Bus Stop Style Guide

Prepared for:

State Transit

Prepared by:

PPK Environment & Infrastructure

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PPK
Environment&Infrastructure

Contents

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Bus Stop Style Guide
Part 1 – Design Manual

1. Introduction

PPK Environment & Infrastructure Pty Ltd was engaged by the State Transit Authority (STA) to prepare a style guide for bus stops in urban areas. The objectives of the style guide, as set out in STA's brief, are "to assist both State Transit and local government in providing consistent, safe and effective bus stops." Issues to be considered in the preparation of the style guide included:

- passenger information;
- identification of service point;
- useful, safe, and easily-maintained infrastructure; and
- consistent design that is accessible to as many potential passengers as practical.

Part 1 of the Style Guide focuses on design requirements for bus stops and bus stop facilities. Part 2 contains discussion of issues relevant to the preparation of the style guide, development of a functional hierarchy of bus stops, and bus stop classification.

This document is based on an international literature review, a review of Australian and STA best practice, and takes into consideration Disability Discrimination legislation (and the Attorney-General's Department Draft Guidelines).

2. STA Bus Design Envelope

STA operates a range of bus types and lengths, including:

- Midi buses in Sydney (ferry wharf feeders) and Newcastle;
- Single door and double door rigid high floor and low floor buses ranging from 10.7 metres to 14.5 metres in length; and
- Articulated buses ("bendy buses") 17.3 metres long.

Table 2.1 below summarises the design parameters of STA buses in service. The design bus for the purposes of this document is the 12.5 metre long rigid low-floor bus. Where longer buses are likely to be encountered (including the 14.5 metre long rigid bus and the 17.3 metre long articulated bus), the design standards in this document are adjusted accordingly. While midi buses are in use on some routes, the design of bus stop facilities should not be based on the dimensions of the midi bus – the 12.5 metre bus should be used as the default design bus.

Table 2.1: Design Parameters of STA Buses

Dimension	Min	Max
Length	9.0 m	17.3 m
Width (mirror to mirror)		2.995 m
Height	2.955 m	3.345 m
Step Height	320 mm	380 mm
Laden Weight Front	6 tonnes	
Laden Weight Rear	13 tonnes	
Wheelbase	5.33 m	7.30 m
Front Overhang	2.3 m	2.7 m
Rear Overhang	3.05 m	3.25 m
Clearance from Road Surface	140 mm	300 mm
Angle of Approach to Kerb		7°
Angle of Departure from Kerb		6.5°

The following vehicle specification sheets are taken from STA's internet website (www.sydneybuses.nsw.gov.au). As new bus types enter the fleet, for instance the new Mercedes low-floor buses with wheelchair ramps which start arriving in late 1999, they will also be added to the website.

MERCEDES BENZ

Chassis Model: 0305
Body Make: PMC
Body Model: GALVASTRESS
Total No: 353 STA Class: Mk4
Fleet Nos: 2728–3070: 3072–3080: 3082
Seats: 43 **Standing:** 27
Total Capacity: 70
Placed in Traffic: 1984–87

GENERAL SPECIFICATION:

Length (mm)	10750
Width (mm)	2500
Height (mm)	3050
Weight unladen Front (kg)	2950
Weight unladen Rear (kg)	5950
Weight laden Front (kg)	6000
Weight laden Rear (kg)	10000
Wheelbase (mm)	5330
Overhang Front (mm)	2370
Overhang Rear (mm)	3050
Turning Circle Wall/Wall (mm)	19300
Turning Circle Kerb/Kerb (mm)	—
Door Opening Front (mm)	1150
Door Opening Rear (mm)	1150
Step height 1 Front/Rear (mm)	350/340
Step height 2 Front/Rear (mm)	225/250
Step height 3 Front/Rear (mm)	180/180
Ceiling height Front/Rear (mm)	2130/1860
Floor height Entry (mm)	750
Floor height Centre Door (mm)	770

BODY:

Construction	Galvastress
Windows	Sliding

BRAKES:

Type	Air & Hydr. Retarder
Handbrake	Spring

ELECTRICAL:

Alternator	Bosch
Voltage (V)	24
Amps (A)	120
Interior lighting	Fluorescent
Destination Equipment	Mechanical

SUSPENSION:

Type	Air Bellows
Tyre Size	11R22.5
Tyre Press Front (kPa)	760
Tyre Press Rear (kPa)	660
Fitted with Kneeling	No
Fitted \With Suspension lift	No

CAPACITIES (ltr):

Fuel	250
Engine Oil	24.5
Gearbox	20
Differential	7.5
Power steering	8.5
Coolant	55

ENGINE:

Type	OM 407 h
Position	Rear Underfloor
Capacity (ltr)	11412
No. Cylinders	6
Compression Ratio	16.5
Bore (mm)	125
Stroke (mm)	155
Max kW (DIN) at (RPM)	147/2200
Max Torque (Nm) at (RPM)	716/1400
Max Gov. speed (RPM)	2200
Fuel Pump	Bosch
Injectors	Bosch

TRANSMISSION:

Type	W3DO80/2.2R
Ist with Torque converter	5.95/13
Ist Ratio/Road speed	2.12/35
2nd Ratio/Road speed	1.35/55
3rd Ratio/Road speed	1/75
Reverse Ratio	2.23
Rear Axle Type	H07/8DL/10
Final Drive Ratio	5.9

(http://www.sydneybuses.nsw.gov.au/sb.bus05.html)

MAN

Chassis Model: SL202–VOITH
Body Make: PMC
Body Model: GALVASTRESS
Total No: 30
STA Class: MAN
Fleet Nos: 3253–3282:
Seats: 43 **Standing:** 27
Total Capacity: 70
Placed in Traffic: 1989

GENERAL SPECIFICATION:

Length (mm)	11103
Width (mm)	2500
Height (mm)	3050
Weight unladen Front (kg)	3300 Approx.
Weight unladen Rear (kg)	6300 Approx.
Weight laden Front (kg)	6000
Weight laden Rear (kg)	10000
Wheelbase (mm)	5333
Overhang Front (mm)	2610
Overhang Rear (mm)	3160
Turning Circle Wall/Wall (mm)	20300
Turning Circle Kerb/Kerb (mm)	—
Door Opening Front (mm)	1150
Door Opening Rear (mm)	1150
Step height 1 Front/Rear (mm)	320/280
Step height 2 Front/Rear (mm)	230/240
Step height 3 Front/Rear (mm)	200/220
Ceiling height Front/Rear (mm)	2120/1860
Floor height Entry (mm)	790
Floor height Centre Door (mm)	790

BODY:

Construction	Galvastress
Windows	Sliding

BRAKES:

Type	MAN S-cam
Handbrake	Maxi spring brake

ELECTRICAL:

Alternator	Bosch
Voltage (V)	28V
Amps (A)	120
Interior lighting	Fluorescent
Destination Equipment	Mechanical

SUSPENSION:

Type	MAN airbag
Tyre Size	11R22.5
Tyre Press Front (kPa)	760
Tyre Press Rear (kPa)	660
Fitted with Kneeling	No
Fitted with Suspension lift	No

CAPACITIES (ltr):

Fuel	300
Engine Oil	25
Gearbox	25
Differential	14.5
Power steering	3.5
Coolant Approx	.38

ENGINE: MAN

Type	D2566 UH
Position	Rear underfloor
Capacity (ltr)	11.413
No. Cylinders	6
Compression Ratio	17.5: 1
Bore (mm)	125
Stroke (mm)	155
Max kW (DIN) at (RPM)	155 @ 2200
Max Torque (Nm) at (RPM)	740 @ 1400
Max Gov. speed (RPM)	2200
Fuel Pump	Bosch
Injectors	Bosch

TRANSMISSION:

Type	VOITH-D851.2
1st Ratio/Road speed	5.8/14
2nd Ratio/Road speed	1.43/57
3rd Ratio/Road speed	1.0/82
Reverse Ratio	4.7
Rear Axle Type	MAN 1080
Final Drive Ratio	5.22

(http://www.sydneybuses.nsw.gov.au/sb.bus13.html)

SCANIA LOW FLOOR BUS

Chassis Model: L113CRL
Body Make: Ansair
Body Model: Orana
Total No: 51
STA Class: SL1
Fleet Nos: 3692–3712; 3717–3746:
Seats: 45 **Standing:** 15
Total Capacity: 60
Placed in Traffic: 1996

GENERAL SPECIFICATION:

Length (mm)	12355
Width(mm)	2500
Height (mm)	3287
Weight unladen Front (kg)	3500
Weight unladen Rear (kg)	7540
Weight laden Front (kg)	6000
Weight laden Rear (kg)	10000
Wheelbase (mm)	6405
Overhang Front (mm)	2700
Overhang Rear (mm)	3250
Turning Circle Wall/Wall (mm)	25700
Turning Circle Kerb/Kerb (mm)	22250
Door Opening Front (mm)	1350
Door Opening Rear (mm)	1150
Step height 1 Front/Rear (mm)	320/320
Step height 2 Front/Rear (mm)	N/A
Step height 3 Front/Rear (mm)	N/A
Ceiling height Front/Rear (mm)	2530/1894
Floor height Entry (mm)	390
Floor height Centre Door (mm)	390

