CITY OF FORT LAUDERDALE | TRANSPORTATION & MOBILITY DEPARTMENT

COMPLETE STREETS MANUAL

Acknowledgements

The City of Fort Lauderdale's Complete Streets Manual was established based on the Broward County Complete Streets Guidelines developed by the Broward MPO, with additional influences by the New Haven, CT Complete Streets Guidebook, and the Philadelphia Complete Streets Design Handbook.

Broward County's Complete Streets Guidelines document was funded through a Transforming Our Community's Health (TOUCH) grant, which is part of the U.S. Department of Health and Human Services' Community Transformation Grants to support public health efforts to reduce chronic disease, promote healthier lifestyles, reduce health disparities and control health care spending. The Broward County Complete Streets Guidelines were adapted from the Los Angeles County Model Design Manual for Living Streets.

Special acknowledgement is made to all of the hard working committee members that spent many hours developing the manuals that were used to develop this one including the Broward Complete Streets Initiative Technical Advisory Committee (TAC), the Los Angeles County Complete Streets Committee, Philadelphia and the New Haven Complete Streets Steering Committees.

Foreword

The City of Fort Lauderdale has adopted a Resolution to follow Smart Growth Principles in decisions being made within the city on investments and project reviews. An important tool to implement Smart Growth Principles is a Complete Streets Manual. Complete Streets are an essential ingredient in creating livable, walkable neighborhoods and reconnecting the community with destinations.

The City's efforts to create a multimodal, pedestrian-friendly community accentuated by the Fast Forward Fort Lauderdale Visioning Process together with the regional efforts to implement Complete Streets, has driven the City to create its own Complete Streets Manual based on the Broward County Complete Streets Guidelines with influences also from the cities of New Haven, CT and Philadelphia, PA Complete Streets Guidelines. Each of those documents was reviewed and amended to fit the needs of the City of Fort Lauderdale to promote the successful implementation of Complete Streets.

By establishing design guidelines to create streets for all users, the City is providing the framework for a transformation of public infrastructure that will help to address a host of critical issues that face the City today including increasing traffic, incomplete network of sidewalks and bike lanes, roadway safety concerns, and decreased level of public health conditions. It is anticipated that this document will provide guidance to on-going projects as well as form the base upon which future strategies will be development to make Fort Lauderdale a connected, livable community.

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Appendix – Street Types

COMPLETE STREETS POLICY

1.1 COMPLETE STREETS POLICY

The City of Fort Lauderdale is creating a balanced mobility system for all users that will realize long-term cost savings in terms of public health, reduced fuel consumption, reduced demand for single occupancy motor vehicles, and increased public safety through the implementation of this Complete Streets Policy. There will also be short-term benefits of increased connectivity, reduced traffic volumes, safer environment, and reduced negative impacts to the environment. Complete Streets contribute to walkable, livable neighborhoods which can build community and create a sense of community pride and improved quality of life.

The Fort Lauderdale City Commission adopted the Complete Streets Policy to guide the planning, design, construction, operation and maintenance of appropriate facilities for pedestrians, bicyclists, motor vehicles, transit and transit riders, freight carriers, and emergency responders. These facilities will be context sensitive to the adjacent land uses. All users will experience a functional, and visually appealing environment while traveling where safely is improved and conveniently on and across all surface roadways in Fort Lauderdale.

2. Who?

FORT LAUDERDALE CONTEXT

The City of Fort Lauderdale is committed to creating a safe, interconnected and convenient transportation system for all of its residents, visitors, and businesses. The Complete Streets Manual reflects this commitment and our priority emphasis on updating all local streets to meet this commitment.

The City of Fort Lauderdale streets provide transportation routes for neighbors, workers and visitors. These streets are often car focused with many lanes, high rates of speed, and limited multi-modal options. This has caused significant traffic concerns as well as bicycle and pedestrian safety concerns.

With the increase in housing density, the rise in gas prices, and the increasing frustration with traffic, coupled with issues associated with climate change, there is a strong movement to create multi-modal accommodations to address all of these concerns. One component of this is ensuring that the streets are designed to accommodate walking, biking, transit, and vehicle access.

2.1 INFRASTRUCTURE

The City of Fort Lauderdale encompasses an area of a little more than 35 square miles, with 4,761.1 persons per square mile according to the 2010 Census. This concentration in population can allow for successful use of alternative transportation modes if the modes are provided for in a well-designed manner. The City of Fort Lauderdale has approximately 500 miles of streets and 325 miles of sidewalk. The existing wide rights-of-way provide ample opportunities for reducing lane widths to add bike accommodations and increase sidewalks and landscaped buffers. Due to the flat topography and generally regular grid pattern of streets, Fort Lauderdale is ideal for being a showcase for Complete Streets. The leaders of Fort Lauderdale have committed to focusing on multimodal transportation and have directed staff to ensure that each mode is accommodated on City streets.

2.2 DEMOGRAPHICS

The current population of Fort Lauderdale is 165,521 (2010 Census). There are several different segments of neighbors that utilize the transportation system in different ways, for different reasons. There are those that choose to not use their car; those that prefer their car; those that can't afford their own car; those that are too young to drive; and those that have reached an age where they no longer drive. There is also a population of visitors who often do not have private transportation. All of these populations rely on the availability of safe and accessible alternative modes of transportation such as walking, biking, and transit.

Of Fort Lauderdale's total population, approximately half are currently in the work force. The others are primarily children too young to drive, elderly whom no longer drive themselves, or are disabled. All segments of the population use the transportation system differently and rely on a safe way to get where they need to go. Of those residents that are in the work force, only 16% use an alternative mode of transportation to get to work. (American Community Survey (ACS) 2007-2011)

Mode of commute	Commuters	Percentage
Total	**80,000**	**100%**
Walk	2,029	2.5%
Bike	1,148	1.4%
Transit	3,532	4.4%
Taxi, motorcycle, other	1,873	2.3%
Worked at home	4,333	5.4%
Car, Truck, Van	67,085	84%
Drove alone	*59,715*	*89%*
Car pool	*7,370*	*11%*

Based on the ACS 2007-2011 estimates, 2.5% walk to work, 1.4% bike to work, and 5.4% of commuters work from home. The mean overall average travel time to work is 24.5 minutes in a private vehicle, yet when public transportation is singled out it rises to 47.3 minutes.

The City of Fort Lauderdale is aiming to increase the use of alternative modes of transportation, other than the private vehicle.

2.3 SAFETY CONCERNS

Pedestrian and bicycle safety is of great concern across the United States. Between 2000- 2009, more than 47,700 pedestrians were killed in the country as a whole, 5,163 of which were in the State of Florida.

Florida contains the Top 4 most dangerous metropolitan areas for pedestrians, with the South Florida area being #4 according to the Dangerous by Design 2011 study completed by Transportation for America. Transportation policies and development patterns in the State of Florida have created a vehicle-centric transportation system that is unsafe for other users such as pedestrians and bicyclists.

Fort Lauderdale also leads surrounding cities in the highest number of bike crashes, and the 2nd highest per capita bike crash rate in South Florida.

Vehicle speeds present the greatest threat to pedestrians. As vehicle speeds increase above 35 mph, the chance of the death of a pedestrian or bicyclist in an accident exponentially increases. Reducing vehicle speeds is an important component of safety for all users of the roadway, along with providing sidewalks, crosswalks, and bike lanes.

Creating a safe, connected network of transportation was a top ranked issue of Fort Lauderdale neighbors. According to the 2012 Neighbor Survey completed as a part of the Fast Forward 2035 Visioning process, only 43% of residents feel safe walking in the City.

2.4 COMMUNITY INVOLVEMENT

Community Involvement was captured both through the Broward County Complete Streets workshops that helped shape the county Policy as well as the recent Fast Forward 2035 Fort Lauderdale community visioning process.

This Manual is part of the City of Fort Lauderdale's response to the concerns about the lack of connectivity and the number/severity of traffic accidents, and the level of traffic on city streets.

The Fort Lauderdale community's number one priority through the Visioning process for Fast Forward 2035 was to develop a fully connected multimodal city. There were 376 ideas generated related to this topic calling for better connections to parks and open spaces, investing in other modes of transportation, and simply making the City safe and walkable.

As the city moves forward, it will continue to work in partnership with citizens, Home Owner Associations (HOAs), businesses, transportation agencies, academic institutions and other groups to implement the strategies necessary to ensure a safe, secure and livable community.

2.5 THE ENVIRONMENT

Fort Lauderdale has a sub-tropical climate. This climate, more than ever, necessitates the need for canopy trees to help cool the temperature and reduce the heat island effect allowing walking and biking as a viable convenient option.

Sea level rise and climate change are a fact for this coastal city. With the increase in severe weather and the continuing sea level rise it is critical to reduce greenhouse gases and stormwater runoff that impact the transportation system.

Maintaining a healthy and attractive living environment is essential to building a strong, sustainable community for the future.

3. What?

WHAT ARE COMPLETE STREETS

Complete Streets are designed and operated to enable safe access and mobility for all users, including pedestrians, bicyclists, motorists and transit riders of all ages and abilities. Complete Streets may look different and contain different elements depending on the location. In urban areas like Fort Lauderdale, the concept of Complete Streets goes beyond safety, tying in with issues of human health, equity, aesthetics, economic development, environmental protection, and livability, all within a specific neighborhood context.

Complete Streets represents a paradigm shift in traditional road construction philosophy. Instead of a reactive attempt to accommodate bicycle- and pedestrian-friendly practices in projects, Complete Streets policies require all road construction and improvement projects to begin by evaluating how the right-of-way serves all who use it.

3.1 COMPLETE STREETS ARE PUBLIC SPACES

Above any specific need by an individual or group of users, the city street is a public space. Due to Fort Lauderdale's density and the development patterns, often times the streets are our front yards and extensions of our living area. At their best, streets:

- Provide for the safe and efficient movement of goods and people of all ages and abilities,
- Are connected, seamless multimodal systems,
- Provide a clean and attractive framework for economic development,
- Create space for social interaction and physical activity; and
- Embrace the vernacular of a place thereby defining a unique identity.

3.2 COMPLETE STREETS AND LAND USE

In urban communities like Fort Lauderdale compact mixed use development makes walking, cycling and transit use reasonable travel choices. The density of housing provides important commercial opportunities. While the city has the framework of a grid of streets, compact development, and a mix of land uses, there is a need to ensure that the street design is inherently safe for all users, encourages the use of alternative modes of transportation, and creates a varied and lively streetscape. This is essential to long-term social and economic success.

3.3 COMPLETE STREETS AS MULTIMODAL TRANSPORTATION NETWORK

Complete Streets provide a choice of mobility options that are viable over the lifetime of a user. From childhood who can't drive yet, to the senior population can no longer drive, and in between, the transportation system offers choices for mobility. The transportation network provides connections between destinations and all travel modes, for all users. Complete Streets are streets where all users coexist in a controlled, low-speed environment. These users may include:

- Pedestrians of all ages and abilities, including children who are small, hard to see, and may be impulsive, as well as seniors and disabled individuals who may be unable to move quickly, or longer distances independently,
- Bicycles – utility and recreational users of all ages,
- Transit vehicles, including public, private and school buses,
- Emergency vehicles,
- Commercial trucks and vehicles for delivery of goods and services, and
- Private motor vehicles.

3.4 COMPLETE STREETS ARE CONTEXT SENSITIVE

Complete Streets are designed to respect the context of their location. Downtown locations, for example, often require greater emphasis on pedestrian, bicycle, and transit access than streets within single family neighborhoods. Context includes elements such as:

- Significant destinations – the beach, cultural center, sports center.
- Adjacent land uses – residential, commercial, institutional, mixed use, etc.
- Neighborhood density – influences how many people are likely to use the street
- Neighborhood character and aesthetics – historic architecture, development patterns, waterfront site, etc.
- Existing transportation system – roadway classification, transit availability, street parking, limited rights-of-way, speed, traffic volumes.
- Mobility Hubs – the presence of high level transit service(s) and transit oriented development.

Additionally, context includes social and demographic factors that influence who is likely to use the street and how. For example, low income families and those without their own car are likely to need a robust pedestrian, bicycle and transit network that connects to important destinations and allows them to travel by foot or bike safely and efficiently. Likewise, elderly residents who may be highly dependent on pedestrian travel often need longer crossing times to be considered for signalized crosswalks.

4. Why Complete Streets?

4.1 REASONS FOR COMPLETING THE STREETS

The City of Fort Lauderdale is committed to a safe and connected transportation system for all of its residents, visitors and businesses. However, much of the existing street network has been engineered previously to facilitate and prioritize the movement of motor vehicles, creating limited transportation choices that are safe and/or convenient.

It is apparent that maintaining the former design practices is not practical for the future. Populations continue to rise, and the number of vehicles on the streets also continues to rise, yet there is no more space to build more lanes of traffic. It is clear that the only way to prepare for the future of Fort Lauderdale is to develop a strong network of various efficient modes of transportation and make it desirable to choose those modes in order to reduce the number of vehicles on the street.

4.2 BENEFITS OF COMPLETE STREETS

By rethinking commonly applied planning and design practices, and orienting our street design and management toward Complete Streets, we intend to alter the balance of power in ways that impress upon users that the street has many purposes and is not simply a travel corridor dedicated exclusively to motor vehicle traffic. At the same time, Complete Streets improvements also make it safer for drivers by providing spaces for sharing the roadway with pedestrians and cyclists, improving the quality of travel through the reduction of unwarranted stops, and smoothing flow in a way that lowers stress and anxiety while encouraging slower and safer travel speeds.

The National Complete Streets Coalition has identified the following specific benefits of Complete Streets:

- **Safety** – Complete Streets designed with sidewalks, raised medians, better bus stop placement, traffic calming measures, slower vehicle speeds, clear spaces for modes of transportation on a street, and treatments for disabled travelers improve pedestrian safety, and many other design elements improve safety for all users.
- **Public Health** – Complete Streets encourage walking and bicycling for health by providing safe places to be active. The Centers for Disease Control (CDC) identified a strong correlation between the level of planning and investments in infrastructure and decreasing incidents of some of the most serious health concerns facing the United States, including heart disease, obesity, and diabetes. The National Institutes of Medicine recommends fighting childhood obesity by establishing ordinances to encourage construction of sidewalks, bikeways, and other places for physical activity.
- **Sustainability** – Complete Streets address climate change and oil dependence by allowing people to make short trips throughout the day by walking or biking instead of utilizing the car. The Broward Metropolitan Planning Organization (MPO) 2035 *Long Range Transportation Plan (*LRTP) calls for a shift from investment in automobile-centric projects to transit and other modes that support transit. The 2001 National Household Transportation Survey found that 50% of all trips in metropolitan areas are three miles or less and 28% of all metropolitan trips are one mile or less – distances easy to walk, bike, or hop a bus or train. Yet 65% of the shortest trips are now made by automobile, in part because of incomplete streets that make it dangerous or unpleasant for other modes of travel. Complete Streets support the sustainable transportation vision established by the MPO and its constituencies and city neighbors.
- **Community Building –** Complete Streets play an important role in livable communities, where all people – regardless of age, ability or mode of transportation – feel safe and welcome on the roadways.

4.3 GUIDING PRINCIPLES FOR FORT LAUDERDALE COMPLETE STREETS

Connectivity

Connectivity is essential if non-motorized transportation is to be a viable and desirable option. Fort Lauderdale streets should be designed to provide connectivity that satisfies travel needs with redundant routes in an intact network system.

Safety & slower vehicle traffic

Traffic injuries and fatalities are often preventable. There is a direct correlation between vehicle speeds and injury/fatality rates. Fort Lauderdale streets should be designed with safety of all users as a priority, and vehicle speeds limited, with the goal of reducing injuries and fatalities.

Livability

Livable cities are characterized by a built environment that enhances quality of life, strengthens community ties, encourages civic engagement, and promotes health. Fort Lauderdale should be designed with livability in mind.

Human health

Healty streets should be designed to increase opportunities for active transportation (walking, biking, etc.), reducing vehicle miles traveled, and decreasing pollution caused by motor vehicles.

Economic Development

Well-designed streets support economic vitality by drawing customers to businesses and providing access and transportation options for reaching businesses. Fort Lauderdale streets should be designed to support the city's current and future development and contribute to the city's economic vitality.

Equity

Equitable streets should be designed to provide for the needs and safety of all users, particularly people with disabilities, the elderly, children, and people who cannot afford a private vehicle.

Aesthetics

Aesthetically pleasing surroundings enhance the experience of using a street, making it a place where people want to be, and show the City's commitment to invest in itself which attracts private investment. Fort Lauderdale streets should be designed with consideration for aesthetic elements, including materials, lighting, landscaping, street furniture, and maintenance.

Context

Context Sensitive streets should be designed to respect and enhance the distinctive identity of our City, its urban character, and its cultural and historical assets.

5. What Now?

STREET DESIGN PROCESS

The Complete Streets Manual aims to formalize a process for street re-design in the City of Fort Lauderdale. Such process provides the best opportunity for transparency and accountability. The re-design shall be guided by the goals outlined in this document. This process will ensure that infrastructure investments will support not only mobility, but the guiding principles of Complete Streets – connectivity, safety, livability, human health, economic development, equity, aesthetics, and context.

5.1 PUBLIC PROCESS

The neighbors of the City of Fort Lauderdale have a vested interest in the changes that occur in the public spaces of their communities, including their streets. Given access to pertinent information, input from qualified professionals and a participatory process that allows for thoughtful collaboration between educated neighbors and city staff, final street designs will result in changes that most clearly reflect the desires and needs of the community.

The steps illustrated below show the basic flow of a Complete Streets Process. Project initiation can be by the public or by city staff based on recommendations received from previous planning efforts.

5.2 USING THE TOOLBOX

A variety of design treatments can be employed to create Complete Streets, each with varying degrees of community involvement, engineering and education necessary for successful implementation. Chapter 7 represents Complete Streets design options in the form of a "toolbox", and it is expected that all roadway projects – whether initiated by the city, state, federal, regional, county or community groups – will employ the toolbox as a starting point. The toolbox does not prescribe which specific tools must be used in a given situation; instead, it offers users guidance in determining which elements are most appropriate and feasible given the context and goals of the particular project, using the Complete Streets guiding principles.

