



Statewide Transit Facility Standards, Criteria, and Guidelines

A Quick Reference Guide

Final Report

January 2011





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Prepared for:
Florida Department of Transportation - Public Transit Office



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Project Objectives

This report is prepared as part of the Statewide Transit Accessibility and Facilities Design Course initiated and funded by the Florida Department of Transportation (FDOT) Public Transit Office. The project focuses on providing comprehensive training on how to incorporate transit facilities into roadway, infrastructure, and other improvement plans. In addition, the training also will include detailed instruction related to implementing the requirements of the Americans with Disabilities Act (ADA) regulations relating to transit facilities located within State rights of way. Finally, the training will incorporate various principles for enhancing pedestrian mobility by improving access and safety to transit stops. The training course will be designed for Public Transportation, Planning, Design, Engineering, Permitting and Maintenance, Construction, Traffic Operations, and other staff from FDOT, local transit agencies, city and county public works departments, permitting agencies, and others as appropriate.

A number of various standards, criteria, and guidelines have been developed by FDOT Districts and the Transit Office. The Statewide Transit Accessibility and Facilities Design Course includes a synthesis to identify a single set of statewide standards to be used in the training program, which is summarized in this report. The ADA regulations have been evolving over the past 20 years and will be incorporated into the training to provide a resource of best practices and include the most up-to-date regulatory conditions available. The training will be designed to facilitate discussion and coordination between local and state staff regarding the design and placement of various stop facilities.

As indicated previously, this report summarizes the effort to identify a single set of statewide standards, criteria, and guidelines to be used in the training program, and a draft set of statewide transit facilities standards, criteria, and guidelines for the Statewide Transit Accessibility and Facilities Design Course training program prepared and conducted by FDOT. Also, these will be used as a basis for the next update to the *Accessing Transit: Design Handbook for Florida Bus Passenger Facilities*.



Key Resources

The State Transit Office developed and published the *Accessing Transit: Design Handbook for Florida Bus Passenger Facilities* in 2004, and completed an updated Version II in 2008. In 2007, the FDOT District Four Office of Modal Development published the *District 4 Transit Facilities Guidelines, Version 3*, to provide guidance on design standards for transit facilities along FDOT rights of way within the District. Additionally, FDOT Districts One and Seven jointly completed and published the *FDOT Districts One and Seven Transit Facility Handbook* in 2007. All three of these resources were welcome tools and have been well received throughout the state and respective districts.

While all three documents include ideas on best practices and provide excellent guidance on the design requirements of transit infrastructure in State rights of way, discrepancies among them have been identified and have resulted in a number of conflicting issues or concerns. Also, periodic updates, interpretations of regulations, and legal challenges related to the Americans with Disabilities Act (ADA) regulations and other standards regulated by the U.S. Department of Justice and U.S. Department of Transportation have led to the need to synthesize the various guidelines into one up-to-date and inclusive set of design standards, resulting in a single set of statewide transit facility standards, criteria, guidelines, and best practices for Florida, which is summarized in this report.

In compiling key resources for this effort, FDOT Public Transit Office first made a concerted effort to gather all necessary resources for identifying applicable transit facility design standards, including the three documents referenced previously, the ADA regulations, and other federal and state regulatory sources. The applicable standards in these resources were then reviewed and compared to formulate a single set of design standards, criteria, guidelines for transit facilities being placed within State rights of way. These standards, criteria, guidelines are developed to rectify existing discrepancies and indicate best practices in facility design and implementation.

The full list of reference material used in this effort is summarized in Appendix A.



Transit Facilities Design Standards, Criteria, and Guidelines

This section presents the Transit Facilities Design Standards, which are categorized into the two key components; curb-side and street-side. The curb-side standards include components outside of the travel lane and are intended to improve the accessibility to buses and bus mobility in the right of way. The street-side standards include components related to the travel lane and are intended to improve the bus passenger experience at the street level. A broad spectrum of various curb-side and street-side standards that are applicable to Florida are identified. In addition, best practices also are listed for each category of the curb-side and street-side standards, providing general directions/guidance beyond meeting the minimum standards and enhancing bus transit facility design and use throughout the state of Florida.

A number of general guidelines were followed in developing a single set of statewide standards for the design of Florida's transit facilities. These include the following.

- **Design Terminology** - The terminology used at the federal level is adopted where necessary in order to increase the consistency at local, state, and federal levels, as well as to enhance the usefulness and user-friendliness of the transit facility design standards to all stakeholders involved. For example, instead of using the terms "Curb-side Bus Stop Pads," which is currently used in FDOT's *Accessing Transit* and other similar documents on transit facilities guidelines in Florida, the term "Bus Stop Boarding and Alighting Areas" is used.
- **Beyond the Minimum Requirement** - Using applicable and current federal, state, and local resources, a careful effort was made to identify the minimum requirements that can be categorized as standards, criteria, and guidelines in designing transit facilities in Florida. While these standards are intended to verify conformity with any applicable rules and regulations that guide transit facilities, the inventory of best practices also is included for each element to provide the Florida transit agencies with a resource to move beyond the minimum requirements in serving its patrons.

The elements included in each of the two key components for the Transit Facilities Design Standards, i.e., curb-side and street-side, are listed on the following page and presented in the remainder of this report.



Curb-side

- Bus Stop Boarding and Alighting Areas
- Bus Stop Shelters
- Bus Stop Signs
- Bus Benches
- Bus Stop Shelter Hurricane Wind Loads
- Bus Stop Information and Way-Finding Devices
- Bus Stop Shelter Lighting
- Landscaping
- Bus Stop Leaning Rails
- Bus Stop Trash Receptacles
- Bollards
- Bike Racks at Bus Shelters
- Shopping Cart Storage at Bus Shelters
- Public Telephones
- Police Call Box
- Vending Machines

Street-side

- Roadway & Special-Use Lanes
- Traffic Signals and Giving Transit Priority
- Street Lighting
- Vehicle Characteristics
- Pavement Markings
- Bus Stop Locations
- Emergency Medical Services (EMS) Access
- Road-Side Bus Stops
- Bus Bays/Queue Jumper Bus Bays

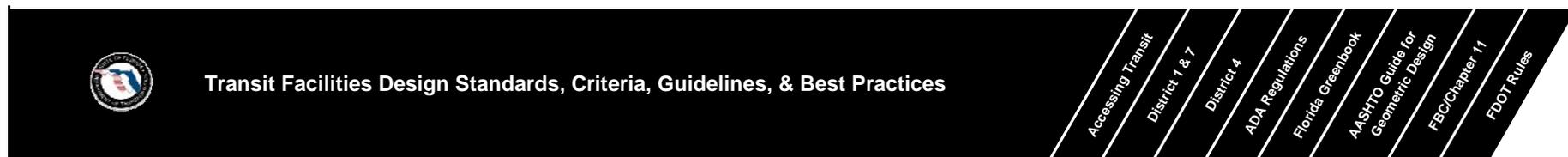
- Bus Bulbs/Intersection Nubs
- Off-Street Half-sawtooth Bus Bays
- Bus Stops and Railroad Crossings
- Bike Lanes
- Pedestrian Crossings
- Raised Pedestrian Crossing/Speed Tables
- Pedestrian Islands
- Transit Provision During Construction
- Street Signage

In addition to presenting standards, criteria, guidelines, and best practices for each of these elements, a checklist of the associated reference materials also is included. These include the following.

- *FDOT Accessing Transit, Version II* (2008)
- *FDOT District 4 Transit Facilities Guidelines, Version 3* (2007)
- *FDOT Districts 1 and 7 Transit Facility Handbook* (2007)
- ADA regulations
- Florida Greenbook (*Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways*) (2007)
- American Association of State Highway and Transportation Officials *Guide for Geometric Design of Transit Facilities on Highways and Streets*- **Ballot Draft** (2009)
- *Florida Building Code* (FBC) - Chapter 11
- FDOT Rules from other resources including *Plans Preparation Manual, Volume 1 & 2* and Florida Administrative Code (FAC) - Chapter 14-20.



