PART Transit Amenity Guidelines

"Transportation is not an end in and of itself, but a means to providing access to opportunity."
Source: LivingCities.org

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POLICY

Installation of transit amenities shall be primarily based on the number of passenger boarding's at bus stops and Park & Ride Lots along the route. These amenities include but are not limited to the following: seating, benches, shelters, canopies, informational signs, maps and schedules, digital and electronic signs, escalators and waste receptacles. Additional requirements for placement include safety, proper zoning approval if necessary and meeting all applicable building and construction laws. Requests for transit amenities can be submitted through our customer service department using a transportation request form. Each request shouldl be reviewed on a monthly basis.

PURPOSE

A good bus shelter is an essential part of any successful public transit system. What constitutes "good," however, depends upon your point of view. From the perspective of the transit agency that is responsible for its management, a good shelter is one that has low maintenance requirements and is vandal-resistant. From the customer's point of view, an ideal shelter is one that allows visibility and easy access to the bus, is comfortable and convenient, provides clear information, and is safe.

Both viewpoints are equally important to consider because an unused shelter is a waste of money and an unnecessary maintenance burden. A well-designed, comfortable shelter can make waiting for a bus a pleasant — and even interesting — experience! Unfortunately, many poorly designed shelters exist.

To decide what type of shelter to use in a particular area requires an analysis of existing and anticipated conditions, as well as some knowledge of the characteristics of good shelter location and design. Information about each factor is included below.

- Is a bus shelter needed?
- Where should it be located?
- How should it be designed?
- How should it be maintained and managed?
- Are there funding options?

WHY ARE SHELTERS AND OTHER AMENITIES NEEDED?

There are some general guidelines that should be followed in deciding whether or not a bus shelter is needed. Situations where a shelter is required include the following: transfer points from one route or system to another; areas with frequent service and high levels of ridership; areas where safety is a concern; and neighborhoods with a higher percentage of older adults or persons with disabilities. If a shelter is no warranted then consideration should be given to a simple concrete pad with lighting a possibly a bench.

WHERE SHOULD BUS STOPS BE LOCATED?

The Basics

Identifying beneficial locations for bus stops and shelters can be challenging. Shelters add permanence to the stop location, yet necessary route and stop adjustments will necessitate the occasional relocation of a shelter. Route operational characteristics and the amenities surrounding a bus stop should be considered when installing shelters. One could assume that riders will arrive at a bus stop sooner and wait longer on routes with a low frequency. The time spent waiting for a bus is much more comfortable if a bench and protection from the weather is provided. Shelters can also help ease and reduce boarding times. The type of roadway a route is traveling can also determine the type of stop. A bus bay or pull-out will be necessary on roadways with high traffic volumes and in urban areas at stops with high boarding rates where traffic can be impeded.

Factors related to amenities surrounding a bus stop include the amount of bags or carry-ons customers at a stop location may be carrying (airports, trains stations, grocery and retail stores); if a specific demographic (older adults, person with disabilities) is being served by the stop; or whether the stop is a transfer point where a wait is often required. Therefore beneficial locations for bus shelters are near retail stores and personal services; hospitals and medical offices; universities and colleges; employment centers; and entertainment and sport venues.

One final factor to consider is respect and civility towards transit users. Bus shelters represent safety, security, courtesy, cleanliness. Whether one relies on public transit or chooses to ride, one appreciates and deserves the same level of amenities as other modes are afforded.

PART's system consists of commuter express routes, shuttles and circulators. The commuter express routes collect riders at park-n-ride lots in rural and urban settings. The park-n-ride lots have shelters and benches or other amenities. Stops along these routes are restricted due the nature of commuter express service. As a route enters the urban area stops can occur at universities/colleges, hospitals, major employment and activity centers. If the routes does not duplicate its entry, as it leaves the urban area bus stops tend to be located in residential areas.

Bus Stop Spacing

Express Service

PART Express generally operates non-stop between outlying areas and urban centers, typically along interstates and highways. Express bus service should follow the same stop spacing as local bus in the portions of its service area where it picks up and drops off passengers, running non-stop between the two service areas at either end of the route. Intermediate stops should be provided in limited instances where the route passes by major activity generators, transit hubs such as Metro and Light Rail stops, or park and ride lots.

Shuttles

A service designed to provide the first and last mile from a transit centers or special location, begins and ends at the same point, covers a specific geography area and provides the first or last mile. Pickups are typically pre-scheduled.