This Toolbox should be used as a resource illustrating practical implementation strategies of Complete Streets guiding principles. Other Complete Streets Best Practices may be utilized with approval and as long as they meet intent of the Complete Streets guiding principles.

5.3 USING THE DESIGN GUIDELINES

Appendix A provides detailed guidelines for each street type to assist in the development of Complete Streets compliant roadway re-designs. It is divided into sections by street type that address each design feature and where they are desired for such things as lane widths, bike lane accommodations, sidewalk widths, and crosswalk accommodations.

5.4 OTHER PRINCIPLES TO CONSIDER DURING DESIGN

Complete Streets is only one principle for designing streets that the City of Fort Lauderdale is committed to following in the re-design of the streets in the city. Several other principles are also critical to creating a Livable Community and overlap with Complete Streets Principles.

Other guiding principles to consider while designing improved streets include:

Green Streets Principles - A Green Street uses a natural systems approach to reduce stormwater flow, improve water quality, reduce urban heating, enhance pedestrian safety, reduce carbon footprints, and beautify neighborhoods. Through various combinations of native plants and soils, these objectives can be met on different types of streets in many settings. Green Street features include vegetated curb extensions, sidewalk planters, landscaped medians, vegetated swales, permeable paving, and street trees.

Permeable Pavers

Curb Extensions with infiltration (rain gardens)

Vegetated Swales

Smart Growth Principles. What, where, and how development occurs will affect neighbors' lives for generations to come. By designing neighborhoods that have shops, offices, schools, churches, parks, and other amenities near homes, residents and visitors have the option of walking, bicycling, taking public transportation, or driving as they go about their business. The Smart Growth Network developed a set of ten basic principles for Smart Growth:

1. **Mix land uses.** Mixed land uses are a critical component of achieving better places to live. By putting residential, commercial and recreational uses in close proximity to one another, alternatives to driving, such as walking or biking, become viable. Mixed land uses also provide a more diverse and sizable population and commercial base for supporting public transit. Mixed use attracts pedestrians and helps revitalize community life by making streets, public spaces and pedestrian-oriented retail become places where people meet.

2. **Take advantage of compact building design.** Compact building design suggests that development occur in a way that preserves more open space, and that individual buildings make more efficient use of land and resources. Compact building design is necessary to support wider transportation choices, and provides cost savings. In order to encourage transit use to reduce air pollution and congestion, minimum levels of density are required to make public transit networks viable.

3. **Create a range of housing opportunities and choices.** Providing quality housing for people of all income levels is an integral component in any Smart Growth strategy. Housing availability is a key factor in determining households' access to transportation, commuting patterns, access to services and education, and consumption of energy and other natural resources. By using Smart Growth approaches to create a wider range of housing choices, communities can mitigate the environmental costs of auto-dependent development, use their infrastructure resources more efficiently, ensure a better jobs-housing balance, and generate a strong foundation of support for neighborhood transit stops, commercial centers, and other services.

4. **Create walkable neighborhoods.** Walkable neighborhoods are desirable places to live, work, learn, and play. Goods and services are located within an easy and safe walk or bike. Walkable neighborhoods make pedestrian activity possible, thus expanding transportation options, and creating a streetscape for a range of users – pedestrians, bicyclists, transit riders, and drivers.

5. **Foster distinctive, attractive communities with a strong sense of place.** A vision and standards for development that respect community values of architectural beauty and distinctiveness, as well as expand choices in housing and transportation are important for smart growth. Smart growth seeks to create interesting, unique communities that reflect the values and cultures of the people who reside there, and foster physical environments that support a more cohesive community fabric.

6. **Preserve open space, farmland, natural beauty, and critical environmental areas.** Open space preservation supports smart growth goals by bolstering local economies, preserving critical environmental areas, improving community quality of life, and guiding new growth into existing communities. Additionally, preservation of open space benefits the environment by combating air pollution, attenuating noise, controlling wind, providing erosion control, and moderating temperatures.

7. **Strengthen and direct development towards existing communities.** Smart growth directs development towards existing communities already served by infrastructure, seeking to utilize the resources that existing neighborhoods offer, and conserve open space and irreplaceable natural resources on the urban fringe. By encouraging development in existing developed areas, there is a benefit from a stronger tax base, closer proximity of a range of jobs and services, increased efficiency of already-developed land and infrastructure, and reduced development pressure in edge areas.

8. **Provide a variety of transportation choices.** Providing people with more choices in housing, shopping, communities, and transportation is a key aim of smart growth. A wider range of transportation options is necessary to improve the current systems. Traffic congestion is worsening; the best way to counteract this congestion is to have a multi-modal approach to transportation to create a variety of transportation options and reduce the reliance on personal vehicles.

9. **Make development decisions predictable, fair, and cost effective.** To successfully implement Smart Growth Principles, the concept must be embraced by the private sector. Development is initiated by the private sector; therefore in order to realize the positive effects of Smart Growth the developers and their lenders need to have bought in to the Principles and be able to market those Principles to make their projects profitable. If the right infrastructure and regulatory decisions are made they will support fair, predictable and cost-effective smart growth.

10. **Encourage community and stakeholder collaboration in development decisions.** Growth can create great places to live, work and play—if it responds to a community vision. There are some Smart Growth Principles over others that are more important for each type of community. Any plans for redevelopment should be in compliance with the Vision of that neighborhood as to what is most important to their community.

Livability Principles. On June 16, 2009, the U.S. Department of Housing and Urban Development (HUD), U.S. Department of Transportation (DOT), and the U.S. Environmental Protection Agency (EPA) joined together to help communities nationwide improve access to affordable housing, increase transportation options, and lower transportation costs while protecting the environment.

The Partnership for Sustainable Communities works to coordinate federal housing, transportation, water, and other infrastructure investments to make neighborhoods more prosperous, allow people to live closer to jobs, save households time and money, and reduce pollution. The partnership agencies incorporate six principles of livability into federal funding programs, policies, and future legislative proposals.

The Partnership for Sustainable Communities established six livability principles that will act as a foundation for interagency coordination:

> **1. Provide more transportation choices.** Develop safe, reliable and economical transportation choices to decrease household transportation costs, reduce our nation's dependence on foreign oil, improve air quality, reduce greenhouse gas emissions and promote public health.
>
> **2. Promote equitable, affordable housing.** Expand location- and energy-efficient housing choices for people of all ages, incomes, races and ethnicities to increase mobility and lower the combined cost of housing and transportation.
>
> **3. Enhance economic competitiveness.** Improve economic competitiveness through reliable and timely access to employment centers, educational opportunities, services and other basic needs by workers as well as expanded business access to markets.
>
> **4. Support existing communities.** Target federal funding toward existing communities—through such strategies as transit-oriented, mixed-use development and land recycling—to increase community revitalization, improve the efficiency of public works investments, and safeguard rural landscapes.
>
> **5. Coordinate policies and leverage investment.** Align federal policies and funding to remove barriers to collaboration, leverage funding and increase the accountability and effectiveness of all levels of government to plan for future growth, including making smart energy choices such as locally generated renewable energy.
>
> **6. Value communities and neighborhoods.** Enhance the unique characteristics of all communities by investing in healthy, safe, and walkable neighborhoods—rural, urban, or suburban.

6. What Else?

ENGINEERING CONSIDERATIONS

The Complete Streets program is part of a fundamental shift in the way the City approaches street design. For Complete Streets to be successful, every road project for every type of roadway should be evaluated for compliance with the Complete Streets policy and guiding principles. Road projects range from minor maintenance to milling and paving to new or realigned roads. Road types range from industrial arterials carrying high volumes of truck traffic to low volume roads carrying residential traffic only.

The modification of the road or transportation system must be thoughtfully considered based on proven and accepted criteria; furthermore, techniques applied in one location may not be suitable in another. All designs must be professionally driven and approved by the Transportation & Mobility Department to ensure that they are safe, feasible, and cost effective. Below are some of the factors that must be taken into consideration in the course of all roadway designs.

6.1 GUIDELINES

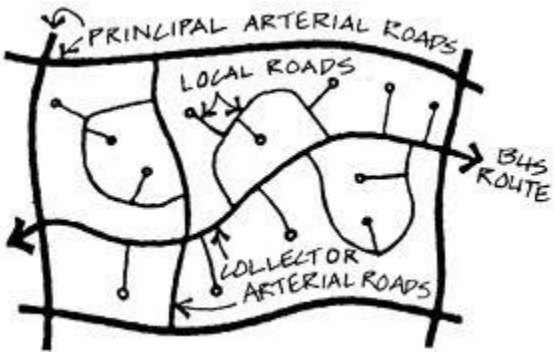
In order to provide consistency and reduce the potential for conflicts, roadway projects must be designed with consideration for nationally and regionally recognized guidelines and standards. The City of Fort Lauderdale has adopted criteria for signage, lane widths, pavement markings, turning radii and other road characteristics for many roadway design treatments. Standard details are available from Transportation & Mobility Department. "Pilot" geometry or any other proposed designs that deviate from the standards adopted will be evaluated on a case by case basis, and must be approved by the Transportation & Mobility Department.

Below is a list of sources that provide commonly accepted guidance for street design. These resources provide references to engineers but generally allow for flexibility. Some of these documents are being revised to incorporate multimodal aspects.

- American Association of State Highway and Transportation Officials (AASHTO) "*Geometric Design of Highways and Streets*", a primary reference for any transportation design. It covers most geometric considerations for the design of roads and highways and should be considered as a good reference to provide a basis for design, through it allows for flexibility and engineering judgment.

- Federal Highway Administration, which publishes the following applicable documents:
    - Manual on Uniform Traffic Control Devices (MUTCD)
    - FHWA Traffic Calming State of the Practice
    - National Committee on Uniform Traffic Control Devices
- Americans with Disabilities Act (ADA) Guidelines
- Florida "*Manual of Uniform Minimum Standards for Design, Construction, and Maintenance for Streets and Highways*". *(Florida Greenbook)* Is intended to provide minimum standards for use on all public streets that are not part of the State Highway System.
- Florida Department of Transportation, "*FDOT Plans Preparation Manual (PPM) Volume I",* outlines the design criteria and procedures for use on the State Highway System (SHS) and on FDOT projects. The criteria in the PPM represent requirements for the design of FDOT projects. The PPM Volume II sets forth requirements for the preparation and assembly of contract plans for FDOT projects.
- Broward County Public Works Guidelines, "*Final Report on Alternative Roadway Design Guidelines for Broward County*" outlines roadway design guidelines consistent with one of the County's priority goals of establishment of a "sense of place". The guidelines are consistent with the county-wide *Community Design Guidebook (CDG),* which develops, promotes, and sets forth the basis for implementing urban design guidelines and principles for use within Broward County that are sensitive to emphasizing and reinforcing the distinctive character of the County and the unique charm of its various cities and places.
- Broward County Complete Streets Manual

6.2 ROADWAY FUNCTIONAL CLASSIFICATION SYSTEM



Source: www.cyburbia.org

Like most jurisdictions in the United States, Fort Lauderdale's streets have been categorized in order to better understand how they serve motor vehicle traffic. Each road's classification has been determined by the state using guidelines developed by AASHTO. Complete Streets projects must take into consideration this roadway classification as it helps determine how the road and network needs to be treated to handle traffic volumes and other conflicts that may arise as a result of design changes. It is also often used in determining Federal or State funding criteria when improvements are needed. The road classifications for Fort Lauderdale are as follows:

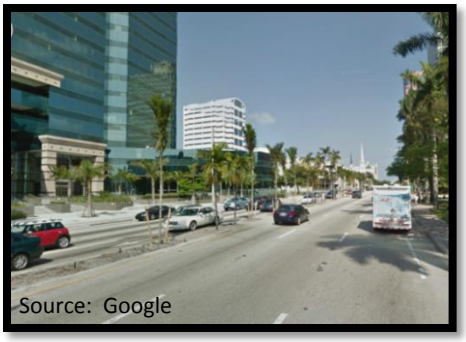
- **Urban Principal Arterial** – Serves major centers of activity and have the highest traffic volumes and longest trips. Generally carries urban commuters. They include both Interstate highways and local roads. Examples include I-95, I-595, Commercial Boulevard, and Cypress Creek Road.
- **Urban Minor Arterial** – Serves to interconnect with principal arterials and other roads and has a lower level of travel mobility. Often used for commuting to employment centers from principle arterials. Examples include Andrews Avenue and NE 3rd Avenue.
- **Urban Major Collector** – Provides land access and traffic circulation in residential neighborhoods, commercial and industrial areas. Examples include NE 15th Avenue, Riverland Road, and SW 31st Avenue.
- **Urban Minor Collector** - Provides land access and traffic circulation in residential neighborhoods, commercial and industrial areas on a smaller scale than a major collector. Examples include Sistrunk Boulevard and Bayview Drive.
- **Urban Local Road** – Provides primary access to residential property. Through traffic is discouraged. Includes most local streets.

6.3 COMPLETE STREET TYPOLOGIES

Complete Streets typologies go beyond functional classification to categorize streets according to the types of users as well as the surrounding land uses and environmental factors. Such typologies allow for more comprehensive understanding of a street's existing and desired functions. The City of Fort Lauderdale has broken Broward County's typologies down further to create a guideline for reviewing streets and identifying the design treatments that are appropriate for a given street.

BOULEVARD: A walkable, divided street designed for high vehicular capacity and moderate speed, traversing the city center. Boulevards serve as primary transit routes and should have bike lanes and wide sidewalks. They serve as primary goods movement, emergency response and evacuation routes, and use vehicular and pedestrian access management techniques. Boulevards may have bus-only lanes or frontage roads buffering sidewalks and buildings. They may have landscaped medians.

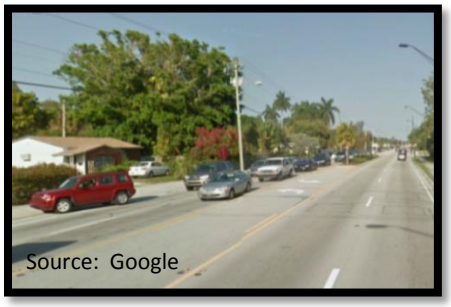
- **Center City Boulevard (arterial)** – Center City Boulevards consist of the portions of Boulevards that run through the highest-density mixed-use centers in the City including the Downtown Core. High-rise development may be located along or proximate to the Center City. Due to its density of mixed uses, and proximity to the center of activity, these streets should contain the highest level of multimodal accommodations including dedicated bike lanes, slow traffic speeds, enhanced pedestrian areas including wide sidewalks, special treatments for crosswalks, transit accommodations, and on-street parking to support street level commercial.


Source: Google

- **Commercial Boulevard (arterial)** – Commercial Boulevards serve primarily commercial uses to move high vehicular volumes. Traffic may flow faster than desired for ideal pedestrian and bicycling conditions. Surrounding land uses include retail, commercial, and some higher density residential. They serve as primary transit routes, routes for goods movement. These streets should include dedicated bike facilities, pedestrian enhancements, and transit accommodations.

Source: Google

- **Residential Boulevard (arterial)** – Residential Boulevards serve primarily residential uses to move high vehicular volumes. Traffic runs slower than on other boulevards. Transit service may be provided. There are frequent curb-cuts for driveways. Bike lanes and sidewalks are provided on both sides of the street.


Source: Google

AVENUES: Avenues are walkable streets of moderate to high vehicular traffic capacity and low to moderate speed that are short distance connectors between urban centers and serve as access to abutting uses. Avenues serve as primary pedestrian and bicycle routes and may serve local transit routes. Avenues are similar to urban minor arterials or urban collectors in the functional street classification system.

- **Center City Avenue (urban minor arterial/urban collector) –** Center City Avenues traverse higher-density mixed-use areas, such as the Downtown Core. The surrounding built environment consists of mid- to high-rise buildings that support a variety of functions, are closely spaced, have minimal setbacks, and contain active uses on the ground floor. Management of parking and loading facilities on these avenues is critical, as these uses typically are imperative to a vitality of businesses but may conflict with pedestrian and bicycle use. These avenues should contain premium transit facilities, enhanced pedestrian facilities to accommodate the high pedestrian use, on-street parking to support ground floor uses,

Source: Google

- **Commercial Avenue (urban minor arterial/urban collector) –** Commercial Avenues tend to have faster moving traffic than other Avenues and act to connect one development node to another. They are secondary to Commercial Boulevards and serve more local population. The surrounding land uses are low- to mid-rise structures at a lower density and may have larger setbacks and serve as transition areas to the higher density of the Center City. The uses on these Avenues typically consist of restaurants, shops, small offices, and multi-family homes. On-street parking should be provided for street-fronting businesses. Structured parking may also be needed.

Source: Google

- **Residential Avenue (urban minor arterial/urban collector) –** Residential Avenues are smaller in scale than Commercial Avenues, with slower moving traffic, but may serve as alternative routes to connect neighborhoods. They typically contain signalized intersections where they cross Boulevards. Surrounding land uses are generally residential with some neighborhood commercial.

Source: Google

STREETS: Streets are local, walkable, multi-movement facilities with speeds that should be no higher than 25 mph. Streets should contain raised curbs (small corner radii, wide sidewalks, parallel parking, and trees in individual or continuous planters. The primary purpose is to serve local traffic and provide vehicular and pedestrian access to abutting properties.

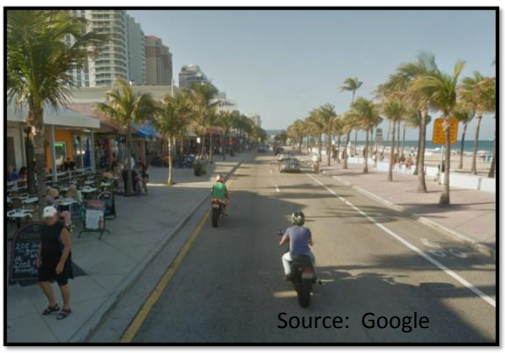
- **City Center Street** – Center City Streets are located within the Center City, and run through the highest-density mixed-use centers in the City including the Downtown Core. High rise development may be located along or in close proximity to these streets. Due to its density of mixed uses, and proximity to the center of activity, these streets should contain the highest level of multimodal accommodations including dedicated bike lanes, slow traffic speeds, enhanced pedestrian areas, special treatments for crosswalks, and on-street parking to support street-level commercial.