**Table 1
FDOT Transit Facilities Design Standards, Criteria, Guidelines, and Best Practices**

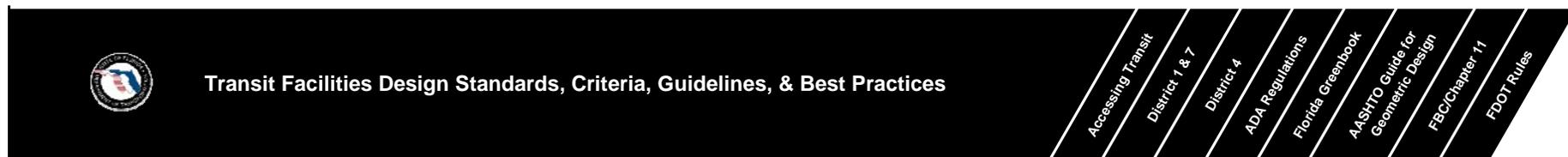


Curb-Side

Bus Stop Boarding & Alighting Areas									
Standards, Criteria, and Guidelines									
1.1.1	The dimensions of bus stop boarding & alighting (B&A) areas may be adjusted as necessary to accommodate site conditions. The minimum size of bus stop boarding & alighting areas, per ADA requirements, shall be 8 feet (perpendicular to roadway) by 5 feet (parallel to roadway).	x	x	x	x			x	x
1.1.2	Bus stop boarding & alighting areas must be connected to streets, sidewalks, or pedestrian paths by an accessible route, the criteria for which are defined by the ADA regulations.	x	x	x	x				x
1.1.3	Bus stop boarding & alighting areas must be designed to maintain a minimum clear width of 4 feet and vertical clearance of 6 feet 8 inches minimum along the accessible route.	x	x	x	x				x
1.1.4	ADA and FAC require a maximum cross slope of 2 percent (ADA maximum cross slope is 2.02%).	x	x	x	x				x
1.1.5	The boarding & alighting area concrete pad must be located within the specified clear zone for the roadway environment being used according to <i>FDOT Design Standards</i> , Index Number 700.	x	x						x
Best Practices									
1.1.1	Free edges of pavement should be strengthened with reinforcement.	x							
1.1.2	Wheelchair and scooter users, older adults, individuals with disabilities, and passengers needing assistance (such as parents with strollers and shoppers with bags) will have less difficulty boarding and alighting the bus when there is a stable, level, and unobstructed boarding & alighting area to operate the wheelchair lift and ramp.	x	x	x	x				x
1.1.3	In urban areas, and where right-of-way permits, the ideal is to provide a continuous 8-foot wide concrete pad along the entire length of the bus stop (40 feet for a standard bus and 60 feet for an articulated bus) adjacent to the curb and gutter. An additional 50-foot length is recommended for each additional bus expected to stop at the bus stop.	x	x	x					
1.1.4	The boarding & alighting area concrete pad should extend 6 inches beyond the area under the shelter canopy in order to prevent soil erosion caused by runoff.	x	x	x					
1.1.5	Any easement obtained for installing a boarding & alighting area concrete pad should extend 2 feet beyond the pad.	x	x	x	x				
1.1.6	The ideal bus stop boarding & alighting area size is 10 feet by 30 feet. When the available space for a pad is less than 10 feet by 30 feet, the pad should be as large as possible.	x	x	x					
1.1.7	An area the length of the bus for transit purposes provides a comfortable waiting, alighting, and boarding area for both front and rear doors and denotes the transit agency's presence.	x	x	x				x	
1.1.8	Bus stop boarding & alighting areas should be constructed of reinforced concrete over an aggregate base or, alternatively, they may be made of recycled plastic or rubber aggregate.	x							
1.1.9	Stop area amenities such as benches, shelters, and bicycle racks can be placed on a boarding & alighting area.	x	x	x					
1.1.10	If a shelter is planned for the location, the boarding & alighting area should follow the shelter profile.	x			x				
1.1.11	The installed boarding & alighting area concrete pad thickness will vary according to the design of the anchoring required for various bus stop elements as affected by expected wind loads.	x	x	x					x
1.1.12	Boarding & alighting areas for sheltered stops may include conduits and junction boxes for utilities.	x	x	x					

Bus Stop Shelters									
Standards, Criteria, and Guidelines									
1.2.1	Bus shelters shall be located a minimum of 12 feet from an intersection at a near-side stop as measured along the tangent line of the state road beginning at the point of the intersection of the radius of the connecting road and tangent of the state road.	x	x	x					x
1.2.2	A minimum 4-foot pedestrian pathway, per FAC requirements (3-foot minimum per ADA), shall be maintained on three sides of the shelter. In areas with high pedestrian volumes, a 6-foot pathway on one side of the shelter is preferred.	x	x	x	x				x

**Table 1
FDOT Transit Facilities Design Standards, Criteria, Guidelines, and Best Practices**



Curb-Side

1.2.25	Shelters should use local recycled or renewable materials in bus shelter designs and should consider reusing existing bus shelters when possible.	x							
1.2.26	The architecture of the various shelters should be indicative of nearby land uses. Agencies should consider soliciting local artists with a competition to modify the design and look of individual shelters.	x							
1.2.27	Agencies should investigate opportunities for using renewable energy technologies.	x							
1.2.28	Agencies should consider constructing bus passenger facilities surfaces (e.g., shelter canopy, boarding & alighting area, and sidewalks) from light-colored, high-albedo materials in order to reduce heat absorption.	x							
1.2.29	Cameras can be installed inside and outside the shelter to monitor activities.		x					x	

Bus Stop Signs									
<i>Standards, Criteria, and Guidelines</i>									
1.3.1	Transit signs must be located near the bus stop B&A area in a place where they are visually accessible to passengers.	x	x				x		x
1.3.2	Non-discrimination requirements of the ADA pertaining to visual signage requirements specify that route indicators must be present on bus stop signs (ADA Part 37, ADAAG 703.5.5).				x				
1.3.3	Bus stop signs must be posted at all bus stops and bus passenger facilities. Signs shall provide a minimum 7-foot vertical clearance from the paved surface (sidewalk or roadway pavement). If the vertical clearance is less than 7 feet, a barrier to warn people with visual impairment should be provided.	x	x				x		x
1.3.4	Sign and signpost placement must conform to ADA requirements for height, width, visibility, and other design criteria.	x	x		x	x	x		x
1.3.5	Sign characters shall be selected from fonts where the width of the uppercase letter "O" is 55 percent minimum and 110 percent maximum of the height of the uppercase letter "I." Characters shall not be italic, oblique, script, highly decorative, or other unusual form. Characters and their background shall have a non-glare finish and shall contrast with their background with either light characters on a dark background or dark characters on a light background. The minimum height of characters necessary to identify the system and routes served at a given bus stop must be determined based on the horizontal and vertical viewing distance, but not less than 2 inches.				x	x			x
1.3.6	For curb and gutter sections, the FDOT Design Standards require a minimum 2-foot distance from the face of the curb to the bus stop sign. For typical rural shoulder sections, the minimum distance is 12 feet from the edge of the traveled way and 6 feet from edge of the shoulder. The minimum distance will vary according to the design speed of the road.	x	x						x
1.3.7	The <i>FDOT Design Standards</i> apply on all state roads. Index 700, <i>FDOT Design Standards</i> , requires a minimum clearance of 4 feet from the face of the curb to frangible signposts.	x							x
1.3.8	Index 17302, <i>FDOT Design Standards</i> stipulates on rural or non-curbed roads that the lateral offset from the nearest edge of the sign itself must be at least 12 feet from any travel lanes and at least 6 feet from the edge of any paved shoulder.	x							x
1.3.9	On non-state roads, according to the <i>Manual on Uniform Traffic Control Devices (MUTCD)</i> , a minimum offset of 1 foot from the face of the curb to the nearest edge of the sign may be used in urban areas where the sidewalk width is constrained or where other vertical structures (e.g., utility poles) are located close to the curb.	x	x	x					x
1.3.10	Bus stop signs must comply with all the applicable requirements set forth in the MUTCD.	x	x	x				x	x
1.3.11	Signposts must break away without slowing the vehicle by more than 15.4 feet per second (5 meters per second) and leaving a stub of no more than 4 inches (100 mm).	x							x
1.3.12	Signposts placed near intersections must be of an omni-directional design, meaning that the support is symmetrical and will break safely when struck from any direction.	x							x
1.3.13	Signposts in the clear zone (a roadside that is traversable and unobstructed by fixed objects to allow vehicles that leave the roadway to recover safely) must be designed with breakaway mechanisms or else protected by a barrier or crash cushion.	x							x
1.3.14	The bus stop sign must neither block jurisdictional signs nor be blocked by other signs, trees, or buildings.		x						x
1.3.15	Signs shall not be installed where signing interferes with the functions or visibility of existing traffic control devices.								x

