TOOLBOX SECTION

6

Pedestrian Access to Transit

Every transit trip begins and ends with pedestrian travel.

PEDESTRIAN ACCESS TO TRANSIT

This toolbox section discusses design practices that promote and enhance pedestrian access to transit and improve conditions at transit facilities, encouraging both transit use and greater levels of walking. Transit includes several types of systems and programs, including public bus services, bus rapid transit (BRT), rail and other fixed guideway systems, paratransit, shuttles, and vanpools. High capacity transit is a term used to describe systems that carry high loads of passengers (such as BRTs, light rail, commuter rail, street cars and other technologies). Transit systems may run within street, roadway, or highway rights-of-way or in independent alignments.

This toolbox section is not meant to be a comprehensive resource for designing transit facilities. Rather, it provides a summary of current best practices and design guidelines related to enhancing pedestrian access to transit. Examples from Hawaii and elsewhere are highlighted.

Refer to the list at the end of this section for other useful documents and resources.

Why Pedestrian Access to Transit is Important

Enhancing and expanding pedestrian access to transit and improving transit facilities are complementary to promoting pedestrian travel. Pedestrian and transit travel work well together. Every transit trip begins and ends with pedestrian travel. Good pedestrian facilities make the trip to transit stations and stops more convenient, safe, and enjoyable. If people do not feel safe or comfortable walking to transit stops, they are likely to choose other modes of travel, such as a car. Yet, transit use, as an alternative to driving, can bring many benefits:

- Decreased household transportation costs;
- Reduced environmental impacts (such as less air pollution and lower greenhouse gas emissions);
- Increased public health (people are likely to walk more to and from transit);
- Improved community livability;

IN THIS SECTION

- Decreased dependency on foreign oil resources; and
- Reduced overall infrastructure expenditures.

The success of transit as a mode of transportation is highly dependent upon good pedestrian access and the level of service and coverage provided. The provision of a variety of safe, efficient, reliable, frequent, and economical transit services and options give travelers and commuters more choices.

Accessibility

Because people with disabilities tend to rely on transit as their primary transportation mode, all transit facilities and the pedestrian routes that lead to them must be accessible. Federal laws require all new and renovated transit stations, stops, and transit facilities to comply with ADA Standards. As a best practice, facilities within the right-of-way, such as sidewalks and pedestrian pushbuttons, should comply with the proposed Public Rights-of-Way Guidelines (PROWAG). In Hawaii, the Disability and Communication Access Board (DCAB) provides design guidance and gets involved in review of the design of transit facilities.

For example, Hawaii Revised Statutes 103-50 requires DCAB document review for all rail station plans and specifications to ensure compliance with ADAAG, as adopted and amended by DCAB.

For further information on accessibility, refer to Toolbox Section 3—Accessibility.

Transit in Hawaii

A variety of public transit services are currently provided in the islands, and some are in the planning stages. Transit operations are provided by each county on Oahu, Hawaii, Maui, and Kauai. Citizens and visitors on Molokai and Lanai are provided with transit service through a private, non-profit server, Maui Economic Opportunity, Inc (MEO). Various resorts also offer private transit services, and there are many private tour companies that use buses and shuttles to transport visitors in the islands.

SERVICES ON OAHU

- The City and County of Honolulu operates TheBus, which provides service throughout the island. A variety of route choices, timetables, and vehicle types (including hybrid buses) are

The success of transit as a mode of transportation is highly dependent upon good pedestrian access.

People with disabilities tend to rely on transit as their primary transportation mode, and all transit facilties and the pedestrian routes that lead to them must be accessible. (gohart. blogspot.com)

provided. More than 230,000 people use the service on a typical weekday.

- The Handi-Van is a public transit service in the City and County of Honolulu for persons with disabilities who are unable to use TheBus. The Handi-Van service is generally available island wide, Mondays through Sundays from approximately 4:00 a.m. through 1:00 a.m. 24 hour service is available in areas located within ¾ mile of TheBus, Routes 2 and 40. Advanced reservations are required. Passengers are picked up and dropped off at the nearest and safest point next to the curbside of the public street address requested.
- The Waikiki Trolley (Green Line = Scenic Attractions, Red Line = Historic and Cultural Sites, and Pink Line = Shopping and Dining), provides service and tours focused in the Waikiki and Downtown areas.
- The Mililani Trolley provides service to over forty stops scattered throughout Mililani, mauka and makai sides.
- Private commuter services, such as the Leeward Oahu Transportation Management Association (LOTMA) Commuter Express and Kamehameha School Charter buses, are also available to serve commuters and students.
- College and university shuttle systems, including the University of Hawaii at Manoa and Hawaii Pacific University on-campus buses.
- Honolulu Rail Transit will be a 20-mile elevated rail line that will connect West Oahu with Downtown Honolulu and Ala Moana Center. The new transit service, which is currently in design, will carry more than 8,000 passengers per hour in each direction via electric, steel-wheel trains that hold more than 300 passengers each. New bus routes will provide direct connections to the stations. Honolulu Rail Transit stations are being designed to maximize pedestrian connectivity and mobility.

SERVICES ON THE BIG ISLAND

- The Hawaii County Mass Transit Agency provides low-priced public transportation on the island of Hawaii via the Hele-On bus (fixed route service). Fifteen routes connect the island, with monthly ridership estimated at over 67,000 according to a study completed in July 2009. In addition, the Transit Agency offers a Shared Ride Taxi program that

The Waikiki Trolley in Honolulu transports people to scenic, cultural, and retail attractions.

The City and County of Honolulu operates TheBus, which provides service to 230,000 islanders per day. (www.allhawaiinews.com)

The Hele-On bus provides low-priced public transportation on the island of Hawaii. (www.allhawaiinews.com)

On Kauai, the County operates the Kauai Bus from Hanalei to Kekaha daily. (Maui County)

provides low-cost door to door transportation within the urbanized area of Hilo.

SERVICES ON MAUI

- Maui County provides service on Maui via the Maui Public Bus Transit System. This public bus system provides service (fixed route) between various Central, South, West, and Upcountry communities. The routes typically operate seven days a week including all holidays, and is estimated to serve more than 6,700 passengers daily. Exhibit 6.1 shows the variety of transit vehicles operated on Maui.
- The Maui Bus Commuter Service operated by Roberts Hawaii is provided for early morning and evening commuter use to augment the Maui Bus Service (routes include Haiku-Wailea Commuter, Makawao-Kapalua Commuter, Wailuku-Kapalua Commuter, and Kihei-Kapalua Commuter).

SERVICES ON KAUAI

- The County operates the Kauai Bus, a public (fixed route) bus service and a Paratransit (door-to-door) bus service from Hanalei to Kekaha daily except on Thanksgiving, Christmas, and New Year's Day. In March 2011 the Kauai Bus ridership was 51,894 trips, and the Paratransit ridership was 6,129 trips. It provides service to the airport, but has limited service to Koloa/Poipu. In the past, there was a proposal to analyze the potential of implementing a high speed rail service on the island known as HART-BEAT, Hawaiian Air Rapid Transit—Beautiful Excursion Aerial Transport.

Transit Compatible Planning and Site Design

Planning for good pedestrian access to transit is an important way to improve community livability. New site and building design should always provide transit compatible features as a best practice.

Across the islands, as elsewhere in the United States, there are many sites and developments that were initially not designed to provide good access to transit. As more transit service is provided, these locations will need to be retrofitted to improve access to transit. Exhibit 6.2 shows an example of how a suburban office park was converted to mixed use and improved for better pedestrian access to transit.

EXHIBIT 6.1 ***Maui County Buses*** *(County of Maui)*

Some transit agencies may extend routes onto a private site to serve transit riders, but most won't operate off of public roadways because of the loss of travel efficiency. It is therefore important to provide good pedestrian access routes from buildings to the transit facilities on nearby public roadways (see additional guidance for pedestrian access routes later in this section).

Encourage transit use by providing direct lines of pedestrian access to transit. Make it easy and convenient for pedestrians to reach the transit stop. Consider the need for short cuts that reduce the distance a pedestrian must walk and provide more convenient access, in locations such as:

- Bridges over streams;
- Paths through parks and neighborhoods;
- Walkways that connect to/from dead-end streets; and
- Walkways in easements to enhance connectivity in neighborhoods with fewer streets or circuitous streets.