- **Commercial Street** – Commercial Streets are less dense than a City Center Street in character, and primarily serve commercial districts. These streets are secondary to Commercial Avenues and serve more local population. The surrounding land uses are low- to mid-rise structures at a lower density and may have larger setbacks and serve as transition areas to the higher density of the Center City. The uses on these Streets typically consist of restaurants, shops, small offices, and multi-family homes. On-street parking should be provided for street-fronting businesses.

- **Residential Street** – Residential Streets are purely residential in character and serve lower-density neighborhoods. These streets have low volume slow moving traffic. Separate bike lane facilities are typically not required. Sidewalks should be provided on both sides of the street.

SPECIAL STREET DESIGNATIONS: Fort Lauderdale has two very distinct typologies of roadways that warrant a designation unto themselves. These streets have very different land uses and multimodal use than any other type of street within the City. They are as follows:

Beach Thoroughfare - Beachside Thoroughfare applies to roads adjacent to or near the beach. These roads have very high levels of every mode of travel. They support festivals, parades, and high levels of tourists throughout the year. The built environment includes a vibrant mixture of low- to high-rise residential, hotels, restaurants, retail, bars, and cafes. Pedestrians tend to cross at all points of the road, so traffic calming and other pedestrian safety measures are essential. Beachside Thoroughfares are fronted by wide sidewalks that facilitate many types of activity, such as sightseeing, bicycling, exercising, and other shopping and dining.


Source: Google

Industrial Thoroughfare - Industrial Thoroughfares are mainly defined by surrounding land uses such as large-scale production, distribution, and repair facilities, and are highly concentrated along the Florida East Coast Rail line and surrounding Port Everglades. They have less active street frontage and focus less on the pedestrian environment due to the presence of large driveways, loading docks, and other motor vehicle or freight facilities necessary to support industrial operations. They are wider roads that can accommodate large trucks, and are unlikely to include many pedestrian or transit amenities; however could benefit from such improvements.

Source: Google

6.4 VEHICLE TARGET SPEEDS

Vehicle target speed is the speed that is desired for a given street. Lowering vehicle speeds lessens the severity and number of crash related injuries and fatalities and is a primary goal for Complete Streets.

Target speeds can be achieved through a combination of design treatments, driver education and enforcement. Streets should be designed with target speeds and speed limits that are appropriate for both their current and future context, including functional classification, adjacent land uses and user demand.

Specific design treatments are capable of achieving predictable speed and volume reductions, though their benefits must be balanced with the potential impacts on parking and emergency vehicles. On local roads and in school zones, target speeds should be set at 20 mph in order for bicycle and pedestrian safety to be maximized.

According to a study completed by the AAA Foundation for Traffic Safety, the speed at which the chance of a pedestrian being severely injured by a vehicle is 32 mph. The chance of death from such impact is 50% when the speed of the vehicle is 42 mph.

6.5 DESIGN VEHICLES, EMERGENCY ACCESS, SANITATION

A design vehicle is the vehicle-type that must regularly be accommodated on a roadway for the purpose of designing the road. The design vehicles used for geometric street designs should reflect the predominant intended users of the street in question. In addition, all street designs must meet minimum standards for fire department and other emergency vehicle access and must consider the needs of sanitation vehicles used for street cleaning and refuse collection.

6.6 INTERSECTIONS

Intersections are statistically the most dangerous part of the street network as they are complex environments where a variety of users are negotiating the same space. Since the chance for conflict between users is highest at intersections, special care must be taken to implement design elements that control vehicle speed and minimize conflict points.

The use of the smallest possible turning radii, raised intersections, crosswalks, lighting, textured pavement, roundabouts and other speed mitigating design elements should be prioritized whenever possible and appropriate to improve the safety for all users.

6.7 ON-STREET PARKING

In Fort Lauderdale, on-street parking offers a number of important benefits. The availability of the appropriate amount of on-street parking is an important factor for some residential streets. On-street parking is also necessary for supporting businesses. This type of parking can be more efficient than off-street parking as on-street spaces are more likely to be shared by a number of users.

When properly oriented, on-street parking can also have a traffic calming effect by slowing vehicle speeds. For instance combined with chicanes (*see Section 7.1.26)*, on-street parking can visually break up long stretches of roadway that encourage speeding. Throughout the city, there are opportunities to increase the number of parking spaces available by narrowing the roadway through the striping of parking spaces along the roadway.

On-street parking should only be implemented with the use of appropriate design elements to avoid negative consequences. Cars parked on the street can impede sightlines for other users including pedestrians entering into a crosswalk. One important management tool is ensuring that on-street parking be properly priced through meters, kiosks, or residential parking permits to control the availability of parking. Consideration needs to be made to providing buffer areas between on-street parking and bike accommodations to reduce hazards of bicyclists being hit by vehicle doors opening.

Opportunities for the use of green stormwater practices through the use of pervious pavers and stormwater infiltration should be considered wherever practicable in the construction of on-street parking areas. The differentiation of parking areas through differing materials further helps to have a traffic calming effect, increasing the safety of pedestrians and bicyclists.

6.8 PEDESTRIAN & BICYCLE USE

The Complete Streets policy requires that all roadway designs take into consideration use by pedestrians and bicyclists of all ages and abilities. Factors that contribute to a good environment for walking include the following:

- Shade along sidewalks
- Frequent crosswalks
- Pleasant visual environment
- Continuous and connected pedestrian facilities separated from vehicle traffic
- Short street crossing distances
- A good mix of land uses
- Pedestrian scale lighting
- Slow and controlled motor vehicle movements
- ADA compliance
- Transit connections

Factors that contribute to a good environment for cycling include the following:

- A well-connected network of bicycling facilities
- Convenient bike parking
- Safe travel routes
- Direct travel routes, particularly when bicycling for purposes other than strictly exercise or recreation
- Slow and controlled motor vehicle movements
- Transit connections

The following data should be considered in order to evaluate and prioritize needs and choose appropriate design treatments:

- Speed – High vehicle speeds are incompatible with safe pedestrian and bicycle environments. Speeds should be reduced if possible; separated bike lanes or parallel facilities should be developed where it is not possible to slow traffic.
- Existing pedestrian/bike volumes – Volume counts, or observations over time are useful. Where there are already significant activity and proper facilities do not exist, these areas should receive priority.
- Major pedestrian/bicycle generators – Schools, hospitals, shopping areas, parks, transit points, employment centers, libraries and centers of neighborhood interest often generate pedestrian traffic. Also new or planned developments may generate pedestrian/bike traffic not reflected in existing volumes. Special attention should be made to these areas to ensure that there are bike and pedestrian accommodations from these generators to surrounding residential areas as well as between generators.

- Crash data – Higher than average numbers of pedestrians or bicycle accidents with vehicles often indicate the need for traffic calming measures and/or pedestrian/bicycle improvements.
- Street classification – The purpose of the road and the volume of vehicle traffic combined with heavy pedestrian or bicycle movements requires careful planning, particularly on arterials. On roads with high volumes of multiple modes of transportation, all modes must be accommodated and balanced.
- Schools and Parks – The network of streets and sidewalks that connect residents to parks and schools should be prioritized to allow for access by modes other than vehicles.
- Other considerations include school walking zones, transit routes, commercial areas, and neighborhood characteristics.

6.9 PEDESTRIAN ACCESS IN CONSTRUCTION ZONES

Complete Streets require that protected pedestrian facilities are maintained during all phases of construction projects that encroach upon the public right of way. If pedestrian traffic is directed across a street, temporary controls, including ADA accommodations are required to reduce pedestrian travel delay.

6.10 PUBLIC TRANSPORTATION

Public transportation and Complete Streets are naturally complementary. Transit vehicles operating on Fort Lauderdale's streets serve people who live, work, shop and recreate in the city. Not only must transit vehicles interface with general traffic, but passengers are also pedestrians and bicyclists for a portion of their trip to and from transit. Complete Streets are those which facilitate intermodal access and transfers and prioritize the needs of many different users.

Road projects in the city should consider the presence of transit vehicles, stops, and locations where passengers must cross the roadway or use sidewalks to access the transit system and nearby destinations. Traditional road construction projects can exclude the needs of transit users in the design phase, so the Complete Streets process will provide opportunity to prioritize transit improvements in such projects.

Incorporating transit more effectively in road projects may increase the usage of the transit system over time through the increased efficiency and reliability of transit. Safety, reliability, convenience and comfort are important considerations for transit users. Well-designed streets can improve the pedestrian or bicycle interface with the transit system and encourage more people to use alternative modes of transportation. Complete

Streets that prioritize transit can also improve the running time of buses which can make transit more competitive with cars.

6.11 LAND USE CONTEXT

Street designs should take into consideration the context of adjacent land uses. Designs appropriate for low-density residential neighborhoods are not likely to be well-suited for the downtown core, which has a much higher number of pedestrians and transit users. Likewise, industrial areas with large volumes of truck traffic generally need wider travel lanes and larger curb radii, elements which should be avoided in commercial and residential areas with high levels of pedestrian activity. In all cases, streets should be designed with safety of all users as a priority.

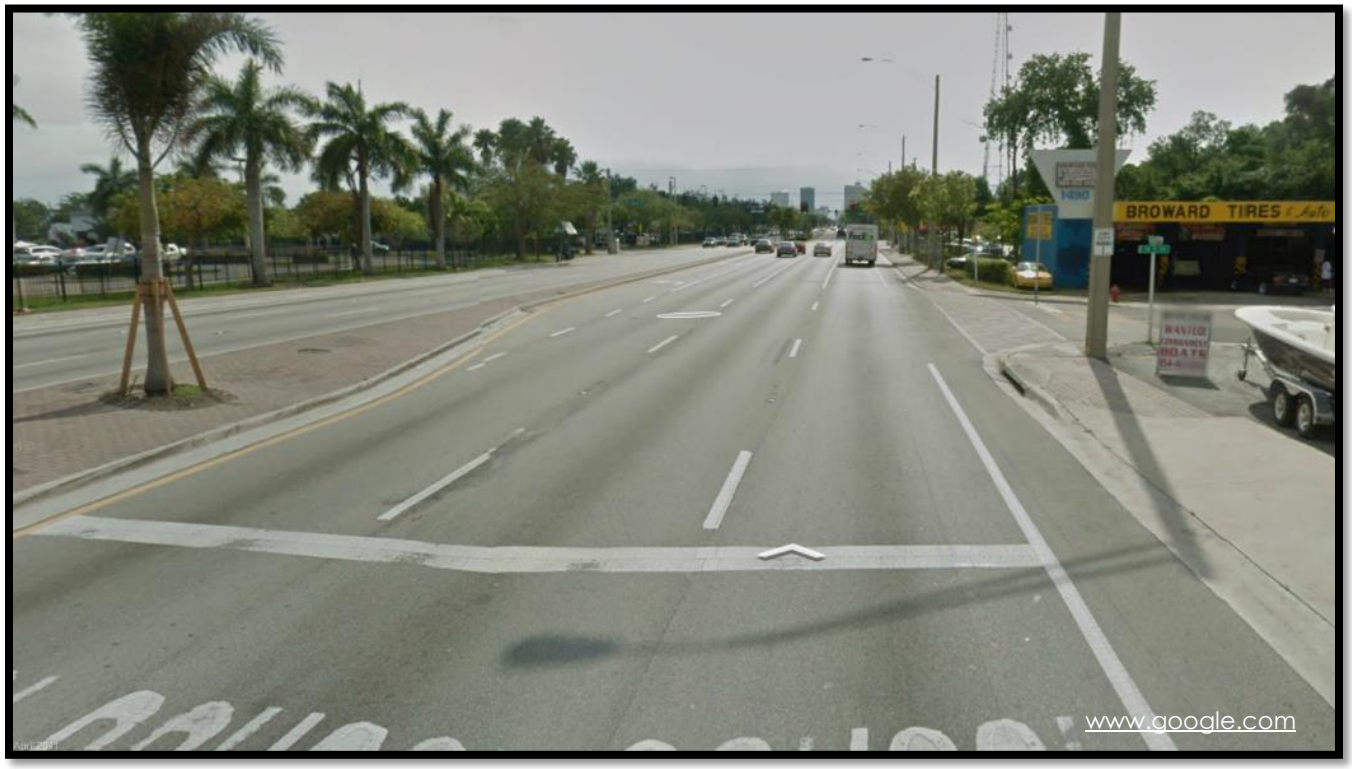
6.12 ENVIRONMENTAL DESIGN

Roadway designs should enhance both the environmental quality and aesthetic appeal of streets. Elements such as landscaping and street trees accomplish both of these goals, reducing air pollution and improving stormwater control, while contributing to a pleasant and appealing environment for street users. Green Streets Principles should be followed, which promote using a natural systems approach to reducing stormwater flow, improving water quality, enhancing pedestrian safety, reducing carbon footprints, and beautifying neighborhoods.

7. How?

CREATING COMPLETE STREETS

A variety of design treatments can be employed to create Complete Streets, each with varying degrees of community involvement, engineering and education necessary for successful implementation. Following is a list of treatments that are most likely to be applicable to Fort Lauderdale streets. This manual represents them as options in the form of a "toolbox", and it is expected that all roadway projects – whether initiated by the city, state, county or community groups – will employ the toolbox as a starting point. The toolbox does not prescribe which specific tools must be used in a given situation; instead, it offers users guidance in determining which elements are most appropriate and feasible given the context and goals of the particular project. In cases of significant safety concerns along a roadway, all measures necessary to increase safety may be utilized based on best practices even if they are in conflict with these general guidelines.

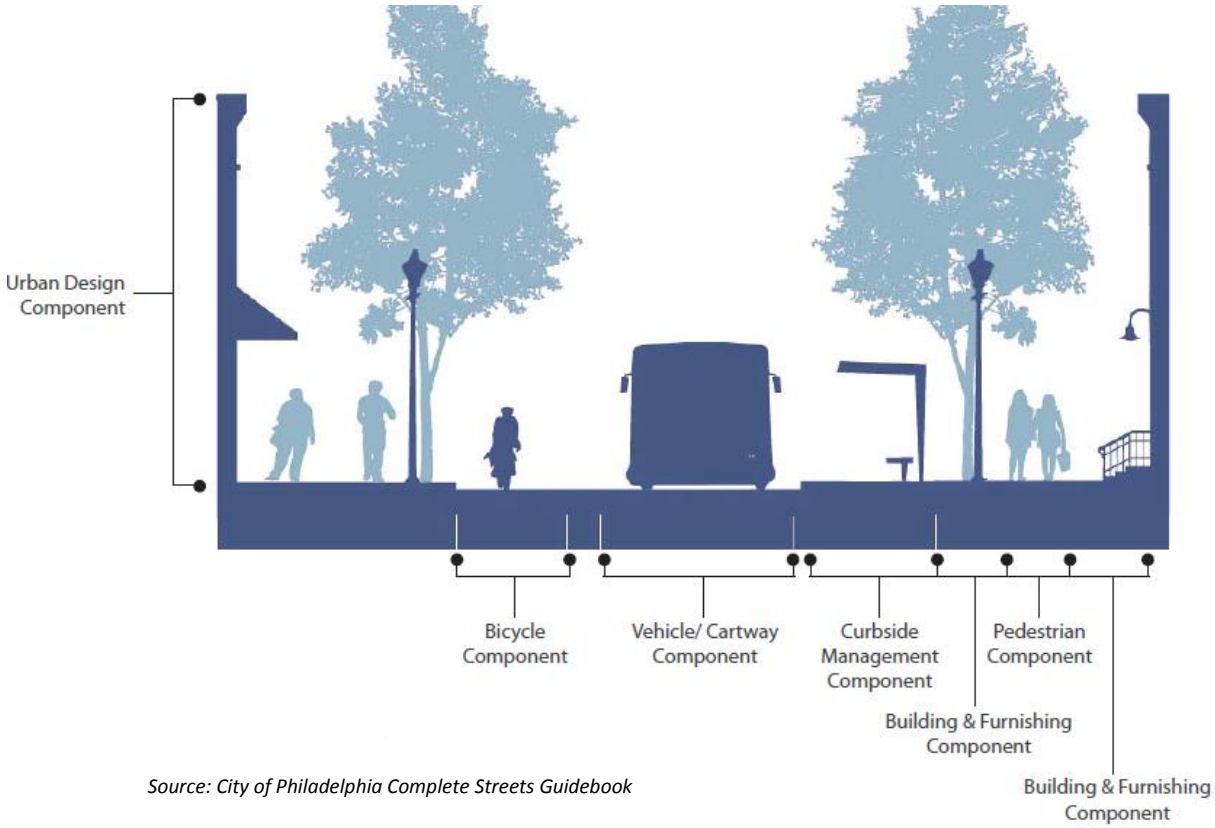


www.google.com

7.1 COMPLETE STREETS DESIGN COMPONENTS & TREATMENTS

All street design should include a consistent set of design treatments that are easily understandable to pedestrians, bicyclists, and motorists. These treatments should be carefully selected to accommodate all roadway users, encourage predicable and desirable travel behavior, and account for the different uses and contexts of various street types throughout the City. Good Complete Streets design should also provide for and balance the multiple functions of streets as spaces for travel, social/cultural events, commerce, and stormwater management. Wherever possible; the City, County and FDOT should coordinate street improvement projects so that related improvements can be made simultaneously. Standalone projects should also be pursued whenever opportunities arise to implement the Complete Streets initiative.

The following section provides specific design guidance for individual Complete Streets design treatments that are appropriate on various street types throughout the City. This section does not provide guidance on specific construction materials, but instead on the general treatment practices preferred as examples in constructing Complete Streets.



Source: City of Philadelphia Complete Streets Guidebook

PEDESTRIAN COMPONENT

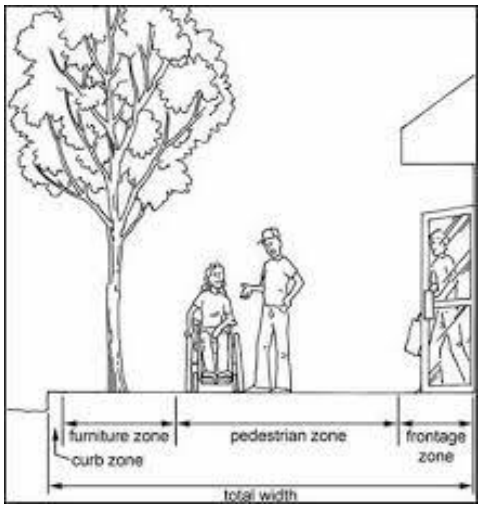
The Pedestrian Component addresses the clear area located between the curb and the adjacent building frontage where pedestrians travel.

