AMENTITIES GUIDELEINES AND POLICIES

For

LAWRENCE TRANSIT

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Bus Stops

Depending on the location, ridership, and adjacent land uses, bus stops can vary in terms of size and included infrastructure elements. The primary factor in assessing what type of infrastructure should be employed at a particular bus stop is the amount of passenger activity that typically occurs there. The potential for bus passenger activity at any particular stop can be influenced by a number of variables, including the population density of the surrounding area, the intensity of the types of nearby land uses, the types of nearby land uses, the accessibility and design of the site, and the condition of the adjacent traffic facilities. In addition, transit service design can impact stop design requirements, such as when the route structure necessitates the transfer of passengers between routes.

A standard bus stop is a stop that has low passenger boarding/alighting volumes. These stops account for the majority of stops and provide system access over a large geographic area. The essential infrastructure necessary for a standard bus stop is a bus stop sign and route designation numbers.

Additional infrastructure improvements may be made to these stops based on special conditions or with community or private sector investments. The following general characteristics describe a standard bus stop:

- Daily boardings of less than 25 passengers per day.
- Consistently spaced with greater distances between stops in less dense areas.
- Orientation, design and minimum stop requirements related to adjacent land uses and passenger activity.
- Orientation to intersection (near-side, far-side, mid-block or terminal.
- Visibility and relationship to roadway type.

The following criteria are evaluated for each bus stop:

- Right-of-way availability
- Pedestrian access
- ADA accessibility
- Safety and security of patrons
- Bus route operational characteristics
- Stop spacing
- Land use
- Customer requests
- Bus operator recommendations
- Routing design and turning requirements

One method for helping make transit more attractive to potential riders is to improve the level of infrastructure available at each bus stop. A stop with seating and a shelter is much more inviting than a stop that consists of only a sign. These additional infrastructure elements also improve the comfort and overall experience of current patrons as well. Depending upon the area type, ridership volume and frequency, the type and function of stop infrastructure may vary. A listing of possible infrastructure elements that could be incorporated at bus stops includes the following:

- Bus stop signs
- Bus stop pads
- Benches
- Shelters
- Information displays
- Lighting
- Landscaping
- Leaning rails
- Trash receptacles
- Bollards
- Bicycle racks

The guideline for determining if an amenity is justified at a bus stop is based on the average number of passenger boardings. The following chart provides a quick overview of the number of daily boardings required for each amenity:

	Daily Boardings				
Feature	<10	10-24	25-50	51-150	>150
Bus Stop Sign	Standard	Standard	Standard	Standard	Standard
Route Designations	Standard	Standard	Standard	Standard	Standard
Benches			Standard	Standard	Standard
Shelter			Standard	Standard	Standard
Information Displays			Standard	Standard	Standard
Trash Receptacle			Standard	Standard	Standard
Bus Stop Pad			Standard	Standard	Standard
Lighting				Standard	Standard
Bicycle Rack				Standard	Standard
Landscaping				Standard	Standard
Leaning Rails				Standard	Standard
Bollards				Standard	Standard

Special consideration should also be given to the types of passengers who frequently use the stop. For example, stops near senior facilities, schools or disability centers may

justify additional amenities. Stops with low levels of service may also justify additional amenities if the stop is isolated.

Bus Stop Signs

Purpose
Bus stop signs are references for bus operators and passengers. Important aspects to be considered in placing transit signs are passenger convenience, public safety, and bus stop visibility. Bus stop signs are an important element in the provision of transit service.

Accessibility Considerations
Whenever possible, bus stop signs should be located on the landing pad in a place where they are visually accessible to passengers. The bus stop sign and poles should be designed in such a way that passengers with visual impairment can distinguish it from other poles in the same area.

Location Factors
Bus stop signs should be posted at all bus stops and bus passenger facilities. Sign and signpost placement should conform to Americans with Disabilities Act (ADA) requirements for height, width, visibility, and other design criteria.

