

BCDCOG

Transit and Bus Stop Design Guidelines



October 2021

5 BUS STOP AMENITIES

Bus stop amenities are the elements available at a given bus stop, such as bus stop signs, maps, shelters, and benches. This chapter provides guidance on the bus stop amenities referenced in Chapter 4 – Bus Stop Typologies.

Amenities covered in this chapter include:



Landing pads



Bus stop signs



Lighting



Real-time information



Enhanced passenger information



Trash cans



Benches and seating



Shelters and shade



Bike racks



Fare machines



Overhead chargers for electric buses



Safety and Security Elements

Each category of amenity includes: (1) a description, (2) where they're required, preferred, or optional, (3) guidance, (4) roles and responsibilities, and (5) relevant appendices. Photos and diagrams are available when relevant.

One central consideration for bus stop amenities is compliance with the Americans with Disabilities Act (ADA). For more information on **ADA compliance**, see the callout box on the next page.

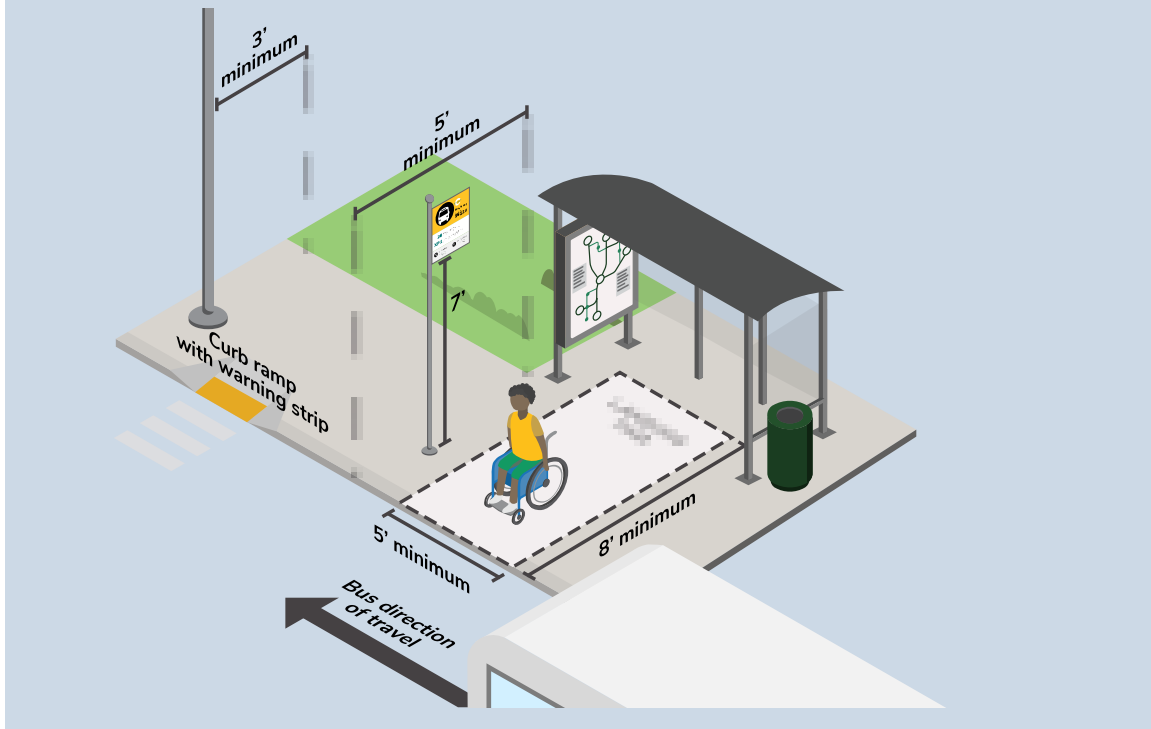
ADA Compliance

Access to bus stops is essential to the success of the transit network. Accessible boarding and alighting areas help to afford equal access to transit for all passengers, including those who use wheelchairs or other mobility devices. All bus stops being installed or upgraded must conform to the physical dimension requirements derived from the Americans with Disabilities Act of 1990 (ADA) and the Public Rights-of-Way Accessibility Guidelines (PROWAG), which are the primary federal guidelines for accessibility relating to transit facilities produced by the United States Access Board. Modifying existing stops to comply with ADA, though desirable from an accessibility perspective, is not required under ADA. Modification of existing stops can be difficult, especially if the stops are at sites with limited easement or not subject to CARTA’s control, such as shopping malls, on state rights-of-way, or suburban subdivisions.

