BALTIMORE METROPOLITAN COUNCIL

Bus Stop Design Guidelines

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Introduction

This bus stop design guidebook was commissioned by the Baltimore Metropolitan Council (BMC) to aid Locally Operated Transit Systems (LOTS) when designing and coordinating bus stop improvements with local jurisdictions and property owners. This guidebook could also be used to supplement local comprehensive plan policies, land use ordinances, pedestrian plans, and street design guidelines.

The goal of this guidebook is to ensure that transit and planning staff have a full understanding of bus stop accessibility issues, Americans with Disablities Act (ADA) accessibility guidelines, passenger amenities, and the basics of a successful bus stop improvement program.

Best practices in bus stop design from the Baltimore region are highlighted in this report; including examples from Annapolis Transit, Anne Arundel County Office of Transportation, Carroll Transit System, Harford Transit LINK, Maryland Transit Administration (MDOT MTA), Regional Transportation Agency of Central Maryland (RTA), Queen Anne's County Ride.


ABERDEEN/BEL AIR
8035
Think LINK
95087

Chapter 1
Bus Stop Accessibility Guidelines

Introduction

The accessibility of transportation facilities, including bus stops, is regulated by the Americans with Disabilities Act of 1990 (ADA). The ADA empowered the United States Access Board to develop and adopt specific accessibility guidelines. These guidelines, pertaining to transportation facilities, are recorded in the ADA Accessibility Guidelines (ADAAG) that were adopted in 2006 and the Public Right-of-Way Accessibility Guidelines (PROWAG) that were proposed in 2011.

The United States Access Board is an independent federal agency that supports equality for people with disabilities by developing accessibility guidelines and standards for the built environment, transit vehicles, telecommunications equipment, medical diagnostic equipment, and information technology. The U.S. Access Board also offers technical assistance and training on these requirements and accessible design while continuing to enforce accessibility standards that cover federally funded facilities.

ADAAG

After the passage of the ADA, the U.S. Access Board developed, and now routinely updates, the ADAAG that the United States Department of Justice (USDOJ) and the United States Department of Transportation (USDOT) have adopted into enforceable standards. Municipalities are required to comply with the ADAAG when designing, building, and improving elements in the built environment; including bus stops, sidewalks and other pedestrian facilities. The ADAAG includes specific guidelines for various elements of bus stops and other transportation facilities under Section 810.

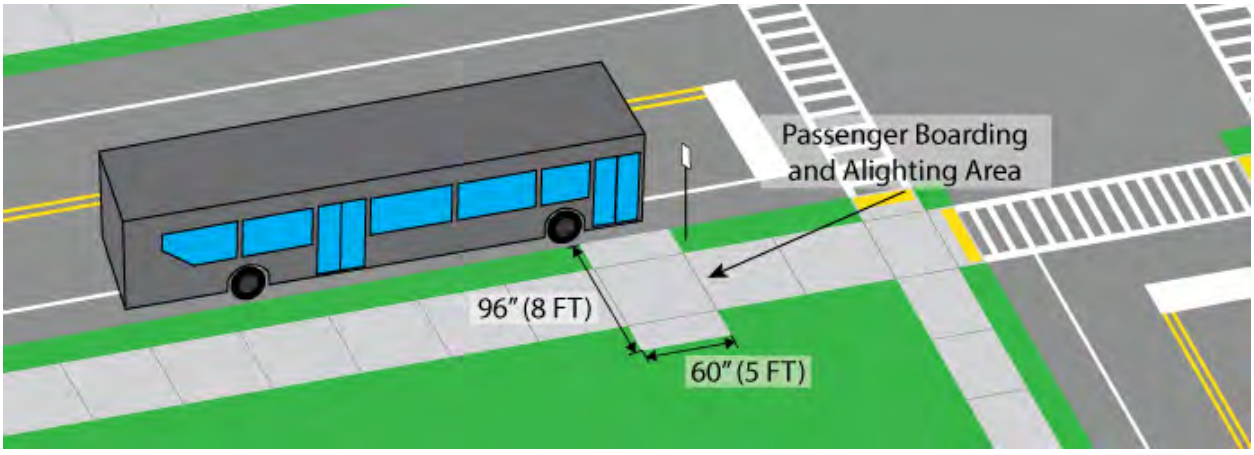
ADAAG Online Resource
United States Access Board's
ADA Standards for Transportation Facilities
www.access-board.gov

Passenger Boarding and Alighting Areas

Bus boarding and alighting area guidelines are detailed under Section 810.2 of the ADAAG; the section includes four specific guidelines:

Surface	Boarding and alighting areas shall have a firm and stable surface
Dimension	Boarding and alighting areas shall extend a minimum of 96 inches deep and 60 inches wide
Connection	Boarding and alighting areas shall be connected to streets, sidewalks, or pedestrian paths by an accessible route
Slope	Parallel to the roadway, the slope shall be the same as the roadway Perpendicular to the roadway, the slope shall be no steeper than 1:48 (approx. 2%)

Figure 1-1: ADA Compliant Passenger Boarding and Alighting Area

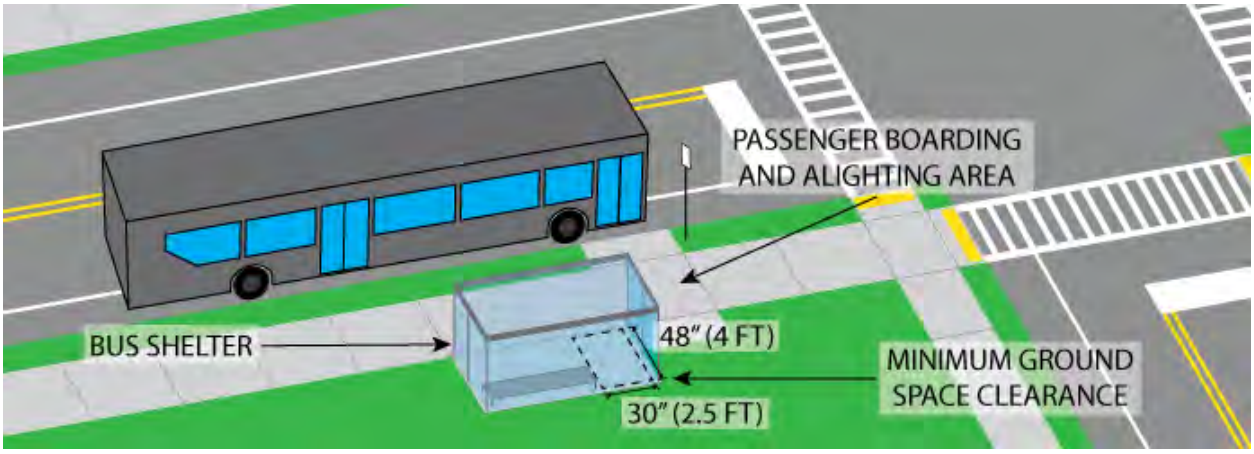


Bus Stop Shelters

Bus stop shelter guidelines are provided in Section 810.3 of the ADAAG; the section includes the following specific guidelines:

Connection	Bus shelters shall be connected by an accessible route to an accessible boarding and alighting area
Ground Space Clearance	Bus shelters shall provide a minimum clear floor or ground space entirely within the shelter
Surface	Floor or ground surfaces shall be firm and stable; changes in level are not permitted
Dimension	Clear floor or ground surfaces shall be a minimum of 30 inches by 48 inches
Position	Floor or ground space shall be positioned to accommodate a forward or parallel approach
Maneuvering Clearance	Where floor or ground space is located in an alcove or otherwise confined on all or part of three sides, additional maneuvering clearance shall be provided Forward Approach: Alcoves shall be a minimum of 60 inches wide where the depth exceeds 24 inches Parallel Approach: Alcoves shall be a minimum of 60 inches wide where the depth exceeds 15 inches

Figure 1-2: ADA Compliant Bus Stop Shelter



Bus Stop Signs

Bus route identification signs shall comply with ADAAG Sections 703.5.1 through 703.5.4, 703.5.7, and 703.5.8. Additionally, bus route identification signs shall comply with ADAAG Section 703.5.5 to the maximum extent practicable. However, bus schedules, timetables, and maps that are posted at the bus stop or bus bay do not have to comply. ADAAG bus stop sign guidelines are detailed below:

Finish and Contrast	Characters and their background shall have a non-glare finish and the characters shall contrast with their background
Case	Characters shall be uppercase or lowercase, or a combination of both
Style	Characters shall be conventional in format; characters cannot be italic oblique, script, highly decorative, or of other unusual forms
Character Proportions	Characters shall be selected from fonts where the width of the uppercase letter "O" is 55% min. and 110% max. of the height of the uppercase "I"
Stroke Thickness	Stroke thickness of the uppercase letter "I" shall be 10% min. and 30% max. of the height of the character
Character Spacing	Character spacing shall be measured between the two closest points of adjacent characters, excluding word spaces; spacing between individual characters shall be 10% min. and 35% max. of character height
Character Height	Minimum character height shall comply with Table 703.3.5 in Chapter 7 of the ADAAG; bus stop sign characters generally fall within the 2 inch height category

PROWAG

The 2011 proposed PROWAG build upon the 2006 ADAAG and consequently the currently adopted and enforceable USDOT and USDOJ standards. The proposed guidelines provide detailed guidance on pedestrian facilities in the public right-of-way that are not addressed in ADAAG's Section 402 and in some cases establish or change minimum or maximum measurements for items in the current ADAAG.

Accessible Pedestrian Routes

An accessible pedestrian route provides a continuous and unobstructed path of travel for pedestrians traveling to and from bus stops. Accessibility guidelines draw from numerous sections of the proposed PROWAG including Chapter R2 (R204, R206, R208, R209, R210), Chapter R3 (R302, R305, R306), and Chapter R4 (R402, R403, R404, R406, R407). Pedestrian access routes summarized in this section apply to sidewalks, pedestrian street crossings, and pedestrian crossing signals.

PROWAG Design Considerations for Pedestrian Pathways

Accessible Widths

In general, a minimum continuous clear width of 4 feet is required for pedestrian pathways

Continuous Width

The continuous clear width of the pedestrian access routes shall be 4 feet, exclusive of the width of the curb

Passing Spaces

On pathways where the clear width of the pedestrian access route is less than 5 feet, passing spaces need to be provided at least every 200 feet; passing spaces must be a minimum of 5 feet by 5 feet and are permitted to overlap pedestrian access routes

Medians and Pedestrian Refuge Islands

The minimum width increases to 5 feet for pathways within medians and pedestrian refuge islands

Accessible Grades

Guidelines for pathway grades will vary based on direction and pathway element

Running Slope

Generally, a pathway's running slope can be no greater than 5% (this includes street crossings)
Exception: where a pathway is alongside a street or highway (e.g. a sidewalk) it is allowed to be the general grade established for the adjacent street or highway but not steeper

Cross Slope

A pathway's cross slope may not exceed 2%
Exception 1: Pedestrian street crossings without a yield or stop control; the cross slope can be up to 5%
Exception 2: Mid-block pedestrian street crossings; the cross slope can equal the street or highway grade

PROWAG Design Considerations for Pedestrian Pathways

Surfaces

Surfaces of pedestrian access routes and their elements must be firm, stable, and slip resistant; they must be generally planar with flush grade breaks and pavement connections

Vertical Surface Discontinuities

Vertical surface discontinuities cannot exceed 0.5 inches in height, and those between 0.25 and 0.5 inches must be beveled with a slope no steeper than 50%

Horizontal Openings

Horizontal openings in gratings and joints can be no wider than 0.5 inches with elongated openings in gratings placed so that the long dimension is perpendicular to the dominant direction of travel.