According to the *Manual on Uniform Traffic Control Devices* (MUTCD), a minimum offset of 1 foot from the face of the curb to the nearest edge of the sign may be used in urban areas where the sidewalk width is constrained or where other vertical structures (e.g. utility poles) are located close to the curb. Otherwise, signposts should be located further away from the face of the curb in order to be visible to the bus operator. Additionally, sign panels must be located to provide a minimum sidewalk clearance of 36 inches.

Where possible, bus stop signs should be placed on existing signposts. This will help limit potential path obstructions and minimize clutter.

Design Factors
Bus stop signs must comply with all the applicable requirements set forth in the MUTCD. Bus stop signs should be designed with a uniform size and shape and will coordinate with the agency's identity package. Signs should clearly display information. When possible, easily understood symbols should be used in lieu of written information. Double-sided signs provide visibility from both directions. For nighttime visibility, signs should use retro-reflection. Expanded information, including schedules in a format that is easy to update and system maps with the bus stop location highlighted, can be added along high volume routes. Signposts should break away upon impact. Breakaway mechanisms include slip bases and bases incorporating a component with low impact strength. Signposts placed near intersections should be of an omni-directional design,

meaning that the support is symmetrical and will break safely when struck from any direction. Signposts in the clear zone (a roadside that is traversable and unobstructed by fixed objects to allow vehicles that leave the roadway to recover safely) should also be designed with breakaway mechanisms or else protected by a barrier or crash cushion.

Bus Stop Pads

Purpose

Bus stop pads (including the area that is accessible to wheelchair users and other landing areas) provide a well drained, non-slippery surface with adequate space for amenities and passenger movement on and off buses. Providing a designated bus stop area benefits all transit users. A bus stop pad provides a comfortable waiting, alighting, and boarding area for both front and rear doors and denotes the transit agency's presence.

Accessibility Considerations

Wheelchair and scooter users, as well as elderly and encumbered passengers (such as parents with strollers and shoppers with bags), will have less difficulty boarding and alighting the bus when there is a stable, level, and unobstructed landing pad to operate the wheelchair lift and ramp. Wheelchair and scooter users require more space to turn around in than other transit users and therefore benefit from sufficient area at the bus stop to maneuver.

Location Factors

Bus stop pads should be placed at all bus stops with shelters. At unsheltered bus stops, bus pads are required when installing certain amenities such as benches and bike racks.

Design Factors

The dimensions of bus pads may be adjusted as necessary to accommodate site conditions. The minimum size of bus stop pads, per ADA requirements, shall be 8 feet (perpendicular to roadway) by 5 feet (parallel to roadway). In urban areas, and where right of way permits, the ideal is to provide a continuous 8-foot wide concrete pad along the entire length of the bus stop (40 feet) adjacent to the curb and gutter. An additional 50-foot length is recommended for each additional bus expected to stop at the bus stop. When the available space for a pad is less than 10 feet by 30 feet, the pad should be as large as possible. If a shelter is planned for the location, the pad should follow the shelter profile. The pad should extend 12 inches beyond the area under the shelter canopy in order to prevent soil erosion caused by runoff.

Benches

Purpose
Seating, most often in the form of benches, is a very important component in the provision of amenities at the facility site. Benches may be sheltered or unsheltered.

Accessibility Considerations
Transit users who experience difficulty walking and standing benefit from benches while waiting for the bus. Benches are beneficial at stops without a shelter when headways are longer than 30 minutes. At stops with high ridership, benches may be provided in addition to shelters to accommodate patrons.

Location Factors
Benches may be provided in high ridership locations that have weather protection but no seating and at bus stops located adjacent to properties with features attracting riders to use them for seating (e.g., retaining walls, stairs, low fences). Whenever possible, benches should not be placed in completely exposed locations. If available, trees and landscaping can provide adequate protections from the weather and should be considered when locating the bench. Unsheltered benches may be provided in locations where the regular number of riders does not warrant a shelter or in high use areas that are unsuitable for shelters because of high levels of pedestrian movement in a small area. Benches should allow transit patrons a clear view of approaching buses and allow the bus driver a clear view of waiting passengers. Consideration should also be given to the placement of the bench to eliminate areas where someone could hide, harm, or rob a waiting transit patron. Benches should be placed on non-slip, properly drained concrete pads. Benches may not be placed on medians or on limited access roadways. Benches should be kept clear of passenger loading and unloading areas and placed no closer than 5 feet and no further than 12 feet from the forward end of any bus stop.