BODY:

Construction	Steel Tube
Windows	Fixed
Saloon Ventilation	Air-conditioned

BRAKES:

Type	Air & Hydr. Retarder
Handbrake	Spring

ELECTRICAL:

Alternator	Bosch
Voltage (V)	24
Amps (A)	120
Interior lighting	Fluorescent
Destination Equipment	Stone McColl

(http://www.sydneybuses.nsw.gov.au/sb.bus24.html)

SUSPENSION:

Type	Air Bellows
Tyre Size	275/70R22.5
Tyre Press Front (kPa)	760
Tyre Press Rear (kPa)	660
Fitted with Kneeling	Yes
Fitted with Suspension lift	Yes

CAPACITIES (ltr):

Fuel	236
Engine Oil	25
Gearbox	30
Differential	11
Power steering	3.8
Coolant	47

ENGINE:

Type	DSC 11–24(EURO 2)
Position	Rear underfloor
Capacity (ltr)	11.02
No. Cylinders	6
Compression Ratio	16:1
Bore (mm)	127
Stroke (mm)	145
Max kW (DIN) at (RPM)	191/1400–1800
Max Torque (Nm) at (RPM)	1315/1350
Max Gov. speed (RPM)	1900
Fuel Pump	Bosch
Injectors	Bosch
Speed Limiter	Yes
Electronic Diesel Control	Yes

TRANSMISSION:

Type	ZF–5HP600
1st Ratio/Road speed	3.43/26
2nd Ratio/Road speed	2.01/45
3rd Ratio/Road speed	1.42/64
4th Ratio/Road speed	1.00/91
5th Ratio/Road speed	0.83/109
Reverse Ratio	4.84:1
Rear Axle Type	SpiralBev.SingleRed.
Final Drive Ratio	3.80:1
Max speed with speed lim	.80 kph

Note: 3695,3712 = 35 + 4 tipup + 22 Standing + Wheelchair ramp at Centre Door.

MERCEDES BENZ

Chassis Model: 0405
Body Make: PMC
Body Model: PMC 160 Coach
Total No: 5
STA Class: Mk6
Fleet Nos: 3394–3398:
Seats: 49 **Standing:** 0
Total Capacity: 49
Placed in Traffic: 1990–91

GENERAL SPECIFICATION:

Length (mm)	11700
Width (mm)	2500
Height (mm)	3155/3345 (A/C)
Weight unladen Front (kg)	3450 Approx.
Weight unladen Rear (kg)	6450 Approx.
Weight laden Front (kg)	6000
Weight laden Rear (kg)	10000
Wheelbase (mm)	5875
Overhang Front (mm)	2670
Overhang Rear (mm)	3155
Turning Circle Wall/Wall (mm)	21300
Turning Circle Kerb/Kerb (mm)	—
Door Opening Front (mm)	1080
Door Opening Rear (mm)	N/A
Step height 1 Front/Rear (mm)	380/N/A
Step height 2 Front/Rear (mm)	210/N/A
Step height 3 Front/Rear (mm)	195/N/A
Ceiling height Front/Rear (mm)	2300/2050
Floor height Entry (mm)	785
Floor height Centre Door (mm)	N/A

BODY:

Construction	PMC 160
Windows	Fixed
Saloon Ventilation	Air-conditioned

BRAKES:

Type	Air & Hydr. Retarder
Handbrake	Spring

ELECTRICAL:

Alternator	Bosch
Voltage (V)	24
Amps (A)	120
Interior lighting	Fluorescent
Destination Equipment	None

SUSPENSION:

Type	Air Bellow
Tyre Size	11R22.5
Tyre Press Front (kPa)	760
Tyre Press Rear (kPa)	660
Fitted with Kneeling	Yes
Fitted with Suspension lift	No

CAPACITIES (ltr):

Fuel	240
Engine Oil	24.5
Gearbox	26.5
Differential	7.5
Power steering	8.5
Coolant	76

ENGINE:

Type	OM 447 h
Position	Rear Underfloor
Capacity (ltr)	11.967
No. Cylinders	6
Compression Ratio	16.5
Bore (mm)	128
Stroke (mm)	155
Max kW (DIN) at (RPM)	184/2200
Max Torque (Nm) at (RPM)	890/1300
Max Gov. speed (RPM)	2200
Fuel Pump	Bosch
Injectors	Bosch

TRANSMISSION:

Type	W3E110/2.2R
Ist Wth Torque converter	5.95/16
Ist Ratio/Road speed	2.12/46
2nd Ratio/Road speed	1.35/71
3rd Ratio/Road speed	1/97
Reverse Ratio	2.23
Rear Axle Type	H07–9DL–10
Final Drive Ratio	4.57

(http://www.sydneybuses.nsw.gov.au/sb.bus19.html)

SCANIA 14.5m BUS

Chassis Model: L113TRBL
Body Make: Ansair
Body Model: Orana
Total No: 50
STA Class: S1
Fleet Nos: 3411–3460:
Seats: 61 **Standing:** 34
Total Capacity: 95
Placed in Traffic: 1993–94

GENERAL SPECIFICATION:

Length (mm)	14500
Width (mm)	2500
Height (mm)	3300
Weight unladen Front (kg)	3600
Weight unladen Rear (kg)	9100
Weight laden Front (kg)	6000
Weight laden Rear (kg)	13000
Wheelbase (mm)	7300/1275
Overhang Front (mm)	2700
Overhang Rear (mm)	3225
Turning Circle Wall/Wall (mm)	26000
Turning Circle Kerb/Kerb (mm)	24640
Door Opening Front (mm)	1300
Door Opening Rear (mm)	1100
Step height 1 Front/Rear (mm)	380/400
Step height 2 Front/Rear (mm)	160/240
Step height 3 Front/Rear (mm)	160/250
Ceiling height Front/Rear (mm)	2230/1910
Floor height Entry (mm)	700
Floor height Centre Door (mm)	890

BODY:

Construction	Steel Tube
Windows	Fixed
Saloon Ventilation	Air-conditioned

BRAKES:

Type	Air & Hydr. Retarder
Handbrake	Spring

ELECTRICAL:

Alternator	Bosch
Voltage (V)	24
Amps (A)	120
Interior lighting	Fluorescent
Destination Equipment	Stone McColl/Alcatel

SUSPENSION:

Type	Air Bellows
Tyre Size	11.00R22.5
Tyre Press Front (kPa)	760
Tyre Press Rear (kPa)	660
Fitted with Kneeling	Yes
Fitted with Suspension lift	Yes

CAPACITIES (ltr):

Fuel	330
Engine Oil	25
Gearbox	30
Differential	11
Power steering	8
Coolant	47

ENGINE:

Type	DS1134 (EURO 2)
Position	Rear Underfloor
Capacity (ltr)	11.02
No. Cylinders	6
Compression Ratio	16:1
Bore (mm)	127
Stroke (mm)	145
Max kW (DIN) at (RPM)	228/2000
Max Torque (Nm) at (RPM)	1335/1100
Max Gov. speed (RPM)	2000
Fuel Pump	Bosch
Injectors	Bosch

TRANSMISSION:

Make/Type	ZF–5HP600
1st Ratio/Road speed	3.43/24
2nd Ratio/Road speed	2.01/41
3rd Ratio/Road speed	1.42/58
4th Ratio/Road speed	1.00/82
5th Ratio/Road speed	0.83/99
Reverse Ratio	4.84:1
Rear Axle Type	SpiralBev.SingleRed.
Final Drive Ratio	4.86:1
Max speed with speed lim	80 kph

(http://www.sydneybuses.nsw.gov.au/sb.bus21.html)

MERCEDES BENZ – ARTICULATED

Chassis Model: 0305G
Body Make: PMC
Body Model: GALVASTRESS
Total No: 30
STA Class: G1
Fleet Nos: 2550–2579
Seats: 69 **Standing:** 45
Total Capacity: 114
Placed in Traffic: 1981–84

GENERAL SPECIFICATION:

Length (mm)	17300
Width (mm)	2500
Height (mm)	2955
Weight unladen Front (kg)	3000 Approx.
Weight unladen Rear (kg)	10500 Approx.
Weight laden Front (kg)	6000
Weight laden Rear (kg)	10000
Wheelbase Front/Rear (mm)	5600/6150
Overhang Front (mm)	2500
Overhang Rear (mm)	3050
Turning Circle Wall/ Wall (mm)	26000 Approx
Turning Circle Kerb/Kerb (mm)	—
Door Opening Front (mm)	1150
Door Opening Rear (mm)	1150
Step height 1 Front/Rear (mm)	370/320
Step height 2 Front/Rear (mm)	210/260
Step height 3 Front/Rear (mm)	250/230
Ceiling height Front/Rear (mm)	2080/1860
Floor height Entry (mm)	830
Floor height Centre Door (mm)	810

BODY:

Construction	Galvastress
Windows	Sliding

BRAKES:

Type	Air & Hydr. Retarder
Handbrake	Spring

ELECTRICAL:

