Government of India
Ministry of Housing
and Urban Affairs

PM Bus Sewa

Guiding Framework for Inclusive and Accessible Bus Shelter Design

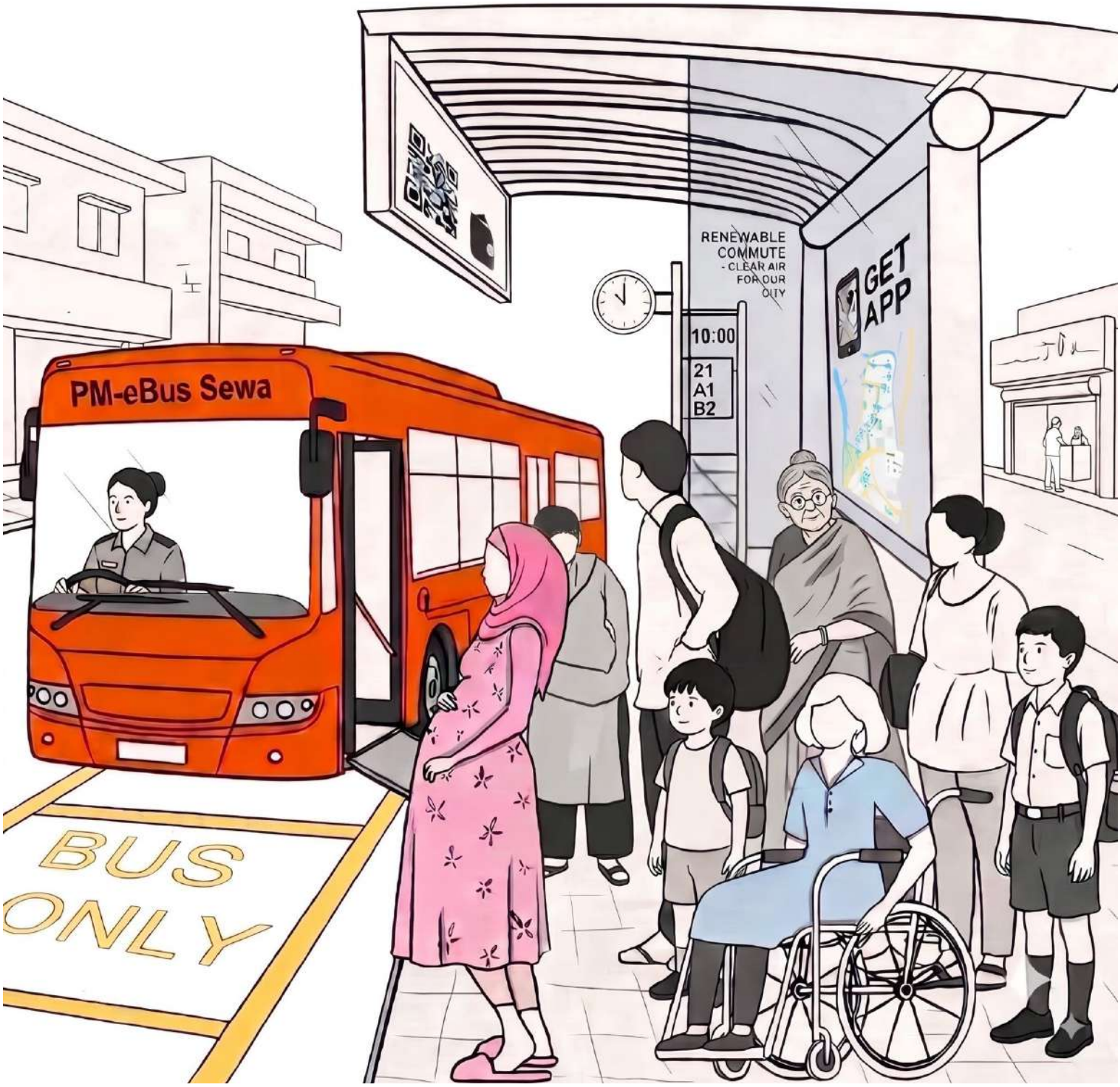


Photo showing PM-eBus on road; Source- Nashik



Guiding Framework for Inclusive and Accessible Bus Shelter Design

PM-eBus Sewa Scheme
October 2026

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Ministry of Housing and Urban Affairs (MoHUA), New Delhi
Government of India

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Photo showing people travelling in the PM-eBus; Source- Indore



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FOREWORD

Cities are growing, and their future depends on how sustainably people move within them. Clean public transport is central to that vision, and so is the dignity, safety and comfort of the passenger who uses it. The PM-eBus Sewa Scheme is supporting cities in transitioning towards cleaner and technology-enabled mobility through electric buses. Complementing this effort, this guiding framework for bus shelter design reflects the Ministry's commitment under PM-eBus Sewa Scheme to making public transport infrastructure inclusive and accessible to all, irrespective of age, gender or ability. The quality and design of such infrastructure play a vital role in shaping the passenger experience and influencing people's perception of public transport. By setting out clear principles and practical design guidance for bus shelters under the PM-eBus Sewa Scheme, this framework will help cities to build bus stops that not only provides passenger comfort but are also inclusive. I am confident that its adoption will make public transport a more attractive and equitable choice for millions of citizens.

Dated: 29th October, 2026

(Satendra Singh)

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Photo showing people boarding the bus; Source- Kolhapur



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Message

PM-eBus Sewa encourages a total-system approach, where deployment of buses, associated infrastructure, and technical handholding are planned together. The success of bus-based public transport also depends upon the availability of adequate bus priority wayside infrastructure that ensures safe, comfortable, accessible, and convenient access to bus services. This Framework will prove to be an important milestone in fulfilment of this need.

It establishes practical design principles for connectivity, accessibility, inclusivity, usability, safety and convenience, translating these priorities into guidance for the planning and development of bus shelters. I encourage State governments, Urban Local Bodies (ULBs) and bus operators to adopt it thoughtfully in their project planning.

Praveer

Shri Praveer Kumar, Joint Secretary (NUDM), MoHUA

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Photo showing PM-eBus on the road; Source- Puducherry



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नई दिल्ली-110011, तारीख 29/10/2026
New Delhi-110011, dated the 29/10/2026



Message

A well-designed bus shelter is the outcome of several small but consequential design decisions. This is a maiden framework for Bus Shelter design under the PM-eBus Sewa and serve as a guidance tool for city officials, Urban Planners, Urban Designer and Engineers, who build bus stops on the ground internalizing accessibility, safety, Inclusivity and functionality.

The framework provides guidance on engineering design parameters for Bus shelter and Bus Zone including aspects like placement of bus shelter with respect to the Right of Way (RoW), intersections, footpath width, and maintain the bus shelter once built. The dimensions provided in the document are indicative, and users of this document are encouraged to apply sound engineering judgement and local knowledge (street level wisdom) for context sensitive design solutions.

An ideal bus stop is one that is not only functional but is also inclusive, safe and accessible to every passenger. The Framework therefore treats accessibility as bedrock of bus shelter design covering design features such as the access ramp, the placement of tactile paving, kerb ramps, handrails, a clear waiting space, and reserved seating. Together these features allow every user including a senior citizen, a person with disability, a pregnant woman or a parent with a child reach the stop, wait in comfort and board with dignity.

The Framework also provides guidance on adequacy of lighting and signage, visible shelter walls that allow "eyes on the street", safe pedestrian crossings, traffic calming near stops, bollards to keep vehicles off footpaths, anti-skid flooring, emergency contact information and clear sightlines for drivers and passengers.

I sincerely acknowledge the dedication, research, and coordination of the project team whose collective efforts made the preparation of this Guiding Framework for Inclusive and Accessible Bus Shelter Design possible. I am also grateful to the cities as well as the states for providing the images featured in this document. Finally, I extend my heartfelt thanks to all the passengers whose daily journeys, experiences, and aspirations inspired this work.

Shri Bhanu Pratap Singh Bhadoria, Director (UT), MoHUA

Photo showing a commuter boarding PM-eBus; Source- Patna



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Photo showing people Boarding the bus; Source- Shillong



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Photo showing PM-eBus arriving at an existing bus shelter; Source- Nagpur



1 Introduction

1.1. PM-eBus Sewa Scheme propagates complete system approach i.e. deployment of buses, creation of associated infrastructure, passenger wayside infrastructure, route planning as well as capacity building support. While the deployment of electric buses (e-buses) forms the core component of the Scheme, the success of bus-based public transport also depends upon the availability of adequate bus priority wayside infrastructure that ensures safe, accessible, and convenient access to bus services. Recognizing the importance of bus priority wayside infrastructure, the Green Urban Mobility Initiatives (GUMI) under the PM-eBus Sewa Scheme, through this document, provides technical support and guidance framework for the development of accessible, inclusive, safe, and climate-responsive bus shelters and bus zones across participating cities.

1.2. Bus stop is an essential passenger wayside infrastructure that provides a designated, safe and organised space for passengers waiting for the buses; reducing conflicts between buses, pedestrians and other road users. When provided with shelters, seating, lighting, signage, route information, connected footpaths, ramps and tactile path, passenger comfort, safety and journey experience is enhanced nudging the use of bus services. Thus, a well-planned bus shelter serves as an important physical, social, and communication interface between the commuter and the public transport system. This system-based approach helps increasing ridership and revenue by providing accessibility to the public bus system and improving end-to-end passenger journey experience.

1.3. This document provides a guiding framework for inclusive and accessible bus shelter design.

1.4. The users of this document should employ these recommendations in conjunction with sound engineering judgement and local context expertise when designing, building, or updating bus shelters/ other bus shelter facilities. Additionally, it is important to note that design solutions need to be adjusted to incorporate local knowledge (street level wisdom) including building by laws, local street policies etc. The dimensions and details provided in the document are indicative. For detailed design specifications, the relevant Indian Roads Congress (IRC) codes may be referred to, while ensuring compliance with minimum safety and accessibility standards as recommended in Harmonised Guidelines and Standards for Universal Accessibility in India,2021, MoHUA.



2 Objectives

i. Handholding the cities to build a sustainable public transport
ii. Enhancing end-to-end journey experience for commuter
iii. Develop bus eco-system with accessible, inclusive and safe bus shelters.
iv. Establishing framework that help cities making decisions across bus shelter planning and designing.

3 Definition of Bus Stop, Bus Shelter and Bus Zone

a) Bus Stop- designated area along the road for boarding and alighting of passengers indicated by an appropriate road marking along with an installed vertical "bus pole" with service information.

b) Bus Shelter/ Bus Queue Shelter- physical structure adjacent to a bus stop to offer passengers, a safe and comfortable shelter from adverse weather conditions while waiting for bus service. Where site constraints do not permit provision of a desirable bus shelter elements, adequate modifications may be made, subject to maintaining pedestrian accessibility and safe boarding/alighting.

c) Bus Zone-encompasses the entire designated area around the bus stop that supports passenger access, bus shelter, boarding, alighting, and bus stop operations area.