Flangeway Gaps

Where a pedestrian pathway crosses an at-grade rail line, the pedestrian access route surface must be level and flush, aligned with the top of the rail; flangeway gaps at pedestrian crossings cannot exceed 2.5 inches on non-freight rail track and 3 inches on freight rail track

Protruding Objects

Protrusions (leading edges that encroach upon the walk path) that fall within a height of 27 inches to 80 inches from the walking surface must not protrude more than 4 inches into the vertical clearance of the walk path

Curb Ramps and Blended Transitions

Curb ramps and blended transitions provide grade transition points between sidewalks and the street. These transition points provide a navigable pathway for people with mobility and vision disabilities. Guidelines are provided in Section R304 of the PROWAG.

Curb Ramps

Generally, the components of a curb ramp are the ramp itself, a level landing at the top of the ramp, a level landing at the bottom of the ramp, and a detectable warning to alert pedestrians with visual impairments of a transition from sidewalk to street crossing.

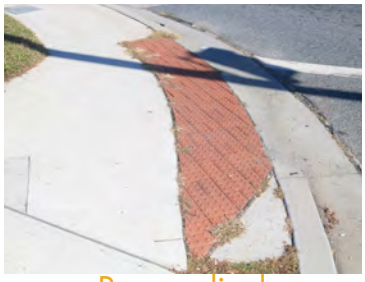
Perpendicular curb ramps are perpendicular to the street curb and permit pedestrians to cross the street perpendicular to vehicular traffic. Ideally, they are in line with the path of travel of both the sidewalk and the street crossing, but this is not always possible due to existing conditions. A common distinguishing feature of perpendicular curb ramps is that each ramp generally serves a single street crossing; at a four-way intersection, two perpendicular ramps are needed at each corner. Diagonal curb ramps have similar design guidelines to perpendicular ramps except that they are placed so that a straight path of travel from the ramp would lead the pedestrian diagonally into the intersection.

Parallel curb ramps typically consist of two ramps connecting to a shared level bottom landing. Ramps are oriented so that pedestrians travelling up or down the ramps travel parallel to vehicle traffic. These ramps are common on narrow sidewalks where there is little area for a top landing. The bottom landing is at street level and does not extend beyond the curb.

Blended Transitions

An alternative approach to curb ramps is a category of treatment referred to as a blended transition. A blended transition is a raised pedestrian street crossing, depressed corner, or similar level connection between the pedestrian pathway and the pedestrian street crossing. Blended transitions are commonly used in locations with high pedestrian activity.

Figure 1-3: Examples of Curb Ramps and Blended Transitions



Perpendicular Curb Ramp

Parallel Curb Ramp

Blended Transition (Depressed Corner)

Table 1-1: PROWAG Curb Ramp Elements

Element	Perpendicular Curb Ramps	Parallel Curb Ramps	Blended Transition
Ramp Run			
Running Slope	5% to 8.3 %	5% to 8.3%	Maximum 5%
Cross Slope	Maximum 2%	Maximum 2%	Maximum 2%
Width	Minimum 4 feet	Minimum 4 feet	Minimum 4 feet
Length	Maximum 15 feet	Maximum 15 feet	-
Flared Sides	Maximum 10%	No flares	Maximum 2%
Top Landing Area			
Dimensions	Minimum 4 feet by 4 feet - where constrained at the back of the sidewalk, a minimum of 5 feet in the direction of the ramp run	As wide as the widest ramp run leading to the landing at least 5 feet long is required at the top and bottom of each ramp run	Minimum 4 feet by 4 feet - where constrained at the back of the sidewalk, a minimum of 5 feet in the direction of the ramp run
Slope	Maximum 2% in any direction	Maximum 2% in any direction	Maximum 2% in any direction
Bottom Landing Area			
Dimensions	Minimum 4 feet by 4 feet - provided within width of pedestrian street crossing.	Minimum 4 feet by 4 feet - where constrained by two or more sides, a minimum of 5 feet in the direction of the street crossing	Minimum 4 feet by 4 feet - provided within width of pedestrian street crossing.
Running Slope	Maximum 5% - "Counter Slope"	Maximum 2%	Maximum 5% - "Counter Slope"
Cross Slope	Maximum 2% - Exceptions: at street crossings without yield or stop control: maximum 5%; at mid-block crossings: equal to street or highway grade	Maximum 2%	Maximum 2% - Exceptions: at street crossings without yield or stop control: maximum 5%; at mid-block crossings: equal to street or highway grade

Detectable Warning Surfaces

Detectable warning surfaces alert pedestrians of the boundary between pedestrian and vehicular routes where there is a flush, rather than curbed, connection. On curb ramps and blended transitions, detectable warning surfaces are required to run the entirety of the leading edge of the ramp and extend two feet in the direction of pedestrian travel.

In addition to curb ramps and blended transitions, detectable warnings are also required for the following locations:

- Pedestrian refuge islands.
- Pedestrian at-grade rail crossings not located within a street or highway.
- Boarding platforms at transit stops for buses and rail vehicles where the edges of the boarding platform are not protected by screens or guards.

Detectable warning surfaces are not required at pedestrian refuge islands that are cut-through at the street level and are less than six feet in length in the direction of pedestrian travel.

Figure 1-4: Example of Detectable Warning Surfaces

Pedestrian Street Crossings

Accessibility guidelines are also outlined for pedestrian street crossings. A pedestrian access route shall be provided within pedestrian street crossings, including medians, pedestrian refuge islands, and pedestrian at-grade rail crossings.

The PROWAG calls for accessible pedestrian signals and pedestrian pushbuttons that communicate information about the "walk" and "don't walk" intervals at signalized intersections; non-visual formats should also be used (e.g. audible signals). Pedestrian signals located at pedestrian street crossings must comply with sections 4E.08 through 4E.13 of the Manual of Uniform Traffic Control Devices (MUTCD).

There needs to be a clear space adjacent to the pushbutton, connected to the pedestrian pathway, and the pushbutton must be mounted within a height range (15" to 48" from the surface) that makes it reachable for wheelchair users. The clear space must have a firm, stable, and slip resistant surface, with a running slope that is consistent with the grade of the adjacent pedestrian access route and a maximum cross slope of 2 percent. It must be a minimum of 48 inches by 30 inches and must be positioned to allow either forward or parallel approach to the pushbutton.

Figure 1-5: Example of an ADA Compliant Pedestrian Street Crossing


RTA
RTA
BUS
STOP
800-270-9553
transitRTA.com
HOWARD
COMMUNITY
COLLEGE
401
401 CLARY'S FOREST
9536
RTA

Chapter 2
Bus Stop Placement & Design Factors

Introduction

Placing and designing bus stops is influenced by the existing transportation network, traffic patterns, and transit ridership. The presence of sidewalks, traffic lights, and pedestrian controls at an intersection are often the main determinants of where to place a bus stop.

This chapter seeks to outline bus stop placement and design factors, expanding on general placement rules by providing alternative installation techniques to design bus stops that will function in concert with the land uses and traffic patterns surrounding them. Specifically, this chapter details bus stop placement considerations, design factors, spacing of stops, variants of on-street stops, curb bulbs, and bus bays.

Bus Stop Placement

The categorization of bus stop placement generally refers to the placement of the stop relative to the nearest intersection.

As shown in Figure 2-1, the general bus stop placement categories include:

- **Near-Side** – before the bus passes through the intersection
- **Far-Side** – after the bus passes through the intersection
- **Mid-Block** – between intersections

Bus stops are largely centered around intersections due to the greater likelihood of safe and accessible pedestrian infrastructure including curb ramps, crosswalks, and pedestrian signals. However, the best placement will depend on vehicle and pedestrian travel patterns at the intersection, right-of-way availability, bus routing, pedestrian facilities, and other conditions at the site. The advantages and disadvantages of each type of bus stop location are provided in Table 2-1.

Figure 2-1: Bus Stop Placement Categories

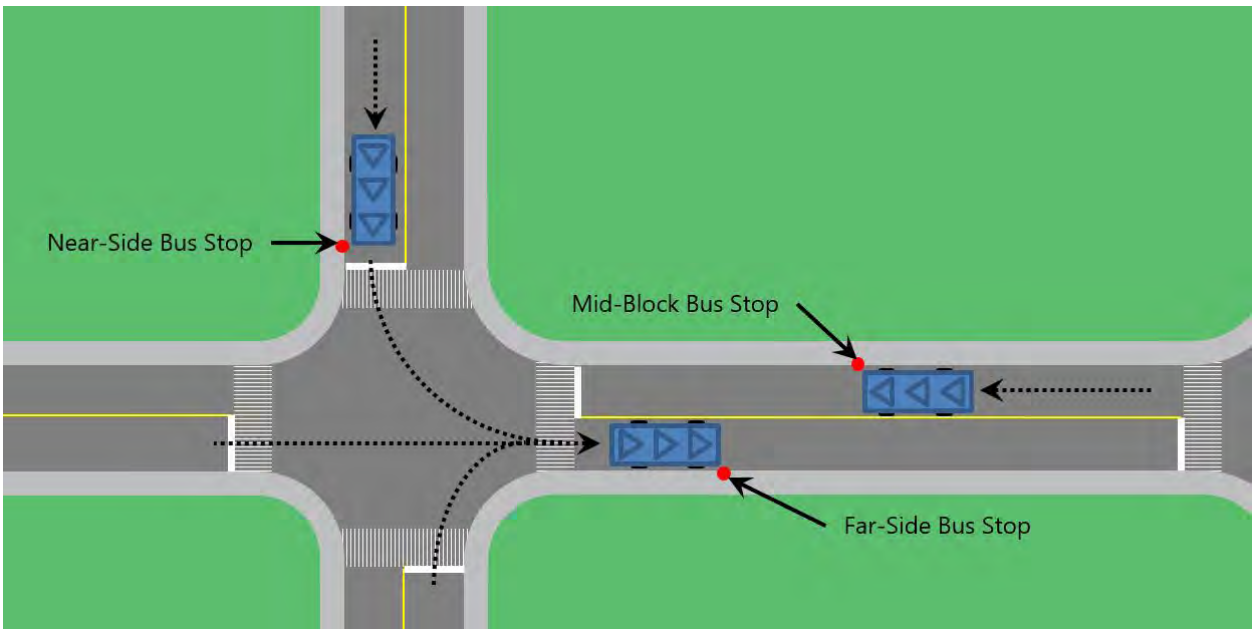


Table 2-1: Bus Stop Placement Overview

Placement	Advantages	Disadvantages	When Recommended
Near-Side	Allows passengers to board and alight while the bus is stopped at a red light Passengers can access the bus close to the crosswalk Minimizes interference with heavy traffic on the far-side of the intersection	Increases conflicts with right turning vehicles Stopped buses may obscure traffic and pedestrian control devices May block the through lane during peak periods	Traffic is heavy on the far-side Pedestrian controls and infrastructure is safer on the near-side Bus routing continues through the intersection
Far-Side	Encourages pedestrians to cross behind the bus Provides greater right turn capacity at the intersection versus near-side stops Drivers can take advantage of gaps in traffic created by the intersection	Traffic may queue behind bus blocking the intersection Could obscure sight lines for crossing vehicles May require the bus to stop after stopping for a red light	There is a high volume of right turns Intersections with multi-phase signals or dual turn lanes Traffic is heavier on the near-side
Mid-Block	Minimizes sight distance problems for pedestrians and vehicles Buses experience less pedestrian and traffic congestion	Encourages jaywalking Increases walking distance for passengers crossing intersections	Problematic traffic conditions at the nearest intersection Passenger generator is located mid-block

Near-Side Bus Stops

Near-side bus stops are popular due to the proximity of the stop to crosswalks and the ability to time the bus stop with a red traffic light. However, near-side bus stops can encourage other drivers to attempt to overtake the bus when turning right, leading to possible pedestrian and vehicular collisions. Use the following guidelines when deciding to place a near-side bus stop.