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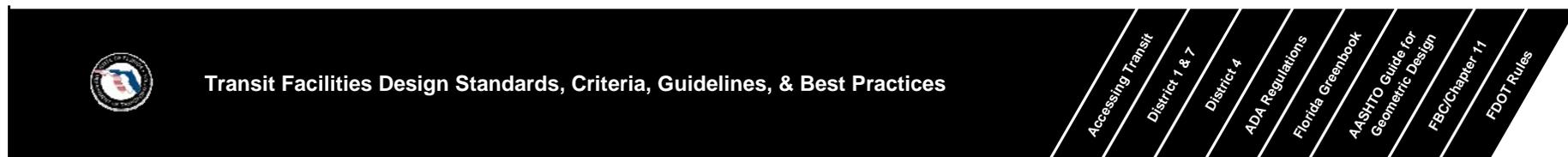
 Transit Facilities Design Standards, Criteria, Guidelines, & Best Practices	Accessing Transit	District 1 & 7	District 4	ADA Regulations	Florida Greenbook	AASHTO Guide for Geometric Design	FBC/Chapter 11	FDOT Rules
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Curb-Side

Bus Stop Shelter Lighting								
Standards, Criteria, and Guidelines								
1.7.1	All shelter utility connections shall comply with Rule 14-46.001, F.A.C., and must be approved by the appropriate city or county building department.							x
1.7.2	Flashing lights on shelters are prohibited. All lights must be placed or shielded so they do not interfere with motorists on the roadway.	x						x
1.7.3	Lights are not permitted for the sole purpose of illuminating advertising.	x						
Best Practices								
1.7.1	Adequate lighting greatly influences actual safety and passengers' perception of safety, especially at off-street facilities.	x	x	x			x	
1.7.2	Light should be concentrated at the shelter or the stop while minimizing overthrow of glare onto the street.	x	x	x				
1.7.3	Local transit stops without a shelter should be located within 30 feet of an overhead light source.	x	x	x				
1.7.4	Light fixtures should be visually non-obtrusive so as not to attract the attention of vandals.	x		x				
1.7.5	If pedestrian paths adjacent to transit stops are illuminated, the height of the light fixture should be appropriately scaled. (7 feet)	x	x	x				
1.7.6	Cutoff luminaries, low-reflectance surfaces, and low-angle spotlights can be employed to reduce light pollution.	x						
1.7.7	For road lighting installations, light near and above the horizon should be minimized to reduce glare and visual intrusion.	x	x	x				
1.7.8	Other technologies, including LEDs, are also very energy-efficient and can provide agencies with cost savings as a result.	x		x			x	
1.7.9	Illumination should also be achieved to prevent harsh shadows, which could pose a security hazard.	x	x	x				
1.7.10	Lumination levels should be between 2.0 and 5.0 foot-candles. The lower end of this range may be as effective for enhancing safety as the higher end, and care should be taken to avoid "over lighting" or "spotlighting " the shelter, which may make it difficult for patrons to observe their surroundings.	x	x					
1.7.11	The fixtures should be vandal-resistant and durable.	x	x	x				
1.7.12	Lamp compartments and electrical access areas should be secured with a recessed hex head screw or equal means.	x						
1.7.13	Electrical services should be low voltage to reduce the risk of electrical shock.	x						
1.7.14	The Crime Prevention Through Environmental Design (CPTED) Program seeks to prevent certain crimes within a specific boundary by manipulating variables within the physical environment. Lighting is the most critical factor in the CPTED Program.			x				
1.7.15	Agencies should consider employing solar lighting in areas where there is currently no utility service or as a temporary measure until utilities can be established for the shelter or stop.	x	x	x				
1.7.16	Portable solar lighting may be used when transit service is detoured during construction projects.	x	x					

Landscaping								
Standards, Criteria, and Guidelines								
1.8.1	In order to ease maintenance and ensure longevity, native plants and wild flowers shall be used. In landscapes installed in coastal areas, plants should also be salt tolerant. Exotic plants should be avoided.	x	x	x				x
1.8.2	All landscaping along FDOT rights of way must comply with standards in the latest editions of the <i>Plans Preparation Manual (PPM)</i> , the <i>Florida Highway Landscape Guide</i> , and the <i>FDOT Design Standards</i> , Indices 546 and 700.	x	x	x				x
1.8.3	Trees shall be pruned to allow 10 feet of vertical clearance from sidewalks or B&A areas.	x				x ¹	x ¹	x ¹

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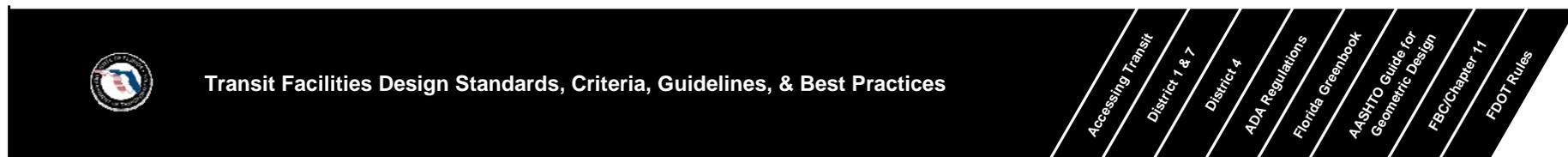


Curb-Side

Bus Stop Trash Receptacles									
<i>Standards, Criteria, and Guidelines</i>									
1.10.1	Trash receptacles must be placed so as not to interfere with the accessibility of the site or with passage along any adjacent sidewalks and so that the containers are accessible.	x		x		x		x	x
1.10.2	Trash receptacles shall not be placed on wheelchair B&A areas to comply with the ADA.	x			x	x		x	
1.10.3	The trash receptacle location must meet the set back and minimum clear recovery zone requirements established in the <i>FDOT Design Standards</i> , Index Number 700.								x
<i>Best Practices</i>									
1.10.1	Maintenance of trash receptacles and trash pick-up are important considerations when receptacles are provided.	x	x						
1.10.2	Transit agencies should choose receptacles that can be used by those with difficulty manipulating objects with their hands, such as those with arthritis or other disabilities.	x							
1.10.3	Receptacles may also be attached to the side of the shelter as a pre-fabricated feature.	x							
1.10.4	Trash receptacle designs should coordinate with benches and other furniture at the bus stop or transfer center with regard to material and finish color.	x							
1.10.5	If vandalism is a concern, agencies should consider trash receptacles with lockable lids or other anti-vandal features.	x							
1.10.6	Trash receptacles should be placed at least 4 feet back from the face of the curb.	x							
1.10.7	The receptacles should be anchored to the pavement or B&A area in order to prevent unauthorized movement.	x	x						x
1.10.8	The receptacles should be placed so that they do not obstruct a driver's vision while turning.	x							
1.10.9	Trash receptacles should not be placed in direct sunlight. Direct sunlight exposure may result in odors.	x							
1.10.10	Trash receptacles could be subject to storing explosive devices. If the bus stop or transfer center is going to be used by a large number of people, the transit agency should consider placing explosive containment trash receptacles in the facility.	x	x				x		x

Bollards									
<i>Standards, Criteria, and Guidelines</i>									
1.11.1	Bollards must not interfere with the accessibility of pedestrian routes, either around or to and from bus stops.	x			x	x		x	
1.11.2	Bollard location must meet the set back and minimum clear recovery zone requirements established in the <i>FDOT Design Standards</i> , Index Number 700.								x
<i>Best Practices</i>									
1.11.1	Bollards should be installed at bus parking spaces where errant buses may "jump" the curb and collide with pedestrians.	x					x		
1.11.2	When used to separate pedestrians and vehicles, bollards should be spaced sufficiently close to clearly define the desired separation of space and to prevent intrusion of automobiles, but not so close that passage of wheelchairs is impeded.	x							
1.11.3	Bollards should be tall enough to discourage vehicle access (standard height of 2 feet to 4 feet) and spaced far enough apart to allow bicycle, wheelchair, and pedestrian access.	x							
1.11.4	A single bollard should be designed to stop a 36,000-pound vehicle traveling at 4 mph.	x							
1.11.5	At bus parking areas, three bollards of concrete-filled, 8-inch diameter, heavy-wall steel pipe should be located ahead of the bus. The pipes should be set vertically in a 6-foot, auger-drilled hole and retained by reinforced concrete.	x							
1.11.6	Bollards should be spaced at 5 feet on center in heavily trafficked locations to protect pedestrian-only zones.	x							
1.11.7	Bollards can either be permanently installed by embedding or may be made removable through the introduction of an in-ground sleeve or receiver, in order to provide temporary service and emergency access.	x							