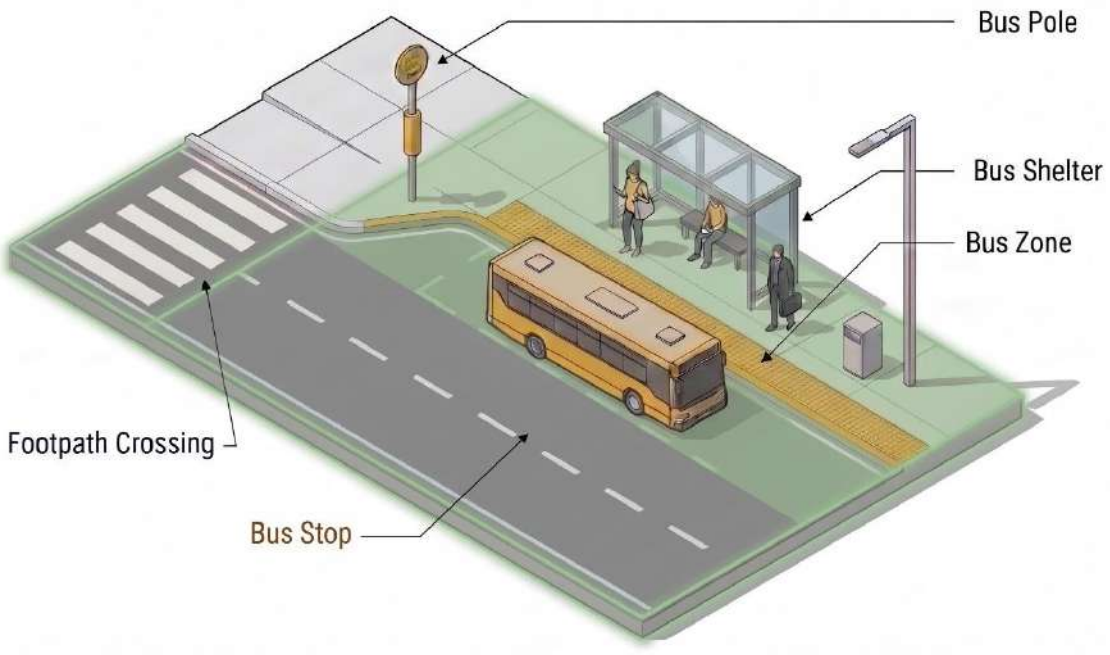


Figure 1: Illustrative diagram showing Bus Stop, Bus Shelter and Bus Zone

4 Design Philosophy for Bus Shelter and Bus Zone

All bus shelters should be designed around the following six core principles. Existing bus shelter may be upgraded to include these core principles.



1 CONNECTIVITY

- **Seamless integration** with pedestrian networks, feeder services and NMT infrastructure;
- **Continuous footpaths and safe crossings** for easy bus access;
- **Proximity to opposite-direction stops** on the same route;
- **Access to major trip generators/attractors and park-and-ride facilities**;

2 ACCESSIBILITY

- **Compliance with Harmonised Guidelines and Standards for universal Accessibility in India 2021** ensuring convenient access for People with Disabilities (PwD), elderly, and pregnant women.
- Barrier free **access to bus shelter** including access / kerb ramps, tactile path, adequate circulation space for wheelchair users, seating, and clear wayfinding features.

3 INCLUSIVITY

- Providing a **safe, and inclusive environment for all users.**
- **Gender-responsive design** through adequate lighting, clear visibility, passive surveillance though transparent panels between footpath, carriageway and bus shelter (eyes on the street), appropriate waiting area and seating arrangements, and provisions that enhance safety and comfort for all.

4 USABILITY

- **Functional, and user-friendly bus shelter** providing adequate seating, and waiting space, bus route(s) and service information and passenger movement thereby ensuring ease of use for all users. enhancing passenger experience.

5 SAFETY

- Bus shelters shall prioritize the **safety and security** of passengers through structurally sound construction, durable materials, adequate illumination, visibility, CCTV surveillance provisions, emergency contact information, fire-resistant materials, anti-skid flooring, and appropriate location planning that minimizes conflicts with vehicular traffic while ensuring clear visibility from the roadway.

6 CONVENIENCE

- Key Passenger amenities like shelter for weather protection, lighting, waste bins, legible signages, and accessible features improving passenger **convenience thereby encouraging public transport usage.**
- Preferred Passenger amenities like passenger information system, mobile charging, Wi-Fi, solar panels, green roofs etc.



5 Bus Stop / Bus Shelter Location

5.1 Identification of Location of Bus Stop/Bus Shelter

a) Bus Stop locations to be identified along the proposed PM-eBus Sewa Routes based on following surveys but not limited to: -

- Reconnaissance Survey: mapping Right of Way (RoW), property access points (driveways), land use, major trip generator/attractor activities, passenger amenities, and utilities along proposed bus routes.
- Road Classification Assessment of available width for carriageway, medians, footpath, bicycle-lane, soft-edge, and utilities.
- Bus Shelter Inventory Survey (where an existing bus stop is being upgraded including bus shelter condition and amenities)
- Pedestrian Network Accessibility Survey along the bus corridor including bus zone (Bus Zone referred in section 3)

b) Placement of bus stop/bus shelter with respect to intersection – far side, near side or midblock to be based on prevailing traffic, geometric conditions, and bus route alignments at each location[1]

- Far Side: Bus Shelter is placed after the intersection in the direction of traffic movement. Preferred where (i) bus routes are merging from various arms of junction, (ii) high traffic corridors with majority left/right turning traffic, (iii) intersections with small waiting time at signal. Far side located bus stops allow pedestrians to cross at the intersection from rear end of the bus.

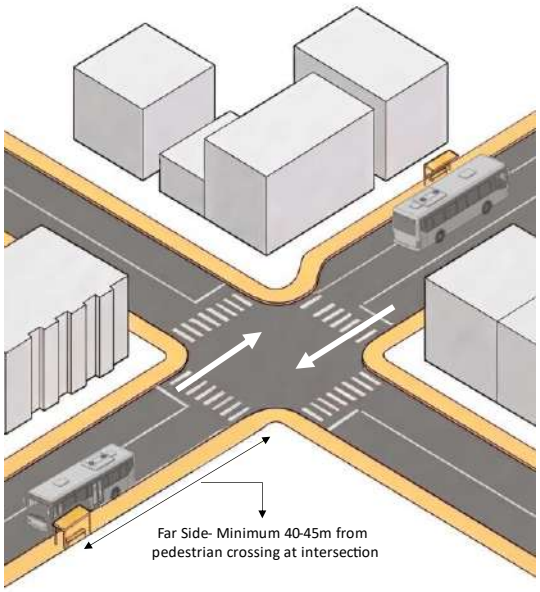


Figure 2: Illustrative diagram showing placement of far side bus shelter

[1] Indian Road Congress (IRC): 70- 2017; Guidelines on regulation and control of mixed traffic in urban areas



- Near Side: Bus Shelter is placed before the intersection in the direction of traffic movement. Preferred where (i) bus routes are expected to diverge into the various arms of non-major traffic intersections, (ii) intersections with longer waiting time at signal.

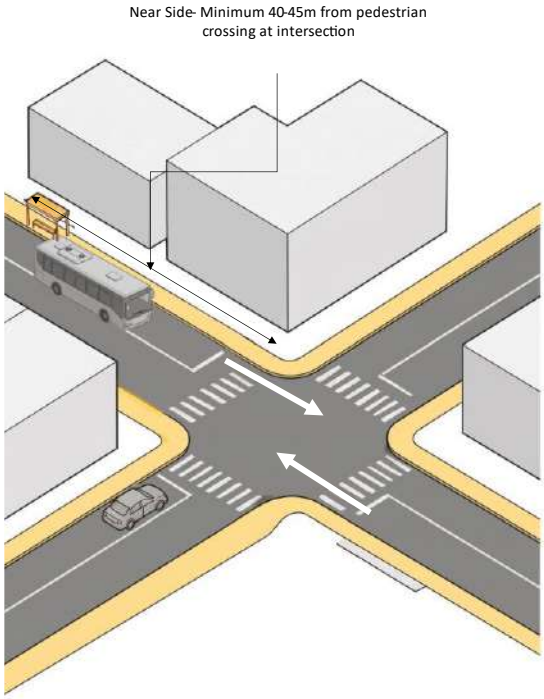


Figure 3: Illustrative diagram showing placement of near side bus shelter

- At Midblock: Preferred to be placed in a staggered manner where major trip generators /attractors are located (away from intersections) that requires an intermediate stop.

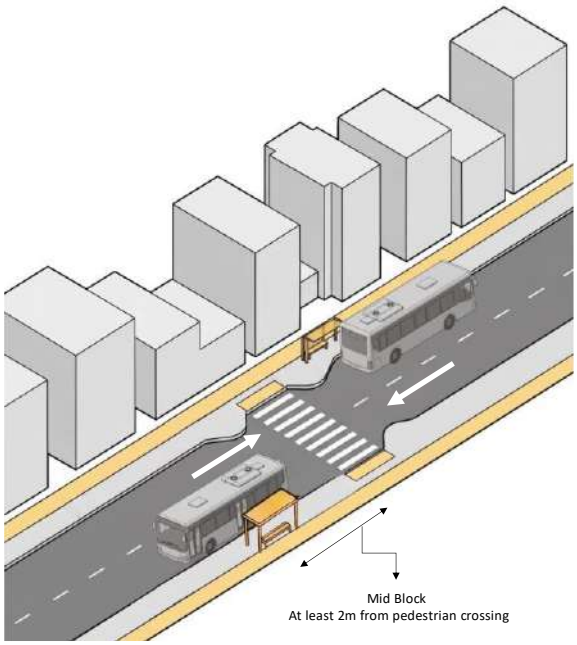


Figure 4: Illustrative diagram showing placement of midblock bus shelter



c) Placement of bus stop/bus shelter with respect to Carriageway: -pull-out, In-lane, and Boarding bulb stop– to be based on prevailing traffic and geometric condition of road

- Pull-Out Stop

  Arrival requires buses to shift from carriageway into a bay with bus stop marking and departure requires buses to pull back into the carriageway. This type of configuration provides smooth traffic flow and may be ideal for high traffic arterial and sub arterial roads, high boarding and alighting stops, subject to availability of adequate RoW to provide bay at bus stop location.

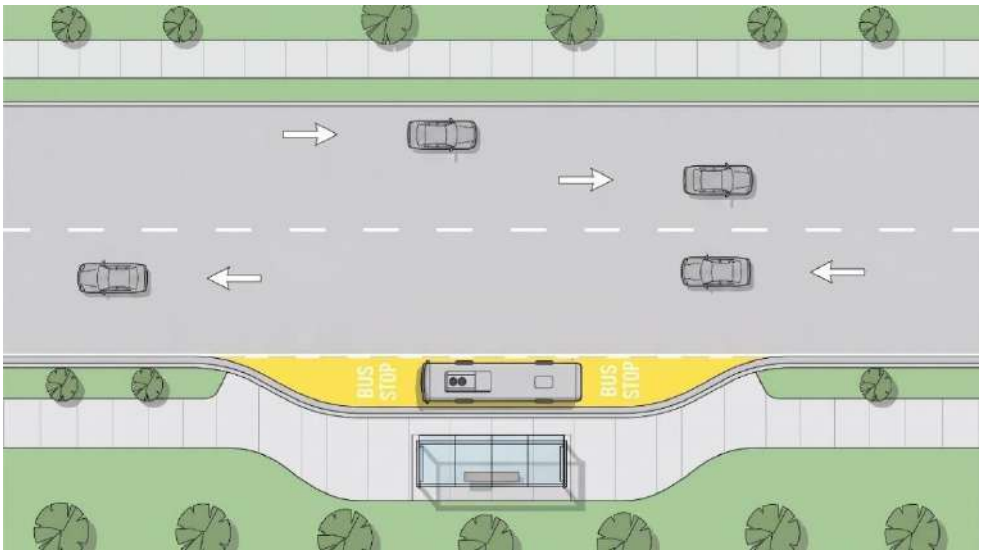


Figure 5: Illustrative diagram showing placement of pull out stop bus shelter

- In-Lane Stop

  Requires buses to stop on the carriageway adjacent to the kerb. Preferred on streets with medium pedestrian movement and moderate traffic speed, where a dedicated bus bay or bulb out stop cannot be accommodated.

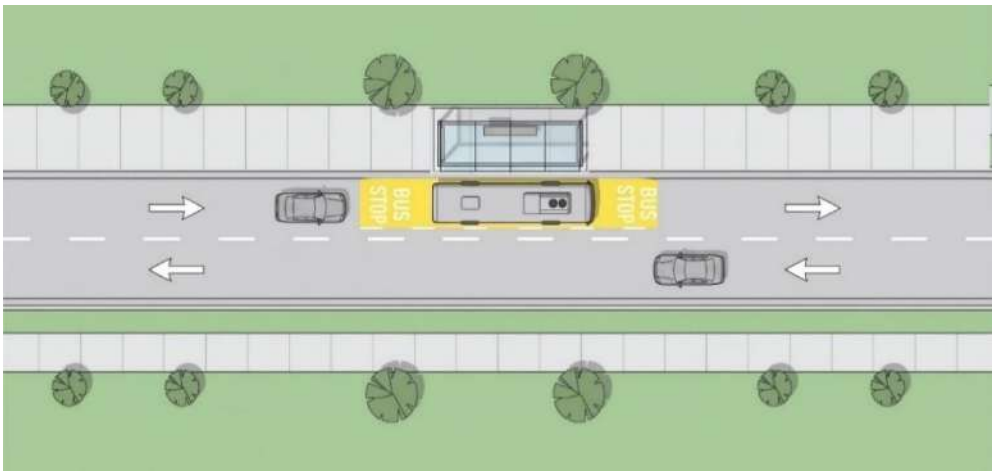


Figure 6: Illustrative diagram showing placement of in lane bus shelter

- Bulb out Stop



Requires buses to stop at a kerb extension. Preferred where there is adequate Right-of-Way (RoW), high pedestrian movement, and formalized on street parking. The bulb out combined with bus shelter prevents passengers from standing on the carriageway and also reduce conflicts with the high pedestrian movement on footpath.