Alternator	Bosch
Voltage (V)	24
Amps (A)	120
Interior lighting	Fluorescent
Destination Equipment	Mechanical

SUSPENSION:

Type	Air Bellow
Tyre Size	11R22.5
Tyre Press Front (kPa)	760
Tyre Press Rear (kPa)	660
Fitted with Kneeling	No
Fitted With Suspension lift	No

CAPACITIES (ltr):

Fuel	250
Engine Oil	24.5
Gearbox	20
Differential	7.5
Power steering	8.5
Coolant	55

ENGINE:

Type	OM 407hA
Position	Rear Underfloor
Capacity (Ltr)	11412
No. Cylinders	6
Compression Ratio	16.5
Bore (mm)	125
Stroke (mm)	155
Max kW (DIN) at (RPM)	206/2200
Max Torque (Nm) at (RPM)	1079/1300
Max Gov. speed (RPM)	2200
Fuel Pump	Bosch
Injectors	Bosch

TRANSMISSION:

Type	W3A110/2.2R
Ist with Torque converter	5.95/13
Ist Ratio/Road speed	2.12/35
2nd Ratio/Road speed	1.35/55
3rd Ratio/Road speed	1/75
Reverse Ratio	2.23
Rear Axle Type	H07/8DL/10
Final Drive Ratio	5.9

(http://www.sydneybuses.nsw.gov.au/sb.bus04.html)

3. Bus Stop Design Elements

Table 3.1 summarises design elements for bus stops. The table identifies the element, its function, options for its provision, comments on application or special circumstances, and specific design requirements.

The design requirements are based on existing standards and guidelines related to bus stop and traffic facilities, modified to reflect STA operations.

Table 3.2 identifies and discusses emerging technologies and special applications for people with disabilities. Best practice should always be considered. While emerging technologies are under trial, no standards have yet been adopted. The design guide should be updated as standards and guidelines for emerging technologies and special applications for people with disabilities are adopted.

Table 3.3 summarises bus stop space requirements based on bus flows during peak operations.

Table 3.1: Design Elements

Element	Function	Options	Comments	Design Requirements
Bus Zone	Clear area in which only buses may stop to load and unload passengers	Kerbside Bus Zone	Most common passenger facility	Sufficient space for bus numbers and lengths, incorporating approach and departure distance. See ***Table 3.3***, and **Figures 1, 2 & 3**. Disability Discrimination Act requires that a bus be close to and parallel to the kerb when stopped, so that special boarding and alighting features and facilities can be used. Generally located on departure side of intersection or pedestrian crossing, but should relate to passenger destinations and pedestrian facilities. Where stop must be located on approach side of signalised intersection with pedestrian crossing, then bus zone should be located 9 m clear of the crossing or stop line.
		Indented Bus Bay	Used in high speed traffic environments, (>60 km/h), or where high occupancy lanes in operation (bus lanes or transit lanes), more than 10 buses and 40 passenger boardings per hour. Should not be used where traffic in adjacent lane delays buses leaving stop.	Bus to be fully out of traffic stream. Dimensions in **Figure 2**. In high speed traffic environments, acceleration and deceleration tapers are required. They are calculated on the basis of the adjacent road's speed limit.
		Open Bus Bay	Variant of indented bus bay. Used at intersections – allows bus to drive straight into, or out of, bay. Can be used as part of bus priority measures (such as a queue jump).	See **Figure 2**.
		Bus Stop Blister	Kerb extension for length of bus stop. Used in areas with extensive kerbside parking. Does not require draw in and draw out length, but stopped bus blocks travelling lane. Reduces delay for buses using stop. Should be used where bus numbers are high and where loss of kerbside parking needs to be minimised. Can provide for turning traffic clear of bus lanes. Can be used as a traffic calming device (unless delay is onerous to other buses and general traffic). Suitable for CBD applications in association with bus lanes.	See **Figure 2**.
Kerb	To allow for loading and unloading of bus passengers.	Standard kerb, kerb only	Buses are designed to use a kerb at bus stops. A standard kerb should be used. Roll top kerb must not be used. Kerb height must allow for standard bus with 300 mm step height to sweep across kerb. Local Government should seek compliance with the Disability Discrimination Act.	See **Figure 5**. 150 mm kerb height coordinates with kneeling and hoist bus and is a DDA requirement based on ramp angles: if the kerb is too low, the ramp may be too steep. At a bus stop, kerbs should be straight, not curved, to allow buses to pull-up parallel to the kerb and thereby minimise the gap between the bus and kerb, for both doors.

Element	Function	Options	Comments	Design Requirements
Pavement	Road surface in bus zone	Bitumen (AC), treated bitumen (Salivisal or similar), or reinforced concrete.	Concrete pad or treated bitumen preferred at terminal stops, where buses wait for long periods, or at transfer stops. This is to minimise damage to roadway or decay of road surface due to chemical action of bus fuel.	The RTA suggests that typical crossfalls range between 2% to 4%, but that local increases to 6% are acceptable in extreme cases. Where a bus bay is used, it should slope downwards towards the edge of the actual roadway.
Footpath	Provide access to and from stop, and allow for pedestrian movement around waiting and loading bus passengers.	Any all-weather non-slip hardstand surface	Minimise gradients and crossfalls; sealed path from bus stop to nearest existing path as a minimum and DDA design requirement; provide for waiting passengers and passing pedestrians. Consider also the need for kerb ramps at nearby intersections.	See **Figure 5**. Desirable minimum widths: Residential areas – 1200mm; 1500mm in retail/commercial areas (preferred minimum 2500mm). Crossfall: maximum 1:40, preferred 1:100. Gradient: maximum 1:12, preferred 1:20. A hardstand surface should be used to ensure that wheelchair users and pram users are able to manoeuvre easily to and from the stop and from the waiting area to the bus.
Bus Zone Signs	Dimension bus zone for bus operations and enforcement	Bus Zone signs; road markings	On-road markings being tested by RTA. Use in circumstances where standard signage is not effective in keeping bus stop clear of illegal use – particularly city centre and town centre stops.	Bus Zone sign dimensions and format are described in AS1742.11 (1989). This Standard also covers bus zone on-road markings (including linemarking and painted text).
Stop Identification Sign	Identifies bus stop and bus stopping location for driver; identifies bus stop for passengers; provides information on all relevant route numbers, service types, and popular destinations.	Tombstone plate in combination with inverted J or inverted U pole. Plate can be mounted on shelter in special circumstances (such as to reduce number of poles in footpath).	Important system identification for passengers and drivers: tells our customers where to find our service. Stop identification signs should be used at all bus stops. Black lettering on yellow field for all services except special services (Airport Express, Explorer, Nightrider). The inverted J-pole is used for standard, part-time, and setdown only stops, so it is the most commonly used type of pole. The inverted U-pole is recommended where a variety of passenger information is explained, such as at interchanges, special service stops, and termini.	Dimension of plate and inverted J pole in **Figure 6a**, and for inverted U-pole in **Figure 6b**. Tombstone plate should have reflective yellow field, with black lettering featuring bus and passenger logo. Route numbers and section numbers, and destination for some routes, can share pole. Located min 4 metres from head of bus zone where departure clearance space is required. Min 400mm from kerbface. Where sign is to be incorporated into a shelter, the shelter should be located such that the head of the shelter coincides with the proposed location of the stop identification sign. Maximum height of pole: 2800mm. Minimum clear height under bottom of plate: 2100mm. Inverted J pole to be used at all stops but higher order stops. Inverted U pole to be used at higher order stops (terminus, CBD stops, transfer stops). Inverted U pole should have block or bar joining legs at ground level to warn visually impaired people.
Bus Shelter	Protect waiting passengers from rain, wind, and sun, while allowing them to see approaching bus	Many types of shelters may be used, as long as they satisfy the design requirements and serve their necessary function.	Use at stops where more than 25 passengers board per day, or where passengers transfer between buses, or where bus are frequent. Bus shelters are the most visible permanent indicators of the presence of a bus service. Located to provide effective shelter, enhance perceptions of personal safety and allow occupants to see approaching bus. Shelter should incorporate seating, space for wheelchair/ pram, lighting, and transport information, on a hardstand ground surface.	See **Figures 4 & 5** for dimensions and design requirements. Minimum 1500mm wide. Minimum height under awning 2100mm. Desirable maximum height for standalone shelters 2400mm to provide effective shelter. Location min1200mm on approach side of bus stop identification sign. Where identification sign is to be incorporated into the shelter, see *"Stop Identification sign"* above. Minimum set-back from kerb – 600mm to edge of awning, but should be increased where there are steep approach and departure angles to the stop. Standard alignment – front of shelter to street. Consider reversing shelter where west-facing (for sun protection) or south-east facing (wind and rain), but ensure maximum visibility of approaching buses, and passive security.