A bus stop area is a designated location indicated by a bus stop sign where the bus will stop to let passengers board and alight. Bus stop signage, landing pads, passenger waiting areas, benches, and shelters are subject to ADA requirements to ensure access for all users. Flag stop areas/zones are not considered a designated area and thus not subject to the requirements outlined.

Bus stops with any of the amenities included in this chapter must have a 3-foot wide path through the stop for pedestrians to bypass the stop. Additionally, a 3-foot wide path must be provided to access any of the bus stop elements provided, including shelters, information, and any interactive elements such as push buttons. ADA Compliance was identified as one of the largest areas of opportunity for improving bus stops in the Charleston region.

Figure 5-1 ADA Compliance at a Bus Stop





LANDING PADS

The landing pad, also known as the accessible boarding area, is the place where riders get on and off the bus from the front door, directly adjacent to the bus stop sign. This is also the space where bus drivers deploy the ramp for riders using mobility devices, such as a wheelchair.

Landing Pads are a Top Priority

The landing pad is the BCDCOG’s top priority for compliance with ADA mandates. Other amenities listed in this chapter are important but should not displace investment in adequate landing pads.

Where They’re Required

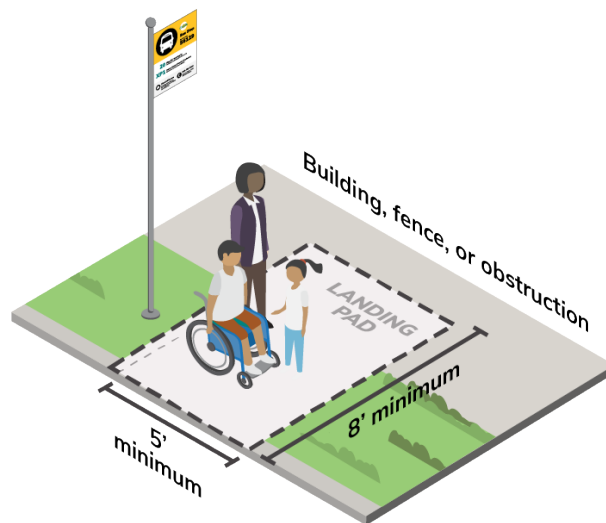
Transit Center	Transfer Stop	Park & Ride	LCRT Station	High Activity Stop	Standard Stop
Required	Required	Required	TBD	Required	Required

Guidance

According to ADA Standards issued by the U.S. Department of Transportation (DOT), all new or upgraded bus stops are **required** to have a front landing pad that:

- Provides a firm, stable surface
- Provides a clear length of 96 inches (8 ft.) minimum, measured perpendicular to the curb, and a clear width of 60 inches (5 ft.) minimum, measured parallel to the roadway
- Parallel to the roadway, has a slope that is the same as the roadway, to the maximum extent practicable
- Has a cross slope perpendicular to the roadway that does not exceed 1:48 (approx. 2%)




Figure 5-2 ADA-Accessible Boarding Area (Landing Pad)



A rear accessible boarding area should also be provided at high ridership bus stops to accommodate boardings and alightings occurring at the rear door of the vehicle. Since the position of the rear door may vary somewhat on various bus types, the rear door clear zone is recommended to be 10' wide (parallel to the roadway), and 4' deep (perpendicular to the roadway). Finally, landing pads and clear zones should not be obstructed by any physical features such as utility poles, sign poles, trees, newspaper machines, etc.

For CARTA, the standard depth for poured concrete or asphalt landing pads is 4".

Roles and Responsibilities

Role	Responsibilities and Considerations
 <p>BCDCOG/CARTA Staff</p>	<ul style="list-style-type: none"> ▪ Coordinate with dev/town planners to make sure all new/upgraded stops have landing pad and that they meet federal guidelines ▪ Does not own street and road right-of-way, except within certain Transit Centers ▪ Responsible for approving all landing pad designs ▪ Responsible for designing or constructing accessible landing pads and paths <i>[when appropriate]</i>
 <p>Other Agency Staff</p>	<ul style="list-style-type: none"> ▪ Responsible for designing or constructing accessible landing pads and paths <i>[when appropriate]</i> ▪ Coordinate with CARTA for their installation as outlined in Chapter 8 – Bus Stop Modifications
 <p>Developer</p>	<ul style="list-style-type: none"> ▪ Responsible for designing or constructing accessible landing pads and paths <i>[when appropriate]</i> ▪ Coordinate with CARTA for their installation as outlined in Chapter 8– Bus Stop Modifications

Relevant Appendices

- Appendix D – Bus Stop Accessibility and ADA Standards



BUS STOP SIGNS

Bus stop signs are the most basic element of a bus stop and are vital to the transit customer experience. As such, all bus stops served by CARTA must have consistently maintained bus stop signs, indicating where bus drivers will stop and where riders will board and alight the bus.