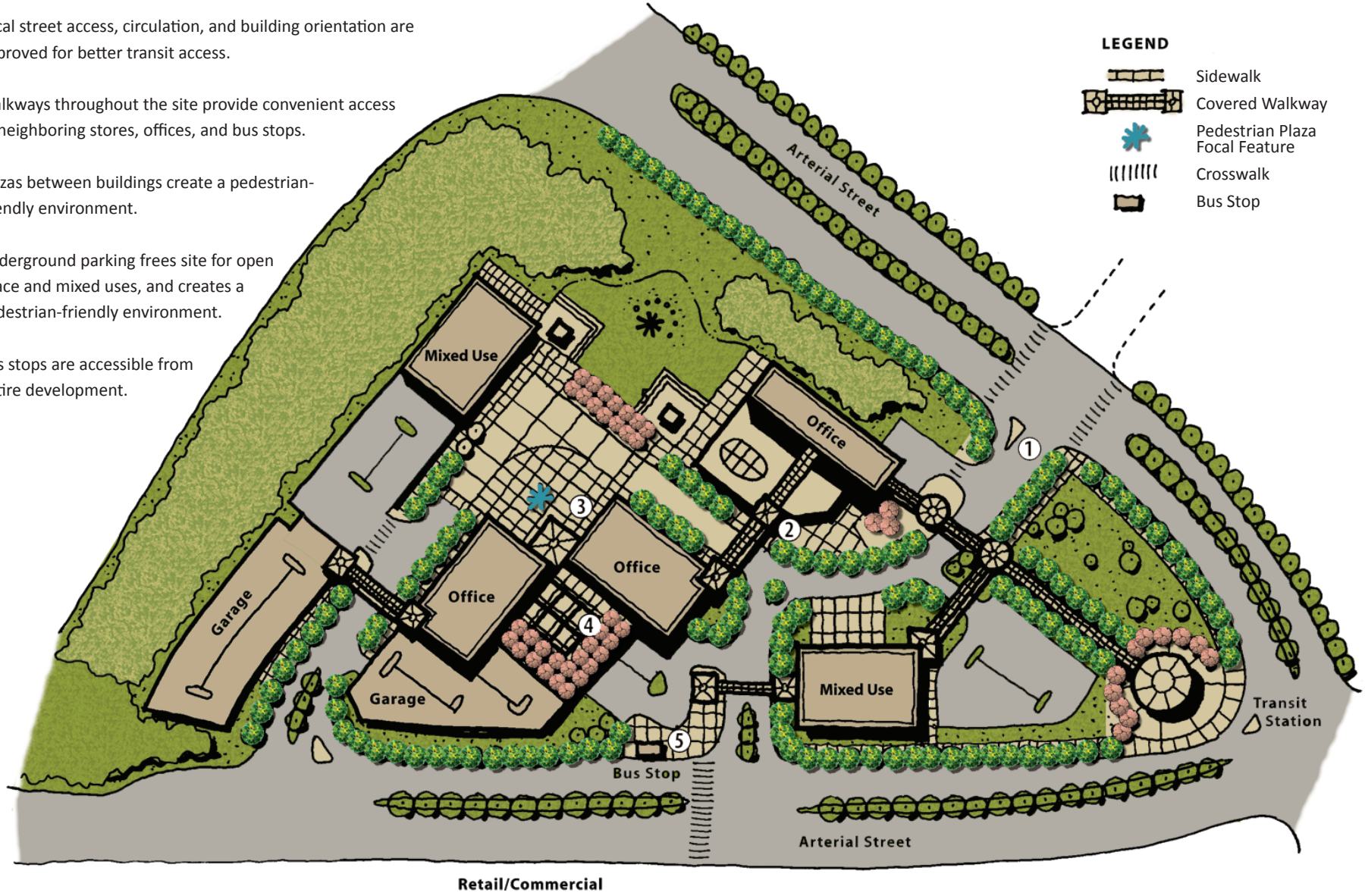
Transit-compatible site design objectives are highlighted in Exhibit 6.2.

Bus stop shelter with waste receptacle along a sidewalk in Honolulu.

Bus stop shelter along the Kamehameha Highway on Oahu.

EXHIBIT 6.2 Transit Compatible Site Design Objectives

1. Local street access, circulation, and building orientation are improved for better transit access.
2. Walkways throughout the site provide convenient access to neighboring stores, offices, and bus stops.
3. Plazas between buildings create a pedestrian-friendly environment.
4. Underground parking frees site for open space and mixed uses, and creates a pedestrian-friendly environment.
5. Bus stops are accessible from entire development.



Coordination Between Agencies

Coordination between transit agencies, local jurisdictions, and transportation system planners and designers is essential when planning and designing pedestrian facilities for access to transit. Land use planning efforts should consider ways to support transit use in communities. Communication and coordinated reviews between transit agency staff and local planners and engineers should occur during the beginning stages of projects.

As an example in the United States, the Central Phoenix/East Valley Light Rail Transit (LRT) project highlights some of the important features of TOD in Urban Design Elements. These include:

- Development of uses adjacent to LRT stations that create a viable "24 hour" area;
- Stations in the direct line-of-sight for pedestrians; and
- Public facilities and community services adjacent to stations such as libraries, police stations, and day care facilities.

Coordination between transit agencies, local jurisdictions, and transportation system planners and designers is essential when planning and designing pedestrian facilities for access to transit.

Transit-Oriented Development

The concept of Transit-Oriented Development (TOD) aims to create pedestrian-friendly communities that have good access to public transit. The mixes of uses that should be encouraged near a transit station to make it effective as a pedestrian and transit destination include mixed-use buildings with higher density residential development, commercial, retail, and office/employment uses, as well as public facilities such as plazas, community centers, and service centers.

Excess parking can discourage transit use. Consider incentives for new development or redevelopment adjacent to proposed transit stations and stops that reduce parking requirements. This is justifiable if public transportation is a convenient alternative to single occupancy vehicle travel. For example, the Lihu'e Town Core Urban Design Plan, through its special planning areas, allows the following:

"The Director may allow a reduction in the parking requirements for commercial uses and multi-family dwellings if a bus or transit stop with a pullout area is provided and built to county Transportation Agency standards (subject to County Transportation Agency approval). The parking requirements shall be one (1) space per 550 sq ft of net floor area or net office area for commercial uses and one (1) space per unit for multi-family dwellings."

Refer to *Creating Transit Station Communities* and other resources listed at the end of this toolbox section for a more in-depth look at TOD. The *Creating Transit Station Communities* report discusses benefits, specific design principles, market analysis, and funding strategies for TOD.

Successful transit-oriented developments include pedestrian-friendly facilities and amenities such as shown in this Portland, OR example.

Transit Stop Locations

When feasible, transit stops should be located to minimize walking distances to and from the activity center that is expected to generate the most ridership. The more convenient it is to walk to transit, the more people will use the service.

A quarter-mile walking distance (typically five minutes) or less between activity centers and transit stops is generally considered to be optimal, with a half-mile (ten minutes) considered to be the maximum walkable distance. (Although some people will walk farther distances to reach transit, studies show that most people prefer to walk no more than half a mile.)

Activity centers are places that consistently generate transit ridership, such as mixed-use villages, multi-family housing areas, employment areas (office complexes, high rises, etc.), major shopping areas, entertainment districts, colleges, and other places.

In general, bus stops should be located to encourage safe crossing of streets at designated locations. The unique circumstances of stops near intersections should be studied on a case-by-case basis to determine the most appropriate location (as discussed in more detail on the following pages).

Spacing between Transit Stops

The following are recommended distances between transit stops.

- Urban Areas—Five to eight stops per mile, with maximum spacing of 750 feet between stops
- Suburban Areas—Four to six stops per mile with typical spacing of approximately 1,000 feet between stops
- Rural Areas—As needed, but typically not more than suburban areas

Note: If stops are placed too close together, the ride time becomes longer, which may make it more efficient to walk and reduce transit ridership.

Near-Side, Far-Side and Mid-Block Locations

There are generally three choices for locations of transit stops along streets: on the near-side of intersections, on the far-side of intersections, and at mid-block. Exhibit 6.4 lists considerations related to each of these placement options. In general, on streets with higher volumes and higher speeds, transit stops should be placed as close as possible to intersections, whether signalized or unsignalized (with a maximum recommended distance of 200 feet from the intersection).

Near-side stops are located on the approaching side of an intersection in relation to the direction of travel. Far-side stops are located on the departing side. Mid-block stops generally are not close enough to an intersection to be affected by the intersection operations.

In deciding whether to locate transit stops near-side, far-side, or at mid-block, placement should be reviewed on a case-by-case basis. Maximizing pedestrian access, convenience, and safety is important in selecting appropriate locations for transit stops. The unique circumstances of each potential location should include the following considerations:

- Walk time from intersection/crosswalk to stop

- Pedestrian sight distance
- Intersection capacity and configuration
- Turning lane conflicts
- Approach sight distance
- Cross traffic sight distance
- Traffic safety, including the potential for increased chance of rear-end collisions
- Congestion at the waiting area
- Traffic patterns
- Turning movements of the bus
- Curb clearance needs
- Location of crosswalks
- Location of nearby driveways

There are advantages and disadvantages related to locating bus stops near-side, far-side, and mid-block. Exhibits 6.3 and 6.4 compare each choice considering several of the circumstances listed above. Additional considerations are listed in the box on page 6-11.

EXHIBIT 6.3 Comparison of Near-Side, Far-Side, and Mid-Block Bus Stops

COMPARISON OF NEAR-SIDE, FAR-SIDE, AND MID-BLOCK BUS STOPS			
CONSIDERATIONS	NEAR-SIDE	FAR-SIDE	MID-BLOCK
Walk Time to Intersection	●	●	
Pedestrian Sight Distance			●
Intersection Capacity / Configuration			●
Right Turn Conflicts		●	●
Approaching Sight Distance		●	●
Cross Traffic Sight Distance			●
Increased Chance of Rear-End Crashes	○		●
Congested Waiting Area			●
Right Turn Capacity		●	●
Traffic May Block Intersection	●		●

● Preferred ○ Acceptable ■ Not Preferred

Other Considerations in Locating Transit Stops

The following additional factors often influence decisions about where to locate transit stops.

- Availability of adequate right-of-way to ensure the stop meets PROWAG
- Curb clearance (i.e. clear access of the bus to the curb or adjacent property, not blocked by on-street parking)
- The intersection of two transit routes proceeding in the same direction should have the same stop as well as hubs and transfer points.

EXHIBIT 6.4 Bus Stop Placement Considerations

BUS STOP PLACEMENT CONSIDERATIONS		
NEAR-SIDE LOCATIONS	FAR-SIDE LOCATIONS	MID-BLOCK LOCATIONS
Allow pedestrians to cross in front of the bus, minimizing the distance those de-boarding have to walk to cross the intersection.	Allow buses to re-enter traffic more easily and in advance of the signal change allowing traffic behind the bus to proceed. Many transit agencies prefer far-side. The City and County of Honolulu Department of Transportation Services also prefers far-side.	Typically discouraged unless signalized mid-block pedestrian crossings are provided.
Bus operators have a direct view in three directions.	If transit stop is in-line, buses can immediately pull forward away from the curb. If the stop is a pull off, buses can pull out before the signal changes.	Where a mid-block crosswalk exists, transit stop should be located on the far-side of the crosswalk to maximize visibility to approaching traffic of crossing pedestrians.
If bus is stopped within the flow of traffic (in-line stop), it is easy for them to proceed when the intersecton signal changes.	No pedestrians are crossing in front of the bus.	Minimum interference of sight distance and intersection operations.
Parking restrictions near these zones can facilitate bus maneuvering.	Eliminates blocking of a signal by a bus.	May be less crowded sections of sidewalks at mid-block.
	Eliminates rear-end protruding into adjacent lane.	May be closer to center of transit patron generator.
	Transit routes turning left typically can access far-side or mid-block locations more readily.	
	Typically better for complex intersections, inlcuding those with dual left turning lanes and right turn lanes.	
	May cause delay and congestion by buses blocking right-turning traffic on a green signal (with in-line stops).	