Figure 7: Illustrative diagram showing placement of bulb out bus shelter

d) Placement of bus stop/bus shelter with respect to footpath.

- Footpath width ≥ 4.5m: Bus shelter at kerb edge, ensuring adequate space for continuous footpaths and cycle tracks behind the bus shelter.[2]

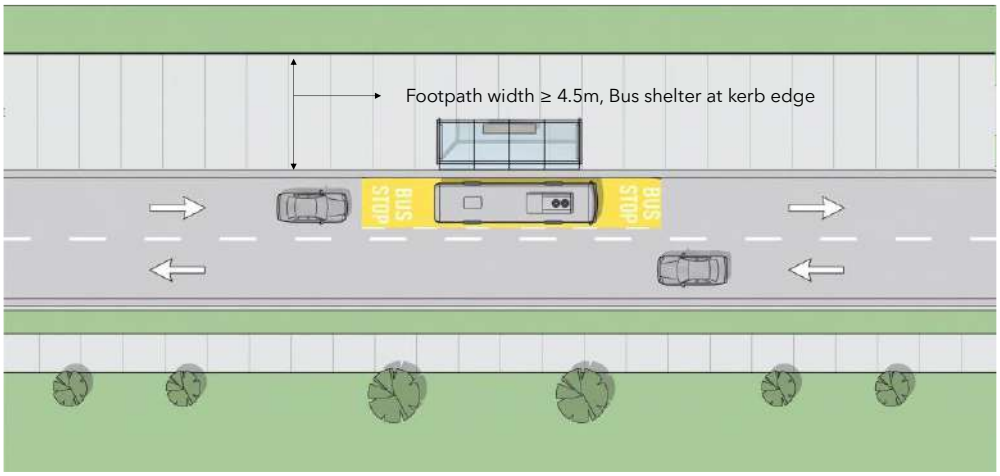
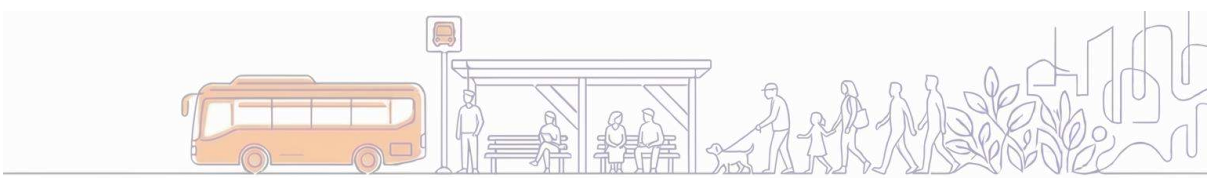


Figure 8: Illustrative diagram for placement of bus shelter when Footpath width ≥ 4.5m

- Footpath width < 4.5m wide: Bus shelter to be placed along the kerb edge/ property boundary edge depending on the RoW while ensuring sufficient

[2] Indian Road Congress (IRC): 103- 2022; Pedestrian Facilities



space for pedestrians as well as for the passengers waiting for the bus to move through the bus shelter. [3]

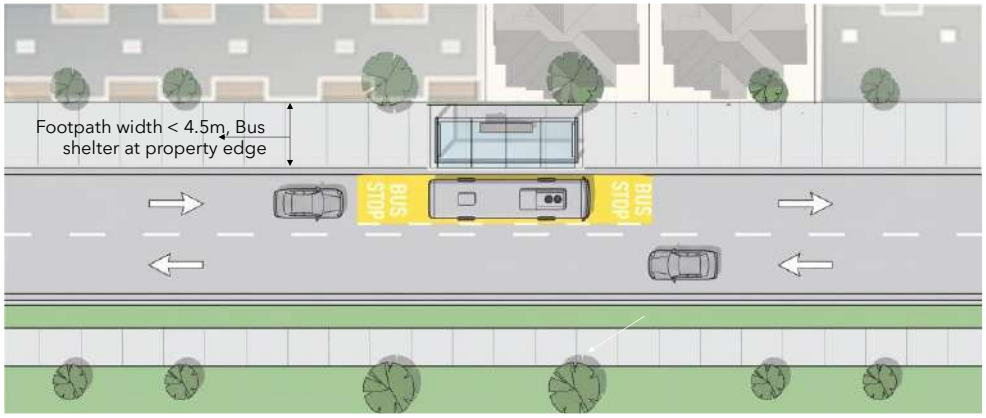


Figure 9: Illustrative diagram showing placement of bus shelter at property edge

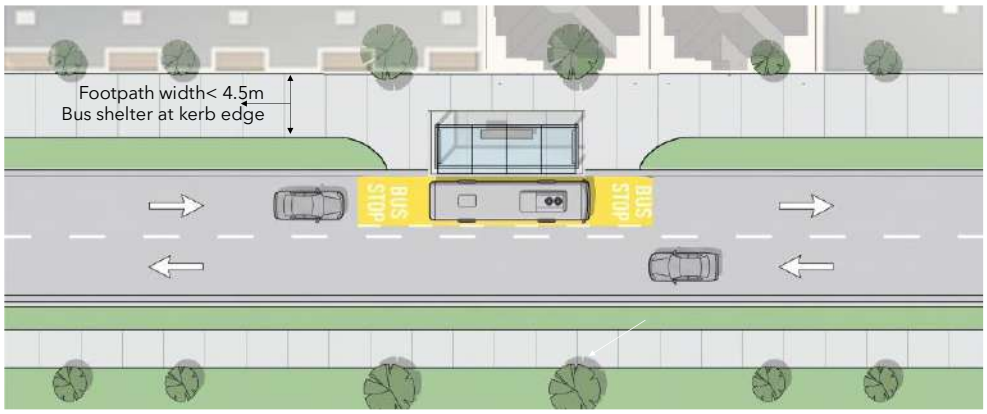


Figure 10: Illustrative diagram showing placement of bus shelter at kerb edge

e) Other location Principles of Bus Stops / Bus Shelters

- Interspacing between bus shelter/ bus stop from pedestrian crossing: -
  - i) At intersection - at least 40-45m away from the pedestrian crossing at the intersections and at least 2m away from the pedestrian crossing on other side.
  - ii) At midblock-at least 2m away from pedestrian crossing.
  - iii) Parking shall not be allowed within at least 5 m before and after the bus stops.[4]
  - iv) Bus Shelter shall not obstruct pedestrian and bicycle movement, and shall minimise conflicts with vehicular movement. Cycle track should preferably be routed behind the bus shelter.[5] The placement of the bus

[3] Indian Road Congress (IRC): 103- 2022; Pedestrian Facilities

[4] Indian Road Congress (IRC): 70- 2017; Guidelines on regulation and control of mixed traffic in urban areas

[5] Indian Road Congress (IRC): 70- 2017; Guidelines on regulation and control of mixed traffic in urban areas



shelter shall not obstruct the frontage, access, and visibility of adjacent properties.[6]

5.2 Accessibility to Bus Shelter

Preferably, bus shelter should be accessible within approximately 500 m[7] walking distance from major activity generators (as shown in the adjoining figure 11). Shorter or longer distance may be considered at major activity generators subject to the availability and quality of the pedestrian network and demand.

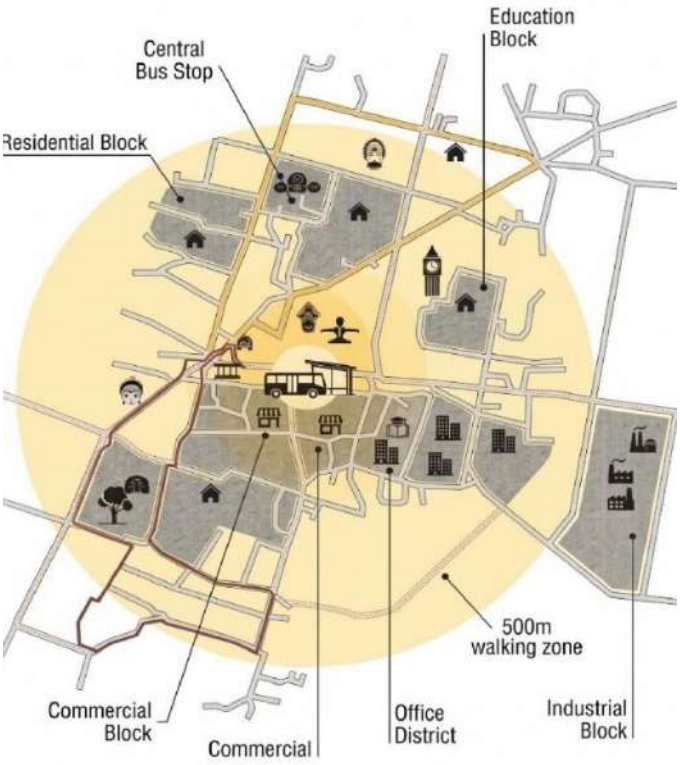


Figure 11: Illustrative diagram showing walkable zone of 500m

6 Indicative Bus Shelter / Bus Stop Design Size

a) Length of Bus Shelter

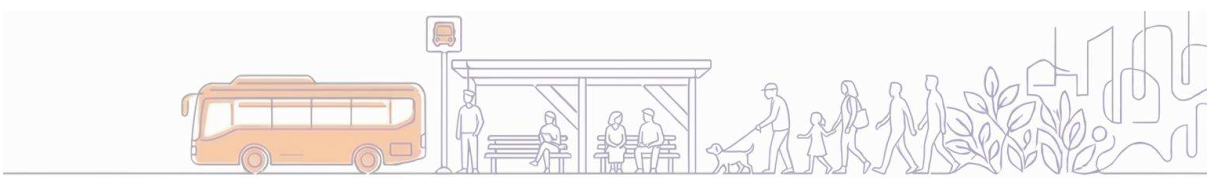
- The length of bus shelter roof shall be at least 6m to cover the front and rear door of the bus. However, the length may be increased where needed, depending on the length of the bus including accommodating peak passenger demand, wheelchair users, priority seating and clear waiting space. Extended/multiple-bay shelters (as per passenger demand) are recommended at interchange points and high-traffic corridors, offering larger waiting areas, improved accessibility, and enhanced passenger amenities.

b) Width of Bus Shelter [8]

[6] Indian Road Congress (IRC): 103- 2022; Pedestrian Facilities

[7] Handbook on Service Level Benchmarks (SLB) for Urban Transport (2009), Ministry of Housing and Urban Affairs

[8] Indian Road Congress (IRC): 103- 2022; Pedestrian Facilities



- The width of bus shelter should accommodate information/signage frame, seating, clear waiting space, and adequate space for passenger movement (including wheelchair)

- Footpath width ≥ 4.5m: Width of bus shelter -2.0-2.4m

- Footpath width< 4.5m: Width of bus shelter- 1.5-1.8m

c) Height of Bus Shelter

- The clear height of bus roof projection shall be a minimum of 3-3.5m from the footpath level.[9]

d) Height of Bus Shelter Platform

- The height of bus shelter platform should be 0.15m[10] from the road level. Where the bus stop platform is not level with the surrounding walkway or pathway, it is essential to provide two separate access ramps including handrails.

- Bus shelter flooring should ideally be different in colour from surrounding paved areas and anti-skid.