Fundamentals:

- *Sidewalks that are designed and maintained to create an attractive pedestrian environment and provide safe access for all citizens.*
- *Use pedestrian volumes and the significance of a street within the pedestrian network as defined by the Street Typology to inform design decisions.*
- *Minimize vehicle intrusions into the pedestrian zone via driveways.*
- *Provide direct pedestrian routes between destinations and frequent crossing opportunities wherever possible.*

SIDEWALKS

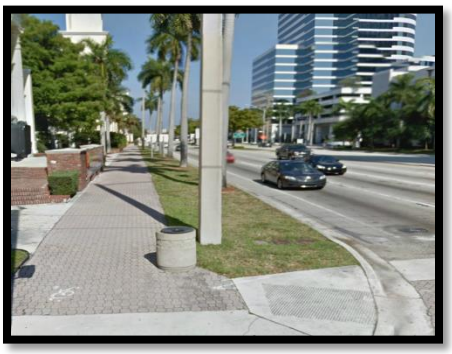
Sidewalks should provide an active and accommodating public realm that creates a pleasant pedestrian environment and serves multiple public functions, including: space for walking, landscaping and green infrastructure, lighting, seating, and other amenities, as well as commercial activities. Sidewalks should almost always be provided on both sides of the street. To balance desire for amenities in the public realm with the need to maintain a safe and comfortable street for pedestrians, the sidewalk must be organized. This organization can be viewed as a series of sidewalk zones from the property line to the curb:



Source: FHWA

- **Frontage Zone** – The transition area between the property line and sidewalk where awnings, stairs, storefront displays, and other building elements intrude into the sidewalk.
- **Pedestrian Zone –** The clear portion of the sidewalk on which pedestrians travel.
- **Furnishing Zone –** The portion of the sidewalk used for street furniture, trees and landscaping, transit stops, lights, fire hydrants, and other furnishings.
- **Curb Zone –** The portion of the sidewalk where the curb is located.

7.1.1 Sidewalk Width



Source: Google

ADA standards specify a minimum of 5 feet clear path width without utilities or other impediments to accommodate two wheelchairs passing each other. Sidewalks should be wider (8'-16') in areas with; high pedestrian volume, street furnishings and/or landscaping, transit stops, street-level commercial activity, civic or ceremonial functions, tall buildings, high traffic volumes or speeds. No existing sidewalks should be reduced. Landscape buffers should be used on high traffic volume streets to provide a barrier for pedestrian safety. Opportunities for widening sidewalks and narrowing streets should be considered whenever roads are reconstructed.

7.1.2 Street Furniture

Source: Google

Functional and aesthetically pleasing street furniture contributes to a pleasant walking environment, transit use, provides places to rest, and supports the use of the street as a public space. Examples of street furniture include benches, lighting, bike racks and shelters, newsstands, informational signs and kiosks, and waste receptacles. Proper design and application is essential to maintain functionality and accessibility of the sidewalk.

7.1.3 Lighting

Source: Ft Lauderdale Downtown CRA

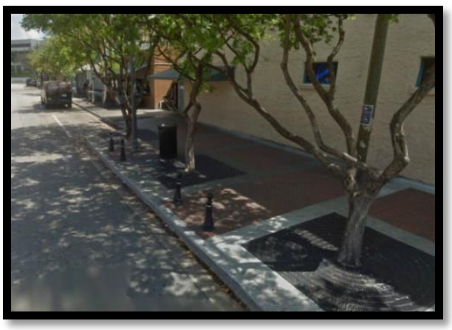
Street lighting helps to increase visibility of pedestrians and bicyclists, thereby increasing their comfort and safety. Illumination along corridors to increase motorists' ability to see pedestrians walking along the road at night is particularly important along Boulevards and Avenues where transit service and land uses that generate pedestrians during evening hours are located. Pedestrian scale lighting can be used to supplement or replace standard lights on streets with high pedestrian significance, high expected night usage, high pedestrian or bicycle crash rates, and complex geometries. The use of state-of-the-art technology is encouraged to provide effective, energy efficient lighting that is dark sky compliant and minimizes light trespass.

7.1.4 Tree Belt Enhancements

Source: Houston Tomorrow

A tree belt area is recommended between the curb and the sidewalk whenever possible. A minimum width of 5' is desired unless site conditions do not make this width feasible. Street trees and other landscaping not only provide aesthetic enhancements to a street, but also help mitigate air pollution, provide shade and lower temperatures, help reduce traffic speeds, buffer pedestrians, and provide opportunities for green stormwater management. Proper maintenance is key to the success of planted areas. Native, non-invasive plant species should be utilized. Opportunities for widening tree belts, and narrowing streets should be considered whenever roads are reconstructed. When possible, green stormwater practices should be included in the design of any tree belt.

7.1.5 Sidewalk Surface Treatments


Source: Google

Sidewalks are typically constructed of standard concrete, but permeable tinted concrete or asphalt can also be used for aesthetic enhancements that contribute to a pleasant walking environment, as well as to improve stormwater control through permeability. Pavers are not preferred due to the significant cost of maintenance required. Proper maintenance is essential, as some materials can settle over time.

7.1.6 Alternative Use of Parking Spaces/Parklets

Source: Pavement to Parks, San Francisco

Parking spaces can be temporarily or permanently converted to other uses that enhance the pedestrian environment, including parklets, planters, or café/restaurant seating. This strategy should be considered on high volume pedestrian streets, and cannot be considered on streets with restricted peak hour on-street parking. They provide additional flexibility for streets with narrow sidewalks, where there is not space to accommodate planters and/or seating, while helping to calm traffic as well. Safety improvements must be included to separate users from vehicles such as bollards, curbs, or other fixed objects. Alternative uses of parking must not impact bike lanes or stormwater management systems.

7.1.7 Vegetated Swales.

Swales are long shallow vegetated depressions with a slight longitudinal slope. As water flows through the swale, it is slowed by the interaction with plants and soil, allowing sediments and pollutants to settle out. Water soaks into the soil and is taken up by plants, and may infiltrate further into the ground if the soil is well drained.

Source: Center for Neighborhood Technology

7.1.8 Stormwater Planters.

Stormwater planters are specialized planters installed in the sidewalk area or median, and are designed to manage stormwater runoff by providing storage and infiltration. They are appropriate on all street types and should be located so that they maintain minimum clear walking zone widths and do not create pinch points or tripping hazards. Stormwater planters should be considered in curb extensions and medians and the furnishing zone, and must consider passenger and wheelchair accessibility at transit stops. They are generally designed with 4 concrete "curbed" sides and inlets that allow runoff to flow into the planter. The planter is lined with permeable fabric, gravel, and soil and filled with plants and/or trees.

Source: Environmental Protection Agency

7.1.9 Stormwater Tree Trenches.

A stormwater tree trench is a system of trees that are connected by an underground infiltration structure. On the surface they look like normal tree grates; however, under the sidewalk there is an engineered system to manage the incoming runoff. This system is composed of a trench dug along the sidewalk, lines with a permeable geotextile fabric, filled with stone or gravel, and topped off with soil and trees. Stormwater runoff flows through a special inlet leading to the stormwater tree trench, is stored which waters the trees and slowly infiltrates through the bottom.

Source: Capital Region Watershed District

INTERSECTION & CROSSING COMPONENT

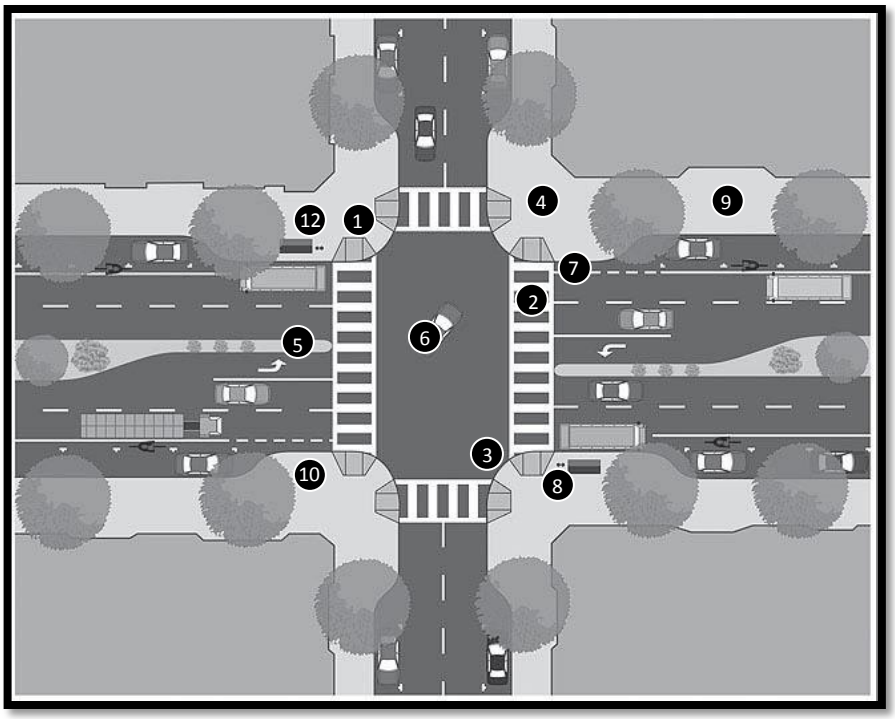
The Intersection & Crossing Component addresses design treatments to facilitate safe movement of all modes at intersections. This component includes treatments that influence the safety, function, and quality of intersections and street crossings for all users, including intersection geometry, pavement markings, and traffic signals.

Fundamentals:

- *Design intersections to reduce conflicts between modes and promote pedestrian and bicycle safety and comfort.*
- *Make intersections and crossings accessible by installing curb ramps and providing adequate time to cross.*
- *Keep pedestrian crossing distances as short as possible to reduce exposure and increase safety.*
- *Providing increased frequency of crossing opportunities.*
- *Reduce vehicle speeds and increase visibility at intersections to decrease the number and severity of crashes.*

THE BASICS OF GOOD COMPLETE STREET INTERSECTION DESIGN:

1. ADA Curb Ramps
2. Marked Crosswalks
3. Tight Curb Radii
4. Curb Extension
5. Pedestrian Refuge Island
6. Signal Timing and Operations
7. Bicycle Intersection Treatments
8. Accessible Transit Stops
9. Street and Pedestrian Lighting
10. Street Trees, Planters, and Stormwater Planters
11. Street Furnishings



Source: Philadelphia Complete Streets Design Handbook

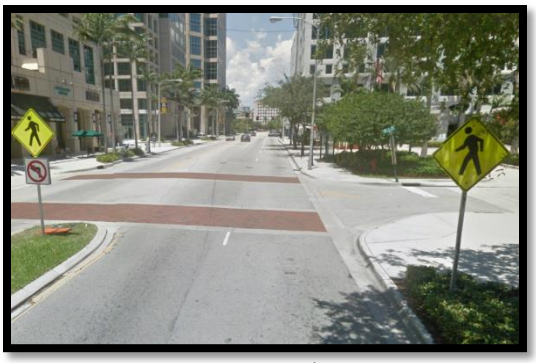
PEDESTRIAN CROSSINGS

7.1.10 Marked Crosswalks at Controlled Intersections

Source: www.redmond.gov

Marked crosswalks delineate the preferred crossing routes for pedestrians and alert other road users where to expect crossing pedestrians. Marked crossings should be utilized at all signalized and stop controlled intersections. Enhanced treatements should be used at high priority intersections where greater visibility is desired such as school crossings, where 2 or more transit routes cross, and within the business districts. Crosswalks must be paired with curb ramps and tactile warning strips per ADA guidelines. Crosswalks should be 15' wide in the Center City and 10' outside the Center City. Wider crosswalks may be provided to accommodate larger volumes of pedestrian traffic.

7.1.11 Uncontrolled Mid-block Crosswalks



Source: Google

Crosswalks should generally be installed at signalized intersections only. Mid-block crosswalks on arterials and collector roads will be considered as needed on long blocks, subject to traffic studies and engineering judgment as well as existing safety concerns. In most cases, mid-block crosswalks should be installed in conjunction with other tools such as bump-outs, pedestrian refuges, flashing beacons, in-pavement lighting, and raised crosswalks.

7.1.12 Curb Ramps

Source: Google

Access for all users is an important part of any Complete Street. Per ADA guidelines, wheelchair ramps with detectable warning strips should be installed wherever a sidewalk crosses a curb, and existing ramps should be upgraded on any project to meet current ADA guidelines. Stormwater bumpouts should be considered. Curb ramps are appropriate on all street types and are required with new development, reconstruction, or alteration of a street.

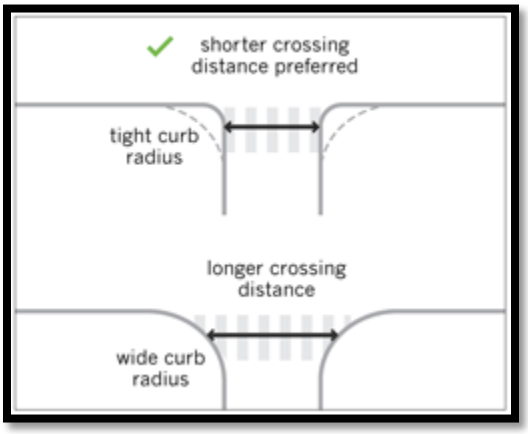
7.1.13 Stormwater Curb Extensions.

Conventional curb extensions are used regularly to enhance pedestrian safety and help in traffic calming. A stormwater curb extension incorporates a rain garden into which runoff flows.

Source: streetswiki.wikispaces.com

7.1.14 Curb/Corner Radii

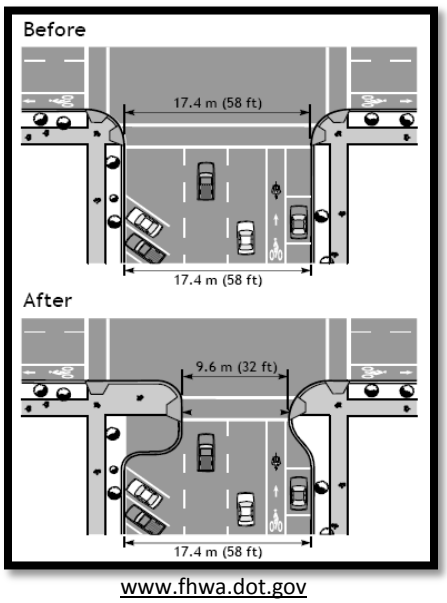
The curb radius of intersection corners impacts turning vehicles and pedestrian crossing distances. Larger curb radii allow larger vehicles, such as buses and trucks, to make right turns without encroaching on adjacent travel lanes or the sidewalk, but increase the crossing distance for pedestrians and allow smaller vehicles to turn at faster speeds. Shorter curb radii slow turning traffic and create shorter crossing distances, but can make it difficult for larger vehicles to navigate the intersection. Curb radii are contingent on the context and traffic character of an intersection as well as; volume of pedestrians, length of crossing, size and location of curb ramps, right turns by larger vehicles regularly using the intersection, and width of intersecting streets.



Source: www.mto.gov.on.ca

7.1.15 Bump-outs/Chokers

Bump-outs are an expansion of the curb line into the adjacent roadway either at a corner or mid-block. Two bump-outs can be located on either side of a street to create a choker. Bump-outs narrow the roadway both physically and visually, slow turning vehicles, shorten crossing distance and reduce potential conflicts between vehicles and pedestrians, make pedestrians more visible to drivers, highlight the presence of the crosswalk and discourage illegal parking within the crosswalk, provide a location for street furniture, and can discourage truck turns onto local streets.



www.fhwa.dot.gov

CROSSING SIGNALS

Source: www.greeleygov.com

7.1.16 Signal Timing and Operation

The timing, phasing, and coordination of traffic signals impact all modes. Well-planned signals reduce delay and unnecessary stops at intersections, thus improving traffic flow without roadway widening.

7.1.17 Pedestrian Signal Crossings

Source: www.gelightingsolutions.com

Pedestrian signal indicators inform pedestrians when to cross at signalized intersections by providing WALK, flashing DON'T WALK, and DON'T WALK indicators. Pedestrian countdown displays inform pedestrians how long they have to cross a street before the signal changes. Signals should be used at all crossings more than 26' wide, but should be prioritized based on pedestrian volume, crossing length, pedestrian crashes, and proximity to schools and senior facilities. Audible pedestrian signals should be used where appropriate. Pedestrian walk signals should be built in to the signal cycle when there are regular high volumes of pedestrians. Leading Pedestrian Intervals (LPI) can be used to allow pedestrians a head start to cross the street before traffic moves. All way pedestrian phasing should be used in limited instances where there are high pedestrian volumes and significant conflicts with turning vehicles.

7.1.18 Bike Signal Accommodations

Source: www.alexandriava.gov

Signals should accommodate bicycles by providing adequate clearance time. At actuated signals, bicycle detection should be provided. Where high volumes bicycle movements conflict with vehicle movements, a separate bicycle signal phase is recommended. Bike signals are used in combination with conventional traffic signals and use the standard green, yellow, red lenses with the addition of a bicycle stencil.

7.1.19 Pedestrian Hybrid Beacons (HAWK)

Hybrid beacons remain unlit until a pedestrian actuates the signal to indicate they want to cross. The hybrid beacon first shows a yellow light to alert drivers, then a solid red light that requires drivers to stop while pedestrians have the right of way to cross the street. They are used at uncontrolled crossings with high pedestrian volumes, especially on larger roadways where crossing opportunities are limited and difficult, but a full traffic signal is not desired and/or warranted. They must be pedestrian activated, and their location must be supported by an engineering study. Outreach needs to be conducted to educate users on this treatment.

