanges that can occur within a community. As we create a more pedestrian and transit-oriented environment, through redevelopment, we can allow for greater propinquity, or nearness in place and time between the various uses as well as to the natural environment. Our transportation system can consist an increased diversity of mobility choices as people and companies coalesce to form centers that fuel economic growth and embody the unique identity of each community.

Multi-modal transportation

Driving has become a matter of necessity rather than choice in Broward County. Thus, many who cannot drive due to age, ability, or income are at a distinct disadvantage. The benefits afforded by improving the transit and pedestrian environment are clear: a higher density of activity per linear foot of street is achieved with an enhanced pedestrian environment. Pedestrians arrive to the street in four ways:

- walking from a nearby location, or drop-off point;
- by car, parking in a consolidated parking facility (a lot or a structure);
- by transit, bus, tram, trolley, or light rail;
- by bicycle.

The most successful and economically sustainable places share a common characteristic: they are multi-modal, the pedestrians arrive via a combination of all four.



Corridors designed mainly for cars have less efficient carrying capacity and create a bland character.



Multi-modal corridors can carry higher volumes of people more efficiently and create a lively character.

Those places we consider alive with activity, places we want to visit and enjoy also share other characteristics related to transportation. For example two local streets, Las Olas Boulevard and Harrison Street rely on a combination of elements, including parallel on-street parking, shared off-street parking, multiple access points to and from a mainly non-hierarchical grid of surrounding streets, a variety of uses within walking distance: including residential, retail, office, parks and community uses; pedestrian amenities such as covered passageways, continuous sidewalks, and articulated crosswalks, and a reduced number of driveway access points from the roadway for cars.

Motion and perception

Our ability to perceive the environment is affected by the speed of our movement through space. Thus, when we are traveling in a car, the primary sense of our environment is through sight. The faster we move at longer distances, the less we perceive at the detail scale; conversely, the slower we move at shorter distances the less we perceive in the large scale. The significant corollary to this is that the faster we move, the narrower our field of vision. All the other senses in addition to sight are picking up the artificial environment of the interior of the car.

Large-scale forms and patterns are readily perceived at higher speeds. The development of roadside signage and the architecture of the strip are instructive. As more people have taken to cars for transportation, even buildings have become signs. In the early 1950s McDonalds™ was one of the first roadside restaurant companies to recognize the significance of this design strategy, and set the precedent for all roadside franchises from IHOP™ and Pizza Hut™ to Pollo Tropical™. At the scale and speed of motorists, the color, massing, shape and form of the building have become a form of branding, if not the logo itself. If the mansard roof of the fast-food franchise functions as a sign, it can then be separated from any functional or spatial relationship with the restaurant kitchen, dining room, or interior program. The big-box retail trend has reduced architecture to function more as a sign in the public space.

The design of the environment adapted to suit the vantage point of motorist is explored in Venturi, Brown, and Izenour's seminal book *Learning from Las Vegas: The Forgotten Symbolism of Architectural Form*.



A sense of place can inform design as seen in this award-winning linear park at a water treatment facility in Bucaramanga, Colombia.

By contrast, in the pedestrian realm we perceive much more because we are not in a car. We are moving in a place rather than between places. We experience a place with our whole body. Various studies have described these as the 'kinesthetic' or 'haptic' sense of place integral to wayfinding and our feeling of control in the space as we move through it. The main advantage of the pedestrian experience is in the ability to control movement through space, the freedom to stop and engage with the surroundings, or to select alternative paths towards or away from a place. The visual experience of the motorist is described in Appleyard, Lynch, and Myer's classic *The View from the Road*.

Most of the environment of Broward County has historically been designed for motorists. However, design responding to the more discerning and prolonged attention of pedestrians is needed. (Carmona, et.al. 135)

More detailed design utilizing high-quality materials can result in less taxpayer expense in maintenance, more long-term value, a positive memorable perception of place, an increase in surrounding property values, enhanced workforce mobility and a sustainable urban environment.

The community connection

Finding the appropriate expression to the guiding forces of character and identity is a matter of understanding the cultural and lifestyle realities of the diverse communities of Broward County. The community design process is a fundamental tool for realizing the goal of making Broward more attractive by harnessing the focus of these artists, designers, and general community, a vital resource of thinkers, problem solvers, and visionaries. Artists and designers help to provide an effective focus on discovering and clarifying the authentic character of a community and its environment. Their involvement in the life and affairs of the community can establish and validate a design response that is tied to an authentic local sense of place. Thus, community participation in a dialogue with designers must be broad and inclusive, yet must be focused on the issues that affect and influence design, such as the infrastructure, particularly at the scale of neighborhoods. Effective creativity can be cultivated within a community through the design process. This is most beneficially done by recognizing the relevance and influence of local resources to provide

“The Asian, African American, and Hispanic populations present major business opportunities that are first driven by retail. That stimulates revitalization and can be followed by vertical residential and some office space.”

-Samuel Marrasco,
President of LandGrant (May)



The open air market in Margate is a multi-cultural experience.

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a focus for innovation and an effective bridge between the designer’s expertise and local knowledge.

Local heritage

The image of a city also depends on myths, which are consolidated over centuries. (Nigro, 124–132) The stories connected with our landmark sites all form part of a larger narrative of our people and places. We can come to know our heritage through sites such as Cap’s Place Restaurant, the Stranahan House, or significant archaeological sites such as the Tequesta Mounds in Weston, and many other sites throughout Broward County, in order to build connections and share our story.

Tropical architecture comes in a variety of styles, but what is universal among them is a clear understanding of the nature of the weather and climate. The skin of the building, like the clothing we wear, can protect us from the heat and the torrential rain, and it can also be designed to breathe, to allow us to live in comfort. It may come in a variety of styles, but it must also satisfy the requirements of function and usability.

One of the most innovative periods in Broward County’s architectural history occurred during the mid-twentieth century. A new optimistic spirit, fueled by rapid advances in technology and transportation, led to an expansion of the population toward a new vision of the city advanced by industrial, architectural and transportation designers, and planners. This vision of the city, exhibited to enthusiastic crowds at the New York World’s Fair of 1939, was characterized by individual transportation, a settlement of the land dispersed upon a naturalistic landscape, and an open, light-filled architecture. The local innovations in design, developed in the mid-twentieth century, followed four general themes: a connection with the landscape, native materials, climate, and a new aesthetic. These innovations and themes serve as the foundation for the four context-driven design principles developed for this Guidebook.



Old development patterns meet the new in older eastside communities of Broward County.

Context-based design

The realms of utility, function, and form together affect the quality and the value of a product: whether it be a chair, a lamppost, a sign, a building, or a city. The intersection and ultimately the unity of these three realms is resolved through design activity. The actors engaged in this activity can be generally categorized into five professional design systems: Transportation Design, Urban Design, Landscape Design, Architectural Design, and Graphic Design. Taken together these five systems constitute the plans of action to be taken on our natural and built environment, which can connect us with an authentic sense of place. While these five systems are indeed interdependent, they are often practiced independently from each other as design activities that are resolved either through negotiation or a rigid application of a particular set of uniform standards. Neither results in the creation of places because the focus of each of the systems is framed around consideration of a specific set of criteria, and holistic awareness of the whole environment is rarely considered. In order for wholeness to be achieved, each design system must be guided by a set of overriding principles established by the community design process.

Conventional design versus context-based design

Conventional design approach tends to be prescriptive, applying patterns, formulas, and templates to a local set of conditions. When competing criteria create conflict, the result is often a compromised solution.

Context-based design differs from conventional design in that it localizes design criteria for a specific area, corridor, community, or neighborhood. Context-based design begins with an assessment of local conditions and seeks the optimal solution based on performance criteria. Context-driven design requires the active engagement of design professionals: traffic engineers, transportation engineers, urban designers, landscape architects, architects, graphic designers, and others; who bring their professional expertise and judgment to bear in achieving criteria based on a common set of principles.



The dramatic expanse of Broward's sky is part of the experience of place.



Concrete street pylons, once the norm, provided a practical and hurricane resistant form of wayfinding.

Design systems that reveal our sense of place

To respond to Broward's unique sense of place, local design activity can develop according to four general criteria:

1. Connection with the natural landscape.
2. Use of indigenous materials.
3. Design for the climate.
4. Integration of multiple modes of transport.

Seven Stages of Place Experience

The experience of a place can be described in seven stages of engagement or movement. (Adapted from Williamson, 80-84)

The first stage: orientation, occurs prior to approaching a place or community. This stage in place experience is anticipatory, based largely on perceptions, memories, or perhaps knowledge of stories about a place.

The second stage: approach, describes the moments leading up to actually entering a place or community. The experience of approach is characterized by the mode of transportation used. This initial awareness or recognition of the destination offers the first suggestion of the character of the place. During this stage of place experience a preliminary assessment of the place as favorable or unfavorable may be influenced by what is revealed on approach, whether by land, air, or sea.

The third stage: threshold, is the moment of entry. During this stage identification of place and a sense of crossing a boundary, and awareness of having entered a community or place may be experienced. Discernible cues, such as signage, materials used in the public space, roads, local architecture, and landscaping provide clear indication of having entered a distinctive place or community.

The historic buildings of Broward County represent a diversity of local architectural styles, each reflecting their unique adaptations to local climate and the locally available building materials and technology of their time. It is important to recognize that “style” represents a way of doing, and the authenticity we attribute to any particular style is connected with the value of a building that can teach us about the way of life, construction, or design of past generations.

Some styles that represent Broward County’s diverse architectural and built heritage include:

- Frame Vernacular
- Masonry Vernacular
- Neoclassical
- Craftsman or Bungalow
- Mediterranean Revival
- Art Moderne
- Art Deco
- Hybrid Mediterranean Revival-Art Moderne
- Mid-Century Modern
- Tropical-Regional Modern
- Tropical Minimalism

The fourth stage: arrival, describes the sense of having entered the center of a place or community. The notion of center is necessary to differentiate a place from its periphery, or edges. The center can be a cultural and commercial core, or an historic main street, or civic plaza or green. The sense of arrival is usually coincidental with information necessary for making a decision about where to park, get off the bus, or exit a transit station, in order to get to a destination.

The fifth stage: docking and way-finding, describes the transition from being a motorist or passenger to becoming a pedestrian. Whether or not the access and circulation patterns of a place are easy to portray in a ‘mental map’ will determine how much way-finding and orientation information are needed for a better understanding.

The sixth stage: circulation, describes the experience of the stroll, the search, the walk from place to place. This is perhaps the most crucial stage as it involves a careful coordination of design from sidewalks, street and public furnishings, crosswalks, landscaping, architectural facades, entrances and interiors, and signage and graphics. Movement and circulation will depend on the optimal mix of comfort, security, and stimulation. This phase is not solely influenced by the design of the physical environment, but by the coordination and quality of business and commercial activity, and a feeling of spontaneity and authenticity generated by a diverse mix of local culture: art, music, performance, cuisine, handcraft.

The seventh stage: departure, is facilitated by awareness and ability to leave by the most convenient means. An easy and seamless departure experience will reinforce a positive impression of a place or community. This stage of place experience will ultimately affect the memory of a place, taking the form of a combination of a special landscape, an architectural feature, clear signage, or public art. The departure sequence starts with orientation toward the boundary, approach to the threshold, and ultimately exit from the place or community. Just as a clear signification is made of entry, exit is an important part of the experience of place.



An outdoor cafe becomes a pocket park at this intersection in Bogotá, Colombia.

Key attributes of successful places

	ATTRIBUTES	INTANGIBLES	MEASUREMENTS
COMFORT AND IMAGE	safety charm history attractiveness spirituality	sittability walkability greenness cleanliness	crime statistics sanitation rating building conditions environmental data
ACCESS AND LINKAGE	readability walkability reliability continuity	proximity connectedness convenience accessibility	traffic data mode split transit usage pedestrian activity parking usage patterns
USES AND ACTIVITY	realness sustainability specialness uniqueness affordability fun	activity usefulness celebration vitality indigenouness 'native' quality	property values rent levels land-use patterns retail sales local business ownership environmental data
SOCIABILITY	co-operation neighborliness stewardship pride welcoming	gossip diversity storytelling friendliness interactivity	street life social networks evening use volunteerism number of children, and elderly

SOURCE: Adapted from Carmona, Heath, Oc, and Tiesdell. *Public Places Urban Spaces* (p.100)

ATTACHMENT 18-2

Design Principles – Urban Design.

Chapter C-3, Broward County County-Wide Community Design Guidebook

Attachment 18-2 can be found on the attached disk.

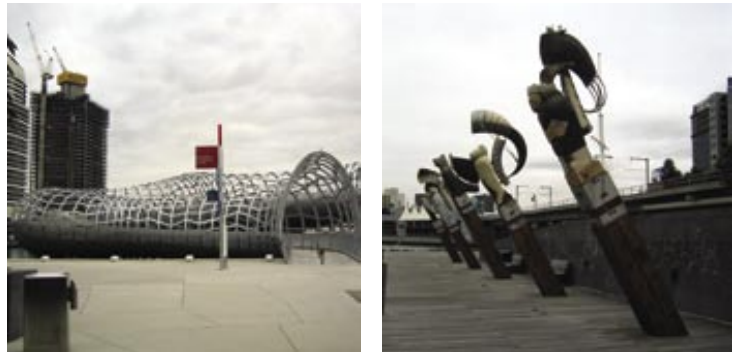
Expect and demand high quality design

High quality design has throughout history linked natural attributes to buildings and public spaces of endearing and memorable beauty. Thus, the knowledge of Broward's substantial natural charm and its unique relationship to waterways should reasonably lead to new and retrofitted facilities worthy of world-class attention.

Redevelopment and improvements to our public infrastructure can be designed to meet current and future needs for creative flexibility, universal accessibility, and the assertion of local identity. Recognizing the diversity within the built environment of Broward County in its urban and suburban contexts it is best for the designer not to impose one theme or set of themes, but rather link consensus based policy with best-practices technical expertise. Most importantly, the community can make the commitment to implement the highest quality design. The ability to distinguish between good design and mediocrity is a critical factor in selecting and working with designers. Being able to communicating high expectations and design standards comes with experience and understanding of the essential role of the designer in defining opportunities and creative problem solving.

considerations

- Use design competitions to encourage innovations, discover new talent, and draw attention to possible design solutions and visions.
- Use high quality materials where people touch buildings: entrances, walkways, storefronts, canopies.
- Buildings should be constructed to be as maintenance free as possible.
- Aim for sustainable design with building life spans 75 years or greater.
- Design for flexibility in program and use so that buildings can adapt to new occupants over time.
- Consider structural grids and floor-to-floor heights for a variety of uses.
- Discourage the use of Styrofoam moldings and ornament below 18'



An aboriginal lobster trap inspired this pedestrian bridge linking new high-rise residential development to the central business district across the river in Melbourne, Australia (above left) has become an international attraction.

A row of whimsical bowsprits at this riverside dock on the Yarra River (above right) point the way toward that city's new convention center while celebrating the town's maritime history.

“Similar to investment in culture, investment in design benefits every citizen, business, and visitor... improves its competitive position for corporate and government relocations, enhances real estate values, and advances its value as a tourist destination.”

-Broward County Seagrass to Seagrass, Identity/Vision Committee Report, 3

As the county grows it is increasingly important to create compact community cores that are lively, accessible centers of activity.

Creating walkable cores will reduce our reliance on automobiles and create the pressure necessary to support mass transit, further reducing reliance on automobiles

considerations

- Encourage pedestrian oriented design where living, working, shopping, leisure, culture, and entertainment can be reached by a choice of transportation modes.
- These centers should be set away from the high traffic corridors which are not conducive to pedestrian activity and rely on higher speed and unimpeded flow to function properly.
- Centers should be accessible from the arterial network and interconnected via a transit/pedestrian overlay.
- The maximum comfortable walking distance in our hot-humid climate is between 0.5 and 1 mile, or between 5 to 20 minutes.
- Consider developing community cores away from major arterial intersections and develop transit links between cores.
- Consider the relationship of a greenway or waterway running adjacent to or through a community core to enhance a local sense of identity.
- Provide safe and convenient walking and bicycle access to the community core from existing surrounding neighborhoods.
- Consider a school, library, government center, community center, or cultural institution as an anchor to the community core.

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Create pedestrian oriented community cores



Diagram of the community core concept to create a network of pedestrian and transit oriented centers integrated with surrounding tapestry of communities, parks, greenways, and waterways.

Permeability allows us to see through or walk through a building or a city block. As the cost of land goes up, the need for a more efficient, multi-functional utilization of space becomes paramount. This process applies not only to private land, where the value of real estate can justify lower or higher densities, but also to public rights of way. The design of the streets, infrastructure, buildings, and gardens must function to accommodate a variety of more efficient modes of transportation such as pedestrians and mass-transit.

Existing buildings and their associated landscape can be retrofitted for enhanced pedestrian/transit access, while buildings still in the planning stages can easily meet even more exacting guidelines for accommodating the pedestrian and public transport and a balanced dispersal of people moving through the city.

considerations

- Develop a network of interconnected public breezeways, courtyards, and small plazas.
- Encourage design strategies that provide shaded places and pocket parks around existing trees.
- Provide public spaces and interconnected pedestrian accessways in large building developments that fill entire city blocks or assembled parcels with frontages greater than 300'.
- Commercial and residential buildings (known as 'fabric-buildings' because they constitute the fabric of the city) can be designed to frame views to public monuments, landscapes, waterways, and cultural, religious, or institutional buildings (known as 'object-buildings' because they are considered landmarks in the community).

Build physical and visual permeability



Fine-grained urban blocks are smaller in size, allowing a more permeable environment. These are characterized by a high degree of pedestrian accessibility, or achievable interaction between individuals and uses through and within a pattern of urban blocks and right of way network. The Las Olas Boulevard area between US-1 and the Las Olas Isles in Fort Lauderdale (above left) still retains some of its original urban structure of passageways and breezeways connecting the street frontages with mid-block parking areas and open spaces. This pattern of interconnected arcades and passageways between buildings once permeated most of downtown Fort Lauderdale until the early 1970s.

A space for a tree in a large scale development (above right) provides visual permeability and even a sense of wonder. Course-grained urban blocks are larger in size, offering fewer choices, and characterized by dead-ends and discontinuities. These block types have fewer physical access choices. Thus, based on the general goal of providing an appropriate balance of visual and physical permeability and accessibility, good urban design can provide a prudent measure of both course grained and fine grained blocks, taking into account the myriad of environmental, economic, and aesthetic factors that help to shape the decisions of community stakeholders.

Create a density gradient around centers

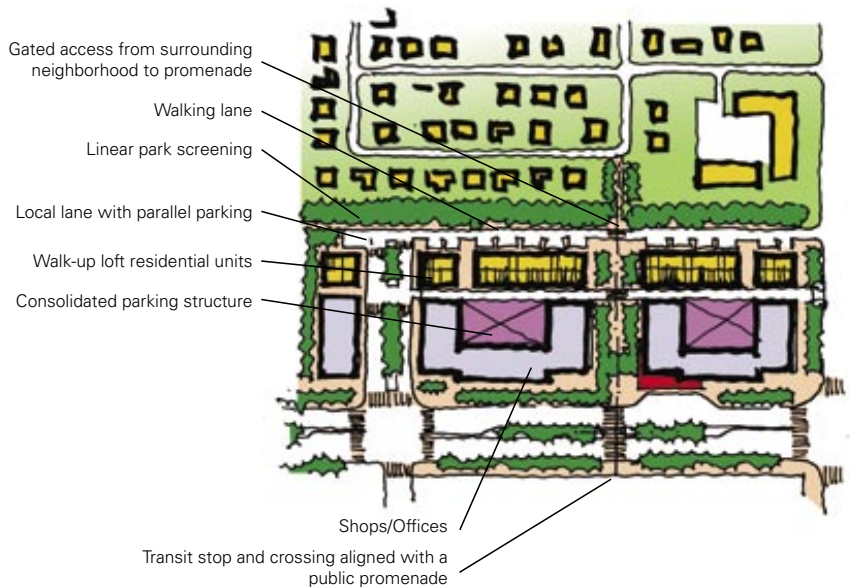
A density gradient can buffer neighborhood edges with a gradual increase in residential density around commercial centers.

While people may enjoy the convenience of having shops and services within walking distance, they still desire the quiet and green environment of an urban residential neighborhood.

A density gradient can provide the transition from single family residential to low to mid-density multifamily around a commercial center.



The historic neighborhood of Colee Hammock in Fort Lauderdale transitions from single to multifamily housing and mixed-use in combination with professional offices extending along the avenues as they approach the commercial uses along Las Olas Boulevard.



Urban massing and building forms can shape public spaces or create a gateway.

Architecture can follow an urban pattern, as building blocks to form urban spaces. Large scale urban spaces can be conceived and envisioned in such a way that piecemeal growth and development completes the picture. A consistent pattern of approach for shaping the public spaces is necessary for a sense of wholeness to emerge.

For example a system of plazas, courtyards, and passageways, both public and private, would begin to generate a pattern of outdoor rooms at various scales throughout a town or city.

considerations

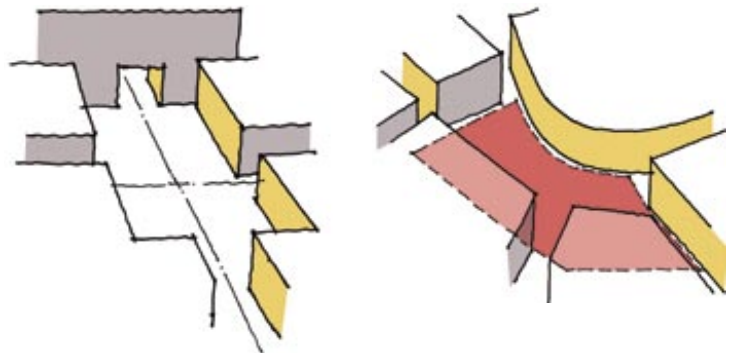
- Public properties, including small parks can be reinforced by the surrounding architecture.
- Buildings can arch across a road or passageway to mark an entrance into a public space, plaza, or courtyard.



An outdoor cafe and a connecting passageway shaped by urban massing and building forms in Amsterdam (left) and West Palm Beach (right).

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Use urban massing to shape public spaces



Urban massing and building forms (above left) can shape public spaces or create a gateway.

Building heights, set-backs, build-to lines, and massing are tools that can be used in any urban design strategy to shape public space (above right).

Landmarks and monuments such as clock towers, bell towers, and other civic focal points are an integral part of a community wayfinding system. They establish a point of reference, and provide an amenity that gives the community a sense of place.

Such urban markers can establish the location of places aiding in orientation and punctuating the place of arrival. Urban markers, along with the public spaces and a fabric of active uses are integral and complementary components of vital communities.

considerations

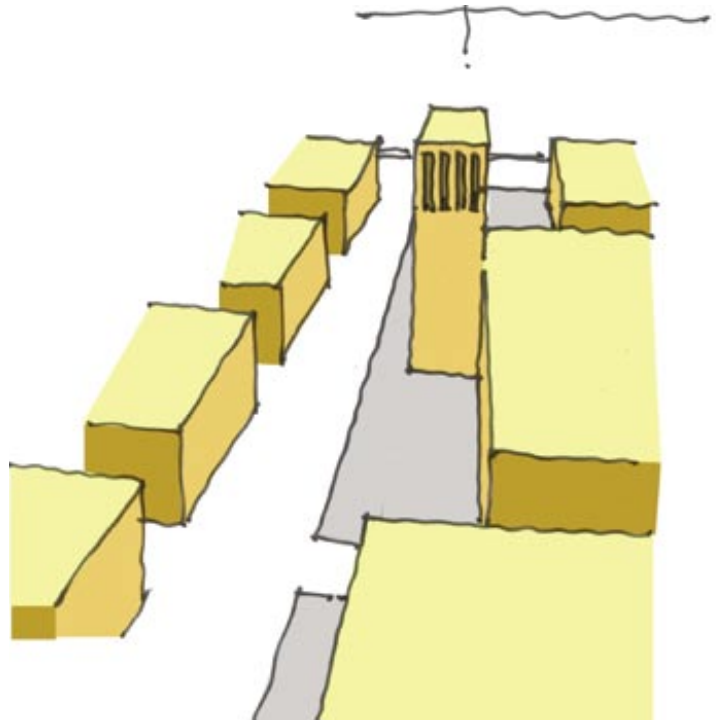
- Integrate urban markers into the design of public buildings such as town halls, public assembly halls, and transit stations.
- If there is a belltower or clocktower in the community, consider the possibility that it serve as an urban marker, and frame views of it as part of a community wayfinding system.



A monument marks a place in central Edinburgh, Scotland (above).

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Identify urban markers

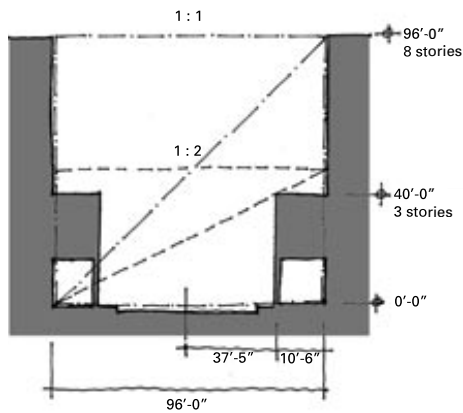


Urban markers, in the form of towers and vertical monuments, can provide powerful wayfinding elements in the built environment.

The sense of enclosure in a public corridor space is a function of the height of the buildings that shape it.

The optimum proportions of building height to corridor width are between 1:1 and 1:2 in urban areas.

Ratios of 1:4 or greater give a weak sense of enclosure, and the view of the sky become dominant.



Example of a corridor proportion guideline for a downtown district.

considerations

- Design the building height to corridor proportion between 1:1 and 1:2 for legible and coherent corridor definition and place making.
- For suburban environments, corridor proportions up to 1:3 are preferred.

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Proportion the space of the public corridor



The proportions of the Rosemary Street redevelopment in West Palm Beach ‘feel’ right (above left). A simple analysis shows the sense of enclosure achieved with a ratio between 1:1 and 1:2 (above right).

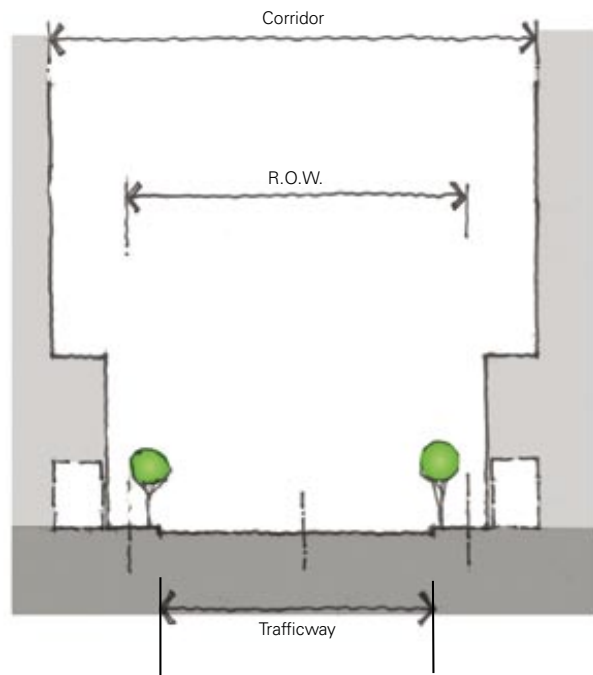
The public right-of-way (R.O.W.) may not always provide adequate space for all the needs within the corridor. Therefore local zoning and development regulations should provide for those needs to create a complete and functional corridor.

considerations

- Determine the present and future needs of the corridor.
- Establish build-to lines for buildings that front the corridor.
- Establish block patterns and relationships for interconnecting arcades, passageways, and sidewalks.
- If the public space and transportation needs are not met within the R.O.W. consider development guidelines and standards to include pedestrian and transit oriented infrastructure, or increase the R.O.W. to accommodate pedestrian and transit transportation needs.

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Provide space to meet the needs of the corridor



The components of the corridor shown in the diagram (above) include a Right of Way that is wide enough to contain the trafficway and a portion of the pedestrian sidewalk and landscaping. The remaining pedestrian way including an arcade in this case is shown as part of the corridor.

The abundance of waterways is a unique feature of Broward County. Our proximity to the water – practically anywhere in the county – is an asset that can be enhanced through design.

Public access to the banks of our rivers, canals, waterways, lakes, ocean, and Everglades is essential to our sense of place. Each of these access points needs careful and thoughtful design consideration in order to maximize the opportunity for enjoyment and to sustain these resources for future generations.

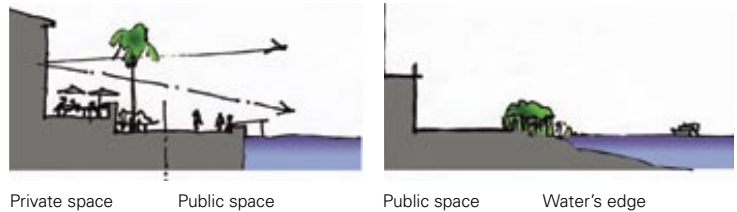
How the water's edge is treated affects our perception of the water. While being on the water is attractive, the mere presence of the water is often insufficient to produce a positive perception. Natural vegetation along the edge, natural forms, and well designed embankments and erosion control can enhance our appreciation of being on the water's edge.

considerations

- Determine the amenities offered by the water, the surrounding landscape and context and the type of access to be provided.
- Consider restoration of the natural vegetation along the water's edge as an alternative to hard-edged erosion control solutions.
- Share access to the edge of a public waterway with a public promenade for walking, biking, or skating; or a series of gateways or places to observe nature.
- Enhance water taxi and water bus stations to improve access and amenity along the water's edge.

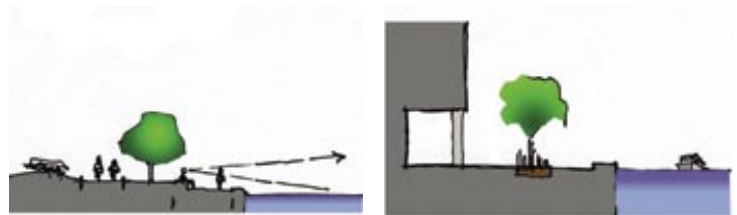
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Develop the water's edge for public access and enjoyment



Access to the water's edge is shared with a level change separation of private and public space.