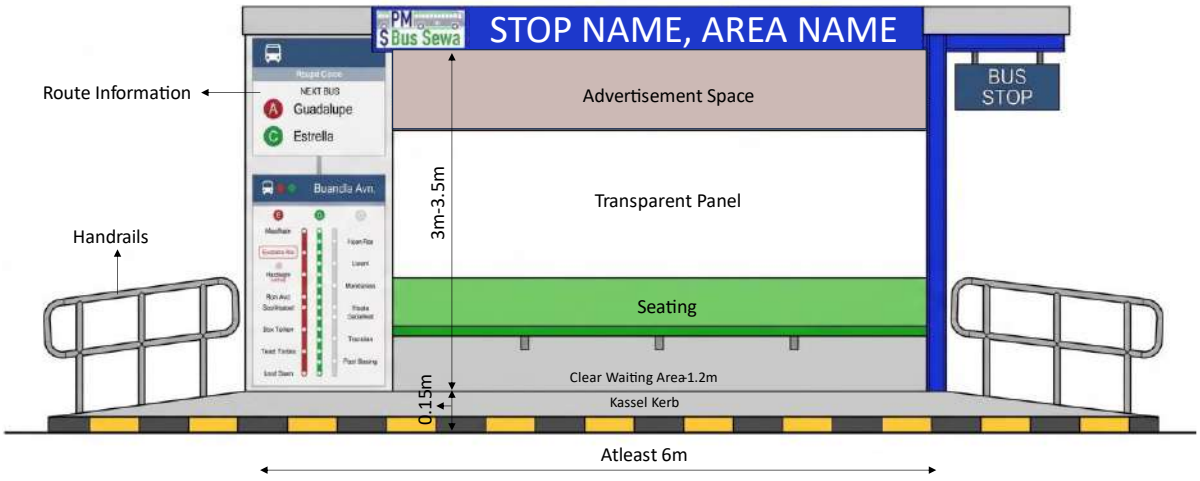


Figure 12: Illustrative diagram showing indicative bus shelter dimensions

e) Size of Bus Pole

- Height – Minimum Clear height upto the bottom of the board- atleast 2.1m from the finished footpath level.

[9] Indian Road Congress (IRC): 70- 2017; Guidelines on regulation and control of mixed traffic in urban areas

[10] UTTIPEC Street Guidelines



- Information Required: - Name of the Stop along with the Bus Route numbers

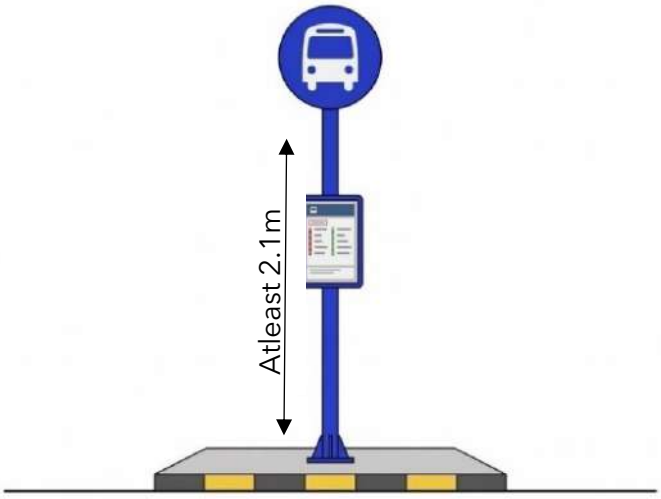


Figure 13: Illustrative diagram showing indicative bus pole height

f) Bus Zone[11] - Bus zone is generally of two types: -

- Intersection bus zone: This zone is bounded by pedestrian crossing from the intersection side and access point of the bus shelter on the other side.
- Midblock bus zone: is bounded by access points of both the bus shelters (i.e. bus shelters placed in staggered manner on both the sides of the roads)
- It is preferred to notify an area with minimum 5m length before and after bus stop as a 'NO PARKING ZONE' for private vehicles and Intermediate public Transport (IPT).

7 Essential Design Elements and Access to Bus Shelters

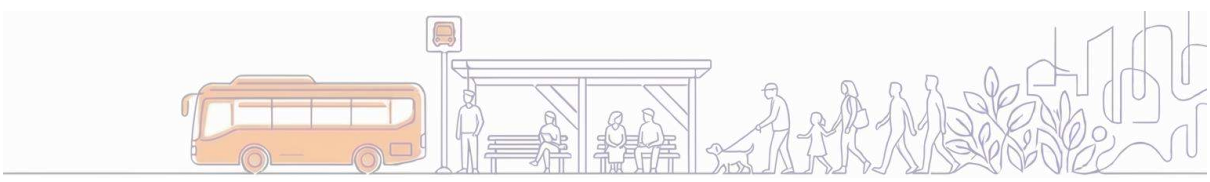
7.1 Bus Shelter Structure

a) Stainless steel or other locally available durable material is preferred.

b) A shelter should be provided at the bus stop for protection against adverse weather conditions (rain and heat)

c) The roof of the shelter should extend beyond the shelter's footprint. It should be wide enough to cover the seating area and simultaneously should not infringe with the standing bus. The roof should primarily extend towards the front and sides (with a slight slope for rainwater drainage) to provide shelter to passengers standing or sitting.

[11] UTTIPEC Street Guidelines



d) The back and side walls of the bus shelter to be designed to maximise visibility of the passengers.

7.2 Seating Arrangement[12]

a) The seating capacity to be provided in proportion to the length of the shelter.

b) Seat height- 0.45m-0.50m

c) Seat depth- preferably 0.35m-0.40m and seat width per person- 0.45m

d) At least one seating position shall be reserved for the following users, as is done for reserved seating inside buses: -

- Senior citizens
- Pregnant women
- Persons with disabilities and Persons with reduced mobility

7.3 Clear Waiting Area

a) Bus-shelter shall have a clear waiting space of minimum 1.2 m.[13]

b) The bus shelter should have a clear, unobstructed waiting space with a minimum wheelchair turning/waiting zone of 0.9m × 1.2m[14]

7.4 Bus Stop, Bus Bays, Bus Lane Road Markings [15]

a) Bus Stop

- The length of the bay for bus stop marking shall be minimum 15m. It may be increased in stages of 30m upto a maximum of 45 m. The line marking for box shall be yellow/white in colour and 0.1m wide.

- Pavement markings at the bus stops should be provided with the word "BUS STOP" written prominently in yellow/white on the road. The word message "BUS STOP "shall be repeated in each box of 15m length.

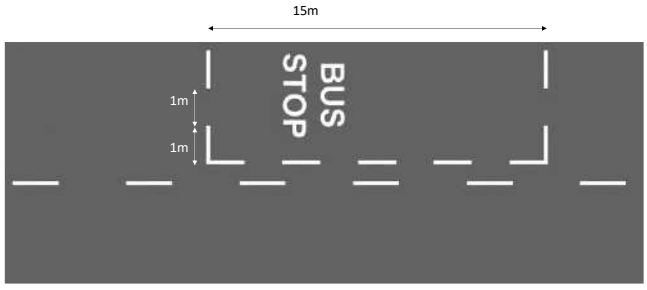


Figure 14: Illustrative diagram showing bus stop marking dimensions

[12] Harmonised Guidelines and Standards for Universal Accessibility, 2021, MoHUA

[13] Indian Road Congress (IRC): 103- 2022; Pedestrian Facilities

[14] Harmonised Guidelines and Standards for Universal Accessibility, 2021, MoHUA

[15] Indian Road Congress (IRC):35- 2015; Code of Practice for Road Markings



b) Where Bus Bays are constructed
   - The bus bay marking should be provided with proper chevron marking and can be either with Physical Island or with Ghost Island. Appropriate continuity lines and diagonal chevron markings shall also be provided ensuring that through lanes are well defined.

c) Where Bus Lanes are constructed
   - The lanes reserved for the buses without physical separation shall be provided with white line as bus lane markings. Generally, a basic width of 3m is required for a bus lane. The distance is measured from the edge of the kerb to the centre of the continuous white line.

   - The legend "BUS LANE" should be marked on the carriageway at its starting point and repeated after each junction. Where junctions are more than 300m apart, this legend should be repeated between junctions at approximately 150m interval.

7.5 Handrails / Guardrails / Safety Barriers [16]

a) For bus shelter with ramps, handrails to be installed along both sides of the access ramp, with the height varying between 0.75m (for wheelchair users) and 0.90m (for standing passengers).

b) Have a minimum clear space of 0.04-0.06m from the walls (0.04m for smooth wall surfaces and 0.06m. for rough wall surfaces)

c) If the shelter has a raised boarding platform, handrails and safety barriers to be provided to guide passengers toward the designated boarding area.

d) Be slip-resistant with round ends and free of any sharp or abrasive elements.

e) The handrails should be clearly visible with respect to the surrounding background.

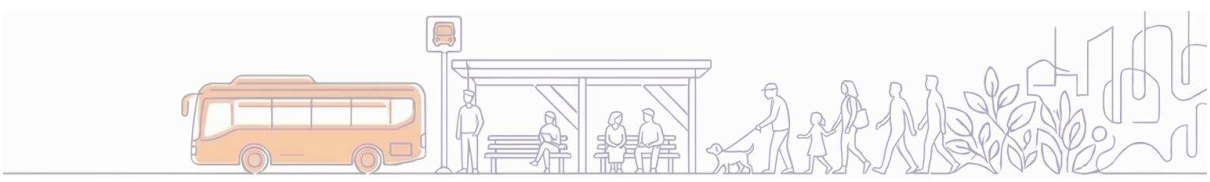
f) The handrails should provide good grip and material should not become too hot/cold when exposed to hot and cold weather.

7.6 Lighting[17]

a) As per 2021 Harmonised Guidelines and Standards for Universal Accessibility in India, the bus shelter shall have minimum illumination level of 50 lux.

b) Lights should be housed in a protective casing to reduce vandalism, and directed so that they illuminate the waiting and boarding areas.

[16] Harmonised Guidelines and Standards for Universal Accessibility, 2021, MoHUA
[17] Harmonised Guidelines and Standards for Universal Accessibility, 2021, MoHUA



7.7 Dustbins

a) Install hands-free, pedal operated waste bins with segregation near all Bus Shelters outside the pedestrian movement and boarding zone.

b) In high-traffic bus stops, install multiple bins to handle the increased volume of waste, preventing overflows.

c) Green (wet waste) and Blue (dry waste), as per Solid Waste Management Rules.

7.8 Bus Stop Name and Passenger Information

a) The Bus Stop name should be clearly visible and should preferably be placed on top of the front façade of the bus shelter. The material should be non-reflective, preferably matt finish. The font type and size should be based on the viewing distance as recommended in 'Accessibility guidelines for bus terminals and bus stops', 2021, Ministry of Road Transport and Highways (MoRTH).

b) Passenger information system in terms of static information such as with route numbers, network(route) map, bus number information, emergency helpline numbers (police, ambulance, fire, women helpline) to be made available at the bus stop. However, cities may do the provision for real time information if feasible. Wall-mounted panels that contain detailed information; timetables, maps or diagrams, should be centered around 1.4m from the ground, with the bottom edge not less than 0.9m from the finished floor level and the top edge up to 1.8m from the finished floor level.[18]



Figure 15: Photo showing route map on a Bus Shelter in Bhubaneshwar; Source: CRUT

[18] Accessibility Guidelines for bus terminals and bus stops, 2021, MoRTH



7.9 Advertisement Panel

a) Advertisements may be used as Non-Fare Box Revenue source.
b) Preferred locations: -
   - Upper half of the shelter
   - Side parts of the shelter, if available
   - Upper half of the back of the Shelter



Figure 16: Photo showing advertisements on a Bus Shelter in Bhubaneshwar; Source: CRUT

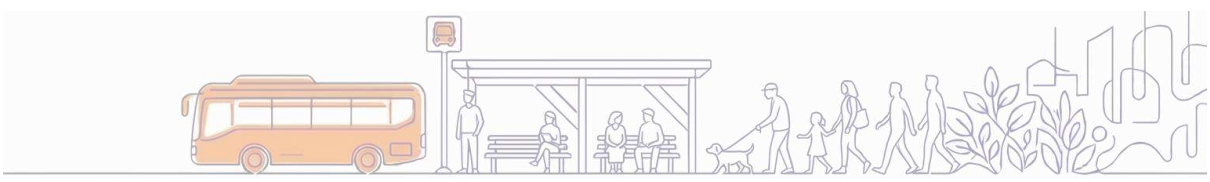
c) However, the advertisements should be located in a way that they do not hinder the visibility of route numbers including the visibility of the pedestrians and passengers waiting at the bus-stop.

