

# Accessing Transit Version 2

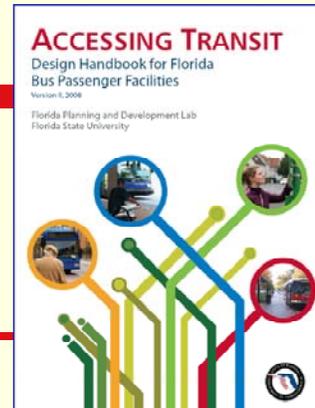
## Design Handbook For Florida Bus Passenger Facilities

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# Accessing Transit Version 2

## Overview

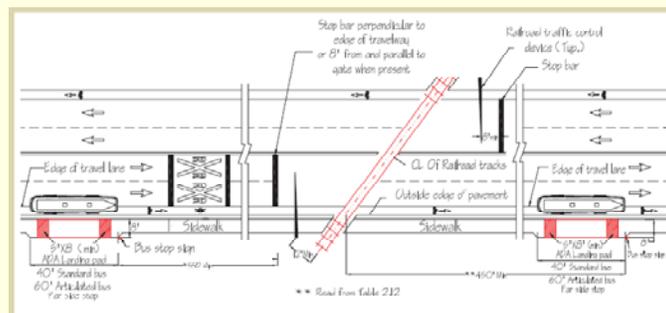
- Handbook can be used by a variety of users
  - Transit agency directors
    - Can customize these guidelines to provide specific physical design criteria within their agencies.
  - Transit agencies planners will want to use the handbook
    - As a basis for planning access improvements to enhance transit facilities.
    - For working with local jurisdictions to comply with transit concurrency levels of service.
    - To plan a bus passenger facility in tandem with street improvements.
    - To integrate guidelines into the broader policies of the local government.

## Accessing Transit Version 2 Overview

- Land use planners and growth managers, traffic engineers and transportation planners, and bicycle-pedestrian coordinators
  - Can work with their local transit agencies and MPOs to integrate guidelines with
    - Local comprehensive plan policies
    - Land use and concurrency ordinances
    - Pedestrian plans and street design guidelines.
- Developers or builders can use the handbook if
  - They are interested in developing transit friendly projects.
  - They are seeking to conform transportation concurrency requirements through transit provision.

## Handbook Version 2

- Revised throughout
  - Responds to comments received since 2004
  - Includes District 1 and 7 Guidelines and
  - District 4 Transit Facility Guidelines



## Handbook Version 2

- Includes important new guidance directed to enhancing inter-modal travel
- Increased universal design guidance
- Further guidance on greening transit facilities



## Handbook Version 2

- Redesigned
  - Improved graphic content
  - New layout
  - New graphic key in Chapters 1 and 2 to improve accessibility of information
  - Rewritten to meet plain language requirement



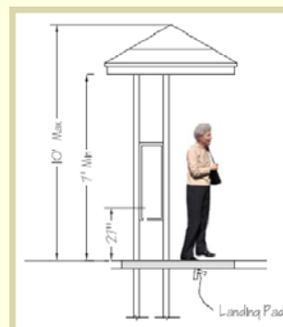
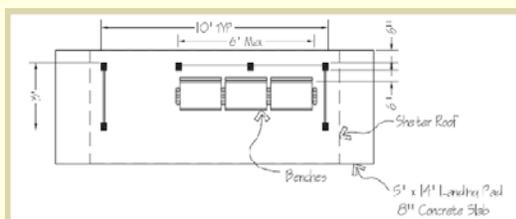
## Handbook Version 2

- Table of Contents
  - Chapter One
    - Curb-side Guidelines
  - Chapter Two
    - Street-side Guidelines
  - Chapter Three
    - Facility Prototypes
  - Chapter Four
    - Land Use Guidelines
  - Chapter Five
    - Safety Appendices



## Chapter One: Curb-side Guidelines

- Bus signposts and shelters
  - Provides additional information on frangibility
  - Incorporates changes to the FL Building Code as they regard bus shelters



