Accessing Transit Handbook Workshops

January – March 2024

1

1

Agenda

Welcome! 8:00 AM	Introductions & Housekeeping
8:30 AM	Transit, ADA & Handbook 101
9:00 AM	Collaboration & Coordination
9:45 AM	Break
10:00 AM	Bus Stop Components
11:30 AM	Training Activity #1
12:00 PM	Lunch
1:00 PM	Bus Stop Placement
2:15 PM	Break
2:30 PM	Training Activity #2
3:15 PM	Break
3:30 PM	BRT Station Design
4:15 PM	Accessing Transit Resources
4:30 PM	Wrap-Up & Evaluations
4:45 PM	Adjourn

2

2

Introductions & Housekeeping

- Training Materials
  - Available to download from PTO website
- AICP/PE Credits
  - FDOT has applied for credits
- Breaks
  - Three 15-min. breaks
  - One hour lunch
- Activities
  - Pre-training poll & two hands-on interactive exercises
- Know Your Workshop Instructors!

FDOT PUBLIC TRANSIT

3

3

Pre-Training Poll

4

4

Pre-Training Poll

I represent…

A. Transit Agency
B. Transit Contractor
C. FDOT District
D. MPO/Planning Agency
E. Municipality or County
F. Other Public Agency
G. Private Consultant

5

5

Pre-Training Poll

My role with facility development is best described as…

A. Bus stop site selection & approvals
B. Designing bus stops & transit facilities
C. Reviewing & permitting bus stop locations
D. Building & constructing bus stops & transit facilities
E. Developing specifications & RFPs for bus stop contracts
F. Primarily on-going maintenance of bus stops

6

6

Pre-Training Poll

My use of the *Accessing Transit* handbook is best described as…

A. Never or rarely; looking to learn much today
B. Occasionally; not too familiar with any version
C. At times; somewhat familiar with previous version
D. Somewhat routinely; comfortable with previous version
E. Often & regularly; familiar with current (latest) version

FDOT PUBLIC TRANSIT

7

7

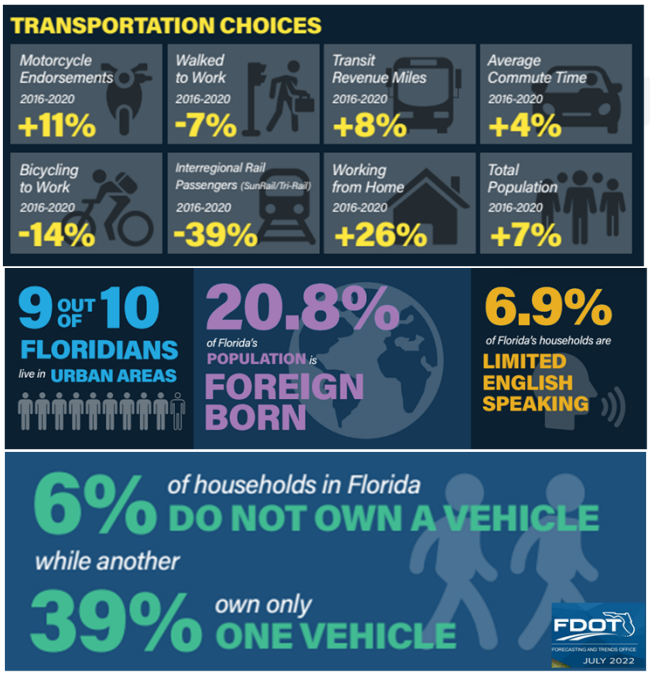
Transit, ADA & Handbook 101

8

8

Transit in Florida

- Growing population
- Need for better services & facilities
- Multimodalism
- FDOT initiatives
  - Complete Streets
  - Safety programs
  - Multimodal (bike/ped expansion)
- Need for coordination & collaboration



9

9

Transit in Florida

10

10

The Americans with Disabilities Act (ADA)

- Civil rights law
- Provides equal access to facilities & services
- Applies regardless of funding
- Covers public & private entities & services

11

11

Why ADA is Important for Transit

- National mandate, enforced Federally
- All new facilities must be accessible, if NTP issued after 1-25-92
- All alterations after 1-25-92 must be readily accessible & usable
- One of the five Parts dedicated to public transportation

12

12

FDOT ADA Procedure

- FDOT issued ADA compliance procedure effective January 8, 2021 (#625-020-015-i)
- Specifies compliance with ADA requirements, for FDOT facilities, within state rights of way, or funded with state funds
- FDOT staff, consultants, contractors & partnering agencies responsible for complying to the maximum extent feasible
- Identifies regulatory sources, citations, guidance and reference documents

13

13

FDOT ADA Procedure

- Must ensure that applicable accessibility compliance issues are addressed
- **ADA & Florida Accessibility Code for Building Construction (Access Code)** are the basis for compliance guidance & best practices
- Florida's accessibility standards include some that are more restrictive than the US requirements
- Therefore, FDOT criteria are the premiere governing source for accessibility requirements in the State of Florida **when they are the most stringent**
- **Reverting to less restrictive federal minimums is not permitted**

14

14


Why Do We Need a Design Handbook?
DRIVELINES, INC.
DRIVESHAFT & CV REPAIR
E Humphrey
JCT
580
BUS STOP
2
39
15

15


Why Do We Need a Design Handbook?
JOHN'S PLAQUES AND ENGRAVING 839-7081
BUS STOP
36
85
A JAYCEE PROJECT
16

16

Why Do We Need a Design Handbook?

17

17

Accessing Transit Handbook: Objectives

- Enhance accessibility & safety for everyone at Florida's bus stops!
- Ensure early coordination & consideration of transit facilities on all FDOT projects
- Promote consistency statewide
- Ensure ADA compliance
- Promote agency collaboration
- Streamline administrative & technical processes

18

18

Goals with 2023 Handbook Update

- Add/update applicable requirements
  - Major update in a decade
  - Builds on 2017 minor update
- Handbook that is easier to use & access
- Capture new/renewed best practices in facility accessibility & design
- Prepare FL agencies for new State of Good Repair & Asset Management requirements/compliance

2023 Handbook Features

DESIGN TIP

A transit agency should consider providing concrete B&A areas at bus stops if there are water drainage issues or the stop is regularly used by patrons using mobility aids.

PLACEMENT TIP

Consider unsheltered benches at locations where the regular number of riders does not warrant a shelter or in high-use areas that are unsuitable for shelters because of high levels of pedestrian movement in a small area.

Design Dimensions

- Use Type E curb (5" curb height) and gutter for B&A areas on flush shoulder roadways.[2]
- Maximum slope of 1:12 (8.33%) should be provided on the upstream side of the B&A area's landing.[2]
- A sidewalk and/or ramp provided with a B&A area must be a minimum of 60" (5') in width, and the ramp must not exceed a slope of 1:12 (8.33%).[2]
- Parallel to the roadway, the slope of the B&A area must be the same as the roadway, to the maximum extent practicable.[2]
- Perpendicular to the roadway, the slope of the B&A area must not be steeper than 1:50 (2%).[2]

CASE STUDY

Responding to Existing Conditions to Meet Desired Infrastructure Goals

Orange County, FL

LYNX, the transit agency that mainly serves Orange, Seminole, and Osceola counties in Florida, providing over 17 million trips annually, has continued to improve and upgrade connectivity at its bus stops. The agency attempts to install bus shelters at applicable stops as part of this process, but regularly runs into issues with existing topography and already-existing sidewalk infrastructure. For example, at a site along US 192 in Kissimmee, the ditch at the bus stop, which was mildly graded, was too shallow to pipe underneath. The shelter would be too low if it were located adjacent to the sidewalk, and there also was no right-of-way available behind the sidewalk.

To remedy this issue and proceed with the sheltered bus stop LYNX had planned for this location, a shelter was placed to allow for a ramp down to the sidewalk, which required a curb transition along the shelter edge. The sidewalk transitions (at a 5% max slope) were needed to get down to the existing grade.

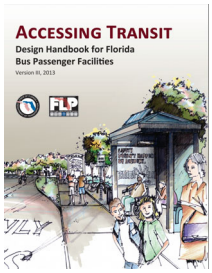
Figure 3.3.4 | Before accessibility improvements.

Figure 3.3.5 | After accessibility improvements and adding the bus shelter.

List of Acronyms

Index of Topics

2023 Handbook Format Changes



Handbook Element	Previously	Now
Key Requirements	Underlined, mixed with best practices	Separated from best practices for easy look up
Quick Reference Guide	End of each chapter	Appendix
Overviews of Service Types & Facilities	Early chapter	Appendix
Agency Coordination	Last chapter	First, right after intro chapter
BRT & Rail Station Design	Minimal coverage on both BRT & Rail	Expanded coverage BRT; Rail not included

21

21

Collaboration for Better Bus Facilities

22

22

Why Collaborate?

It helps **define** project's purpose, **involves** the right people & **achieves "buy-in"** from all involved parties to **collectively reach** the desired goal!

23

23

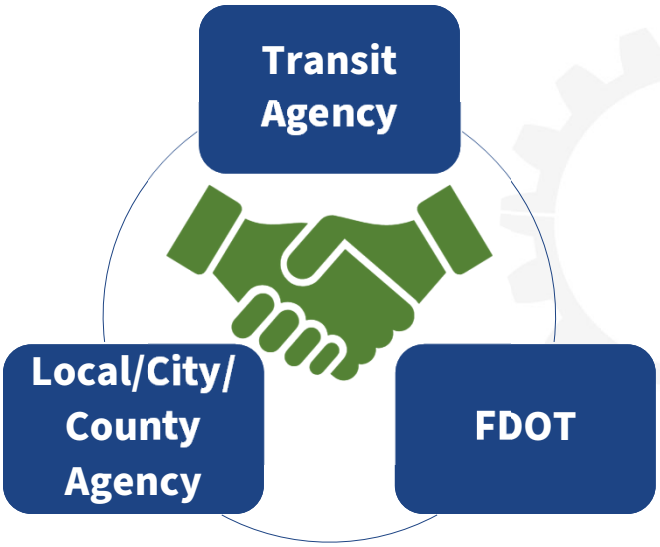
How to Collaborate

- Early & often
- Keep open dialogue
- Clarify roles
- Understand & align goals
- Follow up

24

24

Collaboration Partners



25

25

Agency Roles as a Collective

- Create transit-inclusive development review process
- Utilize GIS-based tools to screen for access & stop needs
- Conduct “bus stop influence area” walking & infrastructure audits

26

26

Transit Agency Role

- Take the lead
- Create & adopt agency standards
- Coordinate with jurisdictions & FDOT
- Establish MOUs
- Develop a quick reference contact list
- Develop required document templates & checklists
- Schedule regular meetings

27

27

Transit Agency Role

- Develop bus stop placement/maintenance agreements
- Establish bus facilities task forces
- Serve on MPO advisory committees
- Engage early in project review & scoping processes
  - Participate when asked & follow up when needed!
- Learn & know FDOT processes
- Do the homework
  - Learn about your roads, transit systems & planned improvements!

28

28

FDOT Role

- Understand the needs
  - Needs of local agency planning the bus facility
- Know which counties or cities have transit
- Contact the right people & ask the right questions
- Know the resources
- Understand FDOT's roles
  - Transit is an FDOT concern, not just responsibility of local entities

29

29

FDOT Role

- When invited, participate!
- Conduct roadway safety audits
- Collect needed information on affected roadways
- Ask many questions
- Conduct periodic & recurring workshops with transit agencies.

30

30

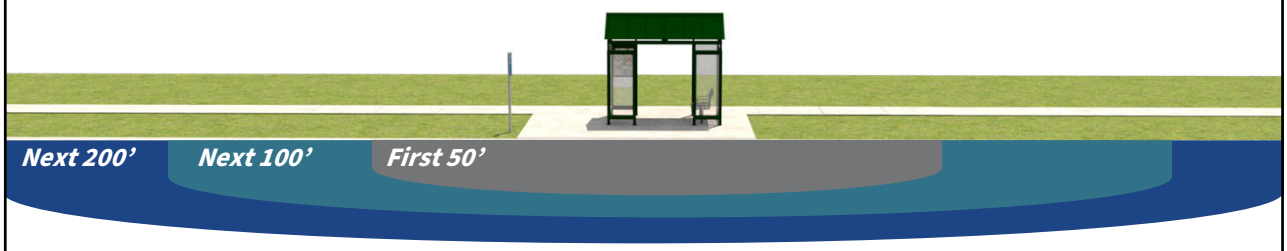
Local/City/County Agency Role

- Know who to contact
- Illustrate your needs
  - Detailed & complete development plans help!
- Manage & maintain your facilities to ensure compliance
- Maintain safe, accessible pathways to transit stops & buses
- Establish a process of public notification

31

31

Agency Roles & Responsibilities



Let's look at who should get involved & their roles within 250' of a bus stop!

32

32

Agency Roles & Responsibilities

Transit Agency
- Shelter Location
- Shelter Lighting
- Shelter Maintenance
- Real Time Information
- Safety Warnings
- Leverage Land Use & Roadway Projects
- Push Button

Roadway Owner
- Sidewalk Connection, ADA Access
- Connectivity
- Landscaping
- Mid-Block Crossings
- Electrical Connection
- Leverage Projects
- Transit Agencies Input

Public Works/ Utilities/Water
- ADA Access
- Canal Maintenance (as applicable)

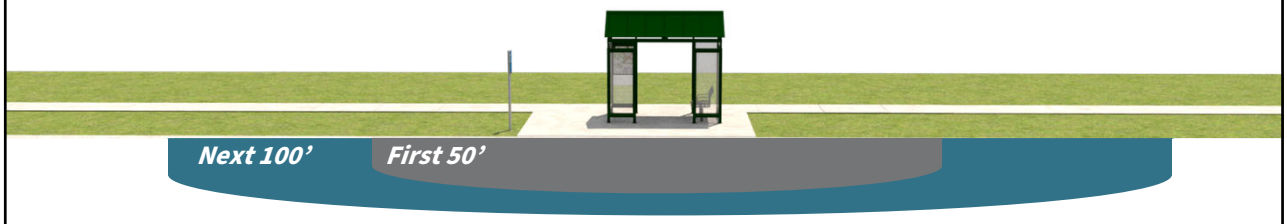
Law Enforcement
- Enforce Speed Limits & Safe Driving
- Prevent Jaywalking

Private Property Owner
- Developer Commitments
- On-Site Pedestrian/ Bicycle Connections
- Transit Agencies Input

33

33

Agency Roles & Responsibilities



Transit Agency
- Safety Warnings
- Leverage Land Use & Roadway Projects
- Guide Rider to Push Button

Roadway Owner
- Sidewalk Connection, ADA Access
- Pavement Markings
- Landscaping
- Review for Mid-Block Crossings
- Push Buttons/Signals
- Transit Agencies Input

Public Works/ Utilities/Water
- ADA Access
- Canal Maintenance (as applicable)

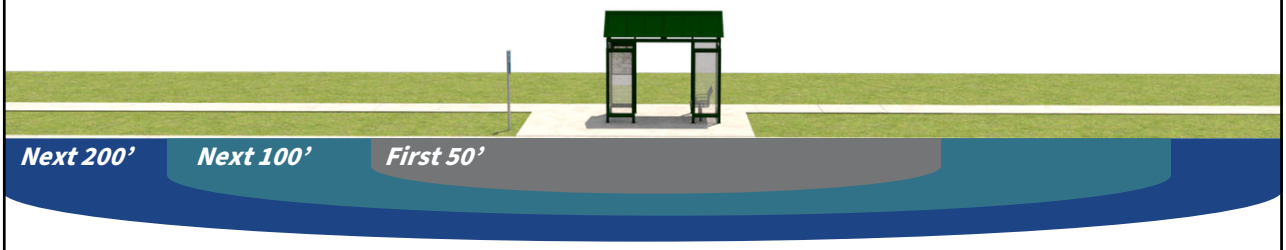
Law Enforcement
- Enforce Speed Limits & Safe Driving
- Prevent Jaywalking

Private Property Owner
- Developer Commitments
- On-Site Pedestrian/ Bicycle Connections
- Input from Transit Agencies Required

34

34

Agency Roles & Responsibilities



Transit Agency
- Leverage Land Use & Roadway Projects

Roadway Owner
- System & Network Connections
- Landscaping
- Review for Mid-Block Crossings
- Signal Optimization
- Maintenance of Traffic Agreements

Public Works/ Utilities/ Water
- ADA Access
- Canal Maintenance (as applicable)

Law Enforcement
- Enforce Speed Limits & Safe Driving
- Prevent Jaywalking

Private Property Owner
- Developer Commitments
- On-Site Pedestrian/ Bicycle Connections
- Input from Transit Agencies Required

35

35

When to Collaborate

- Initiating **facility permitting** for bus stops, shelters, benches, or other amenities
- Placing new bus stops within the **public right-of-way**, especially adjacent to existing uses and/or planned developments
- Designing bus stops & their related access as part of **joint efforts with developers**

36

36

Milestones for Collaboration

- For **routine cleaning & maintenance** of bus stops, to help establish partnerships and/or support local match for grant funding
- For **advertising** at bus stops to support potential generation of revenue
- When working with the private sector to **adopt bus stops** or buy & implement amenities

37

37

Milestones for Collaboration

- **Expanding** bus stops to include more amenities or handle more bus activities
- Before & during **roadway construction** that may impact bus stops & bus operations
- When **improving** bus stop **accessibility** issues
- When **removing or relocating** a bus stop for safety reasons or operational improvement

38

38

Initiating Collaboration

- **Most want** to work cooperatively & be actively engaged
- Plan and/or participate in **joint training** opportunities to establish relationships, common ground & references
- Seek & attend activities and/or workshops where **common issues** may be discussed

39

Things to Remember...

- **Find common ground & mutually understand the parameters** in which agencies must operate; local agencies should ask about FDOT restrictions & allowances; FDOT needs to be aware of local goals & desires for the communities that it impacts
- Know the applicable regulatory requirements & **always use the most stringent regulations**

40

FDOT PUBLIC TRANSIT

40

Bus Stop Permit Process

- For placement of benches & shelters: Rule 14-20, FAC, places the permitting process for state rights-of-way with the local jurisdictions
- Best practice is:
  - Coordinate with local jurisdiction issuing permit
  - Contact FDOT Operation Centers to coordinate with local maintenance staff for ADA-related issues
  - Contact District ADA Coordinator and/or Public Transit Office

41

41

BREAK

42

42

Bus Stop Components

43

Let's Discuss…

- Requirements (R)
  - Boarding & alighting areas
  - Signs
  - Benches
  - Shelters
  - Bicycle parking
  - Landscaping
  - Other design elements
- Design dimensions
- Examples/best practices

44

44

Boarding & Alighting (B&A) Areas

45

45

B&A Areas

- Must have a firm, stable & slip-resistant surface (8'x5')
- Required if amenities such as benches and/or shelters are provided
- Accessible path must be provided (60" clear width, 84" vertical clearance, unless allowed differently)
- Connecting sidewalk/ramp must be minimum 5' in width & ramp must not exceed 1:12 (8.33%) slope
- Must be connected to streets, sidewalks, or pedestrian paths by an accessible route

46

46

B&A Areas

- Detectable warning is required where a sidewalk associated with a B&A area connects to the roadway at grade
- Slope: Parallel to roadway, same as roadway; perpendicular to roadway, not be steeper than 1:50 (2%)
- Can be located either within or outside the shelter
- If concrete, must be 6” thick

47

47

B&A Areas on Flush Shoulder Roadways

- Should be at shoulder break or edge of shoulder pavement for roads posted at 45 mph or less
- Use a Type E curb & gutter (5” curb height)
- Be connected to the sidewalk along the roadway, or to the roadway when no sidewalk present
- Areas surrounding B&A area must be flush with adjacent shoulder & side slopes & designed to be traversable by errant vehicles
- On upstream side, maximum slope of 1:12 should be provided (may be grass or a hardened surface)

48

48

B&A Area Design Dimensions

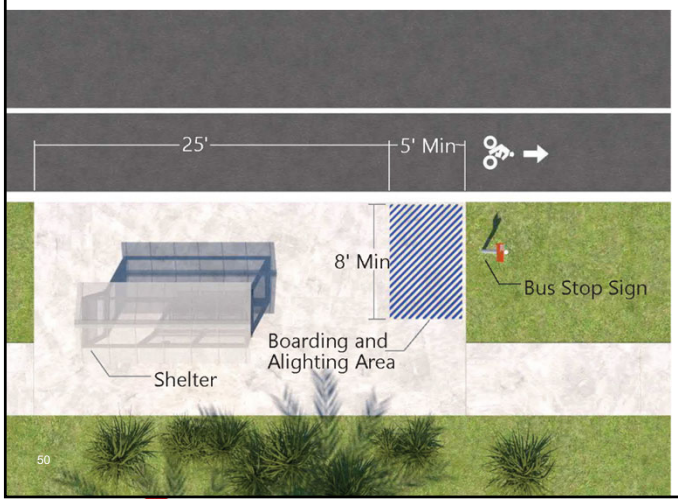
- Minimum dimensions are 8’ (perpendicular to roadway) by 5’ (parallel to roadway)
- A continuous 8’-deep concrete pad along the entire length of the bus stop (40’ for a standard bus, 60’ for an articulated bus) adjacent to the curb & gutter is recommended for sheltered stops in urban areas
- For continuous pads, an additional 50’ length is recommended for each additional bus stopping concurrently
- Use Type E curb (5” curb height) & gutter for B&A areas on flush shoulder roadways
- Maximum slope of 1:12 (8.33%) should be provided on the upstream side of the B&A area’s landing
- A sidewalk and/or ramp provided with a B&A area must be a minimum of 60” (5’) in width & the ramp must not exceed a slope of 1:12 (8.33%)
- Parallel to the roadway, the slope of the B&A area must be the same as the roadway, to the maximum extent practicable
- Perpendicular to the roadway, the slope of the B&A area must not be steeper than 1:50 (2%)