Benches should be placed so that streetlights or other objects do not obscure the visibility of waiting passengers or oncoming buses. Bench placement should accommodate passengers' legs and feet without placing them too close to traffic. Proper horizontal clearance to benches should also be provided. In urban areas, the minimum distance from the face of the curb to the bench is 4 feet. A minimum of a three-foot clearance from the bench to the edge of the roadway for passing pedestrians should be maintained.

Design Factors
Benches shall not exceed 74 inches in length, 28 inches in depth and 44 inches in height. Seat dimensions must be consistent with ADA requirements. All benches must be able to support 250 pounds of force applied at any point on the seat, fastener, mounting device, or supporting structure. All benches should be slip-resistant and

designed to shed water. Grab handles should be provided for those with difficulty standing up. Benches should discourage opportunities for sleeping or reclining.

Possible Materials for Use
Bench materials should be weather resistant, discourage vandalism and vagrancy and require little maintenance. Benches should be installed on, and firmly affixed, to a concrete pad.

Shelters

Purpose
Shelters protect waiting passengers from exposure to the environment. The minimal form of a shelter is an overhead canopy beneath which passengers wait for the bus. Optional side enclosures for shelters and the provision of other amenities under or near the shelter enhance the image of the transit service and offer a comfortable and convenient transit trip for patrons. In Lawrence, it is of particular importance to design and implement shelters with the climate in mind.

Accessibility and Safety Considerations
The seating and protection provided by shelters benefit bus patrons with mobility impairments. Additionally, a shelter clearly marks a bus stop, supplies an area to post route and timetable information and provides refuge for waiting passengers, separated from the public way. Shelters should be located in areas with good lighting and visibility to enhance the safety of the stop.

Location Factors
Bus shelters should be considered at any stop with at least 25 boardings a day. Bus shelters should also be provided at stops that are major generators of peak hour transit ridership or are major transfer points between routes. Stops that attract large concentrations of patrons that are young, elderly, or temporarily or permanently disabled – such as universities, recreation centers, senior citizen housing facilities, or hospitals – should be sheltered.

Right of Way Factors
The open side of a shelter should be placed toward oncoming traffic and should be grade separated from the travel lane. Bus shelters shall be located a minimum of 12 feet from an intersection, as measured along the tangent line of the state road beginning at the point of the intersection of the radius of the connecting road and tangent of the state road. Shelters should be located upstream of the bus zone without interfering with passengers boarding and alighting, in order to maximize the visibility for approaching buses, passing traffic and waiting passengers. The location of bus shelters should minimize walking distances for waiting passengers. Shelters should be located at least 5 feet from the front door of the bus along the direction of travel in order to provide adequate circulating space for persons in wheelchairs. Proper horizontal

clearance to shelters should be provided. Shelters shall not be placed on sidewalks where they could obstruct the movement of pedestrians. The sidewalk adjacent to the shelter should be designed so that two wheelchair users can pass traveling in opposite directions. Shelters will not be placed on the wheelchair landing pad area. Shelters should be located at least 15 feet away from a fire hydrant or a parking space for the disabled and at least 7 feet from a utility pole.

Environmental Factors

Shelters should be oriented so that they provide as much protection as possible from sun, wind and rain.

Design Factors

The shelter shall have provisions to accommodate elderly and disabled people in order to meet ADA standards. A shelter that is accessible to people in wheelchairs must have a minimum clear floor area 30 inches wide and 4 feet deep entirely within the perimeter of the shelter. Access entry points should not have less than a 36-inch wide clearance. There should be no steps between the sidewalk or bus pad and the shelter. The size and design of shelters can vary with the number of boarders at a bus stop and with space availability.