Bikeways and trails can run parallel to the water's edge.



A quay is an urban form of water's edge, with integral seating and trees to separate the quiet zone from a more active zone.

An embankment is a natural form of waterfront that can be integrated along the edge of a promenade.

Preserving important views, of a natural feature or an urban marker, greatly enhances life in the city. Views of the natural landscape reveal our sense of place.

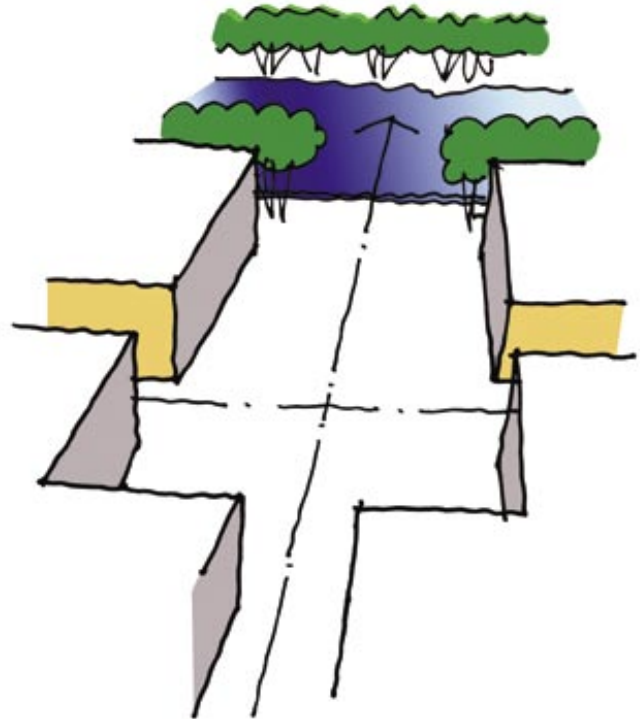
Maintaining visual contact with our surroundings is essential to our social wellbeing and health. We appreciate a good view afforded by a well placed window. In urban settings important and scenic views can be framed with careful attention to the location and massing of buildings and the shared space between them.

considerations

- Consider the view from other vantage points, including those outside as well as inside the public space.
- Gateways, public look-outs, and passageways provide opportunities to frame views or provide visual access to landscapes, natural areas, beaches, and waterways.

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Conserve important views



Framed views can respond to our essential need to connect with the world beyond, and also allow people to orient themselves in a place.

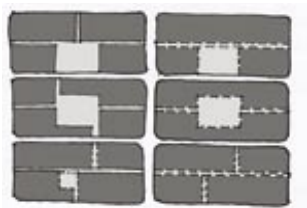
Outdoor spaces are necessary for casual encounters, and diverse social activities that are a natural part of the human environment.

Broward has few major civic open spaces in urban areas other than its large parking lots. Broad roadway corridors, underused and derelict institutional facilities, and remaining unbuilt open properties in the County provide an opportunity for establishing a rhythmic network of squares and other small spaces that will allow residents to experience many of the natural attributes of the County within areas of commerce and housing.

A network of sidewalks, public passageways, breezeways, and dedicated road crossings should connect these outdoor spaces and provide pedestrian access throughout the fabric of the city.

considerations

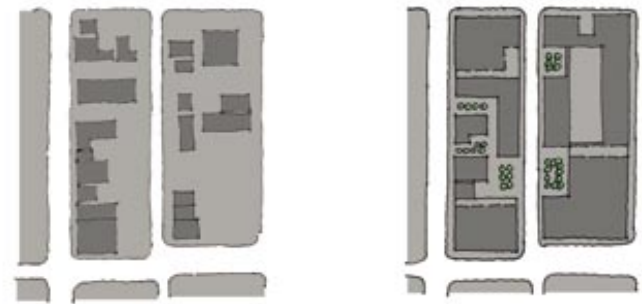
- Small public squares can open along one side to the street, or located within the interior of a block.
- Arcades and passages should run perpendicular to the street.
- Community cores and central business district areas must make pedestrian concerns a priority.
- Wayfinding tools include an ordered, easily recognizable sequence of spaces and continuous connections between them.



The courtyard is an extension of the sidewalk. This diagram illustrates how passageways can provide mobility choices by connecting street sidewalks to internal courtyards, plazas and alleyways.

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Develop a framework of interconnected pedestrian spaces



An existing pattern of buildings and open spaces in the fabric of Broward County (above left) provides access between buildings or along sideyards from streets to alleys.

Recommended pattern of buildings and public spaces (above right) includes courtyards and small plazas, landscaped places and passageways between and through buildings integrating streets and alleys.

Small public places provide the opportunity to expand the linear feet of retail frontage on a street while creating a sense of place. A small square that is 200' x 200' can accommodate a variety of casual and programmed activities, including concerts, receptions, outdoor exhibits, or other group activities.

Small public places such as courtyards and plazas provide natural light and quiet places off the street.

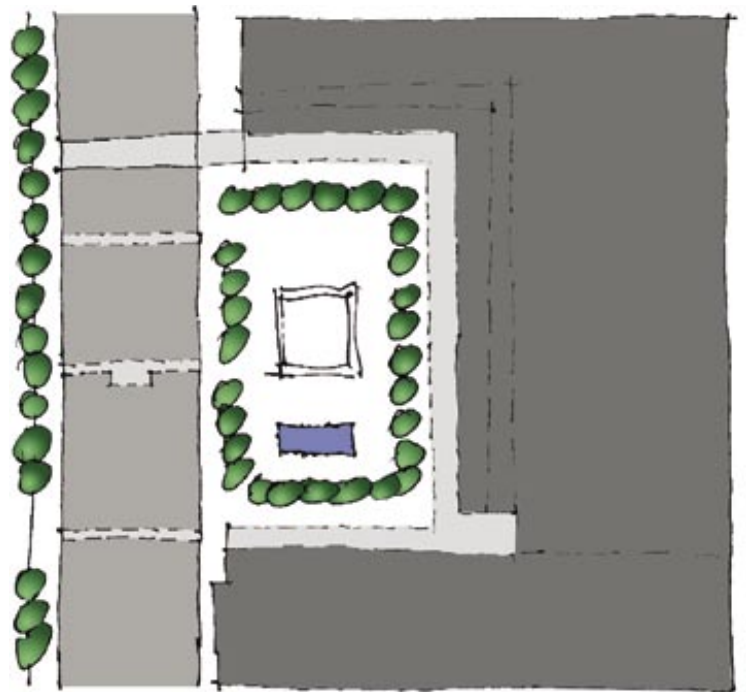
There are only a few such places that remain from the original built fabric of early Broward County. These spaces are a part of the urban heritage of South Florida.

considerations

- Small public places should be accessible via passageways that run 90 degrees to the sidewalk or streetfront.
- Small public places should have a focal point, such as a fountain, sculpture, or specimen tree.
- Buildings that surround public spaces can be designed as though they were on the streetfront, with shops and cafes on the ground level.
- Parking structures along an edge of a small public space should be concealed behind a liner building, a continuous water-wall, or a natural stone wall to provide a backdrop for the square.

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Incorporate small public places into the urban fabric



A internal courtyard with passageways to the main street (left) adds depth and richness to the fabric of the city in a hot-humid climate.

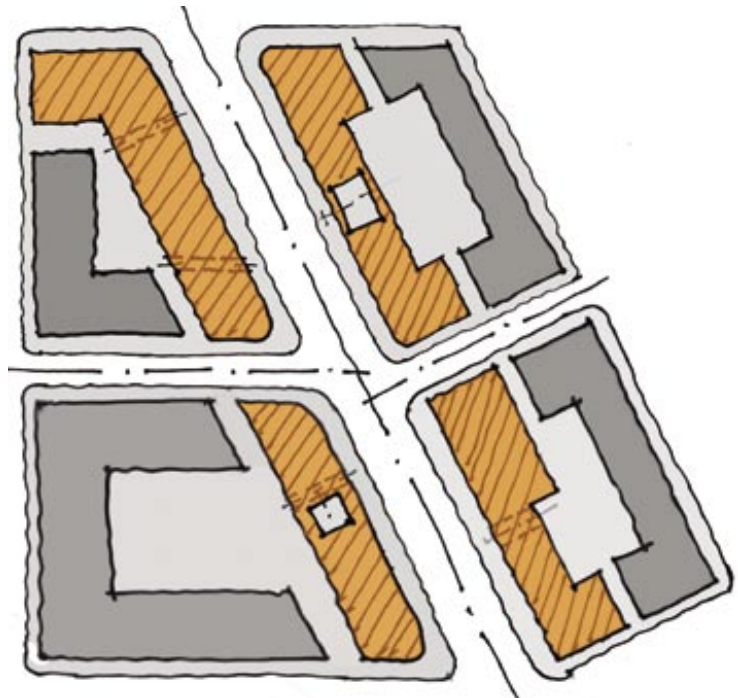
In existing main streets where there is active local retail, sustain and reinforce the character of the street by discouraging new retail located off the main street.

Large-scale developments that internalize retail frontage, creating an alternative to the streetfront, can be catastrophic for existing retail and the life of the street.

considerations

- Listen to the needs of small business and locally supported merchants when planning street and sidewalk improvements.
- Carefully consider the potential for displacement of small businesses that have maintained a loyal customer base over many years.
- Recognize that certain streets have become regional destinations and that increased transportation needs must be met while maintaining the integrity of the street and pedestrian quality of these environments.
- Recognize that projects with internalized retail frontage thrive only in places where the surrounding pedestrian-oriented streets and retail are healthy and can sustain an expansion of activity. Projects such as this frequently fail as generators for revitalization and are more successful as stand alone projects or in areas where there is a very high level of existing pedestrian activity.

Conserve historic main streets



Along existing main streets, maintain retail uses on the street. Office and residential development can frame off-street courtyards and public spaces within a new development.

Older and abandoned malls and shopping centers can be revitalized into new town centers with pedestrian amenities and mixed uses. These greyfield sites, located throughout the county, become opportunities for redevelopment when tied to a dedicated transit system.

reference

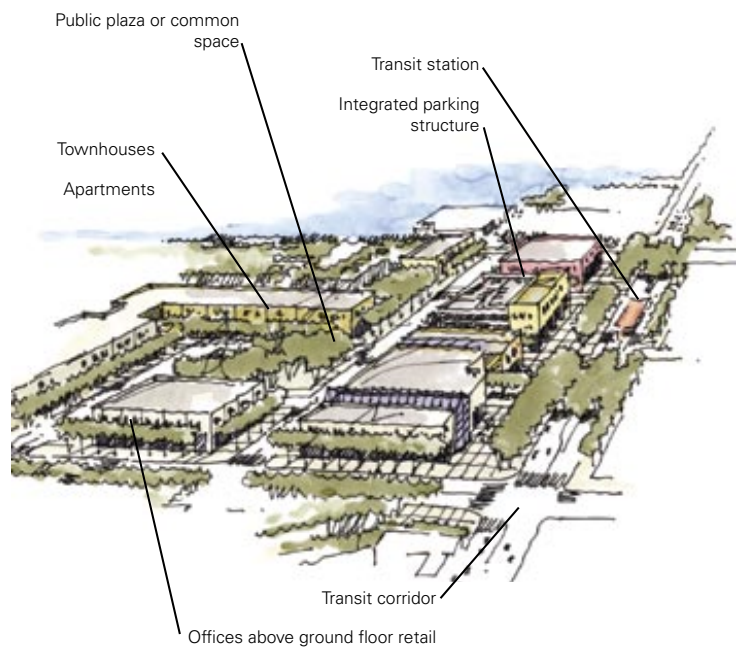
Richard B. Peiser, Will Flessig, and Marin Zogran. "From Shopping Centers to Village Centers." *Sprawl and Public Space, Redressing the Mall*. David Smiley, ed. National Endowment for the Arts. Washington DC: NEA. (2002)

considerations

- The County can proactively work with municipalities to provide opportunities for transit-oriented redevelopment.
- Large parcels once utilized for retail complexes can be considered for transit-oriented redevelopment with a mix of affordable housing, offices, retail, entertainment, and public parks, plazas or promenades that are accessible from surrounding neighborhoods.

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Revitalize underutilized shopping centers into town centers



Air movement provides comfort under conditions of high humidity by relieving vapor pressure. The general requirements for design include promoting evaporation loss, and reducing radiative heat production by encouraging the flow of breezes.

considerations

- Establish series of civic open spaces within urban areas, within short walking distance of each other, designed to encourage the flow of natural breezes and maintain the comfort of the pedestrian environment.
- Include shaded areas to sit, shading canopies and covered walkways.
- Consider the orientation and massing of towers facing the ocean breezes.
- Streets at angle to the east-west axis and skylines open to the prevailing breezes encourages better shading of buildings in summer and more continuous and higher speed natural ventilation (*Givoni 2003, 4.7-6; Knowles 2003, 4.6-4*).
- Encourage subtlety and restraint in coloration due to the intensity of natural sunlight.
- Encourage use of shading devices on major infrastructure, to reduce radiant heat load, provide a protective rain screen, shade the interior spaces.
- Plant a pervasive and if possible continuous shade tree canopy.
- Recognize that the windspeed at ground level of a high-rise building increases in velocity as the height of the building increases.

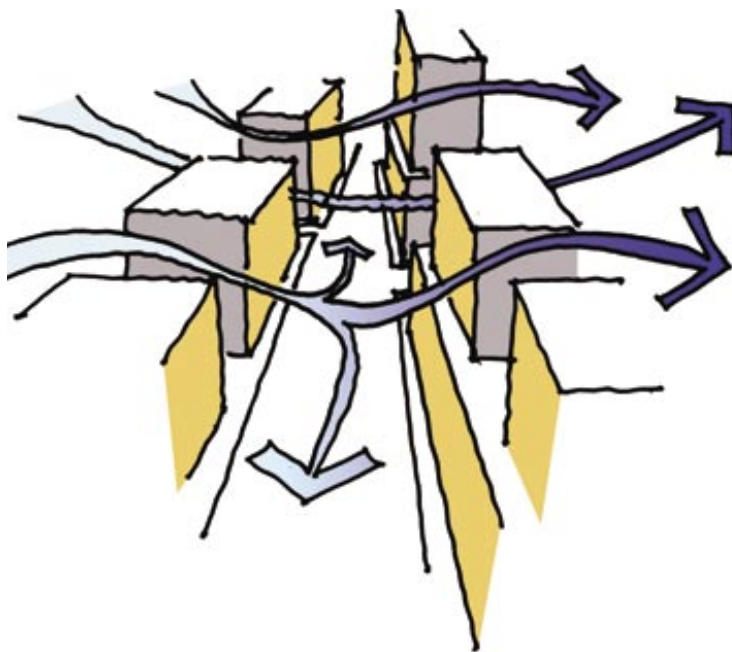
“There are nothing but breezes between here and the ocean.”

—Elsie Montgomery
a pioneer resident of Lauderdale by the Sea.

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Encourage a climatic approach to urban design

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Air currents flow freely between open, loosely connected building masses. These spaces can also provide places for pedestrian walks.

Long stretches of windowless walls project a sense of emptiness and this lack of vitality creates a sensation of fear and anxiety.

A fundamental principle of livable communities, as well as the Crime Prevention Through Environmental Design (CPTED) program, is the concept of “windows at the street.” The first floor on a pedestrian street should consist of primarily windows and storefront. A high level of visual transparency and protection from the sun and the rain, encourages visibility and access to retail shops and other commercial uses.

considerations

- The first floor should have between 50% and 75% transparent glazing, and the 2nd floor should have between 30% and 50% transparent glazing.
- Encourage alternative designs to the windowless big box format in areas where high levels of pedestrian service and activity are desired.
- Glass used in the glazed areas at a streetfront should not be heavily tinted or reflective.
- Infill existing parking lots with new buildings at the street edge in redeveloping suburban core corridors.

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Open up the streetfront



A national retailer occupies the corner of a lively pedestrian oriented street in Bethesda, Maryland (above left) while the facade of a big box retailer in Broward (above right) encourages shoppers to buy online. The lone potted plant underscores the lonesome atmosphere at this streetfront.

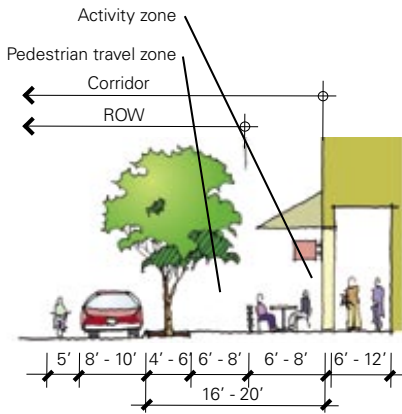
Deep sidewalks along the transportation corridors can support functional urban or village streetfronts that are active and attractive.

Wide sidewalks provide various options to the pedestrian depending on the utilization of the sidewalk.

Create deep active sidewalks that provide practical options

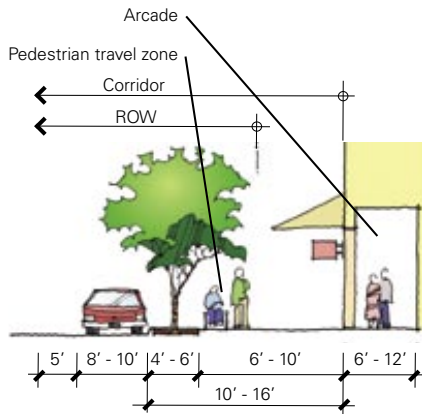
considerations

- Ensure a continuous right of way passage for pedestrians.
- Maintain continuous protection from the sun and rain by aligning and connecting contiguous canopies, overhangs, and arcades.
- Avoid conflicts between the pedestrian right of way and outdoor activities such as restaurant and café seating or outdoor retail.



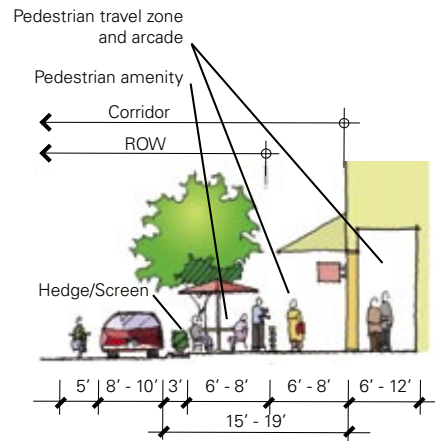
Sidewalk cafe next to building

Separates the pedestrian way from the storefront or divides pedestrian through traffic from window-shoppers



Open sidewalk

Provides options to walk under shade, in the sun, or along the storefront protected by the arcade



Sidewalk cafe at edge of street

Allows for uninterrupted pedestrian walks along the streetfront

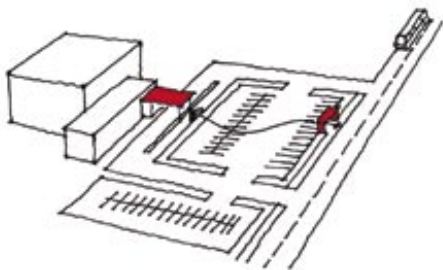
Provide covered walkways to protect from sun and rain

Shopping centers and commercial facilities designed in the mid-twentieth century in Broward County featured covered pedestrian routes from sidewalks and transit stops, through parking lots to the building entrance.

There is also a fading local tradition of providing shaded walks that needs to be revived. Long time residents may remember the nationally acclaimed Sunrise Shopping Center, the Jefferson's store on Federal Highway; or Sear's Town in Fort Lauderdale. These designs recognized the demands of our climate and weather and provided convenience and safety to pedestrians upon leaving their cars, or disembarking transit.

considerations

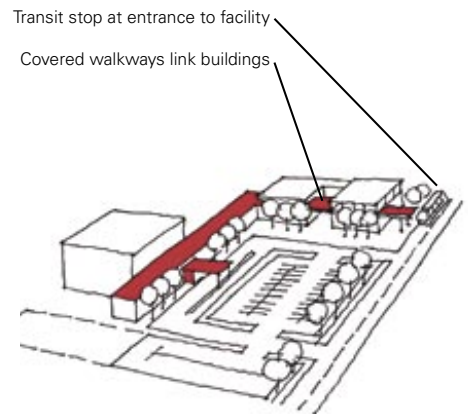
- Provide covered walkways between buildings and to transit stops.
- Incorporate climate sensitive design enhancements for pedestrians arriving by car or transit.



The lack of pedestrian canopies provides no protection from sun and rain. Sketch adapted from *Palm Beach County Transit Design Manual (19)*.



A covered sidewalk in Melbourne, Australia connects a transit stop with nearby cultural facilities.



Transit stop at entrance to facility
Covered walkways link buildings

Covered walkways can link buildings and provide an entrance on the sidewalk for pedestrians and transit users. Sketch adapted from *Palm Beach Transit Design Manual (23)*.

In order to create more transit supportive land use and developments, sidewalks and pedestrian access need to be provided, not only on trafficways, but in all developments.

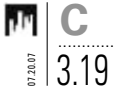
There are significant advantages for development with pedestrian and transit amenities. Even in large parking lots, providing a safe, attractive promenade for people including families with strollers, persons in wheelchairs, and elderly creates a welcome atmosphere. Developments that provide amenities for human comfort become desirable places to live, work, or shop.

considerations

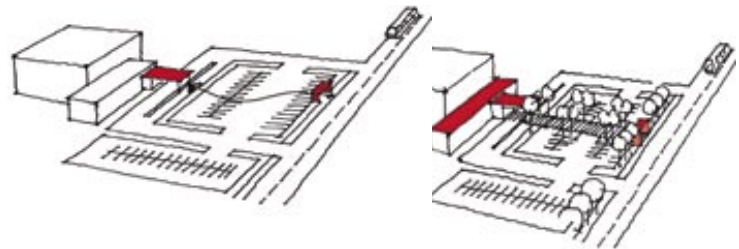
- Shade trees enhance the comfort of pedestrians.
- Pedestrian security and accessibility is enhanced with a clearly articulated path from the sidewalk and transit stop, through the parking facility to the building entrance.
- Illumination of the promenade can maintain security during the evening hours.
- Transit vehicles do not have to enter the site.
- Coordinate landscaping of the parking lot with shading requirements along the pedestrian route.

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Connect buildings to the sidewalk and transit



Walks and promenades link the main entrances of a museum in Launceston, Tasmania and a big-box retailer in College Park, Maryland with local transit facilities and parking.



The lack of pedestrian walks (left) forces people to cross the parking lot, increasing the potential for conflicts between pedestrians and cars. A landscaped promenade (right) enhances comfort and reduces potential conflicts between pedestrians and vehicles. *Sketches adapted from Palm Beach Transit Design Manual (19, 21).*

In the best cities, the sidewalk is the domain of the pedestrian. Conflicts with cars crossing the pedestrian path can be avoided by maintaining the continuity of the sidewalk as a pedestrian right-of-way.

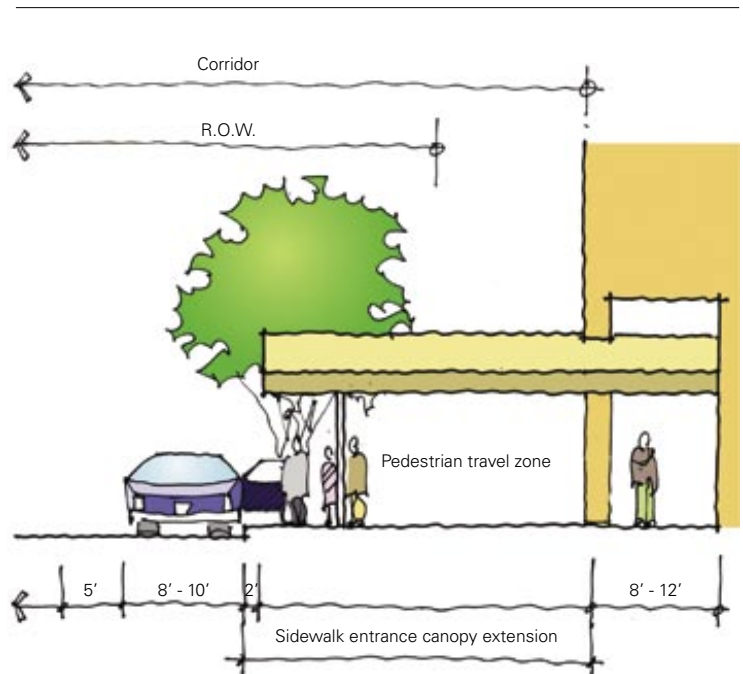
Drop-off zones can be maintained along the edge of the curb if entrance canopies are permitted to extend to the edge of the sidewalk. This serves the needs of the building users and occupants while maintaining the integrity of the sidewalk.

considerations

- Dedicate drop-off, taxi, and delivery zones in the parking lane to maintain continuity of the curb.
- Extend shade canopies and weather protective elements to the curb.
- Amend zoning regulations to allow for shade and weather protective overhead structures to extend over the pedestrian ROW as a matter of health, safety, and welfare.

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Drop-off at the street curb



Shaded and direct covered routes to building entrances benefit those who use the protected cover to walk from a car, taxi-cab, or delivery vehicle to the building entrance during a rainstorm.

When housing is mixed with other functions, such as local commercial shops and services providing everyday needs, the community feels lived-in. Mixing residential and non-residential uses also supports the crime prevention principle of “eyes on the street 24 hours a day”. Mixing uses can also reduce the number and frequency of vehicular trips, creating places where people can live, shop, and work within a walkable area.

Building types that seamlessly integrate enhanced mobility and transportation provide an expanded list of options for market responsive development. Among these are liner buildings, podium housing and office development, mixed-use, and park-once centers. Adaptive-use is another important type of development for maintaining the historic character of a building or a place.

Live-work, or work-live developments can reduce the number of commutes by allowing individuals to work and live in the same place. Park-once centers include forms of retail and commercial development with parking, park-n-ride, transit, pedestrian, or other multi-modal transportation combinations for maximizing pedestrian and transit trips while reducing vehicular trip chains to a single trip.

There are other innovative building types including mixed-use hybrids combining residential built via air-rights above big-box retail, convertible commercial/residential loft buildings, or development built with air rights over existing rail or roadway corridors.

considerations

- Link mixed-use redevelopment and transportation strategies.
- Promote building footprints that can be easily converted for change of use.
- Provide the infrastructure for future pedestrian and transit needs to support redevelopment.

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Link pedestrian-oriented mixed-use development to transit



Retail facade infill in Bethesda, Maryland (above) promotes individual character and sense of place. Large scale office or residential development can have the negative effect of creating a monotonous streetfront. In this case the developer built a vacant structural “shell” at the streetfront that allowed for eventual individual occupant infill. The result creates a vibrant retail streetfront.

Large parking facilities, whether they are parking lots or parking structures can be inhuman. No one wants to walk by them, yet when driving, the entrance to the parking facility needs to be easy to find and clearly visible.

Well-designed parking facilities can result with the recognition that every driver becomes a pedestrian within the parking facility. Therefore the best designed facilities should provide spaces for orientation, wayfinding, and walking with the minimum potential for conflicts between pedestrians and moving vehicles.

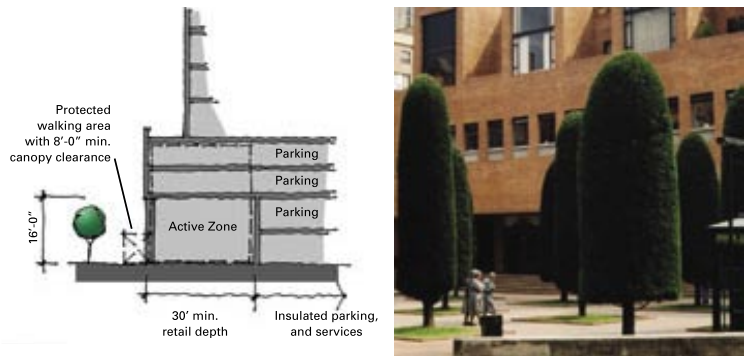
considerations

- Locate parking facilities to the interior, rather than the edge, of the block, and avoid vehicular entrances along the streetfront.
- Design parking lots for safety, ensure convenient and secure transition to the pedestrian route.
- The insulative shield to a parking facility can be a building such as a row of shops, offices, townhouses, or multistory lofts.
- Insulate parking facilities with perimeter spaces that can support retail use at the streetfront. Active retail uses can be as shallow as 30’.
- Incorporate natural light as a wayfinding element within parking facilities.
- Consider underground parking in large developments using slurry wall technology.

reference

GianCarlo Santarelli and Robert T. Ratay, PhD, PE “Diaphragm/ Slurry Walls,” *Handbook of Temporary Structures in Construction*. Robert Ratay, Editor. Boston: MCGraw Hill.

Insulate parking with human occupancy and active uses



An active zone for retail use illustrated in the partial building section (above left) insulates a multilevel parking structure. A urban garden courtyard on the roof of a parking podium structure (above right) is surrounded by retail shops with offices and townhouses above.



Three diagrams illustrate the integration of parking structures: (from left to right) above grade parking insulated with active uses at the street side and landscape screen on the backside; above grade parking insulated with active uses; and below grade parking using slurry-wall technology with active uses at grade and above.

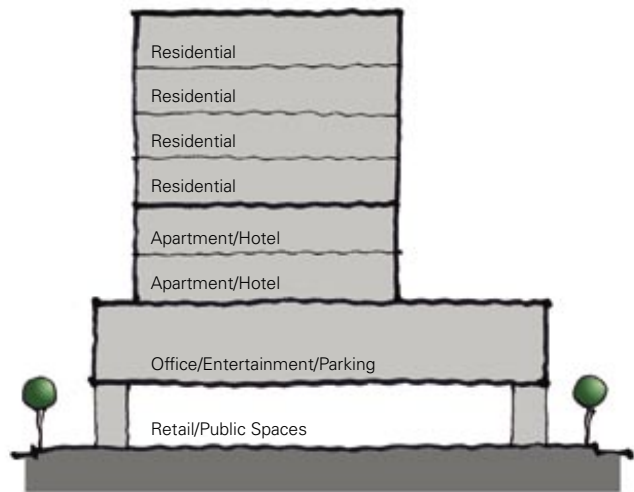
Mixed-use buildings can enhance the value of the different uses relative to their proximity to the streetfront.