- It may be advantageous to locate stops nearby each other at the same intersection when two or more transit routes converge. This will make passenger transfers more efficient and convenient. Exhibit 6.5 shows bus stop locations oriented around a single street corner.
- In some areas, it may be desirable to locate transit stops off-street (such as to avoid the need for pedestrians to cross busy streets). Off-street stops are most appropriate at destinations that are set far back from the roadway (such as sometimes occurs with hospitals and shopping malls).

Highly efficient, comfortable, and convenient intermodal transfer connections between buses and between buses and high capacity transit are vital to the success of the entire integrated system.

A pedestrian area often can be designed as a combined facility with the stop, station, or platform and adjacent activity area. Transit representatives should work with local jurisdiction representatives to relocate bus stops, if necessary, to decrease walking time

EXHIBIT 6.5 Same Corner Bus Stop Locations

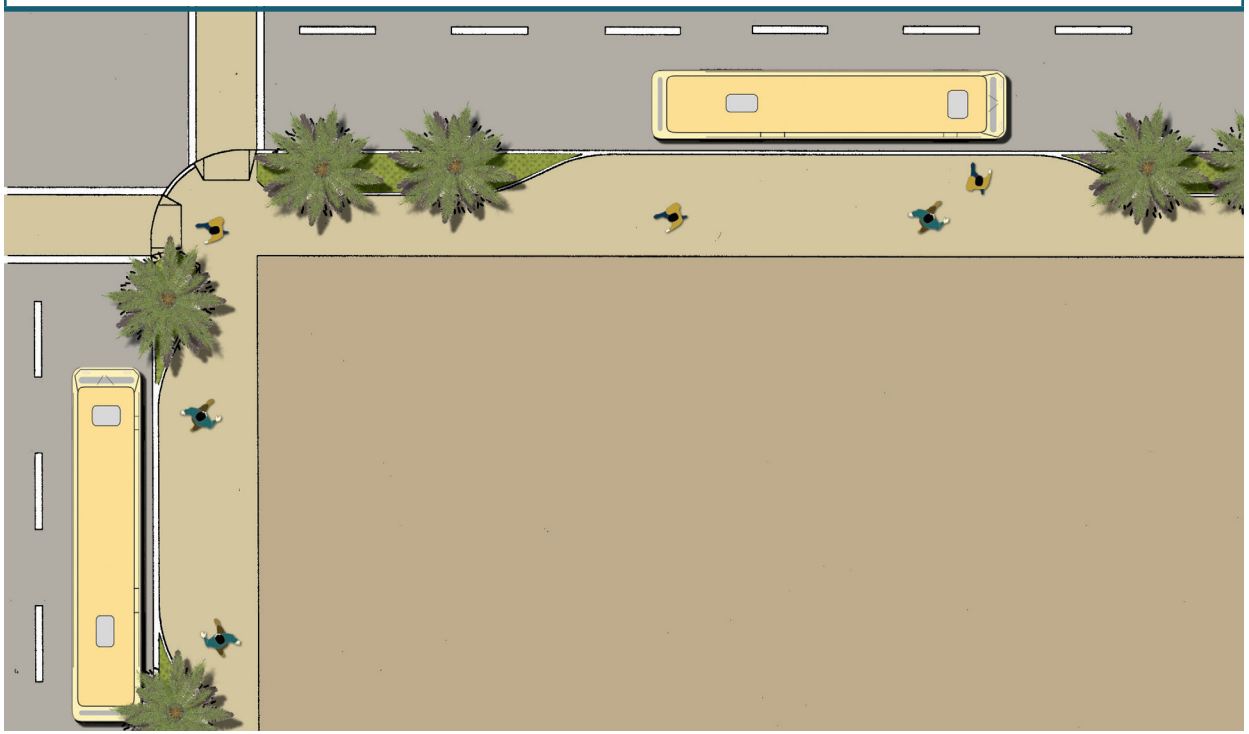
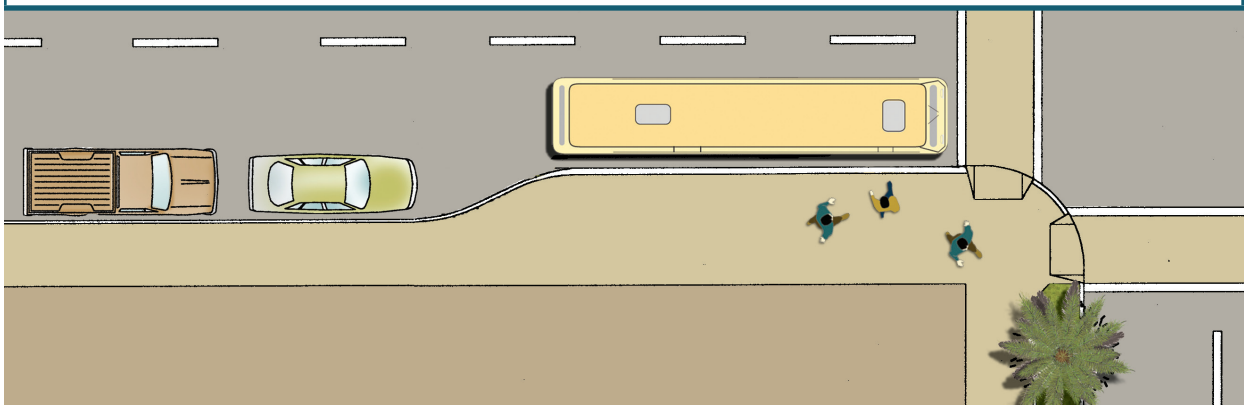


EXHIBIT 6.6 Curb Bulb-out at Bus Stop Located on the Near-side of the Intersection



for pedestrians. Designers should estimate/forecast pedestrian flows, patterns, and volumes between high capacity transit and bus stops to help determine walkway widths. Exhibit 6.6 illustrates a bus stop located along a curb extension area near an intersection.

Pedestrian Routes to Transit

If transit stations or stops on private or public sites (off street locations) are served by public transit, they are required to meet accessibility standards. On-site accessible routes of travel are required to meet ADA Standards, and pedestrian access routes within public rights-of-way must comply with PROWAG. Accessibility features such as curb ramps and pedestrian push button devices must be provided at intersections and crossings. Applicable ADA and PROWAG requirements are summarized below. Also refer to the information provided in Toolbox Section 3—Accessibility and 4—Sidewalks and Walkways.

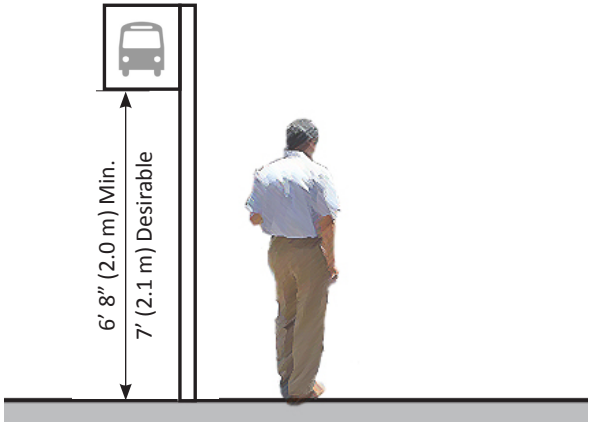
Horizontal and Vertical Clearances

The required minimum width per PROWAG is 4 feet of clear space, sufficient for a person in a wheelchair to use. The preferred best practice width is a minimum of six feet, enabling two adults to walk side-by-side and two wheelchairs to pass comfortably.

See Toolbox Section 4—Sidewalks and Walkways for recommended widths, but generally six-feet-wide is the recommended minimum, and wider sidewalks are desirable along arterial and collector streets and in urban areas. Along more congested pedestrian routes, where groups of people are commonly walking (such as in town/village centers, in urban areas, and around key destinations), pedestrian travel ways should be wider, with a minimum width of ten feet.

Adequate horizontal and vertical clearances around street furnishings, parking meters, sign posts, and other elements located in the pedestrian realm must be provided. Vertical clearance between the sidewalk grade and overhanging signs, signs along the street, tree branches, and other obstructions must be provided. A vertical clearance of 6 ft-8 in (2.0 m) is the minimum required by ADA from the pedestrian surface to the bottom of the obstruction, but a 7 ft (2.1 m) vertical clearance is the recommended best practice. Exhibit 6.7 illustrates sign clearance.

EXHIBIT 6.7 Bus Stop Sign Vertical Clearance



This streetcar shelter in Portland, Oregon separates the pedestrian walkway from the waiting area. (www.protransit.com)

A bus stop in Honolulu with a wide pedestrian walkway allows space for loading and unloading.

Passing Spaces

Pedestrian access routes that are less than five feet wide shall provide passing spaces at intervals of 200 ft (60.9 m) maximum in accordance with ADA. The best practice is to provide sidewalks at a continuous width that does not require passing spaces (see recommended widths in Toolbox Section 4).

Cross Slope and Gradients

The cross slope of a pedestrian access route shall not exceed two percent maximum in accordance with PROWAG.

Pedestrian access routes located in public rights-of-way of streets and roadways should follow the PROWAG standards of maximum five percent grade to the extent feasible. However, if the longitudinal slope of the roadway is steeper, the grade of pedestrian route is allowed to follow (but not exceed) the general grade of the street or roadway.

Accessible routes of travel (off-street) on developed sites shall not exceed the maximum gradient of five percent in accordance with ADA Standards. Ramps may be designed within the route in accordance with ADA standards, not exceeding a 12:1 or 8.33 percent gradient. (See Toolbox Section 3 for ramp design guidance.)

Surfaces

ADA Standards and PROWAG require a firm, stable, slip resistant surface along accessible routes of travel and pedestrian access routes. Paved surfaces are generally preferred because they are easier to maintain in this condition. However, other surfaces that meet the "firm, stable, slip resistant" criteria may be acceptable, depending upon installation and maintenance.