Element	Function	Options	Comments	Design Requirements
Bus Shelter (cont'd)			Should be constructed of vandal-resistant materials and consist of roof, back and at least one side panel. Glazed panels are preferred to mesh for its superior shelter and transparent qualities. Side and rear panels should not extend to ground (see **Figure 5**), to allow for cleaning.	Design requirements should be secondary to function in shelter design. Extend awning when located in unprotected north-facing aspect. Where advertising panel is used for wall element, this should be located on departure side of shelter. When constructed on an island in a traffic situation, protection of the rear of the shelter is required by barrier and set-back.
			Should be connected to a pedestrian footpath to provide an accessible path of travel.	The design of continuous shelters for interchanges and terminals should be subject to a specific design and review process.
Seating	Place to sit, for waiting passengers	Seats may be incorporated into shelters, or stand alone; Bench or individual; made of timber, metal, plastics.	Seats are generally required at pick-up stops, as close as possible to head of bus stop (bus stop identification sign). Number of seats in response to demand and waiting times. Bench seat preferred for versatility of use. Avoid sharp edges and mesh surfaces. Non-flammable material (metal) preferred to timber. Seating material should be strong, easy to clean, quick drying (in exposed positions), and not get too hot/cold under adverse weather conditions.	Seating in shelters should be located at rear of shelter. Seat dimensions shown in **Figure 5**. An area under shelter but free of seating needs to be provided for wheelchairs and prams.
Lighting	Illuminate bus stop to identify stop and provide security for waiting passengers.	Mains or solar powered.	Avoid strong variations in lighting so as to avoid shadows. Illuminate to allow people to see the way to and from stop, and to allow passenger at stop to identify approaching person at sufficient distance to allow evasive action. Allow passenger at stop to read transport information. Lighting should also be provided within a shelter also.	Illumination area at stops shown in **Figure 4**. Illuminate to 300 lux in shelters or at transport information points. Streetside illumination to 200 lux.
Telephone	Ancillary facility to improve security and convenience for waiting passengers	At stop, or near stop.	Telephone should be located near higher-order stops in most circumstances. Phone can be incorporated into shelter design at major stops.	See **Figure 5** for design guideline for a telephone installed within a bus shelter.
Other Street Furniture			Location of street furniture should allow for clear access to loading and unloading points, and access routes to bus stop.	Locate away from shelter to maintain clear space at loading and unloading points and accesses (see **Figure 4**).
Transport Information	Provide passenger information on bus route, present location, bus departure times and route network. Reassurance for waiting passengers.	Bus stop timetable	A3 or A4 case(s) attached to inverted J or inverted U pole (see **Figure 6**). Shows bus stopping times at that particular stop. Should include route map on reverse. Not required at "set-down only" stops. If mounted in shelter, transport information displays should not be located over seating.	A3 case used at multiple route stops. Attach to inverted J/U pole at 1350mm from ground. Can be attached to shelter if bus stop sign not on pole. If mounted in shelter, then timetable and route map should be on same side of display case (ie A3 case). Use standard STA case (see **Figure 7**). At a minimum, the timetable should be illuminated by street lighting.

Element	Function	Options	Comments	Design Requirements
Transport Information (cont'd)		Destination Guide	A3 size sheets showing all significant destinations served by the routes serving that stop. Should be provided at all multiple route stops.	
		STA Route map	A4 or A3. Should be provided at all pick up stops. Should show bus route, including section numbers and identify cross-streets and important destinations. At multiple-route stops, this information should be incorporated into the Destination Guide.	See "Bus stop timetable" above. Title of map to include route number, route description, and region name. Map can be in black and white or in colour. Do not overlay route onto street directory map, because for long routes the scale may be too large for street names to be legible.
		Network Map	A1 format STA network map (840x610mm) to fit A1 metal and perspex case.	Provide at higher-order stops, transfer stops and in CBD where shelter is provided. Mount inside shelter on back or side panel, but not above seating.
		Chronological Display	Use at terminal stops or ranks with number of different bus routes serving it. Display should list scheduled bus departures in chronological order and be combined with a system map.	Provided in free-standing case A1 or larger, or on wall-space in central location in long bus zone. Very frequent services can refer to standard gap, rather than list all departure times.
		Locality Map	To provide "you are here" information relating to stops and nearby destinations in major centres. At locations with large populations having English as second language, consider using pictograms, symbols and landmarks, or a language in addition to English (except where there are multiple languages).	Can be incorporated into A4 or A3 timetable case at stop, or into shelter where appropriate. Translation to be provided by local authority. Visual appearance to be consistent.
Temporary Information	Display of information for a short period of time	Laminated posters, confoam boards, etc.	Temporary information should replace permanent information, and be displayed in the relevant display cases.	Design of temporary information should follow specifications for permanent information, except printed material which can be shown in black and white.
		Temporary bus stop identification sign	In the case of a bus stop requiring a new temporary position (for example, due to roadworks), a temporary bus stop identification sign should be located at the new position.	An inverted J-pole or inverted U-pole, mounted on a solid circular concrete block may be used. Should ensure that it is not easily tipped over. Yellow or white paint should be used around the outer edge of the block and on its sides to alert visually-impaired people.
				Design of temporary information should follow specifications for permanent information, except printed material which can be shown in black and white.
		Bus stop Not in Use	If the identification has not been removed, the normal tombstone should be replaced with a "Bus Stop not in use" tombstone.	"Bus Stop not in use" tombstone should be white with black text reading "Bus Stop not in use". Information directing passengers to an alternative stop should be put in a display case attached to the sign pole.
General Information Format	Font type and size		The font style used should provide easy readability for all customers, and should be consistent. Do not use font with serifs. Recommended font is Helvetica Condensed.	The minimum letter height for each information element on bus stop identifiers should be as follows: Section number – 75mm, Service type – 50mm, Route numbers and description – 20mm. For other information such as timetables and maps – 2.5mm.

Table 3.2: Emerging Technology and Disability Applications

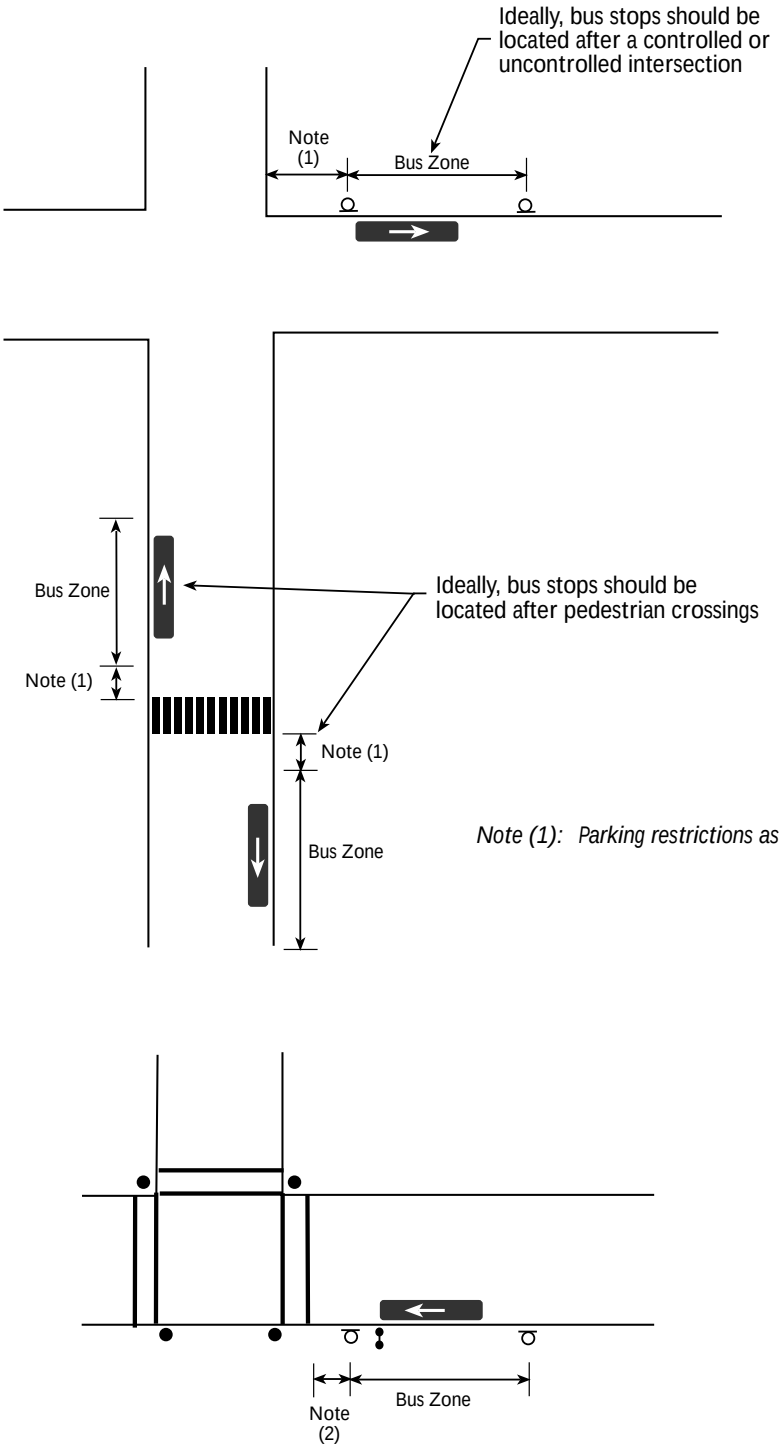
Element	Function	Options	Comments	Design Requirements
Elements to be considered in future bus stops	Advanced passenger information services	Real Time Information Information	Variable message sign, usually LED. Provides "real" – as opposed to "scheduled" information on bus arrival and departure times. For use at major stops, or stops on busy bus corridors. Identifies bus route number and time until arrival at stop, and can also deliver information on cancellation or delays. Real time information has been trialled at Airport Express stops and elsewhere in Australia. Display can be incorporated into bus shelter or on bus stop signpost.	Site to avoid direct light on display, but to be visible to waiting passengers. Various hardware and software options are under trial. No standard real time information system adopted yet.
		Audio Information	Aids visually impaired users. Provides information on bus arrival and departure time and can also deliver information on cancellations or delays. For use at stops with a high proportion of visually impaired users. Current units respond to customer request (by button press).	
		Tactile Information	Aids visually impaired users. Can be incorporated into bus stop information panels, or by using four sided information case with Braille panel. Can also be in the form of paving – as tactile tiles – to warn visually impaired users of sharp changes in grade or other obstructions, and to guide visually impaired users to boarding point or other facilities.	Ideal height range is between 1400 and 1700mm from the floor, with a horizontal stretching distance of 500mm (APTI 1994). Should be used with discretion and only in key locations – refer to *AS 1428.4–1992 – Design for Access and Mobility: Part 4: Tactile ground surface indicators for the orientation of people with vision impairments;* non-slip surface required; requires regular cleaning to remove debris caught on the tiles; contrasting colour.