**Table 1
FDOT Transit Facilities Design Standards, Criteria, Guidelines, and Best Practices**



Curb-Side

1.11.8	Some bollards can be equipped to accommodate chains (e.g., eyebolts). If chain barriers are used in conjunction with bollards, care should be taken to assure that the chain is easily visible and not a hazard.	x							
1.11.9	Bollards separate pedestrian and vehicular areas in order to protect people, buildings, and site elements. They are especially important in areas where errant buses may threaten waiting passengers or pedestrians.	x							
1.11.10	Bollards may be pre-manufactured or custom designed in a style that compliments the bus stop architecture and other site furniture.	x							
1.11.11	When placing bollards in pedestrian areas one should give consideration to marking them with contrasting color bands (e.g., white or red on black bollards) or retro-reflective squares or panels.	x							

Bike Racks at Bus Shelters									
<i>Standards, Criteria, and Guidelines</i>									
1.12.1	Bike racks shall not be placed on ADA-mandated B&A areas.	x			x	x		x	
1.12.2	Bike racks shall not be placed so as to obstruct pedestrian traffic either on the sidewalk or to and from the bus stop B&A area.	x	x	x		x		x	x
1.12.3	Upper elements of the bicycle rack shall not protrude, creating an obstacle for a blind traveler.			x		x		x	x
1.12.4	Bike rack location must meet the set back and minimum clear recovery zone requirements established in the <i>FDOT Design Standards</i> , Index Number 700.								x
<i>Best Practices</i>									
1.12.1	Inverted "U" racks provide more security for bicycles than the traditional "comb" bicycle racks.	x		x					
1.12.2	Bike racks and lockers should never be located in the corner of a parking garage or in other areas with low visibility.	x							
1.12.3	Bicycle parking areas should be provided on the upstream side of the B&A area.	x	x						x
1.12.4	The height of bike racks should not exceed 4 feet from the paved surface.		x	x					x
1.12.5	Association of Pedestrian and Bicycle Professionals guidelines mention that bike racks should support bikes by their frames at two points (as opposed to supporting them by the wheel as common in comb and toast racks).	x		x					
1.12.6	Bike racks should provide 4-foot aisles, measured from tip to tip of bike tires across the space between racks or between the tip of the tire and an adjacent obstacle.	x		x ¹					x
1.12.7	One person should be able to walk one bike through the aisle.	x							
1.12.8	Six feet of depth should be allowed for each row of parked bicycles.	x							
1.12.9	Racks should be located no less than 2 feet from walls. Inverted "U" racks should be placed no less than 3 feet apart widthwise.	x							
1.12.10	Providing bike commuters better access to buses must be accomplished in a manner that maintains full access for other patrons.	x		x					
1.12.11	When locating bike racks, agencies should note that many Bikes-on-Bus (BOB) users only need their bicycle on one end of the transit trip, typically from home to transit stop and vice versa.	x							
1.12.12	Bike racks should be placed at bus stops along routes where bus-mounted bike racks are at capacity and cannot accommodate more bike passengers without causing those passengers to wait for the next bus.	x		x					
1.12.13	Along routes where bus-mounted bike racks are at capacity, transit agencies should consider installing three-bike capacity racks and allowing patrons to bring bicycles on board (when the wheelchair area is vacant).	x							
1.12.14	At park-and-ride lots, it may be appropriate to add a bike-and-ride section to encourage use in a more secure area.	x							
1.12.15	Bicycle storage areas should be placed in spaces that are physically and visually accessible.	x	x	x					
1.12.16	Placement along heavily trafficked streets and walkways protects bicycles from theft and vandalism.	x	x	x					
1.12.17	A good rule of thumb is one bike space for every 20 parking spots.		x						
1.12.18	Multiple racks can be installed to create a "bicycle parking lot" depending on the size of the transit stop and projected use.			x					

**Table 1
FDOT Transit Facilities Design Standards, Criteria, Guidelines, and Best Practices**

 Transit Facilities Design Standards, Criteria, Guidelines, & Best Practices	Accessing Transit	District 1 & 7	District 4	ADA Regulations	Florida Greenbook	AASHTO Guide for Geometric Design	FBC/Chapter 11	FDOT Rules

Curb-Side

1.12.19	To avoid unnecessary water damage to bicycles, bike racks should not be placed near sprinkler systems.	x						
1.12.20	If the bike rack is covered, it should be designed so that explosive devices cannot be hidden in the area.	x						
1.12.21	Bicycle racks should be kept underneath a covered area to protect the bikes from exposure to the weather.	x		x				

Notes:

1. Bike Racks should provide 30" aisles.

Shopping Cart Storage at Bus Shelters								
Standards, Criteria, and Guidelines								
1.13.1	To maintain accessibility, bus stop B&A areas may not be used for shopping cart storage.	x	x			x		x
1.13.2	Shopping cart location must meet the set back and minimum clear recovery zone requirements established in the <i>FDOT Design Standards</i> , Index Number 700.							x
Best Practices								
1.13.1	Shopping cart storage should be provided at bus stops adjacent to retail centers. It should be located at least 4 feet back from the face of curb and should remain clear of sidewalks.	x						
1.13.2	The frames for shopping cart corrals should be constructed from steel pipe.	x						
1.13.3	Surface mounted flanges should be constructed from flat steel bars.	x						
1.13.4	Standard hot-dipped galvanized steel pipes should be used, to resist corrosion and rust.	x						
1.13.5	The transit agency should make arrangements with shopping center managers to have the cart corrals periodically emptied.	x	x					

Public Telephones								
Standards, Criteria, and Guidelines								
1.14.1	Where public telephones are provided, at least one telephone must be accessible by persons using wheelchairs.	x	x		x	x		x
1.14.2	Public telephones must be located so that the receiver, coin slot, and control are no more than 4 feet above the floor.	x			x	x		x
1.14.3	Public telephones shall be fixed on a clear floor or ground space at least 2 feet 6 inches by 4 feet, not impeded by bases, enclosures, and fixed seats, and allow either a forward or parallel approach by a person using a wheelchair.	x	x	x	x	x		x
1.14.4	The length of cord should be a minimum of 29 inches. Phones shall be hearing aid compatible and volume control equipped.	x			x	x		x
Best Practices								
1.14.1	Telephones at bus stops offer many potential benefits for bus patrons, including the ability to make personal and emergency calls while waiting for the bus.	x					x	
1.14.2	The phone and the bus stop waiting area should be separated by a short distance when possible.	x						
1.14.3	Public telephones at bus stops should be limited to outbound calls only.	x						

Police Call Box								
Standards, Criteria, and Guidelines								
1.15.1	The call box must be located in such a place that it does not obstruct access to the stop.	x				x	x	x
1.15.2	Call boxes may be identified instantly in the event of an emergency and must be suitable for users with hearing impairments and those using a wheelchair.	x				x		x
Best Practices								

**Table 1
FDOT Transit Facilities Design Standards, Criteria, Guidelines, and Best Practices**

 Transit Facilities Design Standards, Criteria, Guidelines, & Best Practices	Accessing Transit	District 1 & 7	District 4	ADA Regulations	Florida Greenbook	AASHTO Guide for Geometric Design	FBC/Chapter 11	FDOT Rules

Curb-Side

1.15.1	Police call boxes establish a safe environment, especially at stops with fewer patrons as well as those located in suburban and rural areas.	x	x						
1.15.2	Police call boxes require less maintenance, do not encourage loitering by non-bus patrons, and can be solar powered.	x							