Utilize Near-Side Bus Stops If:

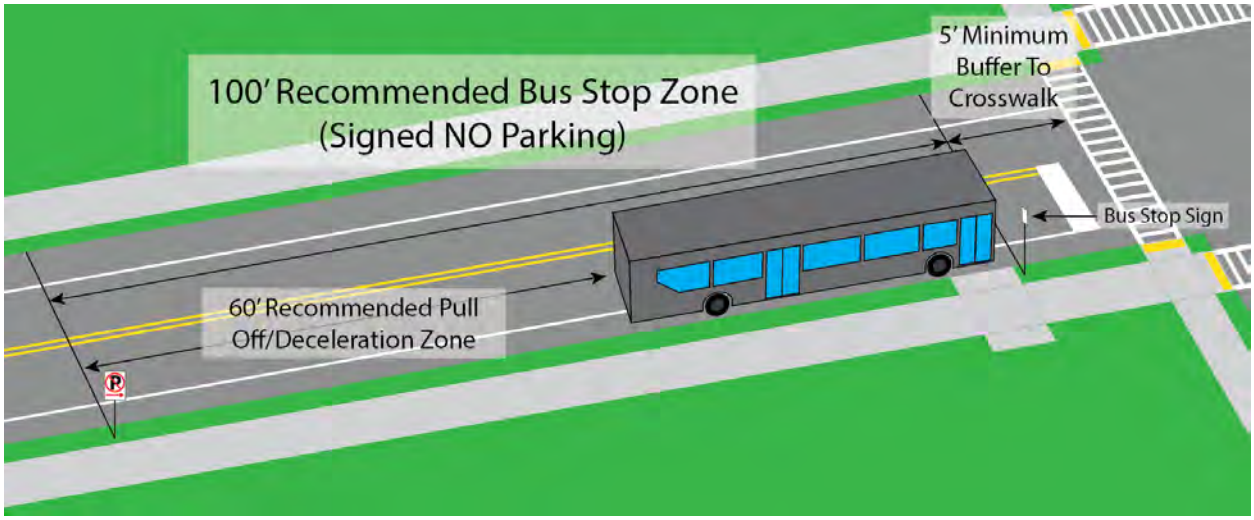
- The primary trip generator is on the near-side of the intersection
- Existing pedestrian facilities are greater/safer than on the far-side
- The route requires a right turn at the intersection
- Vehicle traffic is heavier on the far-side of the intersection

Specific Design Factors to Consider:

- Install a 100' bus stop zone with enforceable no parking signs
- Provide a 5' buffer between the stopped bus and crosswalk/intersection
- Provide a 60' pull off/deceleration zone before the bus stop

Figure 2-2: Near-Side Bus Stop

Figure 2-3: Near-Side Bus Stop Design Considerations



Far-Side Bus Stops

Far-side stops are popular because they encourage passengers to cross behind the bus and they allow the bus operator the ability to utilize gaps in traffic created by the intersection. However, far-side bus stops can lead to an unexpected stop for drivers following the bus and may lead to queuing in the intersection. Use the following guidelines when deciding to place a far-side bus stop.

Utilize Far-Side Bus Stops If:

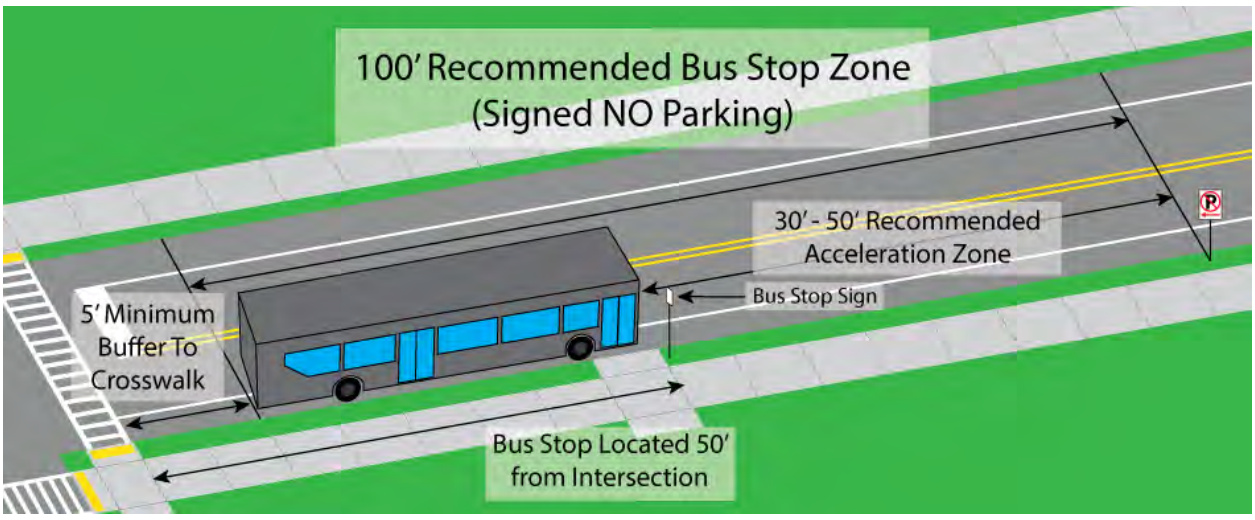
- Near-side of the intersection is a right turn only lane
- Primary trip generator is far-side of the intersection
- Pedestrian facilities are greater/safer than near-side
- High-volume of right turns on near side
- Heavier vehicle traffic on near-side

Specific Design Factors to Consider:

- Install a 100' bus stop zone with enforceable no parking signs
- Locate the bus stop at least 50' after the intersection so that the bus does not extend into the intersection
- Provide a 5' buffer between the stopped bus and crosswalk/intersection
- Provide a 30' to 50' acceleration zone after the bus stop

Figure 2-4: Far-Side Bus Stops

Figure 2-5: Far-Side Bus Stop Design Considerations



Mid-Block Bus Stops

Mid-block bus stops are generally not preferred and should be avoided when possible as they typically lead to jay-walking unless there is a controlled mid-block pedestrian crossing. However, some situations necessitate a mid-block stop; including major trip generators that are between intersections and locations that experience heavy traffic congestion around intersections. Use the following guidelines when deciding to place a mid-block bus stop.

Utilize Mid-Block Bus Stops If:

- The closest intersection is typically congested or has a complex alignment
- The primary trip generator is located mid-block
- Existing pedestrian facilities are greater and safer than at the intersection

Specific Design Factors to Consider:

- Install a 110’ to 150’ bus stop zone with enforceable no parking signs
- Provide a 40’ to 60’ pull off/deceleration zone before the bus stop
- Provide a 30’ to 50’ acceleration zone after the bus stop

Figure 2-6: Mid-Block Bus Stops

Figure 2-7: Mid-Block Bus Stop Design Considerations

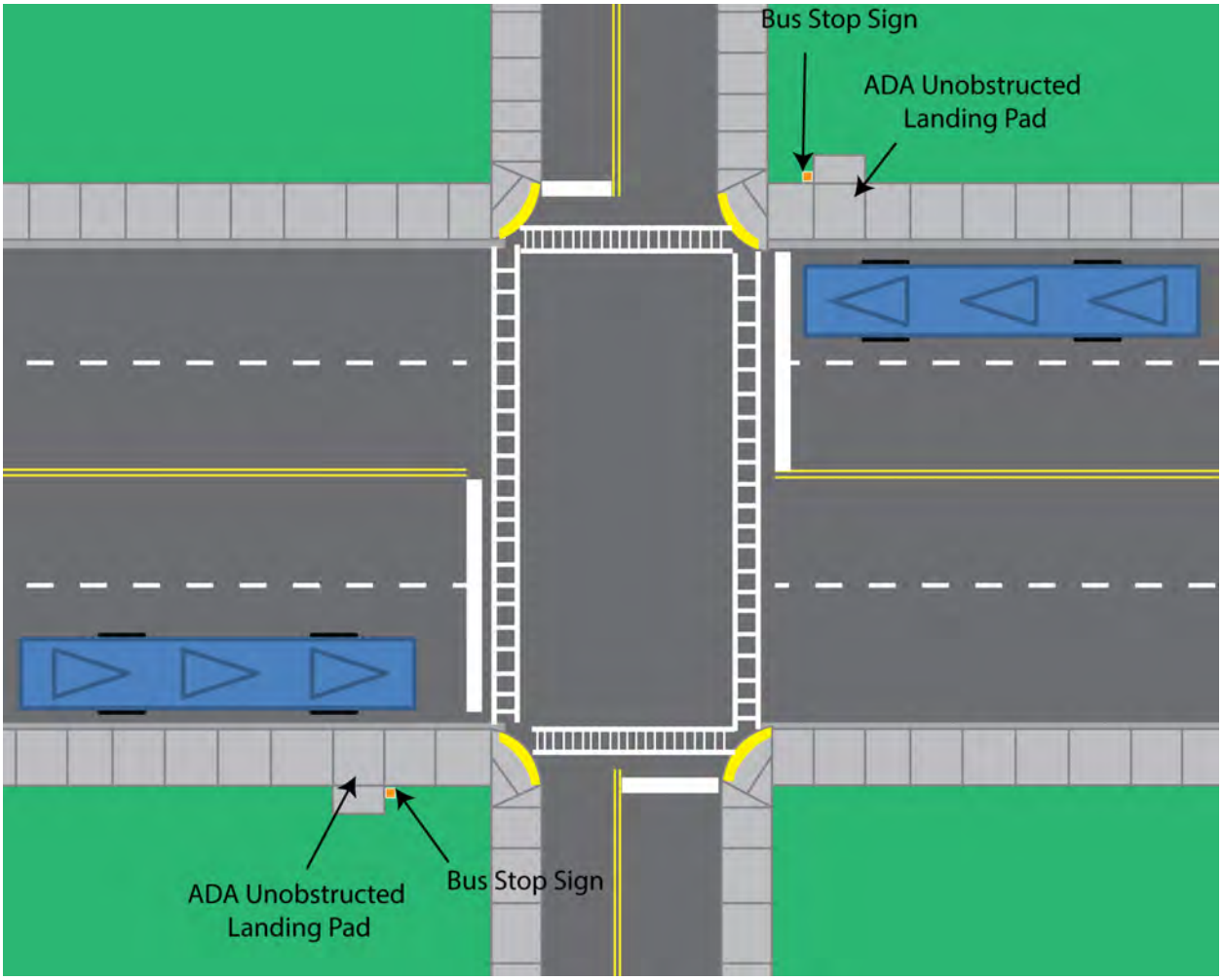
Bus Stop Design Factors

Beyond the bus stop's proximity to an intersection, other significant placement factors should also be considered when establishing bus stops.