49

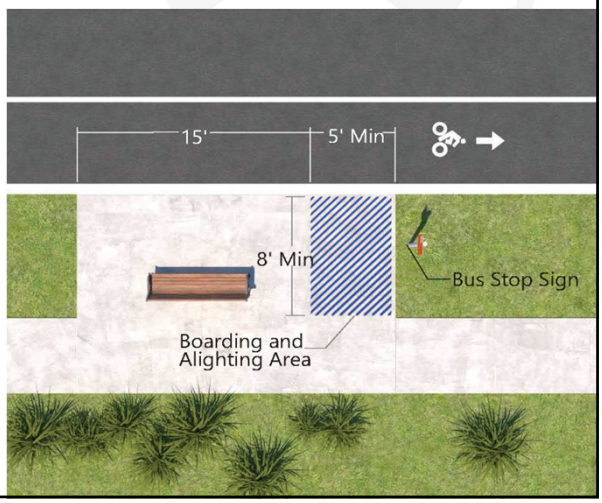
49

B&A Areas

- With shelter



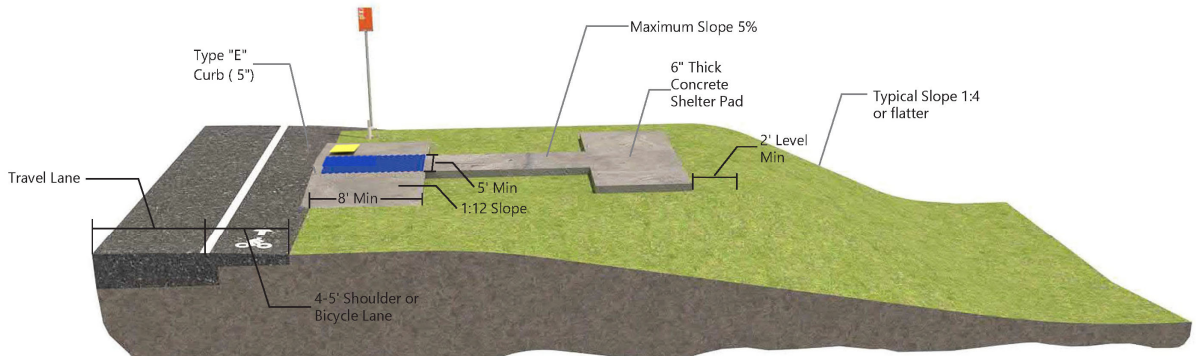
- With bench



50

B&A Areas

- Suburban/no shelter

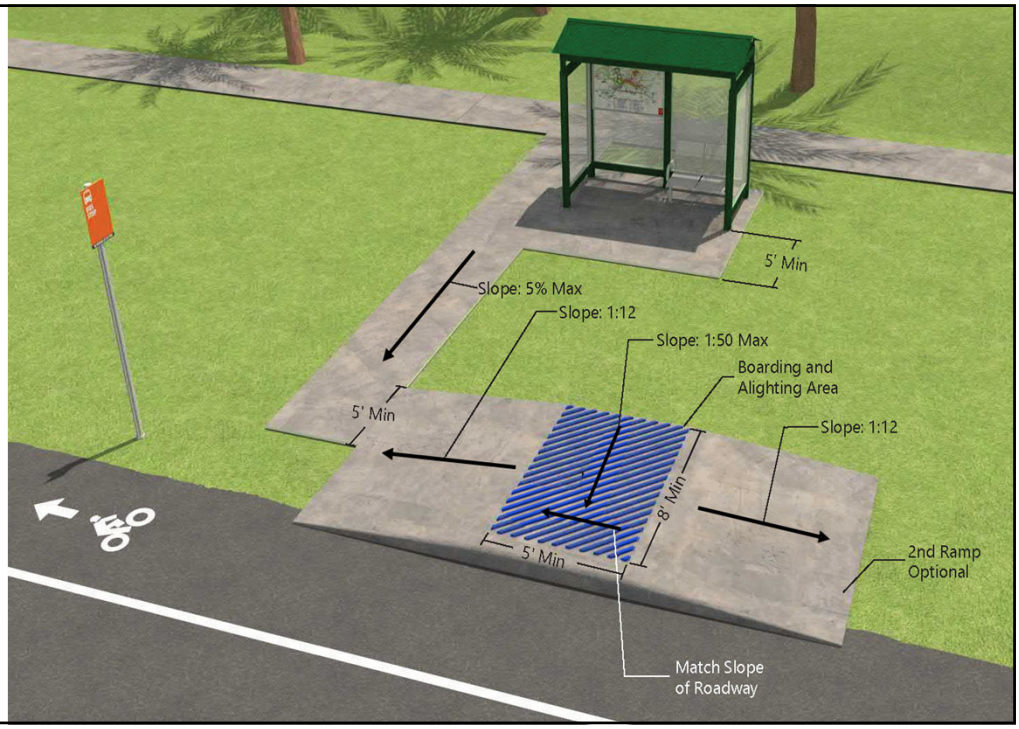


51

51

B&A Areas

- On flush shoulder



52

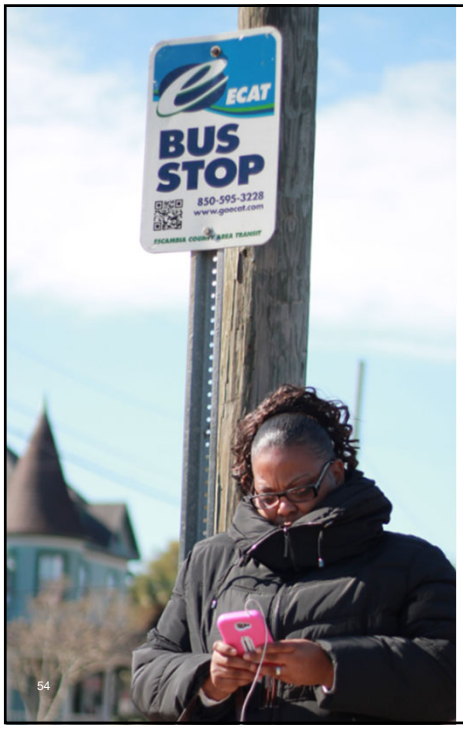
52

B&A Areas

- Examples/best practice

53

53



Bus Stop Signs

FDOT PUBLIC TRANSIT

54

54

Bus Stop Signs

- In business/residential curb & gutter sections, keep minimum 2' distance from face of the curb to nearest edge of the sign
- Provide minimum 7' vertical clearance; if less & installed on an accessible route, provide barrier to warn people
- Signs with leading edges more than 27" & not more than 80" above ground must only protrude 4"

55

55

Bus Stop Signs

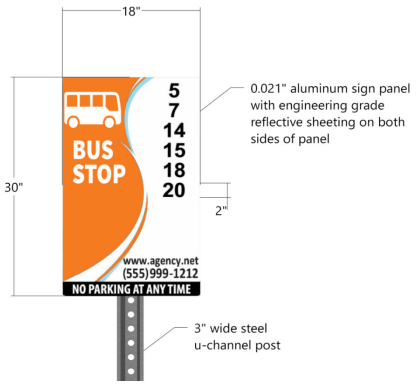
- Must have route indicators on them
- Non-glare finish for fonts & background; use fonts that contrast with the background
- Use font height per uppercase letter "I"
- Bus schedules, timetables & maps do not have to meet bus stop sign requirements

56

56

Bus Stop Signs

Bus Stop Sign Visual Character Heights (based on height of the sign & horizontal viewing distance)		
Height to Finish Floor or Ground From Baseline of Character	**Horizontal Viewing Distance**	**Minimum Character Height**
40” to less than or equal to 70”	Less than 72”	5/8”
	72” and greater	5/8”, plus 1/8” per foot of viewing distance above 72”
Greater than 70” to less than or equal to 120”	Less than 180”	2”
	180” and greater	2”, plus 1/8” per foot of viewing distance above 180”
Greater than 120”	Less than 21’	3”
	21’ and greater	3”, plus 1/8” per foot of viewing distance above 21’



57

57

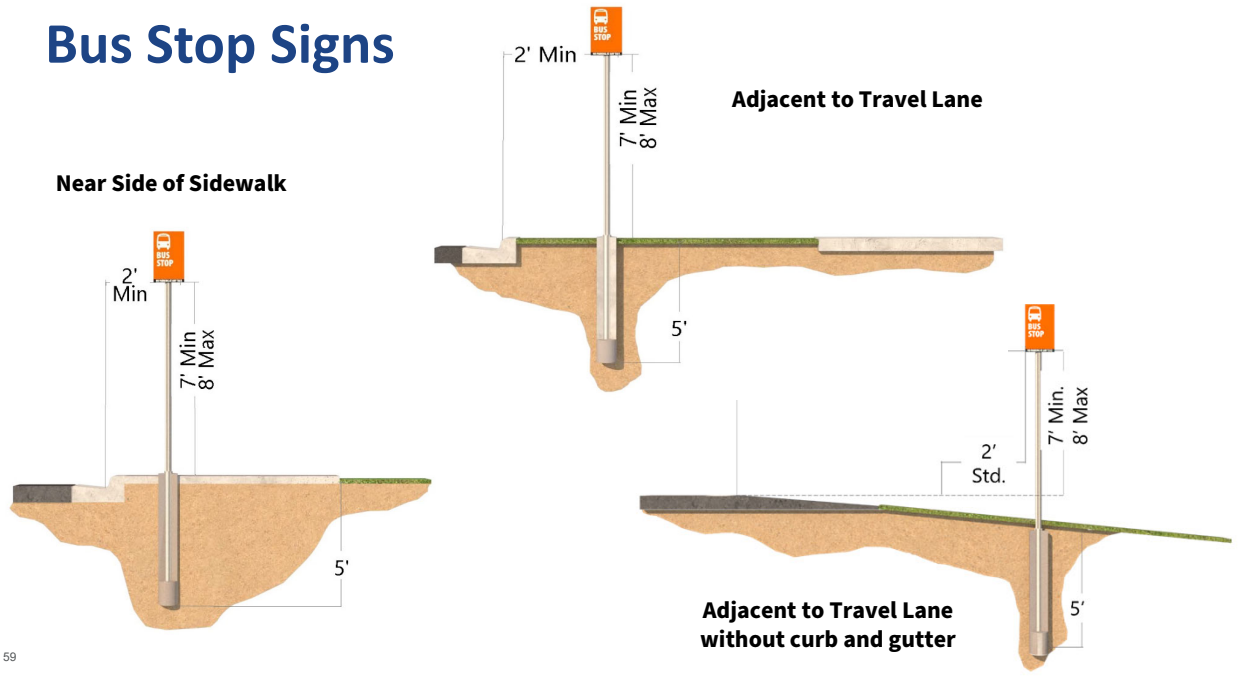
Bus Stop Sign Design Dimensions

- The dimensions and shapes of bus stop signs can vary; the typical height & width of a rectangular bus stop sign are 30” by 18”
- The minimum height of the bus stop sign, measured vertically from the bottom of the sign to the top of the curb or, in the absence of curb, measured vertically from the bottom of the sign to the elevation of the near edge of the traveled way, must be 7’
- To the maximum extent practicable, minimum character heights must comply with specifications listed in the updated handbook

58

58

Bus Stop Signs



59

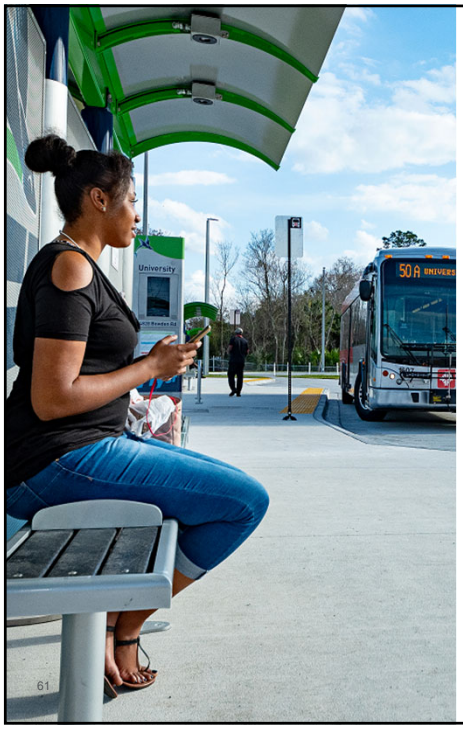
59

Bus Stop Signs

- Examples/best practice

60

60



Bus Stop Benches

FDOT PUBLIC TRANSIT

61

61

Benches

- Clear floor or ground space 30”x48”minimum with slopes not steeper than 1:48 (2.08%) shall be provided & shall be positioned at the end of the bench seat & parallel to the short axis of the bench
- Must be able to support 250 lb of force applied at any point on the seat, fastener, mounting device, or supporting structure
- Shall provide for back support or shall be affixed to a wall
- All benches should be slip-resistant & designed to shed water
- Shall be placed only at agency-authorized transit stops

62

62

Benches

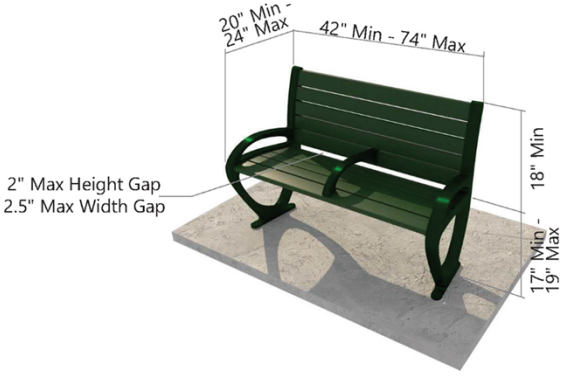
- Commercial advertising shall be displayed upon a bench only on either the front or rear surface of the backrest area
- Any bench placed on any part of a sidewalk shall leave a clear, unobstructed width of minimum 4’ for pedestrian traffic wholly within the improved walking surface
- Prohibited in medians except when maintained by BRT providers utilizing an inside lane for passenger transport
- Location must meet setback & minimum clear recovery zone requirements as established in the FDM
- Benches must not obstruct the full 5’x8’ B&A area or passenger access to loading & unloading

63

63

Bench Design Dimensions

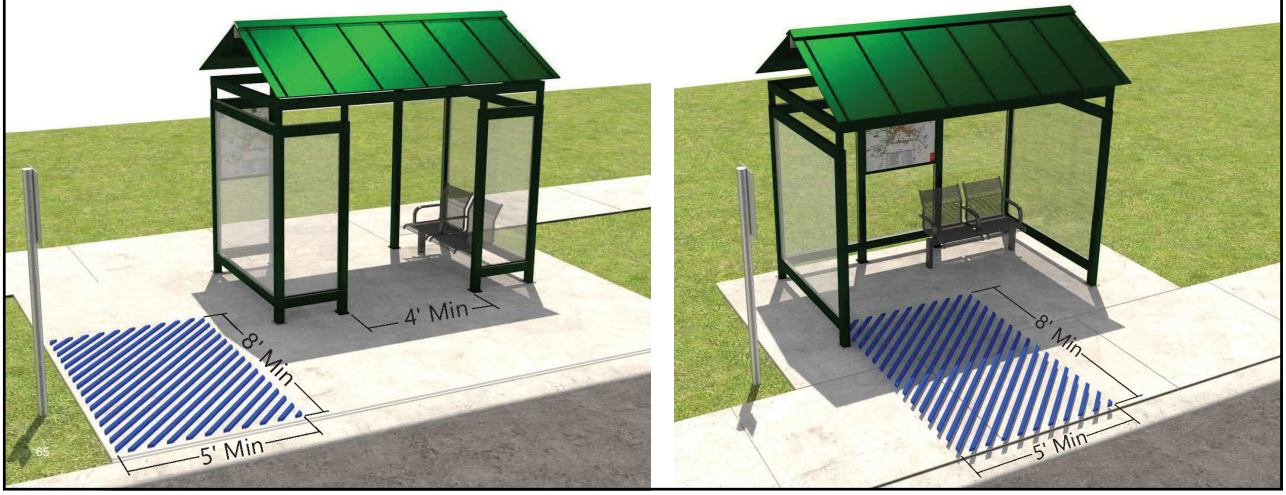
- Bench seat depth: min 20” to max 24”
- Bench height: min 35”
- Bench width: min 42” to max 74”
- Bench seat height above ground or floor: min 17” to max 19” (17” preferred)
- Back support: extends from a point 2” max from above the seat surface to a point 18” min above the seat surface.
- Max width gap of 2.5” between back support & rear edge of bench seat



64

64

Bench Placement



65

Bus Benches

- Recommended if bus headways are longer than 15 minutes
- At least 50% of the benches, but no less than one, at each bus stop location should be fully accessible
- Examples/ best practice

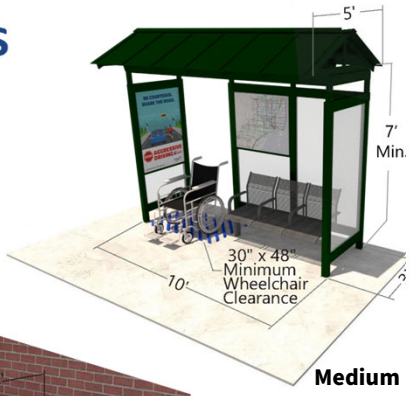
66

Bus Stop Shelters

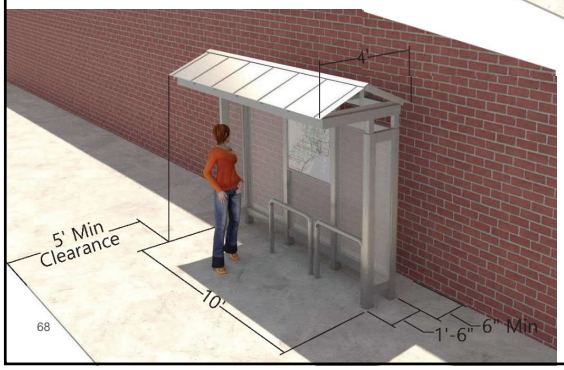
FDOT PUBLIC TRANSIT

67

Bus Shelters

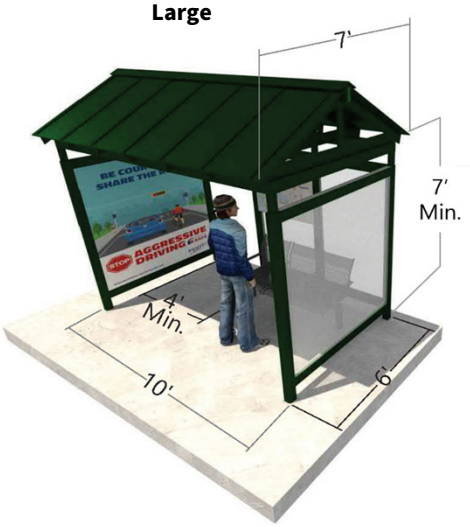


Small



Medium

Large



68

Bus Shelters

- Only at bus stops
  - Designated by transit agency
  - Served at least 10 times/5-day period (excluding weekends & holidays)
- Provide minimum 30”x48” clear floor area entirely within perimeter of the shelter
- If stop B&A area is extended into shelter, no obstructions to clear space
- Entry & exit points must have minimum clear width of 4’ (ADA requirement is 3’)
- Changes in level greater than ½” must be ramped
- No more than one ad (no greater than 6’x5’ in size) per side, including roof
- No ads with reflectorized material or otherwise cause a glare
- Owner of an abutting property must be notified if there will be ads
- Shelters must be connected by an accessible route to a B&A area

69

69

Bus Shelters

- Prohibited in medians, except when maintained by BRT providers using inside lane & on limited access roads
- If outside of urban limits:
  - No more than 2 shelters per mile of a 2-lane highway
  - No more than 4 shelters per mile on highways with 4 or more lanes
- Must meet setback & minimum clear recovery zone requirements established in FDM
- Must not obstruct sidewalk, bike/pedestrian path, driveway, drainage, or ditch
- Provide clear, unobstructed width of 5’ between edges of improved surface, not including top of any roadway curbs
- Sidewalks adjacent or connected to shelter must have width of at least 5’ or, at every 200’, provide at least 5’x5’ space
- No shelters within 15’ of accessible parking space or fire hydrant

70

70

Bus Shelters

- Must be securely attached to their foundations & provide for a clear opening to facilitate cleaning, preclude accumulation of debris & increase security
- Prior to installation, notify any impacted utility companies
- Provide an accessible route from sidewalk or roadway to reach a clear floor area of 30”x48” entirely within shelter
- Lights are not permitted for the sole purpose of illuminating advertising
- Flashing lights are prohibited
- Must be built in compliance with Florida Building Code wind-loading criteria
- Hardware shall be crashworthy if the shelter is not within the clear zone

71

71

Placement

- Boardings/ridership
- Transfer points
- Older adults & those with disabilities
- At park-and-rides
- Environmental necessity
  - Topography
  - Weather

72

72

Bus Shelter Design Dimensions

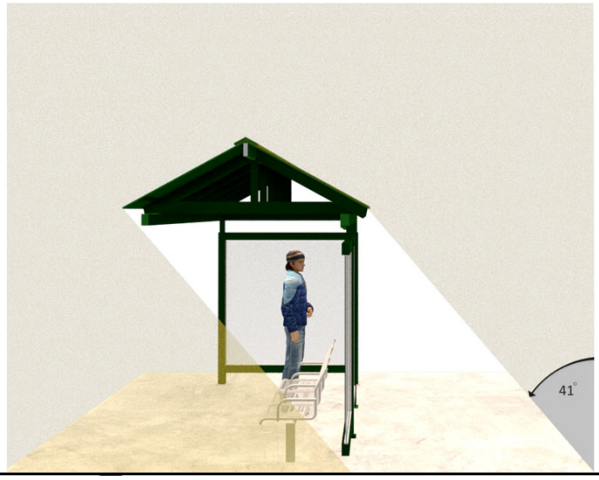
- Recommended minimum interior clearances for bus shelters:
  - Small (10’ wide, 1.5’ deep, 7’ tall)
  - Medium (10’, 3’, 7’)
  - Large (10’, 6’, 7’)
- Minimum 30”x48” clear floor area adjacent to the bench is required when a bench is within the shelter
- Minimum clear area of 2’ should be provided behind the shelter for maintenance
- Provide at least 3.5’ between back of curb & edge of roof or panels of shelter
- Shelter access entry & exit points must have minimum clear width of 4’
- Maximum dimensions of an advertisement in bus shelters is 6’x5’
- No more than one advertisement that meets the minimum dimension requirements is allowed per each side of a bus shelter, including the roof

73

73

Bus Shelters

- For bus stops oriented to southeast/southwest, design shelters to provide adequate shade for waiting patrons

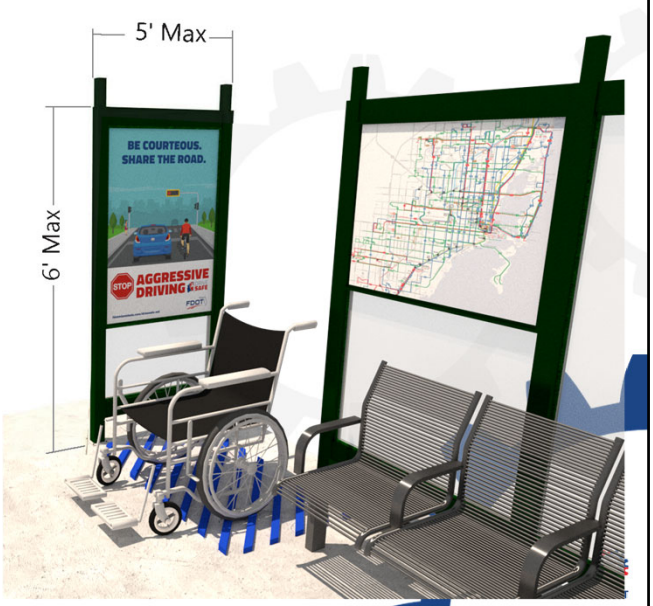


74

74

Advertising

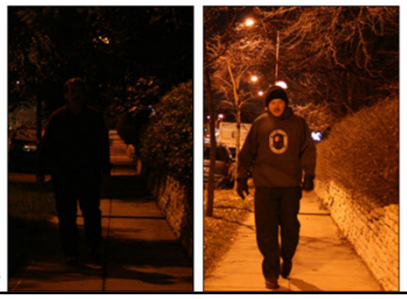
- Downstream location
- Limited to one side of shelter
- Notify owner if adjacent to private land