8. Essential Design Elements for Bus Shelter Access

8.1 Adjoining / Demarcated Pedestrian Walkway (Footpath)[19]

a) Footpath may be planned in 3 different zones – frontage zone, pedestrian/walking zone, and multi-utility zone (MuZ). Minimum width for all 3 zones: -
   - Walking Zone- 1.8m-3m as recommended in IRC: 103. (2022). Pedestrian Facilities. Walking zone may be modified depending upon the land use and availability of Right of Way (RoW).
   - Frontage-0.5m (building compound wall) -1m (recommended for active commercial fronts)
   - Multi Utility Zone (MuZ)- minimum clear width of 1.5m to be provided to accommodate street utilities and amenities such as bulb-out stops, tree pits, vending, street lighting, signage and other street furniture. The width may be increased or reduced, subject to site-specific assessment and ensuring that pedestrian movement is not obstructed.

[19] Indian Road Congress (IRC): 103- 2022; Pedestrian Facilities



b) Maximum height of footpath- Not more than 0.15m.

c) Where a transfer must be made from pedestrian surface to the bus shelter waiting area, it should be blended to a common level or ramped (Maximum access ramp gradient: 1:10 to 1:12)

d) Kerb- 0.15m thick Kerb stone is placed along the footpath edge. Pre-fabricated concrete kerb stones are preferred. On Bus shelters, where feasible concave or bevelled Kassel Kerbs is preferred to enable the bus to come close to the boarding platform without damaging tyres / bus body.



Figure 17: Kassel kerb; Source: iStock

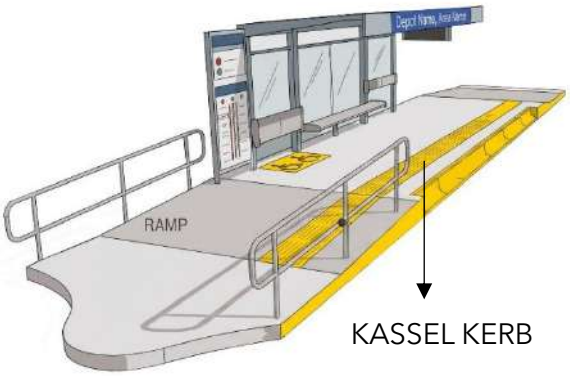


Figure 18: illustrative diagram showing Kassel kerb

e) Bollards- Bollards should be provided at locations on footpath where encroachment is possible such as around property entrance access ramps, raised pedestrian crossings, kerb ramps or kerb edge of footpath.

- Placement – the outer edge of the bollard should be set 0.25m from the footpath kerb edge
- Height- 0.5-0.7m. Optionally, bollards may also be designed as seating at a height of 0.45m.
- Spacing- 0.6m clear spacing between bollards, with one gap widened to 1.2m clear width to allow movement of wheelchair users, caregivers with prams, and persons with luggage.

f) Street lighting- The footpath shall be well-lit. 25-30 lux level of lighting (Warm white preferred) should be available on footpath. For footpaths and Cycle tracks, 3-6m pole height and 9-12m spacing between the poles is preferred. A single row of light is sufficient for upto 12m wide streets.

g) Utilities- utility covers should be located within the MUZ or frontage/dead zone without disrupting the pedestrian movement. However, if they come on walking zone or cycle track, the covers shall be in level with footpath. The gratings of the covers should be perpendicular to the movement of wheels of a wheelchair. IRC:98-Guidelines on Accommodation of Utility Services on Urban Roads should be further referred for guidelines on accommodation of utility services on urban streets.

h) Medians- to be designed to incorporate pedestrian refuge areas to enhance pedestrian safety. Roads with 4 or more traffic lanes shall have medians with pedestrian refuges of minimum 2 m depth, and 3 m width with bollards located in the refuge space to disallow vehicles from entering and to enhance pedestrian safety. However, the depth and width may be modified depending on the RoW availability and site-specific conditions.



Figure 19: Illustrative diagram showing street, median and pedestrian crossing

i) Appropriate way-finding signages should be provided.

j) For further elements and details refer IRC:103- 2022 for pedestrian facilities.

8.2 Pedestrian Crossing Marking[20] [21]

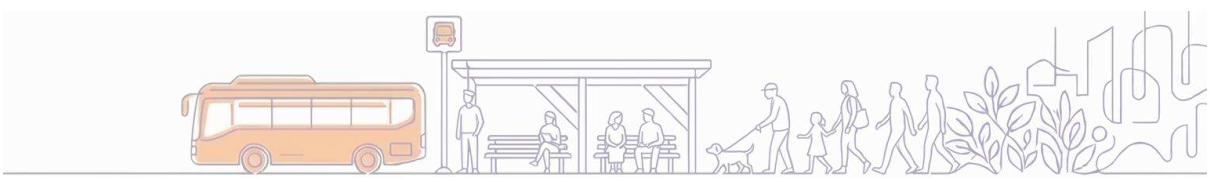
a) Marking- Minimum width- 2m and maximum width- 4m; bands shall be 0.5m wide and 0.5m apart as recommended in IRC:35- 2015 Code of Practice for Road Markings. Pedestrian crossings may either be constructed as table-top crosswalks, or painted as zebra crossings.

b) Painted Zebra Crossing- preferred to be signalized with adequate time to cross. Contrasting colour scheme as per IRC:35-2015 may be chosen for Pavement (Black) and Zebra Crossing (White).

c) Raised Crosswalks- At unsignalized intersections, raised crossings to be provided to ensure pedestrians can cross safely. They shall be elevated to the level of the adjacent footpath, with adjacent ramps for motor vehicles with a slope of 1:8. Bollards may be placed near access ramps ensuring wheelchair access while

[20] Indian Road Congress (IRC): 103- 2022; Pedestrian Facilities

[21] Indian Road Congress (IRC): 35- 2015; Code of Practice for Road Markings



discouraging other vehicles[22] as recommended in IRC: 70- 2017; Guidelines on regulation and control of mixed traffic in urban areas

d) Stop Lines- 1m-3m in parallel to the nearest boundary of the pedestrian crossing

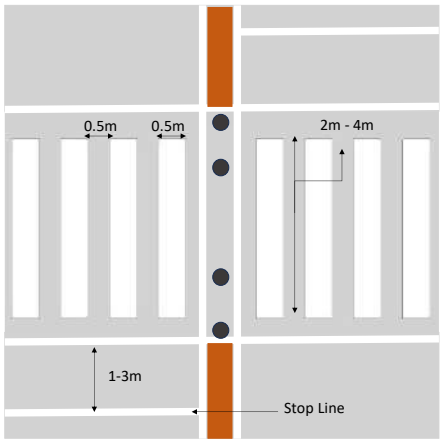


Figure 20: illustrative diagram showing pedestrian crossing dimensions

8.3 Design Enforced Traffic Calming Measures [23]

The main techniques used fall into the following areas: Vertical Deflections; Road Narrowing; Central Islands

a) Vertical Deflections

- Transverse Rumble Strips bar marking- informs about the sudden unexpected changes and alert the drivers to slow down. Each set comprises of 6 bars, 0.2m- 0.3m wide 0.6m apart of 0.005m (5mm) high or 0.3m wide 1m apart of 0.015m (15mm) high.



Figure 21: Photo showing Transverse Rumble Strips bar marking



Figure 22: Illustrative Diagram showing Transverse Rumble Strips bar marking

- Circular Road Humps / Trapezoidal Road Hump / Speed Bump- The profile of circular shaped hump is based on the shape of a circular arc with a radius varying from 11 m to 113 m and a chord length varying from 3.0 m to 9.5 m to achieve desired speed of 20 km/h to 50 km/h. For buses at 20 km/h, the radius of the hump must be 31m and chord length 5m.

- Trapezoidal Hump- flat section of a carriageway with ramps on both sides is called a trapezoidal hump. If buses must be able to pass at speeds of 25 and

[22] Indian Road Congress (IRC): 70- 2017; Guidelines on regulation and control of mixed traffic in urban areas

[23] Indian Road Congress (IRC): 99- 2018; Guidelines for Traffic calming measures in urban and rural areas



30 km/h respectively, ramp lengths must be 1.7m and 2.0m, and gradients 6% and 5% respectively.

- Speed Bump- Precast, ready to install bumps are available and are being fixed on the road. These bumps can be nailed to the pavement. Its usage is recommended for local and collector street.



Figure 23: Photo showing speed bumps; Source: iStock



Figure 24: illustrative diagram showing speed bumps

- Raised table-top Crossings- In a road section having substantial pedestrian crossing, raised pedestrian crossing called Speed Table is a solution, where vertical deflection can be achieved to reduce traffic speed and flat-topped portion for pedestrian to cross



Figure 25: Photo showing raised table-top crossings; Source: iStock



Figure 26: Illustrative diagram showing raised table-top crossings

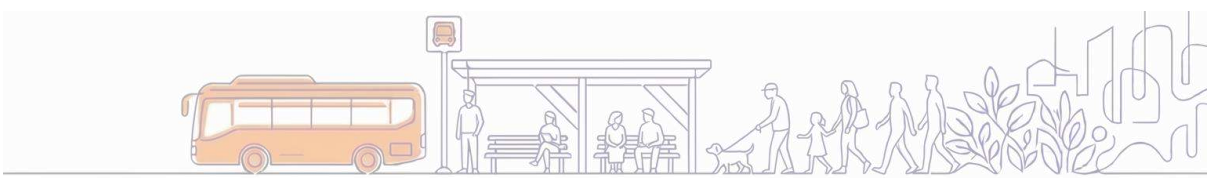
- Turning Radius at Intersections

  Turning radii at intersections should not be less than 9 m on bus-route roads thereby increasing pedestrian safety [24]



Figure 27: Illustrative diagram showing turning radius at intersections

[24] Indian Road Congress (IRC): 70- 2017; Guidelines on regulation and control of mixed traffic in urban areas



- Uneven Road Surface and Stone Set Pavement- changing the surface texture reduces vehicle speed because drivers find the ride uncomfortable.

b) Road Narrowing- Road narrowing may be considered as another supportive measure acting as a reminder or encouragement to drive slowly or calmly. Narrowing the carriageway at specific locations, for example in combination with speed tables, is an effective way of combining measures to increase their effect. The extra space created by road narrowing is generally used to provide widened footpath.

c) Central Islands- Providing Central Island in a undivided carriageway in an urban street is an effective measure, which would not only reduce the speed, but serve as refuge space for pedestrian.

8.4 Signage[25] [26] [27]

a) For Bus pole: -

- A clear height of 2.1 m to be maintained between the signage bottom and the finished footpath floor level to maintain clear passage to the pedestrians.
- Sign Board is recommended to have round corners are to minimise the risk of injury to pedestrians in the event of accidental contact with the signboard, especially, children, and persons with visual impairments.
- The front view of the sign board to be placed perpendicular to the line of traffic, on the left side of the road with clear visibility.
- Braille signboards to be located between 1.4-1.6 meters from floor level for persons with visual impairments.

b) For Bus Shelters: -

- Warning signs placed before the bus stop to alert drivers to slow down and anticipate stopping buses.
- Helpline numbers should be placed at visible heights.
- Signs indicating that the bus stop and bus are wheelchair accessible with appropriate ramps or level boarding platforms.

c) The Signage include regulatory, cautionary and informatory (wayfinding) signages and should be multilingual (Preferably English and Hindi/ Regional Language).

d) For further elements and details refer IRC 67-2022-Code of Practice for Road Signs, as per IRC 103; 2022 and as per Harmonised Guidelines and Standards for Universal Accessibility in India 2021.