Provide surfaces that facilitate good traction without changes in level. Pavement texture and color can also be used to communicate function and spatial relationships for the visually impaired. Pavement texture should not induce excessive vibration for pedestrians using wheelchairs (such as that created by wide, mortared joints of unit pavers).

Lighting

In addition to night-time use of transit, riders often commute to work or school in early morning and late afternoon and evening hours. Pedestrian access routes and accessible pedestrian routes to transit should be well-lit.

Pedestrian scale lighting should be provided along the route, as well as surrounding and within the transit stop area. Lighting should be scaled appropriately to tree canopies and the pedestrian level of activity (with intensity focused on the walking surface). Minimize areas of shadow and low light to decrease the potential for obscured visibility and a compromised sense of security.

Visibility

Open, visible sightlines are important along access routes to transit for safety and security. Both pedestrians and motorists should have open, clear sightlines.

Wayfinding

Wayfinding elements and directional and identification signs help direct pedestrians to stations from transit stations/centers, bus stops, park and ride lots, adjacent pedestrian areas, major neighborhood intersections, and key cultural, educational, and recreational facilities. Regulatory and safety signs encourage safe pedestrian activity in and around transit stations. Providing wayfinding and directional signs to help pedestrians find their way is particularly important along routes where the bus stop is not clearly visible.

Pedestrian Comfort and Amenities

Weather protection and pedestrian furnishings such as benches and leaning rails should be provided periodically along the access route (particularly if it covers a long distance). Other amenities (waste and ash receptacles, information kiosks, etc.) can enhance the character of the pedestrian environment and encourage pedestrian activity.

All furnishings and elements in the pedestrian environment should be durable, lasting, vandal resistant, comfortable, and attractive.

Trees, Landscaping, and Public Art

Trees, landscaping, public art, and other features can help make the walk route more attractive and inviting. (See additional landscaping recommendations later in this section.)

Maintenance

Provide ongoing maintenance of access ways to transit, transit facilities, and surrounding areas. Preserve these areas in an attractive, inviting, safe, and secure condition to encourage ongoing transit access and use. Consider aesthetics and maintenance requirements in the initial design phase, rather than as an afterthought.

Pedestrian access routes to transit should be well-lit.

Providing space for shelters and waiting areas is essential. (www.commons.wikimedia.org)

A raised pedestrian crosswalk is provided at the Waipahu Transit Center on Oahu. (www.google.com)

Intersections and Crossings Near Transit

- Curb cuts with slopes no steeper than 1 inch of level change across 12 inches of distance are needed where level changes occur (such as a crosswalk).
- Coordinate pedestrian signals and other traffic control devices with timings that allow pedestrians sufficient time to comfortably cross the street to reach the transit station or bus stop.
- Provide good visibility and clear lines of sight at pedestrian crossings near at-grade stops (including bus transit, light rail, and commuter lines).
- Minimizing conflicts with vehicular traffic along the accessible route can make pedestrian travel more efficient to and from the transit stop/station.

Designing and Improving Transit Facilities for Good Pedestrian Access

The following guidance applies specifically to designing various types of transit facilities with the intent to maximize efficient, convenient, and safe pedestrian access to transit. Transit facilities include transit stations and transit centers (bus and rail), bus stops, and other places where pedestrians access transit services. These types of facilities may include buildings (enclosed and open air), transit platforms, bus stops (with or without shelters and furnishings), and park-and-ride areas. General guidance is provided first, followed by specific guidance related to these various types of facilities.

Refer to additional guidance in other toolbox sections as well as the local requirements of transit and transportation agencies. For example the City and County of Honolulu Department of Transportation Services and Maui County both publish design guidelines for their transit facilities.

General Guidance

The guidance described above under Pedestrian Routes to Transit (horizontal and vertical clearances, passing areas, cross slope and gradients, surfaces, lighting, visibility, wayfinding, comfort, landscaping and amenities, and maintenance) is also applicable to pedestrian areas surrounding and within transit facilities. In addition, the following guidance applies to all transit facilities.

PASSENGER WAITING, LOADING, AND LANDING AREAS

Design all passenger waiting areas to be open, secure, inviting, well-lit, and comfortable for pedestrians. The following guidance also applies.

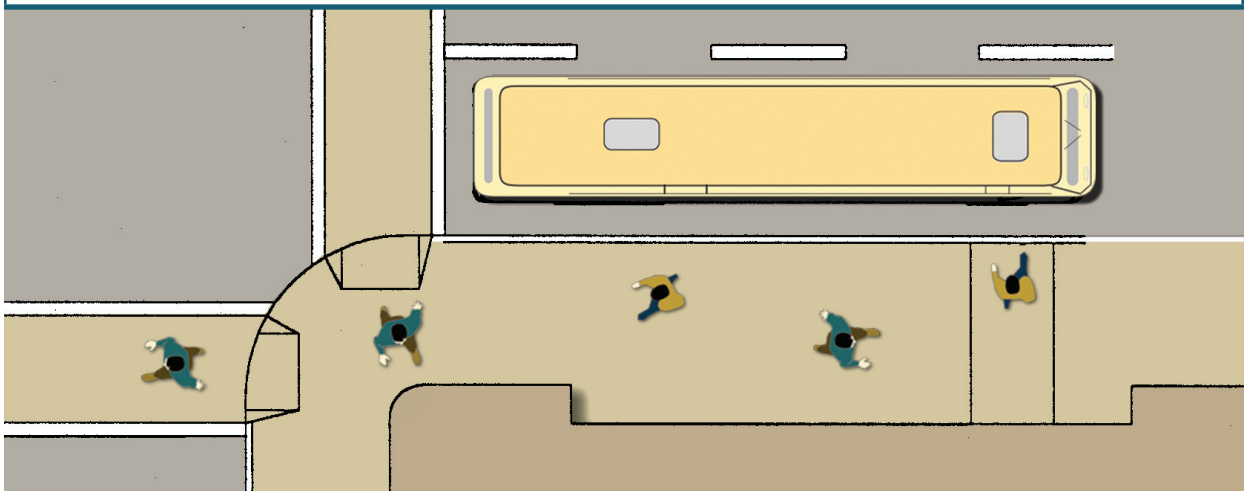
- Provide shelters and covered structures where feasible to protect passenger waiting areas from wind, sun, and precipitation. Waiting space for people in wheelchairs under the sheltered stop must be provided, adjacent to other seating areas. (See Exhibit 6.10)
- Maintain open sight lines between the bus operator's view and the passenger loading areas with shelters and windows constructed with transparent materials to provide a view of waiting passengers.
- Provide a minimum vertical height clearance in the bus stop zone of seven feet from ground level to the bottom of the signs and overhanging tree branches.
- Provide posted schedule information, or if possible, electronic real-time signs so patrons can anticipate bus, trolley, or train arrival. Route and spider maps (that show more than one bus route) are also helpful.
- Improve pedestrian mobility and transit efficiency by providing separate spaces for pedestrians who are waiting/queuing to board or deboarding, as well as those who are transferring between buses and those who are passing through, if possible.
- Provide clear delineation of pedestrian spaces with visual and textural cues that separate pedestrian spaces from parking and driving aisles and bus ways. Refer to PROWAG Standards for guidance on placement and design of detectable warning strips.
- Provide level landing areas or "pads" (also called pedestrian access aisles) at bus entrances and exits as required by ADA. The purpose of the landing pad is to accommodate lifts and ramps to service wheelchair boarding. The landing pad is an unobstructed, level area contiguous to the curb that measures a minimum of 5 ft (1.5 m) parallel to the street/

Design all passenger waiting ares to be open, secure, inviting, well-lit, and comfortable for pedestrians.

bus zone and 8 ft (2.4 m) perpendicular to the street/bus zone. (Refer to Exhibit 6.8.) Landing areas must be free of street level obstacles such as signs, light posts, pay phones, shelters, kiosks, trash receptacles, trees and landscaping or other elements. Exhibit 6.9 illustrates recommended cross section dimensions at a bus stop.

- To provide for rear-door alighting from larger buses, either provide an additional landing pad or a full-width landing area (ideally at least 30 ft (9.1 m) in length for stops served by 40-foot-long buses or at least 40 ft (12.1 m) in length for stops served by 60-foot-long articulated buses.
- Stops where more than one bus is boarding and alighting passengers at the same time will need additional landing pad areas to be determined by the size and placement of the buses serving each stop.
- It may be desirable to build a continuously wider sidewalk along the entire length of the bus stop, rather than try to predict where the landing should be located. Buses may not stop in the exact location each time.