For example, retail uses have more value directly on the streetfront, both for the customer and the owner. Above the streetfront, theaters and offices that do not require frontage on the streetfront have more value without the distractions of the street. Residential units increase in value according to their location and orientation on the higher floors.

Mixed-use in an urban context translates to pedestrian oriented occupancies at the ground level that complement and activate the public realm. Therefore, providing universal access, good visual and physical connectivity, visual transparency, appropriate levels of illumination, spaces for outdoor retail and commercial activity, active edges, all contribute to a more sustainable form of urban design.

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Layer mixed uses vertically



Mixed-uses are organized vertically, maintaining a retail façade at the sidewalk, parking, entertainment and offices on the lower floors above, and hotel and residential uses on the highest floors.

The places that create the most effective settings for everyday life are defined by the quality of light and shadow. The contrast between light and shadow enriches a sense of place and creates a natural rhythm of movement through space.

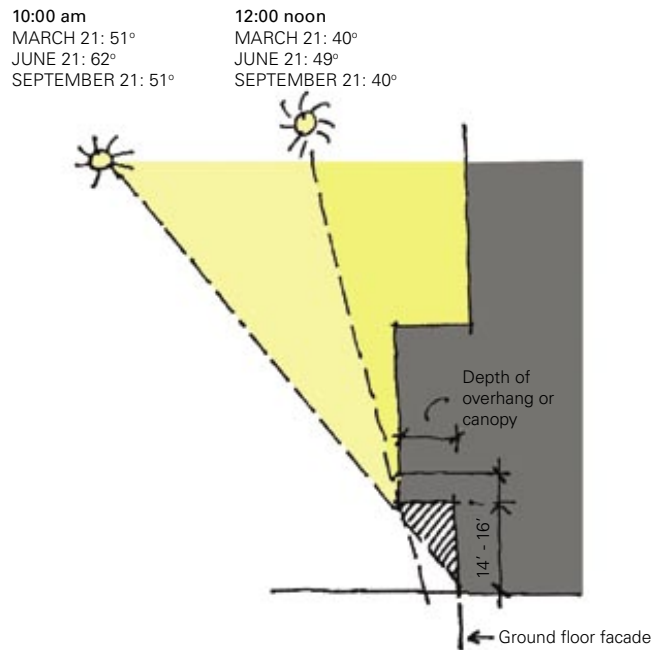
With South Florida's bright daylight conditions, reflective glare can cause distraction, can affect good visibility, and can impact a retailer's ability to display goods in shop windows. Shade minimizes glare, allows for visual adjustment from outside to inside, provides visual and thermal comfort, reduces glare at storefronts, and improves visibility through windows.

considerations

- Discourage the use of reflective glass at storefronts.
- Provide continuous overhangs, canopies, awnings, or other shading devices that are designed using the proper sun angles for the times of day and seasons for our latitude.
- A storefront in shade is more transparent than one in full sunlight.
- Eastern and western exposures can take advantage of additional vertical sunscreen devices and landscaping to shield early morning or late afternoon sun.
- Using the latitude and longitude information for your community available from Google™Earth, commercial software programs such as Google™ SketchUp or Autodesk Form-Z™ can be used to generate shadow patterns cast by buildings and architectural features.

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Shade the streetfront



Sun angle and shadow study for a street level overhang or canopy.

Source: Aron Temkin, Anthony Abbate, and Matthew Weber. FAU School of Architecture, Fort Lauderdale.

The community and places we build can be a model of the values we share. If our sense of place is to a sense of history and the unique character of our natural and built heritage then it is important that we respect those attributes when building for the future.

There is a difference between using historical models for establishing a new settlement for the first time and recreating places that are popular for marketing and entertainment. Borrowing from past styles is often a way to establish meaning or identity. However, the borrowing of entertainment formulas to create themed environments evokes a soulless, commercial impression. Authentic original styles are degraded with caricatures. Such a design strategy will not withstand the test of time.

considerations

- Discourage development of themed environments in community cores and centers as places for people to live and work.
- Develop a palette of authentic materials for community cores and town center districts that include sidewalk and crosswalk pavements, facade finishes, roofing materials, and fences and walls.



A natural stone wall of local oolitic limestone is an example of a material selection that reinforces our sense of place.

Avoid themed environments and use authentic materials

“There is an important difference between today’s thriving entrepreneurship of illusion and the impulses that invented identities for raw land and new communities in the past. Those earlier identities were an investment in character for rapidly growing new settlements, an attempt to establish some ready-made sense of place to define and speed development. Today’s themes creations are not, and never will be, real places; they are not meant to be. They are made for the moment, instant environments intended to

serve only as temporary, substitute events, conceived and carried out as places to visit in which novelty, experience, and entertainment are sold for immediate profit and a short period of time. They are based on proven, family-oriented entertainments formulas. To embrace their limited and exclusionary objectives is to forfeit the larger needs of place and society. To imitate their poverty of reference is to lose all we know about the past. To think that American cities can learn from them is to embrace the most dangerous illusion of all.”

Ada Louise Huxtable.
The New Press. New York. 1997.

Undefined “open space” can have a function that supports a community’s goals and sense of place. Many infrastructure projects and developments provide residual, leftover, and in-between spaces that offer potential sites for small plazas, gardens, passageways, recreation areas, and other uses beneficial to the community.

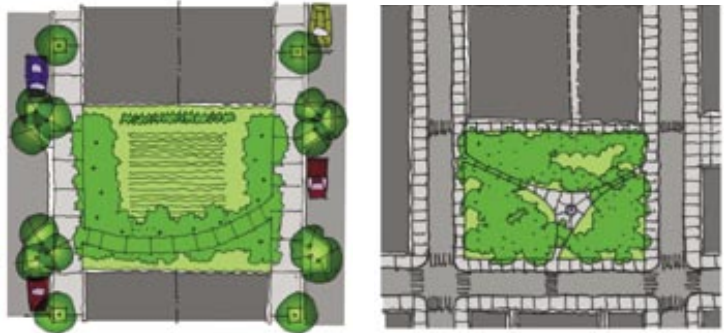
considerations

- Re-examine the standards for park and recreational lands to ensure an adequate supply and variety of scales of public spaces to serve existing and future residents.
- Amend, as appropriate, the standards for addressing adequacy of parks and recreational facilities to expand the availability of parks and open space in existing neighborhoods.
- The Broward County Board of County Commissioners Public Art and Design and Design Arts programs can bring qualified artists and designers together with communities to develop the visions and provide the design concepts for breathing life into undefined open spaces.



A water-park was developed in the residual space around a water treatment plant in Bucaramanga, Colombia.

Turn ‘open space’ into more usable places for people



Residual spaces can become places for people to sit and relax, read, have lunch, exercise, or catch some sun. Areas as small as 200’ x 200’ can be dedicated in urban areas to provide space for informal sports activity between two buildings (above left) and a neighborhood park at the end of a block (above right) can be designed for morning or evening yoga, or simple cloud gazing or bird watching during a lunch break.

Research into the history of the built environment in Broward County reveals that the emerging sense of place, as it is associated with design activity, consists of a combination of those things we have created over time as a response to the climate and the natural setting itself.

The combination of exuberant and dense vegetation, subtle changes in topography, dramatic, expansive skies, large rainbows, together with the incidental high-rise tower, define the local visual environment by measuring space with apparent height, where these objects seem to make landfall, with color, and with the complexity of pattern and movement.

These attributes of the area never seem to constrain the visual space of the County enough so much that imagination cannot be inspired by contemplating the height of the rainbow, what lurks within the forest of trees, or the surprise of a canal or lake behind a low rise in the topography.

considerations

- Providing shade and encouraging breeze are strategies common to climate sensitive urban design in the hot-humid tropics.
- Urban buildings in the tropics are distinguished by the use of continuous shaded colonnades and interior courtyards that are naturally ventilated and open to the sky.
- Utilize NatureScape principles in all county ROW improvements, public works, and public buildings.

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Encourage innovation in ecological design



A glazed canopy and wall provide weather protection on a bridge with unimpeded pedestrian and bicycle access across the Yarra River at Spencer Street in Melbourne, Australia.

Broward County abounds in its diversity of cultural sites and activities of interest to visitors and residents alike.

Providing options for obtaining up-to-date information in the public space increases exposure for local cultural events. Information kiosks can make these events more accessible to the public and also provide an element of wayfinding in the public space.

considerations

- Promote the development and placement of cultural and tourism information kiosks countywide.
- Coordinate implementation and maintenance of kiosks with county and local transit, cultural and tourism agencies.
- Kiosks can provide provide maps and other wayfinding information to facilitate pedestrian and transit mobility.
- Kiosks can function as a meeting point for friends and family in entertainment, historic, cultural, and shopping districts.

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Use kiosks to advertise local information

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Kiosks unfold to provide current cultural and tourist information to residents and visitors in Melbourne, Australia.

Respecting the history of sites means respecting the qualities, integrity, and setting of a site. A high value is placed on authentic places and places that respect local history.

The inventory of listed historic sites in Broward County is small and dispersed over a large geographic area. These sites are an invaluable and essential resource, connecting us to the story of our place and our people. But whether or not a site is officially designated as historic, redevelopment should take cues from the stories related to its site as an effective way to connect with sense of place.

Strategies for any site include uncovering, revealing, and sustaining the local memory of the context. Techniques for conserving or adapting meaningful elements of the site can include:

- Eliciting community stories and local knowledge about the site to inform and inspire a development or design concept;

- Selecting appropriate materials that give a tactile perception of place;

- Locating access routes and framing of views to the surroundings;

- Giving particular attention to scale, massing, proportion, and details.

considerations

- Encourage new development and redevelopment to respond to the history of the site, such as significant buildings, features, places, landscapes, cultural memory and natural history.

- Seek out artists and designers that have a track record of experience and sensitivity with community design.

- Discourage false finishes, materials, and themes designed to mimic historic details and finishes. This creates confusion about the authenticity of truly old buildings and sites and devalues them, diminishing our sense of place.

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Respect the history of local natural and built sites



Shady porches are a local tradition as shown in an early view of Brickell Avenue (above left) and the natural oak hammock through which Las Olas Boulevard passed in 1912 (above right) are examples of local built and natural scenes that capture our unique sense of place. *Photos courtesy of the Fort Lauderdale Historical Society. All rights reserved.*

Adaptive use means to recycle older structures by allowing change of use in old, not necessarily historic structures. This concept began in the 1960s and gained impetus with the National Historic Preservation Act, and similar legislation such as New York City's J-51 program, or the redevelopment of Miami Beach.

Recycling and conversion of existing structures can apply to uses such as urban marketplaces, civic and cultural buildings, educational facilities, commercial buildings, restaurants, and residential uses.

Building reuse conserves physical and cultural resources and reduces the environmental impact of new construction.

considerations

- Review and modify municipal zoning codes that prohibit adaptive use resulting from change of use in existing structures.
- Communities can consider creating an adaptive use district to promote or incentivize business redevelopment and improvements to existing properties, enhancing their viability and value.
- Work with small property owners and merchants who seek to keep their buildings viable through adaptive use in response to evolving and changing market conditions.

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Retrofit older neighborhoods and recycle old buildings



Older buildings are commonly reused and retrofitted to accommodate new uses. This row of old houses in Launceston, Tasmania frames a new pedestrian boulevard with outdoor restaurants, galleries, and retail at the ground level.

Civic art can enhance value by making a place more meaningful, attractive, and memorable.

Civic art can effectively respond to the sense of place. It can take many forms: a pocket park, furnishings, pedestrian bridges, utility infrastructure, memorials, drainage accessories, shelters, and gazebos. How the story is conveyed by design is a matter of interpretation, yet there are certain principles of design for achieving the proper balance of function, usability, and aesthetic delight.

Artists can be commissioned at the early design stages of a project so that they may effectively collaborate with the architect as a member of the project design team. Artists and designers can reach out to the community before design conceptualization to ensure that the resulting works respond to community needs and aspirations.

considerations

- Municipalities can create local public art and design programs and policies modelled after county programs to enhance the quality of public infrastructure projects.
- Large scale private development can commission integrated public art and design in public infrastructure for improved project integration into the community.

Incorporate civic art in urban design



An artist designed boardwalk at the Alvarado Water Plant in San Diego, California (above left), and a bridge along a pedestrian trail in Switzerland (right) designed by an artist-architect team.

Utility, traffic control, and communications apparatus is frequently installed in the public right-of-way. This condition can create conflicts with pedestrian movement, especially for those with disabilities, and can become a practical and aesthetic challenge for pedestrian and transit oriented redevelopment.

considerations

- Locate utility and service equipment and apparatus to maintain continuous accessible passage for pedestrians.
- Utility lines should be placed underground, preferably located where service will not disrupt traffic flows.
- Encourage integration of infrastructure components into the design of new development and redevelopment.
- Better coordinate utility and communications infrastructure to reduce the number of poles occupying the sidewalk.
- Coordinate elements in the public space to improve aesthetics and wayfinding.

An accumulation of infrastructure elements over time conflicts with signage and landscaping at a Broward intersection (upper left).

Consistent and well designed tactile warnings in a public space (upper right) in Melbourne, Australia.

Signage and maps scaled and placed for pedestrian use (lower left) in Bogotá, Colombia.

Traffic control device concealed within a pedestal in a downtown office building in Fort Lauderdale (lower right).

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Improve the coordination of public infrastructure in new development



Urban design recommendations

general recommendations

1. Establish context-based block patterns and identify the relationships between buildings, streets, and pedestrian ways.
2. Establish policies, regulations, and incentives integrating parking requirements and building requirements that support pedestrian and transit oriented developments.
3. Encourage, through amendments to Broward County and municipal comprehensive plans, the development of transit oriented corridors and pedestrian oriented compact development: where living, working, shopping, leisure, culture, and entertainment can be reached by a choice of transportation modes.
4. Prepare model zoning and site plan regulations that provide flexibility to develop new and innovative building types that support the infrastructure and mobility concepts of the Guidebook.

regulatory and policy considerations

1. Broward County Land Use Plan (BCLUP):
 - a. Create new objectives and policies promoting community cores within Mixed Land Uses – Goal 10.00.00. These objectives and policies would include:
 - i. Centers with pedestrian orientation
 - ii. Located where accessible by choice of transportation modes
 - iii. Centers would be set away from high traffic corridors
 - iv. Accessible and interconnected via transit and pedestrian
 - b. Create new objectives and policies within Land Use and Transportation – Goal 12.00.00 promoting transit/pedestrian orientation between community cores. These would include:

-
- i. Mid-block crossings
 - ii. Transit stops mid-block to link with pedestrian oriented development
- c. Add objectives and policies within Recreational and Open Space Uses Goal 5.00.00 to encourage provision of neighborhood parks within existing residential neighborhoods, and policies that provide for identification of new sites.
 - d. Add objectives and policies within Redevelopment and Incompatible Uses – Goal 14.00.00 to encourage retrofitting existing neighborhoods. This would include policies which:
 - i. Create pedestrian friendly neighborhoods.
 - ii. Varying intensities of development.
 - iii. Create open spaces for communities.
 - iv. Establish areas for cultural and civic buildings.
 - v. Establish policies for connection of neighborhood streets to collectors and arterials.
 - vi. Improve traffic conditions through traffic calming, as appropriate.
 - e. Add a new goals, objectives and policies to the BCLUP that establish design standards to be available County-wide such as the following:
 - i. Establish build to lines for the design along street corridors.
 - ii. Establish block patterns and relationships between buildings, streets and pedestrian ways.
 - iii. Establish a policy that ensures coordination between architecture and the pedestrian and transportation environment.
 - iv. Establish policies integrating parking requirements and building requirements supporting pedestrian oriented connections in communities.
 - f. Create a new goal, objectives and policies promoting redevelopment models including liner buildings, podium buildings, mixed-use, park-once centers, destination arcade, and others.

g. Amend the BCLUP and develop Broward County Zoning Code amendments that can be used as a model for local zoning codes to define the following:

- i. Liner buildings
- ii. Podium development
- iii. Mixed-use
- iv. Destination arcades

h. Prepare amendments to the Broward County Zoning Code, that can be used as a model for municipal zoning codes, addressing standards for liner buildings, podium buildings, mixed-use, park-once centers, destination arcade, and others.

2. Broward County Land Development Code (LDC) – Site Planning:

a. Amend Division 4, Section 5-195(a)(6); Section 5-195(a)(17) the LDC to encourage:

- i. Build to lines
- ii. Pedestrian orientation along corridors
- iii. Create incentives for developments to foster these improvements

b. Amend Division 4 – Section 5-195 of the LDC to include pedestrian crossings and transit stops at mid-block.

c. Create incentives to foster a variety of hybrid and emerging building types that support the aforementioned infrastructure and mobility concepts.

d. Add a policy to establish design standards within the LDC and a Broward County Zoning Code/Model Code. Develop zoning code amendments that could serve as a model for municipal codes addressing

design standards that further the development of the guidebook standards. These can address:

- i. Illustrations of various building types
- ii. Interrelationships between landscape, pedestrian and building.
- iii. Relationships between parking, building and pedestrian connections.
- iv. Incentives for meeting standards that demonstrate pedestrian friendly development and connecting mixed-use developments.
- v. Parking requirements that are sensitive to mixed-use projects and pedestrian-oriented development.
- vi. Standards for parking garages interfacing with street frontages.
- vii. Parking lot design
- viii. Flexibility to support various uses over time.
- ix. Sharing parking facilities
- x. Infrastructure designed to permit future building construction.
- xi. Dimensional standards including: Block sizing, pedestrian paths, alleys, spacing, parking maximums, maximum parking ratios

3. Provide a funding mechanism within the administrative code and budget cycle for funding of new parks within existing neighborhoods as well as funding for maintenance on an ongoing basis.

ATTACHMENT 18-3

Design Principles – Architecture.

Chapter C-5, Broward County County-Wide Community Design Guidebook

Attachment 18-3 can be found on the attached disk.

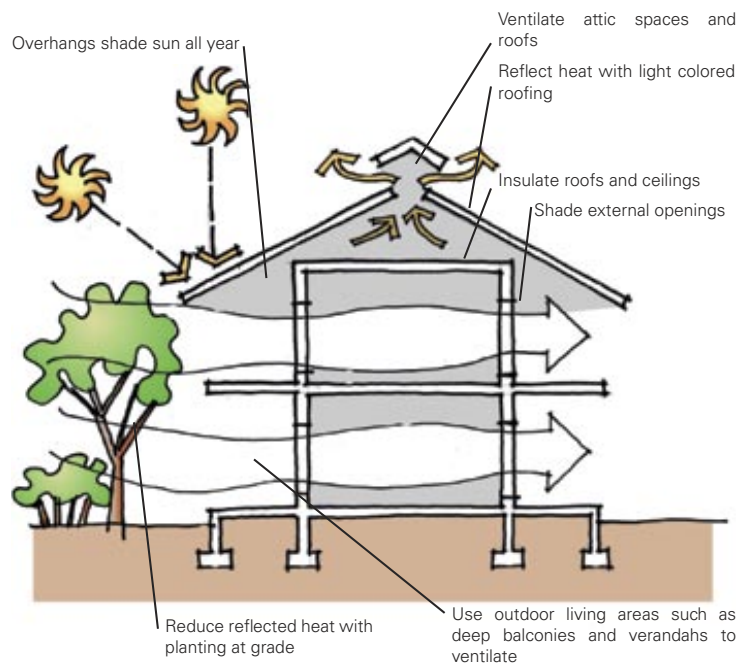
Design for climate

The hot-humid climate of Broward County requires some degree of cooling, especially during the summer and fall months. Our reliance on mechanical cooling systems has fundamentally altered the architectural design of buildings.

While temperature variations from indoor to outdoor environments rarely exceed 26–28°, humidity is the main problem in designing for human comfort. The strategy for design in hot-humid climates includes shading and screening sunlight, reflecting heat, and inducing or encouraging airflow and breezes.

considerations

- Consider one-room deep volumes to promote cross ventilation.
- Use low thermal mass construction.
- Avoid obstructions to cross-ventilation flows.
- Consider whole-house fans with automatic switching for ventilation.
- Consider a 'fly-roof' to shade the insulated ceiling above internal living spaces.



Some general design techniques for natural, or “passive” cooling include:

- Orientation of the rooms in a building for exposure to cooling breezes.
- Encouraging natural airflow through buildings.
- Provide mechanical means to ventilate in the absence of natural breeze.
- Selecting appropriate fenestration for maximum ventilation and minimum heat gain.
- Selecting and placing appropriate insulation materials.
- Encourage use of ceiling fans.
- Choose windows with maximum open areas, such as awning, jalousie-vent type, and casements.
- Avoid fixed glass panels in living and working environments.
- Use landscape design to channel cooling breeze, filter light and reflect heat.
- Use shade structures and trees to shade outdoor areas to lower ambient temperatures.
- Allow warm air to escape via roof turbines, attic vents, ridge vents, clerestory windows, or cupolas.

Climatic Wind Data for South Florida 1930-1996

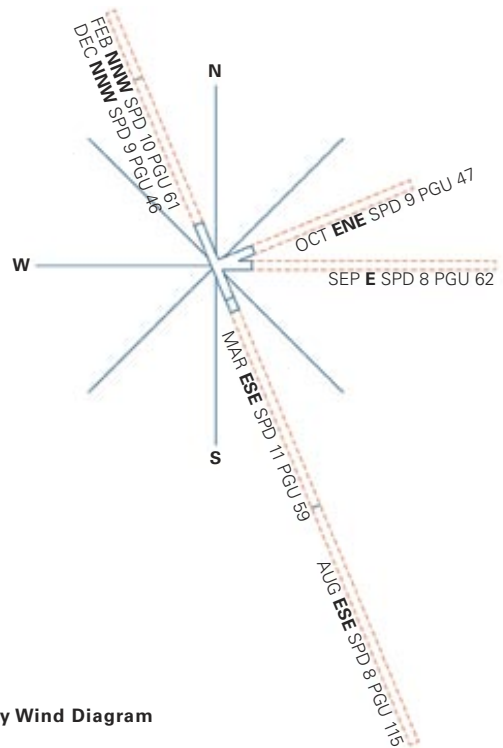
(Source: National Climatic Data Center, Asheville NC. www.ncdc.noaa.gov)

Month: Wind Direction - Mean Wind Speed - Peak Gusts (MPH)

JAN: NNW - 10 - 45	JUL: ESE - 8 - 56
FEB: NNW - 10 - 61	AUG: ESE - 8 - 115
MAR: ESE - 11 - 59	SEP: E - 8 - 62
APR: ESE - 11 - 55	OCT: ENE - 9 - 47
MAY: ESE - 10 - 46	NOV: E - 10 - 49
JUN: ESE - 8 - 58	DEC: NNW - 9 - 46

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Utilize natural breezes for cooling



Broward County Wind Diagram

(Source: Anthony Abbate, FAU School of Architecture)

Solar declination: declination of the sun varies from winter solstice, vernal equinox, and summer solstice. Astronomical description of the sun going south in winter.

Solar azimuth: part of an angular coordinate system for locating positions in the sky. Azimuth is measured clockwise from true north to a point on the horizon below the object.

Solar elevation: part of an angular coordinate system for locating positions in the sky. Elevation is measured vertically from the azimuth point on the horizon up to an object.

Cosine of solar zenith angle: used to calculate the vertical component of direct sunlight shining on a horizontal surface.

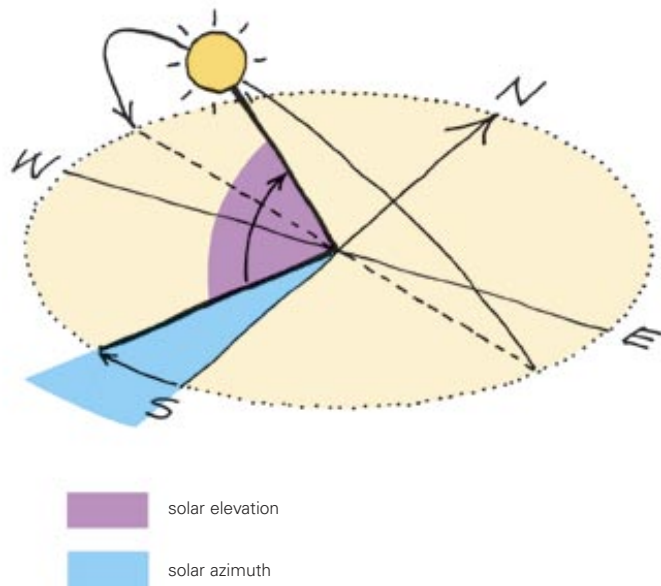
Source: NOAA Surface Radiation Research Branch <http://www.srb.noaa.gov>

Critical Sun Positions in Broward County (26.07N, 80.08W)

	9:00 AM	noon	3:00 PM	5:00 PM
March 21st				
Solar declination	0.40	0.45	0.50	0.53
Solar elevation	20.84	56.78	56.07	32.91
Solar azimuth	190.24	137.09	224.66	252.26
Cosine of solar zenith angle	0.3558	0.8366	0.8297	0.5433
June 21st				
Solar declination	23.44	23.44	23.44	23.43
Solar elevation	31.06	71.14	67.72	40.91
Solar azimuth	77.17	93.70	268.39	279.29
Cosine of solar zenith angle	0.516	0.9463	0.9253	0.6549
September 21st				
Solar declination	0.53	0.49	0.44	0.40
Solar elevation	24.00	58.86	53.72	29.82
Solar azimuth	101.91	142.43	229.22	254.24
Cosine of solar zenith angle	0.4068	0.8559	0.8061	0.4973
December 21st				
Solar declination	-23.45	-23.45	-23.45	-23.45
Solar elevation	10.29	36.92	34.75	17.15
Solar azimuth	122.57	157.25	268.48	232.09
Cosine of solar zenith angle	0.1786	0.6007	0.57	0.2949

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Consider critical sun angles to maximize shading



Sun Angle Diagram

(Source: Aron Temkin, FAU School of Architecture)

The plan of this south Florida residence designed in 1949 by architect James Voorhies responds to the four stages of indoor-outdoor living.

Adapting local architecture to an indoor-outdoor lifestyle is a characteristic architectural response to our balmy climate. Rooms can be considered in terms of their position relative to the outdoors and the degree of enclosure.

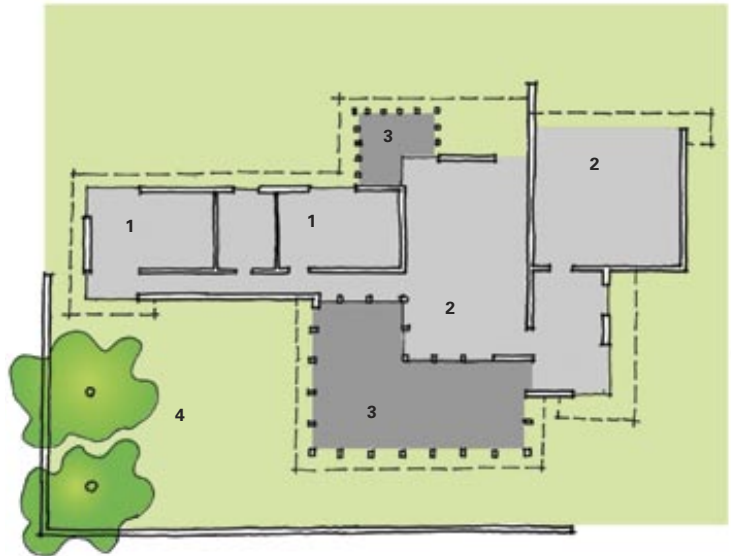
considerations

- There are four combinations that can serve as a guide to a climate sensitive design approach that responds to sense of place:

1. Indoor-Enclosed: Enclosed rooms, bounded by walls or other rooms;
2. Indoor-Open: Rooms with one or more fully operable glazed walls opening onto a porch or covered patio;
3. Outdoor-Enclosed: Rooms with one or more screened walls opening onto an outdoor room or garden;
4. Outdoor-Open: Rooms open to the sky, enclosed with privacy walls, or shaded with a trellis.

design principles | architecture

Integrate with the landscape



Transparent, open buildings with a variety of sunscreening and shading devices for indoor comfort can be organized to form courtyards and open ground floors to create a comfortable outdoor environment.

Heat stored in high thermal mass materials, as well as concrete and asphalt surfaces, can increase ambient temperatures by as much as 10 degrees. Building mass and orientation can affect the flow of cooling breeze and the length of time outdoor spaces are in direct sunlight.

considerations

- Raise enclosed spaces above the ground and provide an open ground floor to encourage natural flow of breezes.
- Design buildings to shade and provide thermal comfort to outdoor spaces.
- Design parking areas as courtyards that function as comfortable outdoor spaces when cars are not present.
- Coordinate building design with landscape and urban design considerations to promote walking and outdoor activity in comfort.



Indoor parking structures connected by an open walkway bridging across the street encourages air-circulation and creates a pleasant breezeway access to Las Olas Boulevard.

design principles | architecture

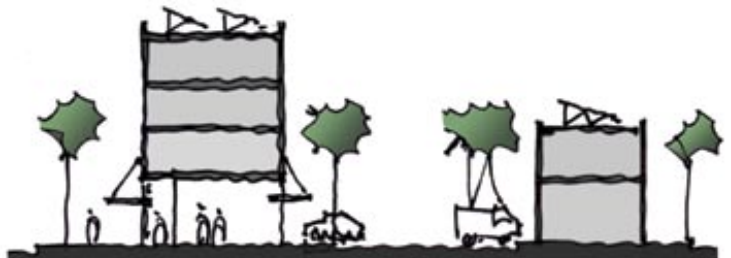
Organize spaces and massing in response to micro climate

Orient roof slopes to capture solar energy

Place parking and services at the interior of the site



Promote natural ventilation and shading with breezeways and courtyards



Locate retail at the ground floor along the streetfront

Locate residential uses in quiet areas of the site

Diffused compact development strategies that distribute open areas and building massing in response to climate can save energy, and increase the usable green area on the ground by optimizing the lot coverage. In our hot-humid climate, the buildings must also be arranged in a diffused open arrangement to encourage natural ventilation and cooling effects.

The benefits of this strategy include on-site retention and absorption of storm water.

considerations

- Regardless of height, narrow long building forms arranged to permit flows of breeze and provide shade, can facilitate passive cooling in hot-humid climates.
- Design side yards to encourage breeze and air circulation to the interior of the site.
- Design passageways and breezeways to open interior courtyards and garden spaces.