Table 3.3: Minimum Bus Stop Requirements (Based on 20–30 Second Stop Dwell Time)

Buses Passing Stop in Busiest Hour	Number of Bus Spaces in Stop
15	1
30	1–2
45	2
60	2–3
75	3
90	3–4
105	3–4
120	3–5
150	4–5
180	5–6

Source: TCRP Report 19. Guidelines for the Location and Design of Bus Stops

Note: Space requirements for buses at stops depends on operational, ticketing and scheduling aspects of the bus service. The above table is based on a Poisson (random) arrival rate. In Sydney scheduling and operational circumstances often combine to impose a requirement for up to 50 per cent more bus stop space.

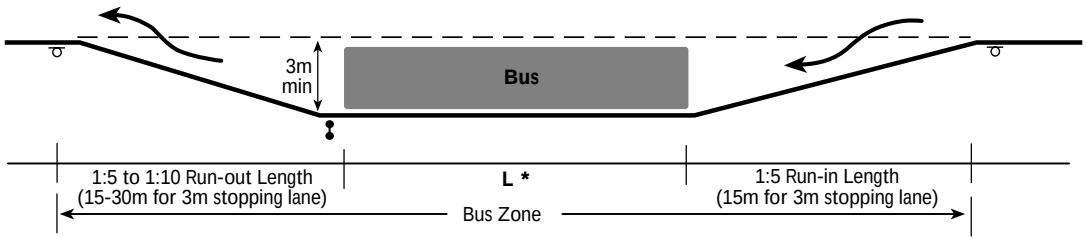


Note (1): Parking restrictions as per AS1742.10

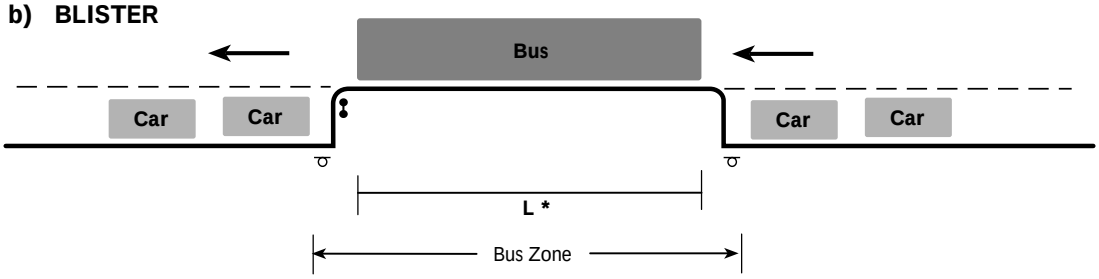
Note (2): Generally, parking restrictions as per AS1742.10 guidelines. In Sydney CBD, a "NO STOPPING" zone of 9 metres minimum can apply.

Figure 1
Locating Bus Zones in the Vicinity of Intersections and Pedestrian Crossings

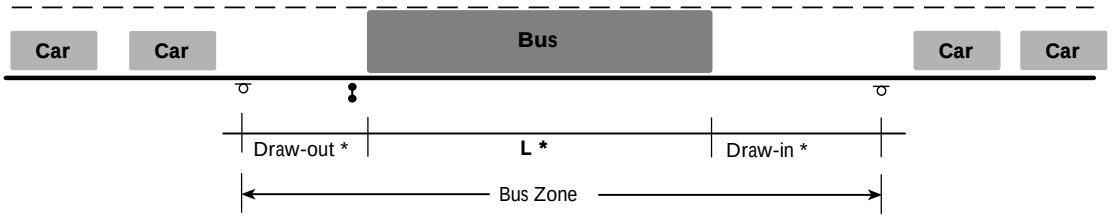
a) BUS BAY



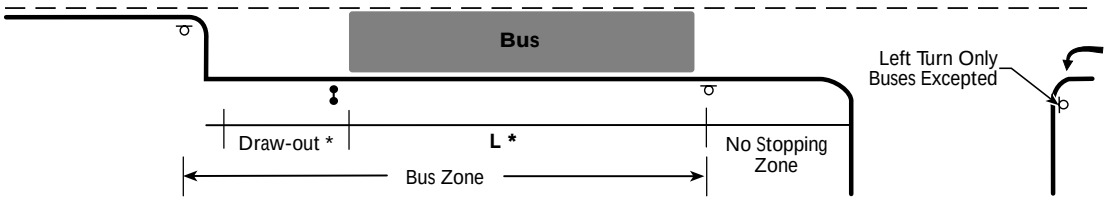
b) BLISTER



c) KERBSIDE

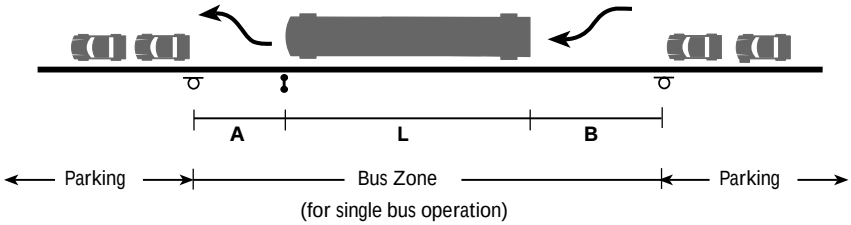


d) OPEN BUS BAY

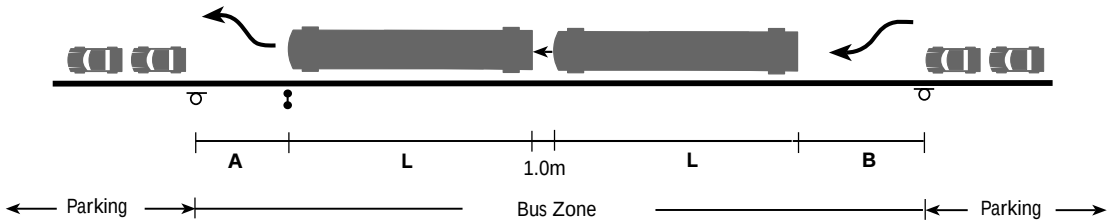


** Note: See table in Figure 3.*
L = Bus length

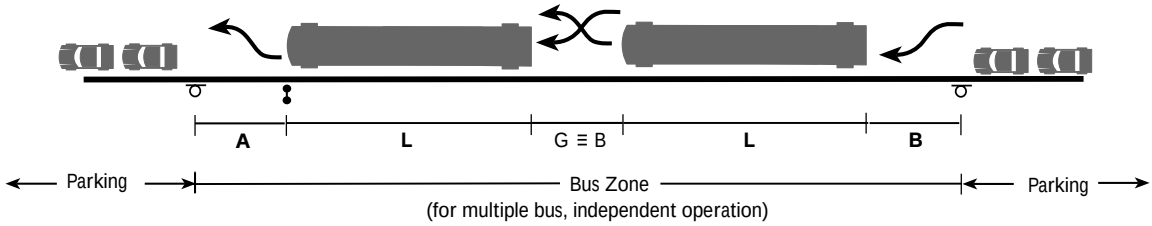
Figure 2
Bus Zone Types



(for single bus operation)



(for multiple bus, nose-to-tail operation)