Source: FHWA

7.1.20 Rectangular Rapid Flashing Beacons (RRFB)

Similar to hybrid beacons, RRFB's are a pedestrian actuated crossing treatment. RRFBs are signs with a "Strobe light" flashing pattern that attracts attention and notifies motorists that pedestrians are crossing. RRFB should be used at uncontrolled crossings with high pedestrian volumes. Outreach needs to be conducted to educate users on this new treatment.

Source: FHWA, MUTCD

7.1.21 In-street Pedestrian Crossing Lighting

Good visibility is vital to keeping pedestrians safe, especially at uncontrolled crosswalks. Providing in-street lighting provides additional attention to motorists of pedestrians within a crosswalk during evening hours when it is more difficult to see crosswalks. The lighting is triggered by the pedestrian entering the crosswalk by either a sensor in the sidewalk or actuated. Lighting should be solar powered LED lighting if possible.

Source: Solar Path USA

VEHICLE COMPONENT

The vehicle component addresses the portion of the public right-of-way that is intended primarily or exclusively for motor vehicle use, including travel lanes.

Fundamentals:

- *Sidewalks that are designed and maintained to create an attractive pedestrian environment and provide safe access for all citizens.*
- *Use pedestrian volumes and the significance of a street within the pedestrian network as defined by the Street Typology to inform design decisions.*
- *Minimize vehicle intrusions into the pedestrian zone via driveways.*
- *Provide direct pedestrian routes between destinations and frequent crossing opportunities wherever possible.*

7.1.22 Speed Humps

A speed hump is a raised area in the roadway pavement surface that can help reduce speeds. Speed humps may be most effective when used in combination with other traffic calming/speed reducing measures, and they are not suitable for all locations. They should be used with care on streets that are designated for transit, freight, and emergency evacuation routes. They are typically 3-4" above the roadway surface and 13' wide. Warning signs and pavement markings should be used to alert drivers. Spacing should be so that the designed operating speeds are maintained.

Source: Google

7.1.23 Raised Table Intersections

A raised table intersection is where the entire intersection is raised and generally treated with a different pavement surface can help reduce speeds. This has a traffic calming effect where drivers slow down as they negotiate the elevated intersections. They are typically 3 to 4" above the roadway surface. Warning signs and pavement markings should be used to alert drivers.

Source: Google

7.1.24 Refuge Islands

Islands enhance pedestrian safety and accessibility on streets with two-way traffic by reducing crossing distances and providing space for pedestrians to cross one direction of traffic at a time. They can also serve as a traffic calming tool by narrowing the roadway at intersections, forcing vehicles to move more slowly.

Source: Google

7.1.25 Chicanes

A chicane shifts traffic from one side of the street to the other through the use of staggered curb extensions or a serpentine roadway alignment. Chicanes create an 'S'-curving street, which can reduce vehicular speeds. Chicanes may also be created by staggering on-street parking. Permeable surfaces, planters, or green stormwater management practices should be utilized in the installation of chicanes. Alternating on-street parking can create a chicane effect as well. Drainage must be studied to ensure that there are no adverse impacts to stormwater.

Source: Google

7.1.26 Diverters

Diverters are physical barriers that redirect motor vehicle traffic with the purpose of reducing cut-through traffic and vehicle speeds on local streets. They are not a preferred design feature due to the break in connectivity of the network that they cause. Diverters must be designed with particular consideration for drainage and emergency vehicle access, and designs should not impede bicycle and pedestrian circulation. They should be only used on local streets with speed or non-local traffic issues. They provide a green infrastructure opportunity. However due to their nature, stormwater and traffic issues must be closely studied prior to implementation.

Source: Google

7.1.27 Medians

Source: Google

Medians separate different lanes or directions of traffic within the roadway and may be planted, raised concrete islands, or landscaped boulevards. They provide opportunities for plantings, green infrastructure, and allow for pedestrian refuge islands. Raised medians should be considered at all pedestrian crossings where the total roadway width exceeds 60' and on 2-way multi-lane streets. The design should account for changes in traffic circulation and emergency vehicle access. Medians should have pervious surfaces and include green infrastructure when possible. The height of plantings should be restricted so that sight lines are not obstructed.

7.1.28 Neighborhood Traffic Circles

Source: Google

A neighborhood traffic circle is a round island at the center of an intersection. It is best suited to low-volume streets, with the purpose of reducing speeds and intersection conflicts, thereby reducing the crash rate and severity. They also provide an opportunity for landscaping and other aesthetic enhancements, and they can usually be installed without changes to adjacent curbs. These should be avoided on major truck routes and should accommodate turning buses and emergency vehicles.

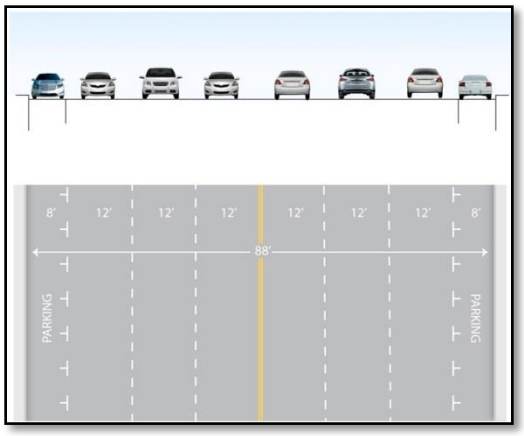
7.1.29 Roundabouts

Source: FHWA

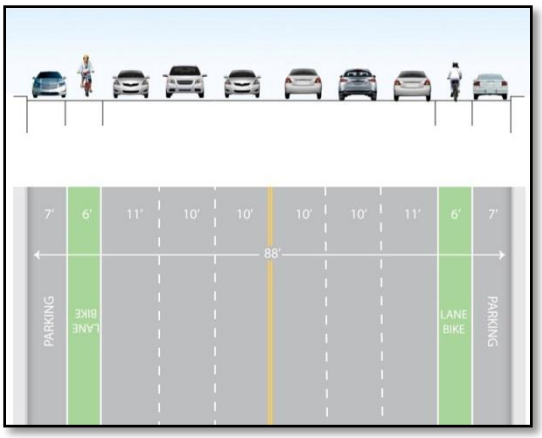
A roundabout is an intersection with one-way, counter-clockwise traffic around a central circle where traffic entering the circle yields to traffic already inside. The main benefit of roundabouts is the elimination of left-turn conflicts, which are a primary cause of accidents. Roundabouts can improve pedestrian safety by simplifying pedestrian crossings, but care must be taken to maintain pedestrian routes that are direct and easily accessible. Larger vehicles should be accommodated in the design, including potentially a truck apron around the center island, if appropriate.

7.1.30 Vehicle Travel Lane Narrowing

In general, narrower areas for vehicle travel result in lower vehicle speeds. The width of a roadway sends an implicit message to drivers about how they should drive – wide streets encourage high speeds, while narrower streets force vehicles to move more slowly to stay in their lane and prepare for potential conflicts. Narrow streets are also easier and safer for pedestrians to cross. Roadway narrowing is a relatively easy design treatment, as it can often be implemented with the relocation of pavement markings. Below are recommended lane widths for various roadway types, though lane width requirements for any given street are subject to professional engineering judgment and applicable design standards and design criteria.



Existing 88' wide Boulevard



Narrow travel lanes to add bike lanes

(Source: Michele Weisbart)

- **Avenues & Boulevards** – Roadways classified as arterials or collectors should have travel lanes generally between 10-12' wide. The wider lane should be located at the outside lane to accommodate truck and bus traffic. This width does not include on-street bike lanes or shoulders. Desired travel speed is also a factor; roads with posted speed limits below 35 mph should have lane widths at the lower end of the range.
- **Local Streets** – Two-way local roads often consist of a paved street with no center stripe. These streets generally operate in one of two ways:
    - The pavement is wide enough to accommodate two vehicles traveling in opposite directions at the posted speed limit. The pavement should be 18-20' wide.
    - The pavement is wide enough to accommodate both vehicles, but a narrower width forces the vehicles to slow down before passing each other, or one vehicle to yield to the other. This is sometimes called a "yield street." The pavement should be 14-18' wide.
    - Local roads in residential neighborhoods should be as narrow as possible with "yield street" operation unless the need for free flow of traffic can be justified.

7.1.31 ON-STREET PARKING. On-street parking serves an important need for motor vehicles. Parking lanes can also help to make streets more comfortable for pedestrians and bicyclists by providing a buffer from traffic and calming traffic by narrowing the perceived width of the roadway. Back-in angled parking may be considered on wide streets in commercial areas with lower volumes and speeds and are typically 8 ½' wide. The desired dimensions of a parking space are 8' wide by 20' long, exclusive of handicapped spaces. At least 1 ½' should be left clear between the curb and any trees, poles, or other objects on the sidewalk to allow for opening and closing car doors.

Source: Google

7.1.32 PERVIOUS PAVEMENT PARKING AREAS. Permeable pavers in parking lanes creates pervious surfaces to allow stormwater to absorb into the ground, which reduces the amount of runoff without any loss of parking on the street. The aesthetics of permeable paving can also give the illusion of a narrower street and therefore helping calm traffic.

Source: Center for Neighborhood Technology

7.1.33 Max Posted Speeds. The target speed is the desirable speed at which vehicles should operate on a street in a specific context. Design speed should be no greater than 5 mph higher than the target speed, and may be equal to design speed in developed urban areas. The existing or projected operating speed should not be used as the basis for determining design speed since operating speed may be higher than desirable in an urban area with high levels of pedestrian and/or bicycle activity, particularly on existing roadways originally designed with high design speeds. Complete street design should start with the selection of a target speed. The target speed is achieved through a combination of measures that include: Using physical measures such as curb extensions and medians to narrow the traveled way; Setting signal timing for moderate progressive speeds between intersections; Using narrower travel lanes that cause motorists to naturally slow; and Using design elements such as on-street parking to create side friction. A target speed range is initially identifed based on the street type and context including whether the area is predominantly residential or commercial.

BICYCLE COMPONENT

The Bicycle Component addresses bikeways and other facilities within the public right-of-way that accommodate bicycle travel, such as pavement markings and signage.

Fundamentals:

- *Connect bicycle facilities to local bicycle and transit networks.*
- *Provide convenient bicycle connections to residences, work places, and other destinations.*
- *Select appropriate bicycle facility design based on local street context; design should always be selected to maximize the comfort and safety of bicycling as a transportation option.*

7.1.34 BIKE ROUTES

All roads except for limited access highways are available for bicycle use. Vehicle drivers are legally required to share the road with bicycles, and cyclists have a legal responsibility to obey all traffic regulations. Dedicated bicycle facilities generally fall into one of the three categories below:

7.1.34 (1) Shared use paths (Class 1) provide separate travel ways designed for non-motorized uses. Bicycles, pedestrians, skaters may use these paths for commuting or recreational purposes with limited conflicts with vehicles. They require a significant amount of land, but in some instances can be accomplished by widening an existing sidewalk.

Source: www.bicyclinginfo.org

Shared use paths should be at least 10' wide, should have frequent connections to the street network, but also have few street or driveway crossings. A local example is the Flagler Greenway.

7.1.34 (2) Conventional bike lanes (Class 2) are dedicated lanes separated from vehicle lanes with pavement markings. These facilities should be considered on two-way Boulevards & Avenues wide enough to accommodate a bike lane in each direction. Usually signage is used to further enhance awareness. Bike lanes can be combined with other pavement markings as part of an overall street narrowing effort. Designated bike lanes should be at least 4' wide, when next to on-street parking lanes should be at least 5' wide, and buffers should be provided when space allows. Lanes should be painted green to draw motorist attention to the facilities.

Source: Seattle Transit

7.1.34 (3) Marked Shared Lanes (class 3) are roadways that are designated for bicycle use but contain no dedicated bike lane. They may be used on streets without sufficient width for bike lanes. This facility is more appropriate for slower speed roadways. Sharrow pavement markings and signage are used to remind drivers of the presence of bicycles, but do not require any additional pavement or lane alterations. Sharrows should be placed every 50' to 200' depending on traffic volumes and should be located 4' from the curb or edge of parking lane, if present.

Source: Transit Miami

7.1.35 BIKE PARKING

Bicycle parking is an important "end of trip" facility that helps make bicycling a more viable transportation option for multiple trips. An ample supply of bike parking can increase the number of cyclists on the road. Bicycle parking is appropriate on all street types, and should be prioritized in high demand areas. Bicycle parking must be provided with most new developments. Parking should provide support for bicycle frames in two locations, and not impede upon the minimum sidewalk clear width. Parking should be located in conjunction with transit stops and structured parking lots. Bicycle parking can be broken down into four broad categories:

- **Short term public parking.** Short term public parking is the most commonly utilized. It is typically provided in the form of bike racks and is used for short trips. Most often it is provided within the right of way along the sidewalk, but may be installed in the shoulder or in a parking space where demand warrants. Parking should be installed both in anticipation of demand as well as upon requests from neighbors and community and business groups in a visable location.

Source: Boston Complete Streets

- **Long term public parking.** Long-term bicycle parking is necessary when cyclists have to store their bicycles away from their homes for an extended period of time such as at major transit hubs, as well as major employment centers. Long-term bicycle parking should be located inside when possible to protect from theft and inclement weather which can include within parking garages.

Source: Kimley-Horn and Associates, Inc.

- **Short- and long- term private parking.** Private bicycle parking includes those locations provided by a private business or an institution. As part of the efforts to develop a transportation system that serves all users effectively, the City will encourage businesses and institutions to provide safe and accessible bicycle parking. Considerations will be made during development reviews to the accommodations of short and long-term bicycle parking. As with publically provided parking, private organizations should provide both types of parking facilities.

Source: www.bikeleague.org

7.1.36 Shared lane markings

Shared lane markings "Sharrows" are arrows painted on the roadway, usually in combination with signage, to alert drivers to the presence of bicycles on roads that have no dedicated bicycle lanes (usually Class 3 bike routes). They are often used in locations where a bike lane is desired but not feasible due to roadway width constraints.

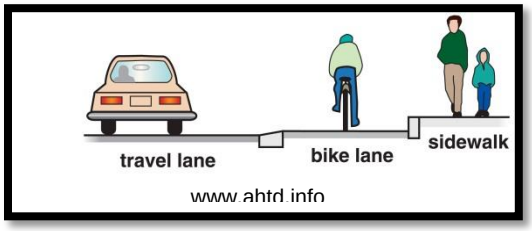
Source: www.bicyclinginfo.org

7.1.37 Buffered bike lanes

Buffered bike lanes are conventional bike lanes with a designated buffer space separating the bicycle lane from adjacent lanes for motor vehicles or parking. They can be used to create a larger space for bicyclists without potentially causing the bike lane to look like a travel lane or parking lane for motorists. They should be considered on streets with high traffic volumes, speeds, or truck travel. Buffers should be 2-3' wide.

7.1.38 Raised bike lanes

Raised bike lanes incorporate the convenience of riding on the street with some physical separation. This is accomplished by elevating the bicycle lane surface 2 to 4 inches above the street level, while providing a traversable curb to separate the bikeway from the adjacent motor vehicle travel lane.



Source: Live Active

7.1.39 Bike route signage

Bicyclists use all types of streets, and signs can be used on any type of roadway to increase awareness of bicycle use. On Class 2 and 3 routes, "Bike Lane" or "Bike Route" signs are typically used. On other roads, signs with messages such as "Share the Road" can improve awareness of motorists that bicyclist may be present. Additionally, signage can be used to direct cyclists on where and how to ride, thereby reducing conflicts with vehicles and improving safety. Current available options for roadway signage typically come from the Manual on Uniform Traffic Control Devices (MUTCD).

Source: Knoxville Regional Planning Org.

7.1.40 Colored Pavement in Bike Lanes

Colored pavement should be used to identify bicycle lanes. Green colored pavement is typically used to increase visibility to prevent conflicts, and reinforce priority to bicyclists when approved. Other colors may be utilized in context to the districts in which they are located. Colored paint increases the visibility of bicyclists and promotes the multi-modal nature of a corridor. The paint should be skid resistant and retro-reflective.

TRANSIT COMPONENT

The Transit Component addresses accommodations for transit services, such as shelters and stop locations.

Fundamentals:

- *Develop major transit corridors tied to land use.*
- *Transit should interface seamlessly with other modes, recognizing that successful transit depends on customers getting to the service via bicycle, walking, car, taxi or paratransit.*
- *Provide convenient, safe and inviting connections to residences, work places, and other destinations for bicyclists and pedestrians.*
- *Design transit features for people; providing benches, trash receptacles, shading louvers, bike racks, and access by the stop for pedestrians.*
- *Green elements should be incorporated whenever possible.*

Well-planned and designed transit facilities provide safe, comfortable and intentional locations for riders to access transit. They send a message to all street users that transit is a legitimate and viable form of transportation. *Broward County County-wide Community Design Guidebook (CDG)* and the *FDOT District 4 Transit Facilities Guidelines* recommend design principles for transportation that integrate public transit into street design and urban form. These principles are integrated into this chapter.

There are three levels of transit passenger facilities on complete streets:

- **Stops** – dedicated waiting areas with appropriate signage for passengers waiting to board a transit vehicle;
- **Benches** – dedicated seating for transit passengers; and
- **Shelters** – covered locations, usually with seating and other amenities, for transit passengers.

7.1.41 Transit Stop

The transit stop should be located on a level surface, such as a concrete pad, that provides a safe distance from moving vehicles in the traveled way. The stop should be located to provide passengers convenient access to and from their likely destinations, particularly passengers with disabilities. Transit stops also should maintain a clear area for disabled access from the bus shelter to a waiting transit vehicle. A transit stop must meet all ADA standards.

Source: BCT

7.1.42 Location of Stop

Transit stop locations should be to the far side of intersections wherever possible because intersections are generally more convenient for passengers intercepting other transit connections, accessing crosswalks, and connecting to pedestrian routes and building entrances. At signalized intersections, far side placement is generally recommended. Far-side placement helps reduce transit delays, encourages pedestrians to cross behind the vehicle where they are more visible to traffic, minimizes conflicts between buses and right-turn vehicles, and allows transit vehicles to take advantage of gaps in traffic flow. Location selection should be done on a case by case basis.