EXHIBIT 6.8 Widened Sidewalk in Bus Loading Area



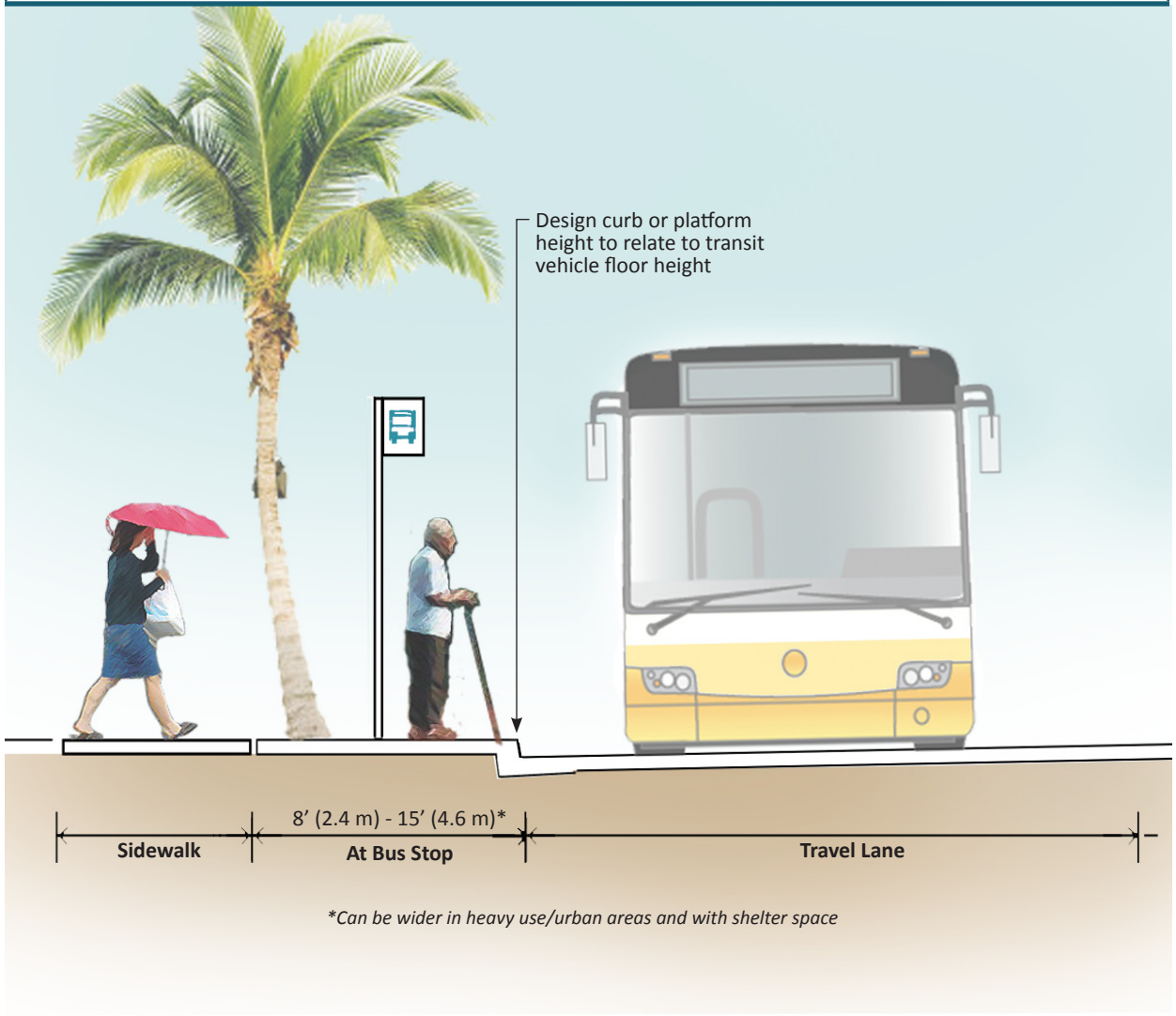
- Areas such as "kiss-and-ride" motor vehicle, taxi, or van drop-off locations must also include an ADA compliant pedestrian access aisle (sidewalk) area for safe pedestrian loading and unloading.
- Provide furnishings and amenities (addressed previously in this section), designed, selected and installed in accordance with ADA Standards and PROWAG. Installation should not block the accessible landing area/pad or primary pedestrian and wheelchair passage areas around and within the transit station or stop.

PARKING/PARK-AND-RIDE AREAS AND CONNECTING ACCESSIBLE ROUTES

Parking areas at park-and-ride facilities facilitate transfer from motor vehicle to transit. As people are transferring from one mode to the other, they are pedestrians with specific needs to be addressed. Pedestrian access ways in parking areas should be clearly delineated. Lighting for security and pay phones should be provided to assist pedestrians who may have car trouble. The following guidance also applies.

- Provide easy access to and from surrounding neighborhoods and businesses. Remember,

EXHIBIT 6.9 *Typical Bus Stop Cross Section*



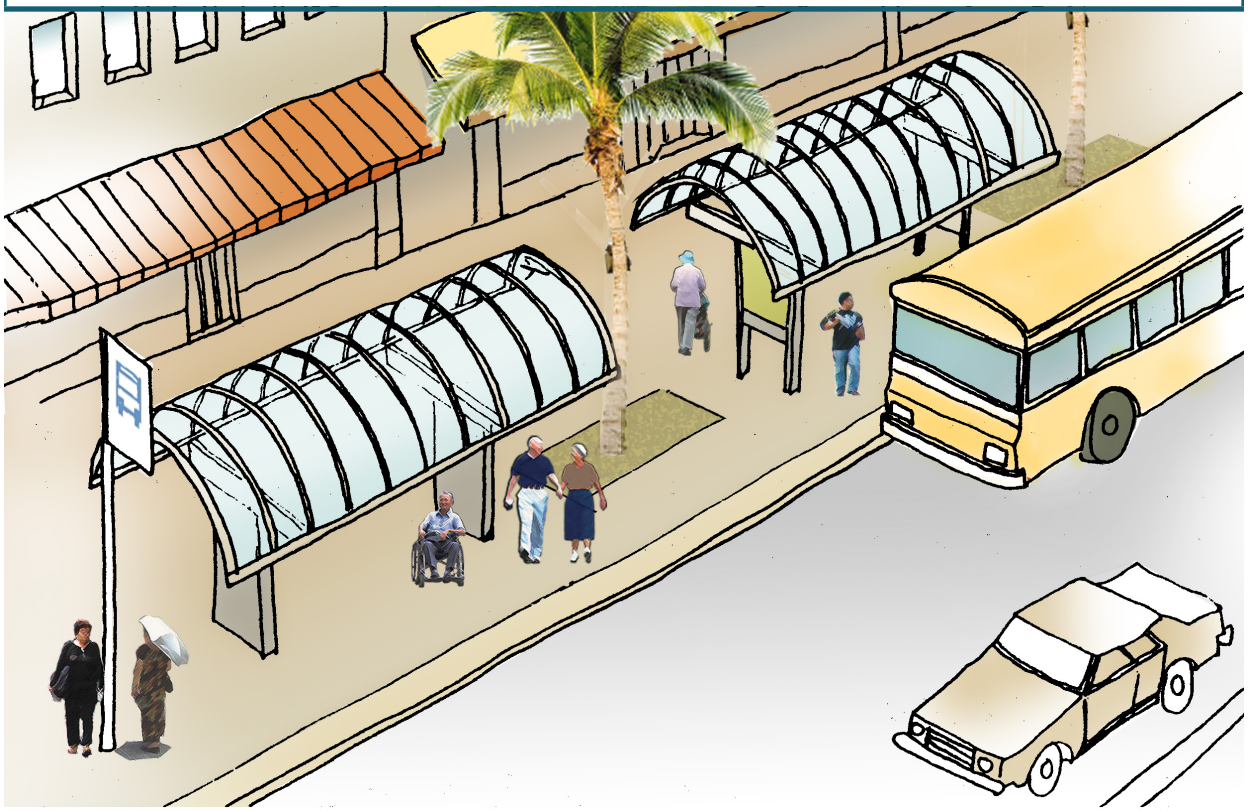
*Can be wider in heavy use/urban areas and with shelter space

Transit shelter with photovoltaic system on roof

Kiss-and-ride sign at the Hawaii Kai Transit Center

If a transit facility is contained within a building, at least 60 percent of public entrances need to be accessible. (www.allhawaiinew.com)

EXHIBIT 6.10 Bus shelters and covered structures enhance pedestrian comfort.



not all park-and-ride patrons are motorists. Pedestrians may walk to the park-and-ride from nearby areas to access transit.

- Design the site with landscaping, public art, and other aesthetically pleasing features that will attract use and enhance the community/neighborhood.
- Mixed use development, when integrated with the park-and-ride, provides services and retail that enhance the pedestrian experience.
- Provide accessible parking spaces in accordance with ADA Standards and HAR 11-219 with aisles alongside (and wider access aisles at van accessible spaces).

- Locate accessible parking spaces closest to the transit boarding/deboarding area.
- Provide at least one accessible route, safely delineated over the entire site, connecting the accessible parking spaces and passenger loading zones, bus stops, and public sidewalks on adjacent streets. Multiple routes may be necessary if it is a large park-and-ride to provide access from locations throughout the site to the boarding area. The route must connect all accessible elements (including any public phones, sheltered areas, drinking fountains, ticket vending, or other elements that transit patrons use.)
- A maximum walking distance of 800 ft (243.8 m) from the car to the bus loading zone is recommended.
- Provide curb ramps and curb cuts where necessary along the accessible route.
- Avoid changes in level along the route, but if an unavoidable change in level occurs, a ramp, lift, or elevator must be provided. Ramps must have handrails and level areas at the top and bottom of the ramp.
- Turnstiles shall not be part of an accessible route. Accessible route shall be located adjacent to the turnstile.
- To encourage transit use in urban areas parking around stations and stops may need to be limited. Refer to transit oriented development earlier in this section.

BUILDINGS, RESTROOMS, ELEVATORS, AND DRINKING FOUNTAINS

If the transit facility includes public buildings or is contained within a building, at least 60 percent of public entrances must be accessible. Additional accessible entrances may be required if the transit station has multiple access points (such as for inbound and outbound travel), more than one emergency exit, or an enclosed parking garage with direct pedestrian access. Features such as restrooms, elevators, and drinking fountains, if provided, must be accessible. The following guidance also applies.