Origins and destinations include those for express routes and points of interest within the service area or community. The principle route is typically the shortest distance connecting points and can be fixed, deviated or demand response. Since the service is very flexible, and stops are subject to move daily, amenities are typically not located along the route.

Circulators

Circulators are a fixed route or limited deviated service designed to 1) provide the first and last mile to a connecting express or urban fixed route, or 2) to provide coverage to an area or small community service without transit service. Circulator stops are typically located twice as far apart as the recommended spacing for local bus service (with the exception of the Downtown area). Service should stop at major destinations that generate a disproportionately large share of ridership along a corridor. Circulator services should also stop at intersecting routes and nearby rail lines (within 2-3 blocks). Outside Downtown, buses should stop at all locations along a corridor with 200 or more boarding's a day. Maximum stop spacing is appropriate for locations with few major destinations or intersecting transit service.

Table 4 – Bus Stop Spacing Guidelines

Land Use Type	Spacing	Target Average	Notes
Urban Core	1,000 – 1,760 ft (1/3 mi)	1,320 ft (1/4 mi)	Stops should be located at major transfer nodes such as rail stations and urban fixed routes bus terminals.
Urban Areas	1,760 – 2,640 ft (1/3 - 1/2 mi)	2,000 ft	Stops should be located at high ridership locations and major destinations. Closer stop spacing is appropriate at locations with 200+ boarding's per day or high frequency connecting bus service.
Suburban Areas	1,760 – 5,280 ft (1/3 – 1 mi)	2,640 ft (1/2 mi)	
Suburban Activity Centers	1,760 – 5,280 ft (1/3 – 1 mi)	2,640 ft (1/2 mi)	

Exceptions to minimum spacing: The spacing guidelines above assume that the circulator is operating as a premium service on the same alignment as local service. However, where a circulator line is operating on segments without local service in the Suburban service area, the minimum spacing guidelines may be relaxed to match the local service spacing minimum. The maximum distance of 1 mile between stops would not change.

HOW SHOULD IT BE DESIGNED?

Bus shelters should be designed to reflect the community in which they are located. This can be accomplished through the use of local materials and by design details. Often standard shelters can be adapted to reflect the unique characteristics of the area in which they are located or system they are serving.

General Qualities

Within this context there are five general qualities that any well-designed bus shelter should have. These qualities are visibility, accessibility, comfort and convenience, information and future functionality.

Visibility - Riders must be able to see the bus coming. Poorly designed shelters that obstruct views of approaching buses will force people to leave the shelters to watch for oncoming buses.

Accessibility - People must be able to board the bus conveniently. The shelter should not obstruct the process of boarding.

Comfort and Convenience - Shelters should provide a place to sit, protection from weather, and a feeling of safety and security.

Information - People need to know when a bus will arrive and where it will go. This is especially important for people who are unfamiliar with the service, such as novices and tourists.

Functionality - The final design factor is functionally. Is the location a transfer point to another bus, system or mode? Is it located in downtown or along a high traffic volume roadway? Is the bus stop subject to a high volume of boarding's or location related loading delays? Is the bus stop in a corridor planned for different levels of service or modes in the future, for example BTR or streetcars?

Planned service upgrades must be considered when installing bus stop amenities. There are locations that public transit will always serve, such as passenger rail stations, sports venues, colleges and universities. And there are roadway corridors that will always be served due to the nature of the road network and historical development patterns of a community. While the current level of service may not warrant a two bench shelter with a ticket kiosk and detailed system maps, it may in the future. This consideration is worthy of exploration.

Determining the Extend of the Amenities at a Specific Bus Stop

Once a bus stop location is determined, its location, permanency and projected or observed boarding's help determine the specific design and extent of amenities provided.

Factors to Consider

- Is near parking areas and commercial development where shelter is already available?
- Is this permanent stop or experimental?
- Is it a transfer point with another system or mode?
- What is the average number of daily pickups?

Amenities Available

- Sign
- Concrete Pad
- Bench
- Shelter
- Solar Lighting

The specific designs and the factors can be found in the Bus Stop Amenity Packages section.

Specific design criteria for bus shelters

Access to Shelter Area

Once the general bus stop location and design has been determined several additional factors need to be considered. They are:

- Bus shelters near intersections should be set back from the crosswalk approximately 10 feet to avoid conflicts with pedestrian traffic. If a bus stop is on the far side of an intersection, the shelter should be located a minimum of 40 feet from the crosswalk to allow adequate room for the bus to stop.