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Use diffused compact development strategies



Use breezeways and small public spaces to encourage air-flow



Use landscaped yards and courtyards to provide cross-ventilation in infill developments

The concept of designing diffused open arrangements of buildings with optimal site coverage can also apply to infill development. Infill development can be designed to open the building mass to allow for breezes to pass.

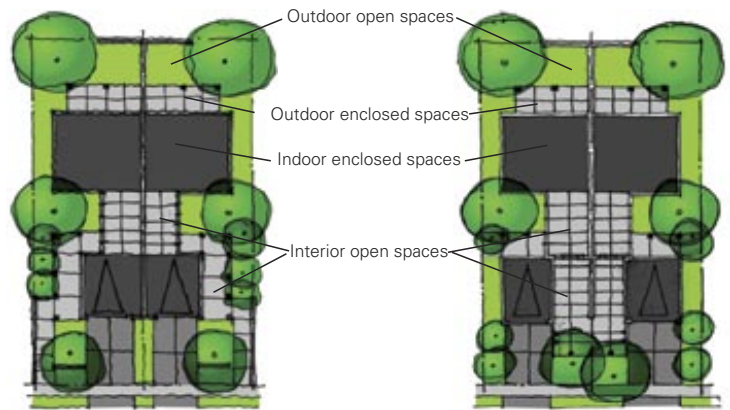
The four combinations of indoor-outdoor rooms that integrate with the garden can work at the scale of duplex and townhouse infill development.

considerations

- Encourage open infill development strategies in redeveloping neighborhoods.
- Design side yards, rear yards, and courtyards to encourage air-flow through the site.
- Interior open spaces can provide a connection to the outdoor environment.
- Consider shared access through a common courtyard.
- Consider carports instead of enclosed garages that can function a dual role as covered entrance canopy.

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Open infill development



Side entrances lead to open entry courtyards at the center of the site.

Shared courtyard entrances open to interior gardens.



Plan diagram of entry courtyard type infill development with alley access to carport.



Open infill type development illustrated in plan oblique diagram.

With the number of balmy days provided during our fall, winter, and spring seasons we would use our air-conditioners less if our buildings were designed for natural ventilation. There are a few basic principles of airflow, based on the application of biology, meteorology, and engineering science to architecture in hot-humid regions.

The prevailing breezes, averaging 10 mph, during the warm seasons are from the east-southeast. Easterly sea breezes and trade winds combined can reach speeds of 20 to 30 mph.

considerations

- The placement and size of inlets and outlets can affect the flow of cooling breezes through a room.
- Maximum airflow can be achieved when the inlet and outlet are of equal area and placed opposite each other.
- Higher velocities of air movement occur when the outlet is larger in area than the inlet.
- Low energy consumption can be achieved by combining this strategy with compact development, multi-use spaces in buildings, designing a privacy gradient, and providing a rain and sun screen.

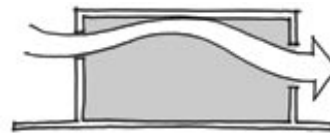
Design for natural ventilation



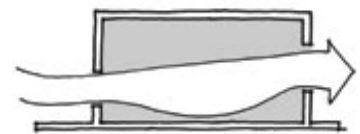
Inlet placed low causes airflow to sweep the floor.



Louvers placed in a downward position at the inlet diffuse airflow.



Inlet placed high directs flow upward resulting in loss of cooling effect.



Inlet placed low directs flow downward. The location of the outlet has no effect on the internal flow pattern.

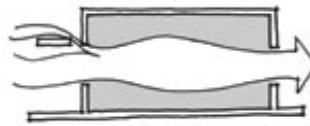
Louvered overhangs and sunshades enhance downward pressure of airflow through a space.

considerations

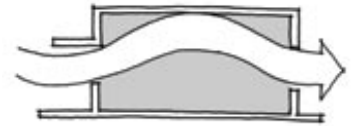
- Use shading devices to protect from the sun and also to direct cooling breezes.
- Use rain screens to improve thermal performance of the building envelope.

design principles | architecture

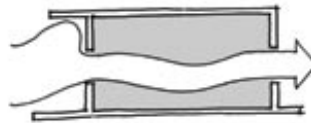
Design overhangs for ventilation



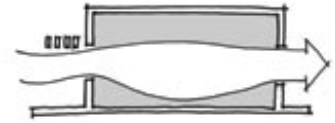
Providing a slot between a canopy or 'eyebrow' can increase downward pressure and result in a more comfortable air flow within a room.



Solid overhangs, or 'eyebrows', directly over a window can direct airflow upward away from the occupied zone of a room.



Overhangs collect breezes and enhance airflow to interior spaces.



Louvered overhangs and sunshades enhance downward pressure of airflow through a space.

The 'middle light' within the spaces of our native tree islands and hammocks provide a transition between shadow and light and a refuge from the sun. Buildings and building facades can be designed in layers to create the 'middle light' characteristic of our subtropical environment.

Careful selection of pavement textures and colors can also effectively reduce glare. These techniques can help reduce the blinding effect of the direct glare of sunlight.

considerations

- Shade all external openings and walls including those facing north.
- Provide covered outdoor living areas such as verandahs and deep balconies and porches to provide shade and cool the air.
- Provide shading devices at skylights to reflect indirect natural light.
- Provide adjustable shading devices to allow users to control the desired level of shade.

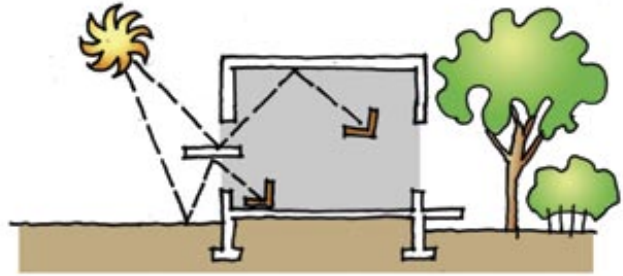


Effective use of louvers, grills, and screens, and overhangs provide a transition from indoor to outdoor light.

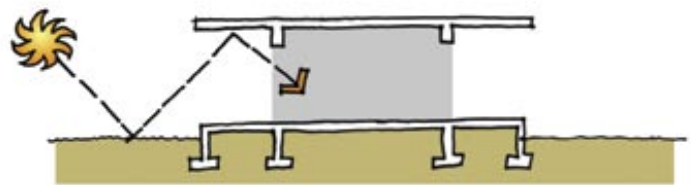
design principles | architecture

Use wall openings and surface finishes to produce 'middle light'

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5.10



Light colored soffits and pavements can reflect and diffuse sunlight. Strategically placed landscaping can soften and filter harsh direct sunlight.



Canopies have a very practical purpose to protect us from heavy rain and sunlight. In Broward County's hot-humid climate, the building and outdoor living spaces should be protected from sun and rain throughout the year.

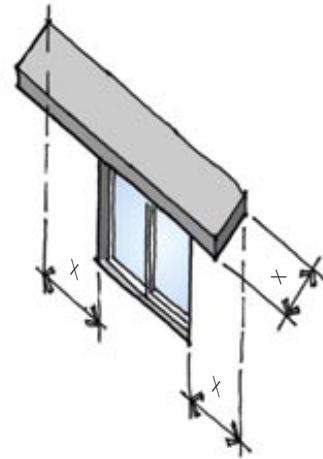
Canopies and awnings should extend beyond the width of an opening to provide full shaded protection.

considerations

- The rule of thumb is that the side extension of the canopy should be equal to the outward projection.
- Consider use of canopies at drive-thru facilities.
- Connect canopies with covered passageways and breezeways to provide continuous weather protection around and between buildings.

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Design canopies for shade and shelter



Canopies can be used in various ways to shade, to protect pedestrians, to protect motorists at drive-thru facilities from sun and rain.

At several times during the course of a typical day we all make the transition from driver to pedestrian. In addition many people now walk the downtowns.

It is also human nature to try to find the most direct, comfortable, and safe route to a destination. As pedestrians provide the economic base for these emerging centers, their comfort and safety is important.

Quite simply, more people would walk if the places they walk through were designed for their comfort and convenience.

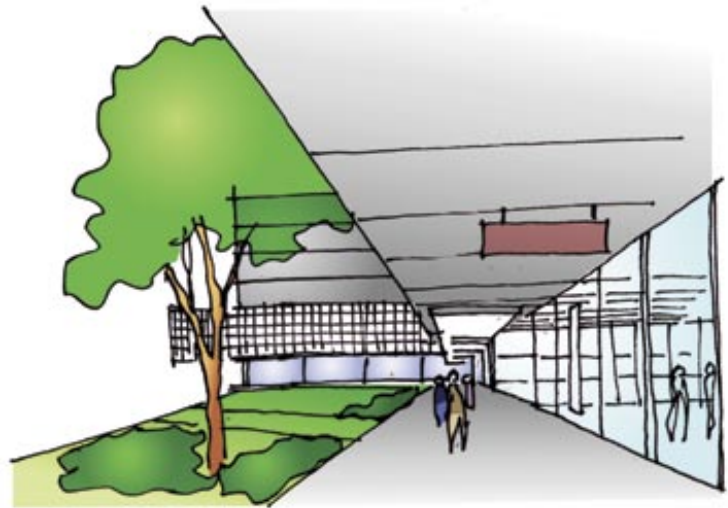
considerations

- Interconnected pathways aligned with crosswalks
- Continuous shelter from sun and rain
- Continuous visibility along the route, both day and night
- Comfortable walking surfaces
- Places to rest and affirm orientation
- Multiple paths providing alternate routes

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Shelter pedestrians where buildings meet the sidewalk

C
5.12



Canopies can increase visibility through display windows by reducing solar glare while providing a shaded environment to walk.

Large development projects in urban areas, or in village centers tend to be monolithic and lacking in character when compared to the traditional main street, built piecemeal over time. No matter how clever the architectural detailing, the lack of richness and diversity found in an authentic town center is lost in the consistency and uniformity of details.

One strategy for bringing back the human character of the street is to allow tenants to build their own storefront as part of their tenant improvements.

considerations

- A developer can improve the sidewalk and public space in partnership with government and provide the framework for tenant infill at the ground floor retail streetfront.

- Above the streetfront, the building can be effectively designed to integrate into the fabric of the city, while at the streetfront a diversity of styles and materials can find expression within a regulated pattern of sill heights, signage sizes and types, canopy depths and clearances.

Investment in the public space combined with incentives to assist tenant participation in the design and construction of individual storefronts give vitality to a large redevelopment on a street in Bethesda, Maryland (right top and bottom).

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Tenant-built storefronts



Improvements and expansion of transit can provide opportunities to reduce the impact, scale, and placeless character of automobile based development.

Transit-oriented design places emphasis on pedestrian convenience, comfort, and safety. Because transit-oriented design is focused on the pedestrian, attention to detail and the small scale is essential.

New developments and redevelopment can incorporate transit stops and facilities into their design.

considerations

- Overhead canopy extensions at transit and taxi areas.
- Dedicated transit and taxi cab pick-up and drop-off zones.
- Visible and accessible shelters with seating.
- Local area wayfinding maps and information.
- Water fountains and trash receptacles.
- Advertising and cultural information.
- Careful selection of pavements, landscaping and lighting.

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Integrate transit stops and shelters

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Integrated transit shelters were a feature of the celebrated Sunrise Center when it opened in 1954, and a continuous pedestrian canopy shelter at the Sears Town Shopping Center in Fort Lauderdale is still in use today.

The roof absorbs the majority of solar energy. With the amount of average available sunshine ranging between 60% and 75% during the daytime our rooftops have the potential to become a fertile territory for harvesting solar energy.

By designing roof forms with the proper orientation and exposure, the opportunity for viable use of photovoltaic and other solar energy collection technologies increases.

considerations

- Solar harvesting canopies can be designed as fly-roofs to reduce heat gain through the roof assembly.
- Design structures to accommodate retrofit for future use.
- Orient photovoltaic panel slopes to maximize solar exposure.

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Use roof shapes to harvest solar energy

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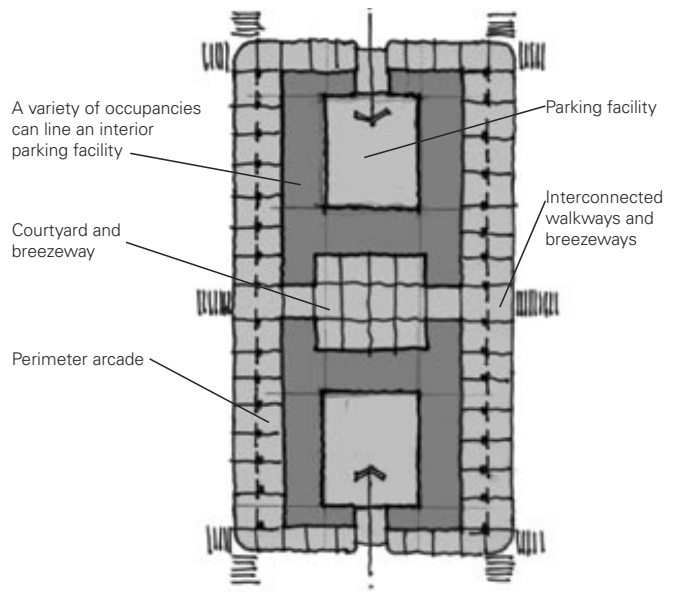
A liner building is a relatively narrow building type of residential, commercial, or mixed use development that faces a pedestrian/transit oriented sidewalk and street section while simultaneously enclosing a mid-block or mid-property parking facility or structure.

Liner buildings work as an integral part of the transportation infrastructure where pedestrians are concerned. A liner building helps to support the pedestrian quality of service on a corridor.

The liner building is an integral building block of the town center or community core that is part of the quilt-net concept, superimposing a pedestrian network onto the existing grid of automobile oriented corridors.

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Liner buildings



Locate vehicular access off of pedestrian intensive streets

Liner building diagram for a standard city block. Note locations of parking facilities and an open courtyard at the interior of the block, and interconnected covered arcades along the major street frontages.

Podium buildings provide protected interior parking that is not visible from the exterior. The roof of the parking area serves as a platform for gardens and outdoor spaces with access to interior spaces.

This building type can serve a variety of uses, including commercial, office, retail, residential, or mixed-use. The ground floor street fronts face a pedestrian/transit oriented sidewalk. Low rise, 3-5 story residential, commercial, or mixed-use structures can be located on the podium with access to the sidewalk and transportation network.

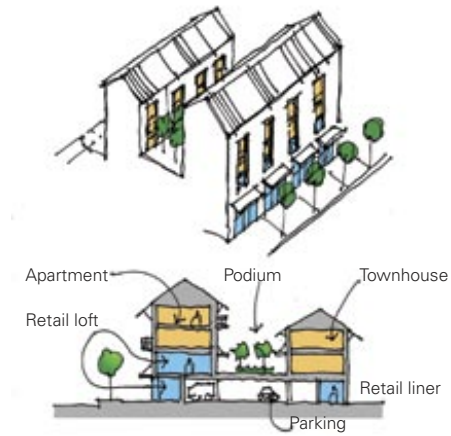
The podium building is an integral building block of the town center or community core that is part of the quilt-net concept, superimposing a pedestrian network onto the existing grid of automobile oriented corridors.

A podium development effectively utilizes outdoor spaces and conceals parking facilities from view.

A townhouse development is built above commercial retail uses on this podium above a parking facility in Bogotá, Colombia.

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Podium buildings



A building throughway is locally known as an 'arcade'.

A number of arcades were built in Fort Lauderdale in the early 20th century that helped to form a shaded and protected pedestrian network within the downtown. Most of this urban structure was torn down, and only a few remnants survive today.

A building throughway is an effective building type of public corridor in situations where there is a higher density of pedestrian activity, such as an urban core. It provides a shortcut through the block, additional retail exposure, and connections between sidewalks and transit facilities.

considerations

- To function as a public corridor it should be between 15' and 20' feet wide with a ceiling height of at least 16'.
- The roof should provide filtered and shaded natural light.
- A throughway can be aligned with other arcades and connected with mid-block crossings throughout the urban core.

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Building throughways

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5.18



Is there a single architecture one can define as “Broward” architecture? The diversity of local architecture is reflected in the different materials and styles, or ways of building, that are represented by buildings built over the last 100 years.

As we examine our local architectural heritage, we can better understand our own sources of design, support the adaptive reuse of existing historic structures, and encourage innovation not imitation in new development and redevelopment. Broward can continue to develop a harmonious diversity in architectural design.

considerations

- Encourage best-practices climatic design for buildings
- Design roofs as much as possible as canopies for the exterior envelope below, or as occupied terraces with views to the surrounding landscape.
- Use on-site renewable energy production as much as possible. Renewable energy production integrated into building is an important component of demand side management, which can significantly reduce operating costs.
- Opening buildings to the surroundings assists in providing access to the natural attributes that are central to it’s sense of place.
- Carefully consider construction site waste management. Recycling and re-using construction materials from site to site encourages new business start-ups to provide these services, decreases the demand on local or regional land-fills, and lowers the embedded and embodied energy of production and transport for buildings.
- Use of recycled/re-used and healthy materials and assemblies removes volume from the waste stream, encourages local business start-ups, lowers the energy within the material, and makes for spaces that cause fewer allergic or toxic reactions.
- Design facilities as much as possible to be flexible enough to accept new ‘green’ technologies that are near commercial application for when they become more affordable.

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Foster the development of a Broward architecture



Architecture recommendations

general recommendations

1. Promote the adoption of local design guidelines that require coordination between architectural design, transit, and pedestrian and other forms of non-motorized transportation.
2. Incorporate context based design into all new and renovated County buildings and encourage the private sector, and municipalities to do the same.
3. Encourage climate responsive design and implementation of LEED (Leadership in Energy and Environmental Design) rating system in all new County buildings.
4. Encourage municipalities to adopt the LEED rating system for development and redevelopment.

regulatory and policy considerations

1. Review local and state building regulations to assess need for adaptations to encourage climate-based design.

ATTACHMENT 18-4

Design Principles – Landscape Architecture.

Chapter C-4, Broward County County-Wide Community Design Guidebook

Attachment 18-4 can be found on the attached disk.

Preserve and enhance the urban forest

Trees are integral to our communities and the ecological systems in which these communities exist. The trees within and around our communities comprise the 'urban forest.'

The benefits of an urban forest include:

- Oxygen and cleansing of the air.
- Energy conservation through shading and cooling.
- Reduction of glare.
- Absorption of noise and airborne pollution.
- Absorption and reflection of heat.
- Reduction of water runoff and soil erosion.
- Provision of wildlife habitat.
- Transformation of barren areas.
- Sense of place, identity and wayfinding.

Six principles for improving the urban forest

1. Preserve existing trees and forest.
2. Increase space for tree planting.
3. Preserve and improve the quality of the tree-growing environment.
4. Select trees for diversity and suitability.
5. Select efficient planting locations.
6. Manage the urban forest as a continuous resource.

-Georgia Forestry Commission

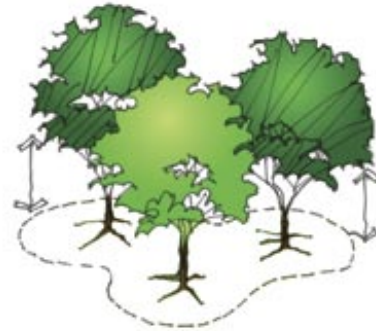
references

Georgia Forestry Commission. Georgia Model Urban Forest Book. January 2001.

Florida Department of Transportation. "Landscape Installation Index No.544." Gary Henry, State Landscape Architect. January 2000.



The critical root zone is related to the drip line of the tree.



The selection and placement of plant material functions to provide shade, lower ambient temperatures; and it attracts birds, butterflies, and other species of life.

considerations

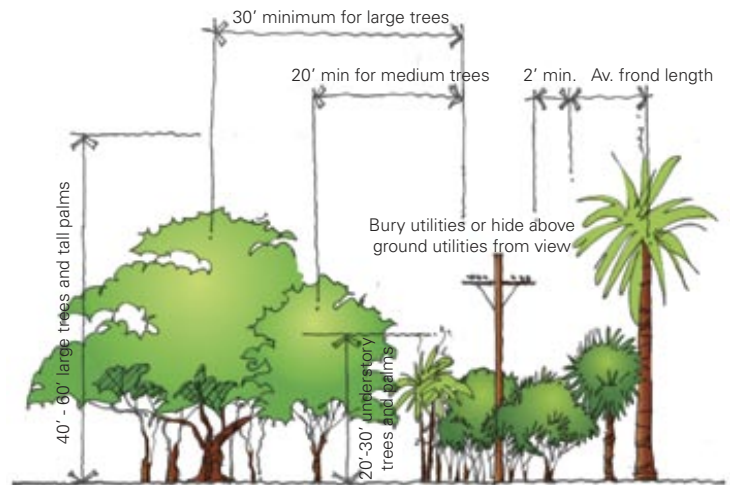
- Use NatureScape principles in selecting trees and plant materials
- Analyze the soil conditions to determine which native plants are best suited to the environment
- Adequate space for the mature height and spread of the tree
- Locations of nearby buildings, signage, and above and below ground utilities. Select and locate trees to conceal views of above ground utilities
- Exposure and amount of sunlight, moisture, and salt spray
- Characteristics of the tree, including type, color, texture, and shape
- Resilience to high velocity wind conditions



Utility lines crossing the street have less visual impact than lines running parallel to the street.

design principles | landscape architecture

Select trees to suit context



Driving or walking under a vault of green foliage is a pleasurable experience. A dense and continuous shade canopy of trees, along with the considered use of ground cover tempers the micro climate, lowering temperatures outside, reduces the thermal load on buildings and infrastructure. Additional benefits include reductions in reflected glare, heat absorption, and a reduction in our consumption of energy.

considerations

Coordinate a dense and continuous shade canopy for the maximum area of the County's corridors with municipal initiatives.

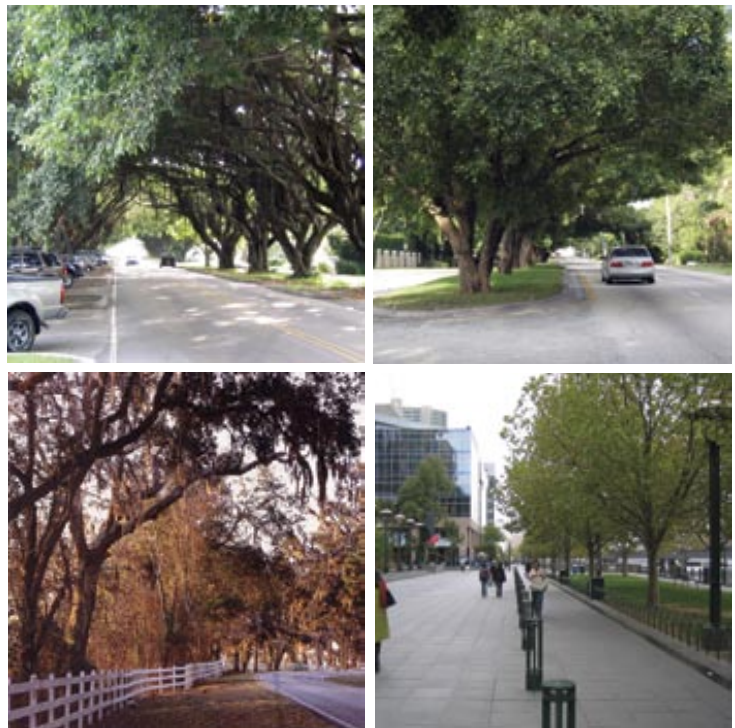
Develop overall landscape concepts for public spaces and corridors, using NatureScape principles.

Encourage a variety of trees along different corridors using native species appropriate to the local context and soil conditions. This can serve as part of a county-wide wayfinding system, as well as prevent the detrimental effects of disease upon individual species.

Trees arch over the roadway in Coral Gables (upper left and right); provide shade, color, and texture along suburban lanes, and line urban pedestrian boulevards.

design principles | landscape architecture

Create corridors of green



The palm tree is an iconic symbol of the tropics. Palm lined boulevards such as the streets in eastern Hollywood and on East Las Olas Boulevard evoke a clear sense of place.

Majestic Royal Palms and other palm species can favorably alter the scale of a wide boulevard, creating rhythm, and framing views.

considerations

- In places where there is insufficient clearance for larger canopy shade trees, a regular spacing of upright palm trees can create an urban colonnade that function as a natural wayfinding element.
- A palm promenade can mark an important route toward a community or cultural center.

A grand colonnade of palms frames the experience of East Hollywood Boulevard .

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Palm-lined promenades

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Street trees should be aligned with structural columns and other vertical building elements between storefronts to provide better visibility to window displays and signage.

A regular spacing of trees creates an atmosphere of order. Irregular spacing of trees must be carefully considered so that a sense of composition and balance is maintained.

considerations

- Select trees with upright trunks and a canopy clearance of at least 7'-0".
- If the building structural grid is less than 20' consider palm and understory trees.
- If the building structural grid is greater than 30' canopy trees may be considered.
- Check that there is sufficient clearance between the trunk and the face of the building for development of the tree canopy.
- Establish corridor landscaping requirements and coordinate with adjacent site landscaping through the development review process.

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Align street trees with building elements



15'-20' spacing for palms and understory trees
20'-30' spacing for canopy trees

Given the variety of types of urban form in Broward County, there should be a clearer sense of when a more structured urban scheme is more appropriate than a suburban garden scheme. The native habitats that are being restored throughout Broward County lead us to consider the design of our streets and buildings in better, more harmonious relationship to not only these particular sites, but as inspiration for the continuation of a venerable Broward landscape tradition for residential, commercial and institutional sites of any size.

Plant materials can shape urban space, frame views, shield pedestrians from moving traffic, and provide separations and buffers between activities. While trees may not always be appropriate for urban areas, they should be selected in relation to the overall effect of the streetscape and public space.

considerations

- Plant vegetation to open views to increase the perception of safety.
- When certain views are undesirable, creating internal views can improve visual access while maintaining a buffer.
- Design for coherency. This makes a place easier to understand. Use repetition and contrast to reinforce edges and borders to reinforce the sense of coherency.

design principles | landscape architecture

Use trees and plants to create urban spaces

Enclose an open lawn or public space with a colonnade of trees.

Frame a street with closely spaced trees for shade and a sense of enclosure.

Use trees to separate parking spaces in a car park.

Use a regular spacing of trees to create a sense of order and rhythm.

Alternate rhythms of tree spacing at boulevards and side streets.

There are very few places where people can simply stroll or sit comfortably along the streets of the modern city. Workers need places to take a break, children need places to play where parents can watch, and the elderly enjoy a special place to go to where they can expect to meet others.

Such activities are diverse and unprogrammed, so they require spaces that are somewhat defined, yet not overly designed. Landscaping can remove surrounding distractions and noise. Quite simply these spaces should be accessible, placed along an important path and visible from nearby offices, shops, and houses.

considerations

- Consider utilizing residual open spaces as pocket parks.
- Place outdoor rooms tangent to pathways leading to them.
- Use surrounding buildings, walls, or fences to define part of a pocket park.
- Provide trash receptacles, seating, and lighting.
- Consider placing signage to identify native trees and plants.
- Providing a continuous accessible route for the disabled.



A landscaped walk connects cultural institutions in Rotterdam, Netherlands.

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Make the landscape accessible



Landscaping has a powerful impact on our perception of the natural character of a place. The variety and exuberance of vegetation in Broward County is an opportunity to combine best-practices climatic design with tropical aesthetics. This allows for diversity in landscape schemes for individual cities, yet the large palette of indigenous species helps to coordinate at the same time an integrated sense of place, as in a variety of variations on a theme.

considerations

- Use landscaping to providing shade and directing cooling breeze in pedestrian areas as well as to the interiors of buildings.
- Select plants that filter light into public spaces and buildings.



Landscaping provides shade on a walk leading to a transit station in Hong Kong.

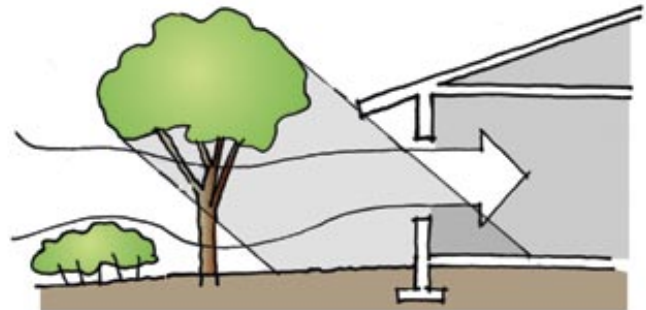
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Design the landscape for climate



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Select and position landscaping to shade and direct cooling breeze to public spaces and to interior spaces.

Blueway and greenway corridors can connect communities to each other and to the natural environment. Indigenous species and carefully considered species mixtures in greenways, blueways, parks, open spaces, and planting schemes for buildings can clean the air and provide effective surface water runoff management.

Through the use of natural vegetation, water and air purification, and surface runoff management can be sustained further in time with lower maintenance costs, and these also connect us with a Broward sense of place.

considerations

- Use NatureScape principles along greenway and blueway corridors.
- Provide access from surrounding neighborhoods and community core areas.
- Restore natural vegetation at the water's edge.
- Utilize botanical signage to identify plant species in public parks and greenways.

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Improve and expand blueway and greenway corridors

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When planting shade trees in a multi modal corridor adequate clearance is needed between the tree and the buildings, as well as beneath the tree for transportation.

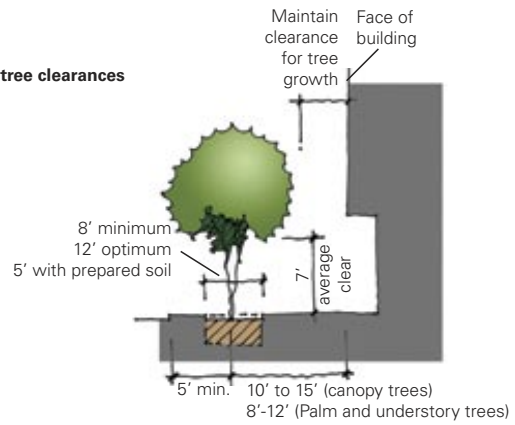
Each tree species has particular growth characteristics. The mature size of the tree canopy and root zone must be taken into consideration when determining setbacks, build-to lines, and planting bed requirements.