Where They're Required

Transit Center	Transfer Stop	Park & Ride	LCRT Station	High Activity Stop	Standard Stop
Required	Required	Required	TBD	Required	Required

Guidance

This guidance covers: (1) elements and design, (2) placement, and (3) mounting.

Sign Elements and Design

Figure 5-3 shows a potential bus sign design for CARTA. It shows the information that should be visible on all CARTA bus stop signs: bus stop icon and text; route number(s), name(s), direction(s), terminus(es), and service type(s); contact information; transit provider logo and branding; and the bus stop ID code.

Figure 5-3 Bus Stop Sign Elements Mockup

High-visibility colors
Use colors that don't blend into foliage or common building materials in the background. Keep contrast high so that signs are easy to read in different lighting conditions.

Logo and branding
Use transit provider logo, fonts, and colors, so riders don't mix up different types of stops.

Bus stop icon and text
"This is a bus stop!" Make this clear to all riders and potential riders at first glance, without prior knowledge of the provider. The bus icon conveys this information to people regardless of English proficiency.

Route information
For each route served by this stop, include the route number, name, direction, terminus, and service type if special (e.g., "express"). This tells riders where they will be headed.

Bus stop ID code
Include the bus stop ID code at each bus stop. This makes it easier for riders to confirm which stop they're at, and check times using an app.

Contact information
Include the provider phone number and website. For the phone number, include hours. For the website, point out that real-time information is available. Also, note the availability of real-time information via apps.

Note: The above mockup is not intended to be an official sign redesign. It is shown only to convey the key elements that should be visible on all bus stop signs.

Sign Design and Accessibility (ADA)

Transit signs should have letter styles, design, and color choices that are unique to the transit system so that passengers can easily identify bus stops. Customer information on the signs, as discussed earlier, should be legible and clear for all users, including persons with disabilities. According to ADA requirements, letters and numbers should have a width-to-height ratio between 3:5 and 1:1 and a stroke-width-to-height ratio between 1:5 and 1:10 (Toolkit for the Assessment of Bus Stop Accessibility and Safety, TCRP Report 19, 1996). The characters and background of signs should be contrasting and should have a non-glare finish. When possible, double-sided signs should be used, so the sign is visible from both directions.

Sign Placement

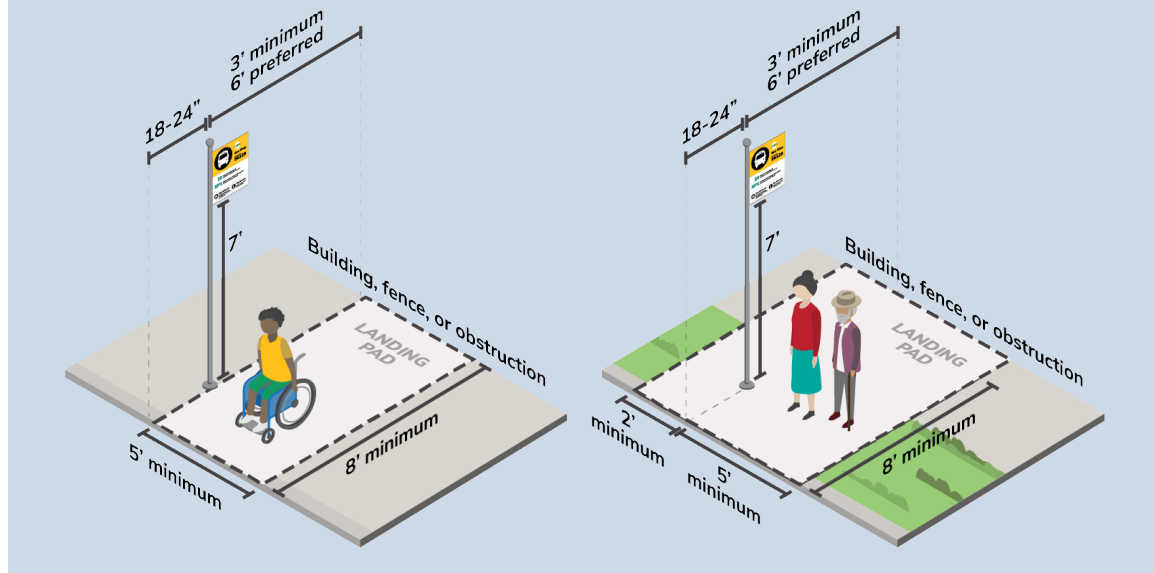
Bus stop signs should be placed where customers board at the front door of the bus, adjacent to the landing pad.