## Chapter One: Curb-side Guidelines

- Provides information on single person solar-powered bus shelters and SMART bus shelters
  - Real-time visual displays in shelters indicating estimated waiting time
- Bus Stop Pads
  - Additional discussion on pavement design at bus bays
  - Additional information on low floor busses

### CURB-SIDE GUIDELINES

#### 1.4 Bus Stop Pads

##### Purpose

Bus stop pads including the area that is accessible to wheelchair users and other landing areas provide a well-drained, non-slippery surface with adequate space for oncoming and passenger movement on and off buses. Providing a designated bus stop area benefits all transit users. An area the length of the bus for transit passengers provides a comfortable waiting, alighting, and boarding area for both front and rear doors and denotes the transit agency's presence.

##### Accessibility Considerations

Wheelchair and scooter users, as well as elderly and inexperienced passengers (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 landing pad to operate the wheelchair lift and ramp. Wheelchair and scooter users require more space to turn around in than other transit users and therefore benefit from sufficient area at the bus stop to maneuver.<sup>1</sup>

##### Location Factors

Bus stop pads should be placed at all bus stops with shelters. It is preferable to provide pads at unsheltered bus stops with benches.

##### Design Factors

The dimensions of bus shelter pads may be adjusted as necessary to accommodate site conditions. The minimum size of bus stop pads, per ADA requirements, shall be 8 feet perpendicular to roadway by 5 feet (parallel to roadway).<sup>2</sup> The ideal bus stop pad size is 10 feet by 20 feet. See Figures 1.16 through 1.18 for alternative stop pad designs. 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 (8-foot for a standard bus and 6-foot for an articulated bus) adjacent to the curb and gutter. An additional 5-foot length is recommended for each additional bus expected to stop at the bus stop. When the available space for a pad is less than 10 feet by 20 feet, the pad should be as large as possible. If a shelter is planned for the location, the pad should follow the shelter profile. The pad should extend 6 inches beyond the area under the shelter canopy in order to prevent soil erosion caused by runoff.

Any equipment obtained for installing a pad should extend 2 feet beyond the pad. Bus stop pads should be connected to streets, sidewalks or pedestrian paths by an accessible route, the criteria for which are defined by the ADA regulations.<sup>3</sup> Bus stop pads should be designed to maintain a minimum clear width of 48 inches and vertical clearance of 80 inches from the sidewalk to the stop.<sup>4</sup> ADA requirements mandate a maximum slope of 2 percent to allow for drainage.<sup>5</sup> Pads for sheltered stops may include conduits and junction boxes for utilities.

For rural bus stops, the concrete pad for a shelter, if it exists, should not be obstructed by the bus stop sign or any other sign. See Figures 1.20 and 1.21. The concrete pad should be located outside the clear zone. Concrete sidewalks should meet ADA criteria.<sup>6</sup>

##### Possible Materials for Use

Bus stop pads should be constructed of reinforced concrete over an aggregate base or alternatively they may be made of recycled plastic or rubber aggregate. The thickness will vary according to the design of the anchoring required for various bus stop elements as affected by required wind loads.<sup>7</sup> Free edges of pavement should be strengthened with reinforcement.

### CURB-SIDE GUIDELINES

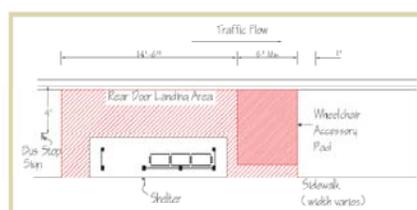


Figure 1.16 | Bus stop pad with shelter.

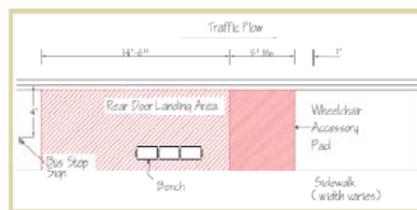


Figure 1.17 | Bus stop pad without shelter but with bench.