Bus Stop Pairs

A key for passenger convenience is establishing bus stop pairs. While this is not feasible along one-way or loop routes, any bi-directional route segments should have an inbound and outbound stop located in close proximity to one another – preferably across the street. These paired stops will ensure consistency and simplicity for passengers when they are planning their trip.

Figure 2-8: Intersection with Bus Stop Pairs



Service to Specialized Facilities

Bus stops serving locations with vulnerable passengers (schools, hospitals, senior centers, etc.) should be placed in close proximity to the specific location or facility to ensure ease of access and the ability for facility personnel to visually monitor the stop location in an effort to increase safety and security.

Driveways

As a general rule of thumb, avoid the placement of bus stops in close proximity to driveways whenever possible. If this is unavoidable, adhere to the following guidelines:

- Attempt to keep at least one exit and entrance driveway open for vehicles to access the site
- Locate the stop where visibility for vehicles leaving the site is not obstructed
- Locate the stop so that passengers do not wait, board, or alight in the driveway
- It is preferable for the bus to fully block, rather than partially block, a driveway

Driveways should never be used as boarding and alighting areas/landing pads. There are potential safety issues with passengers waiting in driveways and driveways are typically sloped towards the street at angles that exceed ADA guidelines and may create unsafe conditions for passengers with mobility devices.

Sight Lines

Bus stops should be located where they are clearly visible to the approaching bus operator as well as other drivers and bicyclists. To minimize the risk of a bus being struck from behind while stopped or pulling back into traffic from an off-street bus stop, bus stops should not be placed over the crest of a hill or immediately beyond a curve where traffic is curving right. Bus stops should also be clear of any sight obstructions including trees, vegetation, poles, and other street signs.

Design Factors for Large Urban Bus Stops

(including bike lanes, pedestrian refugee islands, etc.)

see MDOT MTA's Bus Stop Design Guide

www.mta.maryland.gov/bus-stop-design-guide

Bus Stop Spacing

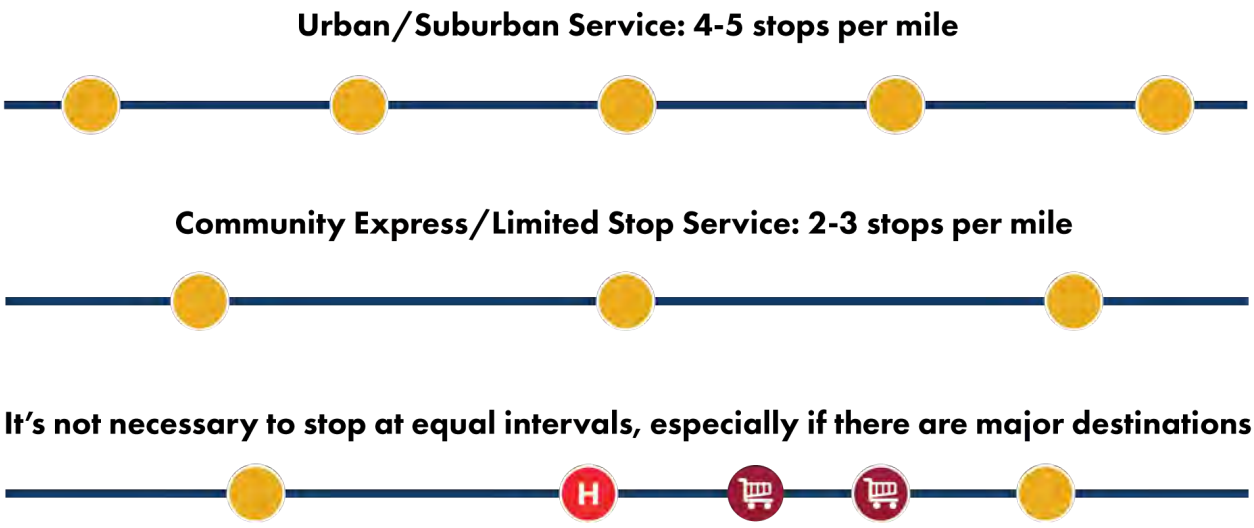
The spacing of bus stops is an optimization matter that attempts to balance the needs of passengers and operators. A greater distance between bus stops presents a reduced number of potential occurrences of deceleration/acceleration and therefore has the possibility to reduce the overall operating time of the route enough to provide customers with a more rapid ride. The disadvantage to having a greater distance between bus stops is that some customers will be required to walk further to the nearest stop, and may find this inconvenience enough of a deterrent, or even a hardship, that prevents them from being able to ride.

Ultimately, bus stops should be spaced close enough so that passengers can walk to them easily, but far enough apart to allow buses to stop/decelerate less and travel faster along their route.

"TCRP Report 19: Guidelines for the Location and Design of Bus Stops" recommends that bus stops in suburban areas be placed every 600-2500 feet, with a typical spacing of one bus stop every 1000 feet. For urban areas,the report recommends that stops be placed every 500-1200 feet, with a typical spacing of one stop every 750 feet. Typical spacing in a suburban area recommends approximately 5 bus stops per mile. Although these recommendations are a helpful guide, bus stop spacing will vary depending on the characteristics of a specific location. Agencies generally use these recommendations to develop their own guidelines that meet local and regional needs.

The guidelines shown in Figure 2-9 outline how to space bus stops depending on the service type. The spacing guidelines are only a guide. The addition or elimination of bus stops should take into account existing transit needs, trip generators, land uses, and pedestrian infrastructure. All bus stops need to have adequate sidewalk connections and intersection crossings.

Figure 2-9: Bus Stop Spacing Guidelines



On-Street Bus Stops

On-street bus stops are those where the bus stops in the travel lane, parking lane, or shoulder of the road. These types of bus stops are the most frequently used because of their operating efficiency. They provide easy access for bus operators and have minimal delays to service. In addition, these types of stops can be established, relocated, or eliminated with relative ease.

Although on-street bus stops are the most common and the easiest to establish, there are some site considerations when evaluating a location for an on-street stop. Some of these considerations include:

- Posted speed limit should not exceed 45 mph
- Adequate street lighting at the location
- Proximity to controlled intersections
- Availability of pedestrian facilities (sidewalks, curb ramps, crosswalks, etc.)
- Adequate right-of-way for passenger amenities and wheelchair access

Bus Stop in Travel Lane

Bus stops in a travel lane require minimal design and are the simplest of the three types of on-street bus stops to establish. Stops in the travel lane should be avoided at locations with high volumes of passenger activity where the bus may be stopped for significant periods of time.

Specific Design Factors to Consider:

- Ensure an ADA compliant landing pad connects to the curb and the pedestrian network
- Avoid this design at locations with high ridership and/or heavy traffic

Bus Stop on Shoulder

Similar to bus stops in parking lanes, a no parking zone would need to be designated and signed along the road's shoulder. The no parking zone should also allow adequate space for the buses acceleration and deceleration areas. It is recommended that there be at least 60' signed as no parking behind a stopped bus.

Specific Design Factors to Consider:

- Ensure adequate space for a no parking zone of 100' with 60' behind a stopped bus
- Ensure an ADA compliant landing pad connects to the curb and the pedestrian network
- Buses may have difficulty pulling back into traffic in congested areas
- Illegally parked cars may render the bus stop inaccessible

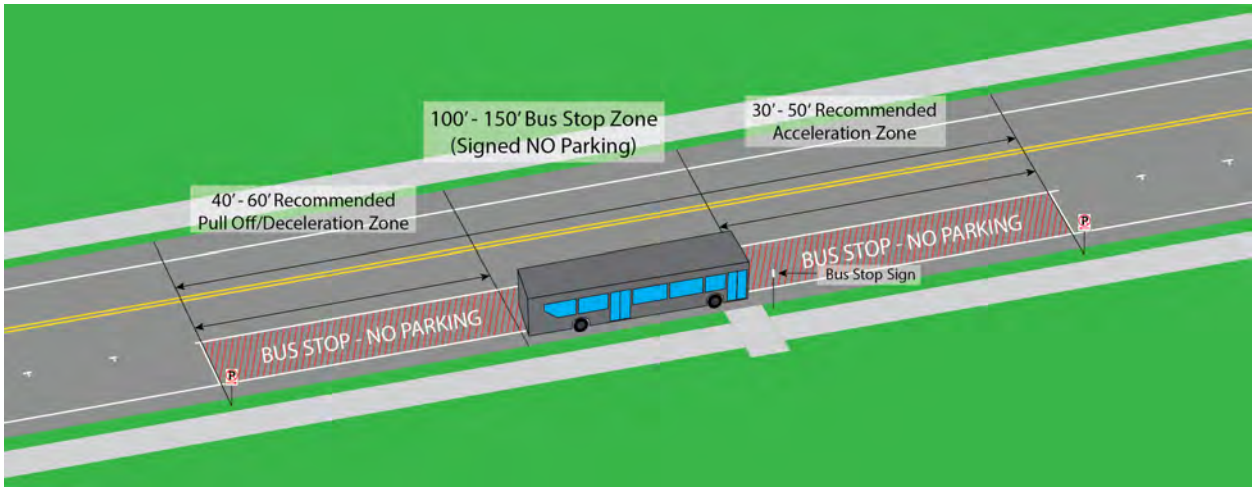
Bus Stop in Parking Lane

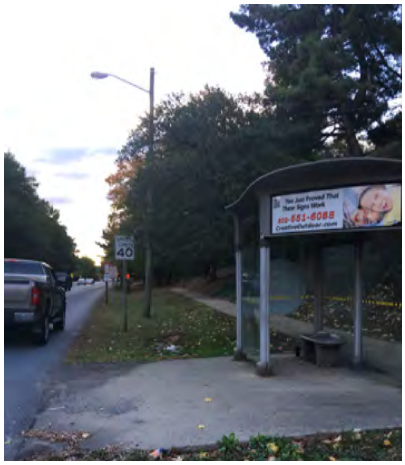
When establishing a bus stop in a parking lane or zone, it is crucial to designate and sign the bus stop area as a no parking zone. The no parking zone needs to include adequate space to accommodate the bus as well as acceleration and deceleration areas. If parked cars block bus access to the curb it may render the bus stop inaccessible and unusable for wheelchair-bound passengers. An alternative to the parking lane would be a curb bulb which would mitigate the issue of illegally parked cars and reduce the space needed for acceleration and deceleration areas.

Specific Design Factors to Consider:

- Ensure adequate space for a no parking zone of 110' to 150'
- Ensure an ADA compliant landing pad connects to the curb and the pedestrian network
- Buses may have difficulty pulling back into traffic in congested areas
- Illegally parked cars may render the bus stop inaccessible

Figure 2-10: Design Considerations for Bus Stops in Parking Lanes





Curb Bulb

Sometimes referred to as curb extensions, sidewalk extensions, or bulb-outs, curb bulbs are used at locations with curbside parking. A portion of the sidewalk extends out to the travel lane, thus allowing most of the curbside parking to remain while providing a connection between the travel lane and the sidewalk. Curb bulbs maximize the amount of on-street parking around bus stops while minimizing needed curb clearances.