Shelters should incorporate seating whenever possible, both to make the service more attractive generally, but especially to serve patrons with mobility impairments. Shelters should include trash receptacles, route maps and schedules. These should be easily readable by people in wheelchairs and those with visual impairments, to the greatest extent possible. Shelters can also be designed to incorporate benches and/or leaning rails.

Shelters should be designed with transparent sides for greater visibility. Alternative material should be considered if panels are frequently damaged or broken. Shelters should allow for unobstructed views into and out of shelter structures. The design of the shelter should not create blind spots or hiding places in order to protect the facility and its patrons from crime.

The shelter should be designed or situated with adequate illumination for security at night. Shelters also should provide a clear opening at their bottoms in order to allow for cleaning and increased security, and a clear minimum area of 12 inches should be provided behind a shelter for maintenance.

Shelters should not be placed in front of store windows of adjacent properties. When a shelter is located in front of a building, a minimum 12-inch space should remain between the building and the shelter to allow for cleaning.

Shelter canopies should take into account sun and rain protection. Shelters should be designed to maximize protection from the environment. Alternative shelter designs may be considered in special situations in order to match surrounding architecture.

Shelters should be designed to require low levels of maintenance. It should be easy to clean the shelters and the concrete landing pad beneath and around the shelters. In order to achieve this, the shelter should be made out of materials that are durable and vandal-resistant.

Information Displays

Purpose
Providing system maps and fare information at bus passenger facilities is both useful to passengers and provides the transit agency an opportunity to educate passengers and potential passengers about transit services.

Location Factors
System maps and information should be provided at all bus stops with high passenger volumes and at stops that serve as transfer points between routes. Fixed maps should be sheltered from inclement weather and should be easily visible to passengers.

Design Factors
System maps highlight routes in order to assist passengers with trip planning. Shelters or stops should be designed to accommodate route or schedule information in a manner that does not reduce visibility or security. Fixed information displays should have a format that is easy to change, so that schedule and route updates can be readily posted. Route maps should be easily understandable to transit passengers. Maps and schedules should adopt uniform graphic standards, sizes and color codes. Where text is necessary, it should be large and easy to read. Real-time information displays may be considered at key bus stops in order to provide up to the minute information on bus arrival times and delays. Solar or wind-powered on-demand illumination is suggested for bus stop information and way finding devices.

Shelter Lighting

Purpose
The purpose of lighting at facilities is to enhance the safety of patrons and to illuminate passenger information and advertising where applicable. Adequate lighting enables the bus driver to see waiting passengers and to approach and depart from bus stops safely.

Location Factors
Bus passenger facilities along routes that offer nighttime or after-dark services should have optimum levels of lighting incorporated in their design. Adequate lighting greatly influences actual safety and passengers' perception of safety, especially at off-street

facilities. If lighting is not incorporated in the stop, special consideration should be given to locate the stop within 30 feet of an overhead light source.

Design Factors
Light fixtures should be visually non-obtrusive so as not to attract the attention of vandals. Light should be concentrated at the shelter or the stop while minimizing overthrow of glare onto the street. Off-site lighting and night sky light pollution can be avoided through proper lighting direction and lamp shielding. For road lighting installations, light near and above the horizon should be minimized to reduce glare and visual intrusion. Specifically designed lighting equipment may be used to minimize this upward spread of light. Illumination should also be achieved to prevent harsh shadows which could pose a security hazard. If pedestrian paths adjacent to transit stops are illuminated, the height of the light fixture should be appropriately scaled.

Possible Materials for Use
The fixtures should be vandal-resistant and durable. Lamp compartment and electrical access areas should be secured with a recessed hex head screw or equal means. If possible, electrical services should be low voltage to reduce the risk of electrical shock. Cutoff luminaries, low–reflectance surfaces and low-angle spotlights can be employed to reduce light pollution.

The use of solar technologies for lighting provides many benefits. At the very least, consideration should be given to employ solar lighting in areas where there is currently no utility service or as a temporary measure until utilities can be established for the shelter or stop.