Tree selection for the public rights of way is an important first step in the community design process to avoid future problems in redevelopment.

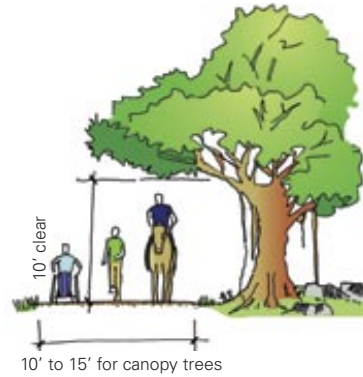
design principles | landscape architecture

Provide adequate tree clearances

Urban tree clearances



Trail clearances



Planting trellises and espalier provide an effective screen to parking facilities, blank facades, and gaps in the enclosure of public space.

considerations

- Confirm long-term care with maintenance agreements.
- Encourage use of vegetation as a significant aesthetic feature to screen facades, define corridors and other public spaces.

design principles | landscape architecture

Screen structures with green facades



The built environment can be brought to life with the lush vegetation of our tropical environment. In such a verdant environment there can be more creative integration of built form and natural plant materials.

Careful design and construction techniques can preserve old growth in surprising and dramatic ways.

considerations

- Seek the advice of professional landscape architects for integrating existing plants with new construction.
- Encourage preservation of existing vegetation and design solutions that integrate with the natural landscape.

Existing trees are dramatically framed by a multi-story educational complex at the Universidad Javeriana in Bogotá, Colombia.

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Integrate buildings and landscape



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Bio-swale rain gardens collect and filter storm water runoff from paved surfaces. Rain gardens provide many benefits, including water filtration and aquifer recharge, and support for vegetation to improve the quality of the physical environment.

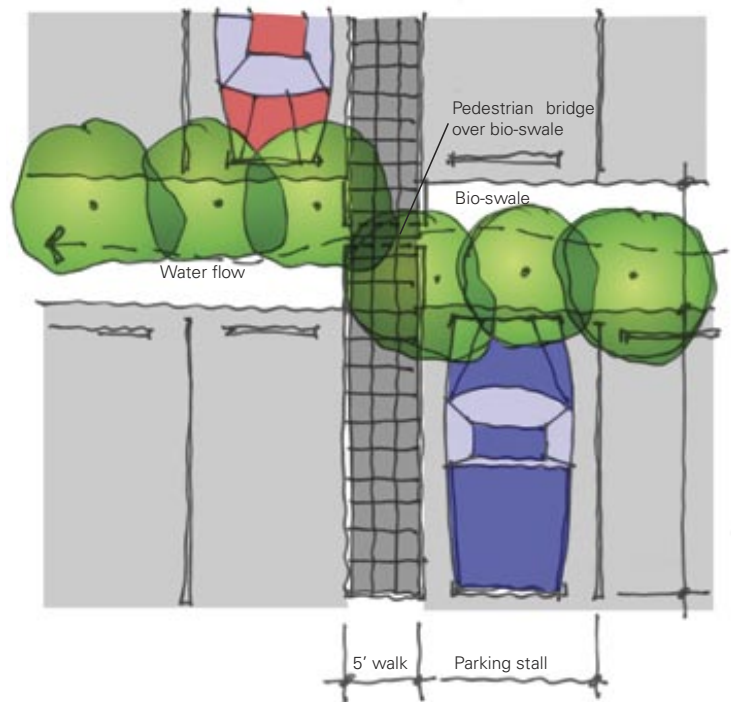
Bio-swales with sinuous shapes encourage the slow, natural percolation of surface water to the ground along with a variety of pervious paving types. These help to avoid ponding of storm water by allowing for the water to percolate, naturally cleansing the runoff water. Proper drainage slows down the percolation to avoid erosion, and if well designed can add aesthetic interest. Drip irrigation conserves water and avoids the inundation of roots

considerations

- Provide continuous wheelchair access across the bio-swale.
- Coordinate plant selection with water filtration objectives.

design principles | landscape architecture

Incorporate rain gardens into parking lots



Proper drainage techniques should be considered for healthy trees. Street trees in particular are surrounded by pavement materials and need to be designed to maintain adequate hydration while managing storm water runoff.

Interconnected sediment trenches or pervious pavement encourages storm water filtration, and proper percolation of water.

considerations

- Use pervious pavement, modular pavers, and bio-swales with gravel or ground cover species to manage surface runoff.
- Encourage the use of drip irrigation systems for planting areas where conventional irrigation is unavoidable.
- Coordinate plant selection with water needs and soil conditions.

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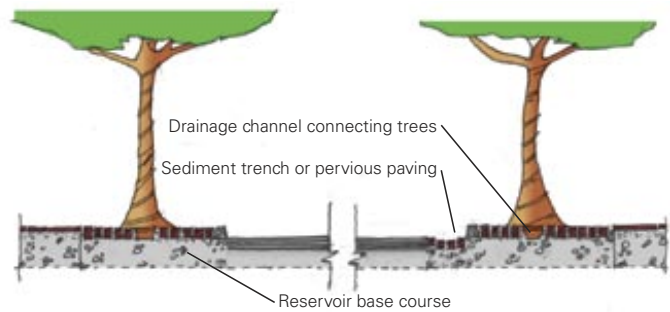
Drain street trees for tree health and storm water runoff



02.01.05

C

4.14



Using street tree wells as catchment areas for sidewalk runoff.

Sediment trenches provide a natural method for cleansing storm water runoff.

Low curb sediment trenches provide storm water cleansing and slows storm water runoff to a manageable rate, directing the water to lower channels for disposal to sewers or watercourses.

design principles | landscape architecture

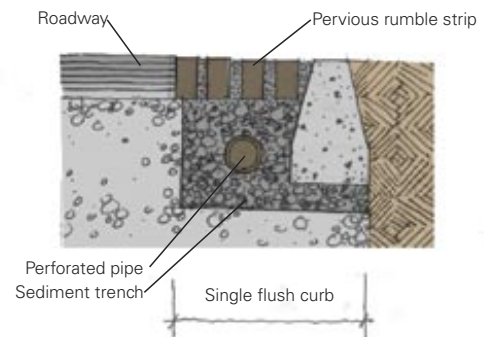
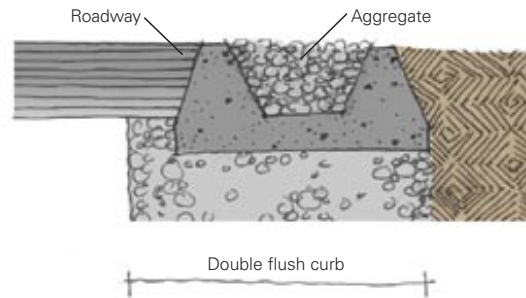
Use sediment trenches for additional drainage and filtration



02.01.05

C

4.15



Prune to the collar of any branch stem for the health of the tree or shrub and a more natural looking result.

At the base of any branch there is a wide section that contains a plant's natural healing agents. Any pruning performed away from this collar will expose the plant to a greater risk of infection. A cut at the collar will naturally heal.

considerations

- For large branches over 2" in diameter, cut from the bottom, then cut down from the top. This prevents tearing of the bark, reducing infection.

design principles | landscape architecture

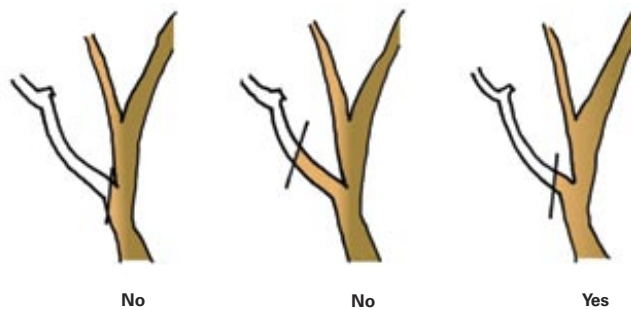
Prune branches properly



02.01.05

C

4.16



Landscape recommendations

general recommendations

1. Implement tree planting schemes at county entry points and along all corridors, including the corridors of green and palm promenade concepts in the Guidebook.
2. Establish a policy that ensures coordination between landscape elements, utility infrastructure, and the pedestrian and transportation environment.
3. Encourage local governments to adopt NatureScape principles.
4. Establish performance guidelines for context-based design of the landscape in the public realm.
5. Amend, as appropriate, the standards for addressing adequacy of parks and recreational facilities to expand the availability of parks and open space in existing neighborhoods.

regulatory and policy considerations

1. The Broward County Land Use Plan (BCLUP) currently has an objective and several policies under Objective 5.05.00 – Greenways and Trails, to further the greenway system within Broward County.
2. Continue to implement the Broward County Greenways Master Plan.
3. Investigate amendments to the Broward County Land Development Code to require dedication or reservation of planned greenways corridors.

ATTACHMENT 18-5

Design Principles – Transportation.

Chapter C-2, Broward County County-Wide Community Design Guidebook

Attachment 18-5 can be found on the attached disk.

The character of a city is based upon its modes of transportation



The character of the city is based on the choices made for its transportation systems. Thus a city that relies on mass transit has a different character than a city that relies on the automobile. The design of a transportation corridor should be based on the present and future urban context.

A basic set of defining characteristics for each context within the county should provide the cues for corridor design concepts. For example, in more 'urban' areas with multi-modal transportation, the context for pedestrian space includes a sense of enclosure that is based on the relationship of the corridor width to the height of the adjacent buildings, or the rhythm and extent of coverage of shade trees. Recognizing the need for flexibility in implementation, professional design judgment is needed on a case-by-case basis.

considerations

- The most effective way to influence the future urban form of a community or along a corridor within a community is to identify and determine the modes of transit to be implemented.
- Without implementation of alternative transit modes the default design mode will continue to be the automobile, independent of the intended effects of pedestrian and transit oriented zoning, parking, and development regulations.

Transportation systems define the character of the built environment (clockwise from top left): Trolleys in Melbourne, Australia and Portland, Oregon; vehicular, bicycle and pedestrian paths in Bogota, Colombia and Hollywood, Florida.



The road corridor network, due to its extent and scale, is one of the most powerful and visible determinants of the character of a place.

The road corridor has many purposes and functions in the community. To varying degrees, the corridor system serves four fundamental community functions:

- Provides public space for wayfinding and social exchange;
- Provides access to properties and land;
- Provides a route for multiple modes of transportation;
- Provides infrastructure for supporting services and utilities.

(Adapted from City of Ottawa. Regional Road Corridor Design Guidelines: 8-11)

considerations

- Include input from design and public art professionals early in the preplanning and planning phases.
- Include design and public art professionals in community workshops.
- Identify corridor functions broadly, and clearly envision these functions within the desired future context.

Corridor functions to accommodate include (clockwise from top left): Places for wayfinding and social exchange; various transportation modes; utilities, public art, shade, and tourist information; access to parks and commercial areas.

design principles | transportation

Balance functions within the transportation corridor



The corridor is often effectively the public space of the community. In order to accommodate future growth, create a sense of place, and build community, the public space function should include the following considerations:

Social exchange is dependent upon access, safety, and usability. The public space includes the area of the corridor and its integration with adjacent land uses and building types. Access and use of the public space should be convenient for pedestrians, bicyclists, and transit users. Universal access provides barrier-free access for people of all levels of physical ability. Compliance with the Americans with Disabilities Act is a requirement of the public space. Usability is determined by physical comfort of the user, the perception of safety, and mitigation of the effects of direct sunshine, rain, glare, visual, noise and air pollution. The design of the corridor should also address the feeling of safety for pedestrians, cyclists, adjacent businesses and residences; and incorporate Crime Prevention Through Environmental Design (CPTED) principles.

considerations

- Determine the proper combinations of elements for effective wayfinding, include integration of public art, selection of materials for lighting, signage, furniture, utility infrastructure, and pavements
- Coordinate with the spatial definition and form characteristics of adjacent buildings and landscaping.
- Vegetation can be used effectively for spatial definition to create public spaces; as well as orient the public to adjacent greenways, parks, and conservation areas.

design principles | transportation

Design the public space for wayfinding and social exchange



A broad pedestrian boulevard parallel to the Yarra River in Melbourne, Australia (above left) affords simple and direct orientation by providing views of major sites, vistas, and sky. Bollards are used to separate pedestrian and bicycle routes on a level stone pavement.



Comfortable street furniture, landscaping, paving materials and generous sidewalks paved in clay brick (above right) make this street in Reston, Virginia an inviting place for a cup of coffee.

The range of access to adjacent properties, from visual access to physical access, is an important design consideration.

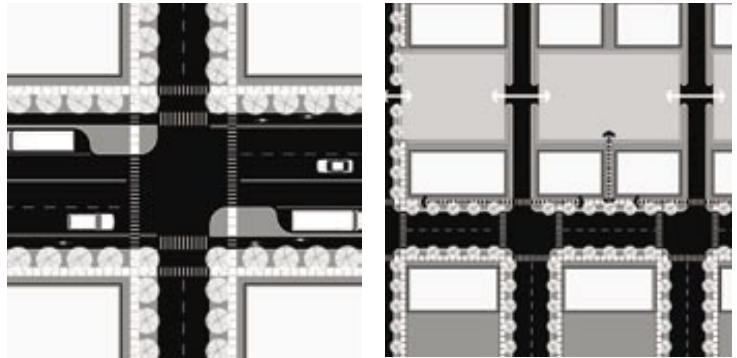
This function includes essential principles that are also part of a wayfinding system: rhythms and legibility of forms, spaces, and signage; clear and consistent information situated at key decision-making points.

considerations

- Continuity of visual and physical access is needed in varying degrees for different uses and activities, existing and planned.
- The order of the landscaping and buildings; the demarcation of pedestrian, bicycle, transit, and vehicular use areas; and the amount and quality of signage should be carefully considered to provide optimal access and exposure to the uses and destinations along a corridor.
- Note that pedestrian scaled environments can sustain a greater number and variety of exposure and access opportunities than vehicular scaled environments.

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Optimize access and exposure to properties and land



Pedestrian access across the street (above left) and protection of pedestrians and bicyclists with sidewalk and crosswalk networks, orderly street trees and curbs make for well designed urban corridors.

Landscaping and simple route networks (above right) for pedestrians and bicyclists make for more convenient and efficient access to properties.

Use and design of adjacent lands are influenced by corridor function and character. The concept of the Quilt-net is based on a coordinated hierarchy of interconnected corridors with varying capacities and functions. Transportation modes accommodating higher capacities such as transit requires pedestrian priority and controlled vehicular access to reduce conflicts between travel modes.

*“How we get around determines
how we live.”*
-Alex Marshall

The multi-modal route provides for the optimum capacity and safety of people. This is accomplished with a variety of travel modes, each designed for safety, efficiency, as well as to provide convenient transition between modes.

considerations

- Priority to transit vehicles, pedestrians, and bicycles.
- Sidewalks and pedestrian amenities along both sides with connections and access to other public roads, sidewalks, parks, and neighboring areas.
- High quality, attractive, safe, comfortable, and convenient facilities to promote transit use.
- Pedestrian oriented places, such as pocket parks or greenways.
- Appropriately designed signage for all modes along the corridor.

Integrating art and design into everyday utilitarian objects and infrastructure components can transform the ordinary into the extraordinary.

design principles | transportation

Design routes for multi-modal transportation



Glass and steel provide layers of protection from rain and sun for pedestrians crossing the river from the convention center at Clarendon Street in Melbourne, Australia (above left).

Multiple modes of transportation are balanced in the design of this intersection in Bethesda, Maryland (above right).

The corridor provides the infrastructure to manage storm water; mitigate light, sound, and air pollution; deliver power, water, sewer, communications; and other municipal services. Plant materials are also an integral component of the service function of the corridor: they clean the air by collecting airborne particulates, absorbing carbon dioxide.

Trees and plantings can also be selected to filter sunlight and sound. Corridor landscaping provides cooler temperatures and surface runoff management in urban areas.

considerations

- Conceal the utility infrastructure, or integrate it into the design of the public space;
- Avoid conflicts with pedestrians, and improve the aesthetics of the corridor by placing utilities underground;
- Locate service access to utilities for minimal disruption to the capacity of walkways, bicycle ways and trafficways;
- Select types, forms and finishes for equipment, lighting, and accessories to support and enhance the character of the corridor.
- The integrity of corridor vegetation as a system should not be compromised above grade, at grade, or below grade.
- Maintain and reclaim where possible natural hydrological flow of water and water quality consistent with Broward County's Naturescape program and the Integrated Water Resources Plan.
- Life cycle and maintenance costs should form the basis of cost considerations for the corridor. Design detailing, materials, and methods of construction should be considered to ensure aesthetic quality, durability and longevity of service.

design principles | transportation

Integrate art and design into the service and utility infrastructure



Aboriginal designs inspired the landscaping, utility, and service infrastructures integrated into the design of the Swanston Street corridor in Melbourne, Australia.

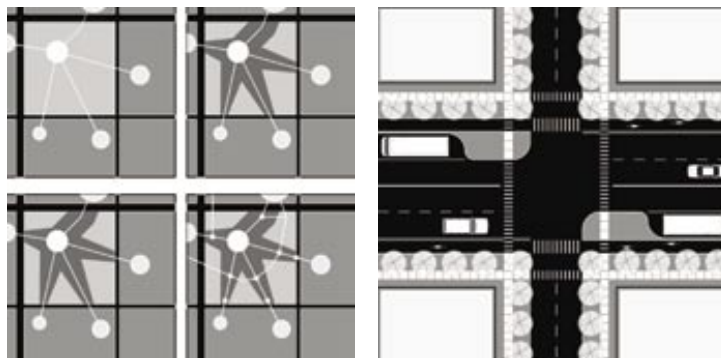
The design and function of our arterial road network can include better-defined functionality and capacity for pedestrian, bicycle, and transit flows. Broward County should thus consider expanding the functional classification of roadways and develop a balanced and syncopated network of transit and pedestrian mobility between centers and between the arterial intersections.

considerations

- Protect the social/pedestrian space from cars.
- Serve the primary right to mobility through various modes including pedestrian and transit.
- Coordinate primary and secondary transit corridors in relation to planned land uses.
- Reduce number of curb cuts on major arterials and limited access highways. Curb cut reduction increases efficiency of arterial corridors, reducing pollution, conflicts with pedestrians, and auto accident occurrence
- Design local streets to slow down or deter high speed, by reducing the width of asphalt and/or travel lanes. Slower neighborhood streets encourages pedestrian and bicycle trips at local level, within ½ mile radius, reducing pollution and enhancing resident health
- Include neighborhood pocket parks and larger parks at intervals along major routes. Parks at intervals on corridors encourages slower vehicle speeds and more pedestrian and bicycle use
- Design blueways and greenways to accept recreational as well as commuter transportation. Multi-use natural ways and trails provide needed open space, habitat corridors over long distances within the county, and encourages pedestrian and bicycle transit for a maximum of resident journeys

design principles | transportation

Create an integrated network of transportation modes



A defining characteristic of living and working in Broward is the dispersal in space of the institutional services, commercial areas, and housing throughout the County. The transportation experience is thus very important to our sense of place, so that the design of road rights-of-way, transit infrastructure, and signage become important opportunities for encouraging a more heightened sense of place and for improving the convenience, efficiency, and environmental performance of the County. The concept diagram (above left) illustrates how the connections between places can be reinforced by providing more efficient transportation choices linked with land use.

Careful design is necessary in places where higher density is anticipated to address the demands of different forms of movement: walking, bicycling, mass-transit, and vehicular. These transportation modes can be integrated into a seamless network to increase options and provide flexibility for mobility throughout the county. The concept diagram (above right) illustrates an integration of transit, vehicular, bicycle, and pedestrian modes.

The location and integration of transit stops and related sidewalks and pedestrian amenities can be considered an essential transportation element to support redevelopment that is pedestrian oriented to create walkable zones throughout the County.

Multi-modal corridors encourage transit use by bringing transit riders within same the proximity of commercial, institutional, and housing uses as that of private autos, reducing pollution and encouraging walking.

Encouraging zero-pollution and low energy transit leads to lower atmospheric and water pollution, lower noise levels, fewer accidents, and in general, better health of residents

considerations

- Coordinate primary and secondary transit corridors in relation to planned land uses. Corridorization of transit increases efficiency of routes and vehicles, reducing pollution and journey time
- Municipal road standards should tie into the county network with more context appropriate classifications of corridors tied to regional or area master plans. Determine a local and a regional hierarchy of transport corridors
- Determine major corridors for transit infrastructure. A rational hierarchy of roads helps in way-finding and transit route planning, reducing pollution, route duration and delays.
- Design major rights-of-way to accept private autos, transit vehicles and infrastructure, pedestrians, Bicycles/disabled vehicles, as well as mixed-use commercial, institutional, and housing areas
- Include facilities for shade and rest, benches, shade trees, sun shelter, bike stands, among others within major rights of way. Providing shade and rest facilities encourages transit use by enhancing the convenience and comfort of transit riders.

design principles | transportation

Develop major transit corridors tied to land use



An articulated bus system has transformed the character of the city of Bogotá as thousands of people have switched to transit and redevelopment concentrates around station stops.

An inner city tram provides efficient, comfortable, and clean service linking the major governmental, cultural, and business centers of Melbourne, Australia.

The primary objective for a transit system is to encourage ridership and enhance urban development. An environment designed for cars cannot sustain higher density as effectively or efficiently as mass transit. Proportionately more land area is dedicated to vehicular traffic in the suburb than in the city. In order to work efficiently an automobile oriented environment must be lower in density, with a large percentage of land developed in the form of roadways, turning lanes, driveways, surface parking lots, drive-thru facilities. Urban development is characterized by comparatively higher density and more efficient use of space dedicated to transportation, designed to carry higher volumes of people more efficiently, in the form of pedestrian and transit facilities: sidewalks, arcades, plazas, promenades, boulevards, dedicated transit lines, stops, and stations.

As Broward anticipates further growth in population and density, certain areas will emerge that will become more urban in character and function. Thus, while the suburbanizing influence of the car seems unavoidable, design and engineering professionals have the ability to design higher quality environments by integrating alternative transit options into transportation and urban design, landscape design, architecture, and graphic design.

references

The Florida Department of Transportation (FDOT) *Transit 2020* Plan includes Objective 3.1, “to promote land use planning and urban design practices that facilitate transit service and access.” Two specific strategies to support this objective are included in the plan:

Strategy 3.1.1. “Incorporate transit supportive strategies and standards in state and local plans, and proactively promote implementation of these standards.”

Strategy 3.1.2. “Strengthen the ability of transit agencies to effectively review and influence the transit accessibility of proposed developments.”

Transit Cooperative Research Program (TCRP) Report 33. *Transit Friendly Streets: Design & Traffic Management Strategies to Support Livable Communities*. Transportation Research Board. National Research Council. Washington DC: National Academy Press. 1998.

design principles | transportation

Design transit to encourage ridership and promote redevelopment



An articulated bus system consists of a dedicated lane for transit and a series of transit stations that provide an efficient and economical form of mass transportation. The Transmilenio system in Bogotá (Colombia) has cut commuting time by as much as 80%. Based on the Curitiba (Brazil) model, similar types of systems are being implemented in other cities around the world.

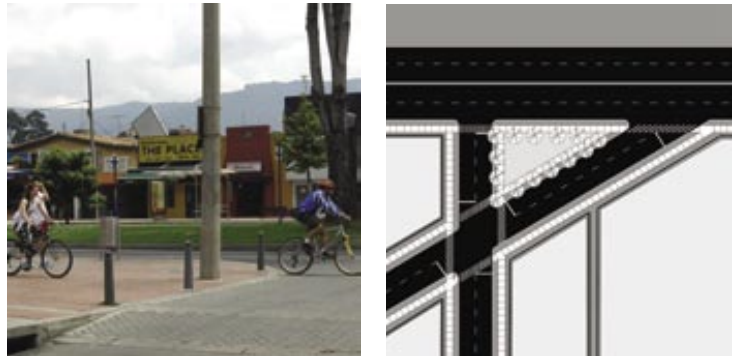
Intersections are the most critical component of the corridor, where travel modes mix, where decisions are made, and where safety is the most important consideration.

considerations

- Assess the need for dedicated right turn lanes and double left turn lanes on a case by case basis, keeping in mind the priority of pedestrian safety, to improve pedestrian security, reduce vehicle speeds, improve visibility, and reduce pedestrian crossing distances where possible.
- In areas with high pedestrian and bicycle traffic, assess lane channelization on a case by case basis, keeping in mind the effects on users and their safety.
- Use the smallest practical curb radii for the predominant transportation mode to minimize pedestrian crossing distances, and reduce vehicle speeds.
- Minimize and consolidate driveway access to reduce the frequency of vehicle connections to the corridor and decrease conflicts with pedestrians.
- Reduce driveway width and turning radii to the minimum practical dimension, while making provision for the turning movements of service and emergency vehicles.
- Raise driveways and minor roads at crossings 6 to 12 inches to the level of the sidewalk to improve visibility of pedestrians and calm traffic. The sidewalk material should be continuous across the crossing.
- Utilize USDOT/FHA recommendations for accessible sidewalks and crossings.

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Design intersections for pedestrian comfort and safety



Pedestrian and bicycle safety is designed into a crossing, raised 8 inches, at the intersection of a local road and an arterial corridor (above left). Note the use of bollards, consistency of surface texture, and use of color for contrast.

Intersections are the most critical component of the corridor and deserve careful consideration in design. The diagram (above right) illustrates a small pocket park in a residual space that can provide a pedestrian rest and wayfinding area.

A great deal of everyday life occurs where cars and pedestrians meet. As much as conventional practices attempt to separate cars and people the fact remain most people continually transition from a driving mode to a pedestrian mode in their day-to-day activities. To resolve potential conflicts between cars and pedestrians, the proper relationship between the pedestrian path and the vehicular use areas must maintain clear boundaries yet meet frequently.

Consistent and safe pedestrian crossing standards for intersection and mid-block conditions can be developed through the coordination of Federal, State, and County guidelines.

There are a variety of design strategies for prioritizing pedestrian and bicycle traffic. These strategies should be considered to support local and regional redevelopment goals and objectives.

considerations

- Use medians and islands as pedestrian refuge areas at wide crossings, where posted speeds are higher.
- Use curb extensions to reduce crosswalk distance and manage on street parking.
- Furniture, shelters, trash receptacles, bollards, and other street furnishings as opportunities for integrated public art.
- Signage designed for effective wayfinding.
- Poles to accommodate banners, electrical receptacles for seasonal use and festivals.
- Surface water and runoff should not pool on pedestrian sidewalks.
- Use curb-face inlets to reduce differential settlement and eliminate obstacles for bicycles and pedestrians
- Plant street trees for shading the sidewalk.

additional resources

Accessible Sidewalks and Street Crossings – An Informational Guide. Federal Highway Administration. FHWA-SA-03-019. USDOT.

Designing Sidewalks and Trails for Access, Part 1 – Best Practice Design Guide. Federal Highway Administration. FHWA-HEP-01-027. USDOT.

Incorporate safe pedestrian crossing strategies



Cars have the power to frighten people walking, bicycling, or in wheelchairs. Creating islands is one way to improve our capacity to cross a vehicular road.

The design of the transportation corridor will characterize the form of future development. Land use becomes viable when it is supported by transportation, providing the lifeblood to the community. The design of the corridor should precede redevelopment activities so that transportation needs are addressed in anticipation of new development. Municipalities can avail themselves of the advice and knowledge of county planners and engineers early in the process of corridor design.

considerations

- Dimensions of the corridor and the right of way
- Existing and proposed land uses along the corridor
- Extent and scope of the pedestrian routes
- Landscape edges
- Transit stops and shelters
- Bicycle facilities
- Visual and noise attenuation
- Number and dimensions of traffic lanes.
- Prioritization to pedestrians, bicyclists, and landscaping.
- Coordinate pedestrian amenities and landscaping through development review.
- Bicycle lanes widths, and placement.
- Transit lane widths, locations, and placement
- Parallel on-street parking as a means
- Limit use of medians, use as traffic control only after other measures have been considered.
- Plant colorful hedges along medians using NatureScape planting guidelines.
- Bury services and utilities where practical.
- Encourage shared trenches and joint use of utility poles.
- Coordinate landscaping with utility plans to minimize conflicts above and below ground.
- Locate utilities to minimize impact or effect on the flows of vehicular and pedestrian traffic.
- Utilize roadway lighting to illuminate the sidewalk and the roadway.
- Reduce glare and spillover, so that light pollution to foliage and other properties is minimized.
- Give priority to performance standards and maintenance over initial cost.
- Use bio-swales and other best-practice storm water management techniques where appropriate.

design principles | transportation

Design street sections before redevelopment occurs



Dedicated bikeways and pedestrian streets set the stage for redevelopment that can accommodate a broad range and depth of activities and uses while responding to a more intimate scale of experience.

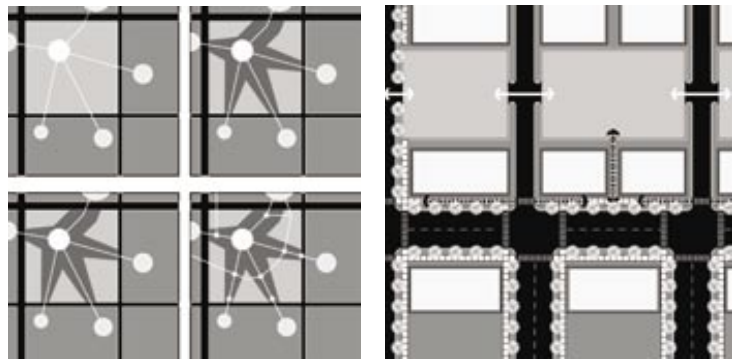
Increased choice in mobility is a consistent quality of those cities that maintain a competitive advantage as desirable places to live and work. By building places to walk, bicycle, and use transit as a convenient and safe alternative to driving we can provide a balanced set of transportation options to better serve the needs of the population and overcome the limitations of automobile based development.

There are generally three patterns of road network in Broward County. Each is described in terms of the geometrical pattern, hierarchy, and permeability. Hierarchy is defined as a grading of the capacity of a street. Permeability is the extent to which there is a choice of transportation means and routes through and within an environment.