Sign Placement: Inside or Outside the Landing Pad

Figure 5-4 shows minimum dimensions for the placement of a sign with respect to the landing pad of the stop.

If the sign is placed outside the landing pad concrete, then the landing pad must be the standard 5' width, perpendicular to the street (left side of Figure 5-4). However, if the sign is placed *inside* the landing pad concrete, then the minimum landing pad width must be 2' wider (right side of Figure 5-4).




Figure 5-4 Bus Stop Sign Placement



Sign Mounting

Whenever possible, bus stop signs should be mounted on their own post or other approved standard post, such as a square post perforated by holes down its length, to make it easier to recognize for riders with visual disabilities to identify the bus stop. Bus stop sign poles can be installed in pavement or turf grass. BCDCOG recommends that bus stop sign posts be buried below grade a minimum of 2 feet, but signs can be surface mounted as needed.

Roles and Responsibilities

Role	Responsibilities and Considerations
 <p>BCDCOG/CARTA Staff</p>	<ul style="list-style-type: none"> Provide, install, and maintain a bus stop sign at every bus stop
 <p>Other Agency Staff</p>	<ul style="list-style-type: none"> Coordinate with CARTA for pole placement and installation in the public right-of-way, as outlined in Chapter 6 – Bus Stop Modifications
 <p>Developer</p>	<ul style="list-style-type: none"> Coordinate with CARTA for pole placement and installation in the private right-of-way, as outlined in Chapter 6 – Bus Stop Modifications

Relevant Appendices

- Appendix D – Bus Stop Accessibility and ADA Standards



LIGHTING

Adequate lighting is important for passenger comfort and security, as well as to improve the visibility of waiting passengers to approaching bus drivers and other oncoming traffic.

Where They're Required

Transit Center	Transfer Stop	Park & Ride	LCRT Station	High Activity Stop	Standard Stop
Required	Required	Required	TBD	Required	Preferred

Guidance

Almost all bus stops are served after dark or during inclement weather and should ideally be located to take advantage of existing street lighting or other outside facility lighting. If that is not possible, lighting should be installed at the stop, either via mounted lights or within shelters.

When possible, efforts should be made to reduce the presence of shadows and dark enclosures in and around the bus stop




Once bus stop lighting is installed, it is important to ensure that all bus stop lights work. Members of the public may report damaged lighting and unsafe waiting conditions to CARTA.

Figure 5-5 Examples of Bus Stop Lighting (Charleston, SC and North Charleston, SC)



Solar lights and shelter lights installed at CARTA stops.

Roles and Responsibilities

Role	Responsibilities and Considerations
 <p>BCDCOG/CARTA Staff</p>	<ul style="list-style-type: none"> ▪ Fund, install, and maintain integrated bus shelter lighting and sign-mounted solar power lights at bus stops
 <p>Other Agency Staff</p>	<ul style="list-style-type: none"> ▪ Install and maintain overhead street lamps at bus stops ▪ Coordinate with CARTA for placement and installation, as outlined in Chapter 6– Bus Stop Modifications
 <p>Developer</p>	<ul style="list-style-type: none"> ▪ Install and maintain adjacent lighting at bus stops ▪ Coordinate with CARTA for placement and installation, as outlined in Chapter 6 – Bus Stop Modifications

Relevant Appendices

- Appendix E –Solar Lighting Specifications



REAL-TIME INFORMATION

Real-time information (RTI) shows riders when a bus will reach a given stop, based on the actual vehicle’s location. RTI enables riders to spend less time waiting for the bus and anticipate arrival times more accurately—even when a bus is delayed. Furthermore, when the underlying RTI data is open source, third-party developers can integrate it into websites and smartphone apps.

RTI can be available at bus stops in the form of digital signage (Figure 5-6). This is especially useful for riders who do not own a smartphone. However, riders who can access RTI through a smartphone app will nonetheless find it easier to check available options on a larger screen.