- A distance of 3 feet should be allowed between the bus shelter and the curb for free movement in boarding and exiting from the bus.

- Bus shelters should have their long side parallel to the sidewalk to minimize interference with pedestrian traffic.

- Exit and entry openings should be oriented so that people are protected from the wind. However, it is important to keep the side of the shelter facing the street open to allow passengers to board or exit the bus easily.

Elements such as information kiosks or vendors that can obstruct the view of oncoming buses should be located "down-stream" from the shelter.

Shelter Design Considerations

The following design guidelines should be used in designing or selecting a bus shelter:

Side Panels

- Side panels should generally not be used on the curbside of the shelter, except on very narrow streets with heavy traffic. If side panels are used on the curbside, an opening at least 3 feet wide needs to be provided to allow people access to the buses.
- Side panels should be mounted 3 inches off the ground so that debris will not collect inside the shelter. If more than 3 inches off the ground, they will not keep out drafts.
- Side panels should be made of clear glass, as noted below.

Roof

- A pitched roof should be used to prevent the collection of rain, snow and debris.

Seating and Leaning Rails

- The amount of seating should be based on both the number of people who will use the shelter and the amount of time people will spend waiting. Where people wait for a long time, or where the shelter is used by the elderly or infirm, more seating is generally needed than in areas where the bus comes more frequently.
- Leaning rails should be provided whenever possible. A wood rail at 3 feet 6 inches above the ground is best.

Lighting

- Lights should be housed in a protective casing to reduce vandalism. Lighting should be directed so that it illuminates the waiting and boarding areas. Solar powered lighting should be considered in remote areas when electrical service may be difficult or expensive to bring to the site, when the meter may be obtrusive and as a way to save on operational costs. Adequate lighting may be accomplished by backlit advertising panels at an intensity of 20 lumens per square foot.

Signage

- Schedule, route information, and a system(s) map should be located in or next to bus shelters but not so that the view of the oncoming bus is blocked.

Size

- The size of a bus shelter depends on the climate as well as the number of riders who are expected to use it. Manual or automated boarding counts can be used to determine a bus stops loading rate.
- Where there are large fluctuations between peak and off-peak use, a bus shelter can be designed with leaning rails, overhangs, and seating areas outside of the shelter to accommodate the differences.

MAINTENANCE & MANAGEMENT

To be durable, bus shelters should be composed of structural members and inset panels, not snap-together "curtain walls" or decorative sections that are easily vandalized. In general, a steel structure is best. Wood is not as durable and concrete tends to be monolithic in appearance and tends to discolor and soil easily. For flexibility, installation should be by means of bolted attachment rather than by casting in place.

There should be few movable parts, as they are easily broken. Parts should be easy to reorder and replace and should not require removal of other parts or sections for access to make a repair. Materials should be vandal, graffiti, weather, salt, and rust resistant, and easy to clean. A protective finish can be applied to steel in cases where salt damage is likely to be severe if unprotected. Herculite glass side panels resist scratching, are strong, shatter-resistant, and easy to clean. Plastic or Plexiglas is not recommended as it tends to discolor and scratch easily, reducing visibility from the shelter. The manufacturer of the bus shelter should be consulted as to the best combination of materials and finishes for a particular geographic area.

In addition to these specific issues, it is also important to consider the bus shelter within the context of the overall transit system. Cooperation is necessary, therefore, between the community, the transit provider, and any other parties or shelter sponsors involved in the maintenance and management of the shelter. This requires a commitment by the responsible party (transit provider or municipality) to a high level of maintenance and management. There is considerable research that shows that a well-maintained bus shelter will be better respected and less subject to vandalism and other abuses than one that is poorly maintained. A good maintenance program is also contingent upon a bus shelter that is designed to minimize the amount of litter collection, cleaning, and minor repairs needed, as previously described. A good maintenance program should include a program for monitoring the use of bus shelters once they are installed.

The above information on the Purpose, Location, Design, Guidelines and Maintenance and Management of bus shelters was adapted from Public Space Amenities: A Guide to their Design and Management of in Downtowns, Neighborhood Commercial Districts, and Parks, published by Project for Public Spaces.