Vending Machines									
<i>Standards, Criteria, and Guidelines</i>									
1.16.1	Vending machines, newspaper boxes, and other street furniture cannot reduce clear spaces required by ADA Accessibility Guidelines. A 30" x 48" minimum clear space must be provided (ADA and FAC).	x	x	x		x	x	x	
1.16.2	Vending machine location must meet the set back and minimum clear recovery zone requirements established in the <i>FDOT Design Standards</i> , Index Number 700.								x
<i>Best Practices</i>									
1.16.1	Vending machines can provide passengers with reading materials while they wait for the bus.	x					x		
1.16.2	ADA mobility guidelines should be followed for improved site circulation.	x			x	x	x	x	
1.16.3	Vending machines should be anchored to the ground to reduce vandalism and placed at least 4 feet back from the face of the curb.	x							x

**Table 2
FDOT Transit Facilities Design Standards, Criteria, Guidelines, and Best Practices**



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District 4

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FDOT Rules

Street-Side

Roadway									
Standards, Criteria, and Guidelines									
2.1.1	Construction procedures to build transit facilities along state roads must comply with FDOT requirements. Under all conditions, all facilities must comply with applicable FDOT and local regulations.	x							x
Best Practices									
2.1.1	Agencies responsible for the following should be contacted during the planning process: utilities, electricity supply and maintenance, traffic impacts and related issues, environmental planning, historic preservation, and adjacent property owners, especially in cases where construction could, temporarily or permanently, affect residents' or businesses' sight view, access to property, etc.	x							

Special-Use Lanes									
Best Practices									
2.2.1	The High Occupancy Vehicle (HOV) or High Occupancy Toll (HOT) requirements vary widely depending on local policies. Occupancy requirements can be raised in order to maintain a desired level of service and increase person moving capacity.	x							
2.2.2	HOV/HOT lanes can be adjusted to reduce the negative public perception caused by the "empty lane" syndrome and maintain the beneficial effects on transit travel times.	x							

Traffic Signals and Traffic Signal Priority (TSP)									
Best Practices									
2.3.1	TSP systems should be used on high ridership corridors with moderate numbers of buses.	x					x		
2.3.2	Bus routes with greatest delays should be considered as the highest priority for TSP system implementation.	x					x		
2.3.3	Bus detectors should be placed farther upstream if bus stops are located on the far side of an intersection.	x							
2.3.4	Active signal priority should be used at far-side bus stops to ensure that signal priority calls are not wasted for stopped	x	x						
2.3.5	Unconditional signal priority should be implemented only for express bus service during off-peak hours and should be implemented by placing limits on green extension and red truncation lengths, especially at intersections with busy cross	x							
2.3.6	Transit agencies must contact the traffic operations department for authorization to own and operate signal priority devices. Additionally, before implementing signal priority, an educational campaign should be carried out throughout the affected area.		x						
2.3.7	Techniques should also utilize a variety of different control strategies such as phase suppression, synchronization, compensation, and green recall.	x							
2.3.8	The volume of bus passengers, degree of existing congestion level, and delay to cross-street traffic are all important variables that must be considered in developing a Transit Signal Priority (TSP) strategy.	x					x		
2.3.9	An effective TSP system ensures that transit vehicles in all directions can be assisted without excess delay to non-transit vehicles.	x	x				x		
2.3.10	Though some small delay to cross-street traffic is inevitable, it can be minimized through signal controls that limit the green light extension for buses. Additionally, at highly congested intersections, green extensions are limited to every other cycle.	x	x						
2.3.11	Active priority systems, where the signal is adjusted for each bus on detection at intersection approach, use both real- and fixed-time control strategies and schedule- and headway-based control strategies. In general, active priority systems are viewed as more effective than passive ones.	x							

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2.3.12	Passive priority systems, where the signals are adjusted to suit the bus schedule along the route, prioritize the traffic signals using a combination of fixed-time and schedule-based control strategies. Passive priority is usually implemented only on roads with high transit usage, often close to the buses' origin point where departure schedules are fixed.	x							
2.3.13	The implementation of a TSP system may call for changes in the positioning of bus stops in order to gain the highest potential benefits from the technology.	x							

Street Lighting									
<i>Best Practices</i>									
2.4.1	Lighting along streets should be designed for smoother vehicular movement and meet illumination requirements of a transit stop.	x							
2.4.2	Places such as mid-block crossings associated with bus stops, where significant vehicle-pedestrian interactions may occur, should be illuminated to enhance the safety of bus patrons.	x	x						
2.4.3	In rural areas, efforts should be made to maximize the safety and security of bus stops with cost-feasible lighting.	x	x				x		
2.4.4	The conditions for lighting transit facilities in rural areas should be reviewed on a location-specific basis.	x	x						
2.4.5	Local transit stops should be located within 30 feet of an overhead light source. A minimum distance of 15 feet is recommended between a shelter and light pole.		x						
2.4.6	Lighting fixtures of any height should have minimum glare that could otherwise adversely impact drivers and provide even and uniform illumination over the whole area.		x						
2.4.7	As needed, lighting should be made suitable for stop areas.	x							
2.4.8	When possible, solar lighting should be used to reduce operating costs and to increase functionality during black-out periods. Solar lighting should also be considered where utility service is not readily available.	x	x				x		
2.4.9	Lighting scaled to the human body helps create pedestrian-friendly environments. Agencies should consider lighting installation at bus stops that attract significant ridership in the evenings or early mornings.	x	x						
2.4.10	Pedestrian-scale lighting at stops near neighborhood business areas, malls, hospitals, and recreational/sports facilities can be achieved through public-private initiatives by contacting adjacent facility owners.	x	x						
2.4.11	Uniform illumination, rather than lighting patterns that produce bright and dark areas, is also helpful in preventing crime at bus stops. Lighting access is also an integral part of CPTED methods.	x							
2.4.12	Lighting fixtures should be oriented so stop area infrastructure such as a shelter or amenities do not cast a shadow on the waiting area and the bus driver should be able to see the waiting passengers.		x						

Pavement Marking									
<i>Standards, Criteria, and Guidelines</i>									
2.6.1	Pavement markings shall be in compliance with maintaining agency regulations and standards in the Manual of Uniform Traffic Control Devices (MUTCD).	x					x		
2.6.2	Physical obstructions in and around bus stops, if identified as a hazard to vehicular or pedestrian safety, must be removed or adequately marked by painting or by use of other highly-visible material.	x				x		x	

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Bus Stop Location									
Standards, Criteria, and Guidelines									
2.7.1	FAC Section 14-20.003 requires that a minimum 15-foot distance be maintained between a bus stop and an on-street parking space for persons with disabilities.		x						x
2.7.2	If a shelter is to be placed, a minimum 15-foot distance from a fire hydrant and 12 feet from the intersection point of curve/tangent should be maintained. Site conditions or other regulations may require more distance.		x						
2.7.3	The actual passenger loading area for a stop must not be located in a driveway where slopes exceed ADA standards.			x					
Best Practices									
2.7.1	It is desirable that a shelter be placed at a 15-foot distance from a pole. Under all circumstances, a minimum distance of 8 feet should be maintained.		x						
2.7.2	Near-side stops are preferred on two-lane roadways without a bus bay, where vehicles are restricted from going around the bus.			x					
2.7.3	Far-side stops are recommended in most other applications, particularly when the street is wide enough to permit other vehicles to pass uncontrolled around the stopped bus.			x					
2.7.4	Transit stops should ideally be located at a minimum of 200 feet from any existing driveway. It is recommended that a bus stop be located downstream of traffic movement from a driveway.			x					
2.7.5	Roundabouts should be treated similarly to conventional intersections. Since the bus stop should, where possible, be located on the far side of the roundabout after the exit, the stop should either utilize a bus bay or be far enough downstream from the splitter island to avoid a long queue from interfering with circulation within the roundabout.	x							
2.7.6	Far-side bus stops are generally preferred to near-side stops because they result in fewer traffic delays, provide better vehicle and pedestrian sight distances, and cause fewer conflicts among buses, cars, pedestrians, and bicyclists.	x					x		
2.7.7	Avoid near-side stops at intersections with dedicated right-hand turn lanes where right-on-red turning is permitted.	x							
2.7.8	Mid-block stops are generally to be avoided. They are appropriate only when: route alignments require a right turn and the curb radius is short; the distances between intersections are unusually long and major transit generators are located mid-block and cannot be served at the nearest intersection; and the pedestrian crossing is accompanied by pavement marking and road lighting.	x							
2.7.9	The bus stop location should minimize the need for buses to change lanes before intersections and before approaches to left hand turns.	x							
2.7.10	Pedestrian impacts of stop placement should be carefully considered.		x				x		
2.7.11	The higher the roadway design speed is, the greater will be the distance of the bus stop from the radial point in the road before or after the intersection. Transit agencies have been considered liable for injuries sustained by their passengers, if, for example, patrons must use a dangerous crossing to reach a bus stop.	x							
2.7.12	For a proposed stop location, all driveways within 250 feet should be identified.			x					
2.7.13	Far-side bus stops are recommended for use under these circumstances: (1) in areas where the right-of-way permits cars to pass the bus and especially in areas where a near-side stop will impede other motorists; (2) where a route alignment requires the bus to turn left before stopping; and (3) at complicated intersections with multiphase signals.	x	x	x			x		
2.7.14	Far-side stop should be considered when: (1) traffic is heavier on the near-side than on the far-side of the intersection; (2) at intersections where heavy right turn activity occurs; (3) when pedestrian access and existing B&A area conditions on the far-side are better than on the near-side; (4) at intersections where traffic conditions and signal patterns may cause delay; (5) at intersections with transit signal priority treatments; (6) when the cross street is a one-way from left to right; (7) at unsignalized intersections.		x						