Real-Time Information Displays are Currently Being Expanded

Real-time information displays are not currently installed at any CARTA stops, but the agency is in the process of deploying the boards at select high-ridership locations.



Figure 5-6 Real-Time Arrival Information Board mounted to CARTA Bus Stop



Where They’re Required

Transit Center	Transfer Stop	Park & Ride	LCRT Station	High Activity Stop	Standard Stop
Required	Required	Preferred	TBD	Required	Optional

Roles and Responsibilities

Role	Responsibilities and Considerations
 <p>BCDCOG/CARTA Staff</p>	<ul style="list-style-type: none"> ▪ Fund, install, and maintain real-time information displays at bus stops
 <p>Other Agency Staff</p>	<ul style="list-style-type: none"> ▪ Municipal planners approve shelters [where appropriate. See Page 6-10 (on Encroachment Permits, Private Property Use Agreements, and Municipal Review Committees for additional information on municipal review committees.)]

Relevant Appendices

- Appendix D –Digital Sign Specifications



ENHANCED PASSENGER INFORMATION

Enhanced passenger information at stops includes schedules, system and route maps, and local area maps. These are important because:

- Schedule information at bus stops helps reduce some of the uncertainty associated with taking the bus.
- Transit system maps can assist passengers in determining the best routing for their trip—including identifying transfer locations. System maps can also act as low-cost advertising and help potential customers understand how they can use transit services.
- Local area maps provide neighborhood context for transit riders unfamiliar with a given location and can alert regular users to previously overlooked destinations and transfer opportunities.

Community Input: More Passenger Information at Key Stops

Community input has revealed a preference for more system information, particularly at stops near major activity centers.

Where They're Required

Transit Center	Transfer Stop	Park & Ride	LCRT Station	High Activity Stop	Standard Stop
Required	Required	Required	TBD	Required	Preferred

Guidance

This section provides guidance on: (1) schedule information, (2) system and route maps, and (3) local area maps and information.

Schedule Information

CARTA should provide relevant route schedules at select bus stops. In the case of schedule changes, CARTA will place rider notices at the affected bus stops. Schedule information may be posted in bus shelters at transfer locations and at stops where it is likely that new, visiting, or occasional passengers are likely to interact with the transit network.

System and Route Maps

Most high ridership stops, especially stops that are major transfer locations, should have some form of a transit system map. CARTA will provide system-wide or route-specific maps at selected bus stops depending on the services available at a given stop. Maps should be prioritized at stops with high volumes of transfers and where new, visiting, or occasional passengers are likely to interact with the transit network.



Figure 5-7 Transit System Maps Installed at Bus Stops (Charleston, SC)



Local Area Maps and Information

Local area maps often highlight nearby transportation services, such as train stations, and other bus stops. Local area maps may also highlight tourist destinations, government offices, or information centers. Local governments may post area maps and information in bus shelters at transfer locations and at stops where it is likely that new, visiting, or occasional passengers are likely to interact with the transit network. Maps should be prioritized at stops with high volumes of transfers and where new, visiting, or occasional passengers are likely to interact with the transit network.

Roles and Responsibilities

Role	Responsibilities and Considerations
 <p>BCDCOG/CARTA Staff</p>	<ul style="list-style-type: none"> ▪ Fund, install, and maintain printed bus schedules and system and route maps at bus stops
	<ul style="list-style-type: none"> ▪ Fund, install, and maintain print local area maps and information at bus stops ▪ Coordinate with CARTA for placement and installation, as outlined in Chapter 6– Bus Stop Modifications



Other Agency Staff

TRASH CANS

Trash receptacles provide a convenience for waiting riders and help to reduce the amount of trash left on buses and on the street.

Where They're Required

Transit Center	Transfer Stop	Park & Ride	LCRT Station	High Activity Stop	Standard Stop
Required	Required	Required	TBD	Required	Preferred

Guidance


Trash cans should be within easy reach of the bus stop waiting area but must not block accessible paths, landing pads, bus door opening zones, shelters, or posted information. Trash cans should be secured to the ground to prevent accidental tipping or unauthorized movement. Trash cans on the ground typically require a 2' by 2' footprint.

Trash receptacle design should be consistent with the design of the other bus stop amenities. There are multiple types of trash cans in use across bus stops in the region. CARTA installs two types of receptacles: landscape trash receptacles, which are attached to signposts, and shelter trash receptacles. The Town of Mount Pleasant and the City of Charleston use streetscape trash cans to service bus stops.