- Restrooms/Toilet Rooms—If the station/facility has a restroom, it must be accessible with the following key features:
  - Door with adequate width, lever handles, and little to no threshold, as well as maneuvering space on both sides that allow accessible approach entering and exiting (see ADA Standards for dimensional requirements)
  - Space that allows a half or full wheelchair turn within the toilet room
  - Toilet with clear and level wheelchair space to allow for transfer, accessible toilet seat height, grab bars on the back and side of the wall, and accessible flush controls on the open side
  - Urinal with elongated rim located at an accessible height, clear and level wheelchair space that allows front approach and accessible flush controls
  - Lavatory with clear and level wheelchair space that allows front approach, knee and toe space under the fixture, insulated pipes under the fixture, and accessible faucet
  - Toilet accessories, such as toilet paper dispensers and soap dispensers, within an

Mililani transit center *(www.starbulletin.com)*

accessible reach range and operable with one hand, not requiring tight grasping, pinching or twisting of the wrist

- Elevators—provide at least one elevator to serve multi-story buildings and stations. All elevators must be accessible. Key features of an accessible elevator include:
  - Automatic operation by passenger
  - Call buttons within accessible reach
  - Hall lanterns and in-cab position indicators mounted high with a visual and audible notification
  - Signs on both sides of the elevator door with raised numbers/letters and Braille for each floor
  - Door reopening devices that detect obstructions without contact
  - Adequate size to accommodate people who use wheelchairs
  - Interior elevator controls within accessible reach range, raised buttons, and raised number or letter and Braille
  - Emergency two-way communication within the elevator that is accessible to people who are deaf or hearing-impaired/hard of hearing.
- Drinking Fountains—if provided, at least half of the drinking fountains must be accessible to people in wheelchairs (or if only one – it must be accessible). Key features of an accessible drinking fountain include:
  - Spout that directs water flow parallel or nearly parallel to the face of the unit
  - Controls located on the front or side of the drinking fountain that are operable with one hand and do not require tight grasping, pinching, or twisting of the wrist
  - Clear floor space that allows use by a person in a wheelchair when facing the drinking fountain from the front
  - Knee and toe clearance at drinking fountains that allow approach from the front

SIGNING, COMMUNICATIONS, AND FARE VENDING

Signing, communications (such as public phones and public announcement systems) and fare vending must be accessible in accordance with ADA Standards requirements. The following guidance applies.

- Transit stops and stations should include route identification signs with a non-glare finish and light text on a dark background (or dark text on a light background). Signage with the international symbol for accessibility should be used to identify ramps and other accessible features.
- Station identification signs must be provided at frequent intervals, clearly visible from within either side of the transit vehicle (bus, trolley, train, etc.) and designed with appropriate character height based on viewing distance.
- Wayfinding and directional signs along walkways help pedestrians find their way to and from the transit facility. The walkable distance (expressed in minutes) to nearby transit facilities, such as bus stops, could be included. (This would be especially helpful to tourists in Waikiki.)

Wayfinding sign in New York City (Christopher Edwards)

This bus stop sign in Seattle, WA provides a route map of the downtown area. (Oran Viriyincy)

- Each entrance of a transit station/building must have a sign with raised and Braille characters, mounted at an accessible height location.
- Signs that designate permanent public rooms and spaces, such as restrooms/toilet rooms, must have raised and Braille characters, non-glare finish, light text on dark background (or dark text on light background), and must be mounted at an accessible height and location.
- Signs that provide information about or direction to a room or space (such as "Employees Only") must also have a non-glare finish and light text on a dark background (or dark text on a light background). The City and County of Honolulu guidelines call for minimum height font of 3 in. Refer to the City and County of Honolulu guidelines for additional guidance. ***(www.honolulutransit.org)***
- Illumination levels in areas with signage must be uniform and located to minimize glare.
- If public phones (such as pay, security or closed circuit) are provided, then accessible telephones must be provided for people in wheelchairs, people who are deaf or hearing-impaired, or people who have difficulty with speech/language. Key features of an accessible telephone include:
  - Clear space that allows a wheelchair to approach from the side or front
  - Operable parts, such as the coin slot, within accessible reach range
  - Volume control with a sign depicting a telephone with radiating sound waves
  - Text telephone (TTY)
- Where a public address (PA) system provides audible information to the public at the transit station, then a means of providing the same or equivalent information to persons who are deaf, hearing-impaired, or with hearing loss must be provided.
- If automated fare vending systems are provided, at least one of each type of device must be accessible and provided at each point of entry or exit. Key features of an accessible vending device include:
  - Clear space that allows approach by wheelchair users from the front or side

- Device controls that are within accessible reach range and operable with one hand, not requiring tight grasping, pinching, or twisting of the wrist
- Accessible and discernable to people who are sight-impaired

DETECTABLE WARNING STRIPS

Detectable warning strips are raised domes on the floor surface typically in a highly visible or contrasting color such as yellow. Their purpose is to alert all pedestrians (including those with sight-impairments) about locations where the pedestrian way is adjacent to (and approaching a crossing of) motor vehicle, train, or bus traffic. Refer to ADA Standards and PROWAG for specific requirements.

ADJACENT ACTIVITY AREAS

Adjacent activity areas are defined pedestrian areas between multiple transit stops or between passenger drop off areas at curbside and transit stops. These areas should be designed similarly to urban plazas or as "park-like" spaces that provide seating areas and other furnishings, decorative plants, public art, drinking fountains, information kiosks, rail or bus arrival and departure information and "sociability" opportunities such as shaded seating areas. The design of these areas enhances the pedestrian environment and encourages use of the transit system.

Activity areas should also accommodate linkages to existing community amenities, provide sufficient bicycle parking and storage facilities, and provide space for outdoor food vendors.

LANDSCAPING AT TRANSIT FACILITIES

Landscaping around transit stations, stops, and waiting areas provides a visually pleasing environment and shade relief from the heat. Distinctive plants should be used to identify the stations as landmarks. Plants that represent the local and natural environment should also be encouraged. Trees that will provide maximum shade should be planted around the station. Avoid trees and plants that drop fruit or have features that could injure pedestrians (such as thorns, spines, or spikes).

Landscaping and irrigation should be designed to maximize water conservation and minimize maintenance requirements. Transit authorities

Detectable warning strip at a Seattle, WA streetcar stop (www.seattletransitblog.com)

The Hawaii Kai Transit Center is nicely landscaped and maintained.

should seek partnerships with surrounding businesses and/or neighborhoods to create small gardens or parks to enhance the pedestrian environment around stations.

Specific Transit Facility Guidance

In addition to the guidance above that applies to all transit facilities, the guidance below is specific to various types of transit facilities.

TRANSIT STATIONS AND TRANSIT CENTERS

Transit centers typically provide an area for transit lines or bus routes to come together at one location for transferring riders. They can also serve as important points of origin and destination.

Transit centers should be sited to optimize pedestrian access to major activity centers, such as downtowns, town centers, and major origins and destinations such as airports, shopping centers, university campuses and other locations. Transit centers promote transfer connections between different transportation systems, because they are highly visible facilities within the community. This high visibility and profile in the community also helps increase public awareness of the availability of transit service.

Both off-street and on-street transit centers can be developed, depending on the space requirements, street traffic volumes, passengers within walking distance, and other factors.

Transit centers function best when designed to meet the demands of peak user levels. Platform space needs to be adequate to accommodate all pedestrians, including those who are waiting, queuing, or simply walking up and down the

Both on-street and off-street boarding areas are provided at this example–the Lake Stevens Transit Center, WA.

sidewalk or platform. A common rule of thumb for determining space requirements for platform areas is ten square feet per person, using the peak pedestrian volume anticipated.

The most important element of design for transit centers is minimizing circulation conflicts between buses, pedestrians, bicyclists, light rail vehicles, and autos. Pavement delineation with texture, color, or striping helps to identify spaces that are for exclusive use by pedestrians. This also helps in boarding areas. Buffering techniques with planter boxes, street trees, furnishings, or other circulation design elements can be used to provide separation between pedestrians and automobiles.

High capacity rail transit pedestrian platform areas at stations are approximately 14 ft (4.26 m) to 16 ft (4.87 m) wide (or wider) by 300 ft (91.4 m) long (or longer) for use by passengers boarding or exiting trains. Platforms for bus rapid transit (BRT) may be shorter and narrower than this depending on the vehicles in operation. Sometimes platforms are split on either side of the system trackways (roads for BRT) and boarding/deboarding activities are also split. Or sometimes a single larger platform is centered between the trackways/roads and pedestrians use this area for both boarding and deboarding.

When high capacity transit is located in street rights-of-way, pedestrian platforms/stations may be located either at the sides of the streets (along pedestrian sidewalk areas) or in the center of the street, where passengers can access the stations from a signalized intersection.

The station platform is usually identified by signing or other features so that it can be readily seen by pedestrians. Shelters for shade, sound, and rain protection are usually provided on the platforms. The platform area also typically provides seating and sometimes leaning areas, route maps, timetables or "real time" information, and trash receptacles. Ticket vending machines are often located near the entry area to the platform. Other amenities such as drinking fountains, public telephones, and public art also may be provided. They should also be well lit to enhance passenger security.

All stations and their site features should be designed for accessibility in compliance with the

Platform surface graphics help users identify bike and wheelchair boarding areas; Edmonds, WA.

ADA. Since platforms are generally raised with curb heights from 10 to 15 in (25.4 to 38.1 cm) (height varies depending on the vehicle used), an accessible ramp must be provided from the level of the crosswalk or sidewalk to the raised platform height. Generally, it is preferable to provide these ramps at less than 5 percent grade, but if steeper slopes are required, the design is to be treated as a ramp with landings and handrails meeting ADA Standards and PROWAG. Refer to Exhibit 6.15.

BUS STOPS

The level of improvements at bus stops tends to vary. In urban and suburban areas, it is common for a shelter, bench, and trash receptacle to be provided, along with the bus sign and passenger waiting/loading area. Some stops may even include landscaping and public art features.
In rural areas, bus stops may be as simple as a sign, designated space at the curb, or a widened shoulder for the bus to stop.

The best practice at all bus stops (whether urban, suburban, or rural), is to provide a design that maximizes pedestrian convenience, safety, and security, as well as one that will attract pedestrian use over time. See previous guidance in this section for more information about design of transit waiting areas and refer to local guidelines. For example the City and County of Honolulu Department of Transportation Services provides Bus Stop Improvement and Design Guidelines. These guidelines include minimum standards for applying passenger amenities to bus stops based on location, wait times, and extent of use. Exhibits 6.11 through 6.13 illustrate bus stop design recommendations. Exhibit 6.15 illustrates preferred best practices for rural area bus stops. Refer to Exhibit 6.14 for the HDOT design standard for a bus bay.

Since this sidewalk to platform ramp exceeds 5 percent, handrails are required to comply with ADA Standards; Eugene, OR.

Bus stops provide designated space for loading and unloading passengers. A bus bay length that accommodates one bus is normally from 40 to 80 ft in length, and may be longer in business districts with high levels of use. Bus stops and loading zones accommodating multiple buses can be much longer. The Maui County Bus Stop Planning and Design Services report recommends a minimum curbside clearance of 40 ft along the length of the bus stop. (See Exhibit 6.11.)