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2.7.15	Recommended locations for near-side stops include: (1) on two lane roads, where vehicles are restricted from going around the bus, in order to prevent the stacking of vehicles in the intersection; (2) when the bus must stop in the travel lane because of curb-side parking in order for the front door of the bus to access an intersection and crosswalk; (3) in combination with curb extensions or bus bulbs to provide direct access from the bus to the sidewalk; and (4) in a right-turn lane if a queue jump signal is provided to allow the bus to merge back into the travel lane and if accompanied by a sign on the side of the road.	x							
2.7.16	Near-side stops should be considered: (1) when traffic is heavier on the far-side than on the approaching side of the intersection; (2) when pedestrian access and landing area conditions on the near-side are better than on the far-side; (3) when street crossings and other pedestrian movements are safer on the near-side than the far-side; (4) when the bus route continues straight through the intersection; (5) when the cross street is a one-way from right to left; (6) when the route causes the bus to turn right from an intersection.		x						
2.7.17	Near-side bus stops should be located in advance of the leading taper for the right turn lane to provide sufficient distance for drivers to see and access the turn lane. When the right turn lane is a through lane that is being dropped at a signalized intersection, a bus stop should also be located at least 100-feet in advance of the intersection to avoid creating a conflict with vehicles merging to the inside lane or turning right at the intersection.			x					
2.7.18	Transit facilities near schools should have the following safety-related measures: (1) near primary schools, stops should be placed in an area where they can be visually monitored by school personnel and/or crossing guards to increase security, and (2) mid-block stops near schools are not recommended.	x							
2.7.19	Mid-block stop should be considered: (1) when traffic or street/side walk conditions at the intersection are not conducive for a near-side or far-side stop; (2) when a major passenger traffic generator is located in the middle of a block; (3) when the interval between adjacent stops exceeds stop spacing standards for the area; (4) when a mid-block stop is compatible with a corridor or district plan. Mid-block stops near schools are not recommended.		x						
2.7.20	Bus stops should be clearly identified with signs or pavement markings to indicate that transit vehicles have exclusive use in the stop area.	x							
2.7.21	A bus stop should not be placed in free-flow right turn lanes.			x					
2.7.22	If blocking a driveway cannot be prevented, at least one entrance and exit to a property should remain open at all times while a bus is loading or unloading passengers.		x	x					
2.7.23	Bus stop infrastructure and amenities should not block the view of traffic entering or exiting the driveway.		x						
2.7.24	Bus stops where a vehicle blocks an access way should not be layover points or transfer locations.		x						
2.7.25	A minimum distance of 5 feet should be kept between a bus stop and the edge of a crosswalk or end of a radius, whichever is farther from the intersection.		x						
2.7.26	The transit agency should consult roadway authorities and property owners when there is a possibility of a transit vehicle blocking the only access route to a property.		x						

Emergency Medical Services (EMS) Access									
Best Practices									
2.8.1	When planning transit facilities near hospitals, fire stations, and police stations, those agencies should be contacted to seek their input on bus stop locations.	x	x						
2.8.2	Bus facilities should not obstruct fire lanes or other similar emergency facilities and equipment.	x	x						
2.8.3	During the operation of transit signal priority, buses must accommodate emergency vehicles at all times.	x	x				x		
2.8.4	Exceptions to parking prohibitions at bus stops should be permitted to allow standing-by emergency vehicles.	x							

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Road-Side Bus Stop									
Standards, Criteria, and Guidelines									
2.9.1	Bus stops must be located so that the front door ADA B&A area is located outside the driveway to ensure compliance with ADA maximum slope requirements.	x					x		x
2.9.6	ADA level change requirements for ground and floor surfaces requires that if level change is less than ¼ inch, then no special treatment is required. If a level change is between ¼ and ½ inch, a bevel with a maximum slope of 1:2 is needed. If a level change is more than ½ inch, then a ramp with a maximum slope not greater than 1:12 is needed.		x		x	x			x
Best Practices									
2.9.1	Ideally, curb-side stops are provided at locations where: the design speed is less than or equal to 45 mph; there is adequate space in the right-of-way for improvement of shelters and benches; access can be provided for passengers with disabilities; major trip generators are nearby; connections exist to pedestrian facilities; nearby major intersections are signalized; street lighting exists for nighttime routes; and adequate curb length is present to accommodate the bus stop zone.	x							
2.9.2	Consider relocating a bus stop to a downstream parcel should a corner location prove to be unacceptable.	x							
2.9.3	It is desirable that all bus stops in urban areas be located at least 20 feet from canals and 6 feet from a drop-off location.		x						
2.9.4	In a constrained right-of-way location adjacent to a canal, adequate canal flows must be maintained in areas where the bus stop encroaches into the canal section. A continuous handrail or pedestrian/bicycle rail on a barrier wall should be provided around stops immediately adjacent to canals.		x	x					
2.9.5	Bus stops should be located so that passengers are not forced to wait for a bus in the middle of a driveway.	x							
2.9.6	Pedestrian access behind the guardrail should be limited to the area of the bus stop.		x						
2.9.7	For rural and suburban areas without a fixed-route service, customer feedback and special requests should be considered proxy for the need to place a fixed-stop with an ADA-compliant infrastructure.		x			x			
2.9.8	The stopped bus should not block driveways.	x						x	
2.9.9	No parking zones for far-side curb-side bus stops should be a minimum of 90 feet in length.	x						x	
2.9.10	No parking zones for near-side curb-side stops should be a minimum of 100 feet in length.	x						x	
2.9.11	No parking zones for mid-block curb-side stops should be a minimum of 160 feet in length.	x						x	
2.9.12	When a guardrail runs parallel to a roadway that has or will have transit service, the bus stop should be located outside the guardrail and an opening provided in the guardrail to permit pedestrian access. A B&A area must be provided at the guardrail opening to permit access to the bus.		x						

Bus Bay									
Standards, Criteria, and Guidelines									
2.10.1	Signing and pavement markings near bus bays shall differentiate bus bays from travel lanes. Generally, a broken 6-inch white stripe, 2-feet by 4-feet skip, should be used in the areas where buses will be entering and leaving the bus bay (acceleration and deceleration tapers). A solid 6-inch white stripe should be used between the dashed areas to delineate the travel lane for through vehicles.				x				
Best Practices									
2.10.1	Bus bays may be appropriate at mid-block stops associated with destinations that are major transit trip generators.	x		x					
2.10.2	The design of bus bays should aim to reduce automobile-bus conflicts, provide greater separation between traffic and pedestrians waiting for the bus, and allow the bus to quickly regain its travel speed upon its re-entry into traffic.	x							
2.10.3	Bus bays at far-side stops should be placed at signalized intersections so that the signal provides gaps in traffic that permit bus re-entry into the travel lane.	x						x	