Figure 5-8 Trash Can at a CARTA Bus Stop



Roles and Responsibilities

Role	Responsibilities and Considerations
 BCDCOG/CARTA Staff	<ul style="list-style-type: none"> ▪ Fund and install CARTA Standard Trash Receptacles at bus stops ▪ Maintain CARTA-installed trash receptacles at appropriate intervals to ensure bus stops remain comfortable for those waiting for the bus



**Other Agency
Staff**

- May fund and install municipal or custom trash receptacles at bus stops
- Maintain municipal or custom trash receptacles at appropriate intervals to ensure bus stops remain comfortable for those waiting for the bus
- Coordinate with CARTA for placement and installation, as outlined in Chapter 6 – Bus Stop Modifications

Relevant Appendices

- Appendix E – Trash Receptacle Specifications



BENCHES AND SEATING

Providing seating at bus stops significantly enhances the experience of waiting for a bus. Benches are the most typical type of seating, but alternatives such as low walls, leaning rails or bollards can also be used. Seating also presents an opportunity to integrate art or advertising into bus stop design.

Where They're Required

Transit Center	Transfer Stop	Park & Ride	LCRT Station	High Activity Stop	Standard Stop
Required	Required	Required	TBD	Required	Preferred

Guidance

All benches and leaning rails installed by CARTA or local governments must meet ADA requirements. Benches must not block accessible paths and landing pads, bus door opening zones, shelters or posted information.

Benches should provide a level of comfort appropriate for the typical wait and constructed of materials that will not be excessively hot in direct sunlight. Seating exposed to the elements can sometimes be placed under trees or near buildings to provide shade. Seating should be secured to a poured foundation and incorporated within shelters when possible. **The standard depth for poured concrete or asphalt foundations beneath benches is 4”.**

CARTA encourages local governments and private entities to install benches at bus stops to increase passenger comfort, especially at stops with long wait times and at stops frequented by older adults, people with disabilities, and children.

Figure 5-9 CARTA-Approved Bus Stop Benches in the Charleston region





Figure 5-10 CARTA-Approved Leaning Rail Design(Source: BASCO)



CONTOUR (LR-CO)

Roles and Responsibilities

Role	Responsibilities and Considerations
 <p>BCDCOG/CARTA Staff</p>	<ul style="list-style-type: none"> ▪ Fund and install only CARTA Standard Benches attached to bus shelters ▪ Maintain all bus stop seating
 <p>Other Agency Staff</p>	<ul style="list-style-type: none"> ▪ May fund and install municipal or custom seating at bus stops ▪ Coordinate with CARTA for placement and installation of bus stop seating, as outlined in Chapter 6 – Bus Stop Modifications

Relevant Appendices

- Appendix E – Bench Specifications and Leaning Rail Specifications



SHELTERS AND SHADE

Bus shelters protect transit riders from the elements, provide seating for waiting passengers, and help to identify stop locations. Aside from buses, they are one of the most visible elements of a transit system. As such, attractive and well-designed shelters can help enhance public perceptions of transit and function as advertisements for available services. Similar to benches, shelters also present an opportunity to integrate art or advertising into bus stop design.

Where They're Required

Transit Center	Transfer Stop	Park & Ride	LCRT Station	High Activity Stop	Standard Stop
Required	Preferred	Required	TBD	Preferred	Preferred

Guidance

Shelters

A number of different shelters are currently in use in the BCDCOG region, including the CARTA standard shelter and standard shelters unique to municipalities. Shelter specifications are not consistent across the system due to various municipal and historic district regulations. Appendix E – Shelter Specifications describes the specific requirements and specifications related to shelters in the historic district of Charleston and all relevant municipalities.

Figure 5-11 Standard CARTA Shelter



CARTA pays for the baseline costs of its approved shelter described in Appendix E – Shelter Specifications. All costs above the baseline costs of the approved shelter design must be borne by the entity requesting or requiring the shelter.

Additionally, all shelter guidelines discussed in Appendix E exist in addition to ADA guidelines. Shelters must not block accessible paths and landing pads, bus door opening zones, shelters or posted information. All shelters must meet Federal ADA requirements. A clear path to access the shelter, minimum 3' wide, must be available to provide access for pedestrian and people using mobility devices.