Bus stops can be designed to accommodate buses stopping in-lane to pick up passengers or buses moving out of lane into a pull out area.

Transit agencies in urban areas throughout the United States are trending away from constructing pull out areas because of their impact to service efficiency.

EXHIBIT 6.11 *Bus Shelter Placement*

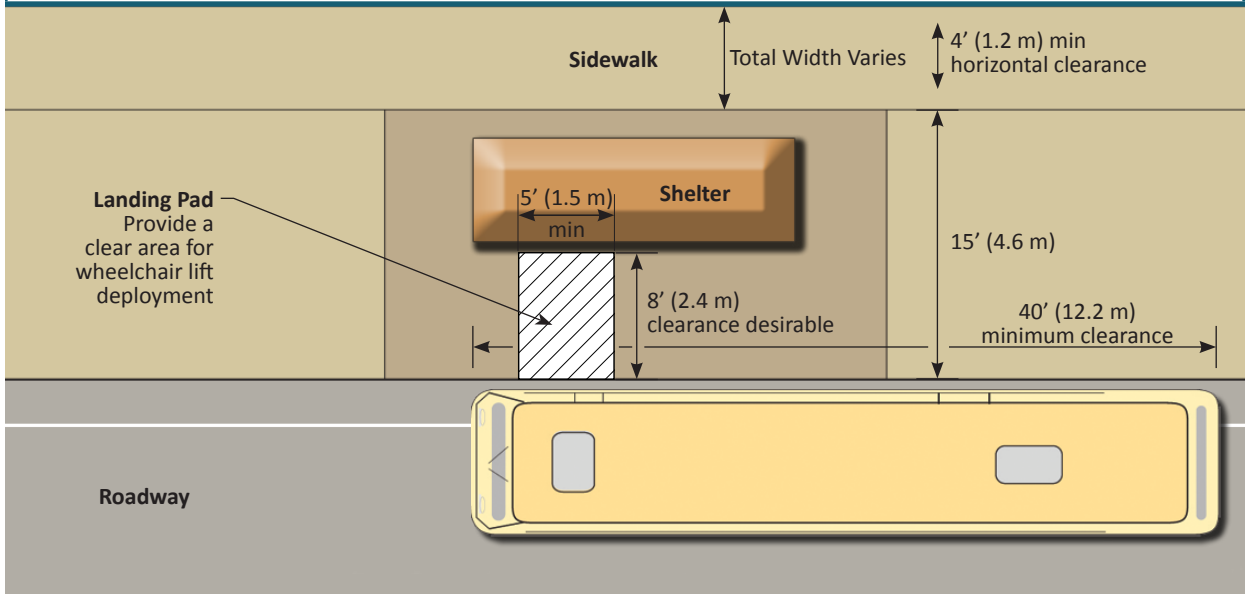


EXHIBIT 6.12 *Bus Shelter Placement on Narrow Sidewalks*

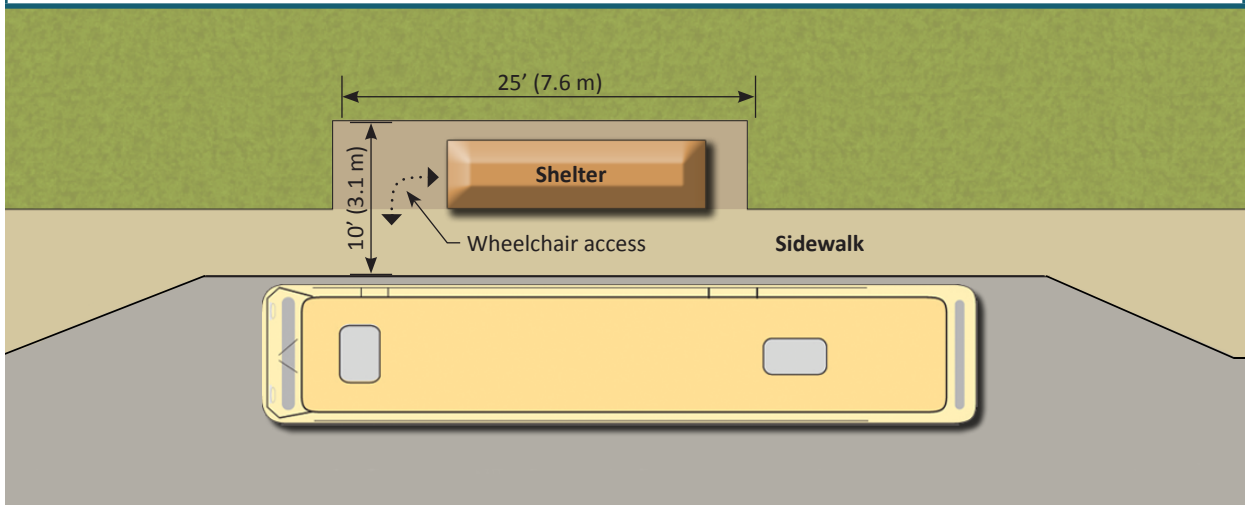


EXHIBIT 6.13 *Bus Shelter Amenities*

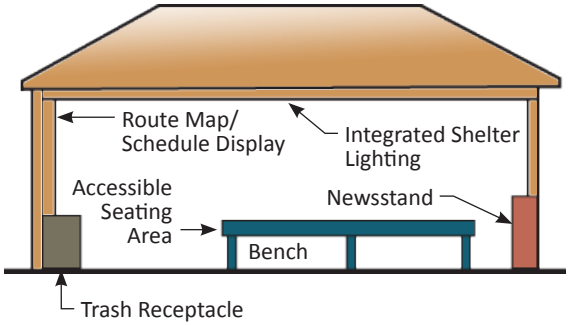
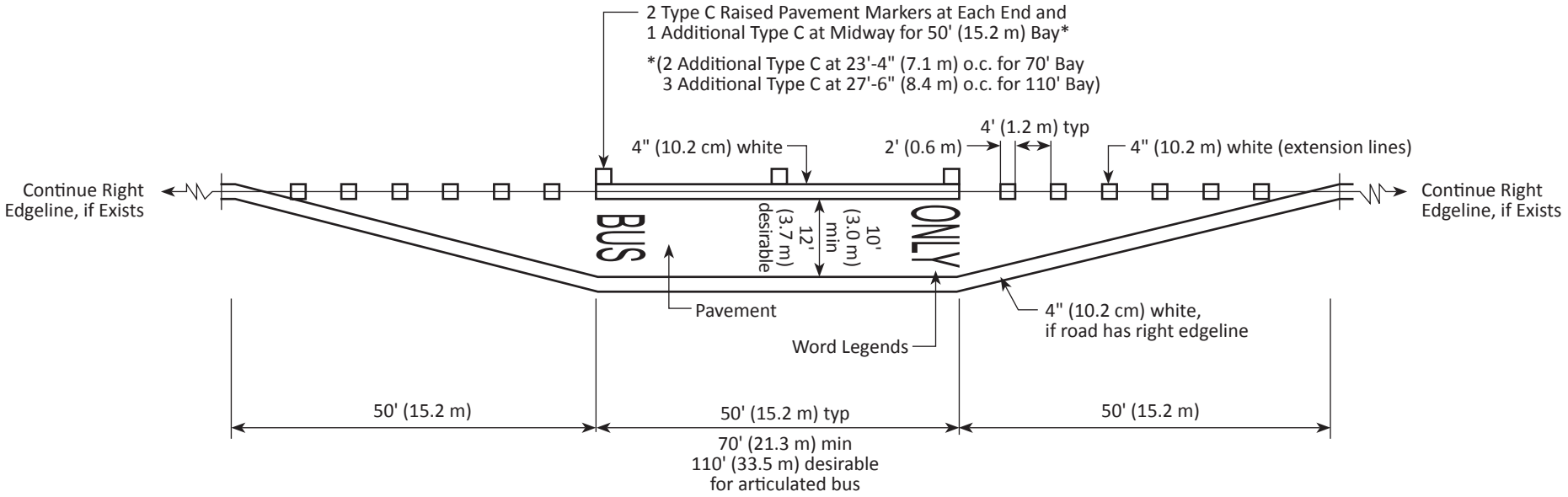


EXHIBIT 6.14 HDOT Bus Bay - Standard Plan TE-28A (7/11/08)



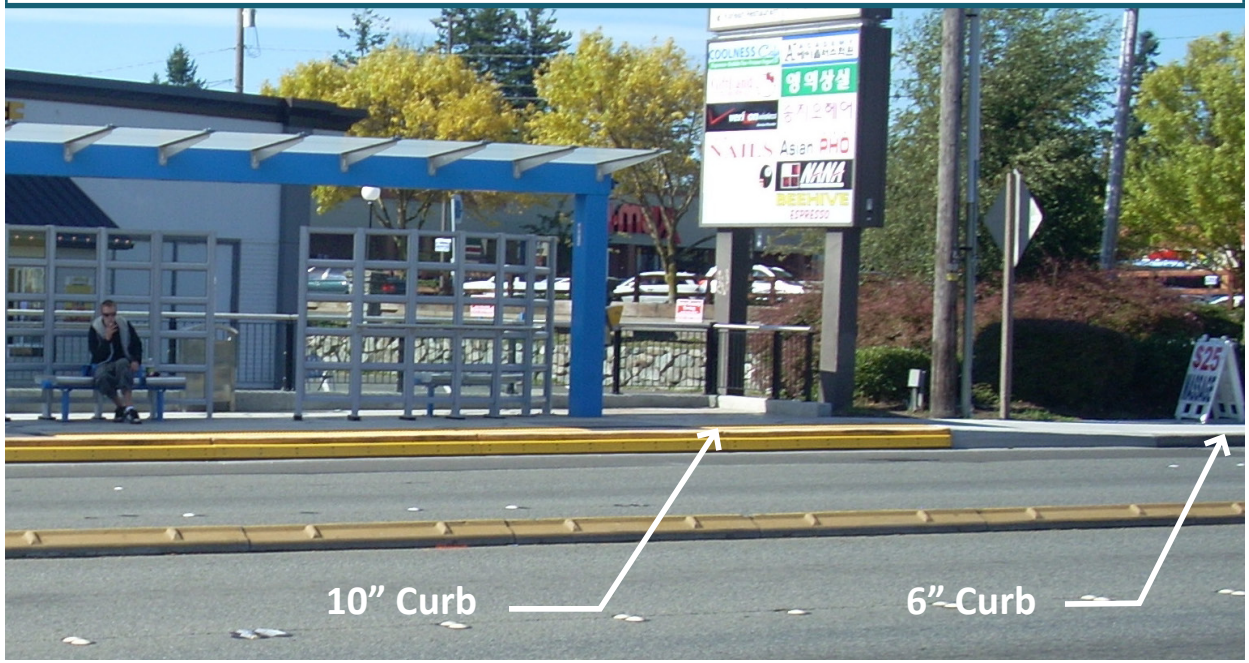
The boarding and exiting of bus passengers should not conflict with pedestrian and bicycle movement. Curb bulb-outs at the intersection can help reduce conflicts with pedestrians, bicycles, and vehicles. Actions that cause frequent delays to other vehicles should be avoided, and where road space is limited, a narrower curb bulb should be considered. Pull outs should be designed to meet roadway conditions and bus characteristics, and allow buses to pull up directly adjacent to the curb.