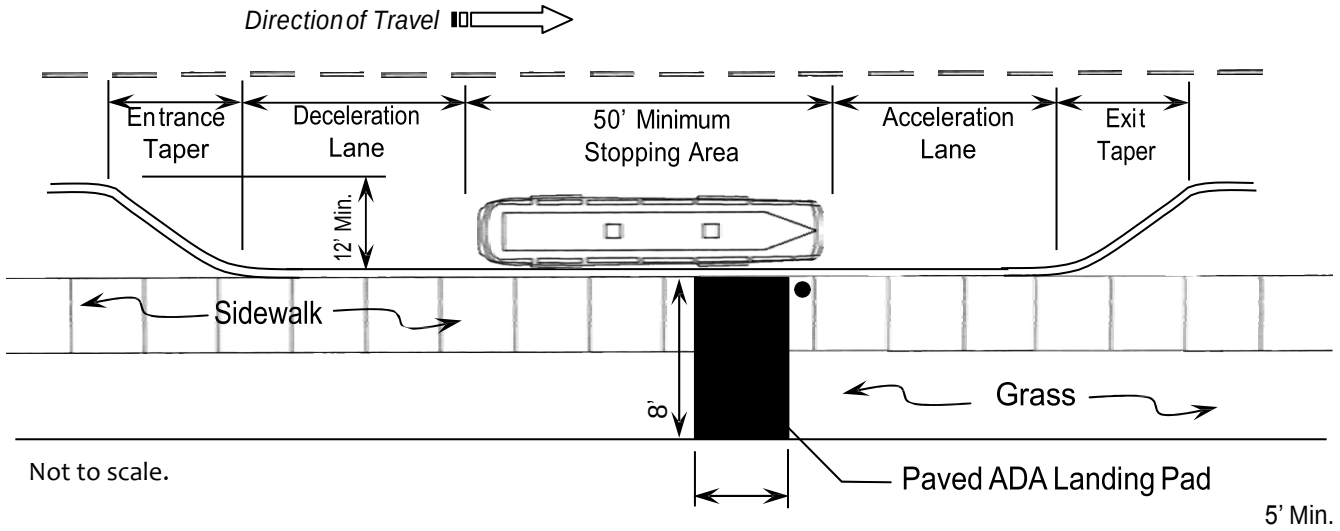
ROADWAY CHARACTERISTICS

The roadway type and anticipated transit service play a role in the location and design of a bus stop and the shelter. The following elements need to be considered:

- Safety
- Comfort
- Capacity
- Security
- Visibility

Bus Bay

The type of stop depicted in the diagram below is called a bus bay, turn-out, or berth. It is constructed as an inset into the curb, typically with tapered ends for acceleration and deceleration. This type of stopping area should be designated and enforced as "no parking" and be visually reinforced with a concrete pad. This type of structure requires enough right-of-way so that sidewalk capacity would not be adversely affected.



Acceleration and Deceleration Dimensions			
Through Speed (mph)	**Acceleration Lane Length (feet)**	**Deceleration Lane Length (feet)**	**Entrance and Exit Taper Length (feet)**
35	250	184	170
40	400	265	190
45	700	360	210
50	975	470	230
55	1400	595	250
60	1900	735	270

Source: TCRP-19: *Guidelines for the Location and Design of Bus Stops.*
Note: Stopping area length is 50′ for each standard 40′ bus and 70′ for each 60′ articulated bus.

Bus bays allow buses to pick up and discharge passengers outside of the travel lanes. As a result, this allows traffic to flow unobstructed while the bus is stopped. Additionally, bus bays increase safety for passengers by increasing the distance between them and traffic. It also lessens the chances of a vehicle rear ending a stopped bus. The diagram illustrates a typical bus bay that will accommodate one 40' bus and the appropriate acceleration and deceleration lanes.

In PART's current system bus bay's would only be considered on facilities with speed limits greater than 40 miles per hour. Coordination and cooperation would be request with NCDOT or a local DOT. The design could also be used when a transit corridor was part of a complete street retrofit.

Location Factors

Based on TCRP 19, the following locations should be considered for bus bays:

- Traffic speeds exceeds 40 mph
- Average peak-period dwell time exceeds 30 seconds per bus
- Buses are expected to layover
- History of vehicles colliding into back of bus
- Multiple buses serve the stop at the same time

Transit Mode Type

The type of transit technology can greatly impact the extent of an amenities package. Fixed guideway modes like passenger rail and Bus Rapid Transit (BRT) require "stations" with platforms, ticket kiosk and a larger capacity. PART's current system does not include a fixed guideway mode. The Piedmont Triad Regional Transit Development Plan and Fixed Guideway Study does include commuter and BRT as potential modes but they are not funded. However should a development or complete street project occur in the fixed guideway corridor PART should investigate the possibilities of installing enhanced stop amenities to establish a presence in the corridor.