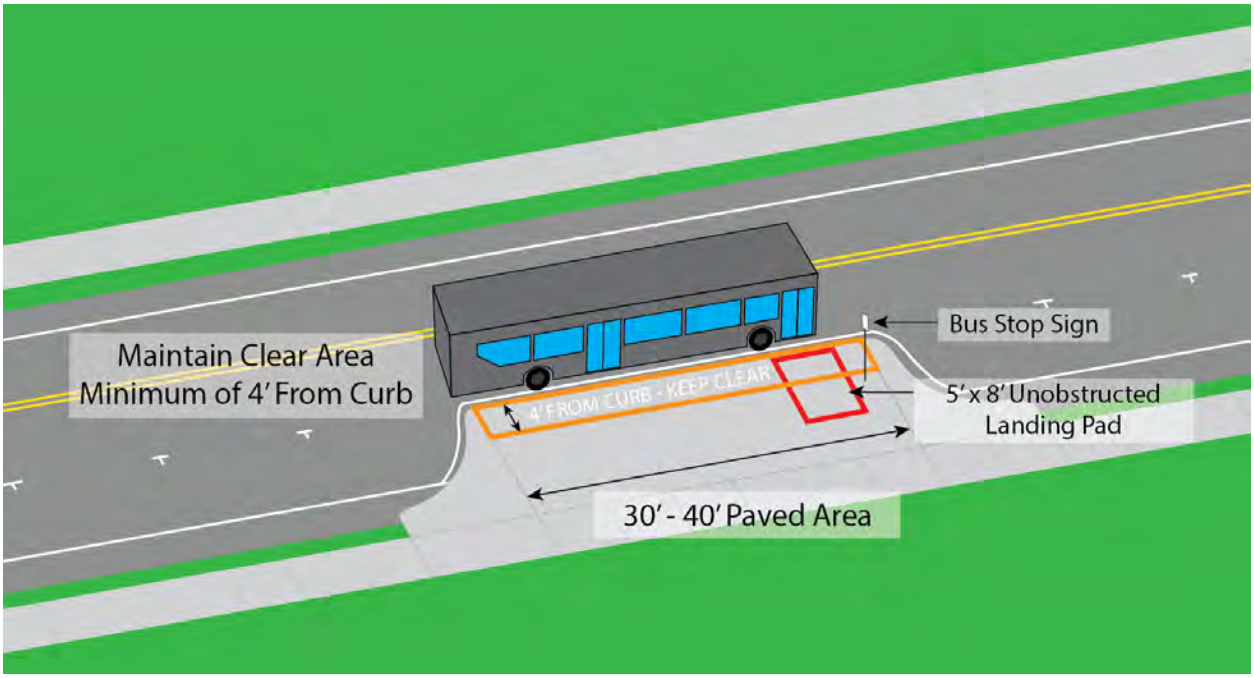
Utilize Curb Bulbs If:

- Parking is critical in the bus stop area
- Limited curb clearance exists in the bus stop area
- Buses experience delays in re-entering the traffic lane
- There are no restrictions on parking

Specific Design Factors to Consider:

- Requires a 30' to 40' paved area parallel to the travel lane
- An ADA compliant landing pad should fit fully within the curb bulb itself
- A 4' clear area must be maintained near the travel lane

Figure 2-11: Design Considerations for Curb Bulb Bus Stops



Bus Bay

Bus bays allow buses to pick up and drop off passengers outside of the travel lane. As a result, this allows traffic to flow unobstructed while the bus is stopped. While there are various types of bus bays, parallel bus bays are most common outside of designated transfer centers. Parallel bus bays are constructed as an inset into the curb. Parallel bus bays can be closed or open; where closed bus bays have tapered ends for acceleration and deceleration and open bus bays have one end tapered and one end that continues as a through lane.

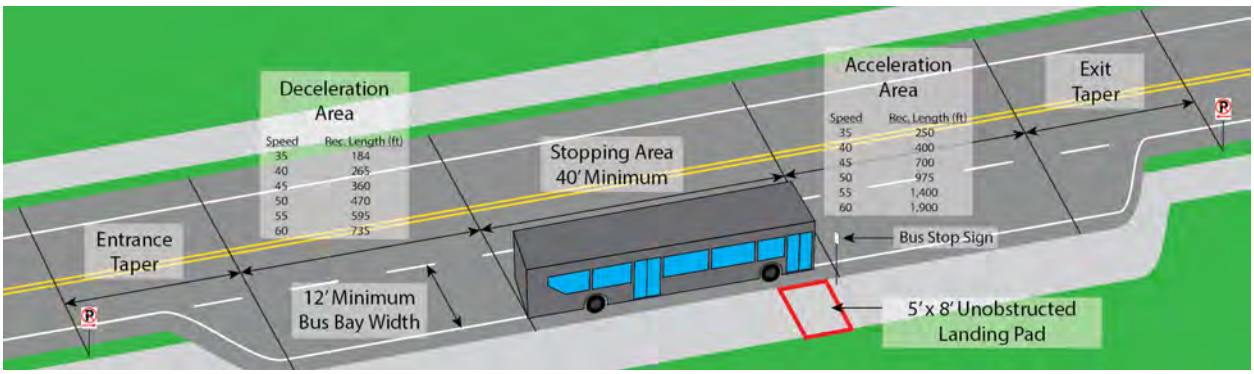
Utilize Bus Bays If:

- Traffic speeds exceed 45 mph
- Average peak-period dwell time exceeds 30 seconds per bus
- Buses are expected to lay over
- Multiple buses serve the stop at the same time
- There is a history of vehicles colliding into the rear of the bus

Specific Design Factors to Consider:

- Ensure adequate space for acceleration and deceleration areas (see Figure 3-8)
- Ensure an ADA compliant landing pad connects to the curb and the pedestrian network
- Buses may have difficulty pulling back into traffic in congested areas

Figure 2-12: Bus Bay Stop Design Considerations and Examples




COUNTY RIDE
BUS STOP
Ford
86014

Chapter 3
Bus Stop Features & Amenities

Introduction

Bus stop features and amenities come in many shapes and sizes, it is key to correctly size amenities for the service area to streamline maintenance and other improvement activities. The placement and type of bus stops enhancements should be influenced by ADA compliance, site-specific conditions, the presence of sidewalks, traffic conditions, level of service and ridership.

This chapter should serve as a guide for the installation of passenger amenities at new and existing bus stops. The chapter provides passenger amenity examples and guidelines found throughout BMC's LOTS service areas. Sections include bus stop signs, landing pads, passenger information, shelters, benches, lighting, and other technological improvements.

Bus Stop Signs

The ADAAG and PROWAG guidelines for bus stop signs require them to either hang at least 80" above the ground or protrude less than 4" from either side of the surface they are attached to. The ADAAG and PROWAG also require sign poles to not interfere with the accessible clearances, including the landing pad and pathway.

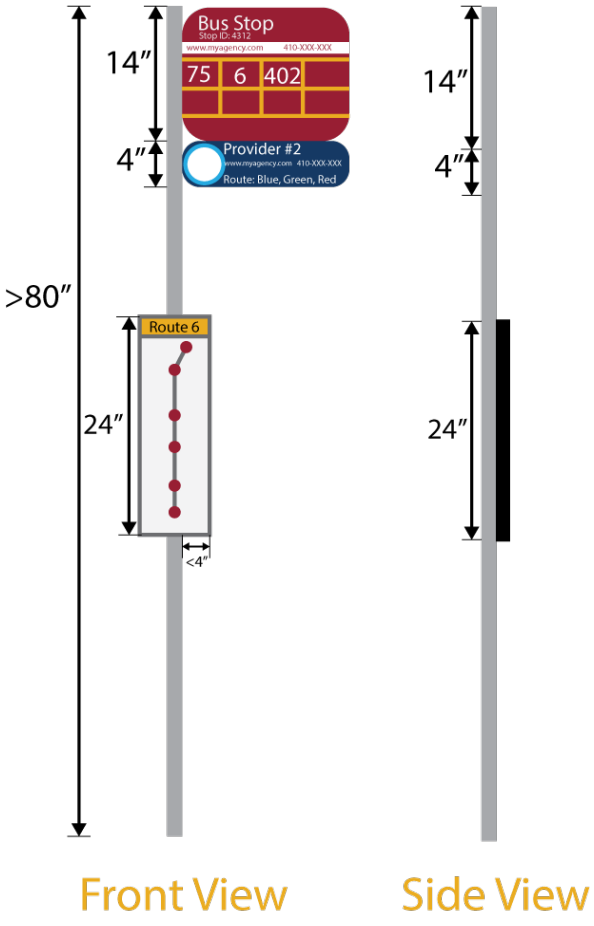
However, these broad guidelines give little insight to making a sign attractive, legible, informational, and noticeable. Some potential design factors to consider:

- Signs should be branded with high contrast colors unique to the transit system
- If there are multiple provider signs, they should share the same bus stop pole
- The sign should be installed close to the landing pad
- Signs should include route information for each provider
- Font color should starkly contrast the base sign colors
- The most pertinent information (routes, provider name) should be in the largest font size
- A unique bus stop ID should be given to the stop when it is installed
- Regional standards for bus stop IDs should be developed for use at stops served by multiple providers

Considering the design guidelines outlined above, Figure 3-1 provides a design template for future bus stop designs in the region. Since many stops in the region are served by multiple providers, it is important to denote the bus stop's ownership through the order of signs. The agency that owns and maintains the stop should display their sign at the top of the bus stop pole; similarly to the red sign in Figure 3-1. Using colors and branding unique to the system, the sign should be clearly visible, legible, and provide the following information:

- Stop ID
- Route Information
- Contact information (website, phone number)

Figure 3-1: Bus Stop Sign Design Examples



The blue, narrow sign, in Figure 3-1, should be used by agencies that are not the primary stop owner. This design should also be well branded and provide route and contact information. Consolidating signage onto one pole limits rider confusion, clarifies stop ownership, and helps limit compliance issues by needing only one bus stop pole.

The information case, an amenity that will be described in further detail later in this chapter, was included on this diagram to show how more detailed information can be made available at bus stops that lack a shelter or other surface to place information. This particular example shows a route map, but information cases can provide schedules, fare structures, and other pertinent information.

Figure 3-2 displays sign styles and best practices found throughout the region. The most recent signage installed in the region are the Anne Arundel OOT signs, examples of which can be seen in the left and right. This sign is fairly attractive, but lacks contact information. Harford Transit LINK and the RTA of Central MD had some of the most attractive and informative sign designs. The Harford Transit LINK signs, shown in the middle image, should be noted for the sticker system used to indicate the routes that serve the stop. Harford Transit LINK recently revised their route structure, which changed the numbers of some routes. The sticker system gave LINK staff an efficient, cost effective, and flexible way to change the information on their signs without having to replace signage. The RTA signage is dynamic and noticeable, and has the most robust contact information of the signs shown above. Cantilevering the sign from the pole, as RTA does, is a sign design that has become more popular in recent years.