75

75

Safety & Lighting



76

76

Bus Shelters

- Examples/ best practice

77

Other Bus Stop Components

FDOT PUBLIC TRANSIT

78

Bicycle Parking

- Inverted “U” racks preferred
- Height should not exceed 3’
- Provide 48” aisles (One person should be able to walk one bicycle through the aisle)

79

79

Bicycle Parking

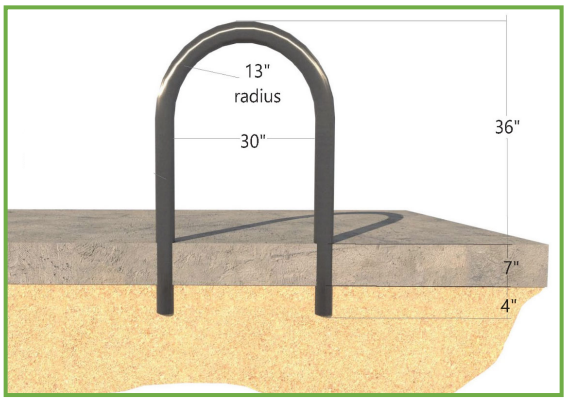
- Bike racks must not be placed on B&A area
- When bicycles are stored in racks, they must not overlap or block B&A area
- Must not interfere with pedestrian facilities
- Must meet lateral offset requirements
- Upper elements must not protrude per ADA Standards, Section 307
- Must meet the setback & minimum clear recovery zone requirements in the FDM

80

80

Bike Parking Design Dimensions

- Maximum recommended height of a bicycle rack is 3’ from the paved surface
- Space between the two poles in the inverted “U” rack should be 30” & the radius should be 13”
- The inverted “U” rack should be secured 11” below ground level
- Bicycle racks should provide 48” aisles
- Racks should be located no less than 2’ from walls
- Inverted “U” racks should be placed no less than 3’ apart width-wise

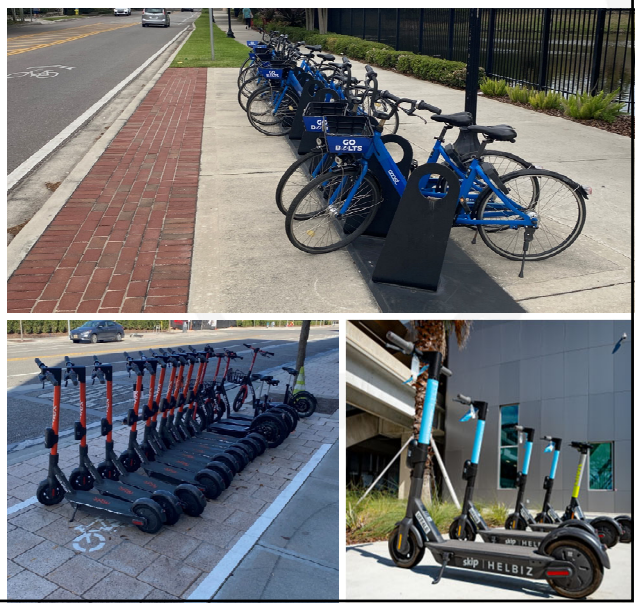


81

81

Shared Mobility at Bus Stops

- Ensure proper placement that decreases sidewalk congestion & interference with bus stop B&A areas
- Post visible safety material & standard bicycle lane etiquette near bicycle sharing hubs/docks at bus stops



82

82

Trash & Recycling Receptacles

- Maximum capacity must be 110 gallons & maximum height must be 4’
- Locate bus stop trash receptacles at least 4’ from face of curb by securely attaching to their foundations or another permanent fixture

83

83

Trash & Recycling Receptacles

- Prohibited on limited access facilities
- Must not obstruct any sidewalk, bike path, pedestrian path, driveway, drainage structure, or ditch
- Must be securely attached to their foundations or another permanent fixture
- Advertising must be affixed to the side of the receptacle & not extend beyond the receptacle; no advertising shall be of a reflectorized material or otherwise cause a glare
- Must be properly maintained for aesthetics, function & safety
- Responsible agencies must maintain regularly scheduled garbage pick-up
- Must not be placed on bus stop B&A areas
- Must meet clear zone requirements in the FDM

84

84

Landscaping

- Should be designed to permit sufficiently wide, clear, accessible & safe pedestrian walkways & transit waiting areas

85

85

Landscaping

- Must preserve required sight distance, lateral offset & clear zone
- Ground cover plants: maximum height 18” within clear sight triangles
- Avoid plants that require routine maintenance
- Trees: limbed up to 5’ minimum above the sight line datum
- Line-of-sight datum: 3.5’ above pavement
- All landscaping along FDOT rights-of-way must comply with FDM section 228.2

86

86

Landscaping Design Dimensions

- Use low-growing plants with maximum mature height of 18”
- The line-of-sight datum between roadways is 3.5’ above pavement
- The canopies of trees & trunked plants must be at least 5’ above the sight line datum

87

87

Leaning Rails/Bars

- Handrails & grab bars must be mounted at 34-38” above the surface of the shelter/ground
- While a leaning rail may not be classified as a handrail/grab bar, a leaning rail that could serve the same purpose as a handrail should be mounted

88

88

Leaning Rail Design Dimensions

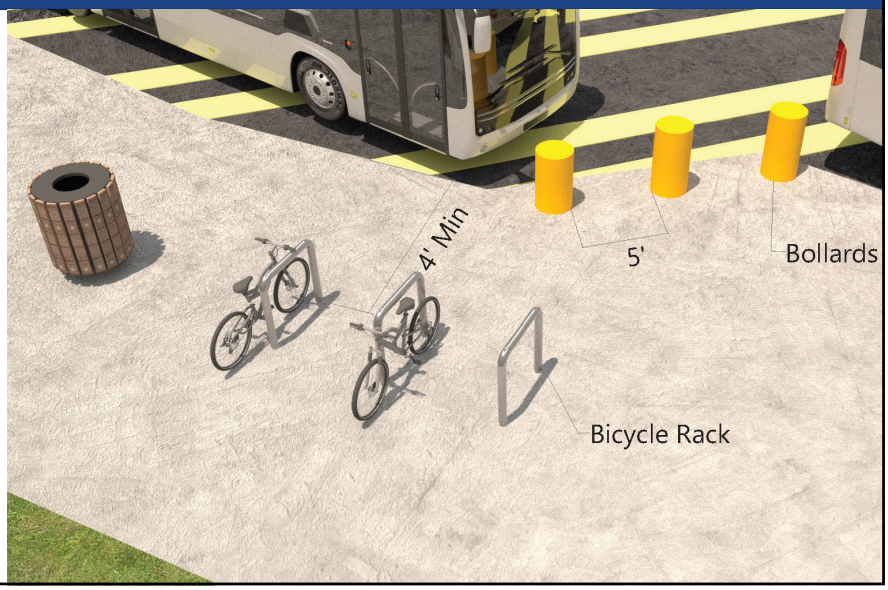
- Recommended height is minimum 27” & maximum 42”
- Provide a round section of the rail with an outside diameter of 1.25” to 2.5”
- Use anodized aluminum to enhance durability

89

89

Bollards

- Bollards are not to be located in the road right-of-way
- Security bollards shall not obstruct a required accessible route or accessible means of egress

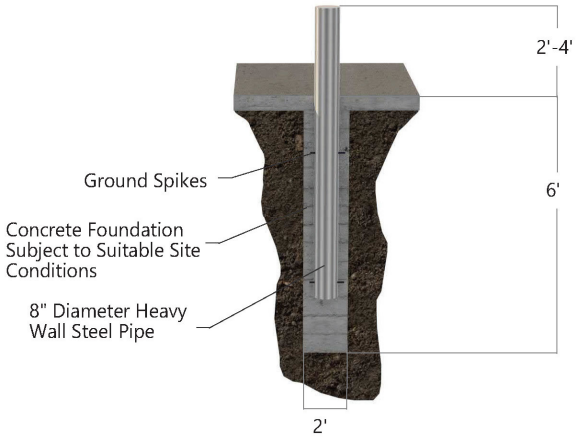


90

90

Bollards Design Dimensions

- Recommended height is 2’ to 4’
- Provide min 5’ clear width between each bollard for bicycle, wheelchair & pedestrian access
- Each bollard should be designed to stop a 36,000-lb vehicle traveling at 4 mph
- Provide 3 bollards of concrete-filled, 8” diameter, heavy-wall steel pipe ahead of each bus; the pipes should be set vertically in a 6’ auger-drilled hole & retained by reinforced concrete

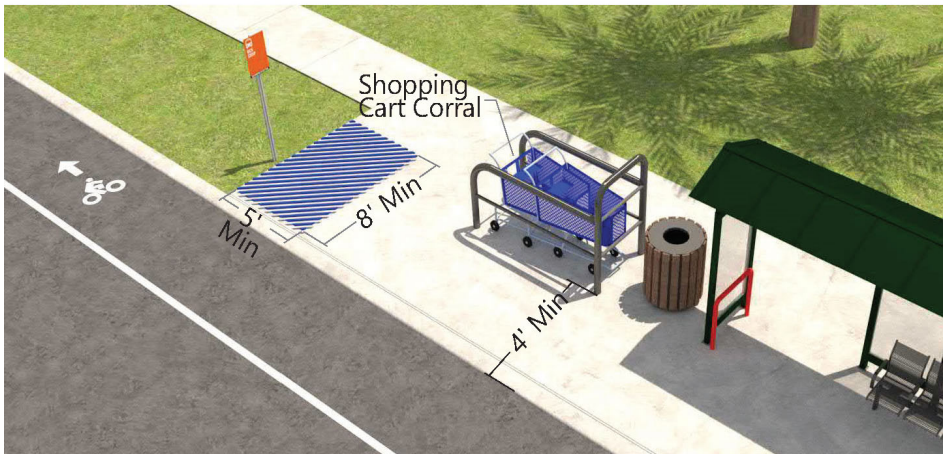


91

91

Shopping Cart Storage

- Shopping cart locations must meet the setback & minimum clear recovery zone requirements established in the 2022 FDM, sections 215.2.3 & 215.2.4



92

92

Shopping Cart Storage Design Dimensions

- Minimum clearance for the cart storage area is 3’ wide & 3’ high
- Use standard hot-dipped galvanized steel pipe construction; surface-mounted flanges should be using flat steel bars
- Install at least 4’ back from the face of curb & clear of sidewalks

93

93

Public Telephones

- The length of the handset cord must be 29” minimum; phones must be hearing-aid compatible & volume-control equipped
- Must provide a clear floor or ground space at least 30”x48” at the approach side of telephone, not impeded by bases, enclosures, or fixed seats
- Where a parallel approach is provided, distance from edge of telephone enclosure to the face of telephone unit must be maximum 10”; if a forward approach is provided, distance from front edge of counter within telephone enclosure to the face of telephone unit must be maximum 20”
- Must follow ADA Standards for protruding objects & operable parts
  - Objects with leading edges more than 27” & not more than 80” above the finished floor or ground may protrude maximum 4” horizontally into a circulation path
  - Operable parts of telephone shall comply with clear floor space, height & operation requirements

94

94

Emergency Call Box

- Must not obstruct access to the bus stop
- Must be accessible to those that are deaf, hard of hearing, or people who use wheelchairs
- Must follow ADA Standards for protruding objects & operable parts
- The ADA Standards for operable parts state that operable parts of a telephone shall comply with clear floor space, height & operation requirements; the clear space requirement is 30”x48” minimum

95

95

Vending Machines

- Vending machine locations must meet the setback and minimum clear recovery zone requirements established in the FDM
- A 30” by 48” minimum clear space must be provided
- According to ADA Standards, when affixed to an existing structure, a vending machine may not protrude more than 4” into the accessible path when mounted at 27” to 80” above the finished floor or ground surface
- ADA guidelines also state that any operable parts shall comply with clear floor space, height, and operation requirements

96

96

Bus Stop Information

- Signs must be installed in a manner that eliminates any protruding object hazards
- Where public address systems convey audible information to the public, the same or equivalent information shall be provided in visual format
- Text should be large, easy-to-read & must comply with all ADA requirements for text & pictogram size, placement & contrast

97

97

Public Art

- Public art designs can vary by purpose, place & the community it serves, but must meet any applicable ADA & FDM requirements

98

98

Training Activity #1
Plan Your Bus Stop

99

99

Scenario #1 - Add New Bus Stop

- Current condition
  - Location is adjacent to a retail shopping complex
  - At an intersection between city & state roads
  - No current bus stop
  - Identified demand for a bus stop due to growing activity
- You want to add new bus stop with:
  - Basic infrastructure (sign, B&A area, bench, shelter)
  - Access to/from retail shopping complex

100

100

Scenario #1 - Add New Bus Stop

- Using the sheet provided, provide input for each the following:

Important Considerations	Who to contact & Coordinate with	Accessibility/Safety Requirements

• Things you need to consider before design & construction
  • Example – roadway requirements, utility, property needs
	• List all agencies & entities you need to contact
	  • Example – County/city public works
		• Identify the type of source/where you will look depending on your infrastructure/situation
		  • Example – FDOT Design Manual (FDM)

101

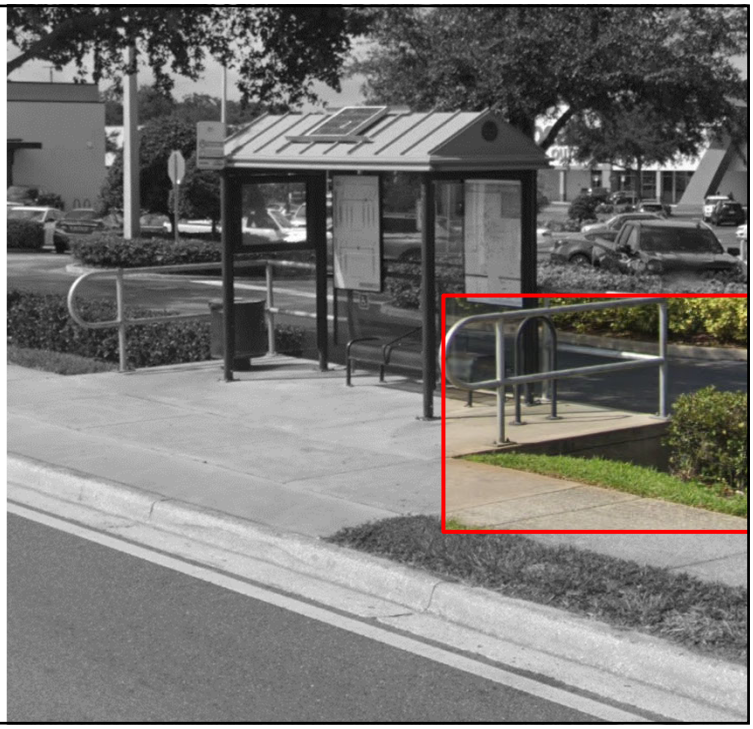
Scenario #1 - Add New Bus Stop

Important Considerations	Who to Contact & Coordinate with	Accessibility & Safety Requirements
• State road requirements • Local road requirements • Local infrastructure/ utility availability • Local permit needs • Retail shopping center agreement • Purchasing amenities	• FDOT Transit Office • FDOT Ops Center • FDOT ADA Coordinator • City • Planning & Permitting • Public Works • Retail shopping center owner • Purchasing agent	• ADAAG • FDOT Design Manual • Florida Building Code • Florida Administrative Code • MUTCD • FDOT Transit Facility Guidelines • FDOT Design Standards • FDOT Accessing Transit • Local building codes

102

Why Coordinate?

- No pedestrian access to the shopping center due to no/ limited coordination with private shopping center
- Pedestrians have to go to nearest signal to access sidewalk



103

103

Scenario #2 - Upgrade Existing Bus Stop

- Current Situation
  - Current bus stop (bench, sign, B&A area is not concrete)
  - Located adjacent to county-owned property
  - Built-out, high-density urban area is adding more density
  - Along a state-maintained road
  - New multi-use trail adjacent to current stop just completed

- You want to upgrade bus stop with:
  - Larger shelter (high growth in the area indicates ridership growth)
  - Enhanced infrastructure (concrete B&A area, more benches, bike rack, trash can)
  - Utility connections (shelter lights)
  - Landscaping
  - Better access from adjacent activity center & multi-use trail

104

104

Scenario #2 - Upgrade Existing Bus Stop

Important Considerations	Who to Contact & Coordinate with	Accessibility & Safety Requirements
• State road requirements • Local road requirements • Local infrastructure/ utility availability • Local permitting needs • Adjacent parcel; owners • Multimodal connections • Purchasing amenities	• FDOT Transit Office • FDOT Ops Center • FDOT ADA Coordinator • County • Planning & Permitting • Public Works • Facilities Management • Parks & Recreation - Trail Management • Local Bike/Ped Coordinator • Nearby & impacted private business owners • Purchasing agent	• ADAAG • FDOT Design Manual • Florida Building Code • Florida Administrative Code • Multimodal design standards • MUTCD • FDOT Transit Facility Guidelines • FDOT Design Standards • FDOT Accessing Transit • Local building codes

105

Scenario #2 - Upgrade Existing Bus Stop

106

106

Scenario #3 - Rectify Non-Compliant Bus Stop

- Current Situation
  - Has B&A area with shelter
  - Seating available but not compliant
  - Has no pedestrian connection (nearest sidewalk is 10' away)
  - Bus stop infrastructure placed improperly within clear zone of a state highway
- You want to rectify bus stop by:
  - Making it ADA compliant & safe
  - Comply with roadway clear zone requirements
  - Provide access to the stop

107

107

Scenario #3 - Rectify Non-Compliant Bus Stop

Important Considerations	Who to Contact & Coordinate with	Accessibility & Safety Requirements
• State road requirements • Local permit needs • Adjacent parcel; owners • ROW availability • Facility & amenity needs • Purchasing amenities	• FDOT Transit Office • FDOT Ops Center • FDOT ADA Coordinator • Local permitting office • Nearby private landowners • Purchasing agent	• ADAAG • FDOT Design Manual • Florida Building Code • Florida Administrative Code • MUTCD • FDOT Transit Facility Guidelines • FDOT Design Standards • FDOT Accessing Transit • Local building codes

108

Scenario #3 - Rectify Non-Compliant Bus Stop

109

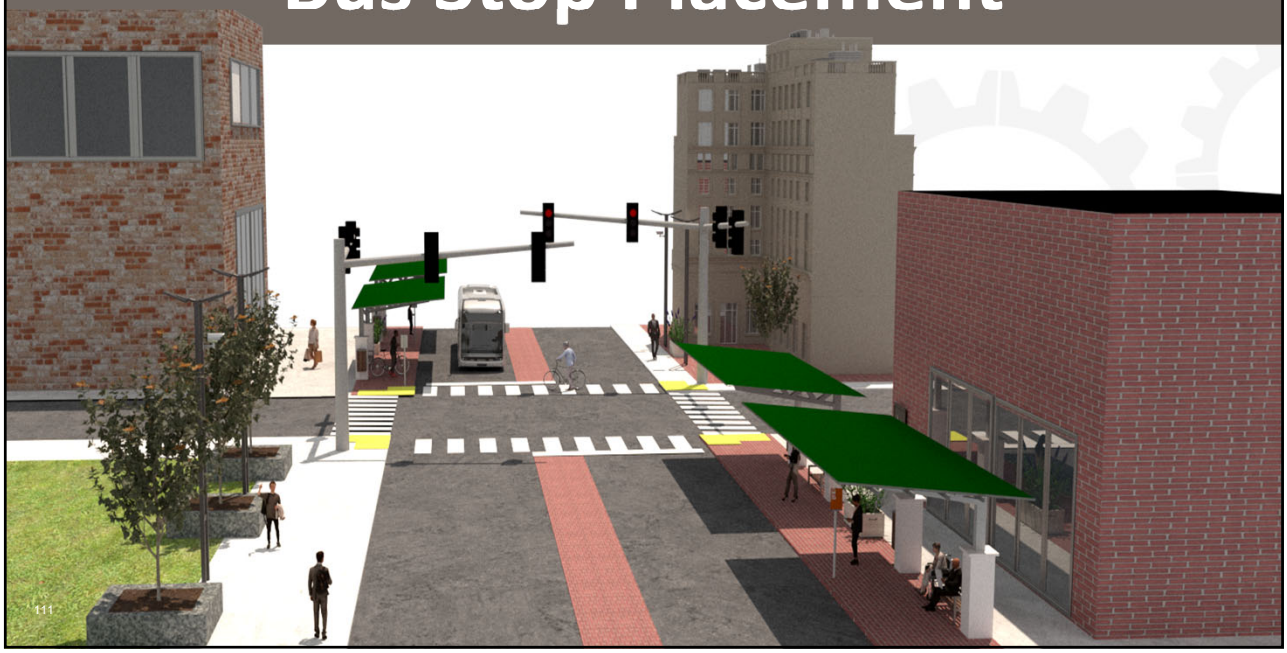
109

Lunch

110

110

Bus Stop Placement



111

Basics on Bus Stop Placement

- Proximity & access to major trip generators
- Adequate right-of-way to provide safe waiting & B&A areas
- Availability of safe & convenient access to the stop
- Avoid bridges, driveways & areas with very little usable right-of-way

112

FDOT PUBLIC TRANSIT

112

General Requirements

- The site selection & establishment of a transit bus stop shall provide the maximum safety to users of the public transit system & vehicular/ pedestrian traffic
- The operator of a transit bus system may designate a bus stop within the boundaries of the right-of-way of a state road
- Keep minimum 15’ distance to a fire hydrant or an accessible parking space
- Must not obstruct a driveway
- In urban areas with curb & gutter, sidewalk
  - Locate bus stops so riders board/alight at a location where full height curb & gutter is present
  - Locate bus stop situated to be 20’ or more away from the edge of a drainage structure