Types	# of Lanes	Desired Operating Speed	Median	Driveway Access	Curb Parking	Transit Service Emphasis	Fixed Guideway Facilities*	Pedestrian Facilities	Bicycle Facilities	Freight Movement
Freeway	4 to 6+	45 to 75	Required	No	No	EIB	BRT, PR, LR	No	No	Interstate and Regional Truck Route
Parkway	4 to 6	45 to 55	Required	No	No	EIB	BRT, PR, LR	Optional Separated Pathway	Optional Separated Pathway	Regional Truck Route
Boulevard	4 to 6	35 to 45	Required	Limited	Optional	EIB, ELB	BRT, PR, LR	Sidewalk	Bike Lanes or Parallel Route	Regional Truck Route
Avenue	2 to 4	25 to 35	Optional	Yes	Yes	EIB, ELB, LB, SC, C	SC	Sidewalk	Bike Lanes or Shared	Local Truck Route
Street "urban core"	2	25	No	Yes	Yes	EIB, ELB, LB, SC, C	SC	Sidewalk	Bike Lanes or Shared	Local Deliveries Only
Rural Road	2	35 to 55	No	Yes	No	EIB, LB	PR	No	Shared or Shoulder	Local Truck Route
Local Street (Subdivision)	2	25	No	Yes	Yes	LB	N/A	Sidewalk	Shared	Local Deliveries Only
Alley / Rear Lane	1 to 2	5 to 10	No	Yes	No	None	N/A	Shared	Shared	Local Deliveries Only (garbage pick-up and utilities maintenance)

Type of Transit Key			
Express Intercity Bus	EIB	Passenger Rail	PR
Express Local Bus	ELB	Paratransit/Community Transportation	PT
Local Bus	LB	Circulator	C
Street Car	SC	Bus Rapid Transit (BRT)	BRT
Light Rail	LR	Service in Corridor, No Stops	

BUS STOP AMENITY PACKAGES

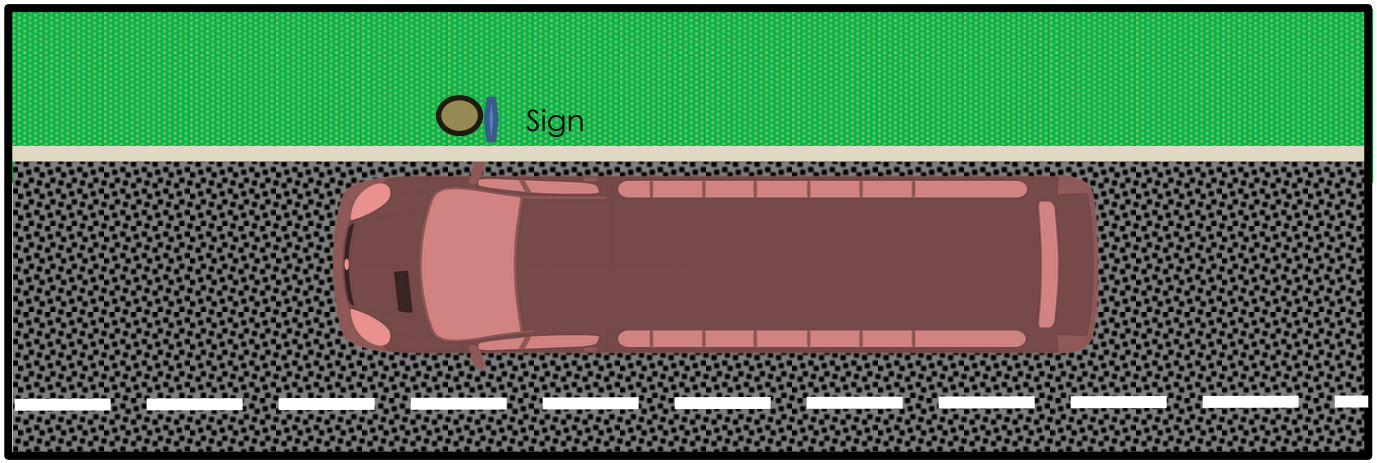
The table below is a descriptive detail of each Bus Stop Amenity Package. It identifies individual elements of each package, the quality needed and an estimated cost.