All proposed shelter locations must be evaluated by CARTA to ensure installation feasibility and accessibility, for each shelter type requires different minimum site envelopes. All shelters must be constructed to be durable and easy to maintain. Shelters must be built on and secured to a reinforced concrete foundation; CARTA requires that the poured foundation for its standard shelter be 8” deep reinforced concrete. Poured foundations for historic shelters must be 12” deep reinforced concrete. Poured foundations for custom shelters must be 4” deep with an 18” edge around the perimeter, and they must also include a “turn down” edge and 4 12” x 30” depth footers of reinforced concrete. Bus shelters should provide a clear line of sight to approaching buses and ensure that waiting passengers are visible to bus operators and other street users.

Shade

Amenities that offer shade from the sun but not shelter include building overhangs, awnings, and trees. Addition shade options include cantilever shade structures like “shade sails” which provide shade over areas that require unobstructed spaces. CARTA does not currently fund, install or maintain shade structures other than the CARTA standard shelter. Local governments or private entities interested in providing alternative shade structures must coordinate with CARTA staff to evaluate implementation and feasibility.





Figure 5-12 Shade Sails at Avondale Park & Ride (Avondale, Arizona)



Figure 5-13 Building Overhang used for Shade at North Charleston Super Stop)



Roles and Responsibilities

Role	Responsibilities and Considerations
 <p>Community</p>	<ul style="list-style-type: none"> ▪ Members of the public may report damaged shelters to CARTA. ▪ Residents, businesses, property owners, and civic groups may take an active role in keeping shelters clean through the Adopt-A-Stop Program. ▪ Members of the public may request a shelter at a stop.
 <p>BCDCOG/CARTA Staff</p>	<ul style="list-style-type: none"> ▪ Fund and install CARTA standard shelters at locations chosen using the Shelter Scoring Criteria described in Chapter 8 – Implementation. ▪ If shelter is being installed by a local government, a developer or in private right-of-way, coordinate with the relevant parties for installation as outlined in Chapter 6 – Bus Stop Modifications ▪ Maintain all shelters within the bus stop network
 <p>Other Agency Staff</p>	<ul style="list-style-type: none"> ▪ Fund and install upgrade shelters ▪ Coordinate with CARTA for their installation as outlined in Chapter 6 – Bus Stop Modifications
 <p>Developer</p>	<ul style="list-style-type: none"> ▪ Fund and install CARTA approved and upgraded shelters ▪ Coordinate with CARTA for their installation as outlined in Chapter 6 – Bus Stop Modifications

Relevant Appendices

- Appendix E – Shelter Specifications



BICYCLE RACKS

Bicycle racks help to provide an additional way for passengers to access bus service. At most bus stops in the BCDCOG region, outdoor unsheltered bike racks are an appropriate solution for short-term bike parking. Short-term bike parking serves those who leave their bicycles for relatively short periods of time, typically for shopping or errands, eating or recreation. Unsheltered bicycle racks provide a high level of convenience by being readily visible and moderate level of security.

Where They're Required

Transit Center	Transfer Stop	Park & Ride	LCRT Station	High Activity Stop	Standard Stop
Preferred	Preferred	Required	TBD	Preferred	Optional

Guidance

Unsheltered bike racks are a common and affordable way to provide short-term parking. While there is a large range of bike storage solutions, “inverted-u” racks with a square tube are CARTA’s approved design for outdoor, unsheltered bike racks at bus stations. “Inverted-u” designs make for easy bike parking by giving bikes full support and multiple locking points for a u-style bike lock, in accordance with the guidelines of the Association of Pedestrian and Bicycle Professionals.

Figure 5-14 Square Tube Bicycle Racks at Bus Stop (North Charleston, SC)






Specifications related to the CARTA approved bicycle rack are available in Appendix E. Bicycle racks at bus stops may be installed and maintained by CARTA, local governments or private entities. SCDOT does not install or maintain bike racks at transit stops. Both CARTA and the City of Charleston use square tube “inverted-u” racks as their standard bike rack.

Bicycle racks should be within easy reach of the bus stop waiting area but must not block accessible paths and landing pads, bus door opening zones, shelters or posted information. They should be sited in areas with adequate lighting to discourage theft.

Bicycle racks should be affixed to a paved surface. For CARTA, **the standard depth for poured concrete or asphalt bicycle rack foundations is 4”**. If multiple bicycle racks are installed, they must be placed at least 3 feet apart to allow convenient access. Where multiple rows of racks are installed to form a “bicycle parking lot,” there should be 4 feet between each row, measured from tire to tire.