Figure 3-2: Bus Stop Sign Design Examples

Landing Pad & Sidewalk

Constructing and maintaining flat, properly sized landing pads and sidewalks is one of the most important, and costly, improvement activities to ensure ADA compliance. Despite the simple and straightforward guidelines, constructing and maintaining landing pads may require enhanced engineering solutions. Some landing pad and sidewalk design factors to consider:

- Landing pads must be 100% clear of any obstructions and free of dirt and debris at all times
- Landing pads must be at least 5' by 8' and physically connected to a sidewalk/accessible pathway
- Landing pads must connect to the street or street curb
- A backstop/knee wall is useful for bus stops with steep elevation changes and erosion issues
- Sidewalk must be at least 4' wide and compliant with the PROWAG

Figure 3-3: Landing Pad & Sidewalk Design Examples

The three images in Figure 3-3 demonstrate the different ways that landing pad installation is influenced by existing sidewalks and adjacent land conditions. The left image shows a landing pad developed by placing a new sidewalk panel in the grassy buffer between a sidewalk and the curb. To reach 8' depth, the pad is also extended into the area behind the grassy buffer. The middle image shows a landing pad with a knee wall which provides protection from erosion accumulation or as a backstop for landing pads that back up to a steep ditch. There are multiple knee wall designs that can be utilized at stops, with the only strict rule being that the knee wall has to be built behind the 5' by 8' landing pad. The right image shows a landing pad developed by placing a new sidewalk panel in the grassy buffer between a sidewalk and the curb.

Concrete Bus Pad

At bus bays and pull outs where buses wait for long periods of time, a concrete bus pad should be considered to prevent road deterioration. Since asphalt is a softer material than concrete, buses idling on asphalt can create treads and damage the road over time. At stops where buses can be expected to idle in anticipation of a transfer or shift change, it is recommended that concrete bus pads be installed. Some design factors to consider:

- Bus pads should be approximately 90' long and as wide as the travel lane to allow for safe deceleration and acceleration
- Pre-existing asphalt bus bays should be the first stops considered for concrete pad installation
- If it is observed that an on-street stop experiences idling, steps should be made to install a concrete pad
- There should be coordination between state and local entities for on-street installation

Figure 3-4: Concrete Bus Pad Examples

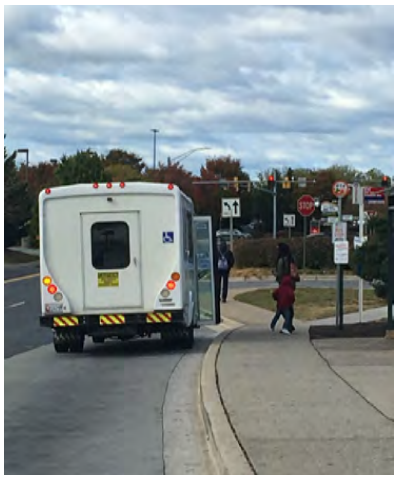


Figure 3-4 gives three examples of existing concrete pads. As you can see, all of these pads are at major transit centers where buses are more likely to idle and wait for customers to make transfers. An example of on-street stops that should be considered for concrete bus pads include the paired stops at US 40 & Paul Martin Drive in Harford County. These stops, both of which serve as important transfer points for riders, idle for several minutes as they wait for incoming buses. Currently, buses pull off onto the asphalt shoulder at both stops.

Information Cases & Real-Time Arrival

An important amenity that riders often find useful are information cases and even real-time arrival information at stops with high ridership. These amenities put the rider in conversation with the transit system, allowing them to learn more about the route system and fare structures while also tracking their bus in real-time. Information cases are most often installed within shelters, though there are many designs that utilize the bus stop pole as their platform. Some design factors to consider:

- Information cases should be installed at all sheltered stops
- Information cases should be installed at stops without shelters when ridership permits
- Schedule or real-time arrival information for *all* routes serving a stop should be provided, especially where transfers are available.
- All information should be legible, clean, and ADA compliant
- Pole-installed information cases should protrude no further than 4" from the pole
- Pole-installed information cases must also provide maneuvering clearance to access the case

Figure 3-5: Information Case and Real-Time Arrival Examples

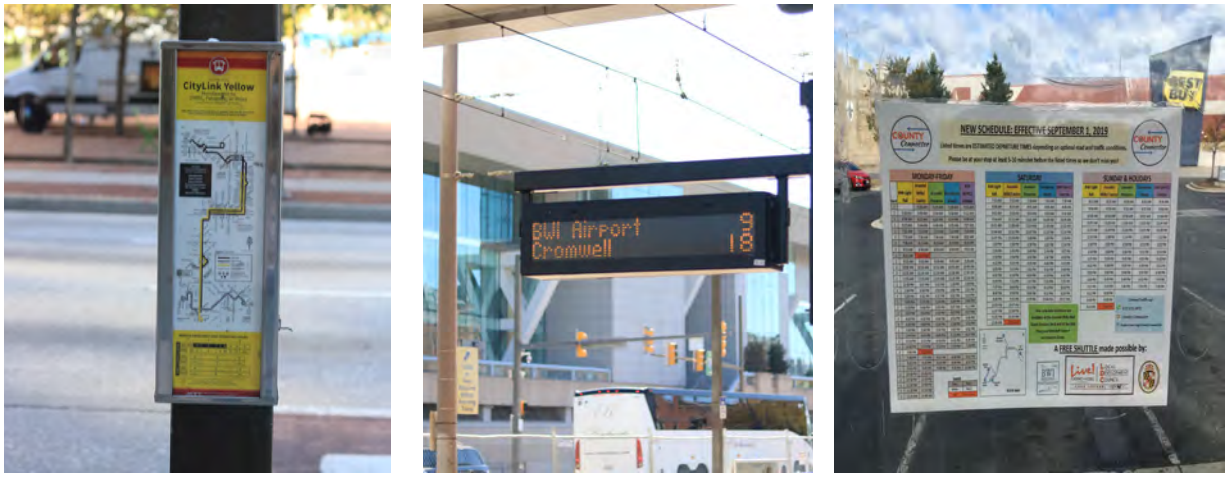


Figure 3-5 shows design examples for information cases and real time arrival displays at stops in the Baltimore region. The left image shows a good example of a pole-installed information case that is informative and maintains ADA compliance. The middle image shows Light Rail arrival times at the Convention Center station in Baltimore. Similar signage is present at all MDOT MTA LightRail Link and MARC stations. Currently, bus arrivals are not included on this signage. The final image is an updated County Connector schedule that was installed within a shelter at Arundel Mills. Information cases provide a useful platform for a transit system to communicate service changes to their riders.

Passenger Shelters

Shelters are an important feature at bus stops with higher ridership, providing defense from the elements and seating for waiting passengers. When designed thoughtfully, shelters can exceed their basic utility and become powerful marketing tools for a transit system. The best shelters are those that include a robust level of information about transit services, the surrounding area, and real-time information. Some shelter design factors to consider:

- The shelter must be placed outside of the 5' by 8' landing pad
- Shelters require an open space that is at least 30" wide and 48" deep
- A clearance of 4' (preferably more) is required when installing shelters on sidewalks
- A clearance of 12" should be preserved on all sides of the shelter for maintenance and cleaning
- Shelters should have some or all of the following features:
    - Trash receptacle
    - Bench that does not extend into the 30" by 48" open space
    - Bus schedule(s)
    - Map(s) (route, system, and/or surrounding area)
- Provide perforated paneling to diffuse sun and glare during warmer months
- If there is limited space, shelter cover can be cantilevered to reduce sidewalk obstruction
- If service hours extend into the evening, there should be enhanced lighting

Figure 3-6: Shelter Design Examples

The images included in Figure 3-6 show different shelter styles and amenities to consider during the implementation process. The left photo shows the bus shelter at the Oakland Mills Village Center in Columbia. This shelter has a unique design that makes the shelter an attractive community landmark in the center of a neighborhood. The second image shows a RTA shelter that is compactly built, with only overhead coverage. This design is useful where space is limited. The right image shows a side view of an Annapolis Transit shelter which features a prime display for advertisements.

Advertisements at bus shelters can generate additional revenue for the transit system, which can supplement the procurement and installation costs for shelters and other transit improvements.

Figure 3-7: Shelter Beautification Ideas - US 1 @ Port Capital Drive, Jessup

Development or redevelopment of an area provides opportunities to upgrade and beautify otherwise staid shelters. Across from the new Howard Square housing/retail development in Jessup, the bus stop at US 1 and Port Capital Drive has been given several colorful and attractive design features, including butterfly stickers, dinosaur figurines, and a mosaic Free Little Library. Other distinct and attractive shelter designs were found at the Oakland Mills Village Center in Columbia, and there are tentative plans to install a unique shelter at Church Circle in Annapolis' historic downtown.

Passenger Benches

Benches provide customers a more comfortable place to wait for the bus while also providing opportunities for transit systems to partner with advertisers. Most bus benches fall into one of two categories: shelter (attached to the shelter) or freestanding. Design considerations for both bench types are slightly different, but there are some factors to consider for all benches:

- Benches cannot obstruct the 5' by 8' landing pad
- Benches cannot obstruct the sidewalk and block the pedestrian pathway.
- If space is an issue, benches can be cantilevered from walls
- There are no strict measurement requirements for benches
- Appropriately sized knee walls can also act as benches

Figure 3-8: Bench Design Examples

The images included in Figure 3-8 demonstrate different bench designs. From the left, the first image shows two freestanding benches at the Columbia Mall. These benches have a simple and attractive design that indicates that the bench comfortably seats three people as they wait for the bus. The second image is a more standard bench located at the Arundel Mills Mall. The right image shows a bench within a shelter that is provides the proper 30" by 48" wide clear area within the shelter interior.

Trash Receptacles

At bus stops with large amounts of boardings and alightings, trash receptacles are a useful - and often necessary - amenity. When properly maintained, trash receptacles empower riders to keep the bus stop clean, beautifying the surrounding area and limiting the amount of trash brought onto the bus. Despite their utility, trash receptacles can also serve as both a pedestrian obstruction and eyesore if they are not properly installed or maintained. Some design factors to consider:

- The trash receptacle cannot block the pedestrian walkway or 5' by 8' landing pad
    - If space is limited, a small receptacle can be attached to the sign pole or shelter
    - If space allows, a separate concrete pad can be installed to house a receptacle
- Trash receptacles should be bolted to the ground to prevent them from being knocked over
- Trash receptacles require dedicated maintenance
- If possible, a receptacle for recycling can also be installed

Figure 3-9: Trash Receptacle Examples

The images in Figure 3-9 demonstrate the ways that trash receptacles can be installed to avoid blocking the landing pad or sidewalk. From left, the first image shows a small trash bag hanging from a bus stop pole. While it does save space, a bag tied to a pole is not particularly attractive. A small receptacle, like the one in the second image, should be considered at the stop in the first image. These small receptacles can be mounted to poles and shelters to provide an attractive and space efficient option for stops with lower activity or limited space. The third image shows larger trash and recycling receptacles placed on a patch of concrete adjacent to the shelter and landing pad, this design is useful at stops with high traffic that are more likely to produce trash.