# Chapter Three: Facility Prototype

- New Facility Prototypes
  - Rail-bus inter-modal center
  - Air-bus inter-modal center
  - University transfer center
  - BRT station



## FACILITY PROTOTYPES

### Interstate Stations

Interstate stations are located within the median where interstate highways are used for rail alignments. Structural sound walls and overhead canopies should be provided to ensure security of the stations. Additionally, interstate station platforms are often separated from direct pedestrian access, bus transfer facilities and parking areas, complicating convenient access to the station.<sup>8</sup>

A single platform shared between the bus and rail stations creates a safe and clear corridor between modes of transportation. These stations provide vehicular access in some form, ranging from small kiss-and-ride (drop-off and pick-up facilities to reserved park-and-ride structures. The function of station and site (size and shape) both determine parking capacity. The design of the station and parking can manage impacts on surrounding properties and maximize

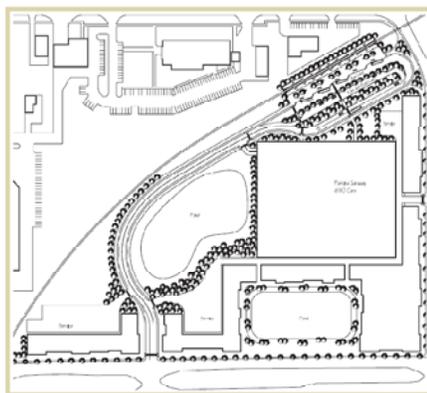


Figure 3.25 | Plan of a rail-bus intermodal transit station in an activity center context.

## FACILITY PROTOTYPES



Figure 3.26 | Section showing at-grade tracks and single platform connecting both modes of transit.

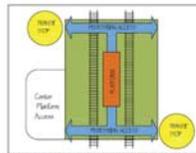


Figure 3.27 | Diagram of a central platform station.

development opportunities around each station. Figure 3.26 is a diagram showing the at-grade tracks and single platform connecting both modes of transit.<sup>9</sup>

There are three basic platform arrangements. They are central, side, and split platforms. Each is described below.<sup>10</sup>

### Center Platform Stations

Center platform stations allow transit customers to be distributed for boarding light or heavy rail vehicles traveling in either direction from a single location. It is the most customer friendly and cost-effective platform configuration. Figure 3.27 shows a diagram of a central platform station.

### Side Platform Stations

This configuration uses separate platforms to distribute

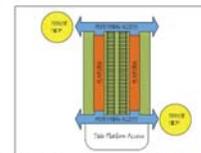


Figure 3.28 | Diagram of a side platform station.

passengers for each direction of travel. It accommodates large volumes of customers. Figure 3.28 shows a diagram for a side platform station.

### Split Platform Stations

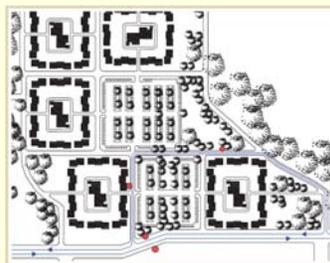
This station also has two platforms, arranged as side platforms serving each direction. It is typically used at the intersection of streets with medians. This configuration minimizes the right-of-way necessary for the station, by locating platforms opposite of left turn lanes.<sup>11</sup> Figure 3.29 shows a diagram of split platform stations.

### Approximate Site Area

One quarter to one half acre without parking. Between acres with parking.

# Chapter Four: Land Use Guidelines

## ■ New Transit Friendly Multi-Family Development Guidelines



### LAND USE GUIDELINES

#### 4.11 Transit-discouraging Office Building

**Density and Intensity of Use**  
Auto-oriented employment zones have floor area ratios of less than 0.25 and 4 to 5 parking spaces per 1,000 square feet of building. See Figure 4.11.

**Network Continuity**  
Few connections are made to other buildings or destinations. On-street walkways do not adhere to the pedestrian network beyond the boundaries of the property.

- Building Orientation**  
Buildings are oriented to the parking lot.
- Building Design**  
Entrances and structures are oriented to parking lots. Weather protection is provided only at the entrances of buildings.
- Landscaping**  
Perimeter sidewalks may not be buffered from auto traffic. Parking lots are unretained. Landscaping at auto entrances and building entrances may be of varied quality.