Roles and Responsibilities

Role	Responsibilities and Considerations
 <p>BCDCOG/CARTA Staff</p>	<ul style="list-style-type: none"> ▪ Fund and install CARTA standard bike racks at high need locations ▪ If a bike rack is being installed by a local government, a developer, or by CARTA in private right-of-way, coordinate with the relevant parties for installation as outlined in Chapter 6 – Bus Stop Modifications ▪ Maintain CARTA-installed racks within the bus stop network
 <p>Other Agency Staff</p>	<ul style="list-style-type: none"> ▪ Fund and install municipal bike racks ▪ Coordinate with CARTA for their installation as outlined in Chapter 6 – Bus Stop Modifications
 <p>Developer</p>	<ul style="list-style-type: none"> ▪ Fund and install bike racks ▪ Coordinate with CARTA for their installation as outlined in Chapter 6 – Bus Stop Modifications

Relevant Appendices

- Appendix E – Standard Bike Rack Specifications



FARE MACHINES

Fare machines, also known as ticket vending machines (TVMs) are secure electronic kiosks that allow passengers to purchase single fares and passes. The installation of fare payment/purchase equipment at bus stops can improve customer convenience and service reliability by reducing on-board cash transactions and bus stop dwell times.

Where They're Required

Transit Center	Transfer Stop	Park & Ride	LCRT Station	High Activity Stop	Standard Stop
Optional	Optional	Optional	TBD	Optional	Optional

Guidance

There are currently no fare machines at transit stops within the BCDCOG region. To be effective, fare payment equipment should be located in close proximity to the bus boarding areas and instructional signage must be provided. Fare machines must not block accessible paths and landing pads, bus door opening zones, shelters, or posted information.


Fare machines must incorporate braille or other tactile labels for buttons and keys and audible instructions for how to use the machine. Operable parts of fare machines must be placed at a height between 34 and 48 inches to accommodate passengers using mobility devices.

Off-board fare payment vending machines typically require a 10' by 10' footprint for two machines and should be semi-enclosed for protection from the elements. Additionally, fare payment equipment requires both power and communication connections as well as video surveillance. It is increasingly feasible to have these machines be solar-powered with wireless communications.

Figure 5-15 Off-Board Payment Equipment (New York, NY)



Roles and Responsibilities

Role	Responsibilities and Considerations
 <p>BCDCOG/CARTA Staff</p>	<ul style="list-style-type: none"> ▪ Fund, install, and maintain fare machines at select transit stops ▪ Coordinate with utility providers for electric and internet connections ▪ Coordinate with public or private partners for equipment installation as outlined in Chapter 6 – Bus Stop Modifications



ELECTRIC BUS CHARGERS

As many transit fleets convert to electric vehicles, agencies increasingly have the need to install on-street chargers to charge electric buses during layover periods. After receiving several discretionary grants and matching funds from BCDCOG, CARTA has a CIP in place to replace its fixed route transit bus fleet with battery electric buses and will have 28 in service by the end of 2022. CARTA is developing an Electric Bus Master Plan to identify charging infrastructure needs and placement. CARTA's Shipwatch Square transit center in North Charleston is planned to have overhead bus chargers.

The overhead chargers require an adjacent power cabinet that transforms the power, as well as the charge pole, a roughly 17' high structure that brings the power to the electrical port in the roof of the vehicle.

Overhead chargers are suitable in layover locations where agencies store vehicles in between runs (this includes transit centers and Park & Rides), and they typically require a 5' by 5' area on the sidewalk for the power cabinet and a 3' by 3' area on the sidewalk for mounting the charge pole.

Figure 5-16 Example Overhead Charger Built by ABB



The power cabinet is in the background to the left of the vehicle.



SAFETY AND SECURITY ELEMENTS

In addition to lighting, elements video surveillance can contribute to making bus stops feel more safe and secure.

Where They're Required

Transit Center	Transfer Stop	Park & Ride	LCRT Station	High Activity Stop	Standard Stop
Required	Optional	Required	TBD	Optional	Optional

Guidance

A key consideration for implementing video surveillance at stops is the supporting infrastructure, which would require at least a power source. Consideration also should be given to connectivity to monitoring systems. Alternatively, the use of CCTV by businesses proximate to bus stops or shelters should be considered.

The use of communication systems at bus stops may enhance security. If cell phones are prevalent in a system, then a security program advising whom to call to report suspicious activity or actual criminal events could benefit passengers. Additionally, improving stops design to avoid blind spots and improve visibility can also help make waiting for the bus feel safer.