Bicycle Racks & Storage Lockers

To improve connectivity and first and last mile connections in the service area, bus stops should be designed with bicyclists in mind. Bike racks mounted on the front of buses are becoming increasingly common, but some bikers would rather leave their bicycle at their stop. The provision of at-stop bike storage is mostly achieved with the installation of either bike racks or bike lockers. Some design factors to consider:

- If a stop serves a large amount of commuters, bike lockers should be considered
- Bike racks and lockers should not obstruct the 5' by 8' landing pad.
- Bike racks can feature attractive and unique designs, especially in high traffic areas

Figure 3-10: Bike Storage Examples

The images above provide examples of best practices for bike storage. The first image shows an attractive bike rack at a stop in downtown Baltimore; there are similar bike racks at the other transit stops including the Cromwell Light Rail Station. These racks maintain their utility and give the stop an eye-catching quality. The second image is a bike locker at the Dorsey MARC Station in Howard County. Lockers should be considered at train stations, park-&-rides, and other commuter-oriented transit centers, since they provide better theft-prevention. The third image is an example of two attractive bike racks with a nautical theme in downtown Annapolis. These bike racks provide storage while showcasing Annapolis' maritime history.

Ticket Vending Machines

Larger transit centers, especially those with connections to the wider light rail, commuter bus, and commuter rail networks, should consider installing ticket vending machines. As area transit providers consider fare payment cards, mobile payment apps, and regional fare systems, these vending machines will become an increasingly important amenity. Currently, these machines are only available at MDOT MTA owned and operated LightRail LINK and MARC stations. These stations allow customers to add value to their CharmCard or buy passes for rail services. CharmCard payment is only available on MDOT MTA and select RTA operated services at specific transfer points. Figure 3-11 displays a ticket vending machine from Cromwell Station in Glen Burnie.

Figure 3-11: Ticket Vending Machine - Cromwell Station

Enhanced Lighting

Bus stops that are served by routes with hours that extend into the evening or early morning should consider enhanced lighting for the stop area. Lighting bus stops provides greater visibility while ensuring customers that the stop is safe and inviting, even during evening hours. Some design factors to consider:

- Stops with early morning, evening, and nighttime hours should be properly lighted
- When possible stops should be placed in close proximity to existing street lighting
- Bus stop shelters should include dedicated lighting
- Solar panels attached to poles or shelters can be used to power a stop's lighting

Figure 3-12: Bus Stop Lighting Examples

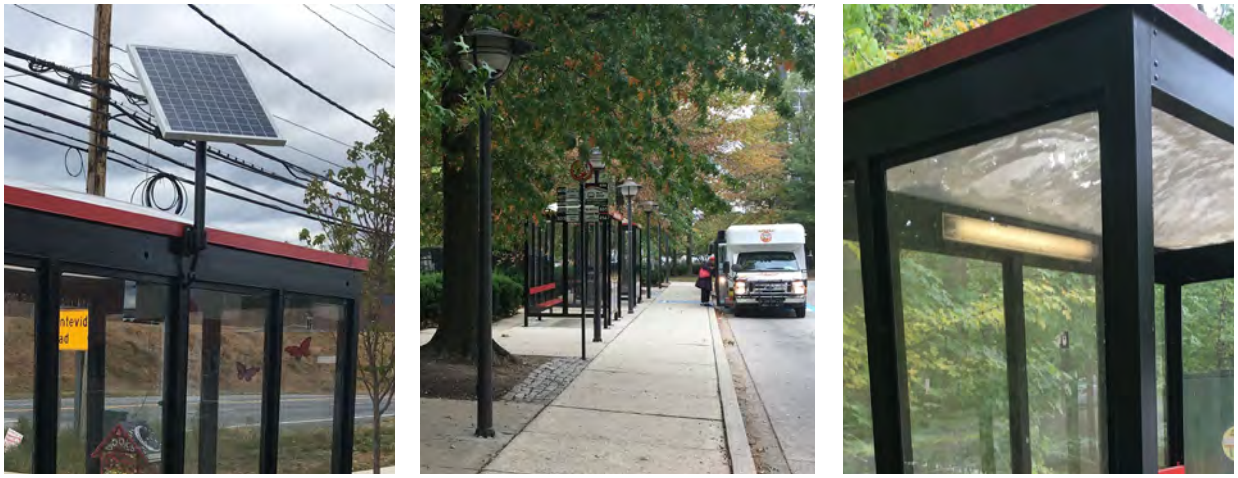


Figure 3-12 displays different lighting fixtures found at stops throughout the region. The first image shows a solar panel attached to a shelter. These fixtures can help power lighting or any digital displays at the stop. The second image shows a line of streetlamps at the Columbia Mall transit center. These lights were installed with the transit center in mind, and add an attractive design element, as well as visibility, to the stop. The right image is a lighting system within a shelter. The placement of the light at the back of the shelter, lighting the shelter's interior, is useful as it circumvents any problems associated with shadows from different street lights.

Wayfinding Signage & Transfer Information

The Baltimore region is unique in the amount of providers that operate fixed-route public transportation. Though many transfer opportunities are available, there is a dearth of information about when and where to make them. Additional signage with wayfinding and transfer information helps riders deepen their understanding of the surrounding area and the full breadth of transit options in the region. Some design factors to consider:

- Wayfinding signage is especially important in walkable areas
- Similar to information cases, any wayfinding signage should be accessible and legible
- Transfer information should be robust, noting all providers and services
    - Schedules or real-time information for all services should be incorporated
    - Maps are especially useful for new riders and visitors navigating the system

Figure 3-13: Wayfinding Signage & Transfer Information Examples

The images in Figure 3-13 show examples of transfer information throughout the region. The first image, an outdated sign at Arundel Mills Mall, actually provides a comprehensive list of the transit services available at that stop. A more updated version of transfer information signage can be found in the second image, which lists all bus and rail services available at the Dorsey MARC Station. An example of wayfinding signage can be found in the third image, which shows an information box of an area map of Church Circle in Downtown Annapolis. This map shows the surrounding road network and points of interest for individuals visiting the area.

Wi-Fi & USB Charging Stations

As mobile technologies continue to influence everyday activities, many transit riders have clamored for the availability of technology amenities at bus stops. Wi-Fi, paired with the introduction of USB charging stations at stops, can provide a customer-friendly amenity at higher ridership transit stops. Major transfer points, as well as other stops where customers can expect a wait, are excellent locations for more technological amenities. Wi-Fi and charging stations can improve the waiting experience and the overall satisfaction with the transit service. Some design factors to consider:

- Wi-Fi and USB charging should be prioritized for stops with multiple transfer opportunities
- These technology amenities can be installed in lockstep with payment/real-time app development

Figure 3-14: Wi-Fi and USB Charging Station Examples

Figure 3-14 shows different examples of amenities and features made to support the expansion of mobile technology in transit service. The Transit app aggregates all local transit schedules into one interface, saving customers the confusion involved with installing multiple proprietary apps. With amenities accounting for increased mobile connectivity, customers can use apps like Transit more effectively. The center and right images show examples of what USB stations and Wi-Fi kiosks can look like. The middle image shows a bus stop in Paris with a built-in Wi-Fi charger. The right image is an example of Wi-Fi kiosks that are currently being installed in New York City, Seattle, and other major metropolitan areas. To continually evolve as modern transit systems, technology-based amenities will help increase the use of a provider's mobile application.

Vendor Publication Boxes

Vendor publication boxes, selling or giving away news publications, advertisements, and other materials, are present at many bus stops within the region. These boxes provide entertainment to riders and marketing opportunities to transit providers. Despite their benefits, vendor publication boxes can easily become obstructions and compromise a bus stop's ADA-compliance. Some design factors to consider:

- Vendor publication boxes cannot obstruct the 5' by 8' landing pad or the accessible pathway
- If possible, publication boxes should be bolted down to prevent them from being knocked over or moved into the bus stop area
- Vendor publication boxes can create additional litter and trash at bus stops
- Advertisement opportunities using publication boxes should be explored as a source of additional revenue
- Publication boxes should be maintained and kept free of vandalism

Figure 3-15: Vendor Publication Box Examples

Advertisements

When done on a large scale, bus stop improvements can be costly; especially the installation of shelters. To offset the costs of these improvements, advertising space can be sold to local businesses, non-profits, or institutions. Shelter advertisements are fairly common in Baltimore City, but become increasinlgy rare when venturing into its suburban areas. Bus stop improvements are often perceived as merely an expense, but they can yield greater opportunities for revenue generation. Figure 3-16 shows a bus shelter in Annapolis with an advertisement for Salisbury University. This shelter should be used as an example for how private advertisements can be integrated into bus stop improvements. Some design factors to consider:

- The advertisements should not impede a riders view of the street
- Advertisements should lay flush on the surface of the shelter
- If it is believed that a stop does not warrant a shelter, there are still opportunities to place advertisements on freestanding benches

Figure 3-16: Advertisement Example - Downtown Annapolis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Chapter 4
Bus Stop Improvement Programs

Introduction

Improving bus stops should be accomplished through a coordinated and concerted improvement process with a defined prioritization process and implementation plan. This chapter outlines the basic steps for establishing a successful bus stop improvement program.

The chapter is organized into sections covering bus stop inventories, improvement hierarchies, prioritization, bus stop guidelines and standards, maintaining bus stops, and potential funding sources for bus stop and pedestrian improvements.

Bus Stop Inventory

One of the first steps in launching a bus stop improvement program is performing a self-evaluation of the existing stops. For many transit providers it can be difficult to monitor improvements at hundreds, sometimes even thousands, of bus stops. Performing a bus stop inventory can be done in house or through technical assistance with local planning departments or consulting firms. Establishing an easily accessible and updatable database of bus stops will allow providers track and prioritize improvements as funding becomes available.

Improvement Hierarchy

To begin prioritizing bus stop improvements, developing a hierarchy of stops is an important first step. The hierarchy classifies bus stops based on the level of service and surrounding land uses to set minimum improvement standards (see Table 4-1). The following hierarchical categories are utilized by peer transit providers and recommended for the Baltimore area's LOTS:

- Transit Center - primary transfer point between routes and to other transportation services
- Enhanced Service Stop - serves major trip generators and key community destinations
- Basic Stop - every other stop, typically represents stops in lower density areas

In addition to stop hierarchy, other prioritization factors include ADA compliance, existing stop amenities, transfer opportunities, and other area specific characteristics.