113

113

Handbook Recommendations/Examples

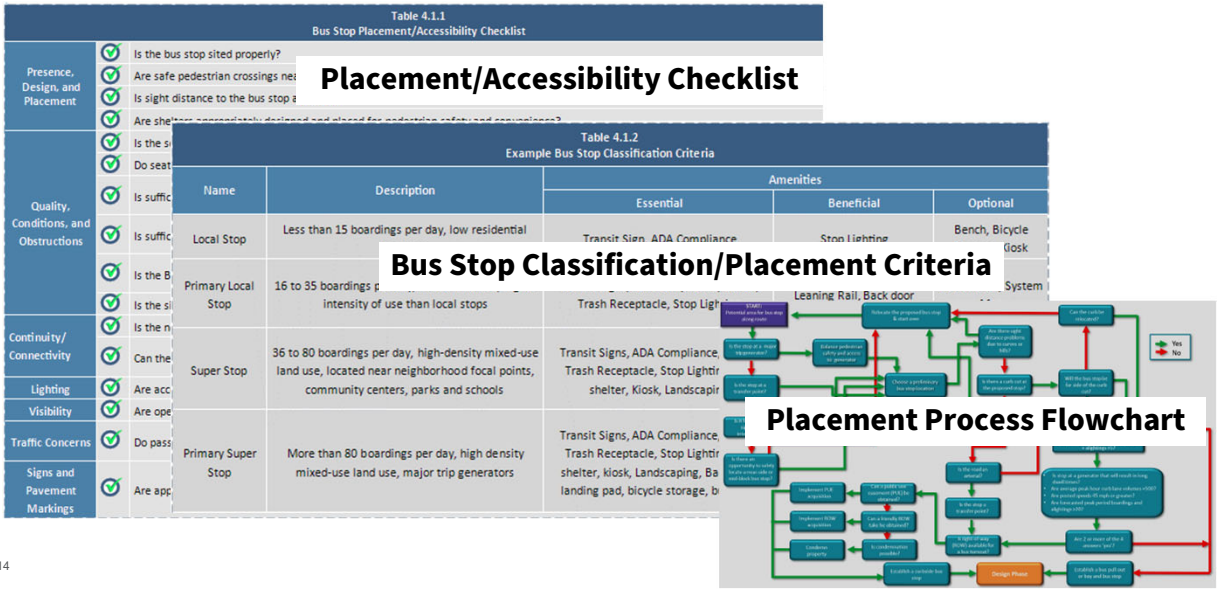


Table 4.1.1
Bus Stop Placement/Accessibility Checklist

Presence, Design, and Placement	✓	Is the bus stop sited properly?
	✓	Are safe pedestrian crossings ne
	✓	Is sight distance to the bus stop a
	✓	Are she
Quality, Conditions, and Obstructions	✓	Is the s
	✓	Do seat
	✓	Is suffic
	✓	Is suffic
	✓	Is the B
	✓	Is the si
Continuity/ Connectivity	✓	Is the n
	✓	Can the
Lighting	✓	Are acc
Visibility	✓	Are ope
Traffic Concerns	✓	Do pass
Signs and Pavement Markings	✓	Are app

Placement/Accessibility Checklist

Table 4.1.2
Example Bus Stop Classification Criteria

Name	Description	Amenities		
		Essential	Beneficial	Optional
Local Stop	Less than 15 boardings per day, low residential	Transit Sign, ADA Compliance	Stop Lighting	Bench, Bicycle Kiosk
Primary Local Stop	16 to 35 boardings p intensity of use than local stops	Trash Receptacle, Stop Ligh	Leaning Rail, Back door	System
Super Stop	36 to 80 boardings per day, high-density mixed-use land use, located near neighborhood focal points, community centers, parks and schools	Transit Signs, ADA Compliance, Trash Receptacle, Stop Lightir shelter, Kiosk, Landscapir		
Primary Super Stop	More than 80 boardings per day, high density mixed-use land use, major trip generators	Transit Signs, ADA Compliance, Trash Receptacle, Stop Lightir shelter, kiosk, Landscaping, Ba landing pad, bicycle storage, b		

Bus Stop Classification/Placement Criteria

Placement Process Flowchart

114

114

Placement/Accessibility Checklist

- Design & placement
  - ❑ Are safe pedestrian crossings nearby?
  - ❑ Is sight distance to bus stop adequate?
  - ❑ Are shelters appropriately designed/placed for pedestrian safety/convenience?
- Quality/conditions/obstructions
  - ❑ Is seating area at safe & comfortable distance from vehicles & bike lanes?
  - ❑ Do seats or persons sitting on them obstruct sidewalk or reduce its usable width?
  - ❑ Is there sufficient area for waiting, B&A & thru foot traffic at peak times?
  - ❑ Is there sufficient area to provide trash receptacles, more seating, bike parking?
  - ❑ Is B&A area free of uneven surfaces, standing water, or steep slopes?
  - ❑ Is sidewalk free of obstructions constricting its width or access to bus stop?

115

115

Placement/Accessibility Checklist

- Continuity & connectivity
  - ❑ Can bus stop be connected to a continuous network sidewalks and/or shared use paths?
- Lighting & visibility
  - ❑ Are access ways to bus stop well lit?
  - ❑ Are open sight lines maintained between approaching buses & passenger waiting and loading areas?
- Traffic/signs/pavement markings
  - ❑ Do passengers B&As conflict with cars, bicycles, or pedestrians?
  - ❑ Are appropriate signage, wayfinding & pavement markings provided?

116

116

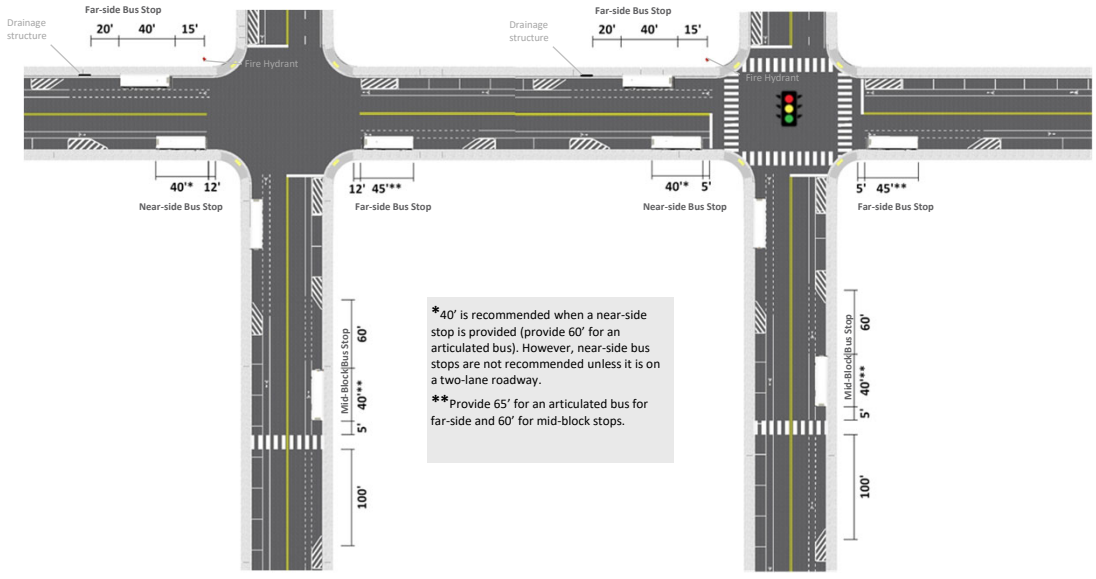
Placement Recommendations

- Far-side stops generally are preferred over near-side stops/bays
  - Exception is at 2-lane roads where vehicles are restricted from going around the bus stopped at a curbside stop
- Bus bays are preferred over in-lane curbside stops
  - When roadway speeds > or = to 45 mph, there is significant bus & passenger volumes, or when placed downstream from a traffic signal
- Closed bus bays are preferred over open bus bays
  - Exception would be at a physically constrained site

117

117

Bus Stops at Intersections



118

118

Far-Side Bus Stops

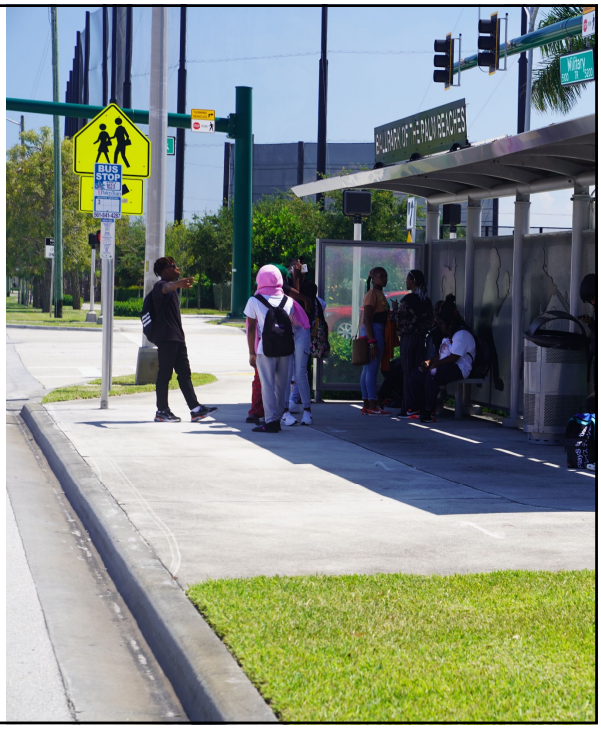
- Fewer traffic delays
- Better sight distances
- Fewer conflicts with buses, cars, pedestrians & bicyclists
- Optimizes intersection operation

119

119

Near-Side Bus Stops

- Preferred on 2-lane roads without bus bay/pullout
- Use when cross-street is one-way from right to left or if the bus route needs to turn right at an intersection
- Avoid at intersections with dedicated right-turn lanes where right-on-red turn is permitted
- Use when far-side stops cannot be provided

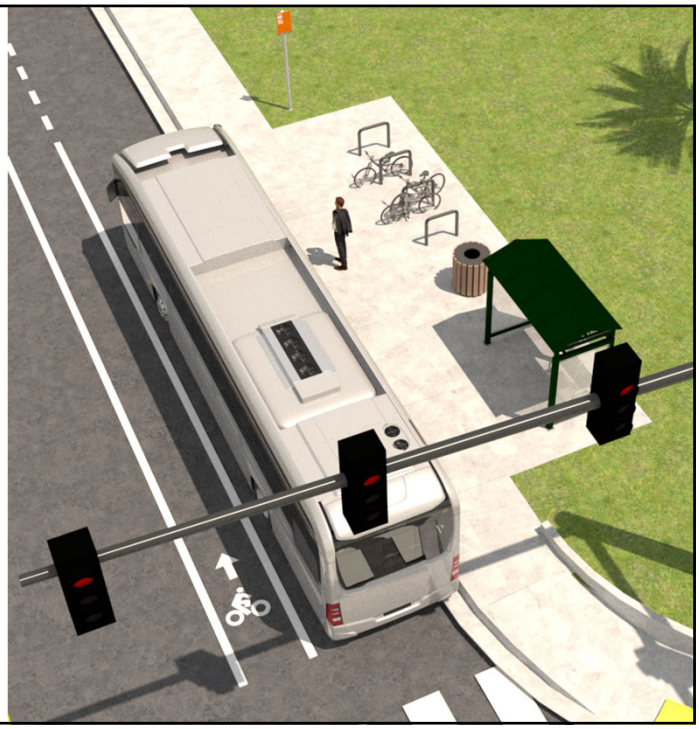


120

120

Far-Side or Near-Side Stops?

- Far-side stops generally preferred at intersections because:
  - Driver can pull across intersection before light turns red (less delay for buses & other traffic)
  - Near-side can mean waiting an extra signal cycle
  - Far-side ensures pedestrians cross behind bus



121

121

Mid-Block Stop

- When distances between intersections are unusually long
- When major transit generators are located mid-block
- Avoid immediately downstream from an intersection
- Not recommended near schools

122

122

Rural Bus Stops

- At least sloped points that comply with ADA guidelines for B&A areas (most kneeling buses create a 1:6 slope on ramps; excessive slope makes wheelchair ramps too steep)

123

123

Bus Stops Near Bridges

- Upstream
  - Far enough upstream from the bridge
  - Locate upstream enough to have a flat surface large enough for ADA-compliant B&A area
- Downstream
  - Far enough downstream from the bridge for safe stops
  - Allow for adequate site distance to accommodate traffic behind buses to see a stopped bus & safely maneuver around it

124

124

Bus Stops Adjacent to Canals

- If ROW is limited, design to encroach into a canal ROW
- In urban areas, keep at least 20’ from canals & 6’ from a drop-off location
- Locate guardrail no closer than 6’ from canal front slope

125

125

Bus Stops Near Guardrails

- Locate outside guardrail that runs parallel to a roadway
- Pedestrian access behind guardrail should be limited to the area of bus stop
- Pedestrian guard rails should be implemented immediately adjacent to canal or drop-off locations if a bus stop location has a drop-off or is located near drainage or a canal

126

126

Bus Stops Near Driveways

- One-driveway parcel: avoid blocking the driveway
- Two-driveway parcel: downstream driveway would be the preferred driveway to block

127

Bus Stops Near Curves or Hillcrests

- Avoid placement over the crest of a hill, immediately after a road curve to the right due to limited visibility of stopped bus
- Avoid even with using a bus bay
- If necessary, approaching vehicles should be warned of the need to be prepared to stop well in advance with proper signage (refer to the most recent MUTCD for additional guidance on such signage)

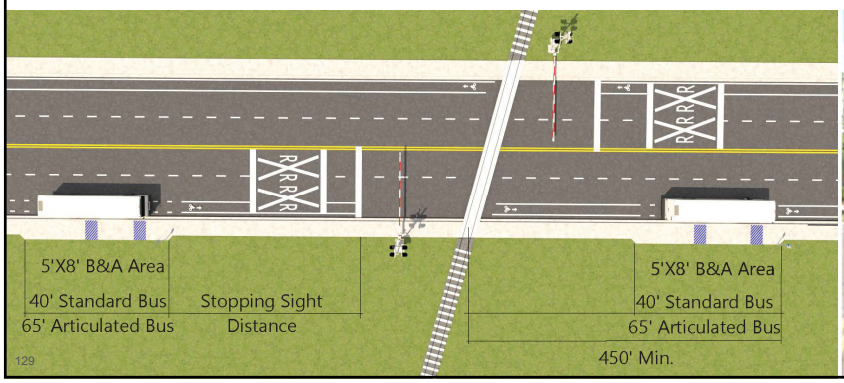
128

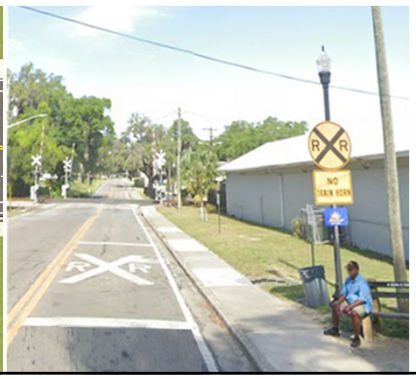
FDOT PUBLIC TRANSIT

128

Bus Stops Near Railroad Crossings

- Locate near-side bus stops so that railroad warning signs are not obstructed by a stopped bus
- For near-side or far-side bus bays, provide a minimum of 50’ to the nearest rail line





129

Bus Bulbs/Nubs

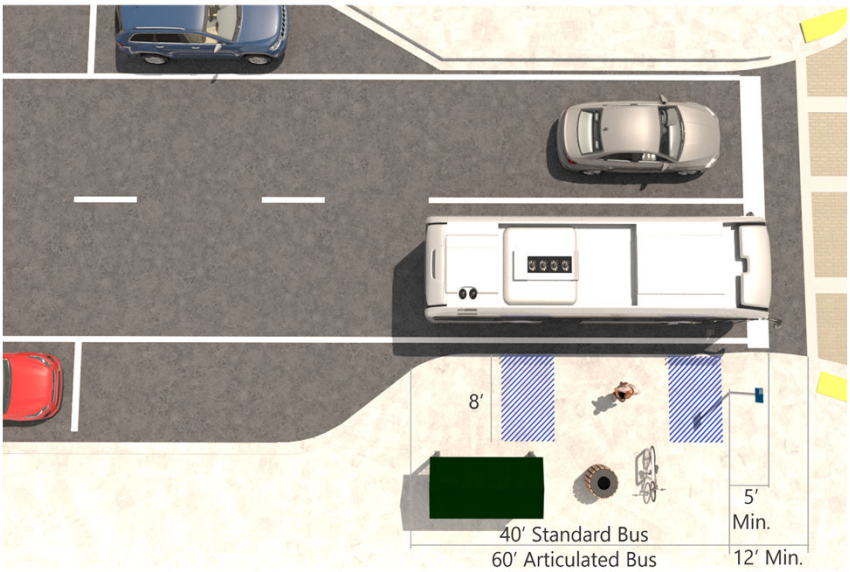
- Extension of curb-line into roadway shoulder or a parking lane, adding curbside space for transit riders waiting for buses
- Locate in high volume pedestrian zones
- Applicable where traffic calming is desired
- Preferred when mid-block stop near transit trip generators are needed
- Allow buses to make curb-side stops without leaving travel lanes
- Can be used in combination with parking in curb lane

130

130

Bus Bulb Design Dimensions

- Minimum 8' wide
- Leave 5' offset between bus stop sign & stop bar
- Accommodate 12' offset between sign & start of crosswalk
- Provide sufficient curb length for at least one 40' or 60' bus



131

131

Boarding Islands/Floating Bus Stops

- Useful in locations with heavy pedestrian activity
- Allows bus to remain in travel lane
- Fully detached from the main sidewalk structure
- Beneficial solution to bus/bike conflicts

132

132

Bus Bays

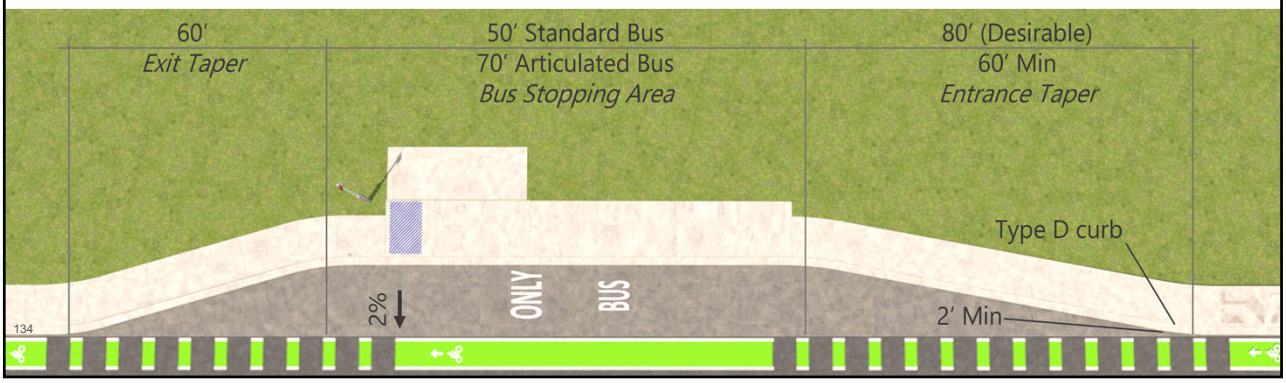
- Allow boarding & alighting outside of travel lanes
- Enhance passenger safety
- Do not interrupt traffic at bus stops
- Increase safety (reduce chances of bus rear-end accidents)

133

133

Bus Bay Design Dimensions

- For stopping area, allow 50’ for each standard 40’ bus, 70’ for each 60’ articulated bus expected to be at the bus stop simultaneously



134

Bus Bay Design Dimensions

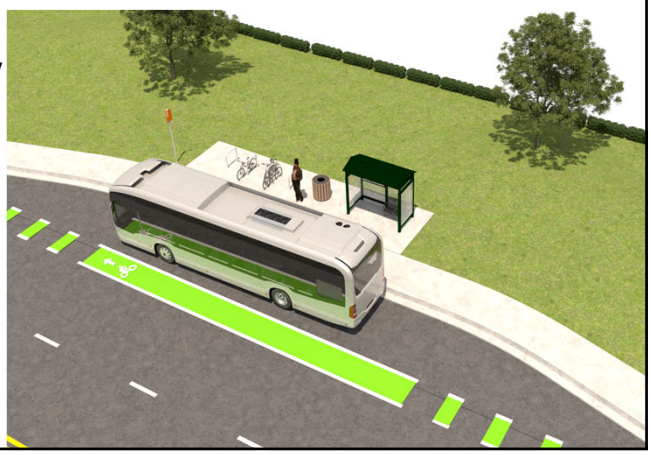
- With curb & gutter
  - Bus bay pavement should slope into roadway at 2% cross-slope
- No curb & gutter
  - Bus bay pavement or B&A areas should be sloped away from roadway (2% cross-slope minimum or matching the adjoining roadway pavement slope)
- Use broken 6” white stripe & 2’ dash by 4’ skip in entrance & exit tapers
- Use solid 6” white stripe between dashed areas to delineate travel lane
- If no bus shelter is used, extend sidewalk to provide a B&A area
- No drainage structures allowed within bus bay
- Bus bay sidewalk should be connected to existing sidewalk or accessible to shoulder

135

135

Closed Bus Bays

- Has physical entrance taper, stopping area & physical exit taper
- Acceleration/deceleration lane applications generally dependent on adjacent roadway volume & speed
- Use at:
  - Far-side bus stops at signalized intersections
  - Mid-block bus stops near major transit destinations or where next intersection is more than 300’away
- Near-side bus bays are not recommended

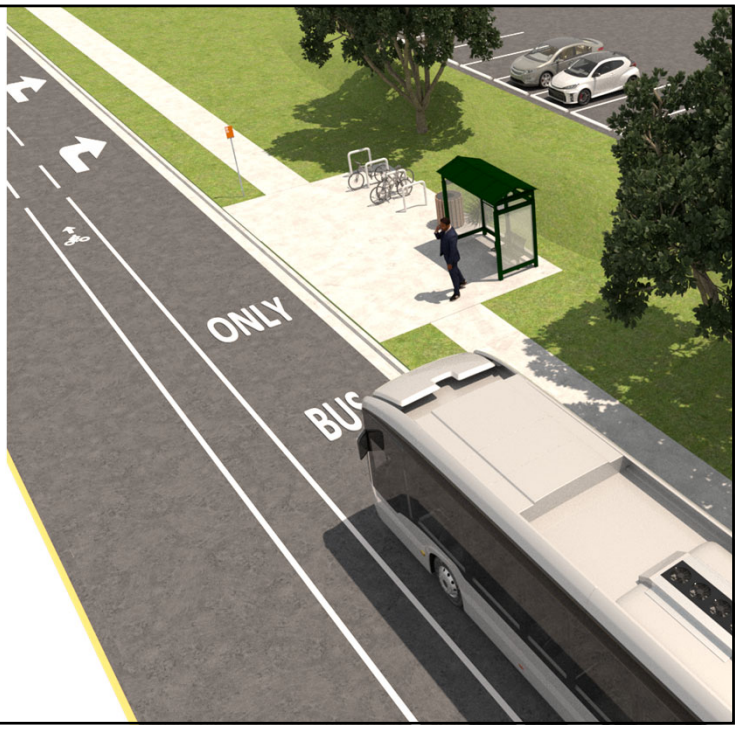


136

136

Open Bus Bays

- Does not have a physical entrance taper
- Recommended for far-side applications at signalized intersections
- Can be used effectively as part of a queue jump bus bay