			Design #1		Design #2		Design #3		Design #4		Design #5	
Signage		Unit Cost	Qt.	Total	Qt.	Total	Qt.	Total	Qt.	Total	Qt.	Total
	Bus Stop	$ 39	1	39	1	39	1	39	1	39	1	39
	Stop ID	$ 21	1	21	1	21	1	21	1	21	1	21
	Pole	$ 60	1	60	1	60	1	60	1	60	1	60
Concrete Pad												
	16' x 8'	$ 1,000	0	0	1	1000	1	1000	1	1000	0	0
	32' x 8'	$ 1,900	0	0	0	0	0	0	0	0	1	1900
Lighting												
	Pole	$ 1,100	0	0	0	0	1	1100	0		0	0
	Interior	$ 1,500	0	0	0	0	0		1	1500	1	1500
	Ad Box	$ 3,000	0	0	0	0	0		1	3000	1	3000
Shelter												
	Install (per site)	$ 20		0	0		0		60	1200	100	2000
	Bench	$ 675	0	0	0	0	1	675	1	675	2	1350
	Display	$ 500	0	0	0	0	0		1	500	1	500
	Garbage Can	$ 450	0	0	0	0	1	450	1	450	1	450
	5' by 12'	$ 7,500	0	0	0	0	0		1	7500	0	0
	5' by 20'	$ 13,000	0	0	0	0	0		0	0	1	13000
				$ 120		$ 1,120		$ 3,345		$ 15,945		$ 23,820

Below are schematics of the five Bus Stop Amenity packages. The design may vary depending on the topography. The schematics do not show bus bays or sidewalk extensions.

Design #1

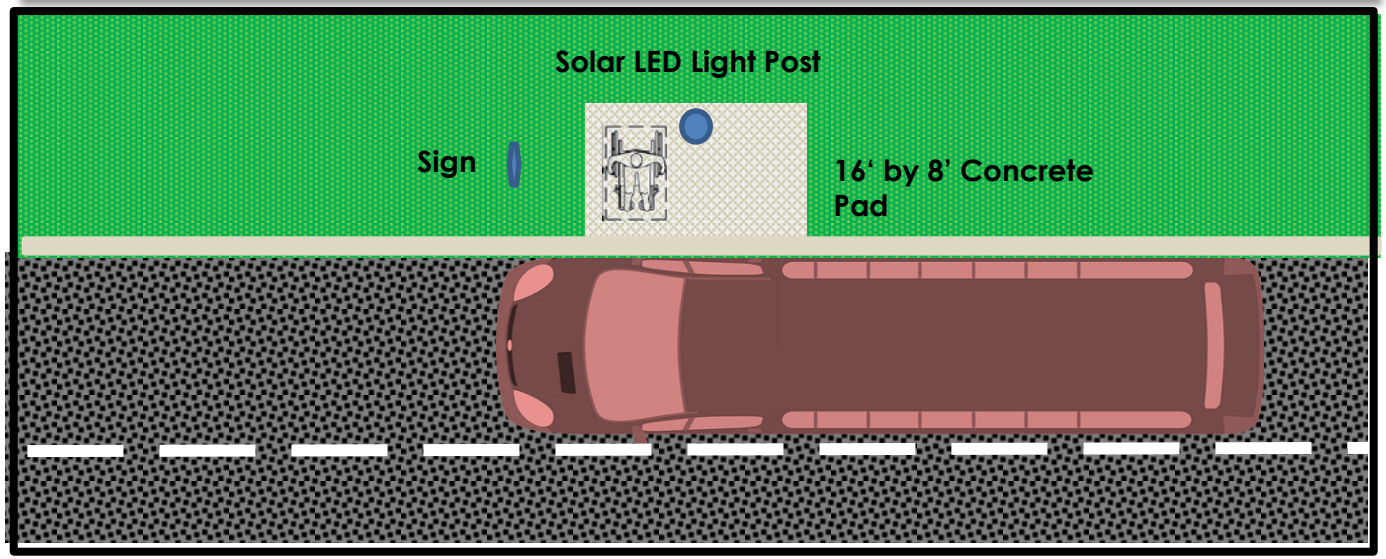
Bus Stop sign on existing pole



Location: Near parking areas and commercial development where shelter is available
Stop Permanency: Low
Average Number of Daily Pickups: 0-5
Average Cost: $100 to $150
Maintenance Cost: Low
Permits and Approvals: None