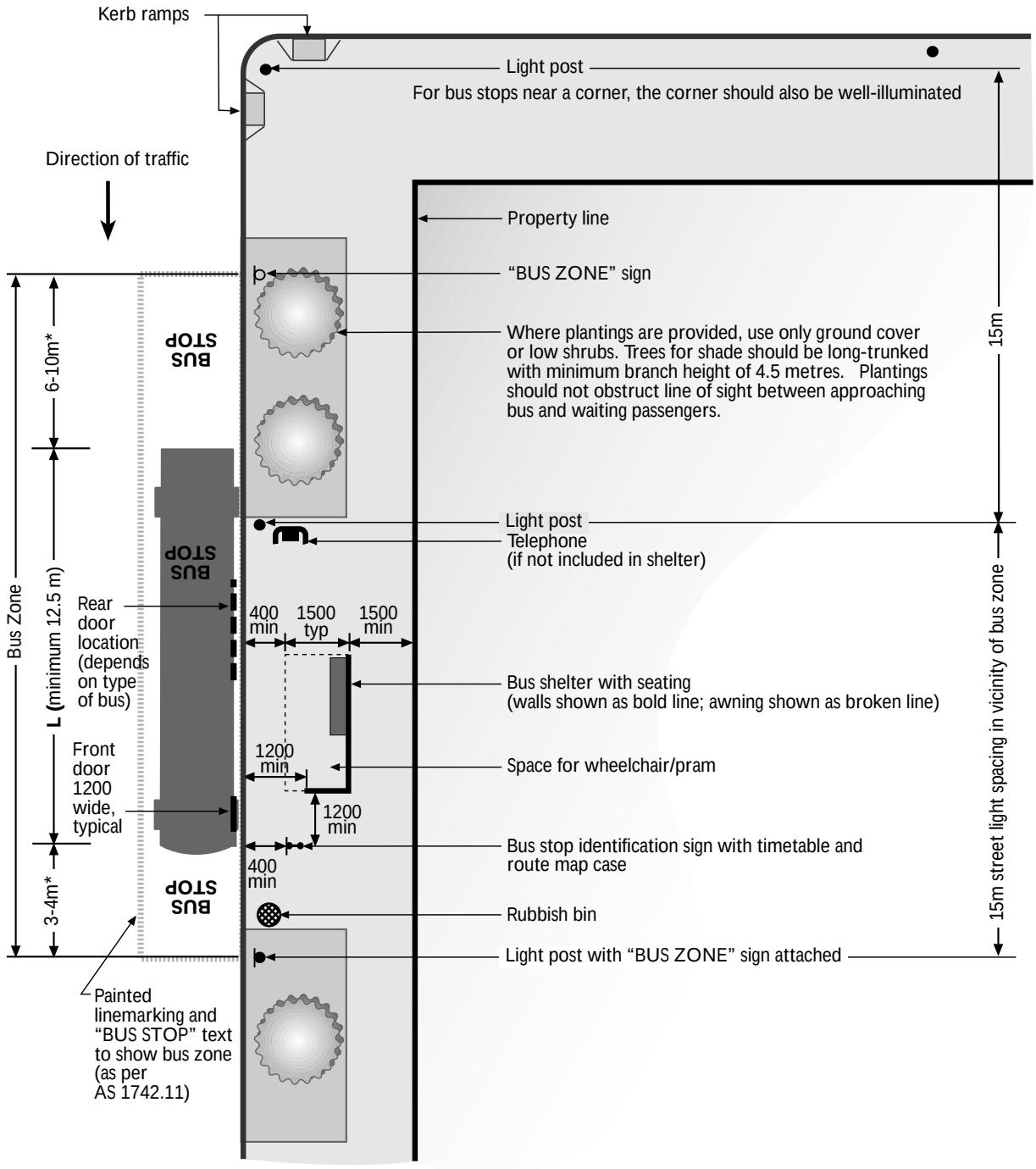
(for multiple bus, independent operation)

Bay Dimensions (m)	Midi	Design Bus	Long	Articulated
L = length of bus	9.0	12.5	14.5	17.5
A = minimum draw out length *	3.0	4.0	4.0	4.0
B = minimum draw in length	6.0	6.0	8.0	10.0
G = minimum gap for independent operation	6.0	6.0	8.0	10.0

*Note: * When located on-street close to an intersection, the statutory no-standing distances may be substituted for dimensions A or B for bus stops on the immediate approach and departure side of the intersection respectively.*

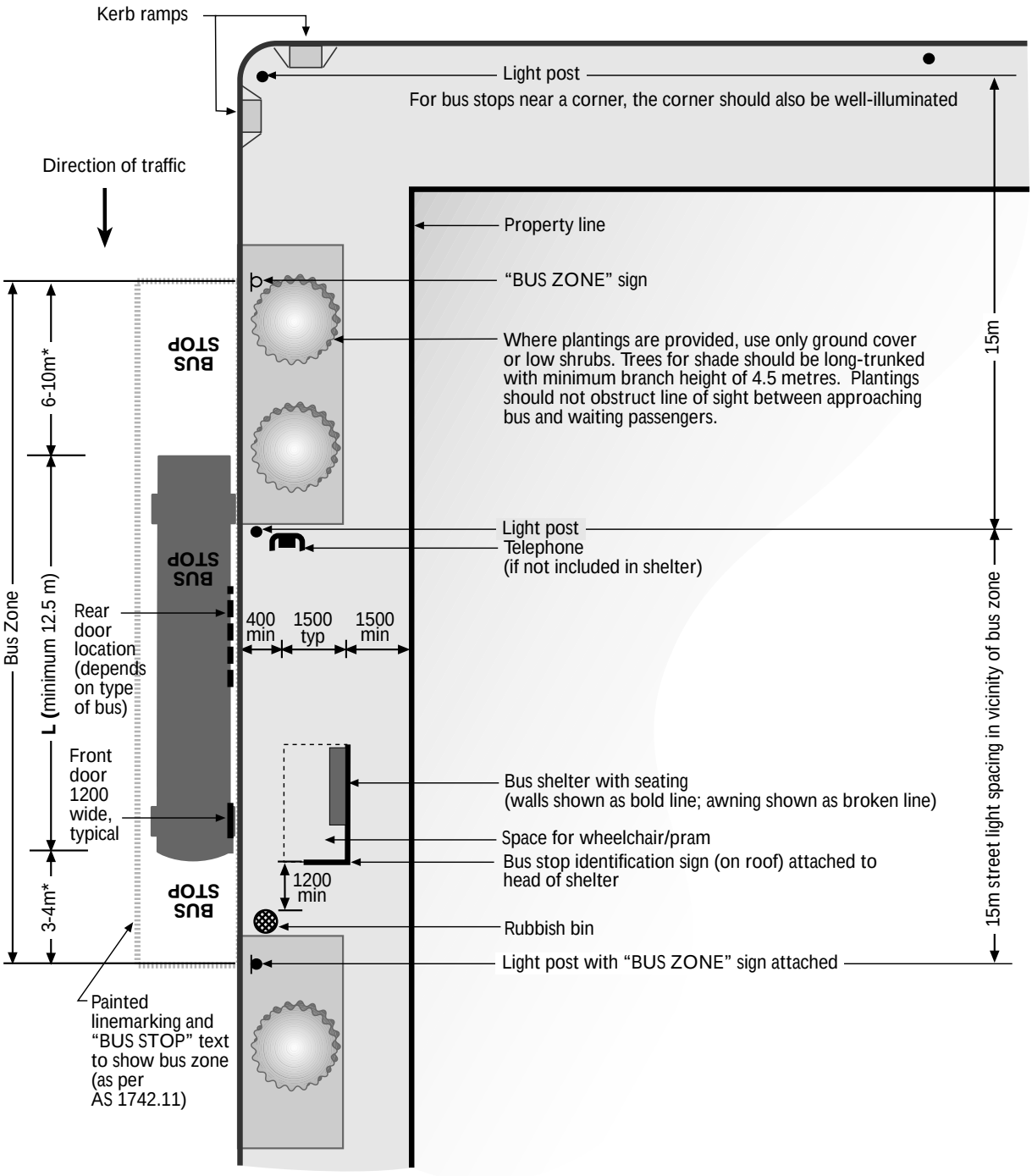
Design for Midi buses only in exceptional circumstances. In general, Design Bus should be used.