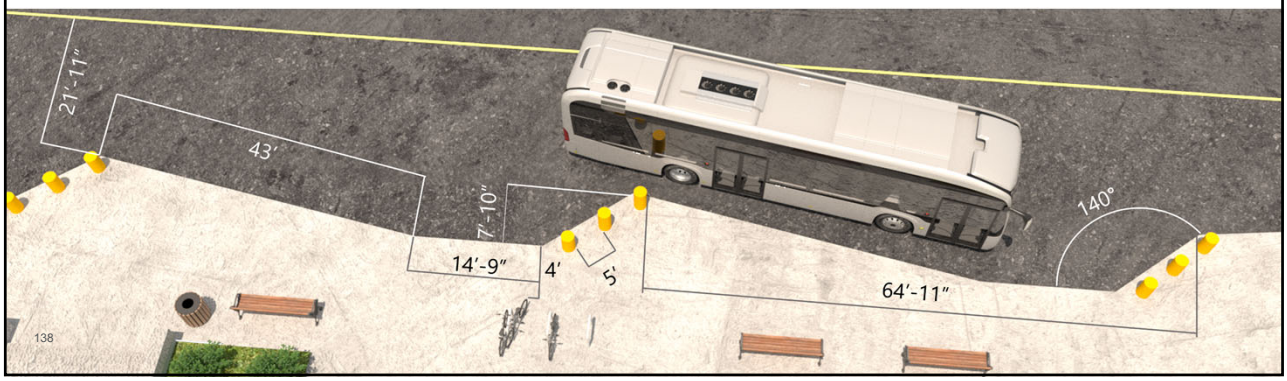


137

137

Half-Sawtooth Bus Bay

- Off-lane transfer centers
- Multiple buses in confined area
- Buses can arrive & depart individually



138

138

Using the Right Bus Bay

	Advantages	Disadvantages
Closed	· **Allows bus to stop safely outside of travel lanes** · Provides a protected area away from moving traffic for a bus operator to accommodate a layover or long dwell time · Allows buses to drop off & pick up passengers outside of travel lanes · **Minimizes traffic delays due to bus operations** · Improves safety for passenger boarding & alighting by increasing the distance between passengers & moving traffic	· May present problems to bus drivers trying to re-enter traffic, especially on roadways with high speed and/or high volume · **Requires infrastructure modifications; more difficult to relocate** · Creates potential bus/vehicle conflicts when buses re-enter a busy travel lane · May reduce parking space curbside · **May reduce sidewalk space & increase pedestrian congestion**
Open	· Similar advantages to the closed bus bay plus the following · **Allows buses to decelerate through the intersection & move into bus bay more efficiently** · Enhances the effectiveness of preferential treatments at intersections, such as transit signal priority & queue jump	· Similar disadvantages to the closed bus bay plus the following · **Can create a conflict for right turning vehicles** from cross-street using open bus bay for acceleration movements · Increases pedestrian crossing distance at an intersection by the width of the bus bay
Half-Sawtooth	· Similar advantages to the closed bus bay plus the following · **Requires less length than parallel bus bays = supports shorter stations** · Allows buses to leave the bay without having to wait for buses ahead of them to exit	· **Requires more depth than parallel bus bays** to accommodate the necessary bus maneuvers
Queue Jump	· Similar advantages to the open bus bay plus the following · Allows buses to proceed through intersection in advance of other traffic · **Gives priority to bus movements at the intersection, which can help speed up overall traffic flow**	· Similar disadvantages to the open bus bay plus the following · May cause delays to right-turning vehicles if the queue jump bus bay is used in combination with a right-turn-only lane for general traffic

139

139

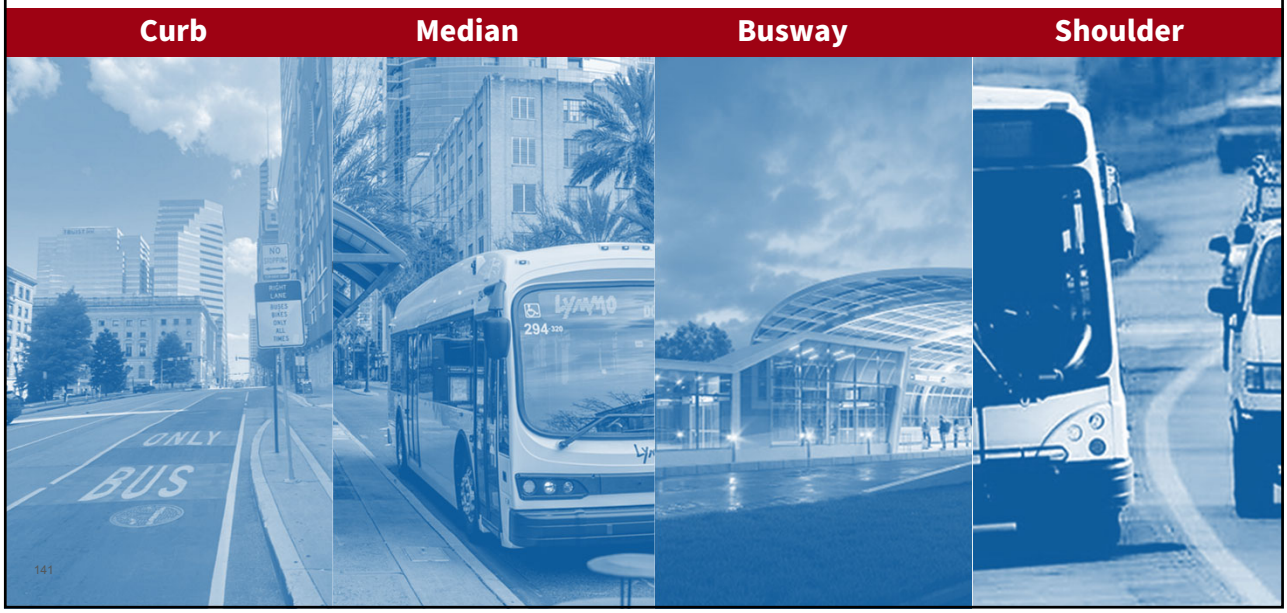
Choosing the Right Bus Pad Material

- More agencies are switching to using concrete slabs instead of asphalt
- Asphalt can shift & become "rippled" due weight/heat of the bus
- Concrete may be better for highly used bus pads at bus bays/stops
- Concrete is more reflective, helping bus operators see the bus stop better
- While concrete may be a better alternative to asphalt, it also may be costlier to implement & repair than asphalt

140

140

Stops on Florida's Bus Lanes & Busways



141

Curb Bus Lane

- Buses move in the same direction as general traffic
- Helps improve visibility & use of a high-quality bus service
- Must maintain the integrity of the bus lane through signs, markings, education & ongoing enforcement
- Benefits areas that have delays due to excessive traffic congestion

142

142

Median Bus Lane

- Applicable where traffic congestion may affect service reliability
- Helps reduce pedestrian and sidewalk congestion
- Best when extended raised median with no mid-block & only minor intersection left turn access is present
- May use a central platform to serve both travel directions

143

143

Contraflow Bus Lane

- One-way
  - Allows a bus to travel in the opposite direction of the normal traffic flow
  - No more than one to two blocks in length
  - Considered when a route needs a connection to a key land use or activity center
- Two-way
  - Allows a bus to travel in the opposite direction of the normal traffic flow
  - Typically in the off-peak direction of travel
  - Different lane would be utilized during each peak period
  - Consider the accommodation of general traffic left turns

144

144

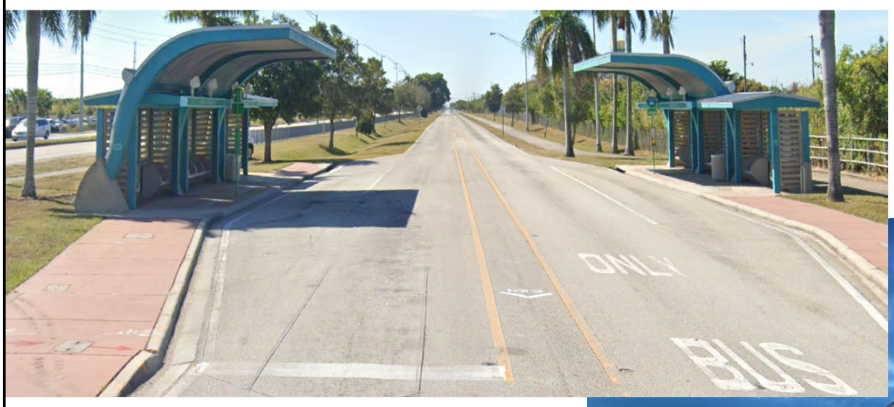
Busway

- Reversible Lane Median
  - Places buses in the center lane of the roadway
  - One lane reversing its direction between peak periods
  - Often used for short route segments
- Exclusive in Roadway Right-of-Way (ROW)
  - Other facilities like bicycle & pedestrian paths that serve both busway & roadway can be shared
- Exclusive in Separate ROW
  - The guidelines & standards for traditional roadways are applicable to these facilities, as well

145

145

Separate ROW Busway in Miami

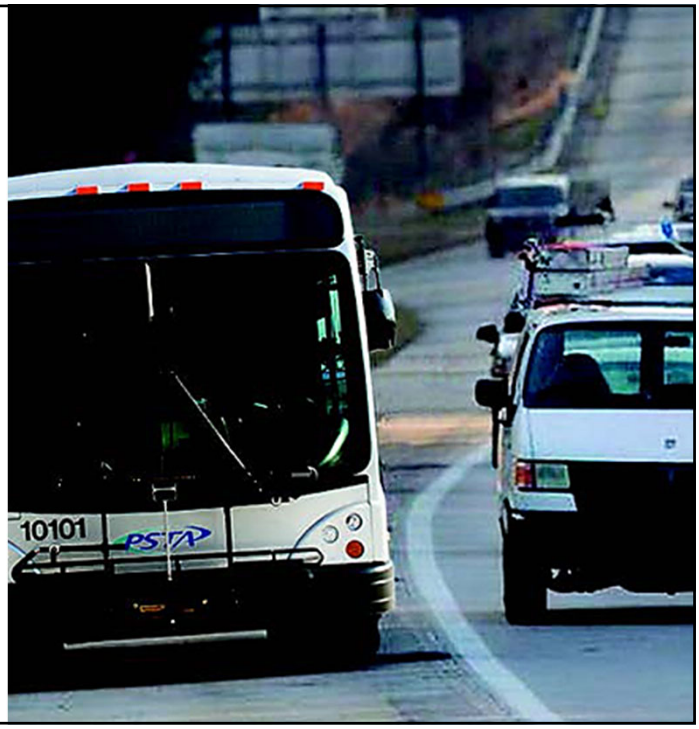


146

146

Bus on Shoulder

- Can reduce bus travel times on congested roadways
- Helps improve travel time reliability
- Consider when travel speeds drop below 35 mph
- Should be accompanied by signage



147

147

Transit Signal Priority (TSP)

- Basic principle
  - Bus is automatically detected on approach to signalized intersection
  - Signal timing & phasing are adjusted temporarily to provide bus with faster & clear passage through the intersection
  - Helps buses stay on a set schedule

148

148

TSP Treatment by Bus Stop & Lane Type

TSP Treatment	Recommended Lane Type	Recommended Stop Type
Green Extension	Bus Lane, Busway, Mixed Traffic	Far-Side; Pullout or In-Lane
Green Reallocation	Bus Lane, Busway, Mixed Traffic	Far-Side; Pullout or In-Lane
Red Truncation	Bus Lane, Busway, Shared Right Turn/Queue Jump	Near-Side or Far-Side; Pullout or In-Lane
Upstream Green Truncation	Mixed Traffic	Near-Side or Far-Side; Pullout
Phase Insertion/Phase Sequence Change	Bus Lane, Busway	Any
Phase Reservice	Bus Lane, Busway, Mixed Traffic	Any

149

149

TSP with Queue Jumps

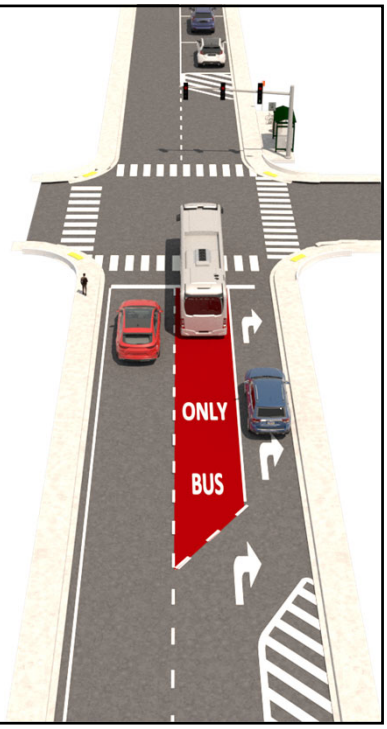
- Requires open bus bay on the far-side of a signalized intersection
- Requires extended lane on near side
- Allows buses to bypass traffic congestion
- Removes stopped buses from traffic stream
- Suitable for high-frequency bus routes with high traffic volumes

150

150

TSP with Transit Approach Lane

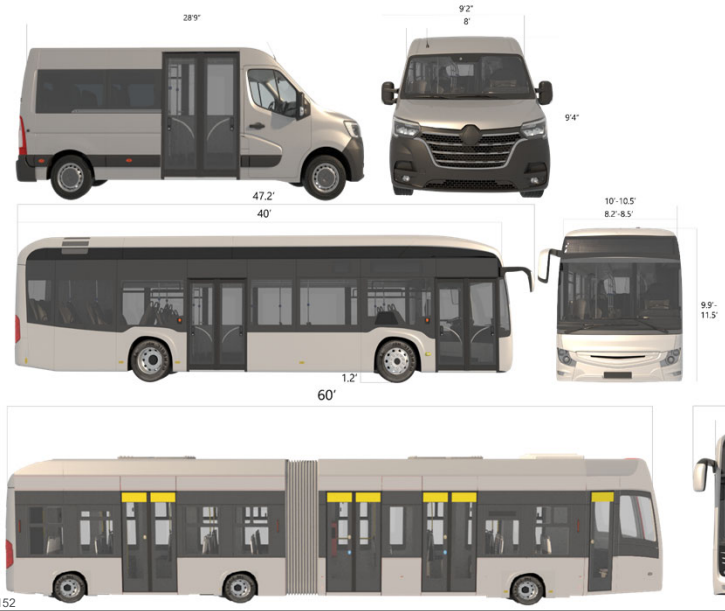
- Short bus-only lane to the approach to a major intersection
- Useful where there is high volume of vehicle right-turns
- Can be paired with active signal priority
- Allows vehicle to stay in own lane
- Useful where a right-turn/queue jump with signal priority application is not practical



151

151

Bus Vehicle Designs & Access to Bus Stops



- Dimensions to establish minimum functional street-side standards
- Consider impacts of roadway grades on bus performance & operations
- Reinforced concrete pads for high bus volume stops

152

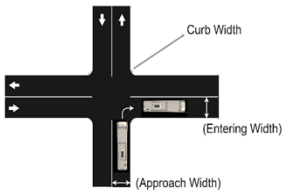
152

Design Considerations/Guidance

General Specifications for Buses

Item	Standard		Articulated
	40′	45′	60′
Width (without mirror)	8.2′-8.5′	8.5′	8.5′
Width (with mirror)	10′-10.5′	10′-10.5′	10′-10.5′
Height	9.9′-11.5′	12.5′	11′
Overhang			
Front	7.2′	7.9′	8.8′-8.9′
Rear	9.3′	9.8′	8.6′-9.7′
Wheel Base	25.0′	22.9′	23.3′-24.5′
Driver's Eye Height	7.0′	7.0′	7.0′
Weight			
Curb Weight	27k-28.2k lbs	38.2k lbs	38k lbs
Gross Weight	36.9k-40k lbs	55.2k lbs	66.6k lbs
Ground-to-Floor Height			
Typical	2.3′	2.3′	2.3′
Low Floor	1.2′	1.2′	-

153



Desirable Intersection Geometry Measurements for Traffic Lanes Used by Buses

Approach Width (feet)	Entering Width (feet)	Curb Radius (feet)
12 (single lane)	12	50
	16	45
	20	40
	24	35
16 (single lane with 4′ shoulder)	12	45
	16	40
	20	30
	24	25
20 (single lane with parking)	12	40
	16	35
	20	30
	24	25

153

Turning Radii

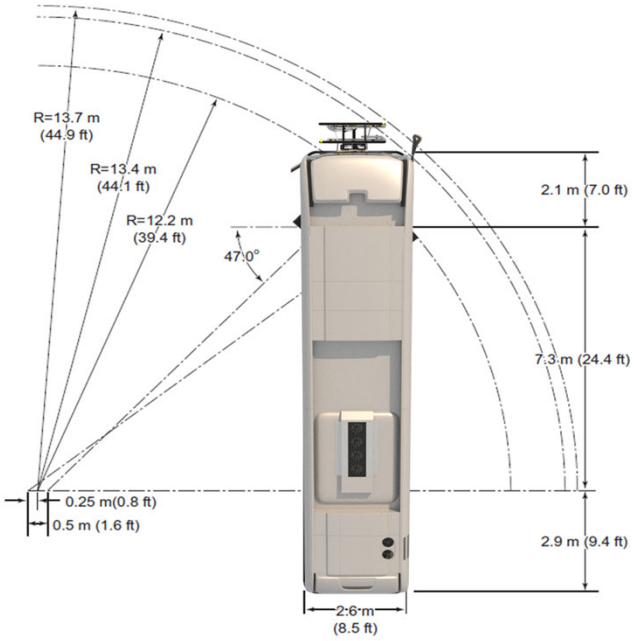
- Turning radii requirements for a standard transit bus are:
  - Min inside radius = 24.5'
  - Min design turning radius = 41.6'
- Turning radii requirements for an articulated transit bus are:
  - Min inside radius = 21.3'
  - Min design turning radius = 39.4'

154

154

Bus Turning Radii

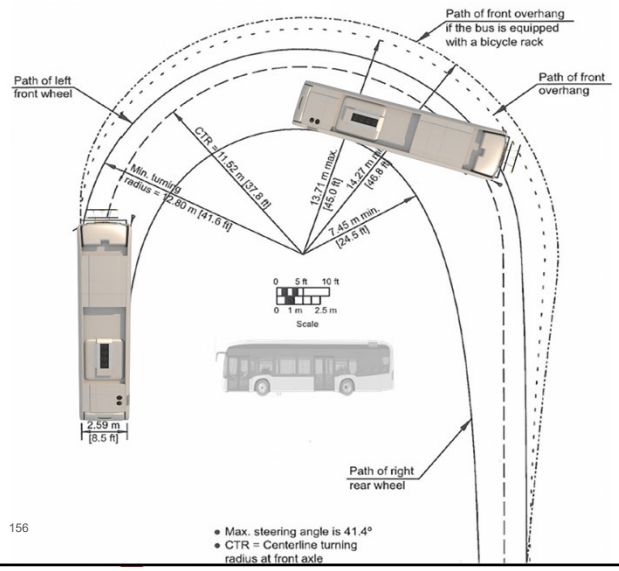
- Add at least 1.5’ for bus with a front-mounted bicycle rack
- More turning radii needed:
  - For turning speeds > 10 mph
  - When making reverse turns
  - For turns in areas with sight distance limitations
  - For turns involving changes in pavement grade
  - For turns in areas that restrict the movement of the bus overhang

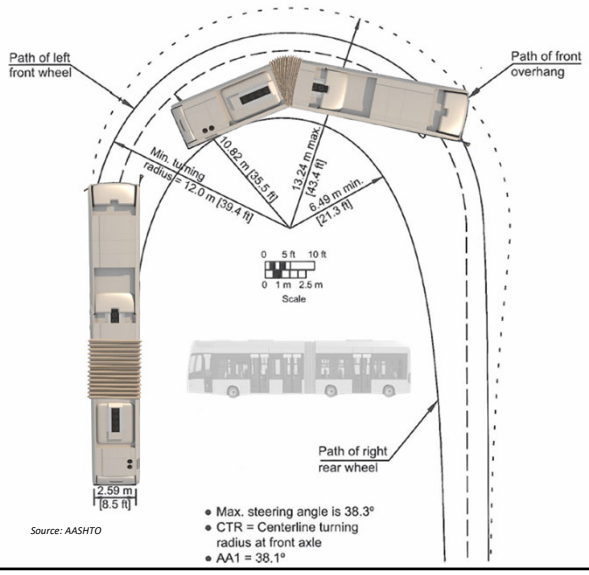


155

155

Bus Turning Radii





Source: AASHTO

156

156

Pavement Markings

- These include pavement & curb markings, delineators, colored pavements, etc.
- Help guide transit vehicle flow & provide info to bus operator
- Ensure safety – orderly & predictable movement of traffic
- Must be MUTCD compliant!

157

157

Pavement Markings

- Pavement markings shall be in compliance with maintaining agency regulations & standards in the MUTCD
- The preferential lane-use marking for a bus-only lane shall consist of the word marking BUS ONLY
- Pavement markings shall be used to guide traffic away from fixed obstructions within a paved roadway

158

158

Pedestrian & Bicycle Access to Bus Stops

- All transit stops are potential pedestrian crossings!
  - Are marked ped crossings convenient to the stop?
  - Have state/local engineering & operational agencies reviewed the plans & provided comments?
  - Is there sidewalk continuity to the bus stop?
  - Is sufficient area provided to accommodate waiting passengers, B&A passengers & thru pedestrian traffic at peak times?
  - Would someone with mobility challenges be able to access & use the transit stop safely?
  - Does the location create operational issues for other road users (sight distance obstruction, stopping sight distance, etc.)?

Bus Stops are being used as pedestrian crossings!