Design # 2

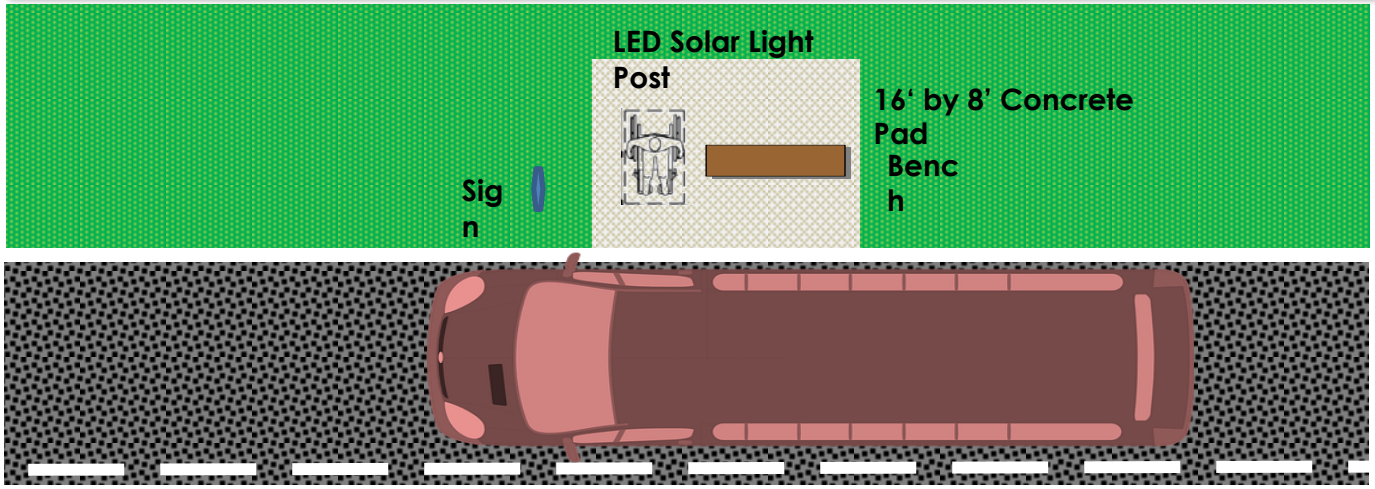
Bus Stop Sign
Boarding and Alighting Pad
Solar Light Post



Location: Near parking areas and commercial development where shelter is available
Stop Permanency: Low to Moderate
Average Number of Daily Pickups: 0-10
Average Cost: $1,000 to $1,500
Maintenance Cost: Low
Permits and Approvals: None

Design #3

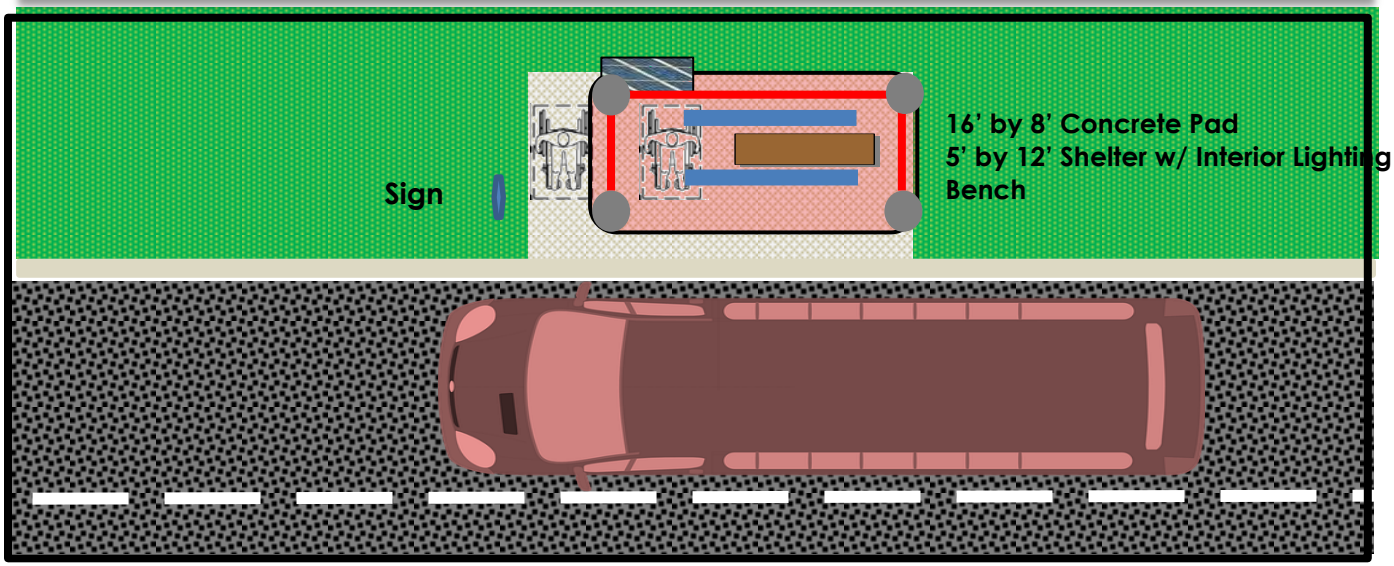
Bus Stop Sign
Boarding and Alighting Pad
Solar Light Post
Bench