Additional guidance specific to pedestrian waiting areas adjacent to transit stops and bus pull out areas is provided below. Some of this guidance reinforces points previously made regarding overall design of pedestrian access to transit facilities, but is specific to bus stop areas.

- Along the paved area adjacent to the bus stop, provide a minimum four-foot-wide clearance zone measured perpendicular to the curb, so that opening bus doors are not blocked by street furnishings, sign posts, landscaping, or other obstructions.
- Provide ADA compliant sidewalks (pedestrian access routes) leading to and from the bus stop as part of complete street improvements (see Toolbox Sections 2, 3 and 4 for more information).
- Provide open sight lines and avoid placing shelters, furnishings, and vegetation that may obstruct driver and waiting passenger views.

- Shelters should be well-lit and constructed of materials that do not obstruct views out of or into the shelter.
- Transit stops should include sheltered, visible, and comfortable seating areas and waiting spaces set back from the walkway. Where there is no room to provide a seating area, a leaning rail could be provided. Protection from rain, sun and wind are important considerations.
- Adequate drainage facilities should be provided at all transit stops. Poor drainage can result in water 'ponding' on the walkway around the passenger waiting or boarding area, creating an undesirable environment and safety hazard.
- Transit riders need to be able to cross the road safely at transit stops. On a typical two-way street, with residences and development on both sides, half the riders will need to cross the road when boarding or exiting the bus. Mid-block crossing facilities should be provided at mid-block bus stop locations. See Toolbox Section 5—Intersections and Crossings for additional information.
- Curb heights should never be higher than the height of the bus step to prevent falls during passenger boarding and departing. Older buses tend to have a bottom step that is 14 in (35.5 cm) to 18 in (45.7 cm) above the roadway. Newer buses can have bottom steps as low as 11 in (27.9 cm) above the roadway. The City and County of Honolulu standard curb height is 5 in (12.7 cm) minimum. Avoid locating bus stops where there are curbs of varying heights.
- At locations with curbside parking, extending a portion of the sidewalk out to the travel lane allows most of the curbside parking to remain, while providing a connection between the travel lane and the sidewalk, so waiting passengers can easily access the bus. Bulbs maximize the amount of on-street parking around bus stops while minimizing needed curb clearance.

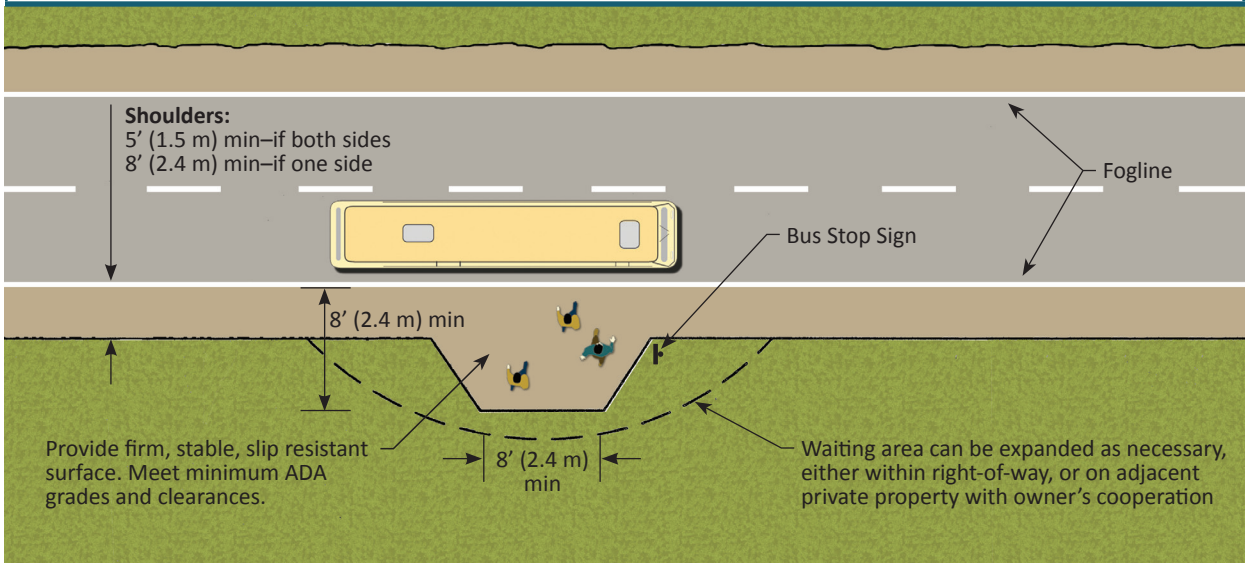
EXHIBIT 6.15 Sidewalk Ramping from a 6 in (15.2 cm) Curb Height to a 10 in (25.4 cm) Platform Height



Louvered panels provide shade at this Phoenix light rail station.

- Bus stop design should avoid conflicts with through pedestrian travel along the route. Sufficient space should be provided adjacent to stops/shelters so that through-traveling pedestrians can easily pass passengers waiting to board. American Association of State Highway and Transportation Officials (AASHTO) guideline recommendations for designing bus stops adjacent to bike lanes include:
  - Bicyclists require a minimum operating space of 4 feet. Where motor vehicle traffic volumes and the mix of bus and truck traffic increase, a more comfortable operating space of 5 feet or more is desirable.
  - Bicycle parking should be provided at all transit stations and bus stops.
- When there is a planting strip directly adjacent to the curb, extend the paving/sidewalk slab in this area adjacent to the transit stop from the existing sidewalk to the curb so that passengers do not have to cross wet grass or mud during inclement weather.
- Strategically locate bus stops to minimize crosswalk movements of transferring passengers where transfer movements between bus routes are heavy. For heavy transfer movements, locate bus stops on the same corner of an intersection so users are not required to cross the street.
- On streets with parallel parking, users of near-side bus stops can benefit from elongated curb bulb-outs/extensions that provide passengers adequate area to board or exit the bus without having to step into the street or the stream of pedestrian travel on the adjacent sidewalk.

EXHIBIT 6.16 Rural Bus Stop Preferred Best Practices



Remember to provide a space for wheelchairs in the passenger waiting area of all transit stops. If a shelter is provided, the wheelchair space should be within the covered area.

Other Resources

The following resources of information are recommended to guide planning and design that enhances pedestrian access to transit.

- American Association of State Highway and Transportation Officials (AASHTO). *Guide for the Planning, Design and Operation of Pedestrian Facilities.* 2004.
- American Planning Association, Wiley & Sons, Inc. publishers. *Planning and Urban Design Standards.* 2006.
- Center for Livable Communities. *Building Livable Communities: A Policymaker's Guide to Transit-Oriented Development.*
- Central Phoenix/East Valley Light Rail Transit Project, Valley Connections. *Urban Design Guidelines.*
- City and County of Honolulu, Department of Transportation Services, *Bus Stop Improvement and Design Guidelines.*
- Federal Highway Administration. *Manual on Uniform Traffic Control Devices.* 2009.
- Hawaii Disability and Communication Access Board. *Honolulu Rail Transit Station Facility Access Information.*
- Livable Communities Initiative. *Planning, Developing, and Implementing Community Sensitive Transit.*
- Maui County/Maui Bus. *Maui County Bus Stop Planning and Design Services.*
- Municipality of Metropolitan Seattle. *Metro Transportation Facility Design Guidelines.*
- Orange County Transportation Authority Transit Programs Department. *Using GIS for Transit Pedestrian Access Analysis.*
- Project for Public Spaces, Inc. *The Role of Transit in Creating Livable Metropolitan Communities.*
- Puget Sound Regional Council. *Creating Transit Station Communities–A Transit-Oriented Development Workbook.*
- Replogle, M. and Parcells, H. *Linking Bicycle/Pedestrian Facilities with Transit.*
- Rubenstein, Harvey M. *Pedestrian Malls, Streetscapes, and Urban Spaces.*
- SE Wisconsin Regional Light Rail Transit Study. *How to Promote and Enhance Urban Development Around Light Rail Transit Stations.*
- Tri-Met, Tri-County Metropolitan Transportation District of Oregon. *Bus Stop Placement and Design and Planning and Design for Transit.*
- United States Access Board. *Proposed Accessibility Guidelines for Pedestrian Facilities in the Public Right-of-Way.* 2011. Website: ***http://www.access-board.gov/*** (May 2013).
- United States Access Board. *ADA Accessibility Guidelines for Buildings and Facilities (ADAAG).* (Reference for applicable requirements to school site design) Website: ***http://www.access-board.gov/adaag/html/adaag.htm*** (May 2013).
- Untermann, Richard K. *Accommodating the Pedestrian, Adapting Towns and Neighborhoods for Walking and Bicycling.*
- Wilbur Smith Associates. Non-Motorized Access to Transit, Final Report and Technical Appendices.

The Waikiki Trolley