159

159

Pedestrian Crossings at Bus Stops

- **Curb ramps must be located** to ensure a person with a mobility disability can travel from a sidewalk on one side of the street, over or through any curbs or traffic islands, to the sidewalk on the other side of the street
- **Detectable warnings are required** at curb ramps & blended transitions at pedestrian street crossings, pedestrian refuge islands, boarding platforms at transit stops for buses where edges of boarding platform are not protected by screens or guards & B&A areas at sidewalk
- Detectable warning surfaces at platform boarding edges shall be 24” wide & shall extend the full length of the public use areas of the platform
- Newly constructed or altered streets, roads & highways must contain curb ramps or other sloped areas at any intersection having curbs or other barriers to entry from a street level pedestrian walkway

160

160

Mid-Block Crosswalks

- For crossing needs when bus stop is in an area between intersections
- For high volume of crossings, consider signalizing the crossing
- Consider "daylighting" in advance of crosswalk
  - Make pedestrians more visible to motorists & cars more visible to pedestrians
  - May be accomplished by restricting parking/installing curb extension
- Stop lines at mid-block crossings should be set back 20'-50'
  - Makes crossing person visible to 2nd driver when 1st driver is stopped

161

161

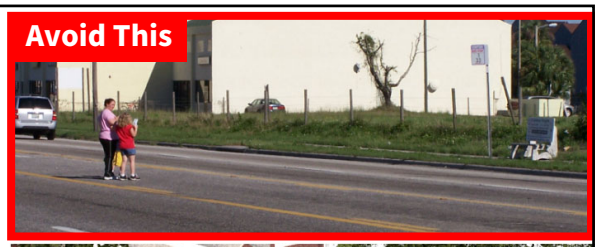
Pedestrian (Refuge) Islands

- Extensions of median into crosswalk to improve pedestrian safety
- Reduces exposure time for pedestrians
- Generally applied when speeds & traffic volumes are high
- When designing pedestrian refuge islands:
  - At least 6' wide (preferred width is 8'-10')
  - Where min 6' wide median cannot be attained, a narrower raised median is still preferable to nothing
  - Ideal length is 40'
- Use plantings or street trees to enhance, but they must meet visibility & clear sight distance requirements

162

162

Pedestrian (Refuge) Islands at Bus Stops

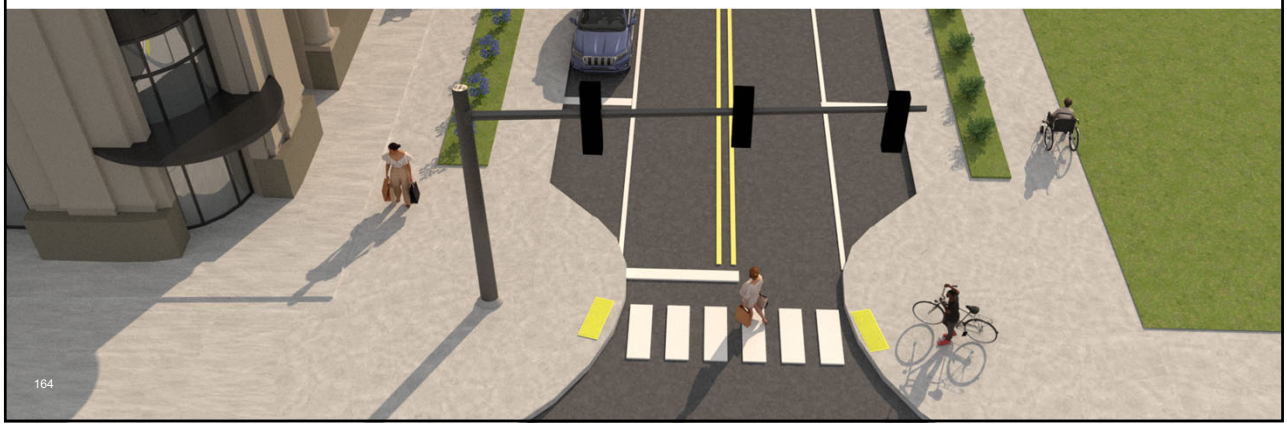


163

163

Intersection Nubs

- Extension of sidewalks into parking lane to reduce pedestrian crossing distances; helps traffic calming
- Should be at least 4’ wide (preferably 8’)



164

164

Bicycles at Bus Stops

- Consider:
  - Safe access to & parking at bus stops
  - Safe travel on bicycle lanes at & approaching bus stops
- Bicycle lanes are:
  - Part of roadway, either with curb & gutter or a flush shoulder
  - Designated by striping & special pavement markings for preferential use by bicyclists
- Bicycle lane minimum dimensions
  - 4' if on paved shoulders, 5' near guardrails or barriers, otherwise 7'

165

165

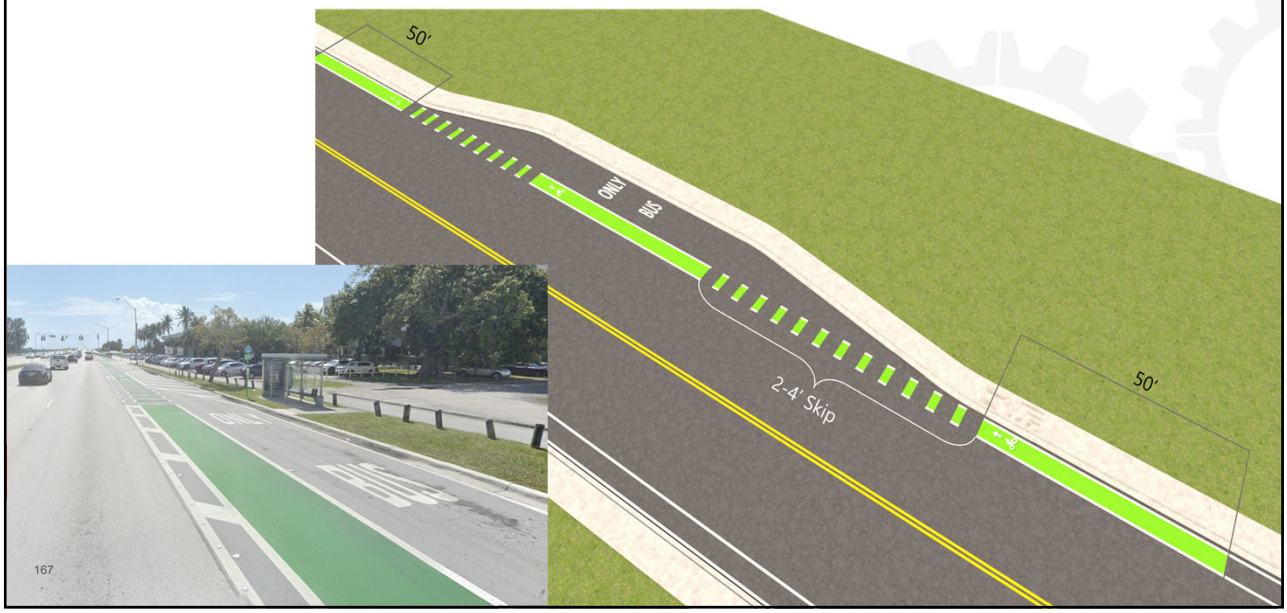
Green-Color Bicycle Lanes

- Permitted on State Highway System in traffic conflict areas when certain additional conditions are met
  - Like with "keyhole lanes" (bicycle lane is between thru lanes & right-turn lanes, bus bays, or parking lanes), but are not restricted to the keyhole lanes
- Enhance visibility of bicyclists to other motorists, especially with turning motorists
- Help make corridor look more multimodal, discourage illegal parking in the bike lane & increase comfort level for bicyclists due to clearly delineated exclusive operating space

166

166

Green-Color Bicycle Lanes



167

Bicycle Lanes

- Pavement markings used for separated bicycle facilities must conform to MUTCD
- When used in conjunction with white dotted lines, such as when extending bicycle lane across right-turn lane or access to bus bay, transverse-colored marking must match 2'-4' white dotted line pattern of bicycle lane extension
- Bicycle lanes shall not be provided on the circular roadway of a roundabout

168

Recommended Design Dimensions

Bus Stop ROW Needed by Bicycle Lane Type	
Curbside Stop with Bicycle Lane	Less than 10'
Raised Bicycle Lane (Shared)	Between 10'-13'
Raised Bicycle Lane (Exclusive)	Between 13'-21'
Boarding Island Bicycle Lane	Greater than 21'

168

Shared Bus/Bicycle Lanes

- Used to give preferential treatment to both bicycles & public transit
- Because buses & bicycles will pass each other in these lanes, lane width is an important factor
- Shared lane width
  - 16' to allow 3' of separation between bicyclist & passing bus
  - 14' or less if either bus or bicycle traffic is light & space is limited

169

169

Raised Bicycle Lanes

- Consider for dedicated bicycle lanes in front of bus stops
- Lane is elevated to height of the curb, bringing bike lane to same height as bus stop/sidewalk (or to intermediate level between roadway and sidewalk)
- Improves interaction between bus and cyclist
- Maximizes available ROW when not possible to position bike lane behind bus stop

170

170

Bicycle Lanes at Boarding Islands

- Preferred strategy for bicycle lanes at bus stops
- Route bicycles behind bus stops entirely, creating a bus boarding island
- Minimize bus-bicycle conflicts & may reduce bus dwell times
- Pedestrian crosswalks & detectable warnings should be used for passengers to safely enter & exit boarding island
- Use striping & curb ramps to connect boarding island to sidewalk

171

171

Bicycle Lane/Bus Stop Configurations

Bike Lane Type	Advantages	Disadvantages
Curbside Lane	• Minimal disturbance to operations • Modal zones are clearly delineated	• **Potential conflict between bus & bicycle** • Potential for bicyclist to merge into traffic to avoid stopped bus • Riders have to step off curb & cross bike lane to board the bus
Raised Bicycle Lane (Shared)	• Minimal disturbance to operations • Riders do not need to step off the curb • **Bus/bicycle conflict removed**	• Potential conflict between bicyclists & pedestrians in shared space • No clean delineation between bike & pedestrian areas • May impact site drainage
Raised Bicycle Lane (Exclusive)	• Minimal disturbance to operations • Riders do not need to step off the curb • **Bus/bicycle conflict removed**	• Requires more signing & striping to clarify conflicts • May impact site drainage
Behind Boarding Island	• Minimal disturbance to operations • Modal zones are clearly delineated • **Bus/bicycle conflict removed** • Improves pedestrian visibility • Provides additional surface for amenities	• **Requires more right-of-way** • May impact site drainage • Requires more signing & striping to clarify conflicts • Introduces conflict area between pedestrians & cyclists • May take away parking spaces • May delay traffic if there are no passing lanes

172

172

Minimizing Bus-Bicycle Conflicts

- Colored lane treatments
- Discontinued bicycle lanes at transit stops
- Physical rerouting of bicycle lanes around bus stops

173

Minimizing Bus-Bicycle Conflicts

- Unique pavement markings/signage on right-of-way such as “Yield to Bus” or “Yield to Bike”
- Protected intersections
  - Provide dedicated bike lanes, exclusive pedestrian/bicycle crossings & curb extensions to slow down turning vehicles & increase visibility
- Raised or boarding island bicycle lanes
- Left-side bicycle lanes
  - Bicycle lanes also can be located on the left side of the roadway on one-way streets where transit is operating to minimize bus-bike conflicts

174

174

Accessing Transit During Construction

- Ensure mechanism that notifies transit agency if road improvement project that affects transit services is planned!
- Reroute pedestrians with safe & accessible methods
  - Explore possibility of maintaining existing routing/sidewalk
  - Develop alternative pedestrian circulation path
  - Reroute pedestrians to nearby parallel sidewalk
  - Use your TTC plan on accessible temporary bus stops, pullouts & satisfactory waiting areas for transit patrons, including persons with disabilities
  - TTC should be provided for cyclists & pedestrians to access bus stop

175

175

Accessing Transit During Construction

- Where transit stops are affected or relocated because of work activity, both pedestrian & vehicular access to the affected or relocated transit stops shall be provided
- When existing pedestrian facilities are disrupted, closed, or relocated in a TTC zone, the temporary facilities shall be detectable & include accessibility features consistent with the features present in the existing pedestrian facility
- Where pedestrians with visual disabilities normally use the closed sidewalk, a barrier that is detectable by a person with a visual disability traveling with the aid of a long cane shall be placed across the full width of the closed sidewalk
- While designing detours, ADA requirements must be considered

176

176

Accessing Transit During Construction

- Measures are required to provide a temporary path anytime a vehicle, equipment, or workers or their activities encroach on a sidewalk for a period of more than 60 minutes; if a barrier is constructed, it must be a detectable barrier to encourage compliance & communicate with pedestrians that a sidewalk is closed
- Any temporary sidewalk must be a minimum of 4’ wide with a maximum of 2% cross-slope
- Temporary walkways less than 5’ in width must provide for a 5’x5’ passing space at intervals not to exceed 200’
- Temporary ramps must meet the requirements for curb ramps
- Temporary walkway surfaces & ramps must be stable, firm, slip-resistant & kept free of any obstructions & hazards such as holes, debris, mud, construction equipment & stored materials

177

177

BREAK

178

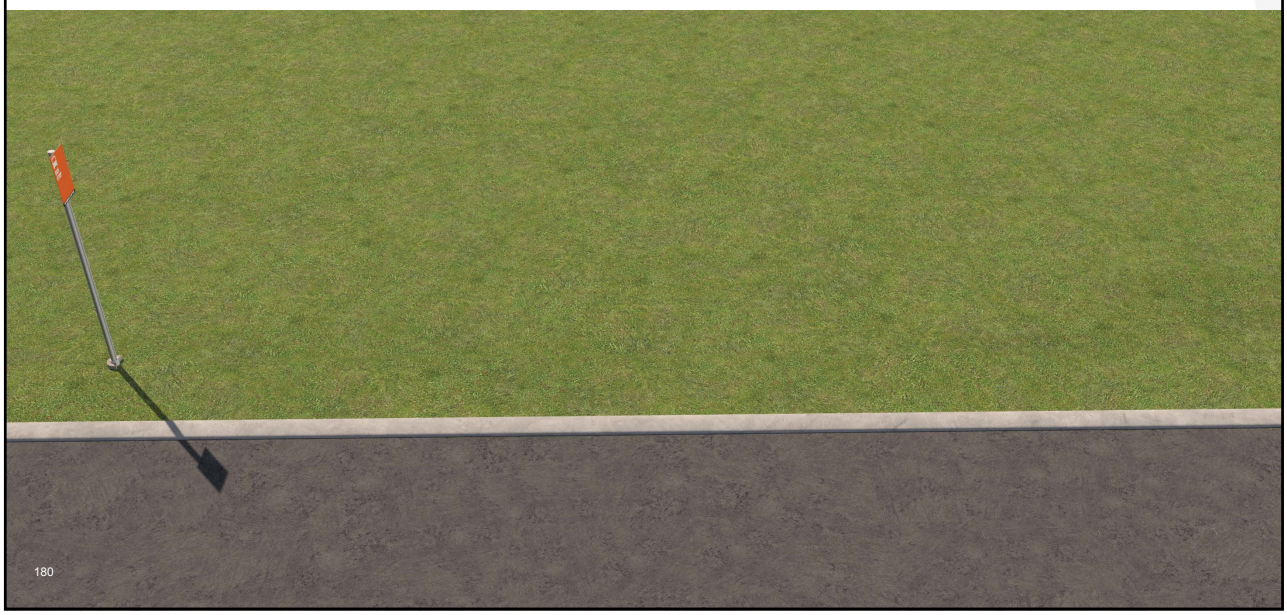
178

Training Activity #2
Build Your Bus Stop

179

179

Bus Stop Scenario #1 | Before



180

180

Build Your Bus Stop - Scenario #1

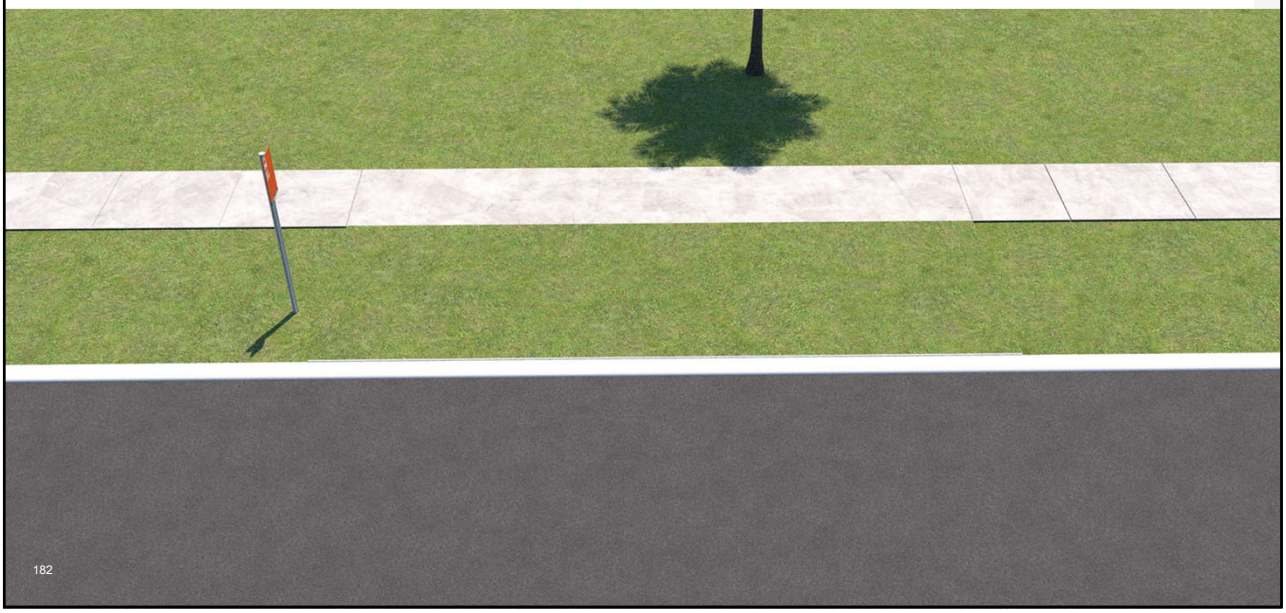
- Current condition
  - Sign only

- You want to add:
  - Concrete B&A pad
  - Connecting path
  - Bike lane
  - Bike parking
  - Small shelter with bench
  - Trash receptacle

181

181

Bus Stop Scenario #2 | Before



182

182

Build Your Bus Stop - Scenario #2

- Current Situation
  - Sign only
  - Connecting path
- You want to upgrade bus stop with:
  - Concrete B&A pad
  - Shelter with bench
  - Additional bus stop seating
  - Trash receptacle
  - Bike parking
  - Bike lane
  - Closed bus bay

183

183

Bus Stop Scenario #3 | Before

184

184

Build Your Bus Stop - Scenario #3

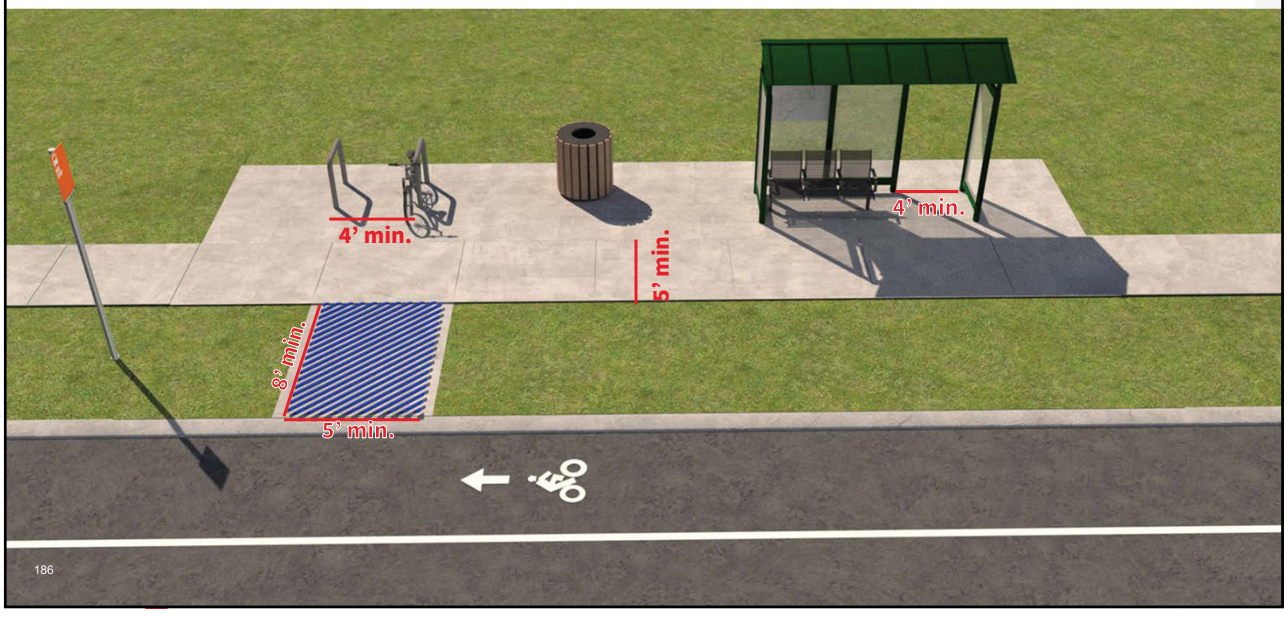
- Current Situation
  - Sign
  - Shelter
  - Trash can
  - Connecting path

- You want to upgrade bus stop with:
  - Open bus bay
  - Micromobility parking
  - Bicycle parking rack
  - Fare kiosk/off-board fare collection
  - Additional seating bench
  - Recycling receptacle