Figure 4-1: Bus Stop Hierarchy

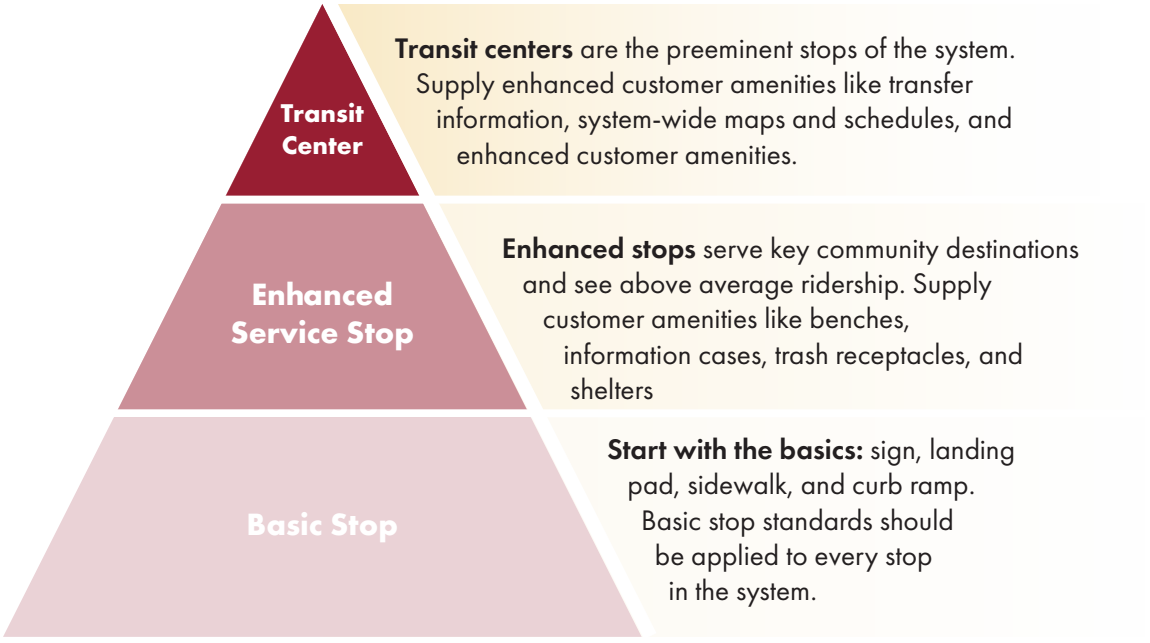


Table 4-1: Bus Stop Hierarchy and Recommended Bus Stop Elements

Bus Stop Elements / Passenger Amenity	Basic Stop	Enhanced Service Stop	Transit Center
Bus Stop Sign	✓	✓	✓
ADA Compliant 5′ by 8′ Landing Pad	✓	✓	✓
Sidewalk Connection	✓	✓	✓
Lighting	Evening Service	✓	✓
Bench/Seating	Site Specific	✓	✓
Information Case	Site Specific	✓	✓
Trash Receptacle	Site Specific	✓	✓
Shelter	Set a Threshold Based on Average Daily Boardings	Set a Threshold Based on Average Daily Boardings	✓
System Wide Map and Schedules			✓
Bus Bay/Pull Off			✓
Real-Time Arrival Display			✓
WiFi/USB Charging			✓

Transit Center

Transit centers are bus stops that provide multiple intra-agency and/or inter-agency transfers. Each LOTS in the Baltimore Region has at least one transfer center where riders can make a transfer to local bus, commuter bus, heavy rail, light rail, or intercity bus. These bus stops require the highest level of investment and improvements to ensure that they provide customers with a safe, comfortable, and informative transit experience. A transit center can take several forms, including:

- Off-Street Transit Center: usually found at light rail and heavy rail stations, these stations require buses to turn off the road and pull into the facility (Figure 4-2).

- On-Street Transit Center: utilizes a bus lane, parking lane, or shoulder to come to a full stop and allow customers to transfer between buses at a set time (Figure 4-3).

Figure 4-2: Off-Street Transit Center - Aberdeen MARC Station

Figure 4-3: On-Street Transit Center - US 40 & Paul Martin Drive

Enhanced Service Stop

An enhanced service bus stop is any stop that serves a major trip generator or important location within the community. Enhanced service stops are most often found at shopping centers, high-density housing, medical and educational facilities.

Enhanced service stops should include all required signage, landing pads, and pathways along with seating, a trash receptacle, and an information case. Shelters and other amenities could also be added, but they should be installed based on the number of average daily boardings.

Figure 4-4: Enhanced Service Stop Examples

Walmart
Aberdeen

Anne Arundel Community College
Arnold

CVS at Howard Square
Jessup

Oakland Mills Village Center
Columbia

Basic Stop

A basic bus stop is simple in design, but should always provide a safe and accessible pedestrian connection (sidewalks, crosswalks, curb ramps, etc.), an ADA compliant 5' by 8' landing pad, and bus stop signage.

Basic bus stops are typically found in single-family neighborhoods, smaller retail centers, and other low-density areas. Heavy ridership or proximity to unique locations may necessitate additional passenger amenities including seating, trash receptacles, information cases, and shelters.

Figure 4-5: Basic Bus Stop Examples

MDOT MTA Stop @ Columbia Mall
Columbia

Rowe & Taylor
Annapolis

Opposite Walmart
Aberdeen

Oceano & Assateague
Jessup

Bus Stop Guidelines and Standards

Each of the transit providers in the Baltimore Region should consider formally adopting bus stop guidelines. This guidebook provides a starting point for establishing locally developed guidelines that can influence the design of future developments and street/sidewalk design guides. Establishing guidelines also provides local thresholds for providing enhanced passenger amenities in a fair and balanced manner.

Figure 4-6 outlines an improvement process combining each bus stop category to ensure continuous assessment, maintenance, and improvement of stops. Categorizing bus stops can help focus planning efforts, but it is important to note that each stop is unique. Land use, ridership, and pedestrian walkways can influence decision-making even if the stop is within the same category.

Maintaining Bus Stops

Just like any piece of transportation infrastructure, bus stops must be maintained to be keep them attractive and effective. Each transit provider should ensure that regular maintenance activities are performed at their bus stops. Bus stop maintainance activities may include trash removal, litter pickup, graffitti removal, replacement of damaged amenities, and snow removal.

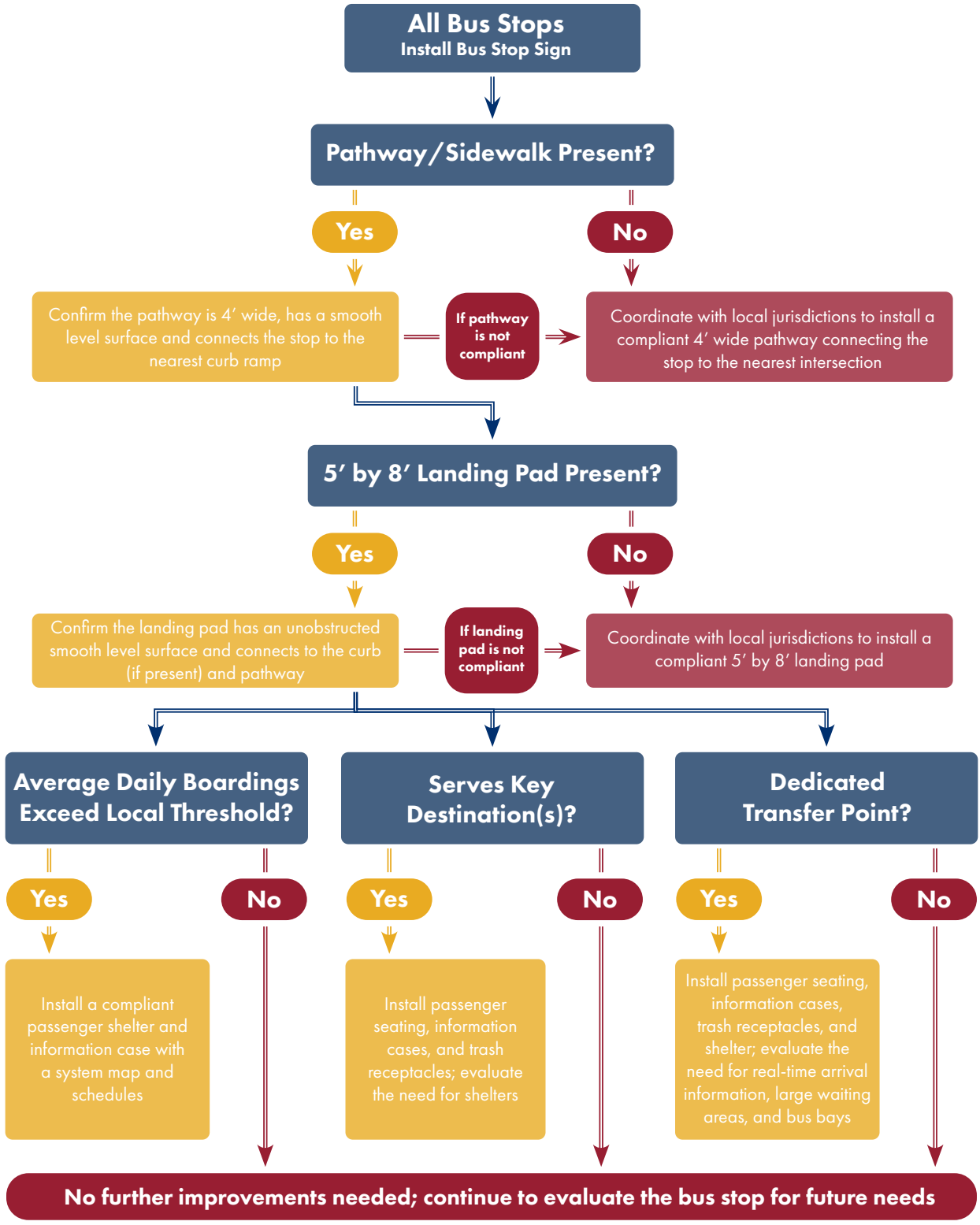
Contracted Bus Stop Maintenance

As the number of bus stop amenities increase throughout the system, transit providers should explore contractual bus stop maintenance with city/county partners or private companies. Jurisidctions may partner with their public works or waste management divisions to provide regular maintenance and trash pickup. Some providers have entered into contracts with advertisement agencies to maintain bus stops in exchange for the advertisement rights.

Volunteer Based Bus Stop Maintenance

Transit providers may also consider establishing an adopt a bus stop program that would allow individuals, local service organizations, and business partners to sponsor improvements or volunteer to maintain stops. Similar to the Adopt-A-Highway program, volunteers would regularly visit the sponsored bus stop to pickup trash and assist with minor repairs and snow removal; larger repairs would be reported to the transit provider for further maintenance. In exchange for their time or sponsorship, a sign with their name(s) and/or organization could be placed at the stop to market the program and honor the participants. MDOT MTA's Adopt-A-Stop Program is an excellent regional example of a volunteer based program.

Figure 4-6: Bus Stop Improvement Guidelines



Potential Funding for Improvements

Typically, the primary barrier to improving bus stop accessiblity and amenities is a lack of funding. There are various funding options, from competitive grants to business improvement districts. These funding options and more are outlined below.

Bonds

Municipal or infrastructure bonds could help finance bus stop and pathway improvements. Bonds are a voter-approved mechanism that allow debt which is paid back through local taxes.

Improvement Districts

Common in high activity centers and downtowns, business improvement districts, public improvement districts, infrastructure development zones, and tax increment development districts are excellent vehicles for beautification and passenger enhancements at and around bus stops. These districts and zones are typically funded through property taxes or special levies and have the ability to issue bonds and borrow money for various beautification efforts.

Transportation User Fees

Surcharges or sales taxes could be added to parking fees or other existing transportation related charges such as registration fees or revenue producing projects. Enforcement fees (parking fines, sidewalk related violations, etc.) could also be allocated to future bus stop and sidewalk improvements.

Grants

Grants are typically the primary source of bus stop improvement funding. However, traditional capital grants like the Federal Transit Administration's Section 5307 and Section 5339 are just a sampling of potential grants. Other competitive grants that could fund sidewalk and bus stop improvements are the Department of Housing and Urban Development's Community Development Block Grant (CDBG), the Federal Highway Administration's Congestion Mitigation and Air Quality Improvement (CMAQ) Program, and the U.S. Department of Transportation's Better Utilizing Investments to Leverage Development (BUILD) grants.

Public Private Partnerships

Public private partnerships could also generate funding for improvements. Potential partners may include neighborhood associations, local businesses, foundation grants, and real estate developers.

BALTIMORE METROPOLITAN COUNCIL

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