**Table 2
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2.10.4	Near-side bus bays should be avoided because of conflicts with right-hand turning vehicles and delays in service resulting from the difficulty associated with bus re-entry into the travel lane.	x						
2.10.5	When site constraints do not prevent it, closed bus bays should be used instead of open bus bays to minimize the disturbance to other vehicular movements.	x				x		
2.10.6	Bus bays should be placed in a recessed curb area of the roadway, separated from moving lanes of traffic.	x						
2.10.7	Length of the bus bay should be increased by 50 feet for each additional 40-foot bus and 70 feet for each additionally 60-foot articulated bus expected to be at the stop simultaneously.	x						
2.10.8	The bus bay sidewalk should be connected to the existing sidewalk or accessible to the shoulder.	x						
2.10.9	Bus bays should be considered when: (1) traffic in the curb lane exceeds 250 vehicles during the peak hour; (2) passenger volume at the stop exceeds 20 boardings per hour; (3) traffic speed is greater than 40 miles per hour; (4) bus volumes are 10 or more per peak hour; (5) recurrent crash patterns are present; (6) right-of-way and suitable roadway geometrics are available; (7) buses are expected to layover at the end of a route or at transfer locations; (8) average peak-hour dwell time exceeds 30 seconds per bus; (9) improvements such as widening are planned; and (10) roadway profile low points can be avoided and a 2-percent cross slope can be achieved on the roadway.		x				x	
2.10.10	When bus bays are placed at a near-side location, the arterial design speed should be less than 40 mph to lessen potential conflicts as the bus re-enters the flow of traffic.	x						
2.10.11	The total length of the bus bay should allow room for an entrance taper, a deceleration lane, a stopping area, an acceleration lane, and exit taper. However, in some cases it may be acceptable to use the through lane as the acceleration and deceleration lane and provide only the tapers and the stopping area.			x			x	
2.10.12	Open bus bays are not recommended on six or more lane facilities.			x				
2.10.13	In curb and gutter locations, the bus bay pavement should slope into the roadway at a 2-percent cross slope that directs run-off to a drainage structure located outside of the bus bay area.			x			x	
2.10.14	In the absence of curb and gutter, bus bay pavement or B&A areas should be sloped away from the roadway (2-percent cross slope minimum or matching the adjoining roadway pavement slope) to direct runoff to roadway drainage ditches.			x			x	
2.10.15	Lighting design for bus bay pavement areas should meet the same criteria for minimum illumination levels, uniformity ratios, and max-to-min ratios that are being applied to the adjoining roadway based on FDOT Lighting Design Criteria.			x				
2.10.16	Typical size of an open bus bay for a 40-foot bus with a design speed of 40/mph consists of a 50-foot stop area for one bus and a 60-foot acceleration lane.			x			x	
2.10.17	Standard asphalt pavements are normally adequate to handle bus traffic, including bus bays.	x						
2.10.18	For concrete pavements, it is important to provide adequate sub-grade drainage, thickness, and joint details.	x					x	
2.10.19	Various bus bay and right turn configurations include three basic options: (1) most desirable design: the bus bay is placed entirely upstream from the right turn lane; (2) second most desirable design: the bus bay is placed partially upstream from the right turn lane since the bus bay and right turn lane share the bus exit and right turn entry taper; (3) minimum design: the bus bay and right turn lane share space but with the bus bay located as far upstream as feasible.			x				
2.10.20	Bus bays should not be located on profile low points to avoid placing passengers in areas of potential ponding.			x				
2.10.21	A mid-block crosswalk can be used in locations where there is a major transit-oriented activity center or the distance to the next intersection is greater than 300 feet.	x		x				
2.10.22	Signalization may be provided as per the MUTCD.	x					x	
2.10.23	Drainage structures should not be located within the bus bay stopping area. Additionally, drainage structures should be kept away from the passenger loading areas.	x						
2.10.24	For alternative pavement treatments (patterns or textures), the PPM should be used for guidance. Architectural pavers are not acceptable for use on the state highway system in the travel way, but can be used elsewhere as specified in Volume I, Subsection 2.1.6.1, PPM.	x						
2.10.25	Alternatives to bus bays should be considered when: The traffic volumes exceed 1,000 vehicles per hour per lane and in high-density commercial areas with on-street parking. Bus bulbs are potential alternatives to bus bays.		x				x	

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Queue Jumper Bus Bay									
<i>Best Practices</i>									
2.11.1	Near-side stops increase bus dwell time creating signal prioritization difficulties and preventing effective use of the queue jumper lane.	x							
2.11.2	When using a queue jumper bus bay, the bus stop should be located at the far side of an intersection.	x					x		

Bus Bulb/Nub									
<i>Best Practices</i>									
2.12.1	Bus bulbs are not appropriate on facilities with: (1) high operating speeds, generally 45/mph or greater; (2) high traffic volumes; (3) transit corridors that serve a large wheelchair dependent population; (4) less than 24-hour on-street parking available; (5) low transit ridership or pedestrian activity; or (6) transit layover stations.			x				x	
2.12.2	Bus bulbs tends to reduce delays associated with buses reentering traffic lanes.	x						x	
2.12.3	Bulbs should be located in following areas: (1) where parking is critical (and bus bays may take up too much space); (2) where buses experience delays in re-entering the traffic lane; (3) where traffic calming is desired; (4) on streets that are perceived to be pedestrian friendly; (5) on the near-side of signalized intersections; (6) on streets with design speeds up to 40 mph; (7) in low traffic volume areas or on streets with diagonal or parallel parking; and (8) where mid-block stops may be appropriate to serve a transit demand generator.	x						x	
2.12.4	Bus bulbs should not be located on streets with design speeds greater than 40 mph or high-volume facilities.	x						x	
2.12.5	Bus bulbs should not be located at stops where the bus route requires the bus to make a right hand turn, unless the bulb precedes a right-turn lane.	x						x	
2.12.6	Nubs should be designed to allow for bus turning movement and can form bus bulbs that allow buses to make curb-side stops without weaving in and out of the travel lane. They also have a traffic calming effect.	x							
2.12.7	Nubs should be avoided at intersections where the bus route requires the bus to make a right turn.	x							
2.12.8	Nubs should also be avoided in low speed central business districts to avoid congestion of traffic.	x							
2.12.9	Nubs should extend into the street for the width of a parking lane.	x							
2.12.10	Nubs should be used at mid-block crossings where feasible.	x							
2.12.11	Nubs are appropriate in areas where there are significant volumes of pedestrian traffic and at intersections with roads that have parallel or diagonal on-street parking.	x							

Off-Street Half-Sawtooth Bus Bay									
<i>Standards, Criteria, and Guidelines</i>									
2.13.1	Half-sawtooth bus bays allow for shorter stations, but require greater station widths.	x						x	
<i>Best Practices</i>									
2.13.1	Half-sawtooth bus bays should be used at off-line transfer centers, where the length of the site is limited but where the depth of the site is adequate to accommodate bus movement in and out of bays.	x						x	
2.13.2	Half-sawtooth bus bays are also preferred at locations where parallel buses may result in delays caused by more than two buses stopping at one time.	x						x	
2.13.3	The loading lane width of 43 feet is the minimum berth length required for 40-foot buses with bus-mounted bike racks. The bus berth lengths must be increased by 20 feet for articulated buses.	x						x	

**Table 2
FDOT Transit Facilities Design Standards, Criteria, Guidelines, and Best Practices**



Transit Facilities Design Standards, Criteria, Guidelines, & Best Practices

Accessing Transit
District 1 & 7
District 4
ADA Regulations
Florida Greenbook
AASHTO Guide for Geometric Design
FBC/Chapter 11
FDOT Rules

Street-Side

Bus Stops and Railroad Crossings									
<i>Standards, Criteria, and Guidelines</i>									
2.14.1	Per Florida Statute 316.1945 (l), a minimum distance of 50 feet should be maintained between bus stops and the nearest railroad crossing.		x	x					x
<i>Best Practices</i>									
2.14.1	When possible, it is recommended to place bus stops on the near side of a railroad crossing to avoid creating a queue that would conflict with the crossing.	x							
2.14.2	For bus routes perpendicular to railway tracks, near-side bus stops are recommended and should be located such that railroad-warning signs are not obstructed by a stationary bus. Supplemental left-side signs should be provided at all near-side bus stop locations.	x							
2.14.3	For bus routes parallel to railway tracks, bus stops should be placed outside of the clear zone of the railroad (minimum 8 feet) or be protected by crash walls.		x						
2.14.4	The stopping sight distance for a bus stop near a railway crossing should be consistent with Indices 17346 and 17882 of the <i>FDOT Design Standards</i> for railroad marking and sign details.		x						x
2.14.5	Bus stops should be located on the near side of the crossing in advance of the railroad crossing stop bar.			x					
2.14.6	If a bus stop must be located on the far side of a crossing, it should be located at least 450 feet beyond the crossing.			x					