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[25] IRC: 67- 2022; Code of Practice for Road Signs

[26] Indian Road Congress (IRC): 103- 2022; Pedestrian Facilities

[27] Harmonised Guidelines and Standards for Universal Accessibility, 2021, MoHUA



8.5 Kerb Ramps [28]

a) The width of kerb ramps shall not be less than 0.9m and is recommended to be equal to the width of the pedestrian walkway.

b) Kerb ramps should have flared sides where pedestrians are likely to walk across them. Maximum Gradient shall be 1:12, if a flared kerb ramp, the gradient for flared sides shall not be more than 1:10.

c) The kerb ramps at pedestrian crossings do not have railing. Ramps should have a detectable tactile warning indicators at both entry and exit points connecting the tactile guiding path on the walkway. Pedestrian ramps can be oriented parallel to sidewalks, where space is limited and it is difficult to fit a top landing.

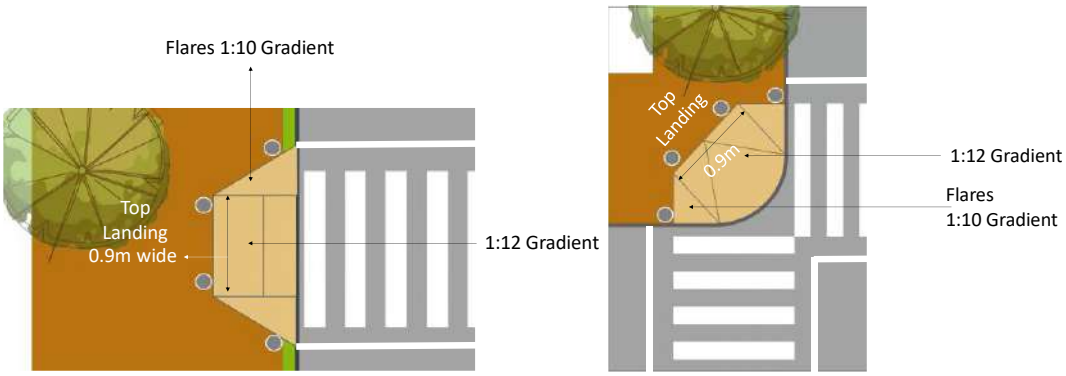


Figure 28: Illustrative diagram showing kerb ramps at midblock (left) and at intersection (right)

8.6 Tactile Pavers[29]

a) 5mm raised strip tiles with contrasting color (Yellow)
b) There are two types of tactile ground surface indicators:
   a. Warning indicators; and
   b. Directional indicators

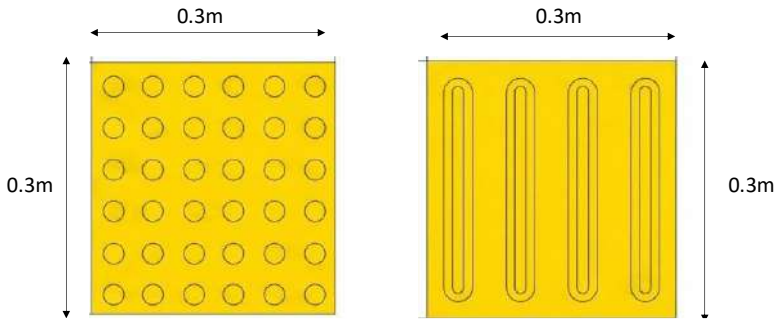


Figure 29: Illustrative diagram showing Warning tactiles (Left) and directional tactiles(right)

[28] Harmonised Guidelines and Standards for Universal Accessibility, 2021, MoHUA
[29] Harmonised Guidelines and Standards for Universal Accessibility, 2021, MoHUA



Figure 30: Photo showing tactile flooring; Source: iStock

c) Directional (Guiding) Indicator- A distance of minimum 0.45m from the edge of the footpath, corridor or path to be maintained (preferably along the centre line of the indicated path of travel).

d) Warning Indicator- applied in a perpendicular direction to the line of approach or to the target object. In addition, a warning treatment shall be placed atleast 0.3m from the target object. Also, Warning blocks to be placed at the beginning and end of the ramps & stairs, at landings and entrances.

8.7 Drainage.

Following recommendations are suitable for inclusion of drainage: -

a) Saucer drains and openings to catchment pits shall be laid along the footpath kerb to channelise and collect stormwater runoff.

b) For further details, following relevant IRC codes to be referred:

- IRC: SP: 50- 2013 – *Guidelines on Urban Drainage* relevant for assessing runoff, drainage capacity, outlets and waterlogging around the bus shelter.

- IRC: SP:42- 2014- *Guidelines on Road Drainage* relevant for Road runoff, roadside drains and water interception.

- IRC:103- 2022 – *Guidelines for Pedestrian Facilities* relevant for pedestrian environment including accessible walking surfaces, gradients, crossfalls and the safe treatment of drainage elements.

- IRC:86- 2018 – *Guidelines for Geometric Design Standards for Urban Roads in Plains* relevant for designing road's crossfall and kerb levels with the adjoining footpath so that surface runoff is directed appropriately.



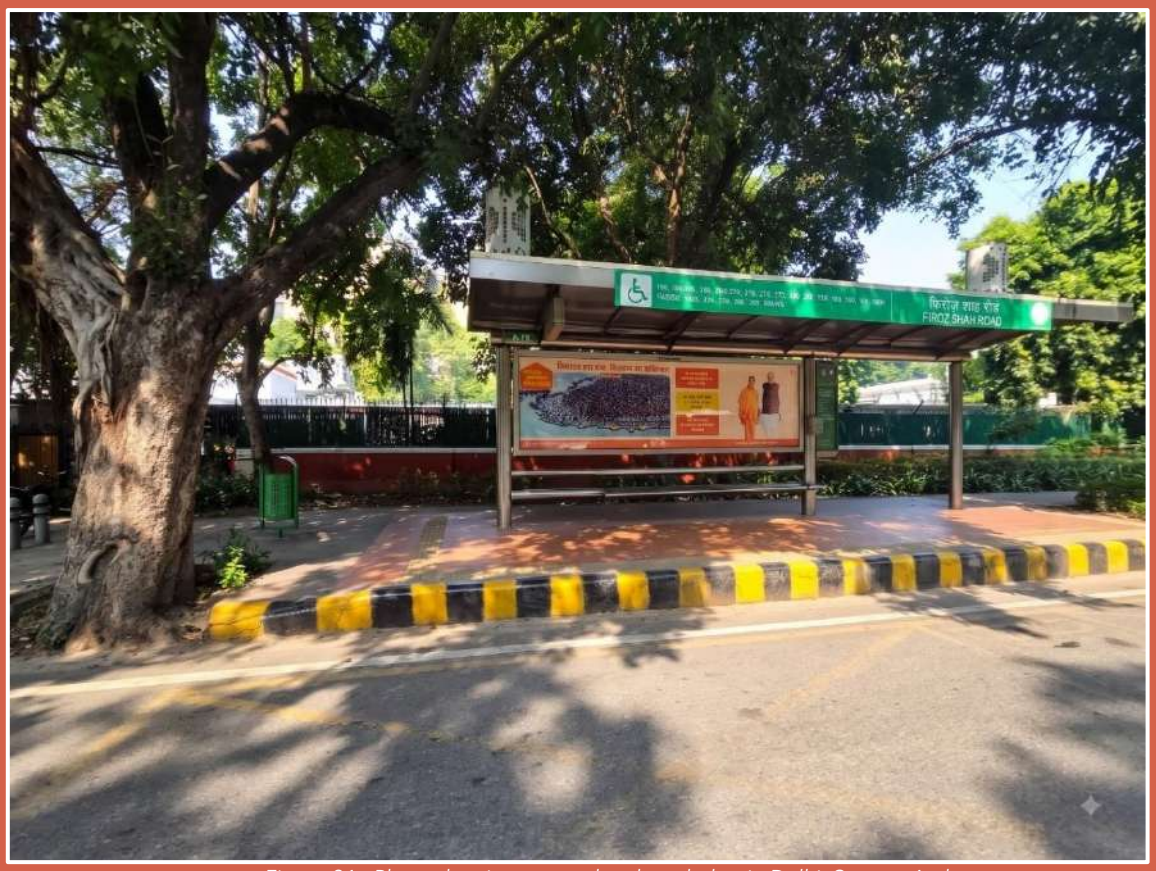


Figure 31: Photo showing a complete bus shelter in Delhi; Source: Author



Figure 32: Photo showing a complete bus shelter in Bhubaneshwar; Source: CRUT, Odisha



Figure 33: Photo showing a Bus Pole in Bhubaneshwar; Source: CRUT, Odisha



Figure 34: Photo showing a Bus Shelter in Chandigarh; Source: Chandigarh

9. Desirable Bus Shelter Design Elements

a) Backlit Advertisement panel –recommended at feasible locations to enhance visibility and revenue potential adding a layer to safety, security and non-fare box revenue.

b) Bicycle Parking - recommended at bus shelters with adequate space and passenger demand, without obstructing the footpath, to facilitate first- and last-mile connectivity.

c) Technology Elements: Bus shelters may incorporate CCTV surveillance, real-time Passenger Information Systems (PIS), public Wi-Fi, USB charging points based on passenger needs, audio video solutions for visually impaired people.

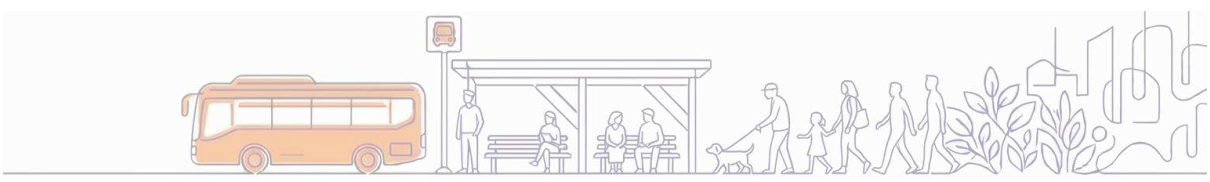
d) Green Infrastructure and Sustainability- When constructing a bus shelter, green infrastructure and sustainability practices to be given due consideration for long-term viability mitigating the effects of climate change, and quality of the system Green and sustainable infrastructure at a bus stop can take the form of: -

- Greenways- tree canopies, green areas can act as a buffer between different activities such as vehicular movement, cycle racks, opportunity charging and bus shelter to provide spatial separation thereby enhancing safety and security. while ensuring adequate visibility and accessibility.
- Integration of existing trees with the bus shelter design and pedestrian access infrastructure.
- Solar Panels- offer a way for a bus stop to get renewable energy to power their amenities that require electricity.
- Bioswales- are landscaped depressions that capture stormwater creating first pass of the filtration process in a city
- Rain water harvesting – offers a way to collect the rainwater and use it for green infrastructure (trees / green areas) surrounding bus shelters.

e) Pelican Signals- is a signal-controlled pedestrian crossing, including accessible push-buttons and audible indications for visually impaired is recommended at suitable locations based on pedestrian demand, and traffic volume.

f) QR Codes for Passenger Feedback- QR codes linking to passenger feedback forms recommended to be displayed at accessible and clearly visible locations, enabling passengers to report service issues, and maintenance requirements.

g) Identity - Aesthetics become a key consideration when a bus stop is located in an urban space with an established character, or where an art installation might carry



historical significance. In such cases, integrating the historical character with the bus shelter can be a valuable opportunity where feasible.

10. Monitoring for Planning, Execution and Maintenance of Bus Shelter

a) Bus shelter design and implementation to be monitored through regular audits as per the indicative checklist provided in Section 12.

b) Bus shelters to be regularly inspected, cleaned and maintained to ensure hygiene and serviceability of all infrastructure amenities.

- Periodic inspections to be undertaken to identify and rectify damage, corrosion, loose fittings, surface deterioration, water leakage and other structural issues to ensure reliable functioning.

- Regular sweeping, cleaning of seating and surfaces, and timely collection of waste to be ensured in coordination with the designated municipal agency or service provider.