7.1.43 Shelters

Source: City of Fort Lauderdale

Ideally, passenger shelters should be located at occasional intervals along all transit routes and especially at stops with substantial passenger activity. At stop locations with passenger activity throughout the day, a shelter is preferred. Green shelters should be incorporated whenever possible. Larger developments – shopping centers, office buildings, etc. – should be encouraged to build transit shelters concurrent with construction (this can be achieved through land development regulations).

7.1.44 Transit Stop Signage

Source: BCT

Transit stop signs indicate where people are to wait and board a transit vehicle. The signs should clearly identify the transit operator, route number, and schedule. Maps showing transit lines servicing the stop should also be provided. Flag signs should be located towards the front of the stop.

7.1.45 Transit Bulb-outs

Source: www.rtamobility.com

Bus bulb-outs are typically more pedestrian friendly than bus turnouts. Besides allowing for better visibility of transit riders waiting at stops, they can be an effective traffic calming strategy for traffic adjacent to the curb.

7.1.46 Bus Turnouts

Bus turnouts should be used only where there is ample opportunity for buses to re-enter the traffic stream, such as on the far side of a traffic signal.

Source: www.rtamobility.com

7.1.47 Bike racks

Bike racks should be included at transit stops. They can either be part of the shelter, when appropriate, or supporting adjacent to the stop. Bicycles are often used to get to and from transit stops, but there is not always a need for the transit rider to take it with them.

Source: www.sfgate.com

7.1.48 Sidewalk Capacity at Transit Stops

Sidewalks at transit stops should extend to the curb so that passengers may access the sidewalk directly from the bus doors. It is desirable to provide a continuous wide area at least the distance between the front and rear bus doors. The sidewalk capacity should be increased where higher volumes of pedestrians on the sidewalk and high transit use exist. Where the sidewalk does not contain sufficient width, curb extensions can be installed to increase capacity.

Source: City of Fort Lauderdale

7.1.49 Mid-Block Crosswalk

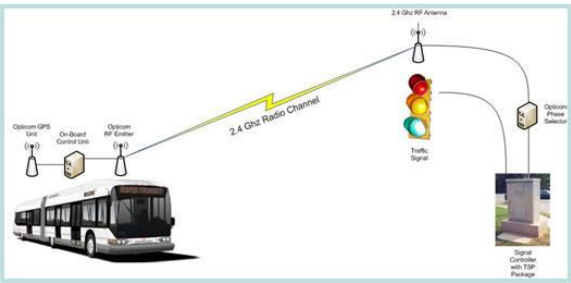
It is often necessary for pedestrians to cross roadways to access a transit stop. Where bus stops are located mid-block on a long block, a mid-block crossing should be considered. The crosswalk should be located behind the stop and controlled by a traffic device.

Source: National Complete Streets Coalition

Pedestrians will begin to seek out mid-block crossing opportunities when signalized crosswalk spacing exceeds 400 feet. The distance can be even less when two high-volume, complementary uses are located directly across the street from each other. It is at these locations that mid-block crossing treatments should be considered. Installing mid-block crossings can: (1) help channel crossing pedestrians to the safest mid-block location, (2) provide visual cues to allow approaching motorists to anticipate pedestrian activity and stopped vehicles, and (3) provide pedestrians with reasonable opportunities to cross during heavy traffic periods when there are few natural gaps in the approaching traffic streams.

7.1.50 Signal Prioritization

Signal prioritization is a component of technology-based "intelligent transportation systems" (ITS). These systems should be used in conjunction with transit agencies to help improve the roadway system's overall operations by: reducing traffic signal delays for transit, help reduce transit vehicles' travel time, help improve transit system reliability and reduce waiting time for people at transit stops. Priority transit corridors should utilize signal prioritization to ensure transit reliability. ITS can include equipment to extend green lights for approaching transit vehicles to increase efficiency.



Source: Hillsboro Area Regional Transit Authority

7.1.51 Bus Lanes

Bus lanes provide exclusive or semi-exclusive use for transit vehicles to improve the transit system's travel time and operating efficiency by separating transit from congested travel lanes. They can be located in an exclusive right-of-way or share a roadway right-of-way. They can be physically separated from other travel lanes or differentiated by lane markings and signs.

Source: New York City DOT

7.2 WHAT NOT TO DO

Street design should solve problems rather than merely shifting traffic or other negative impacts from one street or neighborhood to another. Particular care should be taken to avoid negative impacts on federally protected populations. Other practices that should be avoided include:

One-way Streets. Sometimes street design treatments intended to solve a traffic or safety problem have unintended impacts. An example is the conversion of two-way streets to one-way operation. Despite the benefits of reducing some turning conflicts and cut-through traffic, one-way streets run at cross purposes with most of the Complete Streets guiding principles. As a general principle, conversion from two-way to one-way operation should be avoided, and conversion from one-way to two-way operation should be considered when appropriate and feasible.

Signage. A properly designed roadway will elicit the proper behavior from drivers without cluttering the right-of-way with unattractive signage. Road design is an exercise in behavioral engineering.

Street Closures. The connectivity of the street network should be maintained. Vacation of Rights of Way should be avoided as well as the use of diverters. A connected street grid reduces traffic congestion by providing the ability for users to choose a variety of paths to get to their destination instead of all trips required on one main roadway.

Oversaturation of Traffic Calming – the use of too much traffic calming reduces mobility through the connected street network. It makes people avoid the area and diverts traffic onto other streets instead of it being distributed across the street network.

8. Measurement

MAKING IT COUNT

The continued measurement and evaluation of the overall use of the transportation system is an essential part of creating Complete Streets. This entails determining who is using the street network, how they are using it, how usage changes over time, and establishing the adequacy of the street network as it pertains to each of the major modes of transportation utilized within the City of Fort Lauderdale.

8.1 WHY MEASURE?

The purpose of the Complete Streets Manual is to ensure that all streets are designed to provide a safe and comfortable environment for all roadway users. It is essential, therefore, that the quality of the transportation system, and the users' experiences of that system, are measured and evaluated continually to ensure that any changes and improvements facilitate the achievement of the program's objectives. Additionally, by measuring the effects of each roadway improvement, we can fine tune the approach to street design while providing neighbors with quantifiable results. Specifically, the measurement and evaluation program is necessary in order to:

- Provide baseline data to determine trends, evaluate effects, determine where improvements are most needed;
- Support estimates of costs and benefits;
- Determine the overall level of travel demand by mode;
- Assist in the data collection necessary for the continued application for, and receiving of, state and federal grants; and
- Assist in the allocation of funding for transportation projects.

8.2 WHO TO MEASURE?

Complete Streets safely and comfortably accommodate all roadway users. In order to move toward a transportation system where all users count, all users must first be counted. Until recently, however, data collection for transportation planning has focused largely on counting the number of automobiles on a roadway and to a lesser extent the number of bicycle riders on a roadway. The actual numbers of other users of the transportation system by pedestrians and bicyclists is unknown. While estimates may be available through the data compiled by the U. S. Census, travel behavior as it pertains to cyclists, transit users and pedestrians remains largely unknown. Data should be collected as it becomes available.

8.3 HOW TO MEASURE?

Measurement and evaluation of the transportation system should focus on the collection of both objectives and subjective data.

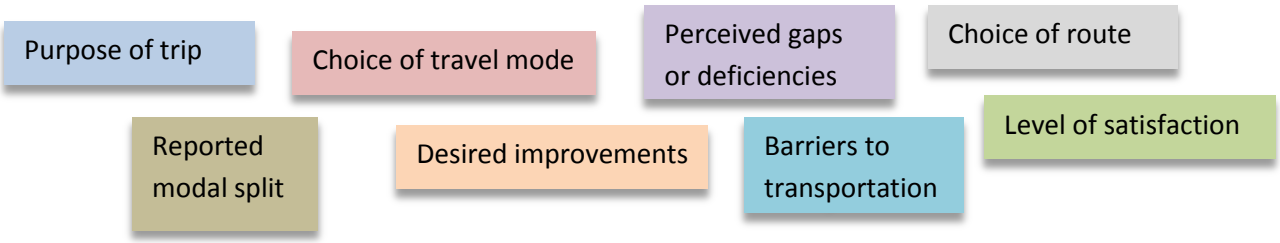
8.3.1 *Objective data*

Objective data includes the volume of users, the number and rate of traffic accidents, travel speeds, and the demographics of roadway users. Objective data may be obtained using a variety of methods and sources including manual counts, automated counts, user surveys, and accident reports. In order to ensure that all roadway users are counted, it should be a requirement that pedestrians, cyclists, and transit users are counted whenever automobile counts are undertaken. Existing counts carried out by other agencies should be utilized when possible and supplemented with the additional data needed.

In addition to collecting data, it is important to make use of objective performance measures for each major mode of transportation, including automobile, bicycle, pedestrian, transit and multimodal levels of service (LOS). Much of the current imbalance in our transportation system has come about in part as a result of overreliance on automobile LOS as a metric for the quality of a given roadway segment, intersection, or corridor. Recognizing that all transportation modes must be provided for, the measures mentioned above should be reported in the course of all major studies and projects, allowing for a comprehensive and thorough summary of the quality of the transportation network.

8.3.2 *Subjective data*

Recognize that users' experiences of the transportation system cannot always be captured by objective measures, user surveys should be administered at regular intervals and integrated into the city's transportation planning and engineering projects. Surveys can be conducted in a variety of ways including intercept surveys, take-home surveys and web-based surveys. This subjective data focuses on the attitudes and beliefs of those individuals using the transportation system.



8.4 WHEN & WHERE TO MEASURE?

As mentioned above, a large amount of data is generally obtained at irregular intervals during the course of transportation plans and studies. This data provides important snapshots of how the transportation system is used; however, for measurement and evaluation of the transportation network to be maximally effective, it must be standardized and undertaken at regular intervals. Below are data collection guidelines for the measurement and evaluation program:

- Counts and users surveys should be done bi-annually for all modes;
- Counts should reflect a typical weekday and typical weekend with particular emphasis on peak periods of travel demand;
- A set of permanent count locations should be established so that trends and changes may be observed and measured;
- Because of the large tourist population in Fort Lauderdale, counts should be taken both during peak and non-peak seasons;
- Counts should not be undertaken during inclement weather or during festivals or special events;
- Counts submitted by developers in support of development applications; and
- User surveys should be kept relatively constant so that results from different survey years may be compared. While new survey questions can and should be included, this should be done carefully and sparingly.

In order to understand the effects and benefits of improvements made to the transportation system, it is essential to conduct before and after studies, obtaining data on volumes, modal split, travel speed and crash experience. By doing this, we can determine which improvements are most effective, discontinue improvements that are ineffective and demonstrate the overall return on investment to taxpayers.

9. Future Strategy

FUNDING & FUTURE STRATEGY

9.1 FUNDING

Local funding sources are limited relative to the citywide mission; however, the funding strategy going forward includes the use of MPO, FDOT, grant and private developer funds to implement Complete Streets retrofit projects as appropriate. The Complete Streets Manual will be used with private developers on major projects and with the State and County for transportation improvements.

9.1.1 City of Fort Lauderdale

The City of Fort Lauderdale administers the following programs which relate specifically to Complete Streets and transportation investments.

- Business Capital Improvement Program (BCIP)
- Sidewalk construction & repair
- Pavement management
- Street reconstruction
- Major sidewalk reconstruction
- Traffic calming initiatives
- Neighborhood Capital Improvement Program
- Transportation Enhancements
- TMA – Sun Trolley

In addition, private developments are reviewed by City staff. As part of this review, Complete Streets will now be reviewed for consistency with the proposed design.

9.1.2 Broward MPO

The Broward MPO has led the way in Complete Streets by developing a county-wide Complete Streets Design Manual. That manual has been tailored to meet the needs of Fort Lauderdale. The City works closely with the Broward MPO on planning and implementation of projects in the City. For these projects, the City will work with project planners and engineers to review specific projects from a Complete Streets perspective.

9.1.3 State of Florida

The City works with the Florida Department of Transportation (FDOT) on planning and implementation of transportation projects under their jurisdiction in the City. For these projects, the City will work with project planners and engineers to review specific projects from a Complete Streets perspective.

9.1.4 Broward County

The City works with Broward County on planning and implementation of transportation projects under their jurisdiction in the City. These include Broward County Traffic Engineering and Broward County Transit projects. For these projects, the City will work with project planners and engineers to review specific projects from a Complete Streets perspective.

9.2 FUTURE STRATEGY

The City has developed a Multimodal Transportation Plan that includes a detailed implementation plan of necessary strategies to fulfill the Complete Streets Policy as well as other transportation goals for Fort Lauderdale. This Plan is using the Complete Streets Manual as a guide to develop the implementation strategies.

Fort Lauderdale will work with its partners including the Florida Department of Transportation (FDOT), Broward County, Broward MPO, and local developers to develop these goals into reality and make the city a more livable community.

The City will work closely with the Broward MPO to program the projects as part of the Long Range Transportation Plan as well as the Broward MPOs Transportation Improvement Program (TIP). The City will aggressively pursue funding through competative grant programs including the Transportation Alternatives Program (TAP) as well as through private foundations, developers and local funding where appropriate.

9.3 ENFORCEMENT OF TRAFFIC VIOLATIONS

The City is developing a Pedestrian Safety Action Plan (PSAP) to identify safety needs for pedestrians in accordance with federal guidelines. Enforcement and education efforts are a crucial component to achieving safe, complete streets in Fort Lauderdale together with infrastructure improvements. Without the expectation of compliance to traffic laws, even a perfectly engineered Complete Street will be insufficient.

APPENDIX A

1.1 CENTER CITY BOULEVARDS

Center City Boulevards consist of the portions of Boulevards that run through the highest-density mixed-use centers in the City. High-rise development may be located along or proximate to Center City. Due to its density of mixed uses, and proximity to the center of activity, these streets should contain the highest level of multimodal accommodations including dedicated bike lanes, slow traffic speeds, enhanced pedestrian areas including wide sidewalks, special treatments for crosswalks, transit accommodations, and on-street parking to support street level commercial.

PEDESTIAN SIGNIFICANCE:
High

VEHICLE SIGNIFICANCE :
High to Medium

FUNCTIONAL CLASSIFICATION:
Arterial

TYPICAL LAND USE & CHARACTERISTICS:
Mixed-use, commercial, higher-density residential within the Center City

CONSIDERATIONS:

- Use green infrastructure to improve pedestrian environment, calm traffic, and manage stormwater.
- High levels of pedestrian activity. Focus on pedestrian environment and public realm.
- Driveways may create frequent conflict points for pedestrians & bicyclists.
- Buildings set at edge of street line and commercial uses create high potential for sidewalk encroachments.

PEDESTRIAN COMPONENT

Required

- Min 8’ Sidewalk Widths (7.1.1)
- Min 4’ Furnishing Zone (7.1.2)
- Lighting (7.1.3)

High Priority (include if width permits)

- Street Furniture (7.1.2)
- Tree Belt Enhancements (7.1.4)

Priority (consider if width permits)

- Stormwater Planters (7.1.8)
- Stormwater Tree Trenches (7.1.9)

Appropriate in Limited Circumstances

- Sidewalk Surface Treatments (7.1.5)
- Alternative Uses of Parking Lanes/Parklets (7.1.6)

BICYCLE COMPONENT

High Priority (include if width permits)

- Bicycle Parking (7.1.35)
- Buffered Bike Lane (7.1.37)
  - 5’ bike lane w/ buffer
- Bike Route Signs (7.1.39)
- Colored Pavement in Bike Lanes (7.1.40)

Priority (consider if width permits)

- Conventional Bike Lane (7.1.34 (2))

Appropriate in Limited Circumstances

- Shared Lane Markings (7.1.36)
- Raised Bike Lane (7.1.38)

VEHICLE COMPONENT

High Priority (include if width permits)

- Refuge Islands (7.1.24)
- Medians (7.1.27)
- Lane Width: 10’ – 11’ (7.1.30)
- Max Posted Speed 35mph (7.1.33)

Appropriate in Limited Circumstances

- Roundabout (7.1.29)
- On-street Parking (7.1.31)
  - Min 8’ parking lane
- Pervious Pavement Parking Areas (7.1.32)

Examples of street typology are:

Broward Boulevard (within Center City)
US1 (within Center City)

INTERSECTION & CROSSINGS

Required

- Marked Crosswalks at Controlled Intersections (7.1.10)
- Curb Ramps (7.1.12)
- Pedestrian Signal Crossings (7.1.17)

High Priority (include if width permits)

- Stormwater Curb Extensions (7.1.13)
- Corner Radii – 25'-30' (7.1.14)
- Bump-outs/Chokers (7.1.15)

Appropriate in Limited Circumstances

- Uncontrolled Mid-block Crosswalks (7.1.11)
- Bike Signal Accommodations (7.1.18)
- Pedestrian Hybrid Beacons (7.1.19)
- Rectangular Rapid Flashing Beacons (7.1.20)
- In-street Pedestrian Crossing Lighting (7.1.21)

TRANSIT COMPONENT

Required

- Transit Stop (7.1.41)
- Transit Stop Signage (7.1.44)

High Priority (include width permits)

- Shelters (7.1.43)
- Bike Racks (7.1.47)

Priority (consider if appropriate)

- Location of stop, Far side of intersection (7.1.42)
- Transit Bulbout (7.1.45)

Appropriate in Limited Circumstances

- Bus Turnouts (7.1.46)
- Signal Prioritization (7.1.50)
- Bus Lanes (7.1.51)

TYPES

1.2 COMMERCIAL BOULEVARDS

Commercial Boulevards serve primarily commercial uses to move high vehicular volumes. Traffic may flow faster than desired for ideal pedestrian and bicycling conditions. Surrounding land uses include retail, commercial, and some higher density residential. They serve as primary transit routes, and routes for goods movement. These streets should include dedicated bike facilities, pedestrian enhancements, and transit accommodations.

PEDESTIAN SIGNIFICANCE:
Medium

VEHICLE SIGNIFICANCE :
High

FUNCTIONAL CLASSIFICATION:
Arterial

TYPICAL LAND USE & CHARACTERISTICS:
Commercial, big box retail and shopping centers, automotive services, etc.