Bike Lanes									
<i>Standards, Criteria, and Guidelines</i>									
2.15.1	Bike networks should connect with other modes of transportation.	x							
2.15.2	When the bus stop is located in a bus bay, dashed line pavement markings consistent with the MUTCD must be used to notify bicyclists and transit operators of the potential conflict.		x	x		x			x
2.15.3	Where bicycle paths (facilities not immediately adjacent to the travel lane) are provided, bus stops should be coordinated so that they are located in the proximity of the bicycle path access points to the roadway. Refer to the AASHTO Guide for the Development of Bicycle Facilities for information on the design of bicycle facilities.			x			x		
2.15.4	On curb and gutter roadways, a 4-foot minimum bicycle lane width measured from the lip of the gutter is required.								x
2.15.5	A 5-foot minimum width shall be provided when the bicycle lane is adjacent to on-street parking, a right turn lane, guardrail, or other barrier.								x
<i>Best Practices</i>									
2.15.1	Dashed line pavement markings can be used where buses are allowed to move in and out of bike lanes.	x							
2.15.2	Use of bikes in combination with public transit ensures improved low-density, urban, and suburban public transportation. When conflict is inevitable, the shared area should be marked for visual attention.	x							

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Pedestrian Crossings									
Standards, Criteria, and Guidelines									
2.16.1	Pedestrian crossings should be provided at the following locations: (1) intersections where bus passengers are required to cross streets to transfer between routes; (2) signalized intersections in urban areas with marked crosswalks on all four corners unless there is a specific reason to direct pedestrians to alternative crossing locations; (3) where a marked crosswalk can channel pedestrians to a single crossing location; (4) where there is a need to delineate an ideal crossing location due to confusing street geometries; (5) and unsignalized intersections where there are no signalized crossings within 600 feet.	x							
2.16.2	Conditions for not providing crosswalks at unsignalized intersections are: (1) the posted speed is greater than 40 mph; (2) a roadway with four or more lanes without a raised median or crossing island that has (or will soon have) average traffic of 12,000 vehicles per day or greater; (3) a roadway with four or more lanes with a raised median or crossing island that has (or will soon have) average traffic of 15,000 vehicles per day or greater.	x							
2.16.3	Crosswalks shall be no less than 6 feet wide. Crosswalks of at least 10 feet in width are preferred. Greater widths may be necessary where the volume of pedestrian traffic is high.	x							x
2.16.4	ADA-compliant curb ramps (at all curbs along accessible routes) shall be provided at all crosswalks, marked and unmarked. Curb ramps should not interfere with free access to the bus stop. Bus stop locations should not be interrupted by curb ramps. Curb ramps must be fully within striped crosswalks.	x			x	x			x
2.16.5	The following must be considered to ensure that crosswalks are in compliance with ADA requirements: (1) the Access Board requires that curb ramps must be provided wherever there is a difference in level on an accessible path; (2) curb ramps should not be located at places where water accumulates or the access is blocked by vehicles. (3) ramps should also have detectable warning surfaces and the running slope should not exceed 1:12; (4) crosswalk markings should be located so that a pedestrian in a wheelchair should not have to leave the crosswalk to enter or exit the street, and (5) the curb ramp shall be wholly contained within the crosswalk markings, excluding any flared sides.	x			x	x			x
2.16.6	If a raised central median extends into the crosswalk, an ADA-compliant channel must be provided through the median.	x				x			x
Best Practices									
2.16.1	Crosswalks are essential to bus passengers who may have origins or destinations on either side of the roadway.	x							
2.16.2	Streets within walking distance from a transit stop should be designed to accommodate pedestrians, as well, with an emphasis on pedestrian safety.	x							
2.16.3	In an area where major transit destinations and origins are located, but where crosswalks would be dangerous, consideration should be given to installing a pedestrian bridge over the roadway if transit ridership would suggest such an investment.	x					x		
2.16.4	MUTCD allows use of colored pavement between white lines at crosswalks if it does not degrade contrast.	x							
2.16.5	Too much pavement texturing should be avoided, as it may negatively impact wheelchair and cane users.	x							
2.16.6	Crosswalk and pavement markings increase the visibility of the crosswalk.	x							
2.16.7	Where the curb ramp is completely contained within a planting strip or other non-walking surface, so that pedestrians would not normally cross the sides, the curb ramps can have steep sides, and even be vertical-turned curbs.	x							
2.16.8	Crosswalks should have an audio component to signal to the blind when it is and is not safe to cross.				x				
2.16.9	At mid-block stop locations, if a significant number of pedestrians cross roadways, signalized crossings should be considered. In such cases, crosswalks should be located such that incoming traffic is visible to pedestrians.				x				
2.16.10	Median refuges should be considered in the following situations: (1) wide crossings with high pedestrian volume; (2) mid-block stops with high pedestrian volume; (3) street crossings with a high number of elderly, young pedestrians, and wheelchair users; (4) bus stops located around schools; and (5) areas where pedestrians are likely to use strollers or carry bags.				x				
2.16.11	Sidewalks should be constructed along both sides of arterial roadways that are not provided with shoulders, even though pedestrian traffic may be light.	x							

**Table 2
FDOT Transit Facilities Design Standards, Criteria, Guidelines, and Best Practices**

	Transit Facilities Design Standards, Criteria, Guidelines, & Best Practices	Accessing Transit	District 1 & 7	District 4	ADA Regulations	Florida Greenbook	AASHTO Guide for Geometric Design	FBC/Chapter 11	FDOT Rules

Street-Side

2.16.12	In urban areas, it is desirable to provide two curb cuts; the road agency with jurisdiction should be consulted about design and construction of curb ramps along public roadways.	x							
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Transit Provision During Construction									
<i>Standards, Criteria, and Guidelines</i>									
2.20.1	When detours are required, the geometry of the detour route should be compared against the operational requirements of transit vehicles. While designing detours, ADA requirements should be considered. If a transit stop or route needs to be relocated, appropriate signage and advance notification to passengers should be provided.	x			x	x			x
<i>Best Practices</i>									
2.20.1	If a road improvement project affects transit services, transit agencies should be involved in the planning of traffic control during construction.	x							
2.20.2	Traffic control devices should not be placed in locations where they will block transit stops or passenger access to stops.	x							
2.20.3	Typically, roadway construction or improvement projects should have a Temporary Traffic Control Plan (TTCP), which is a set of specific sheets, references to standard (typical) layouts, and/or notes on roadway plans describing how traffic should be controlled through a work zone.	x							x

Appendix A: References



References

1. *Accessing Transit: Design Handbook for Florida Bus Passenger Facilities*, Public Transit Office, Florida Department of Transportation, 2008.
2. *Districts 1 and 7 transit facility standards and guidelines*, Florida Department of Transportation District 1 & 7, 2008.
3. *FDOT District 4 transit facility guidelines*, District Office of Modal Development, Florida Department of Transportation, 2002.
4. *Design Standards, Index No. 700*, Florida Department of Transportation. 2010, <http://www.dot.state.fl.us/rddesign/DesignStandards/Standards.shtm>
5. *Design standards, Index No. 17302*, Florida Department of Transportation, 2010, <http://www.dot.state.fl.us/rddesign/rd/RTDS/06/17302.pdf>
6. *Plans Preparation Manual*, Florida Department of Transportation, 2010, <http://www.dot.state.fl.us/rddesign/PPMManual/PPM.shtm>
7. Fla. Admin. Code Ann. r. 14-20.0032, 2008, <https://www.flrules.org/gateway/RuleNo.asp?ID=14-20.0032>
8. *Guide for Geometric Design of Transit Facilities on Highways and Streets—Ballot Draft*, American Association of State Highway and Transportation Officials, 2009
9. *Americans with Disabilities Act and Architectural Barriers Act Accessibility Guidelines*, U.S. Architectural and Transportation Barriers Compliance Board (Access Board), 2004.
10. *Florida Building Codes*, Florida Department of Community Affairs, 2007, http://www2.iccsafe.org/states/florida_codes/
11. *Manual of Uniform Minimum Standards for Design, Construction, and Maintenance for Streets and Highways*, Florida Department of Transportation, May 2010, <http://www.dot.state.fl.us/rddesign/FloridaGreenbook/FGB.shtm>