The *gridded street* system pattern is prevalent in the eastern communities, especially around the small centers that were established along the FEC railroad corridor by Henry Flagler. Most of these streets are characteristically non-hierarchical with high permeability. The *eroded grid* occurs where the open gridded system is transformed into super-blocks through street and alley closures or abandonment. Permeability is reduced generating increased car dependency and more limited choice in transportation alternatives. The *laddered street system* is predominant throughout the county. It is hierarchical, concentrating traffic into collectors and arterials. This system relies on dispersed activity centers with optimized movement of traffic between them. Permeability is greatly reduced and is restricted to the interiors of discrete centers and private developments. The functional capacity of many roads characterized as 'arterials' in central Broward is compromised due to the frequency of curb cuts that provide access to commercial centers situated along the transportation corridors.

Broward County Transit provides transportation within Broward County via fixed route buses, community buses, 'paratransit' and waterbus services. The transit system has the potential to provide a coherent identity with attractive infrastructure of signage, protective shelters and access to parks, cultural institutions, commercial and business centers, tourist centers, and residential areas. The route system can be better coordinated within the overall pattern of roadway corridors to improve way-finding and encourage pedestrian and transit orientated development.

Build to increase choices for mobility



Ways to make more efficient use of the street network:

- Replace car trips with other modes, including walking, bicycle, and using transit, if these choices are available;
- Remove unnecessary trips by combing trip purposes, by promoting park-once or multi-modal strategies that allow a combination of trip purposes;
- Reduce trip lengths, through the promotion of appropriate zoning, land-use, and traffic engineering principles;
- Reuse saved space; allocate right of ways to pedestrian functions, bicycle trails, parks, public information and cultural event plazas, and greenways;
- Reciprocate by providing incentives for development to concentrate exchange opportunities in communities that make their streets more efficient for mutual benefit. A well-designed public environment is good for business.

Adapted from David Engwicht, "Five R's" Street Reclaiming, Creating Livable Streets and Vibrant Communities. British Columbia: New Society Publishing, 1999. (p19)

A syncopated network for transit and pedestrian mobility between centers and intersections of the arterials can provide an alternative means to accommodate increased pedestrian mobility linked to land uses supporting transit-oriented and pedestrian-oriented development. As the design for functional efficiency of high capacity vehicular intersections, with multiple turning lanes, makes it difficult to accommodate increased pedestrian and transit flows, these additional flows should be considered as part of an entirely independent overlay network.

There are three basic relationships of the pedestrian path to the roadway or vehicular use area: parallel-separated, parallel-adjointing, and perpendicular. The applicability or practicability of each can be determined according to context and traffic density.

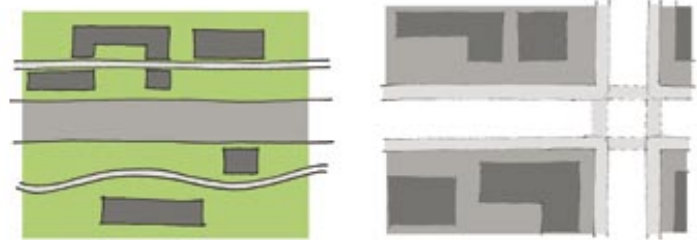
Pedestrian crossing can occur at mid-section (between major intersections) where the paved street section is narrower, and there are no turns or other conflicts with vehicular movement. Transit stops can occur at these midsections as well, forming a node around which compact development can occur. This strategy can effectively reduce the potential for congestion at major intersections.

“A person occupies about 5 square feet standing still, and perhaps 10 when walking. A car occupies about 200 square feet when standing still (including space for access), and traveling at 30mph when cars are three car lengths apart occupies about 1000 square feet of space. This means that an individual driving a car occupies almost 100 times more space as when they are a pedestrian.”

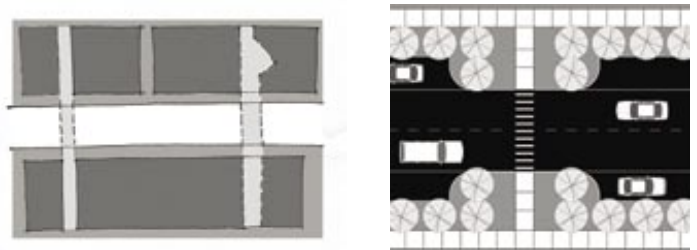
Christopher Alexander
A Pattern Language, 65

design principles | transportation

Create a network of paths for pedestrians and transit



Three relationships between the pedestrian and vehicular paths, parallel-separated, where traffic speeds are high (above left); parallel-adjointing, where traffic speeds are low (above right); and, a perpendicular relationship, where traffic speeds are medium (below) illustrating paths at right angles to the road, forming a secondary network.



To encourage transit use, transit facilities should not only be attractive, they should protect people from the sun and rain, serve as an integral component of a countywide wayfinding system and be easy to maintain.

considerations

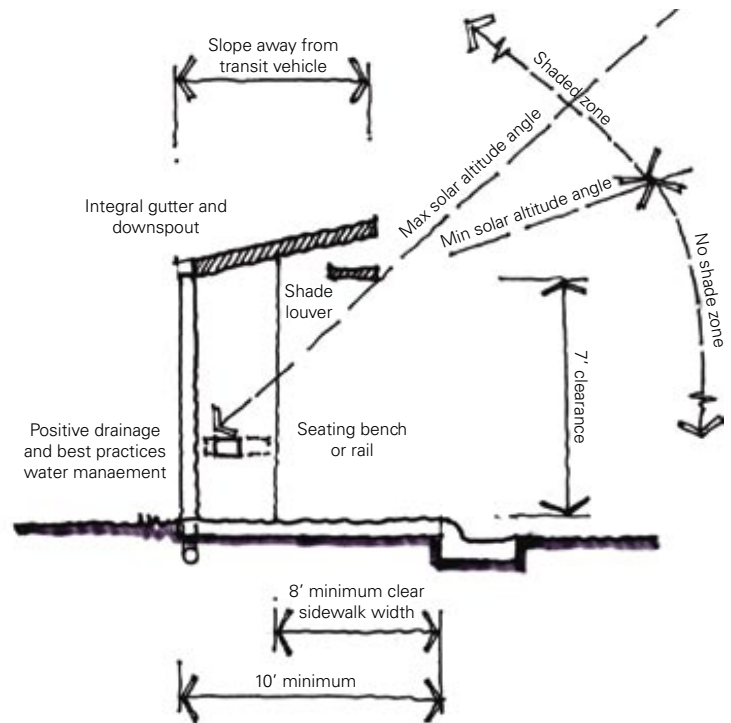
- Design shelters for full accessibility.
- Slope the roof of the shelter away from the transit vehicle and provide integral gutters and downspouts.
- Integrate shading louvers to provide shade and increase protection from inclement weather.
- Provide a bench or a rail for resting.
- Provide trash receptacles.
- Lighting can be powered with photovoltaics.
- Provide a means for displaying well-designed public information and advertising.



Attractive comfortable transit shelters provide protection from the sun and rain, and demonstrate a commitment to provide convenient and reliable access to transit.

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Design transit facilities for people



People who use transit need to feel comfortable knowing that they will not be soiled with storm water runoff while they wait.

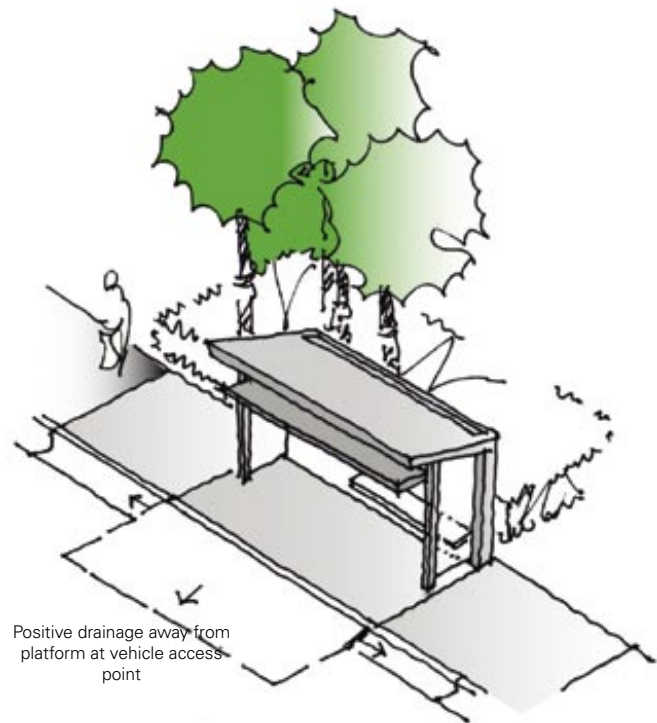
Design the road edge, the sidewalk, and apron so that water does not collect between the transit facility and the transit vehicle.

considerations

- Provide a no-puddle zone to prevent storm water splash at the bus stop and at sidewalks.
- Design gutters and downspouts integral with shelter structure.
- Use bio-swales or other best-practices for stormwater run-off management.
- Provide positive drainage away from platform at vehicle access point.
- Select materials and finishes that are resistant to salt laden air within 10 miles of coastline, ultraviolet rays and solar degradation, rainwater, cleaning chemicals, urine, and local pollutants.

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Design transit facilities for climate



The original plats of Broward County's first cities created a simple and easy to understand grid of regular blocks.

The grid allows for a balanced and equitable distribution of traffic and land. The small blocks (generally 300' x 600') are divided into small lots (generally 50' x 135') which produce the very human scale of buildings we can still experience in Dania Beach, Hollywood, Fort Lauderdale, Deerfield Beach, and other places.

Large assembled parcel developments should maintain and enhance the fine-grain character of local street, alley, and passageway networks.

considerations

- The County should proactively work to encourage the retrofitting of neighborhoods to re-establish a sound pattern of streets and lots.

- Add objectives and policies within Redevelopment and Incompatible Uses – Goal 14.00.00 to the Broward County Land Use Plan (BCLUP) that encourage retrofitting existing neighborhoods. This would include policies for:

 - Creating pedestrian friendly neighborhoods.

 - Varying intensities of development.

 - Creating open spaces for communities.

 - Establishing areas for cultural and civic buildings.

 - Connecting neighborhood streets to collectors and arterials.

 - Improving traffic conditions through traffic calming, as appropriate.

Limit street closures



It is important to conserve this local heritage and discourage the creation of super blocks and street closures that create imbalances in the flows of traffic and lead to disinvestment in the surrounding areas.

Effective design of inlets, catch basins, and curbs can provide good drainage conditions for walking and bicycling and maintain the safety of the walking or bicycling route during inclement weather conditions.

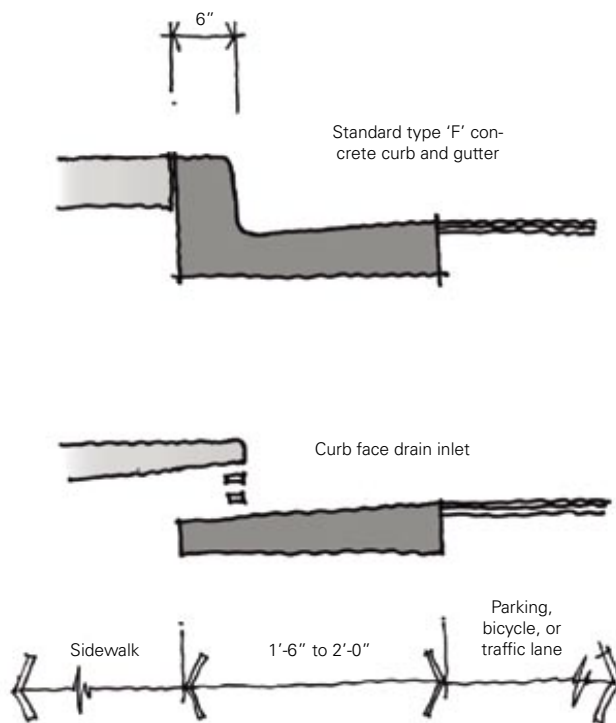
Caps, grates, and other such openings occurring at curb inlets, tree grates, and railroad crossings should not create obstacles for bicyclists and persons who are vision impaired or using wheelchairs. Wheels and walking canes, and crutches often get caught in openings and gaps wider than $\frac{1}{2}$ " , and at improperly aligned openings and perforations. The proper selection, location, and placement of drain covers should be implemented as the new standard.

considerations

- Openings and perforations should not allow passage of a $\frac{1}{2}$ " (13mm) sphere.
- The long dimension of the opening or perforation should be perpendicular, or between 45 and 90 degrees, to the direction of travel.
- Maintain a safe slope at inlet aprons located within a path of travel.

design principles | transportation

Design curbs and drainage inlets for pedestrian and bicycle safety



The quality of light can make the difference between an environment that feels comfortable and safe and one that is harsh and menacing. The two components of a light fixture: the type of lamp and scale and design of the luminaire combined can create an environment where people feel secure and comfortable.

Placement of light fixtures should be coordinated with the placement of trees, signage, and amenities including drinking fountains, trash receptacles, and benches or seating bollards.

considerations

- Select appropriate lamp types and wattage to maintain local ecology of plant and animal life.
- Coordinate the placement of luminaires with the placement of trees, signage and other amenities.
- Consider the effects of color and reflectivity of surrounding materials and finishes.
- Maintain a consistent luminance along pedestrian routes.
- Shield the source of light by placing the lamp outside the range of direct sight to prevent glare. Luminaires that utilize reflectors are preferable to exposed lamps.

design principles | transportation

Provide high quality pedestrian lighting



Luminaires, pedestrian street furnishings, and wayfinding signage in Melbourne, Australia.

The immediate adjacency of municipalities is characteristic of Broward. The boundaries they share need design attention. They mark the end of one place and the beginning of another, forming a transition.

The transition from one municipality to another can take the form of a gateway, a bridge, a boulevard of trees. In each case the transition is experienced as a change in the character of light, texture of surface materials, crossing a waterway, passing through a gateway or vaulted canopy of trees. In each case, continuity of movement, by car, on foot or bicycle, should be maintained.

considerations

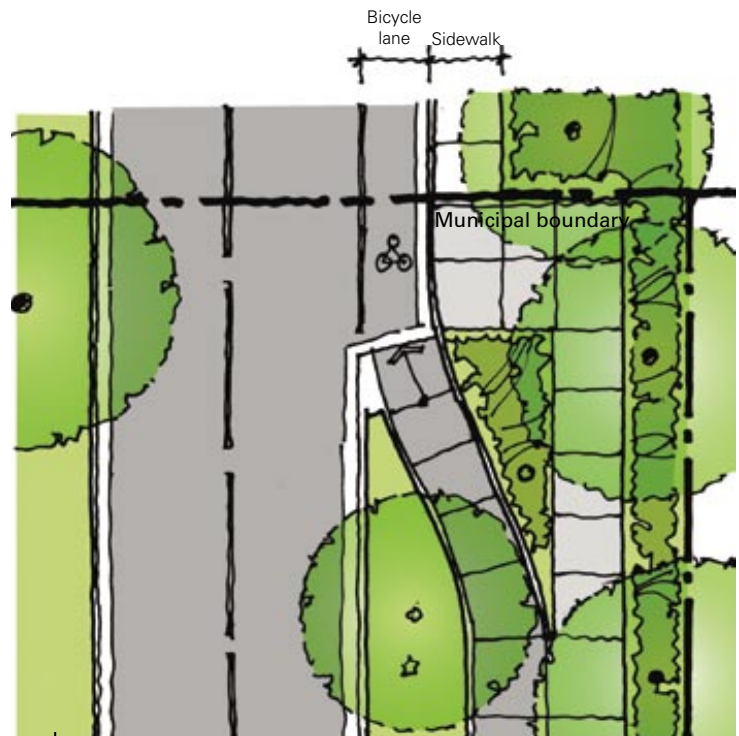
- The seven stages of place experience should be taken into consideration when designing at the boundary of a municipality:
 1. Orientation
 2. Approach
 3. Threshold
 4. Arrival
 5. Docking and wayfinding
 6. Circulation
 7. Departure

“Broward County appears marked by an uninterrupted extension in space, time, or sequence. Individual cities bleed into one another. Neighborhoods disappear behind major thoroughfares lined with bold signage and commercial messages. Homes reside between elusive sidewalks in landscapes punctuated with strip development.”

-Design Broward, 27

design principles | transportation

Coordinate the design of the public space at municipal borders



A bicycle route crossing a municipal boundary marks a transition point and may include a change in direction, material, or mark the beginning or end of a path. Design coordination is needed for continuity, proper alignments, and transitions between surfaces and materials.

The poor image of transit is exacerbated with the lack of amenities, wayfinding and signage. A significant countywide goal is to encourage transportation alternatives in addition to the automobile.

considerations

- Additional site plan standards can be incorporated into the land development code to encourage transit oriented development.
- Prepare code amendments, which could serve as a model for municipal codes, which provide standards and incentives that foster enhancements to parking lot design; integration of transit facilities; flexibility to support various uses over time, such as temporary parking zones, or parking areas that convert to plazas to support programmed activities; shared parking facilities;
- Transportation infrastructure can be designed to support redevelopment future building construction.
- Provide clear pathways to transit vehicles from shelters.
- Sidewalks should be constructed to the nearest intersection or to the nearest section of existing sidewalk from all urban transit facilities.
- Provide suitable and universally accessible waiting areas for transit users.
- Coordinate locations of crosswalks with placements of wayfinding signage and shelters.
- On streets with parking, consider curb extensions at near-side bus stops so passengers can board transit directly from the curb without stepping onto the street and to comply with ADA universal accessibility standards.
- Encourage and promote high quality design, durable, easy to maintain materials, and modern vehicles to encourage ridership.
- Develop a consistent graphic system for wayfinding and information to facilitate increased ridership for all community sectors.

design principles | transportation

Enhance transit facilities to encourage use



Broward County can modify and amend its Trafficways Plan to incorporate the revised cross sections that are responsive to context conditions and are recommended as part of the design guidebook. In addition, it should also amend the plan to incorporate the following new road corridor types related to multi-modal transportation and land use:

UC	Urban core
UR	Urban residential
UMS	Urban main street
SCC	Suburban center commercial
SCR	Suburban center residential
SEC	Suburban institutional/employment center
RS	Rural suburban

Examples of seven basic context types applicable to Broward County are described in the following pages. These include community main street, urban village, and central business district contexts where redevelopment is anticipated, as well as redevelopment areas of suburban commercial or multi-family residential character where transit oriented redevelopment is anticipated, and a suburban context where low density is to be maintained and where the corridor can be enhanced with trails.

design principles | transportation

Implement guidelines for context driven corridor design



The road corridors of Broward County vary according to function; the presence and type of transit facility; Broward County Trafficways Plan classification; right of way (ROW) width; adjacent land uses; and environmental and historical context. Designing the corridor according to context begins with determining the trafficway designation. The following characteristics of the physical environment should then be considered in determining a context type for a corridor:

- Jurisdiction of corridor
- Number of travel lanes
- Mode dedication of travel lanes
- Number of transit stops
- Frequency of curb cuts or access ways
- Distance between intersections
- Corridor width
- Right of way width
- Vehicle lane width
- Transit lane width
- Bicycle lane width
- Sidewalk width, including bus stop and transit waiting area width
- Adjacent land uses
- Age and economic life-cycle stage of surrounding development
- Building setback
- Building height
- Length and depth of building frontage
- Historical and environmental context
- Quantity and quality of landscaping
- Quantity and quality of signage

Corridor dimensional criteria depend on the context, and should be established as part of a community development plan, area master plan, or other community corridor improvement plan process. Each municipality should review their needs and local conditions with County Engineering and Traffic Engineering.

considerations

- Delete one or more parking lanes to increase sidewalk width and encourage transit use.
- Locate trees on adjacent properties for shade.
- Add pedestrian lighting and signage.
- Use additional ROW to provide wider sidewalks, bicycle routes, and street trees for shade.
- Encourage provision of transit infrastructure in lieu of parking. Provide dedicated transit facilities, including universally accessible shelters and sidewalk connections, integrate with adjacent development where practical.
- Develop a continuous interconnected pedestrian network between properties protected from direct sun and rain with access to properties within walking distance.
- Provide pocket parks and various urban spaces such as plazas to expand retail frontage and increase the public space and pedestrian amenity.
- In redevelopment and roadway improvement scenarios, the design intention should be to optimize connectivity and access.
- Shared use lanes at curbside for drop-off, deliveries, off-peak parking, vehicle and/or bicycle traffic.
- Avoid medians to provide narrow pedestrian crossway width, improve visibility, and maximize extent of sidewalks on each side.
- Consolidate parking into structures or park-once shared parking lots.

design principles | transportation

Guideline to corridor components



Table of recommended corridor components

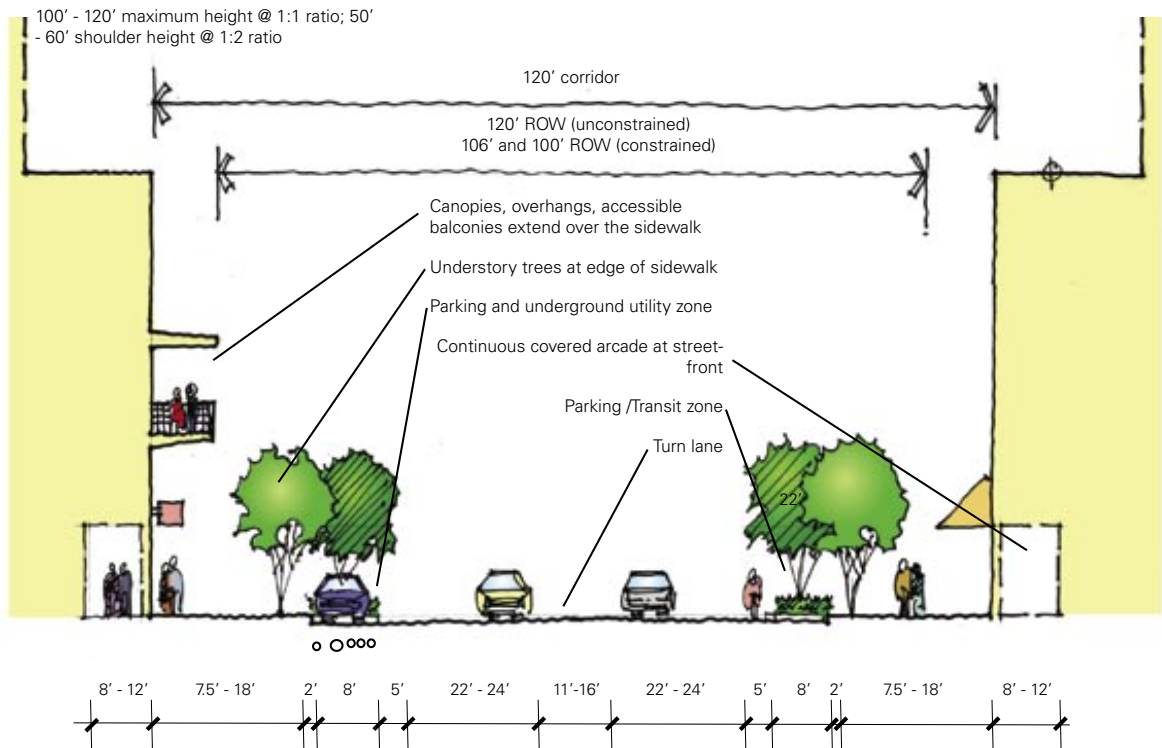
The dimensions indicated are not minimums, in certain cases less than the optimal dimension may be accepted when necessary, based on a professional design assessment of the conditions, functions, and priorities.

Component	Urban <i>ROW constrained</i>	Urban <i>ROW unconstrained</i>	Suburban
Building Height to Width Ratio	1:1 - 1:2	1:1 - 1:2	1:2 - 1:3
Build-to lines	0', .5'- 10'	0', 5' - 10'	-
Setbacks	-	-	18' - 20'
Sidewalk width (unobstructed)	5' - 18'	8' - 20'	5' - 8'
Sidewalk width at bus stop	8' ⁽¹⁾	10' - 20'	8' ⁽¹⁾
Sidewalk offset from buildings	0' - 5'	0' - 5'	0' - 15'
Sidewalk cafe or seating area	0', 10'	0', 12'	0', 10' - 12'
Lighting pole offset from curb	1.5' - 3'	1.5' - 3'	5'
Utility pole offset from curb	1.5' - 5' ⁽²⁾	1.5' - 5' ⁽²⁾	5' +
Tree offset from curb	1.5', 3'	1.5', 3' - 5'	10 +
Landscape strip	-	7' - 10'	7' - 12'
Utility Strip	3' - 8'	3' 8'	3' - 8'
Median	-	0, 3', 16'	0' 3', 16
Transit facility landing pad	5'	8'	8'
Transit facility Shelter	8'	10'	10'
Dedicated bicycle lane	4', 5' ⁽³⁾	4', 5'	4', 5 - 8'
On-street parking lane	8'	7', 8'	8'
Vehicle thru lane with F-curb	11' ⁽⁴⁾	11'	11'
Vehicle thru lane with no-curb	11'	11'	12'
Vehicle turn lane with F-curb	10'	10'	11'
Right of Way width	50' +	70' +	94' +
Corridor width	80' +	80' +	100' +

Notes:
 (1) Minimum to comply with ADA universal accessibility standards.
 (2) Applicable with building setback minimum 10' from curb.
 (3) Undesignated lanes may be reduced to 3'.
 (4) Variances possible under constrained conditions, 11' minimum width for county transit bus lane.

Urban Core corridor (UC)

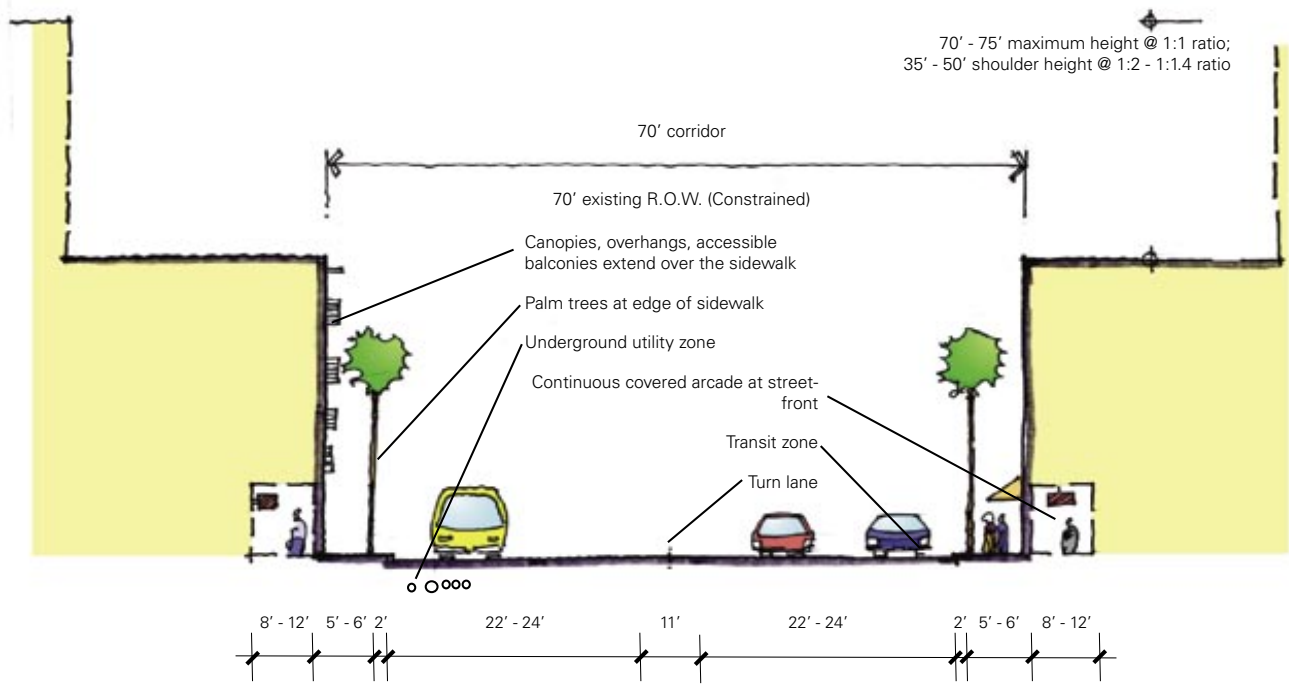
The urban core context (UC) has high potential to support a variety of traffic modes, with pedestrian and transit priority, and a strong sense of enclosure with a commercial/office character at the streetfront. Characteristically located in older, denser urban areas such as the RACs in central and eastern Fort Lauderdale and Hollywood. These roads have historically narrow ROW widths flanked by a variety of uses and building types including mid and high-rise. There are minimal setbacks or no setbacks in some areas. There may be on-street as well as off street parking.