- Advertisement panels and digital displays to be maintained in a presentable condition, with damaged or unauthorised displays promptly repaired or removed.

c) Periodic audits to be conducted to assess the following with corrective measures undertaken as required: -

- Atleast Monthly- maintenance and infrastructure condition of bus shelter

- Atleast Yearly- functionality, safety, and accessibility of bus shelter

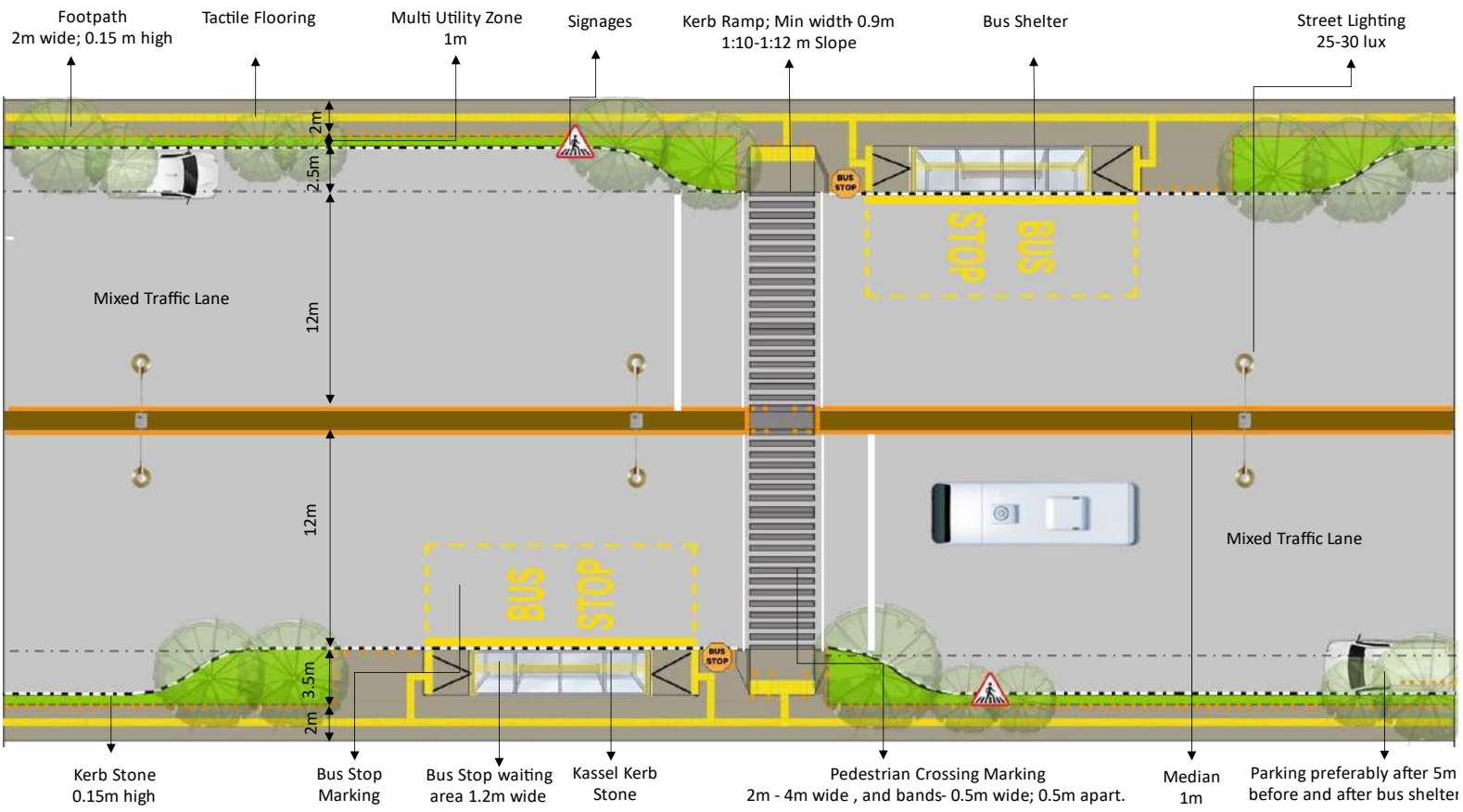
d) To establish a shared vision for bus stops and access infrastructure across the city all relevant departments and agencies shall work collaboratively to build consensus on land allocation, planning, design, implementation, and maintenance of bus shelter. This collaborative approach shall promote consistency and ensure effective implementation of bus stops and access infrastructure.

e) The implementation roadmap and monitoring framework should therefore cover baseline assessments and surveys, site selection, identification of appropriate bus stop locations and configurations, stakeholder consultation and coordination, delineation of roles and responsibilities, bus shelter implementation planning, designing and execution, review and audit, periodic monitoring, and maintenance to ensure long-term sustainability.