Figure 3
Bus Zone Dimensions for Various Bus Operations



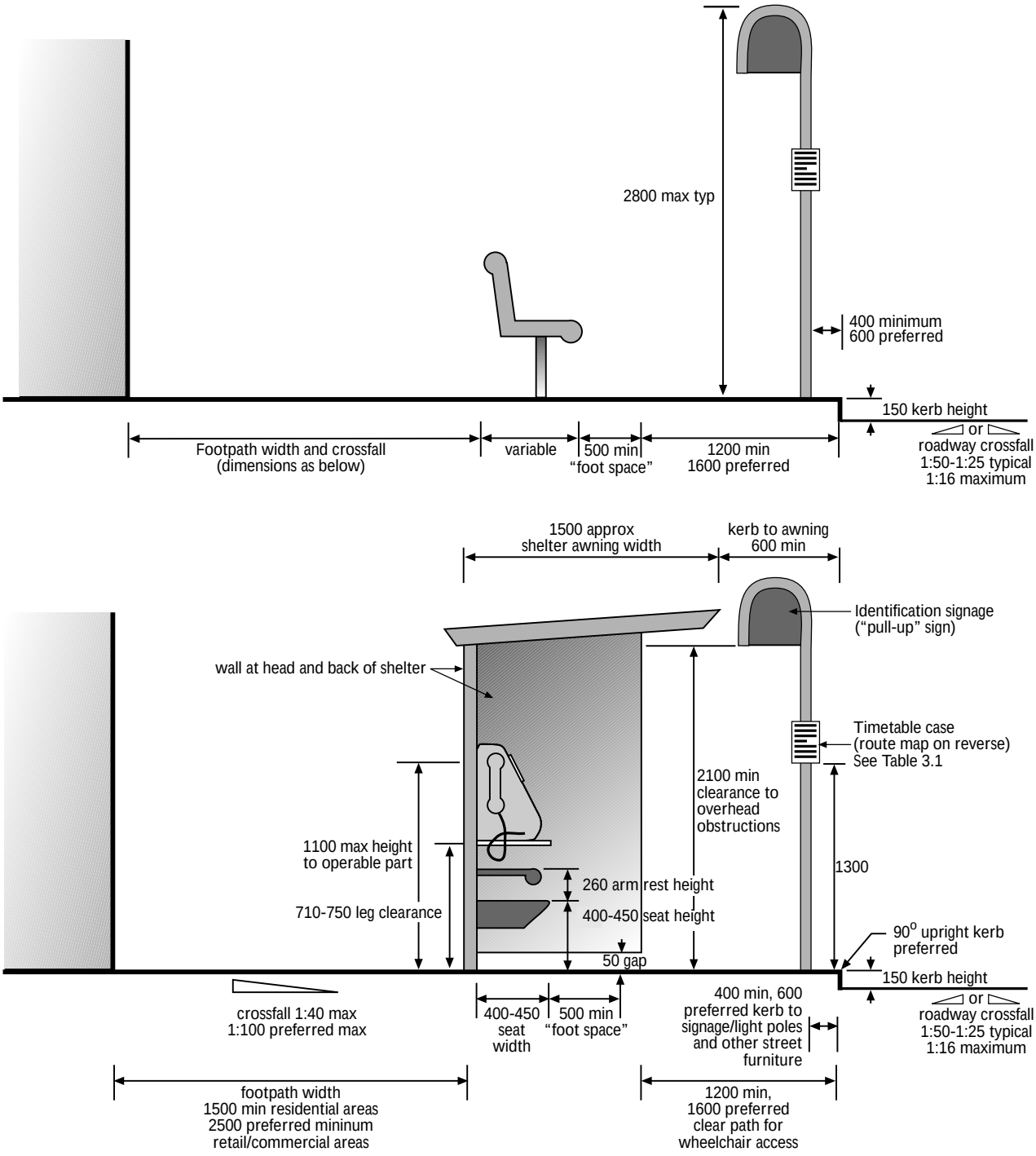
*Notes: * depends on "L"*
"L" = bus length (see table in Figure 3)

Figure 4a
Bus Stop Example Design (Plan)



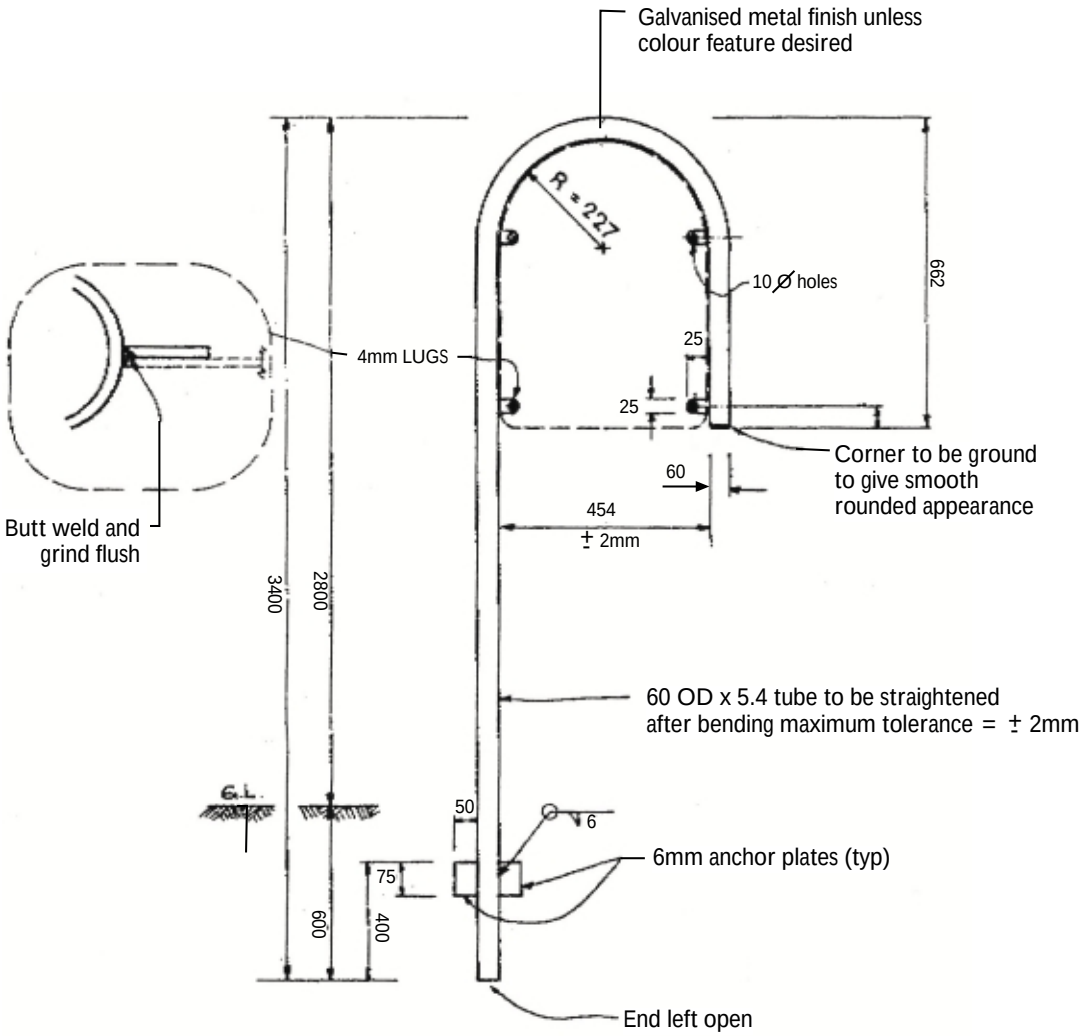
*Notes: * depends on "L"*
"L" = bus length (see table in Figure 3)

Figure 4b
Bus Stop Example Design with Identification Sign Attached to Shelter (Plan)



Notes: All measurements in millimetres.
Boarding and alighting zones should be free of street furniture.

Figure 5
Bus Stop Example Design (Section)