(This street section may also be applicable to UMS, and SEC contexts)

Urban Residential corridor (UR)

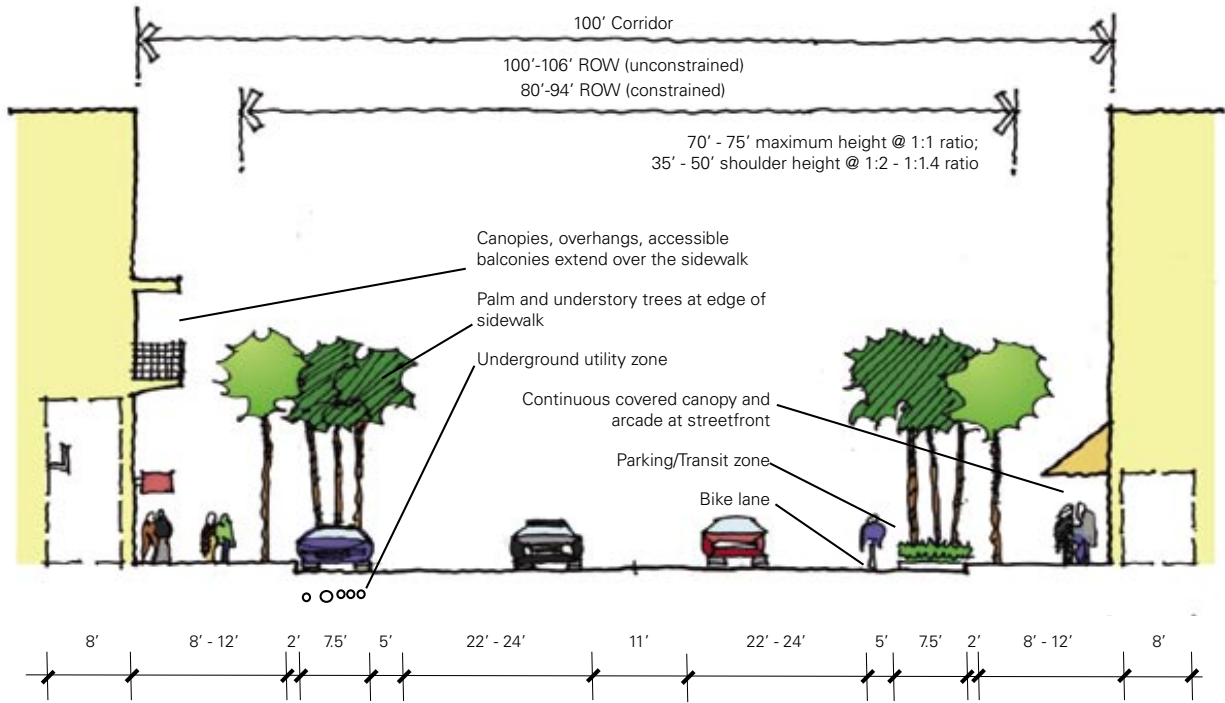
The urban residential context (UR) has a high potential to support a variety of traffic modes, with pedestrian and transit priority, and a strong sense of enclosure with a medium density residential and/or neighborhood commercial character at the streetfront. Characteristically located in areas such as the Flagler Village of Fort Lauderdale, Wilton Manors, or Deerfield Beach. Historically narrow ROWs with on-street parking and typically unmarked travel lanes. These roadways are typically flanked with bungalow houses, townhouses, and low to mid-rise multifamily buildings. Mixed uses are limited to neighborhood commerce and retail activities, civic and community centers, social services, churches, and schools. There may be shared driveways, or access to on-site parking facilities.



(This street section may also be applicable to UC and UMS contexts)

The urban main street context (UMS) has high potential to support a variety of traffic modes, with pedestrian and transit priority, and a strong sense of enclosure with a retail, commercial character at the streetfront. Characteristically located along the US-1 corridor in Dania Beach, Wilton Drive in Wilton Manors, Sistrunk Boulevard and Andrews Avenue in Fort Lauderdale, Dixie Highway in Oakland Park. ROW widths vary. Typically the urban main street contains a mix of uses with at grade retail residential, office, or both above. Buildings are typically low to mid-rise, with closely spaced with narrow side-yard setbacks or shared party walls. There is both on and off-street parking.

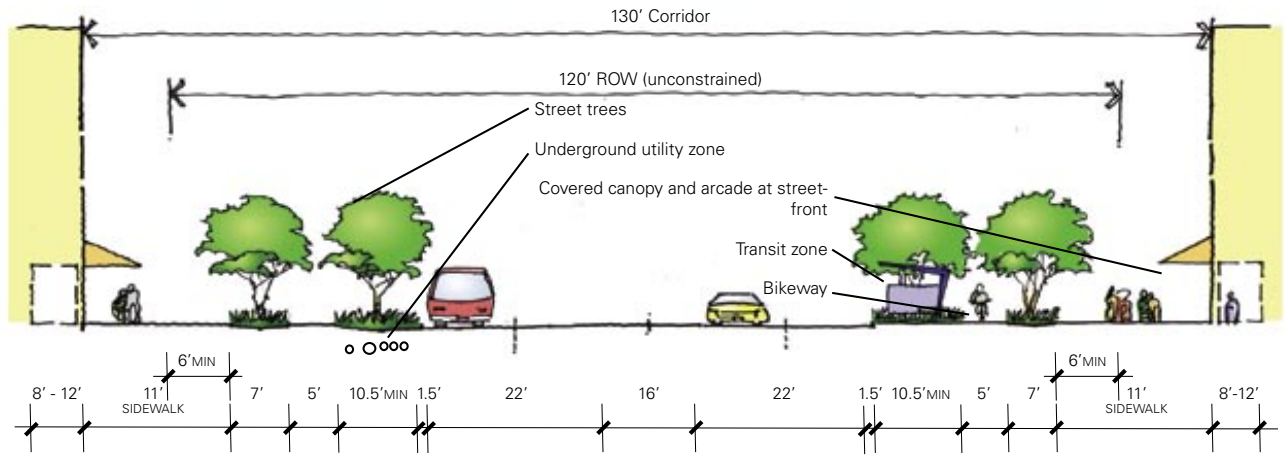
Urban Main Street corridor (UMS)



(This street section may also be applicable to UC context)

Suburban Center Commercial corridor (SCC)

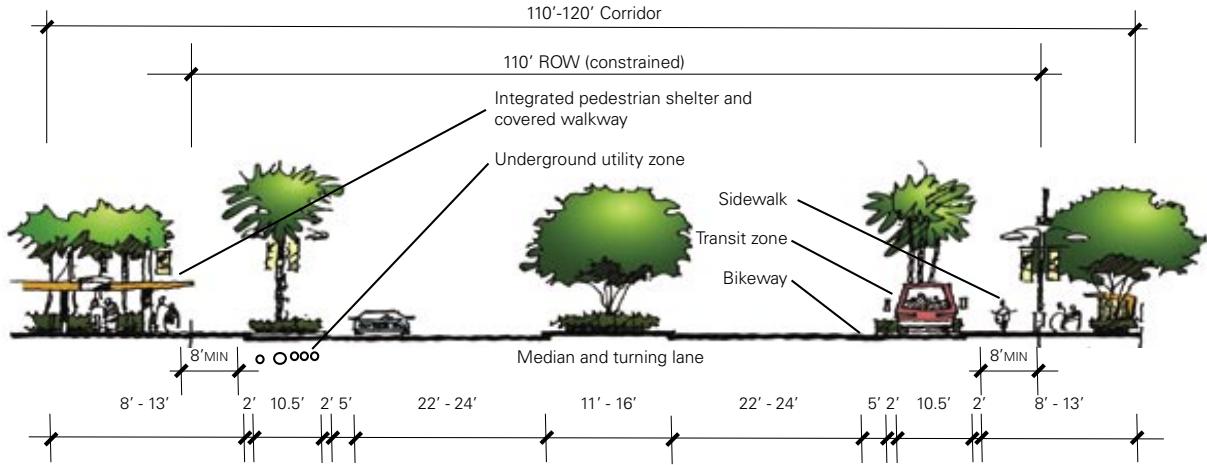
The suburban commercial context (SCC) has potential for improving transit, pedestrian and bicycle traffic volume, while maintaining traditionally higher levels of vehicle traffic. There is a moderate sense of enclosure, and the floor area ratios of development are generally lower. There is also potential for redevelopment of aging strip shopping centers into mixed-use community cores. Characteristically located on the commercial arterials throughout the County, such as SR7-441 in Lauderhill and Miramar. These roadways are flanked with low-rise to mid-rise buildings with predominantly commercial and retail uses. There is extensive parking between the buildings and the roadway. Landscaping treatment is mainly aesthetic and frequently in conflict with signage. The pedestrian environment is limited to discontinuous sidewalks, unprotected walkways, and open parking lots. Transit stops are usually not directly accessible. Universal ADA access is limited to the building and the accessible route to dedicated parking.



(This street section may also be applicable to UMS, SCR, and SEC contexts)

The suburban residential context (SCR) has potential for improving transit and pedestrian volumes, though this context traditionally maintains higher levels of vehicle traffic. There is a low to moderate sense of enclosure. Characteristically located on arterials throughout the county, such as 48 Street in Deerfield Beach, Oakland Park Boulevard in Lauderdale Lakes. These roadways are flanked with neighborhood commercial uses and multi-family residential of medium to high density. There is extensive parking between the buildings and the roadway. Landscape treatment is mainly aesthetic. The pedestrian environment is limited to discontinuous sidewalks, unprotected walkways, and open parking lots. Transit stops are not directly accessible. Universal ADA access is limited to the building and the accessible route to dedicated parking. Encourage development options that front the corridor and create special town centers. Provide retail and business uses to serve nearby residential uses. Locate the sidewalk inside the lot line to provide for a larger planting zone to create an environment conducive to walking and transit use.

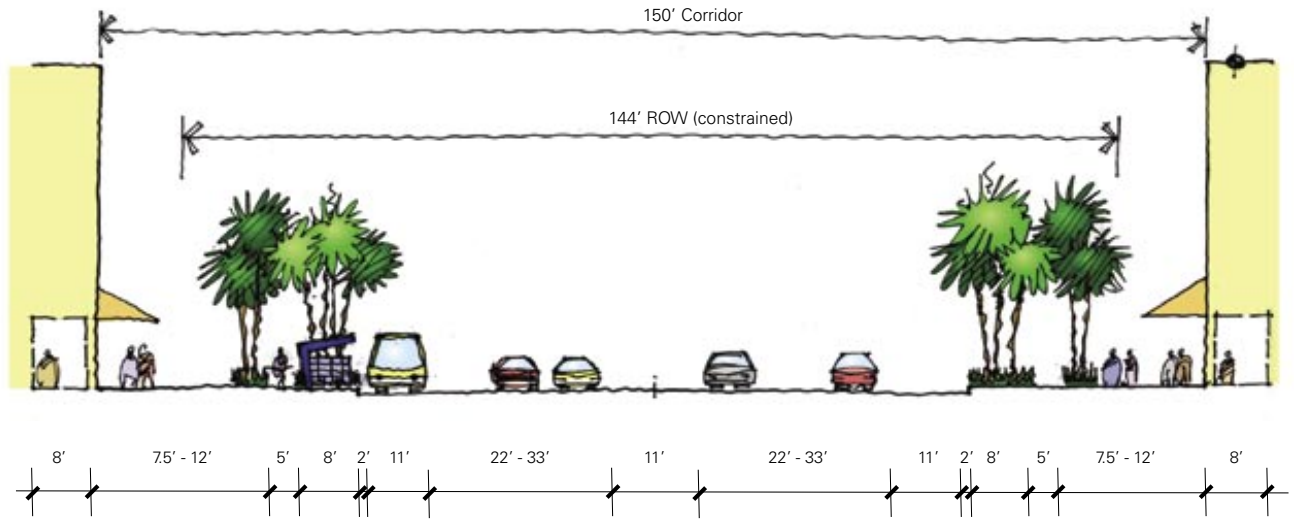
Suburban Center Residential corridor (SCR)



(This street section may also be applicable to UMS, SCC, and SEC contexts)

The suburban institutional or employment center context (SEC) has the potential for improving transit and pedestrian volumes, while maintaining traditionally higher levels of vehicle traffic. There is a low to moderate sense of enclosure. Characteristically located on arterials throughout the county, such as Coconut Creek Parkway in Coconut Creek, Nova Drive in Davie, Prospect Road in Fort Lauderdale, and North Andrews Avenue in Pompano Beach. These roadways are flanked with institutional, office, or light industrial, office-warehouse uses. There is extensive parking between the building and the roadway. Landscape treatment is mainly aesthetic. The pedestrian environment is limited to on-site mainly unprotected walkways and open parking lots. Universal ADA access is limited to the building and the accessible route to dedicated parking. Encourage development options that front the corridor with direct access to transit facilities. Provide continuous sidewalks, protected by continuous hedges or shaded with trees along the roadway edge and between the transit facility and sidewalk and the buildings. Provide bicycle lanes and bicycle facilities. Encourage shower facilities within buildings for bicycle commuters. Provide pocket parks, small plazas for employee breaks and recreation.

Suburban Institutional/ Employment Center corridor (SEC)



(This street section may also be applicable to UC context)

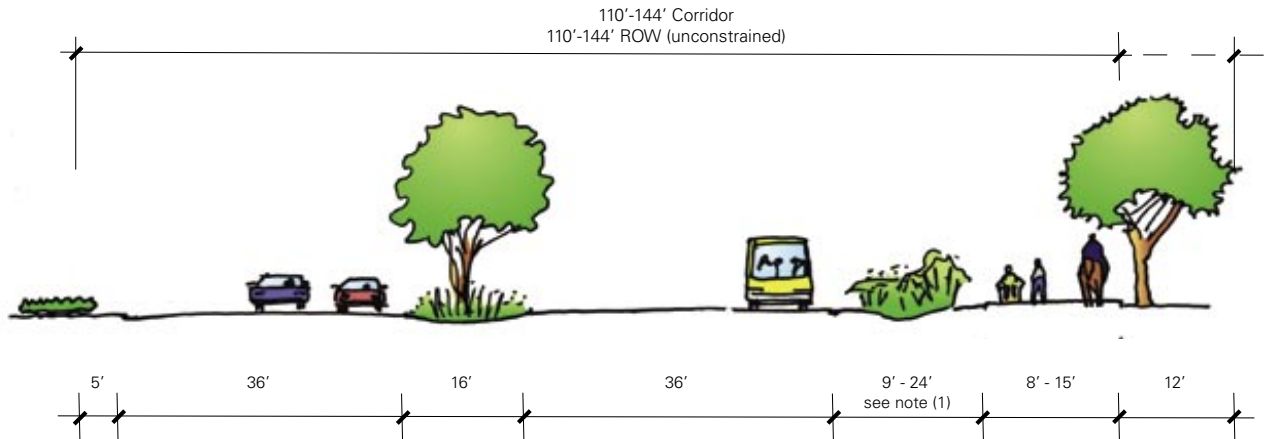
Rural suburban corridor RS

The rural suburban context (RS) is characterized by minimal transit and pedestrian volume, predominantly vehicle oriented environment, with recreational trails and equestrian trails. There is a sense of openness, with spaces and vistas defined by the natural landscape. Buildings are more object than fabric. Such corridors are characteristically located on arterials such as Griffin Road in Southwest Ranches and Pine Island Road in Parkland. These roadways are flanked with low-density estate residential and residential equestrian ranches. Commercial uses are limited. Landscape treatment is mainly aesthetic. The pedestrian environment is limited to walking and riding trails and paths for recreation. Universal ADA access is limited to accessible routes at public facilities. Encourage the commercial development that front the corridor, such as a corner general store with residential above. Provide universally accessible sidewalks linking transit facilities to public facilities including retail, commercial, and civic/institutional uses. Protect sidewalks with continuous hedges or shaded with trees. Link equestrian trails to access commercial and civic development. Encourage park-n-ride and shared use of parking facilities to minimize the area of pavement. Encourage use of percolating pavement materials in parking areas where practicable. Reclaim landscape to optimize natural water flow to reduce storm water runoff and pollution. Integrate storm water management with large-scale landscape design schemes. Employ integrated public art and CPTED principles in public space design.

references:

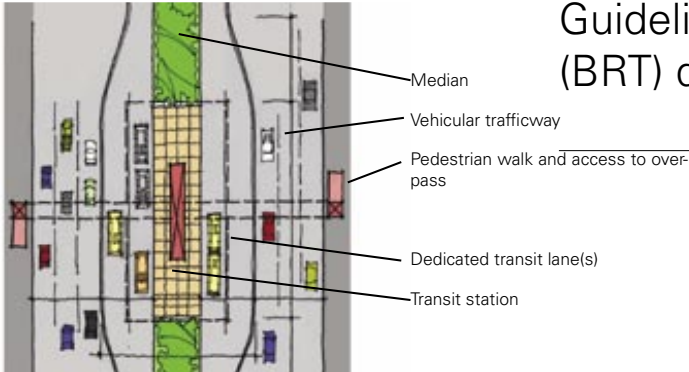
Trail Design Construction and Maintenance. Harper's Ferry: Appalachian Trail Conference. 1981

Charles Vogel. *Trails Manual.* North Hollywood: Equestrian Trails Inc. 1968



Note: An equestrian riding trail is shown in this diagram. For off-road bicycling facilities (bi-directional off-road bicycling) a 10' width with 2' recovery zone on each side is recommended.

Guideline for bus rapid transit (BRT) dedicated transitway



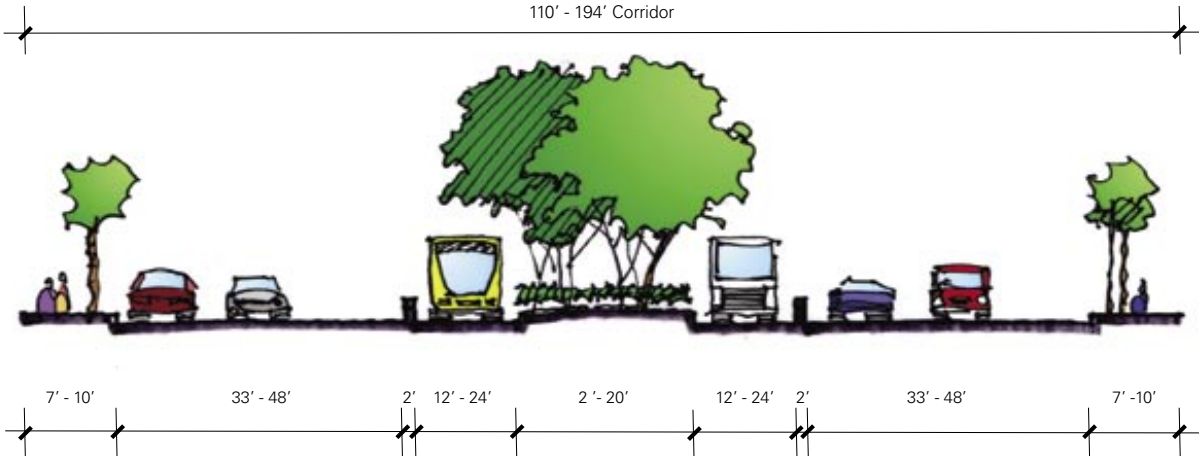
Articulated bus corridor and station plan (above)



Transit systems are integral to creating compact more diverse redevelopment opportunities and direct continuous access to major activity centers.

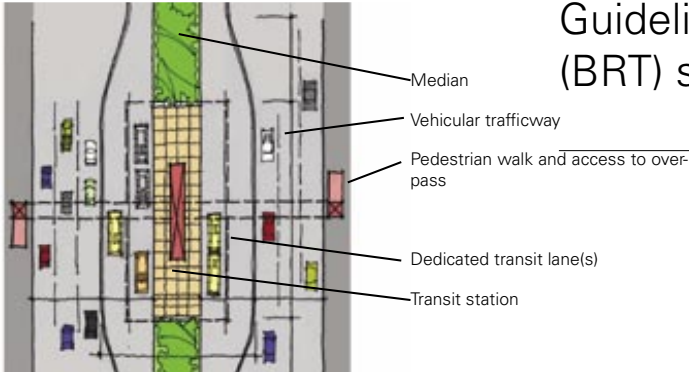
Articulated Bus/Bus Rapid Transit Corridor Section

110' - 144' ROW
110' - 194' Corridor



(This street section may be applicable to SEC, SCC, UMS, or UC contexts)

Guideline for bus rapid transit (BRT) station



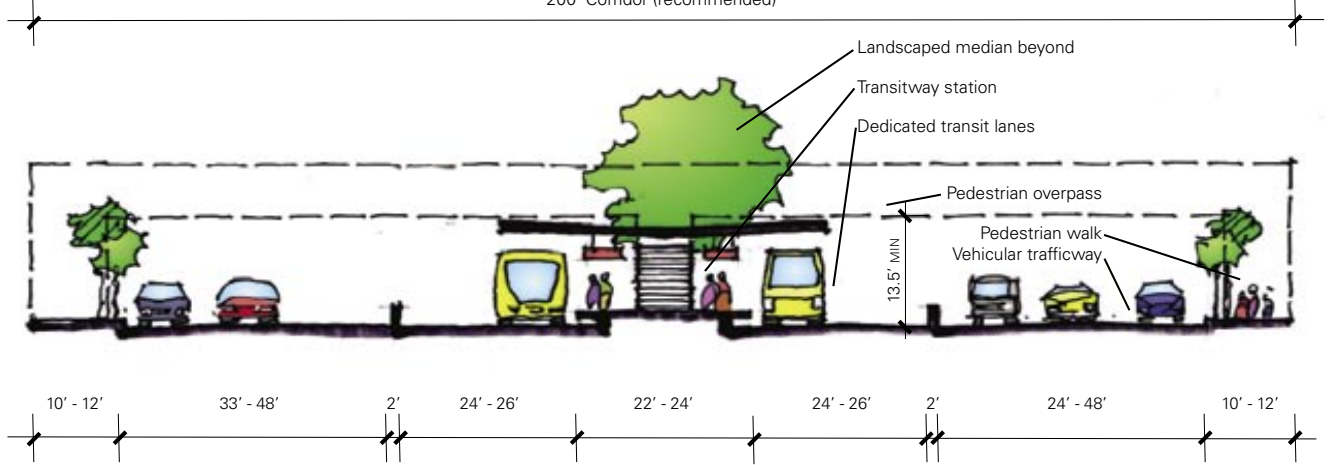
Articulated bus corridor and station plan (above)



Transit stations can become hubs of activity and create places that make walking and using transit enjoyable.

Articulated Bus/Bus Rapid Transit Station Section

144' ROW (minimum)
200' Corridor (recommended)



(This street section may be applicable to SEC, SCC, UMS, or UC contexts)

general recommendations

1. Develop and adopt a County Transportation Vision Statement for providing transportation systems that achieve County goals to foster sense of place, create a more pedestrian and transit oriented environment, enhance economic development and opportunity.
2. Construct, improve, and maintain public infrastructure, bridges, a system of accessible sidewalks, crosswalks, public spaces, and neighborhood improvements to support pedestrian and transit oriented redevelopment.
3. Provide for a maintenance program of Accessible routes (to ensure ADA compliance).
4. Construct, improve, and maintain transit facilities county-wide, including shelters, wayfinding and information system, trash receptacles, lighting, and integrated news dispensers.
5. Implement a program for integrating art in the public infrastructure county-wide, for example at traffic control boxes, street lighting poles and standards, service access covers, etc.
6. Adopt Pedestrian level of service (LOS) models, based on the 2002 Quality/Level of Service Handbook published by the Florida Department of Transportation (FDOT), for county and local road multi-modal transportation planning.
7. Adopt corridor designations as identified in the guidebook for urbanized, transitional and urban, and rural developed areas county-wide to facilitate context-based design; and pedestrian, bicycle, and transit improvements.
8. Develop performance guidelines for context-based design of pedestrian crossings, at intersections and at mid-section (between major intersections) to improve pedestrian movement county-wide.
9. Encourage local governments to adopt standards for implementation of pedestrian and transit amenities and facilities in new development and redevelopment.
10. The County and its municipalities should continue to implement and enhance their zoning and site planning requirements that provide for safe sidewalks and bike paths, including landscape, design features, and integration with utility infrastructure.

Transportation recommendations

11. The County should pro actively work to encourage the retrofitting of neighborhoods to establish a sound pattern of pedestrian movement and circulation.

regulatory and policy considerations

1. Broward County Land Use Plan (BCLUP):
 - a. Continue to provide for the implementation of objective 5.03.00 – Bicycle and Non-Motorized Transportation Facilities, and its related policies.
 - b. Create new objectives and policies within Land Use and Transportation – Goal 12.00.00 promoting transit/pedestrian orientation between community cores. These would include:
 - i. Mid-block crossings in combination with traffic calming measures.
 - ii. Transit stops mid-block, in combination with traffic control devices, or traffic calming, to link with intensive pedestrian-oriented development.
 - iii. Construct accessible sidewalks or waiting areas at all transit stops.
2. Broward County Land Development Code (LDC) – Site Planning:
 - a. Amend Division 4 – Section 5-195 of the LDC to include pedestrian crossings and transit stops at mid-block. Create incentives to foster these developments.
 - b. The County should continue to implement provisions that provide for sidewalks and bike paths as a part of roadway construction, greenway implementation and land development. These elements should also include landscape and design features that enhance pedestrian utilization and safety. They also should be developed to be an interconnected system with other forms of transportation.
 - c. In the zoning code and site plan process, provide incentives for the incorporation of these elements.

ATTACHMENT 18-6

Design Principles – Environmental Graphics.
Chapter C-6, Broward County County-Wide Community Design Guidebook

Attachment 18-6 can be found on the attached disk.

The quality of signage is dependent on its legibility. To ensure safe and usable communities for all types of people and transit appropriate standards of legibility should be utilized.




considerations

- Light letters on dark backgrounds will appear larger.
- Contrast between backgrounds and text should be 70% or higher.
- Upper and lowercase letters will increase legibility except in the case of single-word signs.
- Utilize letterforms and color combinations that comply with ADA Accessibility Guidelines.
- The width of a letter's vertical strokes should be one-fifth its height and not exceed one tenth. Horizontal widths can be slightly less than the vertical strokes.
- The width-to-height ratio of a letter should be between 3:5 and 1:1.
- Legibility of fonts is affected by the speed of the user and the distance at which they are to be read. Larger fonts are required for vehicular traffic than for pedestrians.
- Letter height for roadside legend should generally be 4" minimum for speeds under 40 mph and 6" or greater for faster speeds.
- General text legibility requires a minimum letter height of 1" per 10 - 20' of distance.
- To provide emphasis, change the weight of the font rather than the size of the font.
- Liberal space between letters and words will increase legibility. The space between words should be the size of the letter "e" or larger. Avoid overcrowding text.
- The space between lines of text should be greater than the space between words. Avoid single-line spacing.
- Use flush left, ragged right text.
- Avoid glare on backgrounds of signs.
- Horizontal text is easier to read than vertical text.

design principles | environmental graphics

Emphasize legibility for clear and effective signage



	<p>Use Flush Left, Upper and Lowercase Text</p>
<p>> 70 %</p>	
<p>Change Emphasis</p>	<p>word word</p> 

Signage clutter negatively affects communities in many ways. Areas overly populated with signs make wayfinding difficult and dangerous while also making places feel unsafe and overly complex. Additionally, poorly placed signs and the confluence of signage types detract from a community's inherent character. Enhanced civic beauty, increased safety and easier, more pleasurable navigation can be achieved through the reduction of signage clutter.

considerations

- Develop funded programs to coordinate signage placement and material types with various government agencies and businesses who are responsible for the placement of signs in the community.
- Reorganize the placement of signs where conflicts and/or overabundance of signage occur.
- Ensure that immediacy of information determines signage placement.
- Develop wayfinding systems to coordinate and simplify community navigation signs.
- Ensure that wayfinding signage is used only at the point the information is needed and other signs do not interfere.
- Combine signs when appropriate.
- Remove outdated, unnecessary and temporary signs.
- Coordinate signage styles and materials.
- Ensure consistent and appropriate signage placement.
- Redesign and redevelop physical conditions that necessitate unusual types and amounts of signage.

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Increase safety and civic pride by reducing signage clutter

C
6.2



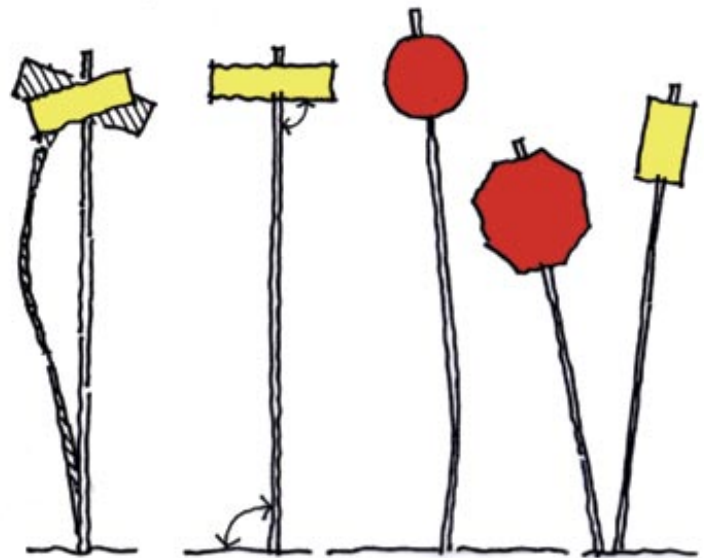
All types of signs age and deteriorate over time and can negatively impact community aesthetics. To create a more beautiful environment, strengthen civic pride and create a sense of economic well being, develop programs to maintain, repair and upgrade signs.

considerations

- Develop funded programs that supervise, maintain and upgrade community signs.
- Replace or repair broken, bent, rusted or otherwise compromised signs and supports.
- Upgrade signage materials.
- Straighten posts and signs so they are properly aligned at right angles.
- Regularly clean signs and remove graffiti, stickers, dirt and debris.
- Remove temporary signs.
- Remove outdated signs that are no longer required.

design principles | environmental graphics

Increase civic pride through the proper maintenance of signs



Upgrading and coordinating community signage materials and styles can create sense of place and civic pride as well as serving as an attribute to assist in wayfinding.

considerations

- Develop and fund signage programs to upgrade, coordinate and maintain community signs and materials.
- Develop a county-wide program to support and assist local communities in building consistent signage.
- Coordinate signage materials with other urban furnishings such as street lamps, mailboxes and park benches.
- Use signage materials that communicate the character of the community and are sensitive to the landscape.
- Coordinate park and civic building signage with community signs to reinforce identity.
- Encourage local businesses to utilize signage that supports the local community identity.

design principles | environmental graphics

Coordinate community signage to create community identity

C
6.4



Effective signage is important to the success of businesses; but its impact – both positive and negative – on community character can be equally profound. Businesses should be encouraged through incentives to use signs in a creative and context-sensitive manner.

considerations

- Incentives should be offered to encourage better sign design.
- Businesses should be encouraged to use creative signs that project the nature of their goods and services.
- Business signage guidelines should promote creativity not uniformity.
- Small businesses should be provided with the opportunity to use signs that allow them to compete with larger chains.
- Signage should be promoted that contributes to building the unique character and image of a community.
- The needs of business signage should be equally weighed with the needs of other signage.
- Businesses should be encouraged to scale and place signs appropriately for pedestrians.

design principles | environmental graphics

Encourage businesses to use creative, context-sensitive signage

C
6.5



Signs should be designed with the understanding that become a part of the landscape. Signs should consider the distinctive qualities and character of the surrounding context. The design of essential characteristics such as size, color, location, materials, and illumination will determine how positively it impacts a community's sense of place.

considerations

- Signs should be designed to complement the architecture and natural landscape where they appear.
- Signs in natural places should incorporate natural materials and colors.
- Signs in natural areas, such as parks, should be placed low to the ground, under sightlines, and be at a minimum in number.
- Signs should not dominate the skyline, rather architecture should define the image of a community.
- Freestanding signs should be integrated with the landscape, be low lying, and utilize natural plantings and materials.
- Signs that are mounted on buildings should complement the architecture.
- Signs should stand out appropriately and be placed so as not to be blocked by landscape or other signs.
- Signs should not be placed within sightlines in historic places, landmarks, and other significant natural places.

design principles | environmental graphics

Make signage sensitive to the nature of the surrounding context

C
6.6



Businesses should be encouraged to use various sign types and sizes to accommodate the needs of pedestrians. Properly oriented and scaled information can draw pedestrians to areas and add character that contributes to a community's sense of place and economic vitality, while also enhancing pedestrian safety.

considerations

- Sign ordinances should be written to allow for pedestrian-oriented signage.
- The appropriate addition of signs on windows, doors, awnings, protruding blades, walkways and temporary frames can elevate the pedestrian experience.
- ADA compliant signs and the principles of Universal Design should be utilized whenever appropriate.
- Businesses should be encouraged to use signs that are easily viewed at distances by pedestrians, such as blade and awning signs. These types of signs help inform pedestrians what is around them and expand the distances they will travel.
- Fonts can be reduced in pedestrian-oriented signs and consequently the amount of information expanded, particularly in maps and directories.
- Font styles and colors do not have to be limited to those legible at high speeds, which can increase creativity in signs and add community character.
- Wayfinding signs should convey routes and distances with a pedestrian orientation, such as places and distances with indications of the walking time required.