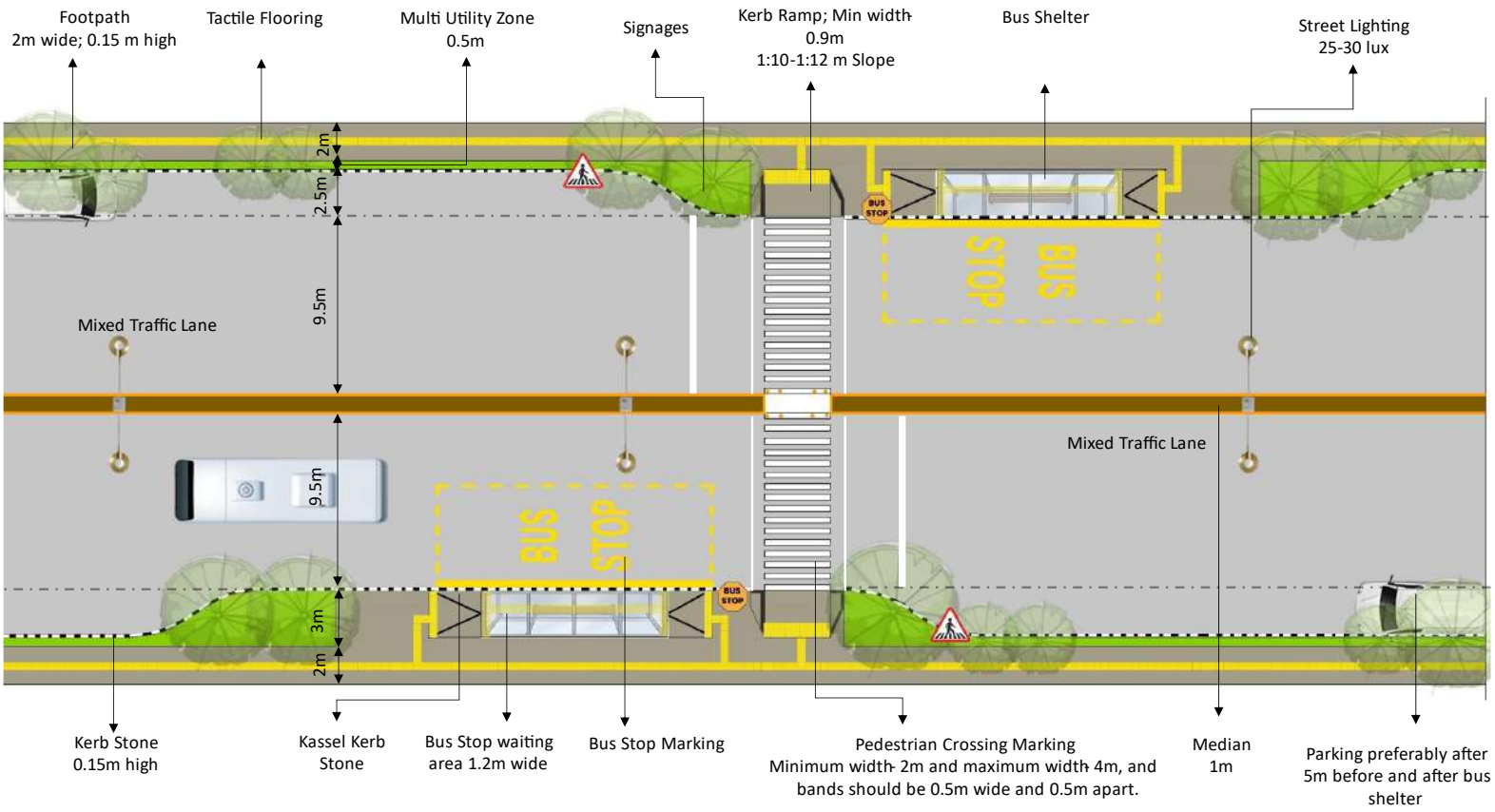


11. Indicative Bus Shelter Placement Design

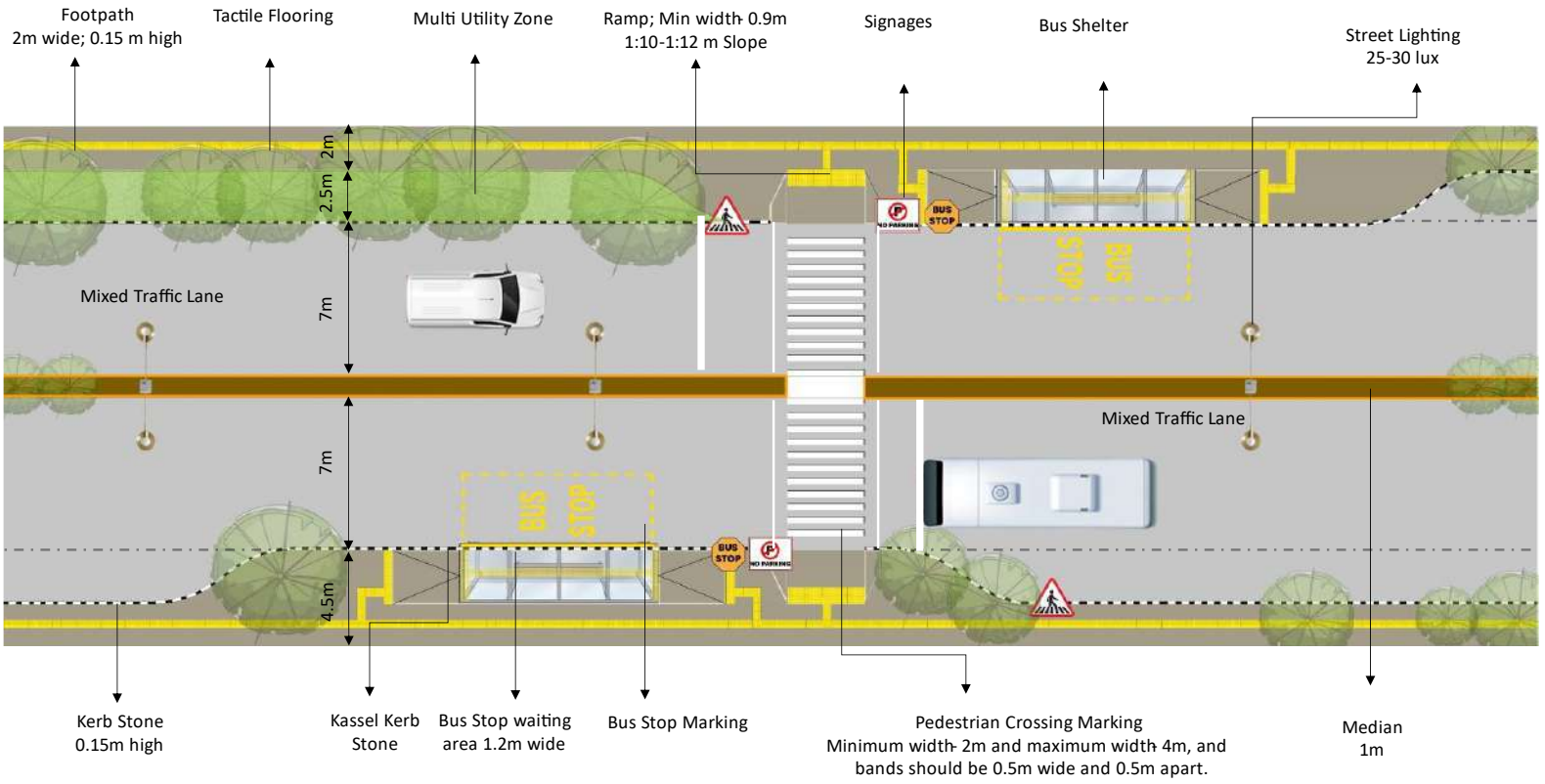
a) For 36m RoW



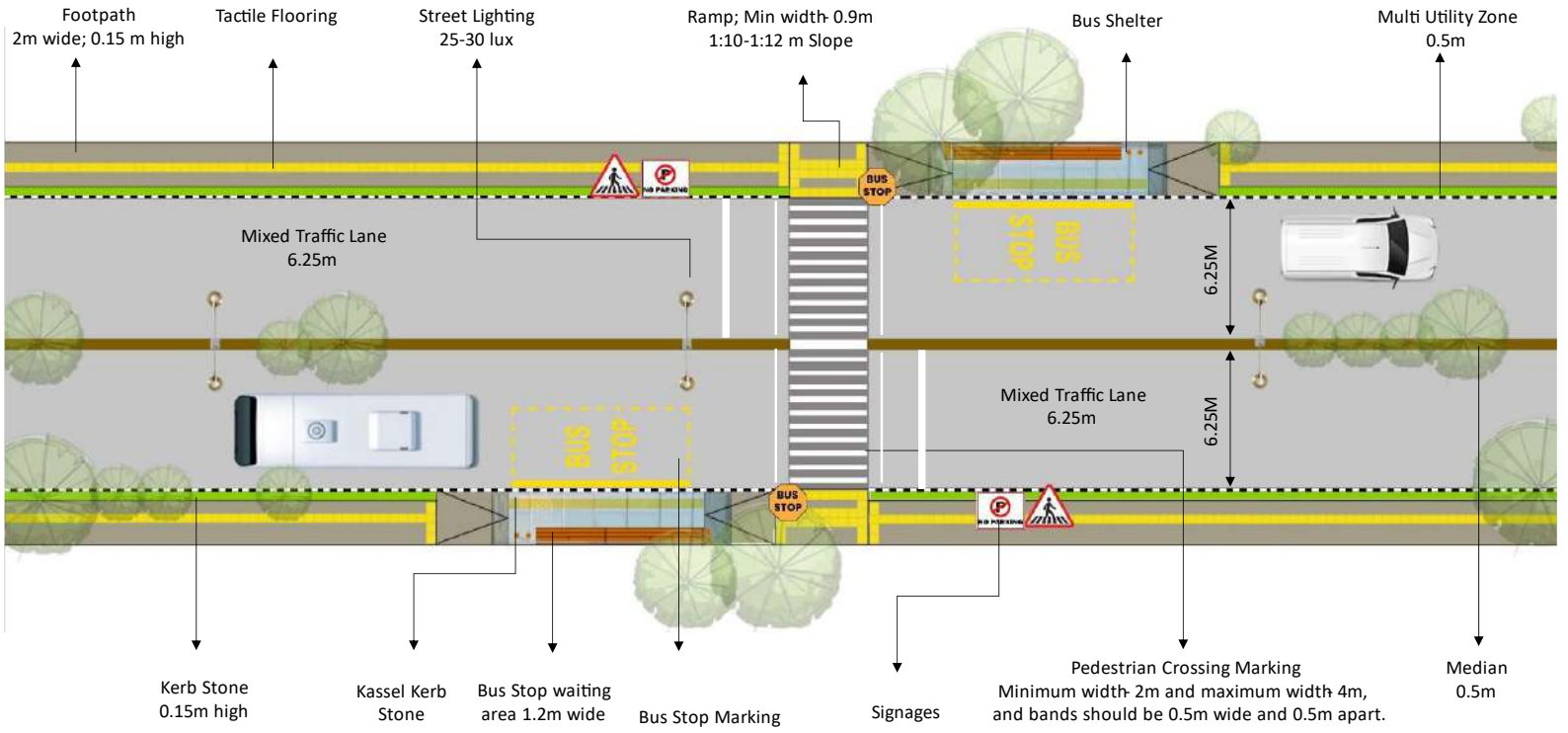
b) For 30m RoW


Footpath
2m wide; 0.15 m high
Tactile Flooring
Multi Utility Zone
0.5m
Signages
Kerb Ramp; Min width
0.9m
1:10-1:12 m Slope
Bus Shelter
Street Lighting
25-30 lux
2m
2.5m
9.5m
Mixed Traffic Lane
BUS STOP
Mixed Traffic Lane
9.5m
BUS STOP
3m
2m
Kerb Stone
0.15m high
Kassel Kerb
Stone
Bus Stop waiting
area 1.2m wide
Bus Stop Marking
Pedestrian Crossing Marking
Minimum width 2m and maximum width 4m, and
bands should be 0.5m wide and 0.5m apart.
Median
1m
Parking preferably after
5m before and after bus
shelter

c) For 24m RoW

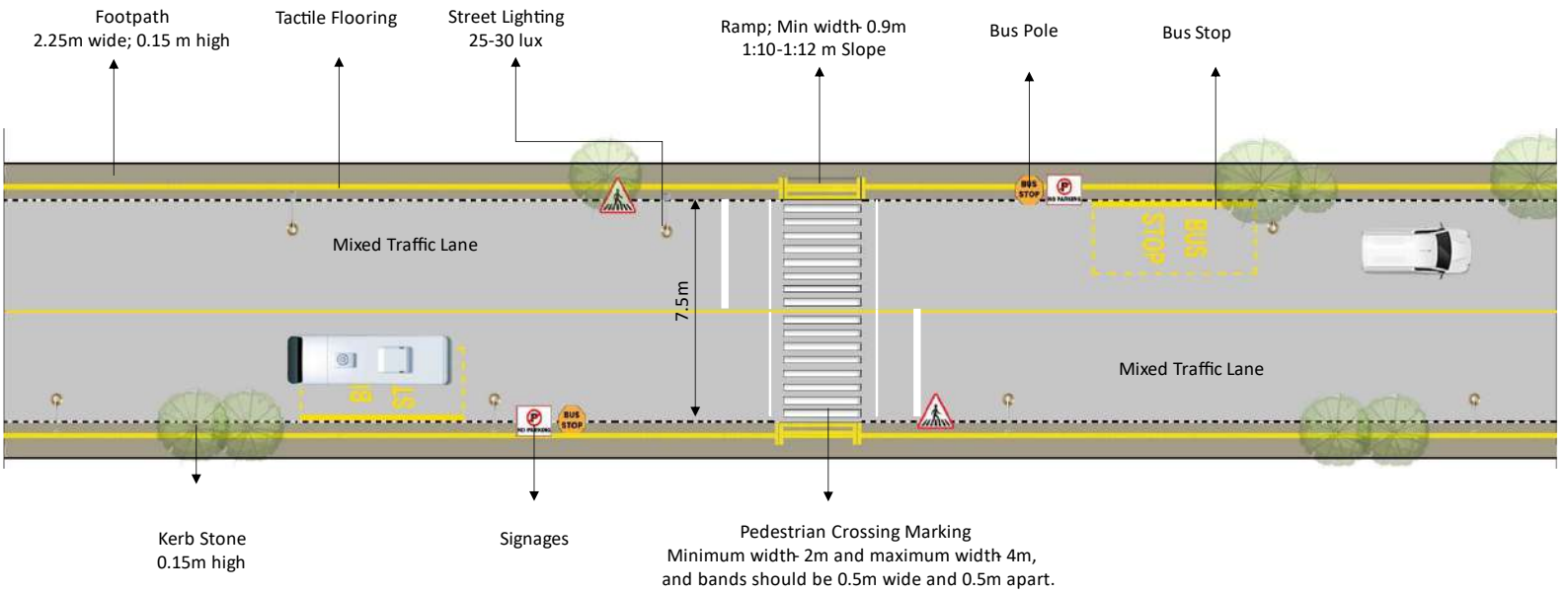

Footpath
2m wide; 0.15 m high
Tactile Flooring
Multi Utility Zone
Ramp; Min width- 0.9m
1:10-1:12 m Slope
Signages
Bus Shelter
Street Lighting
25-30 lux
2m
2.5m
7m
7m
4.5m
Mixed Traffic Lane
Mixed Traffic Lane
BUS STOP
BUS STOP
BUS STOP
Kerb Stone
0.15m high
Kassel Kerb
Stone
Bus Stop waiting
area 1.2m wide
Bus Stop Marking
Pedestrian Crossing Marking
Minimum width- 2m and maximum width- 4m, and
bands should be 0.5m wide and 0.5m apart.
Median
1m

d) For 18m RoW



S

e) For 12m RoW





f) At intersection



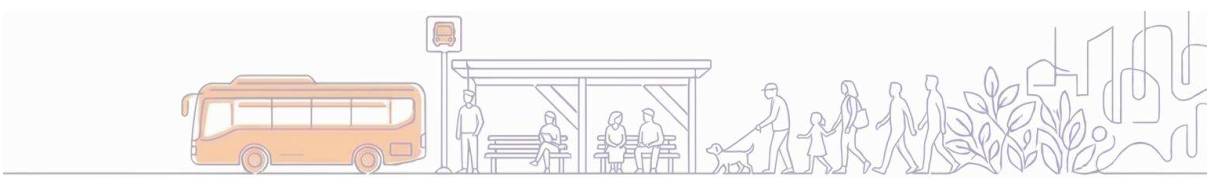
12. An Indicative Compliance Checklist

An indicative compliance checklist, as give below, is prepared for macro assessment of surveys, processes, planning, design compliance by the city administration.

S.No	Items	Compliance (Y / N / NA)
A	**Planning of Bus Shelter**	
i	Identification of Bus Routes	
ii	Reconnaissance Survey	
iii	Road Classification Assessment	
iv	Pedestrian Network Accessibility survey	
v	Bus Shelter Inventory Survey (existing bus stops including condition of bus shelter and amenities)	
vi	Bus Stop Sizing (L*B*H) based on Passenger Demand	
vii	Identification of location for bus stops and bus shelters with respect to intersections (Far Side / Near Side / Mid-Block)	
viii	Identification of location of bus stops and bus shelters with respect to RoW (Pull out / In Lane / Bulb Out)	
ix.	Identification of location of bus stops and bus shelters with respect to available width of footpath.	
B	**Essential Bus Shelter Elements**	
i	Bus Shelter platform size including the Bus shelter roof projection size for weather protection	
ii	Use of Durable and Low Maintenance Material for Shelter	
iii	Adequate Seating	
iv	Priority Seating (Spaces and Signages) for PwD, Senior Citizens, etc	
v	Adequate Circulation (for waiting passengers and pedestrians)	
vi	Adequate Circulation for wheelchair users	



S.No	Items	Compliance (Y / N / NA)
vii	Anti-skid flooring for bus shelter	
viii	Tactile Pathway	
ix	Access Ramps with handrails	
x	Bus Stop Road Marking	
xi	Bus Stop Name	
xii	Route and Area Map	
xiii	Service information (Route Number and Time)	
xiv	Information in Braille	
xv	Emergency Contact Numbers	
xvi	Visibility of waiting area from all sides of the bus shelter	
xvii	Adequate Lighting	
xviii	Advertisement Panels	
xix	Road Surface Drainage	
xx	Dustbins	
C	**Essential Bus Shelter access elements**	
i	Access Footpath for Bus Stop	
ii	Kerbs	
iii	Kerb Ramps	
iv	Tactile Pathway up to Bus Stop	
v	Demarcated Pedestrian Crossing (Zebra Crossing)	
vi	Bollards for preventing encroachment	
vii	Street/Footpath Lighting	



S.No	Items	Compliance (Y / N / NA)
viii	Street/Footpath Signages (informatory, warning, regulatory)	
ix	Demarcation of 'NO PARKING' for bus zone	
x	Pedestrian Signal	
xi	Traffic Calming Measures (speed bumps, raised crossing etc.)	
D	**Desirable Bus Shelter elements**	
i	Branding	
ii	Use of energy efficient lighting	
iii	Solar Panels	
iv	Rain Water Harvesting	
v	Landscape Cover (Tree canopies, hedges)	
vi	CCTVs	
vii	Passenger Information System	
viii	Bus Arrival Information for Visually Impaired	
ix	Pelican Signal	
x	USB Charging ports and Wifi	
x	QR Code for feedback	
xi	Bicycle Stand	

Note- Relevant IRC codes, accessibility guidelines, acts, and good practices to be followed for each item combined with the street level wisdom including building by laws, local street policies.



Photo showing PM-eBus on road; Source- Bhopal





Government of India
Ministry of Housing
and Urban Affairs

PM eBus Sewa