Location: Near parking areas, commercial development where shelter is available
Stop permanency: Potential to be moved
Average Number of Daily Pickups: 0-10
Average Cost: $3,000 to $5,000
Maintenance Cost: Low
Permits and Approvals: Varies

Design #4

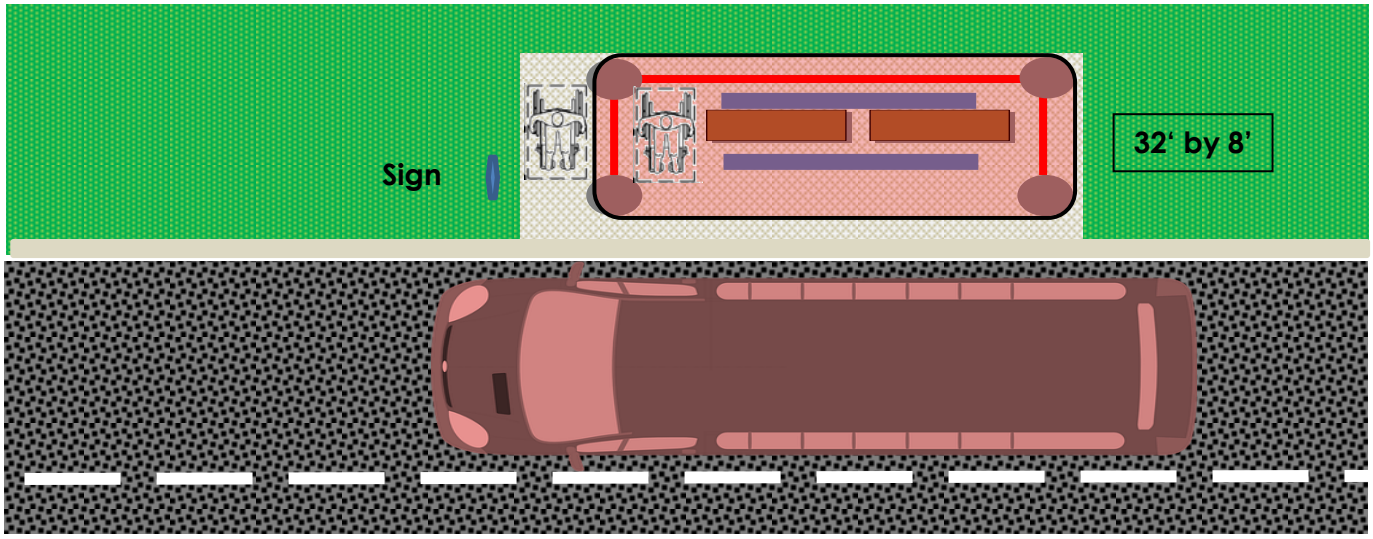
Bus Stop Sign
Boarding and Alighting Pad
Solar Light Post
Covered Shelter with Bench and interior Solar Lighting



Location: Near commercial development and employment areas, transfer point
Stop permanency: High
Average Number of Daily Pickups: > 5
Average Cost: $14,000 to $17,500
Maintenance Cost: Moderate
Permits and Approvals: Required

Design #5

Bus Stop Sign
Boarding and Alighting Pad
Solar Light Post
Covered Shelter with two Benches and interior Solar Lighting



Location: At moderate density residential development, commercial development and employment areas, transfer point
Stop permanency: High
Average Number of Daily Pickups: > 10
Average Cost: $20,000 to $25,000
Maintenance Cost: Moderate
Permits and Approvals: Required