CONSIDERATIONS:

- Use green infrastructure to improve pedestrian environment, calm traffic, and manage stormwater.
- Driveways may create frequent conflict points for pedestrians and bicyclists.
- Use signal timing, pedestrian refuges, crosswalks and other treatments to create safe convenient crossings and routes to transit and activity centers.

PEDESTRIAN COMPONENT

Required

- Min 6' Sidewalk Widths (7.1.1)
- Min 4' Furnishing Zone (7.1.2)
- Lighting (7.1.3)

High Priority (include if width permits)

- Tree Belt Enhancements (7.1.4)

Priority (consider if width permits)

- Street Furniture (7.1.2)
- Stormwater Planters (7.1.8)

Appropriate in Limited Circumstances

- Sidewalk Surface Treatments (7.1.5)
- Alternative Use of Parking Spaces/Parklet (7.1.6)
- Stormwater Tree Trenches (7.1.9)

BICYCLE COMPONENT

High Priority (include if width permits)

- Buffered Bike Lane (7.1.37)
  - 5' bike lane w/buffer
- Bike Route Signs (7.1.39)
- Colored Pavement in Bike Lanes (7.1.40)

Priority (consider if width permits)

- Conventional Bike Lane (7.1.34 (2))
- Bicycle Parking (7.1.35)

Appropriate in Limited Circumstances

- Shared Use Path (7.1.34(1))
- Shared Lane Markings (7.1.36)
- Raised Bike Lane (7.1.38)

VEHICLE COMPONENT

High Priority (include if width permits)

- Refuge Islands (7.1.24)
- Median (7.1.27)
- Lane Width: 10' – 12' (7.1.30)
- Max Posted Speed 35 mph (7.1.33)

Priority (consider if appropriate)

- On-street parking (7.1.31)
  - 7' parking lane w/ 4' door zone

Appropriate in Limited Circumstances

- Roundabouts (7.1.29)
- Pervious Pavement Parking Areas (7.1.32)

Examples of street typology are:

Broward Boulevard
Commercial Boulevard
Oakland Park Boulevard
Sunrise Boulevard
Cypress Creek Boulevard

INTERSECTION & CROSSINGS

Required

- Marked Crosswalk at Controlled Intersection (7.1.10)
- Curb Ramps (7.1.12)
- Pedestrian Signal Crossings (7.1.17)

High Priority (include if width permits)

- Stormwater Curb Extensions (7.1.13)
- Corner Radii – min 25' (7.1.14)

Priority (consider if appropriate)

- Bike Signal Accommodations (7.1.18)
- In-street Pedestrian Crossing Lighting (7.1.21

Appropriate in Limited Circumstances

- Uncontrolled Mid-block Crosswalk (7.1.11)
- Bump-out/Chokers (7.1.15)
- Pedestrian Hybrid Beacons (7.1.19)
- Rectangular Rapid Flashing Beacons (7.1.20)

TRANSIT COMPONENT

Required

- Transit Stop (7.1.41)
- Transit Stop Signage (7.1.44)

High Priority (include width permits)

- Shelters (7.1.43)
- Bike Racks (7.1.47)

Priority (consider if width permits)

- Location of stop, Far side of intersection (7.1.42)
- Transit Bulbout (7.1.45)

Appropriate in Limited Circumstances

- Bus Turnouts (7.1.46)
- Signal Prioritization (7.1.50)
- Bus Lanes (7.1.51)

1.3 RESIDENTIAL BOULEVARDS

Residential Boulevards serve primarily residential uses to move high vehicular volumes. Traffic runs slower than on other boulevards. Transit service may be provided. There are frequent curb-cuts for driveways. Bike lanes and sidewalks should be accommodated on both sides of the street.

PEDESTIAN SIGNIFICANCE:
Medium

VEHICLE SIGNIFICANCE :
High to Medium

FUNCTIONAL CLASSIFICATION:
Arterial

TYPICAL LAND USE & CHARACTERISTICS:
Primarily Residential

CONSIDERATIONS:

- Use green infrastructure to improve pedestrian environment and manage stormwater.
- Appropriateness of bike lanes or marked shared lanes should be evaluated based on expected use, vehicle speeds, and volumes.
- Speeds should be evaluated for opportunities to reduce speeds in these residential areas for increased safety.
- Pedestrian access to these streets for access to transit and across streets should be considered.

PEDESTRIAN COMPONENT

Required

- Min 6' Sidewalk Widths (7.1.1)
- Min 4'Furnishing Zone (7.1.2)
- Lighting (7.1.3)

High Priority (include if width permits)

- Tree Belt Enhancements (7.1.4)

Priority (consider if width permits)

- Stormwater Planters (7.1.8)
- Stormwater Tree Trenches (7.1.9)

Appropriate in Limited Circumstances

- Street Furniture (7.1.2)
- Vegetated Swales (7.1.7)

BICYCLE COMPONENT

High Priority (include if width permits)

- Buffered Bike Lane (7.1.37)
  - 5' bike lane with buffer
- Bike Route Signs (7.1.39)
- Colored Pavement in Bike Lanes (7.1.40)

Priority (consider if width permits)

- Conventional Bike Lane (7.1.34 (2))
- Marked Shared Lane (7.1.36)

Appropriate in Limited Circumstances

- Shared Use Path (7.1.34(1))
- Bike Parking (7.1.35)

VEHICLE COMPONENT

High Priority (include if width permits)

- Refuge Islands (7.1.24)
- Median (7.1.27)
- Lane Width: 10' – 11' (7.1.30)
- Max Posted Speed 35 mph (7.1.33)

Appropriate in Limited Circumstances

- Roundabouts (7.1.29)
- On-street Parking (7.1.31)

Examples of street typology:

Powerline Road
Davie Boulevard

INTERSECTION & CROSSINGS

Required

- Marked Crosswalk at Controlled Intersections (7.1.10)
- Curb Ramps (7.1.12)
- Pedestrian Crossing Signal (7.1.17)

High Priority (include if width permits)

- Stormwater Curb Extensions (7.1.13)
- Corner Radii -15' – 20' (7.1.14)

Priority (consider if appropriate)

- Bike Signal Accommodations (7.1.18)

Appropriate in Limited Circumstances

- Uncontrolled Mid-block Crosswalk (7.1.11)
- Bump-outs/Chokers (7.1.15)
- Pedestrian Hybrid Beacons (7.1.19)
- Rectangular Rapid Flashing Beacon (7.1.20)
- In-street Pedestrian Crossing Lighting (7.1.21)

TRANSIT COMPONENT

Required

- Transit Stop (7.1.41)
- Transit Stop Signage (7.1.44)

High Priority (include width permits)

- Shelters (7.1.43)
- Bike Racks (7.1.47)

Priority (consider if width permits)

- Location of stop, Far side of intersection (7.1.42)
- Transit Bulbout (7.1.45)

Appropriate in Limited Circumstances

- Signal Prioritization (7.1.50)

2.1 CENTER CITY AVENUES

Center City Avenues traverse higher-density mixed-use areas. The surrounding built environment consists of mid- to high-rise buildings that support a variety of functions, are closely spaced, have minimal setbacks, and contain active uses on the ground floor. Management of parking and loading facilities on these avenues is critical, as these uses typically are imperative to the vitality of businesses but may conflict with pedestrian and bicycle use. They should contain premium transit facilities, enhanced pedestrian facilities, and on-street parking to support active ground floor uses.

PEDESTIAN SIGNIFICANCE:
High

VEHICLE SIGNIFICANCE :
Medium

FUNCTIONAL CLASSIFICATION:
Minor Arterial/Urban Collector

TYPICAL LAND USE & CHARACTERISTICS:
Retail, commercial mixed-use, residential, some institutional.

CONSIDERATIONS:

- Primarily located in Center City
- High levels of pedestrian activity. Focus on pedestrian environment and public realm.
- Buildings set at edge of street line and commercial uses create high potential for sidewalk encroachments.

PEDESTRIAN COMPONENT

Required

- Min 8' Sidewalk Widths (7.1.1)
- Min 4' Furnishing Zone (7.1.2)
- Lighting (7.1.3)

High Priority (include if width permits)

- Street Furniture (7.1.2)
- Tree Belt Enhancements (7.1.4)

Priority (consider if width permits)

- Stormwater Planters (7.1.8)
- Stormwater Tree Trenches (7.1.9)

Appropriate in Limited Circumstances

- Sidewalk Surface Treatments (7.1.5)
- Alternative Use of Parking Spaces/Parklets (7.1.6)

BICYCLE COMPONENT

High Priority (include if width permits)

- Buffered Bike Lane (7.1.37)
  - 5' bike lane w/ buffer
- Bike Route Signs (7.1.39)
- Colored Pavement in Bike Lanes (7.1.40)

Priority (consider if width permits)

- Conventional Bike Lane (7.1.34 (2))
- Bike Parking (7.1.35)
- Marked Shared Lane (7.1.36)

Appropriate in Limited Circumstances

- Raised Bike Lanes (7.1.38)

VEHICLE COMPONENT

High Priority (include if width permits)

- Refuge Islands (7.1.24)
- Median (7.1.27)
- Lane Width: 10'-11' (7.1.30)
- Max Posted speed 30 mph (7.1.33)

Priority (consider if width permits)

- On-street Parking (7.1.31)
  - Min 7' wide w/ 4' min. door zone

Appropriate in Limited Circumstances

- Roundabouts (7.1.29)
- Pervious Pavement Parking Areas (7.1.32)

Examples of street typology:

Andrews Avenue

NE 3rd Avenue

INTERSECTION & CROSSINGS

Required

- Marked Crosswalk at Controlled Intersections (7.1.10)
- Curb Ramps (7.1.12)
- Pedestrian Crossing Signal (7.1.17)

High Priority (include if width permits)

- Stormwater Curb Extensions (7.1.13)
- Corner Radii – 15’ - 20’ (7.1.14)
- Bump-outs/Chokers (7.1.15)

Appropriate in Limited Circumstances

- Uncontrolled Mid-block Crosswalk (7.1.11)
- Bike Signal Accommodations (7.1.18)
- Pedestrian Hybrid Beacons (7.1.19)
- Rectangular Rapid Flashing Beacon (7.1.20)
- In-street Pedestrian Crossing Lighting (7.1.21)

TRANSIT COMPONENT

Required

- Transit Stop (7.1.41)
- Transit Stop Signage (7.1.44)

High Priority (include width permits)

- Shelters (7.1.43)
- Bike Racks (7.1.47)

Priority (consider if width permits)

- Location of stop, Far side of intersection (7.1.42)
- Transit Bulbout (7.1.45)

Appropriate in Limited Circumstances

- Bus Turnouts (7.1.46)

2.2 COMMERCIAL AVENUES

Commercial Avenues tend to have faster moving traffic than other Avenues and act to connect one development node to another. They are secondary to Commercial Boulevards and serve more local populations. The surrounding land uses are low- to mid-rise structures at a lower density and may have larger setbacks and serve as transition areas to the higher density of the Center City. The uses on these Avenues typically consist of restaurants, shops, small offices, and multi-family homes. On-street parking should be provided for street-fronting businesses.

PEDESTIAN SIGNIFICANCE:
Medium

VEHICLE SIGNIFICANCE :
High to Median

FUNCTIONAL CLASSIFICATION:
Urban Minor Arterial/Urban Collector

TYPICAL LAND USE & CHARACTERISTICS:
Retail, commercial mixed-use, residential, some institutional.

CONSIDERATIONS:

- High levels of pedestrian activity. Focus on pedestrian environment and public realm.
- Buildings set at edge of street line and commercial uses create high potential for sidewalk encroachments.
- Use green infrastructure to improve pedestrian environment and manage stormwater.
- Appropriateness of bike lanes or marked shared lanes should be evaluated based on the street conditions.

PEDESTRIAN COMPONENT

Required

- Min 6' Sidewalk Widths (7.1.1)
- Lighting (7.1.3)

High Priority (include if width permits)

- Min 4' Furnishing Zone (7.1.2)

Priority (consider if width permits)

- Street Furniture (7.1.3)
- Tree Belt Enhancements (7.1.4)
- Stormwater Planters (7.1.8)
- Stormwater Tree Trenches (7.1.9)

Appropriate in Limited Circumstances

- Sidewalk Surface Treatments (7.1.5)
- Alternative Use of Parking Spaces/Parklets (7.1.6)
- Vegetated Swales (7.1.7)

BICYCLE COMPONENT

High Priority (include if width permits)

- Bike Parking (7.1.35)
- Buffered Bike Lane (7.1.37)
  - 5' bike lane w/ buffer
- Bike Route Signs (7.1.39)
- Colored Pavement in Bike Lanes (7.1.40)

Priority (consider if width permits)

- Conventional Bike Lane (7.1.34 (2))
- Marked Shared Lane (7.1.36)

Appropriate in Limited Circumstances

- Shared Use Path (7.1.34(1))

VEHICLE COMPONENT

High Priority (include if width permits)

- Refuge Islands (7.1.24)
- Median (7.1.27)
- Lane Width: 10' – 11' (7.1.30)
- On-street Parking (7.1.31)
  - 7' parking lane with 4' door zone
- Max Posted Speed 30 mph (7.1.33)

Appropriate in Limited Circumstances

- Roundabouts (7.1.29)

Examples of street typology:

NE 4th Street
Las Olas Boulevard
SR 84

INTERSECTION & CROSSINGS

Required

- Marked Crosswalk at Controlled Intersections (7.1.10)
- Curb Ramps (7.1.12)
- Pedestrian Crossing Signal (7.1.17)

High Priority (include if width permits)

- Stormwater Curb Extensions (7.1.13)
- Corner Radii – 15’ - 20’ (7.1.14)

Priority (consider if appropriate)

- Bike Signal Accommodations (7.1.18)

Appropriate in Limited Circumstances

- Uncontrolled Mid-block Crosswalk (7.1.11)
- Pedestrian Hybrid Beacons (7.1.19)
- Rectangular Rapid Flashing Beacon (7.1.20)
- In-street Pedestrian Crossing Lighting (7.1.21)

TRANSIT COMPONENT

Required

- Transit Stop (7.1.41)
- Transit Stop Signage (7.1.42)

High Priority (include width permits)

- Shelters (7.1.43)
- Bike Racks (7.1.47)

Priority (consider if width permits)

- Location of stop, Far side of intersection (7.1.42)
- Transit Bulbout (7.1.45)

2.3 RESIDENTIAL AVENUES

Residential Avenues are smaller in scale than Commercial Avenues, with slower traffic, but may serve as alternative routes to connect neighborhoods. They typically contain signalized intersections where they cross Boulevards. Surrounding land uses are generally residential with some neighborhood commercial.

PEDESTIAN SIGNIFICANCE:
High

VEHICLE SIGNIFICANCE :
Medium

FUNCTIONAL CLASSIFICATION:
Urban Minor Arterial/Urban Collector

TYPICAL LAND USE & CHARACTERISTICS:
Mixed-use within the Center City

CONSIDERATIONS:

- Located in primarily residential areas
- High levels of pedestrian activity. Focus on pedestrian environment and public realm.
- Use green infrastructure to improve pedestrian environment and manage stormwater.
- Pedestrian access to these streets for access to transit and across streets should be considered.

PEDESTRIAN COMPONENT

Required

- Min 6' Sidewalk Widths (7.1.1)
- Lighting (7.1.3)

High Priority (include if width permits)

- Min 4' Furniture Zone (7.1.2)
- Tree Belt Enhancements (7.1.4)
- Vegetated Swales (7.1.7)

Priority (consider if width permits)

- Stormwater Planters (7.1.8)

BICYCLE COMPONENT

High Priority (include if width permits)

- Buffered Bike Lane (7.1.37)
  - 5' bike lane w/ buffer
- Bike Route Signs (7.1.39)
- Colored Pavement in Bike Lanes (7.1.40)

Priority (consider if width permits)

- Marked Shared Lane (7.1.36)
- Conventional Bike Lane (7.1.34 (2))

Appropriate in Limited Circumstances

- Shared Use Path (7.1.34(1))

VEHICLE COMPONENT

High Priority (include if width permits)

- Refuge Islands (7.1.24)
- Median (7.1.27)
- Lane Width: 10' – 11' (7.1.30)
- Max Posted Speed 30 mph (7.1.33)

Appropriate in Limited Circumstances

- Roundabouts (7.1.29)
- On-street Parking (7.1.31)
  - Min 7' parking lane w/ 4' door zone

Examples of street typology:

Bayview Drive
Davie Boulevard
NW 31st Avenue
SW 4th Avenue

INTERSECTION & CROSSINGS

Required

- Marked Crosswalk at Controlled Intersections (7.1.10)
- Curb Ramps (7.1.12)
- Pedestrian Crossing Signal (7.1.17)

Priority (consider if appropriate)

- Corner Radii – 15' - 20' (7.1.14)
- Bike Signal Accommodations (7.1.18)

Appropriate in Limited Circumstances

- Uncontrolled Mid-block Crosswalk (7.1.11)
- Bumpout/Chokers (7.1.15)
- Pedestrian Hybrid Beacons (7.1.19)
- Rectangular Rapid Flashing Beacon (7.1.20)
- In-street Pedestrian Crossing Lighting (7.1.21)

TRANSIT COMPONENT

Required

- Transit Stop (7.1.41)
- Transit Stop Signage (7.1.44)

High Priority (include width permits)

- Shelters (7.1.43)
- Bike Racks (7.1.47)

Priority (consider if width permits)

- Location of stop, Far side of intersection (7.1.42)
- Transit Bulbout (7.1.45)

TYPES

3.1 CENTER CITY STREETS

Center City Streets are located within the Center City, that run through the highest-density mixed-use centers in the City including the Downtown RAC. High rise development may be located along or in close proximity to these streets. Due to its density of mixed uses, and proximity to the center of activity, these streets should contain the highest level of multimodal accommodations including dedicated bike lanes, slow traffic speeds, enhanced pedestrian areas, special treatments for crosswalks, and on-street parking to support street-level commercial.

PEDESTIAN SIGNIFICANCE:
High

VEHICLE SIGNIFICANCE :
Median

FUNCTIONAL CLASSIFICATION:
Local Street

TYPICAL LAND USE & CHARACTERISTICS:
Mixed-use within the Center City

CONSIDERATIONS:

- Primarily located in Center City
- High levels of pedestrian activity. Focus on pedestrian environment and public realm.
- Buildings set at edge of street line and commercial uses create high potential for sidewalk encroachments.