185

185

Bus Stop Scenario #1 | After

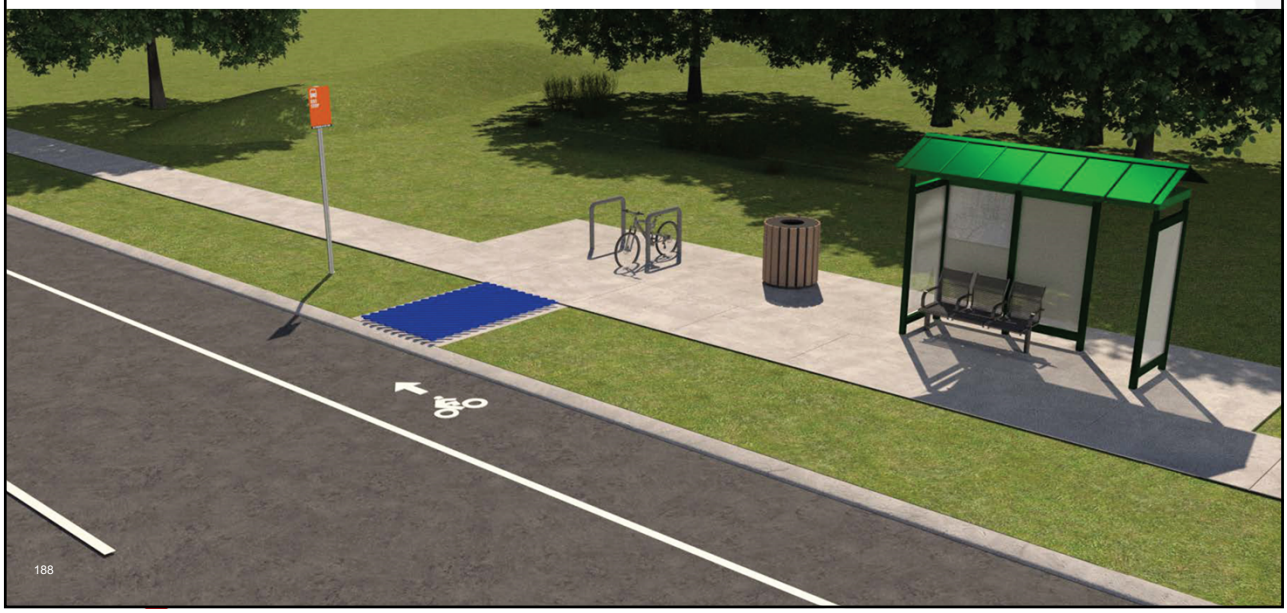


186

Bus Stop Scenario #1 | After

187

Bus Stop Scenario #1 | After

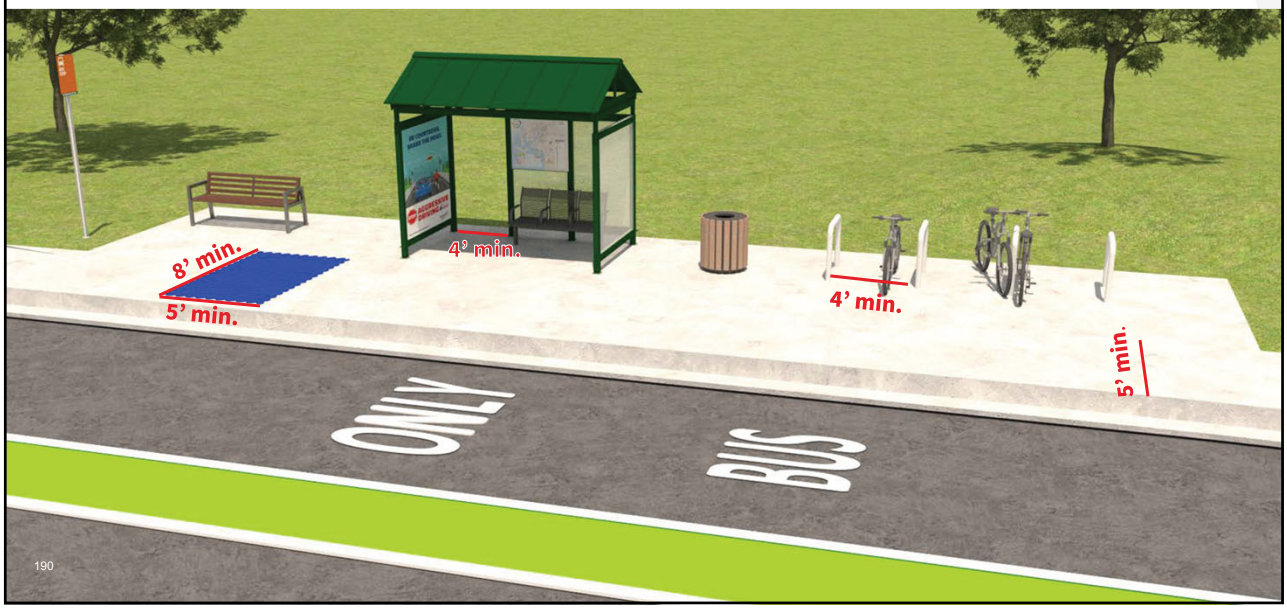


188

Bus Stop Scenario #2 | After

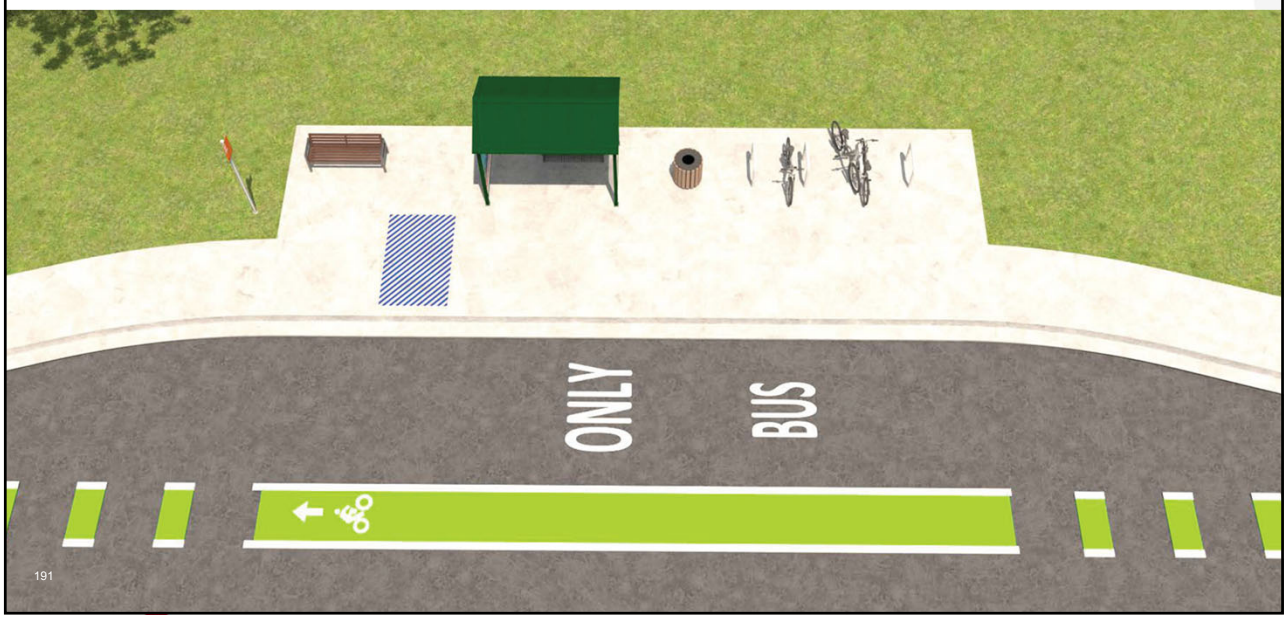
189

Bus Stop Scenario #2 | After



190

Bus Stop Scenario #2 | After

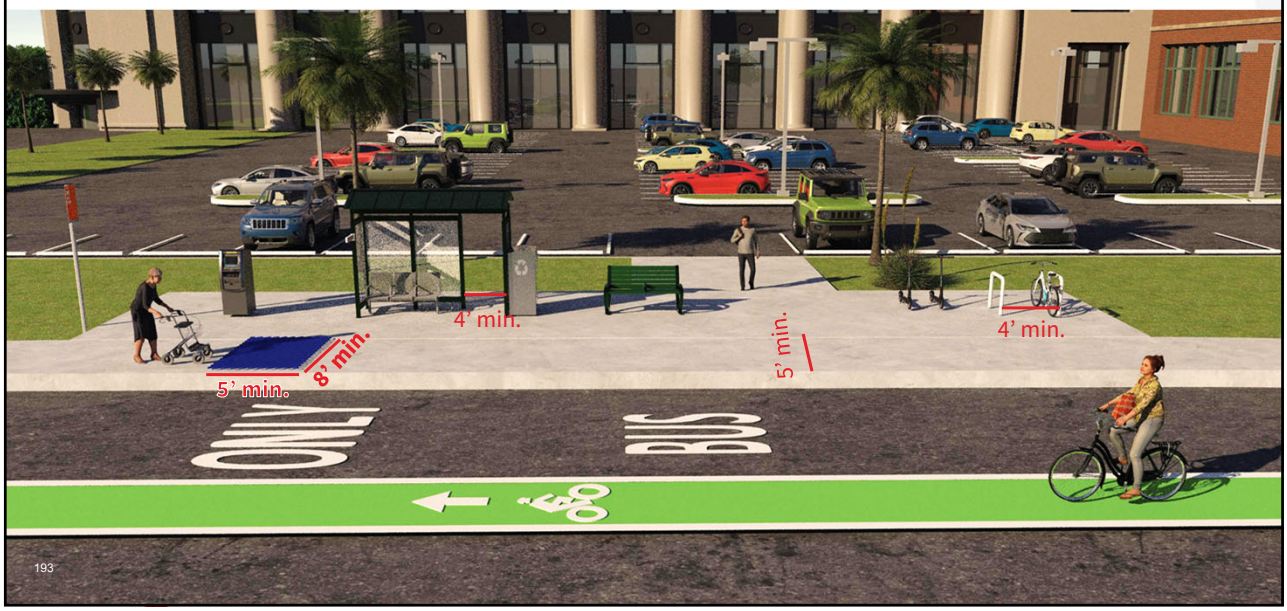


191

Bus Stop Scenario #2 | After

192

Bus Stop Scenario #3 | After



193

Bus Stop Scenario #3 | After

194

Bus Stop Scenario #3 | After

195

BREAK

196

196

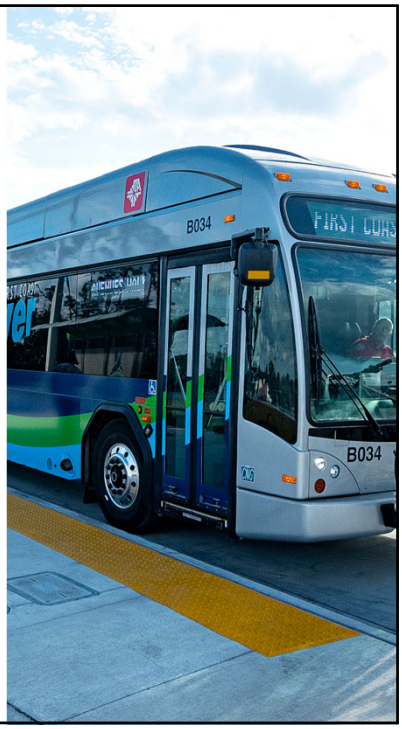
BRT Station Design

197

BRT Stations

- *BRT is "high-quality bus-based transit delivering fast & efficient service that may include dedicated lanes, busways, TSP, off-board fare collection, elevated platforms & enhanced stations"*
- BRT types
  - **Full BRT** operates on dedicated bus lanes or on exclusive runningways with most BRT features/ elements applied
  - **BRT Lite** operates in mixed traffic with some BRT features/elements and is applied where dedicated bus lanes or runningways are not feasible or may be under development

198



198

Station Components by BRT Type

BRT Lite	*Full BRT*
Stations with branding or enhanced bus stop with shelter	Uniquely branded stations
Additional signage	Platforms for level or near-level boarding
Bicycle parking	Enhanced stations with better amenities & accessibility options
Shared use mobility parking possible	CCTV for safety
Station shared with regular fixed-route bus services	Limited to no station sharing with regular fixed-route bus services

199

199

BRT Stations

- Design & placement requirements applicable to traditional bus stops are also applicable to BRT stations
- Stations must meet vertical & side clearance of the vehicle, turning radius of the intersection, curb lane width, parking clear zone & presence of driveways
- Provide waste & recycling receptacles, seating, basic covered shelter & bicycle parking
- Provide safe waiting environment through lighting, runningway barriers & CPTED standards
- Provide relevant passenger information including system maps, area destinations & real-time information
- Facilitate multi-door boarding & enable near-level boarding
- Accommodate Universal Accessibility

200

200

201

Basic Station

- Bus shelter, passenger information, seating, lighting & may have branding
- Smaller in size/scale, quick to install & inexpensive
- May distinguish BRT service only moderately from traditional bus service
- When used
  - Travel demand is low
  - Space limitations
  - As transitional strategy/short-term use (an enhanced stop is planned)

202

202

Premium Station

- All components of basic BRT station plus level boarding, off-board fare collection, enhanced branding, security
- When used
  - Sufficient space permits installation
  - High demand is expected
  - Passenger experience is a high priority
  - Desired to protect passengers from weather conditions
  - TOD is desired or proposed

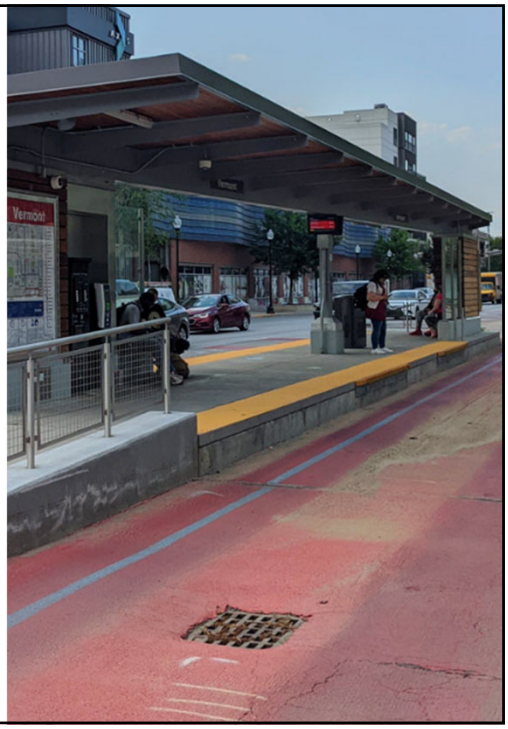
203

203

Highway Station

- May have median platforms or side platforms
- Bus access to station may vary from bus-only dedicated runningways to general purpose ramps, shoulder lanes, and/or HOV or express lanes
- When Used
  - Near major activity centers or park-and-ride lots
  - Where supporting infrastructure, including pedestrian overpasses, multi-use paths, pedestrian tunnels, or nonmotorized crossings, is available to facilitate last-mile connections

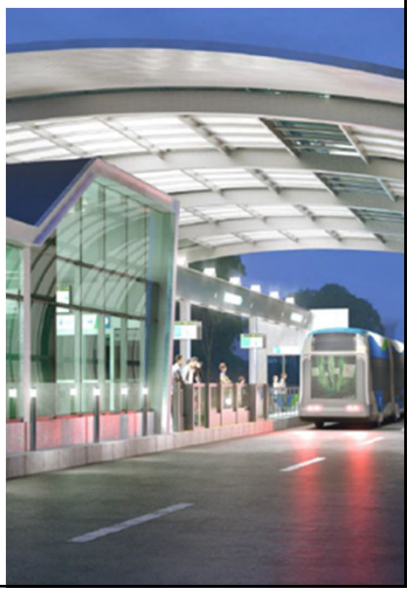
204



204

Transit Center/Terminus Station

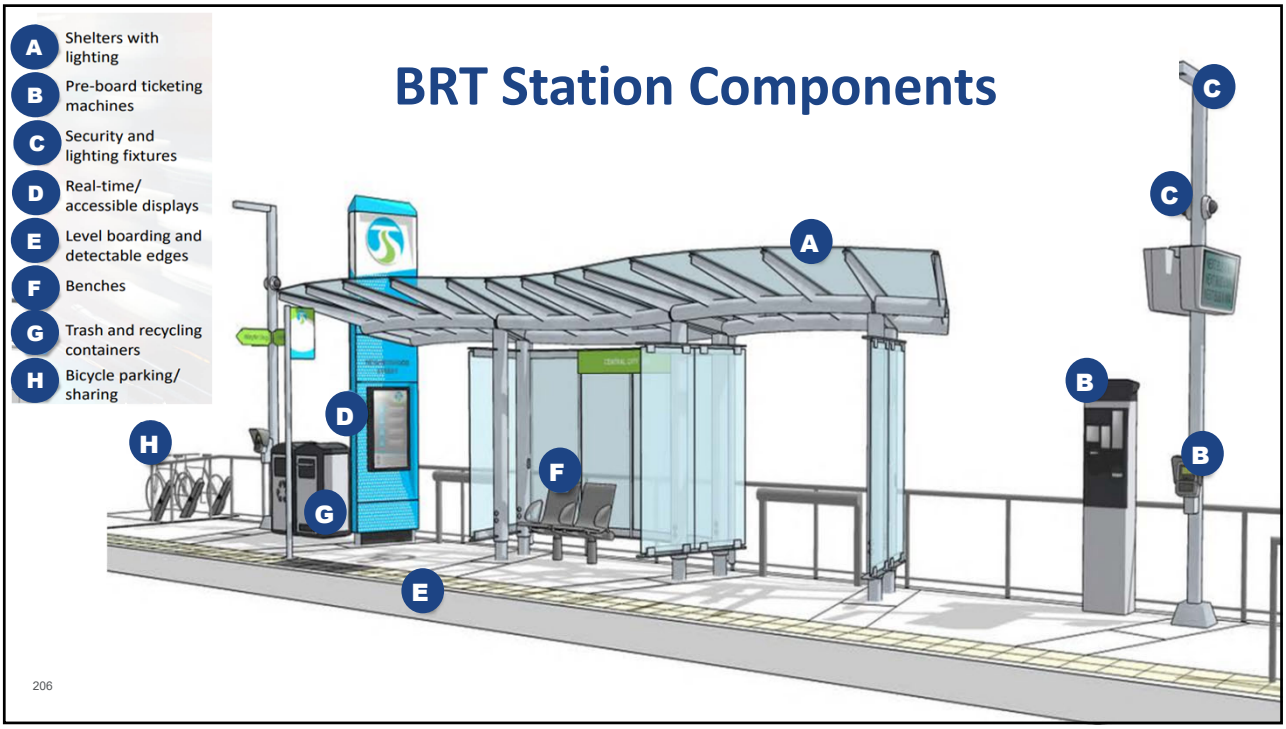
- Located on or off transit line, enables passengers to transfer to other transit services, generally without leaving the station
- May function as end-of-line facility for some routes
- May include commercial & food services & transit-supportive land uses
- When used
  - Large capital investment possible & space is available
  - Where the BRT alignment interfaces with other modes and/or other transit services
  - In many cases, existing transit centers have been converted to support BRT



205

205

BRT Station Components



206

206

Station Design Dimensions

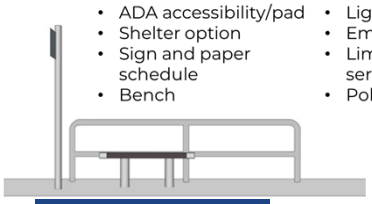
- All Station Types
  - Station Height—14.5”-15.5”
  - Station Length—140’
  - Approach Taper Length—1.5x Bus Length
  - Departure Taper Length—1x Bus Length
- For Median Station
  - Station Width (overall)—30’ max to 26’ min
  - Clear Platform Width (Each Side)—12’ desirable, 10’ min
- For Curb-Side Station
  - Station Width (overall)—16’ max to 10’ min
  - Clear Platform Width—12’ desirable, 10’ min
- For Park & Ride Station
  - Station Width (overall)—20’ max to 10’ min
  - Clear Platform Width—12’ desirable, 10’ min

207

207

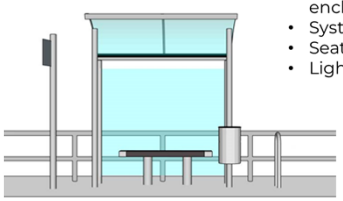
Example Design & Components by Station Scale

- ADA accessibility/pad
- Shelter option
- Sign and paper schedule
- Bench
- Lighting
- Emergency phone
- Limited micro-mobility services
- Pole



Width 10’ & Length 50’

- ADA accessibility/pad
- Shelter or partial enclosure
- System map (wayfinding)
- Seating
- Lighting and security
- Fare collection system
- Emergency phone
- Provide micro-mobility capacity if not already in close proximity



W 10’-12’ & L 50’-100’

- ADA accessibility/pad
- Partial or full enclosure
- Real-time passenger message boards/LCD
- Seating
- Lighting and security
- Fare collection system
- Landscaping
- Focus on rideshare; provide micro-mobility capacity if not already in close proximity
- Art installations

208 W 10’-12’ & L 100’

208

BRT Station Components by Investment Type

Investment	Shelter Type	Security Cameras	Outdoor Rated Display Monitor	Ticket Vending Machine	Bench	Trash Receptables	Bike Rack	Artwork
$$$$	Large Shelter with Totem	2	Yes	Yes	Multiple	Yes	Yes	Should consider depending on location
$$$	Small Shelter with Totem	1	Yes	Yes	1	Yes	Yes	Should consider depending on location
$	Totem only	None	Yes	Yes	Leaning Rail	Yes	Yes	As applicable

209

209

Station Platform Design

- Key Considerations
  - Efficient flow of pedestrians
  - Accessibility for persons with disabilities
  - Passenger amenities
  - Compatibility with BRT vehicle door configuration
  - Station name visible from inside the vehicle
  - Clear & simple wayfinding signs
  - Fare collection & control systems
  - Safety & security
  - Emergency evacuation procedures

210

210

Platform Length Dimensions

- The **length of a platform** should exceed the length of the longest vehicle multiplied by the maximum number of vehicles expected to serve the station or stop simultaneously
- Space also must be provided for infrastructure & the transition area
- **If vehicles are utilizing the same platform**, the vehicle waiting in queue behind a BRT bus currently at the station should be able to wait behind the first vehicle without blocking the station on either side
- To achieve this, minimum spacing between bays should remain at **least 1.7 times the length of the longest vehicle** utilized at the station
- If using 60' articulated bus, the necessary distance would be approximately 100'

211

211

Platform Width & Height Dimensions

- ADA required **minimum width** for a BRT station platform is 8'
- **Center platforms** should be as wide as 20' to 25' because they are serving buses on both sides of the platform
- Width should accommodate:
  - Ramps, garbage receptacles, ticket vending machines, signage, bicycle racks, stairs, elevators, etc.
  - Passenger waiting areas, entry/exit & circulation & access & safety for all, including mobility-aid users
- **If right-of-way is limited**, consider reducing width requirements by offsetting vehicle berths on either side of the station, thereby reducing the depth needed to accommodate passenger waiting areas for those traveling in opposite directions
- Height needs to be coordinated with fare collection & vehicle design
- **Standard curb**: 6" high above street level, leaving 8" to base of vehicle
- **Raised curb**: 9" to 11" high above street level, leaving 3" to 5" to base of vehicle
- **Level platforms**: 14" to 15" high

212

212

213

Station Area Design Dimensions

- A portion of main ticketing counter must be at least 36” long with maximum height of 36”
- Space in front of counter must provide for a parallel approach or, if the counter is not at least 36” long, then it must be at least 30” long & provide knee/toe space under the counter for a forward approach
- Ticket counters providing a front approach must satisfy knee/toe clearance requirements; the assessment must ensure that a forward approach with a clearance depth of 17” to 19” is provided to permit a person in a wheelchair to pull up far enough under counter to utilize it as a work surface
- If public address systems are provided to convey information to the public, there also must be a means of conveying the same or equivalent information to persons with hearing impairments
- Lighting plans for BRT station platforms, B&A areas & other station areas must meet bus stop lighting guidelines
- Where clocks are installed overhead, numerals & digits shall comply with ADA requirements for the visual character heights

214

214

Station Placement - Curbside

Pros	Cons
• Space is more likely to be available • Possible to avoid taking street space by using existing sidewalk area • Can be integrated with buildings & may complement other uses of sidewalk • Possible to use a standard bus & share facility with traditional bus service • Eliminates need for some pedestrian street crossings	• Curbside real estate is quite valuable, particularly in dense urban locations • Buses must use curbside lane to serve station, potentially creating conflicts with right-turning vehicles, parked cars, bicycles, etc. (use of a curb extension helps to mitigate this issue) • In heavily commercialized areas, may be difficult to distinguish station signs on curbside from other signage

215

215

216

216

Station Placement - Median

Pros	Cons
• Can serve both directions simultaneously, providing more similarity to rail • Can maximize speed by minimizing car conflicts & make TSP easier with unique signals/signal phasing • Can take advantage of unused medians & may enable curbside parking • Easy to distinguish, enhancing system identity & visibility • Does not create a visual obstruction for businesses	• May require taking of more right-of-way than curbside stations • May conflict with other uses of road, including left turn lanes • May require unique signal timings • Requires passengers to cross some traffic lanes to get to the stations, creating need for a longer walk than for curbside stations • Median space may be limited • Relatively more difficult to maintain than a curbside station

217

217

218

218

Median Center Platforms

- Allow shared passenger facilities serving both directions
- Minimize the right-of-way requirements for the station
- Reduce pedestrian congestion
- Make TSP easier with unique signals & signal phasing

219

219

Median Side Platforms

- Do not require crossover operations since right-side vehicle door boarding & alighting is accommodated
- Requires more design, space & infrastructure considerations

220

220

When Implementing BRT

- Imagine as if you are tasked with implementing rail!
- Plan in concurrence with other supportive strategies, such as additional pedestrian infrastructure, road diets & lane repurposing
- Consider climate & other sustainability aspects
- Recognize that introducing BRT infrastructure may require educating the local community!