Landscaping

Purpose
Landscaping at bus stops promotes transit ridership by enhancing its image. Landscaping also contributes to the safety, security, and comfort of passengers, reducing heat islands (thermal gradient differences between developed and undeveloped areas) and minimizing the facility's impact on the microclimate.

Accessibility Considerations
A properly-landscaped bus stop can be an oasis of calm and beauty in a "concrete jungle." Care, however, must be taken to prevent landscaping from obstructing views and thus presenting both accessibility and safety hazards. Trees can provide transit patrons with a low-cost shelter from wind and rain and can, together with other landscaping elements, make a bus stop more inviting, both visually and physically.

Location Factors
Landscaping should be located so that it buffers waiting passengers from traffic and provides them some degree of protection from the weather. Landscaping should not

block the view of patrons from outside the bus stop. Landscaping should be self sufficient.

Design Factors
In order to ease maintenance and ensure longevity, native plants and wild flowers should be used. Exotic plants should never be used. Landscaping should be draught resistant and require little, if any, potable water.

Shade trees should be high branching so that they do not interfere with breezes or sightlines. Trees should be pruned to allow 12 feet of vertical clearance from sidewalks or transit stop pads. Recycled materials like plastic or rubber may be used for sidewalk installed near trees to allow water to seep in between panel seams. They also can be easily relocated when tree roots surface and avoid the maintenance problems associated with concrete.

When river-rock and other masonry materials are used, the material should be grouted or cemented to prevent removal by hand.

Leaning Rails

Purpose
A number of passengers prefer leaning to sitting while waiting at bus stops. Leaning rails also provide a place to shelve objects passengers may carry. Leaning rails at bus stops can be inexpensive to install and are often heavily used by passengers.

Location Factors
Leaning rails can be mounted on shelter walls, be free standing or can be built into the landscape.

Design Factors
Freestanding leaning rails should be between 27 and 42 inches in height. Leaning rails attached to bus shelters should be no more than 27 inches in height.

Trash Receptacles

Purpose
Trash receptacles should be treated as normal parts of most bus passenger facilities. Maintenance of trash receptacles and trash pick-up are important considerations when receptacles are provided.

Accessibility Considerations
Trash receptacles should be placed so as not to interfere with the accessibility of the site or with passage along any adjacent sidewalks. Additionally, trash receptacles should

allow for easy use by those with difficulty manipulating objects with their hands, such as those with arthritis or other disabilities.

Location Factors
Trash receptacles shall not be placed on wheelchair landing pads. Trash receptacles should be placed at least 4 feet back from the face of the curb. Trash receptacles should not impede pedestrian circulation in and around the transit stop.

Design Factors
The receptacles should be anchored to the pavement or landing pad in order to prevent unauthorized movement. They may also be attached to the side of the shelter as a pre-fabricated feature. The receptacles should be placed so that they do not obstruct a driver's vision while turning. If possible, trash receptacles should not be placed in direct sunlight. Direct sunlight exposure may result in odors. If possible, trash receptacle designs should coordinate with benches and other furniture at the bus stop or transfer center in regard to material and finish color. If vandalism is a concern, consideration should be given to use trash receptacles with lockable lids or other anti-vandal features. Trash receptacles could be subject to storing explosive devices. If the bus stop or transfer center is going to be used by a large number of people, the transit agency should consider placing explosive containment trash receptacles in the facility.

Possible Materials for Use
Trash receptacles should be made out of steel with a powdercoat paint finish. Steel receptacles are capable of handling a certain amount of explosives; agencies should ensure that the container itself does not become shrapnel during an explosion.

Bollards

Purpose
Bollards separate pedestrian and vehicular areas in order to protect people, buildings and site elements. They are sometimes illuminated in order to provide path lighting. They are especially important in areas where errant buses may threaten waiting passengers or pedestrians.

Accessibility Considerations
Like other elements, such as trash receptacles, benches and shelters, bollards must not interfere with the accessibility of pedestrian routes, either around or to and from bus stops.