PEDESTRIAN COMPONENT

Required

- Min 8' Sidewalk Widths (7.1.1)
- Preferred 4' Furnishing Zone (7.1.2)
- Lighting (7.1.3)

High Priority (include if width permits)

- Street Furniture (7.1.2)
- Tree Belt Enhancements (7.1.4)

Priority (consider if width permits)

- Stormwater Planters (7.1.8)
- Stormwater Tree Trenches (7.1.9)

Appropriate in Limited Circumstances

- Sidewalk Surface Treatments (7.1.5)
- Alternative Use of Parking Spaces/Parklets (7.1.6)

BICYCLE COMPONENT

High Priority (include if width permits)

- Marked Shared Lane (7.1.36)
- Colored Pavement in Bike Lanes (7.1.40)

Priority (consider if width permits)

- Bike Parking (7.1.35)

Appropriate in Limited Circumstances

- Conventional Bike Lane (7.1.34(2))
- Buffered Bike Lane (7.1.37)
- Raised Bike Lanes (7.1.38)
- Bike Route Signs (7.1.39)

VEHICLE COMPONENT

High Priority (include if width permits)

- Lane Width: 9' - 11' (7.1.30)
- On-street Parking (7.1.31)
  - Min 7' parking lane w/ 4' door zone
- Posted Speed 25mph (7.1.33)

Appropriate in Limited Circumstances

- Median (7.1.27)
- Neighborhood Traffic Circle (7.1.28)
- Pervious Pavement Parking Areas (7.1.32)

Examples of street typology:

SE 1st Street
SE 6th Street
NE 1st Street

INTERSECTION & CROSSINGS

Required

- Marked Crosswalk at Controlled Intersections (7.1.10)
- Curb Ramps (7.1.12)
- Pedestrian Crossing Signal (7.1.17)

High Priority (include if width permits)

- Stormwater Curb Extensions (7.1.13)
- Corner Radii – 15' (7.1.14)
- Bump-outs/Chokers (7.1.15)

Appropriate in Limited Circumstances

- Uncontrolled Mid-block Crosswalk (7.1.11)
- Pedestrian Hybrid Beacons (7.1.19)
- Rectangular Rapid Flashing Beacon (7.1.20)
- In-Street Pedestrian Crossing Lighting (7.1.21)

TRANSIT COMPONENT

High Priority (include if transit route)

- Shelters (7.1.43)
- Bike Racks (7.1.47)
- Transit Stop (7.1.41)
- Transit Stop Signage (7.1.44)
- Location of stop, Far side of intersection (7.1.42)

3.2 COMMERCIAL STREET

Commercial Streets are less dense than a City Center Street in character, and primarily serve commercial districts. These streets are secondary to Commercial Avenues and serve more local population. The surrounding land uses are low- to mid-rise structures at a lower density and may have larger setbacks and serve as transition areas to the higher density of the Center City. The uses on these Streets typically consist of restaurants, shops, small offices, and multi-family homes. On-street parking should be provided for street-fronting businesses.

PEDESTIAN SIGNIFICANCE:
Medium

VEHICLE SIGNIFICANCE :
High to Medium

FUNCTIONAL CLASSIFICATION:
Street

TYPICAL LAND USE & CHARACTERISTICS:
Mixed-use within the Center City

CONSIDERATIONS:

- Primarily located in Center City
- High levels of pedestrian activity. Focus on pedestrian environment and public realm.
- Buildings set at edge of street line and commercial uses create high potential for sidewalk encroachments.

PEDESTRIAN COMPONENT

Required

- Min. 5' Sidewalk Width (7.1.1)
- Preferred 4' Furnishing Zone (7.1.2)

High Priority (include if width permits)

- Street Furniture (7.1.2)
- Lighting (7.1.3)
- Tree Belt Enhancements (7.1.4)

Priority (consider if width permits)

- Stormwater Planters (7.1.8)
- Stormwater Tree Trenches (7.1.9)

Appropriate in Limited Circumstances

- Sidewalk Surface Treatments (7.1.5)
- Alternative Use of Parking Spaces/Parklets (7.1.6)

BICYCLE COMPONENT

High Priority (include if width permits)

- Marked Shared Lane (7.1.36)
- Colored Pavement in Bike Lanes (7.1.40)

Priority (consider if width permits)

- Bike Parking (7.1.35)

Appropriate in Limited Circumstances

- Buffered Bike Lane (7.1.37)
- Raised Bike Lanes (7.1.38)
- Bike Route Signs (7.1.39)

VEHICLE COMPONENT

High Priority (include if width permits)

- Lane Width: 9' – 11' (7.1.30)
- On-street Parking (7.1.31)
  - Min 7' parking lane w/ 4' door zone
- Posted Speed 25 mph (7.1.33)

Appropriate in Limited Circumstances

- Median (7.1.27)
- Neighborhood Traffic Circle (7.1.28)
- Pervious Pavement Parking Areas (7.1.32)

Examples of street typology:

SW 7th Street
NE 33rd Street
Cordova Raod

INTERSECTION & CROSSINGS

Required

- Marked Crosswalk at Controlled Intersections (7.1.10)
- Curb Ramps (7.1.12)
- Pedestrian Crossing Signal (7.1.17)

High Priority (include if width permits)

- Stormwater Curb Extensions (7.1.13)
- Corner Radii – 15' (7.1.14)
- Bump-outs/Chokers (7.1.15)

Appropriate in Limited Circumstances

- Uncontrolled Mid-block Crosswalk (7.1.11)
- Pedestrian Hybrid Beacons (7.1.19)
- Rectangular Rapid Flashing Beacon (7.1.20)
- In-Street Pedestrian Crossing Lighting (7.1.21)

TRANSIT COMPONENT

High Priority (include if transit route)

- Shelters (7.1.43)
- Bike Racks (7.1.47)
- Transit Stop (7.1.41)
- Transit Stop Signage (7.1.44)
- Location of stop, Far side of intersection (7.1.42)

3.2 RESIDENTIAL STREET

Residential Streets are purely residential in character and serve lower-density neighborhoods. Speeds are low with traffic limited to local traffic. These streets generally do not have transit service, but should connect to Avenues and Boulevards nearby to provide connectivity to transit.

PEDESTIAN SIGNIFICANCE:
Medium

VEHICLE SIGNIFICANCE :
Low

FUNCTIONAL CLASSIFICATION:
Local street

TYPICAL LAND USE & CHARACTERISTICS:
Residential

CONSIDERATIONS:

- Primarily low density residential uses.
- Use green infrastructure to improve pedestrian environment and manage stormwater.
- Driveways may create frequent conflict points for pedestrians and bicyclists.
- Generally a shared road approach for bikes and vehicles is preferred based on the low volumes and low speeds of vehicles.

PEDESTRIAN COMPONENT

Required

- Min 5' Sidewalk Widths (7.1.1)

High Priority (include if width permits)

- Preferred 4' Furnishing Zone (7.1.2)
- Tree Belt Enhancements (7.1.4)
- Vegetated Swales (7.1.7)

Priority (consider if width permits)

- Lighting (7.1.3)
- Stormwater Planters (7.1.8)
- Stormwater Tree Trenches (7.1.9)

Appropriate in Limited Circumstances

- Sidewalk Surface Treatments (7.1.5)
- Alternative Use of Parking Spaces/Parklets (7.1.6)

BICYCLE COMPONENT

Appropriate in Limited Circumstances

- Marked Shared Lane (7.1.36)

VEHICLE COMPONENT

High Priority (include if width permits)

- Lane Width: 9' – 11' (7.1.30)
- On-street Parking (7.1.31)
  - Min 7' parking lane w/ 4' door zone
- Posted speed 25 mph (7.1.33)

Appropriate in Limited Circumstances

- Speed Humps (7.1.22)
- Raised Table Intersections (7.1.23)
- Chicanes (7.1.25)
- Diverter (7.1.26)
- Median (7.1.27)
- Neighborhood Traffic Circle (7.1.28)
- Pervious Pavement Parking Areas (7.1.32)

Examples of street typology:

NE 12th Avenue
NW 16th Avenue
West Melrose Circle
SE 13th Street

INTERSECTION & CROSSINGS

Required

- Marked Crosswalks at Controlled Intersections (7.1.10)
- Curb Ramps (7.1.12)
- Pedestrian Crossing Signal (7.1.17)

High Priority (include if width permits)

- Stormwater Curb Extensions (7.1.13)
- Corner Radii – 15' (7.1.14)
- Bump-outs/Chokers (7.1.15)

Appropriate in Limited Circumstances

- Uncontrolled Mid-block Crosswalk (7.1.11)
- Pedestrian Hybrid Beacons (7.1.19)
- Rectangular Rapid Flashing Beacon (7.1.20)
- In-Street Pedestrian Crossing Lighting (7.1.21)

TRANSIT COMPONENT

High Priority (include if transit route)

- Shelters (7.1.43)
- Bike Racks (7.1.47)
- Transit Stop (7.1.41)
- Transit Stop Signage (7.1.44)
- Location of stop, Far side of intersection (7.1.42)

4.1 INDUSTRIAL THOROUGHFARE

Industrial Thoroughfares are those streets that are located within Industrial land uses within the city. They have high volumes of truck traffic, and limited pedestrian and bicycle traffic. They are generally limited to any commercial or residential uses within these area.

PEDESTIAN SIGNIFICANCE:
High

VEHICLE SIGNIFICANCE :
Medium

FUNCTIONAL CLASSIFICATION:
Urban Minor Arterial/Urban Collector

TYPICAL LAND USE & CHARACTERISTICS:
Mixed-use within the Center City

CONSIDERATIONS:

- Located in primarily residential areas
- High levels of pedestrian activity. Focus on pedestrian environment and public realm.
- Use green infrastructure to improve pedestrian environment and manage stormwater.
- Pedestrian access to these streets for access to transit and across streets should be considered.

PEDESTRIAN COMPONENT

Required

- Min 5' Sidewalk Widths (7.1.1)

High Priority (include if width permits)

- Lighting (7.1.3)
- Vegetated Swales (7.1.7)
- Stormwater Planters (7.1.8)
- Stormwater Tree Trenches (7.1.9)

Appropriate in Limited Circumstances

- Tree Belt Enhancements (7.1.4)

BICYCLE COMPONENT

High Priority (include if width permits)

- Conventional Bike Lane (7.1.34(2))
  - 5' bike lane w/ buffer
- Colored Pavement in Bike Lanes (7.1.40)

Priority (consider if width permits)

- Marked Shared Lane (7.1.36)
- Buffered Bike Lane (7.1.37)

Appropriate in Limited Circumstances

- Shared Use Path (7.1.34(1))
- Bike Route Signs (7.1.39)

VEHICLE COMPONENT

High Priority (include if width permits)

- Lane Width: 11'-12' (7.1.30)
- Max Posted Speed 35 mph (7.1.33)

Priority (consider if width permits)

- Median (7.1.27)
- Refuge Islands (7.1.24)
- On-street Parking (7.1.31)

Examples of street typology:

S Andrews Ave
NW 7th Ave
Eisenhower Blvd

INTERSECTION & CROSSINGS

Required

- Marked Crosswalk at Controlled Intersections (7.1.10)
- Curb Ramps (7.1.12)
- Pedestrian Crossing Signal (7.1.17

High Priority (include if transit route)

- Corner Radii – min. 30’ (7.1.14)

TRANSIT COMPONENT

High Priority (include if transit route)

- Transit Stop (7.1.41)
- Transit Stop Signage (7.1.44)
- Shelters (7.1.43)
- Bike Racks (7.1.47)

Priority (consider if width permits)

- Location of stop, Far side of intersection (7.1.42)

Types

4.2 BEACH THOROUGHFARE

Beachside Thoroughfare applies to roads adjacent to or near the beach. These roads have very high levels of every mode of travel. They support festivals, parades, and high levels of tourists throughout the year. The built environment includes a vibrant mixture of low- to high-rise residential, hotels, restaurants, and retail. Pedestrians tend to cross at all points of the road, so traffic calming and other pedestrian safety measures are essential. Beachside Thoroughfares need wide sidewalks that facilitate many types of activity, such as sightseeing, bicycling, exercising, shopping and dining.

PEDESTIAN SIGNIFICANCE:
High

VEHICLE SIGNIFICANCE :
Medium

FUNCTIONAL CLASSIFICATION:
Minor Arterial

TYPICAL LAND USE & CHARACTERISTICS:
Commercial, Recreational

CONSIDERATIONS:

- Primarily commercial, hotel, restaurant uses.
- Generally separated lanes for bikes and vehicles is preferred based on high pedestrian, bike and vehicle volumes.
- Wide sidewalks/promenades required.
- High levels of tourist use necessitates the use of special signage.
- Premium transit facilities should be provided.
- Significant attention should be paid to the public realm.

PEDESTRIAN COMPONENT

Required

- Min 8’ sidewalk widths (7.1.1)
- Min 4’ furnishing zone (7.1.2)
- Lighting (7.1.3)

High Priority (include if width permits)

- Street furniture (7.1.2)
- Tree Belt Enhancements (7.1.4)
- Sidewalk Surface Treatments (7.1.5)

Priority (consider if width permits)

- Stormwater Planters (7.1.8)
- Stormwater Tree Trenches (7.1.9)

Appropriate in Limited Circumstances

- Alternative Use of Parking Spaces/Parklets (7.1.6)

BICYCLE COMPONENT

High Priority (include if width permits)

- Shared Use Path (7.1.34(1))
- Bike Parking (7.1.35)
- Bike route signs (7.1.39)
- Colored Pavement in Bike Lanes (7.1.40)

Priority (consider if width permits)

- Buffered bike lane (7.1.37)
  - 5’ bike lane w/ buffer
- Raised Bike Lanes (7.1.38)

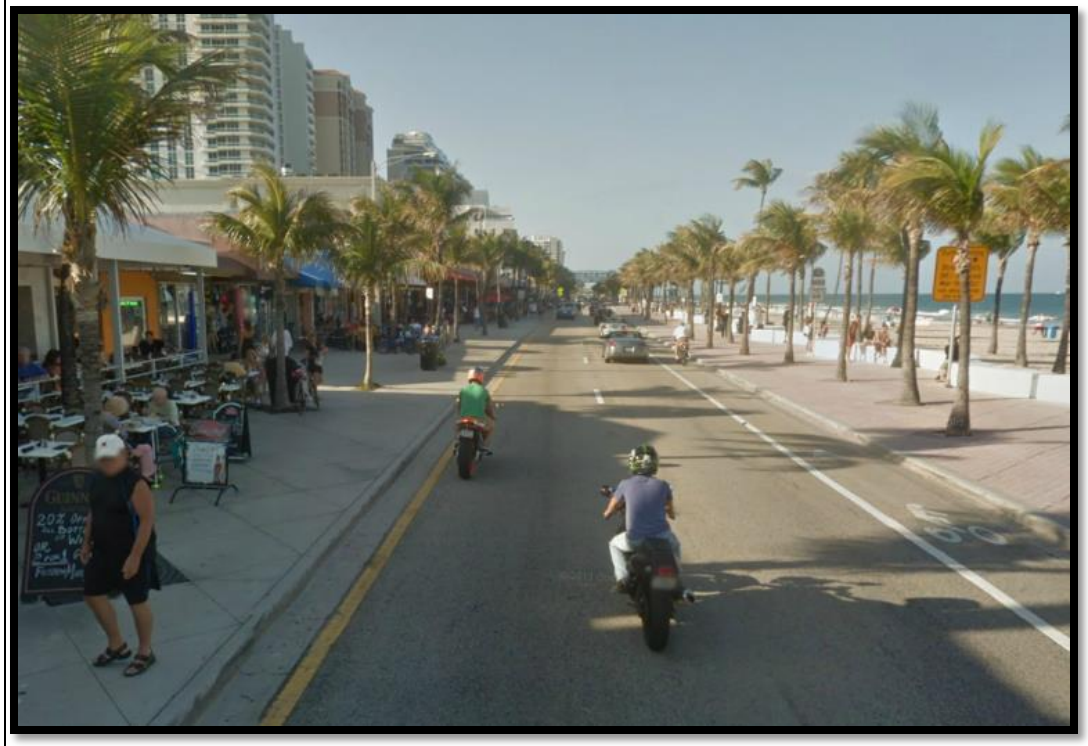
VEHICLE COMPONENT

High Priority (include if width permits)

- Refuge Islands (7.1.24)
- Median (7.1.27)
- Lane Width: 9’ – 11’ (7.1.30)
- On-street Parking (7.1.31)
  - Min 7’ parking lane w/4’ door zone
- Posted Speed 25 mph (7.1.33)

Appropriate in Limited Circumstances

- Neighborhood Traffic Circle (7.1.28)
- Roundabout (7.1.29)
- Pervious Pavement Parking Areas (7.1.32)



Example of street typology:

A1A

INTERSECTION & CROSSINGS

Required

- Marked Crosswalk at Controlled Intersections (7.1.10)
- Curb Ramps (7.1.12)
- Pedestrian Crossing Signal (7.1.17)

High Priority (include if width permits)

- Stormwater Curb Extensions (7.1.13)
- Corner Radii – 15' (7.1.14)
- Bump-outs/Chokers (7.1.15)
- Bike Signal Accommodations (7.1.18)

Appropriate in Limited Circumstances

- Uncontrolled Mid-block Crosswalk (7.1.11)
- Pedestrian Hybrid Beacons (7.1.19)
- Rectangular Rapid Flashing Beacon (7.1.20)
- In-Street Pedestrian Crossing Lighting (7.1.21)
- Roundabouts (7.1.29)

TRANSIT COMPONENT

Required

- Transit Stop (7.1.41)
- Transit Stop Signage (7.1.44)

High Priority (include width permits)

- Shelters (7.1.43)
- Bike Racks (7.1.47)

Priority (consider if width permits)

- Location of stop, Far side of intersection (7.1.42)
- Transit Bulbout (7.1.45)

Appropriate in Limited Circumstances

- Bus Turnouts (7.1.46)
- Signal Prioritization (7.1.50)
- Bus Lanes (7.1.51)