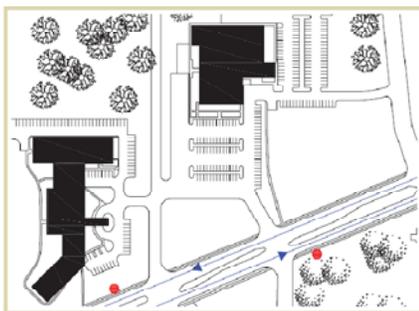


Figure 4.11 Many office buildings are set back from the right of way, causing increased trip length and reduced accessibility for transit riders and pedestrians. Bus stops are indicated in red dots in plan.

### LAND USE GUIDELINES

#### 4.12 Transit-oriented Office Building

**Density and Intensity of Use**  
Transit- and pedestrian-oriented office buildings are designed to allow for the future intensification of development. See Figure 4.12.

**Network Continuity**  
Sidewalks are provided around building perimeters and building entrances provide accessibility for pedestrians and transit riders. Sidewalks are articulated across driveway access.

- Building Orientation**  
Buildings are oriented to the street and to transit corridors. Building entrances are oriented to the pedestrian network.
- Building Design**  
All building facades facing the transit corridor and pedestrian network have windows or display, signage and awnings along the pedestrian network provide protection from the weather.
- Landscaping**  
Landscape buffers are provided between transit routes and pedestrian paths. Trees provide a shade canopy along pedestrian and transit routes.

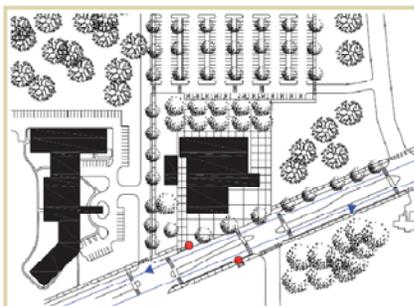


Figure 4.12 Simply locating an office building closer to the right of way greatly enhances its accessibility to transit riders and pedestrians. Bus stops are highlighted in red.

# Chapter 5: Safety

- New chapter on:
  - Safety at transit stops
  - Security at transit stops



## CHAPTER FIVE: SAFETY

### 5.1 Introduction

The safety of patrons at bus stops should get top consideration from transit agencies. Crime and crashes at bus stops endanger transit agency employees and customers, make them feel vulnerable and generate negative perceptions of transit that discourage ridership. Nevertheless, there is much that can be done through the design of bus transit passenger facilities to ensure passenger safety.

This chapter covers issues related to traffic, safety, security, and crime prevention at transit facilities. While the policing of crime is beyond the scope of transit agency missions, transit agencies can use design to limit passenger exposure both to criminal activity and to traffic safety hazards.

Crime prevention through environmental design, or CPTED, concepts seek to reduce vulnerability to crime.<sup>1</sup> Other techniques, outside of CPTED, can also be implemented to reduce passenger exposure to accident and injury. Like CPTED, the focus of the injury prevention section of this chapter is on simple and cost-effective design solutions and facility maintenance.

### 5.2. Environmental Factors Related to Crime at Bus Passenger Facilities

Table 5.1 below summarizes some of the findings from recent research focusing on bus stop crime.<sup>2</sup> Bus passenger facilities that are poorly maintained, especially where litter is allowed to accumulate, may be associated with higher rates of crime. The presence of litter may convey the impression that no one cares or takes responsibility for the bus stop, turning it into a "nobody's land." On the other hand, a clean bus stop indicates that regular maintenance is performed and that the transit agency cares about its facilities and its passengers. Well-maintained facilities may lead people to feel safer and more comfortable waiting for the bus and may increase pedestrian transit. See Figure 5.1.