Location Factors
Bollards should be installed at bus parking spaces where errant buses may "jump" the curb and collide with pedestrians, though the chance of such an event occurring at bus stopping locations, i.e., bus stops and gates at transit stations, is generally low. When used to separate pedestrians and vehicles, bollards should be spaced sufficiently close

to clearly define the desired separation of space and to prevent intrusion of automobiles but not so close that passage of wheelchairs is impeded.

Design Factors

Bollards may be pre-manufactured or custom designed in a style that compliments the bus stop architecture and other site furniture. Bollards should be tall enough to discourage vehicle access (standard height of 24 to 48 inches) and spaced far enough apart to allow bicycle, wheelchair, and pedestrian access. Additionally, when placing bollards in pedestrian areas one should give consideration to marking them with contrasting color bands (e.g., white or red on black bollards) or retro-reflective squares or panels. A single bollard should be designed to stop a 36,000-pound vehicle traveling at 4 mph. At bus parking areas, three bollards of concrete-filled, 8-inch diameter, heavy-wall steel pipe should be located ahead of the bus. The pipes should be set vertically in a 6-foot, auger-drilled hole and retained by reinforced concrete. They should be spaced at 5 feet on center in heavily trafficked location to protect pedestrian-only zones.

Possible Materials for Use

Bollards should be solid for durability and stability. They can either be permanently installed by embedding or may be made removable through the introduction of an in-ground sleeve or receiver, in order to provide temporary service and emergency access. Some bollards can be equipped to accommodate chains (e.g., eyebolts). If chain barriers are used in conjunction with bollards, care should be taken to assure that the chain is easily visible and not a hazard.

Bike Racks

Purpose

Transit agencies are increasingly recognizing the needs of the inter-modal bicyclist-passenger. A study by the Center for Urban Transportation Research (CUTR) has found that a significant proportion of transit riders are so-called "bike-on-bus" users. While the overwhelming majority of the buses operating in Lawrence are equipped with bike racks mounted at the front of the bus, less has been done to accommodate bicycles at bus passenger facilities. Some bicycle storage facilities offer more security to bike owners than others. For instance, inverted "U" racks provide more security for bicycles than the traditional "comb" bicycle racks.

Accessibility Considerations

Although bike-on-bus commuters effectively expand the bus transit service area by making a portion of their trip by bike, providing bike commuters better access to buses must be accomplished in a manner that maintains full access for other patrons. Bike racks should not be placed on ADA mandated landing pads. Like other street furniture, bike racks should not be placed so as to obstruct pedestrian traffic either on the sidewalk or to and from the bus stop landing pad.

Location Factors

Many bike-on-bus users only need their bicycle on one end of the transit trip, typically from home to transit stop and vice versa. To address this issue, bike racks can be placed at bus stops along routes where bus-mounted bike racks are at capacity and cannot accommodate more bike passengers without causing those passengers to wait for the next bus. Along routes where bus-mounted bike racks are at capacity, consideration should be given to installing three-bike capacity racks. Bicycle storage areas should be placed in spaces that are physically and visually accessible. Placement along heavily trafficked streets and walkways protects bicycles from theft and vandalism. Bike racks and lockers should never be located in the corner of a parking garage or in other areas with low visibility. Where bus shelter pads are provided, bicycle parking areas should be provided on the upstream side of the pad. Where possible, bicycle racks should be kept underneath a covered area to protect the bikes from exposure to the weather.

Design Factors

Association of Pedestrian and Bicycle Professionals guidelines mention that bike racks should support bikes by their frames at two points (as opposed to supporting them by the wheel as common in comb and toast racks). An inverted "U" is a simple effective design to do this. Bike racks should provide 48-inch aisles, measured from tip to tip of bike tires across the space between racks or between the tip of the tire and an adjacent obstacle. One person should be able to walk one bike through the aisle. Seventy-two inches of depth (6 feet) should be allowed for each row of parked bicycles. Racks should be located no less than 24 inches from walls. Inverted "U" racks should be placed no less than 36 inches apart widthwise. If the bike rack is covered, it should be designed so that explosive devices cannot be hidden in the area.