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Use signage types that accommodate pedestrian needs

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02.01.05 | 6.7



Banners can be used to build community identity, promote events and assist in wayfinding. Banners can be a powerful, versatile and economic means of building community identity, announcing special events, assisting in wayfinding, revealing community assets and building civic pride.

considerations

- Banners can be employed in a variety of manners to support multiple civic goals, including building identity, promoting events and revealing civic assets.
- Banners can be an effective means of defining districts to assist in wayfinding.
- Banners are most effective when they utilize bold, simple graphics.
- Banners should be used liberally with substantial repetition.
- Banners should be placed a minimum of 7 1/2 feet above the ground.
- Banners can utilize different shapes to create interest and build character.
- The visual scale and effectiveness of banners can be significantly increased if they are placed on both sides of a single pole.
- Banners should be a minimum dimension of 2' x 4' however larger banners will appear more important and have greater impact.

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Use banners for community identity, promotion, and wayfinding

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Entry signage marks transition between neighborhoods, cities, districts and counties which assist in wayfinding and promotes civic pride and a sense of place.

considerations

- Entry signage should be used to announce entry points of neighborhoods, cities, districts and counties to promote community pride and assist in wayfinding.
- The scale and placement of entry signs should be appropriate with the significance of the transition.
- Signs should use materials that communicate the character of the community.
- Signs should be sensitive to the landscape and context.
- Signs should utilize friendly messages such as “welcome to” instead of “entering.”
- Signs should use both sides, when appropriate, to mark entering and leaving.
- Coordinate park and civic building signage with community entry signage to reinforce identity.

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Use entry/gateway signs to build community identity and character

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Pedestrian-oriented signage should be placed in a manner that supports easy access, legibility and safety. Though pedestrians move at slower speeds than vehicles, which allow for a more expanded cone of vision, the quality of the pedestrian experience is enhanced if signs are properly positioned.

considerations

- Signs which are 15 degrees above or below the cone of vision should be angled to permit easy viewing.
- Signs outside the cone of vision should be tilted at an angle of 30 degrees to allow for easier viewing.
- Effective signs are usually sized and placed within the pedestrian's cone of vision. Exceptions to the cone of vision are best done on the high side.
- Signs should be oriented to allow for use by those with disabilities.
- ADA guidelines and the principles of Universal Design should be utilized whenever appropriate.
- Signs should not obstruct the pedestrian path.
- Overhead signs should be placed at minimum height of 7 1/2 feet so not to pose a risk to pedestrians.
- Overhead and blade signs should appear constructed in a manner that they do not pose the risk of falling.

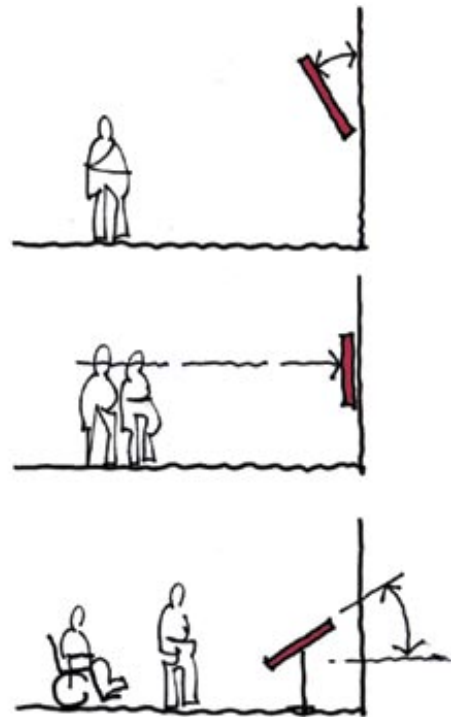
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Place signs to accommodate pedestrian requirements for visibility

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Signs are most effective when the appropriate amount of information is displayed in a manner consistent with their context. Signs which are designed primarily to be viewed from vehicles should convey only the most necessary information which results in safer and less cluttered corridors.

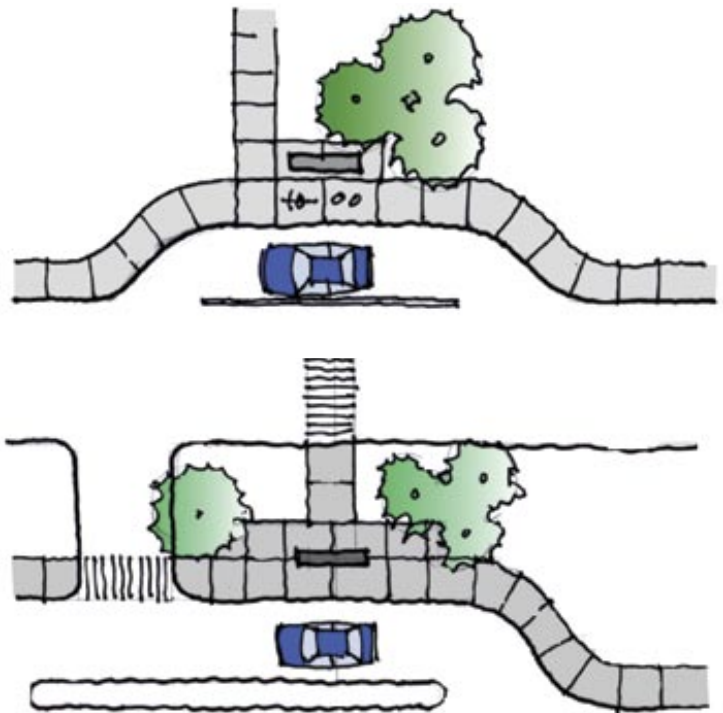
considerations

- Guidelines should promote the use of the appropriate amount and type of information on business signage.
- Text should be sized and placed appropriately for the speed at which it is viewed.
- All business plazas and buildings should be clearly identified with both a name and address.
- Businesses should use the most common, and simple, terms to describe their goods and services, which result in clearer communication and less clutter.
- Complex plaza signs with numerous listings should be replaced with simpler signs and separate directories that can be viewed in pullover lanes.
- Business directories and kiosks should be designed for both pedestrian and vehicular traffic when appropriate.
- Business directories and kiosks should provide a “you are here” map to provide context.
- Business signs should be placed with primacy over roadway signs when appropriate to create safer and easier navigation.

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Design content and placement of signage appropriate to context

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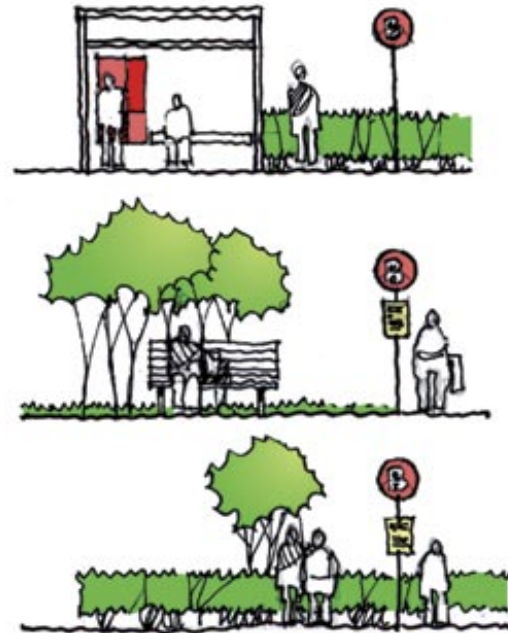
To encourage and support pedestrians, wayfinding information should be provided at all transit stops. This information could serve as a unifying system throughout the county to promote local businesses, institutions and attractions, while also encouraging mass transit use within and between communities.

considerations

- A wayfinding system should be developed to provide pedestrian-oriented information at transit stops.
- Criteria should be established to determine the amount of wayfinding information needed at each stop which could include:
 1. Route identification and route maps
 2. County contextual map(s) to show routes in relation to other transit hubs, districts, significant places, landmarks and destinations
 3. Local wayfinding map(s) that include:
 - a. "you are here" designation
 - b. destinations and landmarks
 - c. paths and routes
 - d. distances and time required for pedestrian travel
 4. Directory of local businesses, attractions, civic places and events
- The placement and quantity of wayfinding information at transit stops should be predictable to provide pedestrians with confidence that the information they need will be available when and where they expect it to be.
- Kiosks should be considered at primary hubs that provide connections to county and community Internet-based information.

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Display wayfinding maps and information at transit stops



Wayfinding maps provide simple, understandable representations of complex and unfamiliar urban environments. Maps supplement directional information, reducing signage needs by showing pedestrians a variety of information. Development of community and county-wide wayfinding maps that follow good graphic design practices can lead to a greater sense of place and encourage pedestrian activity within and across communities, benefiting residents, visitors and businesses.

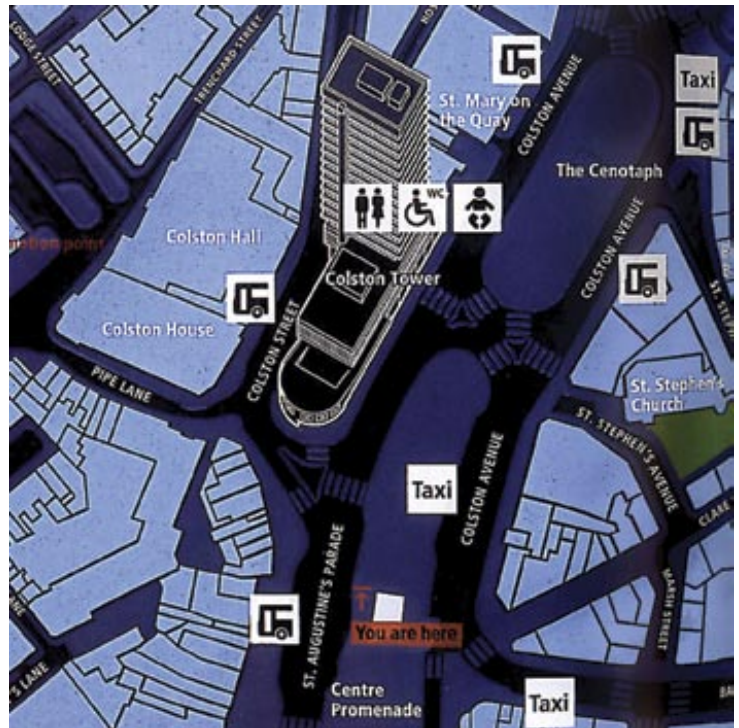
considerations

- County-wide design guidelines for wayfinding maps and their placement should be developed.
- Wayfinding maps should be designed to be an integral part of a larger wayfinding system and placed at all major decision points.
- Wayfinding maps should show the organizational elements and principles of the wayfinding system.
- Maps should show districts, landmarks, attractions, routes, paths and essential safety and service elements.
- Maps should show where you are, where you want to go, and the path to get there.
- Maps should be presented in a heads-up view rather than a compass orientation whenever possible.
- Maps should always have a “you are here” indicator.
- Maps should utilize color coding, simple consistent language and understandable pictograms.
- Maps should provide walking distances.

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Increase pedestrian activity through wayfinding maps

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Bristol, England wayfinding map designed by Meta Design.

Wayfinding systems can help establish places that are safer and easier to navigate, while helping people understand complex urban environments. Graphic simplicity in wayfinding signage communicates effectively to people with different needs and reduces the requirements for other navigational signs, leading to less cluttered and more attractive places.

considerations

- Ensure that text follows principles of legibility and ADA accessibility guidelines.
- Design signage to comply with Universal Design principles.
- Text should be in common language.
- Be consistent with text and graphic devices.
- Arrange information consistent with its importance.
- Group information on complex signs.
- Avoid more than five messages and five lines of text on a single directional sign.
- Use flush left, ragged right text.
- Use consistent directional arrows and place on left or right side of information as appropriate.
- Text should have greater emphasis than arrows.
- Use familiar, intuitive pictograms.
- Avoid difficult to understand pictograms
- Use pictograms with text to reinforce meaning.
- Color code districts.
- Use colors that are easily described.
- Avoid colors reserved for public safety.
- Standardize names for buildings, services and destinations.

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Visual simplicity is fundamental to effective wayfinding signage

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Bristol, England wayfinding signage designed by Meta Design.

Good wayfinding relies on the appropriate amount of navigational information to be available at the time it is needed. Consistent signage and graphics is an essential component of developing an understandable, predictable and memorable wayfinding system. Additionally, graphics can help create unique identities for districts and communities which further aid in wayfinding and a sense of place.

considerations

- County-wide design guidelines for graphic wayfinding should be developed.
- Graphic elements that should be consistent county-wide should be developed, coordinated and promoted for use within community-based wayfinding systems.
- Graphic identities should be developed to distinguish different districts, zones and communities.
- Graphics of community-based wayfinding systems should be integrated into larger county-wide system(s).
- Criteria for destinations to be included on signage should be based on frequency (popular destination); memorability (landmark or point of reference); immediacy (how close is it) and utility (help complete a task or assure on the right path.)
- Signs should be used at all transitional areas to define districts, neighborhoods and reassure people are on the correct path.
- Signs should be placed consistent with expectations and at all key decision points and thresholds.
- Signs should be placed to accommodate views for all necessary directions and sized appropriately for the viewer.

Hollywood's wayfinding signage is more extensive than most communities in Broward County.

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Content and placement of signage is essential to good wayfinding C 6.15



Environmental graphics resources

additional resources

Phil Baines, "Signs: Lettering in the Environment." Harper Design International, 2003

Jeffry Corbin, "A Single Voice." American City & County, March 2003

Mark Foltz. "Designing Navigable Information Spaces," Massachusetts Institute of Technology, 1998

Mark Henshaw, FAIA, FAICD. "Aesthetic Context: Designing for Place." Context Signage Design American Planning Association.

Wayne Hunt, "Environmental Graphics, Projects and Process," Harper Design International, 2003

Douglas Mace, "On-Premise Signs and Traffic Safety." Context Signage Design. American Planning Association

Marya Morris, AICP, "The Economic Context of Signs: Designing for Success." Context Signage Design. American Planning Association.

"The Principles of Universal Design." The Center for Universal Design, NC State University, 1997

"Universal Design New York." Center for Inclusive Design and Environmental Access, School of Architecture and Planning, University of Buffalo, The State University of New York. 2001

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Environmental graphics recommendations



general recommendations

1. Incorporate high quality graphic design systems into all County entry points including roads, interchanges, rail, sea, and air terminals.
2. Improve and maintain County entry points at roads, interchanges, rail, sea and air terminals.
3. Develop and implement a high quality graphic identity system for transit vehicles.
4. Encourage municipalities to adopt design guidelines requiring inclusion of quality pedestrian oriented graphic design into the development and redevelopment of town centers and transit-oriented development.

ATTACHMENT 18-7
An Overview of Building Green.

Attachment 18-7 can be found on the attached disk.

An Overview of Building Green

Green Buildings and Architecture

Buildings have a major impact on the environment. According to the Environmental Information Administration, energy consumption of new and existing buildings are a leading contributor to global warming and account for 39% of carbon dioxide emissions in the U.S. However, with the appropriate use of construction materials and methods common to green buildings, carbon dioxide emissions can be reduced by 33-39%.

In addition to green buildings, green architecture can also lessen the effects of carbon dioxide emissions and minimize other impacts on the environment. Green architecture uses construction materials and operation methods to conserve water, land, energy, and other natural resources. As a sound option to demolition, high-performance designs and sustainability measures of green architecture can reduce dependence on new materials via remodeling or adaptive reuse, and can meet or exceed codes, ordinances, and permit requirements. Green architecture construction methods and materials can help to preserve the integrity and history of a community.

Another feature that has a role in green buildings and green architecture is passive survivability. According to Building Green (www.buildinggreen.com), passive survivability is a building's ability to maintain critical life-support conditions in the event of extended loss of power, heating fuel, or water, or in the event of extraordinary periods of extreme heat. Passive survivability includes features such as cooling-load avoidance, natural ventilation, a highly efficient building envelope, passive solar heating, natural day lighting, and onsite water collection and storage.

Green buildings use green architectural design to conserve and protect the environment, increase profitability through energy efficiency and create healthier places to live, work and play.

Green Certification Program

Programs certifying green buildings establish criteria and standards for various levels of environmental merit. There are numerous international and domestic programs that promote sustainable green building design and construction. Requirements for what determines a green building can vary widely. Some programs offer green building certification. Some programs offer a wide variety of tools and standards. For example, one tool could be details on how to conduct site selection to minimize environmental impacts. An example of a standard could be criteria for on-site mitigation for the management of water and wastewater.

Two examples of international organizations that focus on environmental assessment protocol, rating systems, and green construction guides are the Green Building Initiative (www.thegbi.org) and Green Globes (www.greenglobes.com).

In the United States, the National Association of Home Builders' (www.nahb.org) Model Green Home Building Guidelines are designed to advance green building practices for residential construction into mainstream marketplaces. Domestic certification programs include the U.S. Green Building Council (USGBC) (www.usgbc.org) Leadership in Energy and Environmental Design (LEED) for neighborhoods, schools, and new and existing residential and commercial buildings. The LEED green building rating system awards points for meeting different design criteria and standards. The six major environmental LEED categories that projects can earn points for are: Sustainable Sites, Water Efficiency, Energy and Atmosphere, Materials & Resources, Indoor Environmental Quality and Innovation in Design. LEED can be applied to all building types including new construction, commercial interiors, core & shell developments, existing buildings, homes, neighborhood developments, schools and retail facilities. The USGBC is currently developing a category for healthcare.

LEED certification is awarded at four progressive levels: Certified (26 pts), Silver (33 pts), Gold (39 pts) and Platinum (52 pts). A green building is awarded a certification level based on the total number of points earned within each LEED category. A minimum number of twenty-six points must be earned for a project to achieve the minimum LEED certification level of Certified.

Another domestic certification program, Green Advantage (www.greenadvantage.org), focuses on connecting consumers to construction industry professionals. In Florida, the Florida Green Building Coalition (www.floridagreenbuilding.org) offers a certification program to establish criterion for green residential, high rise and commercial buildings.

In 2005, as part of Florida's Energy Plan, the Florida Department of Environmental Protection began working administratively with other state agencies to improve energy diversity, sustainability, efficiency and conservation statewide. In 2006, the Governor's Action Team on Energy and Climate Change issued three energy policy Executive Orders to address global climate change, reductions in greenhouse-gas emissions, and increased energy efficiency and development of renewable energy sources. The Orders specify that all new construction of state buildings adopt USGBC LEED new construction standards to the highest certification level possible. Also, Florida State Statute, Chapter 255.2575 (2), states, All county, municipal, school district, water management district, state university, community college, and Florida state court buildings shall be constructed to meet the United States Green Building Council (USGBC) Leadership in Energy and Environmental Design (LEED) rating system, the Green Building Initiative's Green Globes rating system, the Florida Green Building

Coalition standards, or a nationally recognized, high-performance green building rating system as approved by the Department of Management Services.

At the local level, in counties and municipalities throughout Florida, the adoption of innovative policies and standards continues to foster government capacity for green buildings. In South Florida initiatives to implement certifications, tools and standards for green buildings typically reflect the region's climate and the unique character of individual jurisdictions. In response to the statutes and the state energy directives, Broward County has adopted Resolution 2008-856. The resolution specifies that all new county-owned and operated building construction achieve a minimum rating of LEED certified.

Green Building Incentives

Florida continues to undergo expansion of green construction in the public sector. To encourage this effort, several Florida green building incentive programs have been established. In Alachua County, an ordinance in the City of Gainesville requires that county buildings achieve LEED certification. Gainesville also provides a fast-track building permit incentive and a 50% reduction in the cost of building permit fees for private contractors that use LEED.

The Residential Green Homes Policy of Hillsborough County offers expedited permitting to home builders with a completed scorecard from either LEED for Homes or Florida Green Home Standard Checklist. The Hillsborough County Board of Commissioners has also updated its Development Review Procedures Manual to allow for expedited plan review for projects with a USGBC or Florida Green Building Coalition completed scorecard.

In Sarasota County a resolution has been issued that mandates all county buildings achieve LEED certification. The county also provides a fast-track building permit incentive and a 50% reduction in the cost of building permit fees for private contractors that implement LEED. Incentives are also offered for projects pursuing LEED for Neighborhood Developments or Florida Green Building Coalition Green Development Standards.

The City of Jacksonville in Duval County recently issued an Executive Order to establish a Sustainability Policy. The Order requires all new municipal building construction and major renovation achieve LEED certification, and that all existing and future municipal buildings be maintained and operated in accordance with LEED for Existing Buildings.

In Miami-Dade County, commissioners passed an ordinance to expedite the permit process for commercial, industrial, and residential green building projects in unincorporated areas and the City of West Miami that are certified by recognized environmental rating agency.

A list of green building incentives has been compiled by the Florida Green Building Coalition. The list includes incentives available across Florida including the state's energy office, local utilities, local building departments, and discounts and rebates from product manufacturers. In addition to the green building resources and incentives available from local governments the Florida Public Utilities (www.fpuc.com) also encourages the building of energy efficient homes. Toward this end, this agency offers a range of program entitlements to assist the development community build green.

Conclusion

Among the various tools, standards and purveyors of programs and certifications there is a general consensus that green buildings provide a wide range of environmental, economic, health and community benefits that contribute to an improved quality of life. According to the USGBC, green buildings are healthier and safer for occupants, lower operating costs and increase asset values, reduce landfill waste, conserve energy and water, and reduce harmful greenhouse gas emissions. Additionally, green buildings demonstrate an owner's commitment to environmental stewardship and social responsibility, and qualify for tax rebates, zoning allowances and other incentives.

At the local level, Green Advantage reports that commercial and residential owners can also benefit directly from green building practices. Benefits include reduced energy dependence, fewer power plants, cleaner air, healthier environment, increased sustainability, improved public health, and decreased susceptibility to disasters. Both Green Advantage and USGBC concur that the "triple bottom line" of green buildings equates to financial, social and environmental benefits.

In combination or applied independently, green buildings, green architecture, and passive survivability offer a wide range of opportunities to improve the quality of life in Broward County. As the County explores opportunities for future redevelopment, green construction methods and standards will play a major role in establishing the high-quality, carefully designed pedestrian-friendly neighborhoods and self-sustaining communities that are vital to the region's sustainability.

ATTACHMENT 18-8
An Overview of Crime Prevention through Environmental Design (CPTED).

Attachment 18-8 can be found on the attached disk.

An Overview of Crime Prevention through Environmental Design (CPTED)

CPTED Principles and Classifications

“Crime Prevention through Environmental Design” or CPTED is based on the assumption that the proper design and effective use of the built environment can lead to a reduction in the fear and incidence of crime, and lead to an improvement of the quality of life. CPTED focuses on physical environments, the behavior of people, and redesigning or using existing space more effectively.

Crime Prevention is defined as the anticipation, recognition, and appraisal of a crime or safety risk and the initiation of some action to remove or reduce it. CPTED takes this one step further by studying site design and working with stakeholders to create safer designs in both the new and existing built environment.

CPTED has three classifications. Mechanical Measures, which refers to target hardening, or using hardware and technology systems to protect targets. Human and/or Organizational Measures, which refers to the teaching of individuals and groups to take steps to protect themselves and the spaces they occupy. Natural Measures, which refers to designing space to ensure the environment works effectively for its users while also deterring crime.

There are several core characteristics of CPTED design. Natural surveillance allows for maximum visibility. The placement of physical features, people, and activities acts as a deterrent towards criminal or unsafe acts and allows for the easier apprehension of an offender. Natural Surveillance is a way to deter criminal activity. Access control employs elements like doors, shrubs, fences, and gates to deny admission to a crime target and then create a perception among offenders that there is a risk in selecting the target. Territorial reinforcement uses design elements such as sidewalks, landscaping, and porches to help distinguish between public and private areas and helps users exhibit signs of ownership. Property lines and private areas should be defined with plantings, pavement treatments, or fences. Fencing or landscaping should direct pedestrian traffic to desired access points only. Private areas should be distinguishable from public areas. Site signage should indicate public entrances. Maintenance is also part of CPTED design. Care and maintenance allows for the continued use of a space for its intended purpose.

CPTED Design Specifics

Natural Surveillance

Blind Corners - Avoid blind corners in pathways and parking lots. Pathways should be direct and all barriers along pathways should be permeable including landscaping, fencing, etc.

Site and Building Layout – Layout shall allow natural observation from the street to the use, from the use to the street, and between uses. In multifamily development, orient the main entrance towards the street. Habitable rooms should be positioned with windows that face the front. Access to residential units should not be from the rear of the building. Offset windows and doors to allow for natural surveillance as well as privacy. In commercial areas the main entrances should also be oriented towards the street. If employee entrances must be separate from the main entrance they should allow natural surveillance from the street. Administration and offices should be located at the front of the building/property. Avoid large expanses of parking lots. Where large parking areas are proposed, surveillance should be provided such as security guards or cameras. Use of perpendicular parking at storefronts is preferred rather than parallel parking as perpendicular parking allows more visibility between cars. Access to elevators and stairwells in parking structures should be clearly visible from the parking area. Hidden recesses should be avoided. Locate parking areas in locations that can be observed by adjoining uses.

Open Space/Common Areas – Active uses of habitable rooms shall be positioned with windows adjacent to main open space areas. Dumpster enclosures should not provide opportunities to hide. Walking areas and external entries to elevators/stairs shall be located close to areas of active uses to make them visible from the building entry. Locate public seating in areas of active uses.

Entrances – Design entrances to allow users to see into them before entering. Entrances should be clearly identified

Fencing – Fence design should maximize natural surveillance from the street to the building and from the building to the street, and minimize opportunities for hiding. Front fences shall be open in design, allowing for visibility. High solid fencing shall be designed in a manner that incorporates open elements to allow visibility above five feet in height. For example, open elements of the fencing could be present at the level above five feet so as to be visible above five feet from the other side. If noise insulation is needed for the building, install double glazed windows rather than high fencing at the front of the building.

Landscaping – Landscaping that does not allow natural surveillance shall be avoided. Trees with dense low growth should be spaced. Use low groundcover or high canopied trees around play areas, pedestrian pathways, and parking areas. Avoid landscaping that conceals the building entrance from the street.

Exterior Lighting – Exterior lighting shall enhance natural surveillance. Locate elevated light fixtures in a coordinated manner that provides coverage. When lighting is placed at lower levels for pedestrians, ensure that it is resistant to vandalism. Ensure that inset areas, access routes and signage are well lit. Ensure that lighting shines on pedestrian walkways and possible entrapment spaces. Place lighting to account for vegetation in both its current and mature form. Avoid lighting areas not intended for night time use to avoid giving a false sense of security at night. Avoid climbing opportunities by locating lighting and electrical equipment away from walls or low buildings. Use photoelectric lighting rather than lighting that operates on a timer.

Mix of Uses – Locate shops and businesses on lower floors and residences on upper floors. Include food kiosks, restaurants etc. within parks and parking structures. Mixed use buildings that have users at various times and locations provide a greater opportunity for natural surveillance.

Security Bars, Shutters, and Doors – When used and permitted by code, security bars, shutters, and doors should allow observation of the street and be consistent with the architecture of the building. Security bars should be visually permeable.

Access Control

Building Identification - Buildings should be clearly identified by street number to prevent unintended access and to assist people trying to find the building. Street numbers should be made of durable materials, preferably reflective or lighted. Larger projects should provide location maps and directional signage at entry points and along internal routes. With proper identifiable locations, police and fire response will be easier and it will be less likely for users to get disoriented.

Entrances - Entrances should be easily identifiable through design features and signage.

Landscaping - Use vegetation as barriers to deter unauthorized access such as using thorny plants as a barrier. Thorny plants should be considered as a deterrent to unauthorized access. Barrier landscaping may create a perception among intruders that there is more risk to entering the area.

Landscaping Location - Landscaping should not be placed in locations that enable access to a building. Large trees should not be placed next to second story windows or balconies.

Security - Security systems or security staff should be used to inhibit opportunities for unauthorized access.

Signage - Signage should be clearly visible. Informational signs should make use of bright colors, standard symbols and graphics. Parking areas should have signage showing pedestrians and drivers the directions to stairs, elevators, and exits. This will allow users to promptly find their destination and reduce chances of becoming a victim of crime. In multi-level parking structures, use of creative signage or colors should differentiate the different floors. Clearly show what security features are in place and where to find them such as security phones. Provide signage in the parking areas advising users to lock their cars. This will deter break-ins and auto theft.

Ownership

Maintenance – Create an image that looks cared for. Landscaping should be well maintained and give an impression of ownership. Users tend to respect a property that is taken care of, and criminals will feel less comfortable in well-maintained areas.

Materials – Materials that are vandalism-resistant should be used. Common area street furniture or lighting should be anchored securely. Anti-graffiti paint or clear coat over paints should be used so that graffiti can be easily removed. Materials should be used such as glazed ceramics, stainless steel, and treated masonry to inhibit graffiti.