221

221

Additional Resources

222

222

INDEX OF RESOURCES

A

Accessing Transit, Version III, FDOT
https://fdotwww.blob.core.windows.net/sitefinity/docs/default-source/content/transit/pages/2013accessingtransitfinal.pdf?sfvrsn=8310beb8_0

ADA Accessibility Specifications for Transportation Vehicles, US DOJ
https://www.ecfr.gov/current/title-36/chapter-XI/part-1192

ADA Standards for Accessible Design, US DOJ
www.ada.gov/regs2010/2010ADAStandards/2010ADAStandards.pdf

Applying the Americans With Disabilities Act In Work Zones: A Practitioner Guide
https://workzonesafety.org/publication/applying-the-americans-with-disabilities-act-in-work-zones-a-practitioner-guide/

B

Bus Rapid Transit: Current State of Practice, National Academies of Sciences, Engineering, and Medicine, 2022
https://nap.nationalacademies.org/catalog/26597/bus-rapid-transit-current-state-of-practice

Bus Rapid Transit Stations and Stops, APTA
https://www.apta.com/wp-content/uploads/APTA-BTS-BRT-RP-002-10_Rev1.pdf

D

Design Manual, FDO
https://www.fdot.gov/r

Design Standards, FD
https://www.fdot.gov/ro

Don't Stop at the Stop
https://fdotwww.blob.cor
transit/documents/
sfvrsn=61573fe6_2

F

Florida Administrat
https://www.flrules.org

Florida Building Code
https://codes.iccsafe.org/

G

Guide for the Geometric
Highways and Streets, A
https://store.transportation.o

Guidelines for Bus Transit S
Zones
https://rosap.ntl.bts.gov/view/d

223

Index of Topics

224

Appendix A: Quick Reference Guide

Bus Stop B&A Areas

- A B&A area must have a firm, stable, and slip-resistant surface with a minimum clear length of 8 feet (measured perpendicular to the curb or roadway edge), and a minimum clear width of 5 feet (measured parallel to the roadway).[2]
- Firm, stable, and slip-resistant B&A areas are required if amenities such as benches or shelters are added to a bus stop.[2]
- An accessible path to a bus stop B&A area must be provided and designed to maintain a minimum clear width of 60 inches and vertical clearance of 84 inches, unless approved design variation by the District Design Engineer.[2]
- On flush shoulder roadways, B&A areas should be constructed at the shoulder break (or edge of shoulder pavement on roadways with a posted speed of 45 mph or less) to create an accessible bus stop.[2]
- The B&A area on flush shoulder roadways shall use a Type E curb and gutter (5" curb height) and be connected to the sidewalk along the roadway, or to the roadway when no sidewalk is present.[2]
- Except for the area adjacent to the 5-inch curb, the areas surrounding the B&A area on flush shoulder roadways shall be flush with the adjacent shoulder and side slopes and designed to be traversable by errant vehicles.[2] On the upstream side of the B&A area's landing, a maximum slope of 1:12 should be provided, and may be grass or a hardened surface.[2]
- A sidewalk and/or ramp provided with a B&A area shall be a minimum of 60 inches (5 feet) in width, and the ramp shall not exceed a slope of 1:12 (8.33%).[2]
- Bus stop B&A areas shall be connected to streets, sidewalks, or pedestrian paths by an accessible route.[1]
- A detectable warning surface is required where a sidewalk associated with a B&A area connects to the roadway at grade.[2]
- Parallel to the roadway, the slope of the bus stop B&A area shall be the same as the roadway, to the maximum extent practicable. Perpendicular to the roadway, the slope of the bus stop B&A area shall not be steeper than 1:50 (2%).[2]
- The B&A area can be located either within or outside the shelter, and shall be connected to streets, sidewalks, or pedestrian circulation paths by an accessible route.[7]
- If a concrete B&A area (and ramp and level landing, if needed) are to be constructed, requirements include 6-inch-thick concrete.[2]
- The design of vehicles shall be coordinated with the boarding platform design such that the horizontal gap between each vehicle door at rest and the platform shall be no greater than 3 inches and the height of the vehicle floor shall be within plus or minus 58-inch of the platform height under all normal passenger load conditions. Vertical alignment may be accomplished by vehicle air suspension or other suitable means of meeting the requirement.[11]
- For drainage purposes, a maximum slope of 1:50 (2%) measured perpendicular to the roadway is allowed.[2]

FDOT PUBLIC TRANSIT

225

Appendix B: Glossary

A

Access, limited (controlled access) – in transportation, to have entry and exit limited to predetermined points, as with rail rapid transit or freeways.

Accessibility – 1) a measure of the ability or ease of all people to travel among various origins and destinations; 2) in transportation modeling and planning, the sum of the travel times from one zone to all other zones in a region, weighted by the relative attractiveness of the destination zones involved; 3) In traffic assignment, a measure of the relative access of an area or zone to population, employment opportunities, community services, and utilities.

Accessibility, persons with disabilities (full accessibility) – the extent to which facilities are free of barriers and usable by persons with disabilities, including wheelchair users.

Accessible transportation facilities – transportation facilities that are barrier-free, allowing their use by all travelers, including older adults, persons who are transportation disadvantaged, and persons with disabilities.

Accessway – a paved connection, preferably non-slip concrete or asphalt, that connects the bus stop waiting pad with the back face of the curb.

Advertising shelter – a bus shelter that is installed by an advertising agency for the purpose of obtaining a high visibility location for advertisements; by agreement, the bus shelter conforms to the transit agency specifications but is maintained by the advertising company.

Alight – to get off or out of a transportation vehicle.

Alignment – in transportation, the horizontal and vertical layout of a roadway, railroad, transit route, or other facility as it would appear in plan and profile; the alignment is usually described on the plans by the use of technical data, such as grades, coordinates, bearings, and horizontal and vertical curves; see also *Roadbed*.

Alternate fuel – alternatives to conventional diesel fuel for urban transit buses, intended to reduce pollution; includes methanol, propane, CNG (compressed natural gas), LNG (liquefied natural gas), hydrogen (for fuel cells), and biomass derived fuels, all of which carry premium costs that trend in larger or more cost-conscious operators toward "clean diesel" solutions.

Amenities – items that provide or increase comfort or convenience.

American Association of State Highway and Transportation Officials (AASHTO) – national organization whose membership includes state and territorial highway and transportation departments and agencies and the U.S. Department of Transportation; its goal is to develop and improve methods of administration, design, construction, operation, and maintenance of a nationwide integrated transportation system; studies transportation problems, advises Congress on legislation, and develops standards and policies.

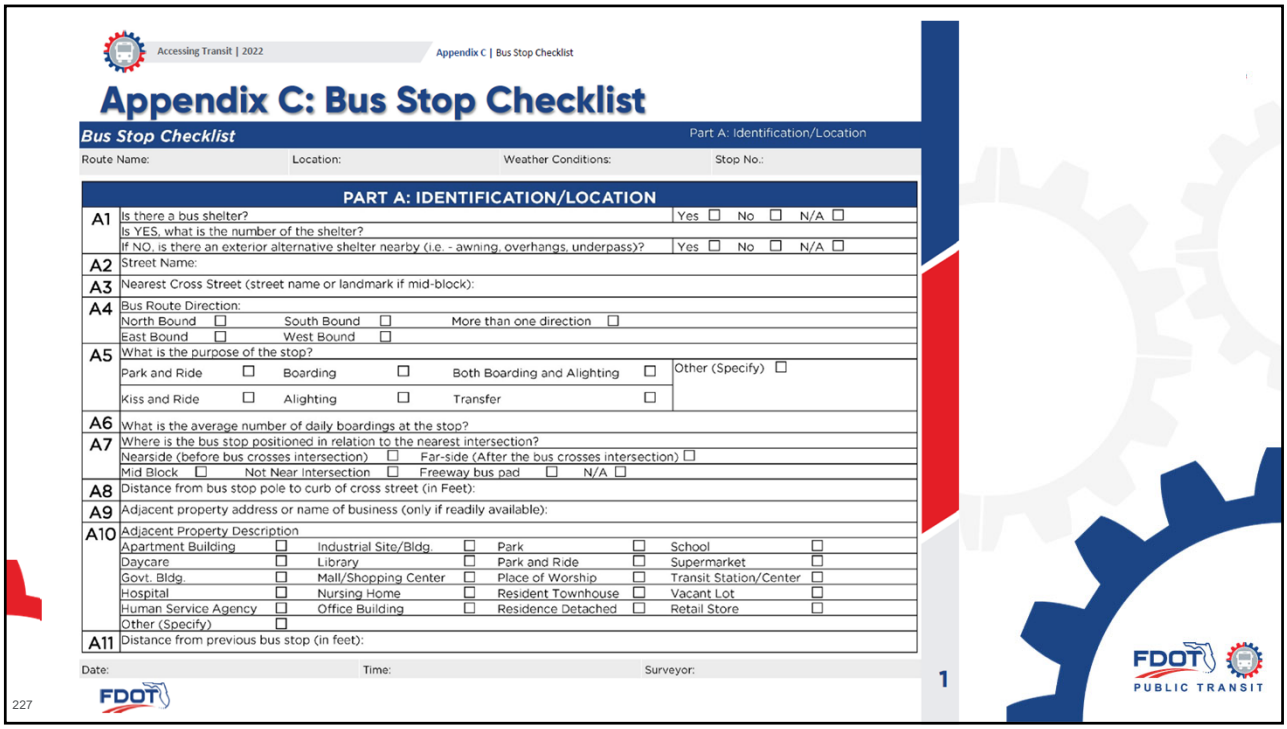
American Public Transit Association (APTA) – a non-profit international industry association made up of transit systems and other organizations and institutions connected to or concerned with the transit industry; performs a variety of services for the industry; objectives include promotion of transit interests, information exchange, research, and policy development.

Area, service – 1) the jurisdiction in which the transit property operates; 2) the geographic region in which a transit system provides service or that a transit system is required to serve.

Area, urbanized (UA) – as defined by the Bureau of the Census, a population concentration of at least 50,000 inhabitants, generally consisting of a central city and the surrounding, closely settled, contiguous territory (suburbs). The boundary is based primarily on a

FDOT PUBLIC TRANSIT

226



Accessing Transit | 2022 — Appendix C | Bus Stop Checklist

Appendix C: Bus Stop Checklist

Bus Stop Checklist

Part A: Identification/Location

Route Name: | Location: | Weather Conditions: | Stop No.:

PART A: IDENTIFICATION/LOCATION

A1	Is there a bus shelter?			Yes ☐ No ☐ N/A ☐	
	Is YES, what is the number of the shelter?				
	If NO, is there an exterior alternative shelter nearby (i.e. - awning, overhangs, underpass)?			Yes ☐ No ☐ N/A ☐	
A2	Street Name:				
A3	Nearest Cross Street (street name or landmark if mid-block):				
A4	Bus Route Direction:				
	North Bound ☐	South Bound ☐	More than one direction ☐		
	East Bound ☐	West Bound ☐			
A5	What is the purpose of the stop?				
	Park and Ride ☐	Boarding ☐	Both Boarding and Alighting ☐	Other (Specify) ☐	
	Kiss and Ride ☐	Alighting ☐	Transfer ☐		
A6	What is the average number of daily boardings at the stop?				
A7	Where is the bus stop positioned in relation to the nearest intersection?				
	Nearside (before bus crosses intersection) ☐	Far-side (After the bus crosses intersection) ☐			
	Mid Block ☐	Not Near Intersection ☐	Freeway bus pad ☐	N/A ☐	
A8	Distance from bus stop pole to curb of cross street (in Feet):				
A9	Adjacent property address or name of business (only if readily available):				
A10	Adjacent Property Description				
	Apartment Building ☐	Industrial Site/Bldg. ☐	Park ☐	School ☐	
	Daycare ☐	Library ☐	Park and Ride ☐	Supermarket ☐	
	Govt. Bldg. ☐	Mall/Shopping Center ☐	Place of Worship ☐	Transit Station/Center ☐	
	Hospital ☐	Nursing Home ☐	Resident Townhouse ☐	Vacant Lot ☐	
	Human Service Agency ☐	Office Building ☐	Residence Detached ☐	Retail Store ☐	
	Other (Specify) ☐				
A11	Distance from previous bus stop (in feet):				

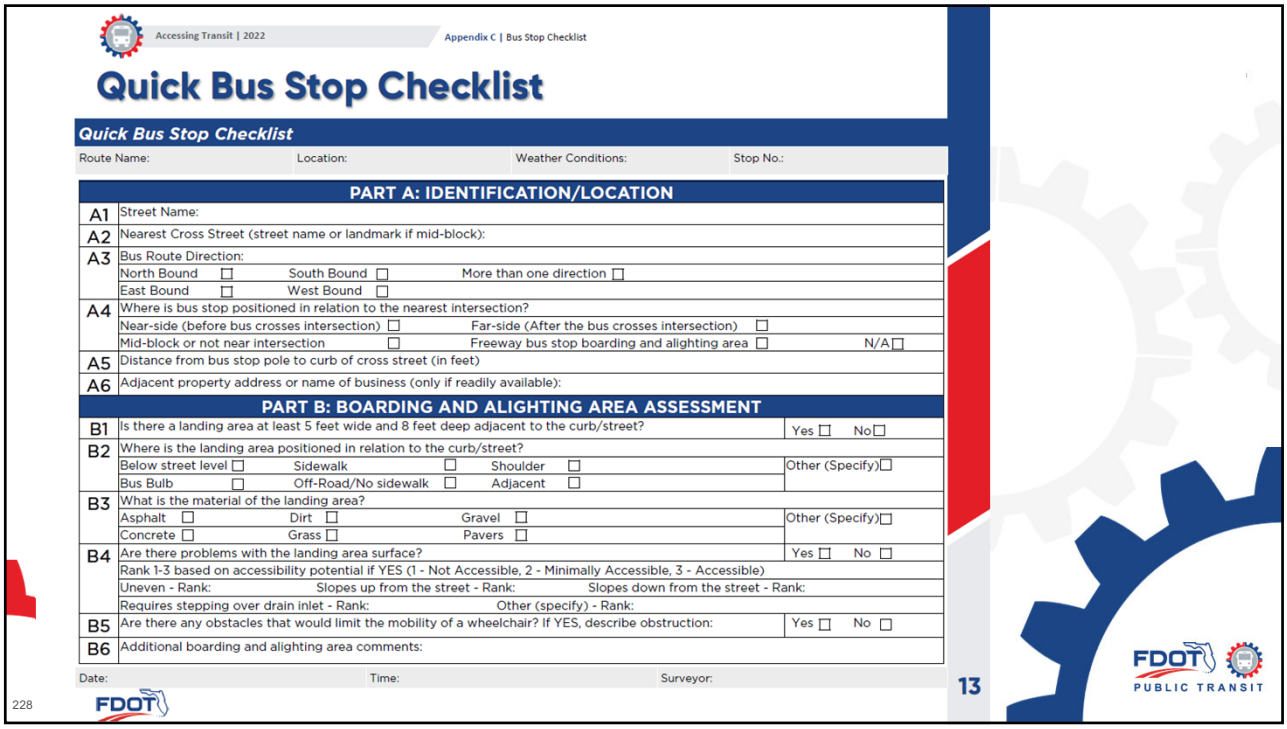
Date: | Time: | Surveyor:

1

227

FDOT PUBLIC TRANSIT

227



Accessing Transit | 2022 — Appendix C | Bus Stop Checklist

Quick Bus Stop Checklist

Quick Bus Stop Checklist

Route Name: | Location: | Weather Conditions: | Stop No.:

PART A: IDENTIFICATION/LOCATION

A1	Street Name:				
A2	Nearest Cross Street (street name or landmark if mid-block):				
A3	Bus Route Direction:				
	North Bound ☐	South Bound ☐	More than one direction ☐		
	East Bound ☐	West Bound ☐			
A4	Where is bus stop positioned in relation to the nearest intersection?				
	Near-side (before bus crosses intersection) ☐	Far-side (After the bus crosses intersection) ☐			
	Mid-block or not near intersection ☐	Freeway bus stop boarding and alighting area ☐		N/A ☐	
A5	Distance from bus stop pole to curb of cross street (in feet)				
A6	Adjacent property address or name of business (only if readily available):				

PART B: BOARDING AND ALIGHTING AREA ASSESSMENT

B1	Is there a landing area at least 5 feet wide and 8 feet deep adjacent to the curb/street?			Yes ☐ No ☐	
B2	Where is the landing area positioned in relation to the curb/street?				
	Below street level ☐	Sidewalk ☐	Shoulder ☐	Other (Specify) ☐	
	Bus Bulb ☐	Off-Road/No sidewalk ☐	Adjacent ☐		
B3	What is the material of the landing area?				
	Asphalt ☐	Dirt ☐	Gravel ☐	Other (Specify) ☐	
	Concrete ☐	Grass ☐	Pavers ☐		
B4	Are there problems with the landing area surface?			Yes ☐ No ☐	
	Rank 1-3 based on accessibility potential if YES (1 - Not Accessible, 2 - Minimally Accessible, 3 - Accessible)				
	Uneven - Rank:	Slopes up from the street - Rank:	Slopes down from the street - Rank:		
	Requires stepping over drain inlet - Rank:	Other (specify) - Rank:			
B5	Are there any obstacles that would limit the mobility of a wheelchair? If YES, describe obstruction:			Yes ☐ No ☐	
B6	Additional boarding and alighting area comments:				

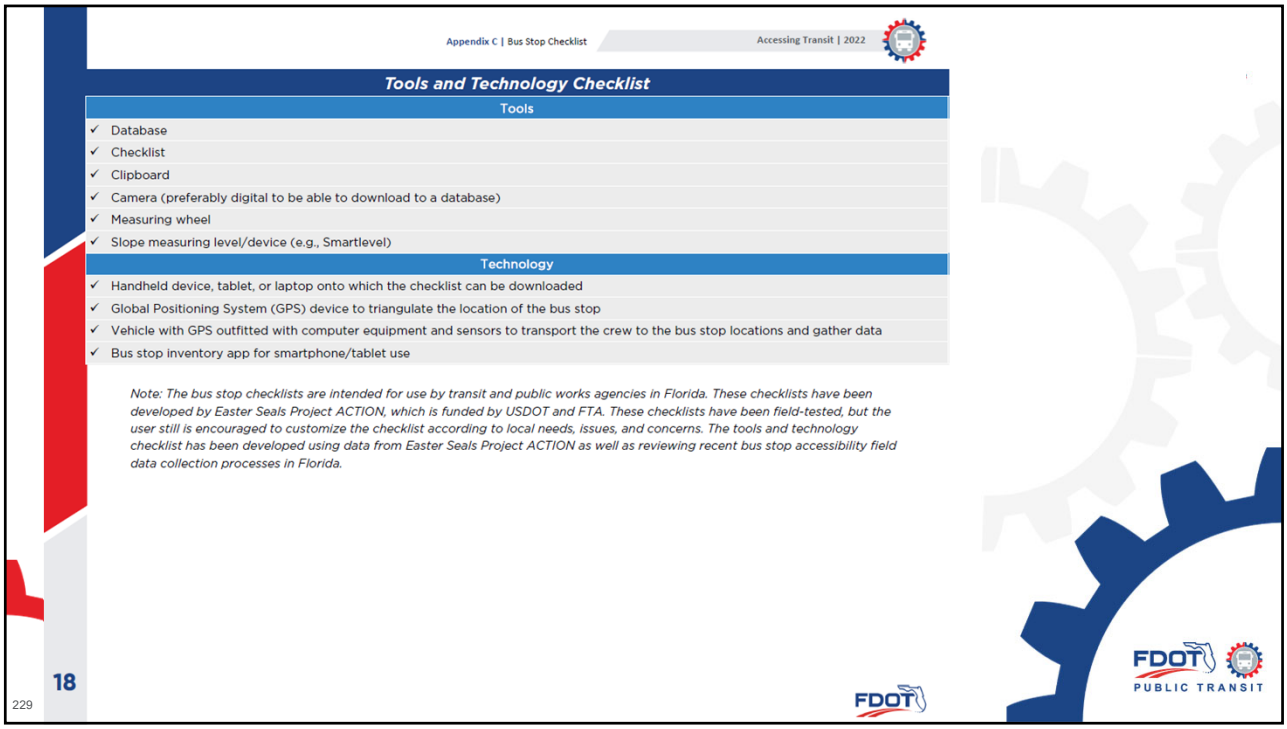
Date: | Time: | Surveyor:

13

228

FDOT PUBLIC TRANSIT

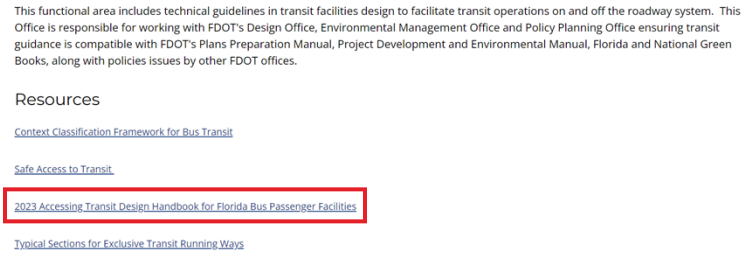
228



229

Accessing Transit

- Version IV, 2023
  - www.fdot.gov/fdottransit/transitofficehome/transitplanning.shtm/newtransitfaciliti esdesign.shtm



2023 Accessing Transit Design Handbook for Florida Bus Passenger Facilities

230

230

Evaluations & Wrap Up

231