Pedestrian presence and visibility are, in fact, the two environmental factors most often associated with lower rates of crime. In other words, a high pedestrian presence and high transit stop visibility may correlate with lower crime rates at bus passenger facilities. Increased pedestrian presence in the vicinity of a bus stop provides more surveillance of the environment. Visibility, the absence of visual obstructions, allows passers-by, local businesses, passing motorists and others to keep an eye on the bus stop and minimize places in which it is easy to hide, look or loiter without notice. Figure 5.2 illustrates a facility that offers poor visibility.

Table 5.1 | Environmental variables related to bus stop crime

Variables Associated with Higher Crime Rates	Variables Associated with Lower Crime Rates
<b>Total Crime Rates</b>	
Level of litter	Pedestrian presence
Lighted stores and other undesirable establishments	Visibility
Vacant buildings and lots	Large front-loaded commercial
Hand-down buildings	Bus shelters
	Street traffic
<b>Violent Crime Rates</b>	
Vacant lots	Large front-loaded commercial
Hand-down buildings	Visibility
	Pedestrian presence

Source: Uggler, R., Subudis-Suhis, A. & Henricks, J. (2005). An stop environmental condition. The characteristics of the bus environment correlate with bus stop crime. CPTED Report No. 413.

## SAFETY

### 5.3. Crime Prevention Through Environmental Design (CPTED)

Research has shown that at all transit-related crime, about 46 percent occurs on the bus, 32 percent occurs at the bus stop, and the other 22 percent occurs when passengers travel to and from the transit passenger facility.<sup>3</sup> In general, non-transit riders are three times more likely than transit riders to perceive bus passenger facilities as dangerous because of crime,<sup>4</sup> because there is a strong correlation between perceptions of personal security and willingness to ride the bus. Transit agencies seeking to lure more "choice riders" to transit should concern to the wider public, that bus passengers in them, are safe, secure, and crime-free.

There are several strategies transit agencies can employ to increase the perceptions of safety at bus passenger facilities. First, every effort should be made to the bus stops in front of establishments that offer opportunities for mutual surveillance and away from desolate spaces, empty lots, and vacant buildings. Additionally, the placement of bus stops in the immediate vicinity of establishments that attract crime (liquor stores, bars, adult bookstores and movie theaters) as well as facilities that favor many cash transactions (pawn shops or check cashing establishments), should be avoided. It is important to install and maintain sufficient lighting (see Section 1.8 for lighting standards), especially at stops served by night routes, if streetlights do not provide ample illumination. Agencies should consider installing LED lighting that is both resistant to tampering and more efficient or solar lighting. Regular maintenance of landscaping around and on bus stops and transit facilities should be performed. Overgrown bushes potentially present a security hazard and obstruct the approach on the sidewalk and landing area to the bus stop.

Transit agencies should strive to keep the bus stop environment clean from graffiti and litter, thus sending the message that the bus stop environment is actively looked after and kept in order. Transit facilities should be clean, well kept environments in order to increase perceptions of safety and decrease potential projections of crime. Any opportunities to store explosive or other harmful objects in and around transit facilities should be eliminated by installing hand-pumped trash cans (see Section 1.11) and by ensuring that bus shelter partitions can be seen in, around, and through.



Figure 5.1 | A clean, well-maintained bus stop indicates that regular maintenance is performed and that the transit agency cares for its bus stops and its passengers.



Figure 5.2 | Even temporary low-visibility can create places where it is easy to hide, look, or loiter without notice.

Finally, agencies should consider hiring transit police or engaging local police and sheriff's departments to cope with any crime that may occur on the buses and at bus stops.

Bus stops that are used by students, the following additional considerations are important. Bus stops near schools should be located in the vicinity of clearly established and defined school property lines. Any opportunity to collocate bus passenger facilities with blue security lights having direct phone connection to police should be realized.

(continued on page 7)

## Acknowledgements

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The Florida Department of Transportation (FDOT) requested that Florida State University (FSU) develop for Florida Transit agencies design guidelines for bus passenger transit facilities. Beyond identifying the minimum standards, the purpose of this study is to provide transportation agencies with feasible alternatives when developing bus passenger facilities that focus on the interaction of transit facilities with transit operations and the built environment.

The following members of the FSU community participated in conducting the research, analysis and preparation of this report:

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