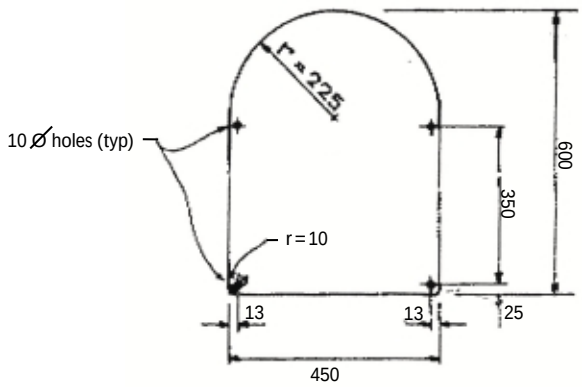
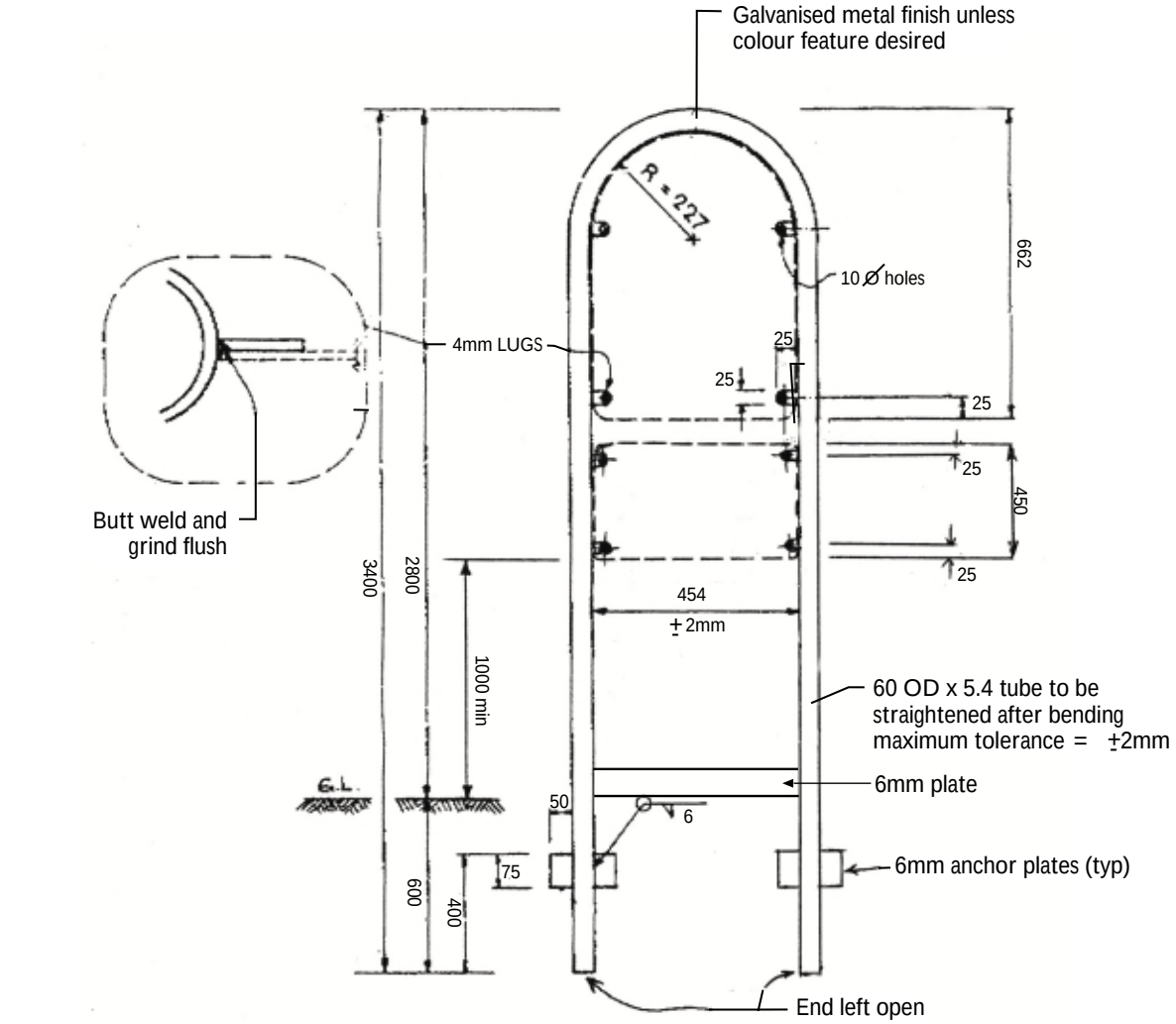
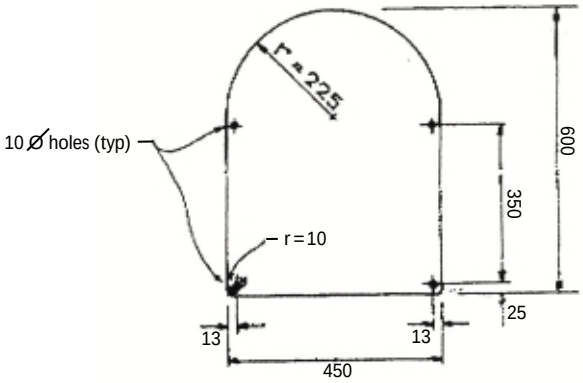


PLATE DETAIL

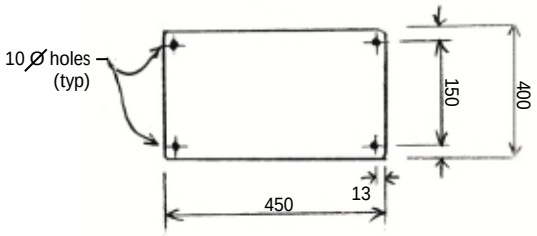
Note: Anchoring to Council's specification for roadside signs.

Figure 6a
Dimensions for Inverted J-Pole Bus Destination Signs
(adapted from drawing supplied by State Transit)





IDENTIFICATION PLATE DETAIL



INFORMATION PLATE DETAIL

Figure 6b
Dimensions for Inverted U-Pole Bus Destination Signs
(adapted from drawing supplied by State Transit)

Note: Anchoring to Council's specification for roadside signs.

Figure 7a: Example of STA A4 Bus Timetable Case Containing Timetable Information

Figure 7b: Reverse Side of Timetable Case Showing Bus Route Map

Bus Stop Style Guide

Part 2 – Hierarchy and Classification of Bus Stops

1. Introduction

PPK Environment & Infrastructure Pty Ltd was engaged by the State Transit Authority (STA) to prepare a style guide for bus stops in urban areas. The objectives of the style guide, as set out in STA's brief, are "to assist both State Transit and local government in providing consistent, safe and effective bus stops." Issues to be considered in the preparation of the style guide included:

- passenger information;
- identification of service point;
- useful, safe, and easily-maintained infrastructure; and
- consistent design that is accessible to as many potential passengers as possible.

Part 1 of the Style Guide focuses on design requirements for bus stops and bus stop facilities. Part 2 contains discussion of issues relevant to the preparation of the style guide, development of a functional hierarchy of bus stops, and bus stop classification.

2. Stop Location

The style guide does not focus in detail on the determination of stop location – rather, it concentrates on the placement and design of bus stops in the surrounding environment, and the design and use of the stop elements and facilities under different circumstances.

However, the general principles of stop placement and location encompass the following issues:

- traffic safety for vehicles and passengers;
- accessibility (particularly for mobility-impaired passengers);
- proximity to attractions and pedestrian facilities;
- gradients and surfaces of roadways and footpaths;
- legibility, stop spacing and relationship to other bus stops;
- personal safety and security (particularly lighting);
- capacity requirements for buses, passengers, and passing pedestrians; and
- traffic and parking impacts.

3. Relevant Issues

Issues relevant to bus stops vary in three broad functional ways:

- the passengers for whom the stops are access points for bus transit;
- the efficient operation of the bus services themselves; and
- outside influences and other users (such as traffic, passers-by, adjacent land uses and the like).

3.1 Passengers

STA passengers expect the following things from bus stops:

- comfort while waiting for the bus, including weather protection, and cleanliness ;
- recognisability and consistency – bus stops provide system information and enhance network legibility. They say "a bus route goes past here" and identify where the passenger can get on or off the bus. A consistent design approach through different areas can enhance market presence and passenger perceptions of the network;
- safety and security – the stop should be a safe place to approach, wait, and leave;
- information – passengers expect to find information on bus frequency, routes and relevant maps, at the stop;
- accessibility (special needs) – the stop should relate to its surroundings, connect with footpaths, pedestrian crossings and the like, have regular surfaces, and provide for access by the mobility impaired; and
- allow waiting passengers a clear view of oncoming buses so that they can anticipate and signal drivers to stop.

3.2 Operational

Bus operators are usually not responsible for the provision of stops and bus stop infrastructure. However, bus stops and the facilities provided with them can have significant implications for a bus operator – both in terms of day to day bus operations, and capital and recurrent budgets. Bus stops are a key element of a bus service's image and can impact on the perception of the service by users and non-users alike.

For an operator of bus services, bus stops:

- should be conspicuous, because they provide simple information on the existence of a bus route for users and non-users (ie system legibility);
- allow the bus to stop close to and parallel with kerb and with minimum delay;
- have sufficient capacity for passengers and buses;
- should not be blocked by illegal parking but be kept clear for buses, and not disrupted by road and utility maintenance activity;
- should be readily accessible without complicated manoeuvres;
- can indicate to drivers where exactly to stop the bus;
- should allow for standardisation of STA inputs (such as user information, identification signs, route destinations, and section numbers); and
- should provide for other operational requirements, such as ticket selling, and the requirements of other operational staff (such as inspectors etc), where appropriate.

3.3 Non-Users

The way in which a bus service presents itself to the broader community is affected by the form, quality and condition of its bus stops. Well-designed and maintained bus stops and related facilities can enhance the perception and attractiveness of a bus service, even to current non-users.

Issues of relevance to non-users can include:

- pedestrians – incorrectly located bus stops with waiting passengers can act as a barrier to pedestrian through-movement and disrupt access to adjacent land uses and activities,
- care should be taken to ensure road safety and personal safety is enhanced and not diminished by the siting of a bus stop and shelter;
- other road users – for safety, potential conflicts (such as with driveways, turning lanes, etc) should be minimised; and
- bus stopping and waiting passengers should not conflict with adjacent land uses.

4. Functional Hierarchy of Bus Stops

4.1 Determinants of Function

The function of bus stops is generally determined by operations and their location/situation. That is, the nature of bus operations themselves (service frequency, schedules, route network, interchange etc) will assign roles and classifications to bus stops consistent with the structure of the bus routes serving them. The situation that the bus stop is in, in terms of the traffic environment, land use and activity levels, or other factors, will also influence its role and its design requirements.

The purpose of a discussion of determinants of function is to provide a consistent and functional basis for the identification of design elements required at bus stops in different circumstances.

In the development of a hierarchy of stops, the key consideration is the link between bus stop facilities (such as shelters, transport information, bus zone delineation) and the location/situation and operational determinants relating to the stop.

4.1.1 Operational

These aspects are related to the operation of bus services in a network sense (frequency of service, stopping patterns etc). Bus stops have an operational function and relationship between stops, which is indicative of a hierarchical structure.

Stops can be grouped in the following way:

Terminus – stops at the beginning or end of a route where terminal functions (meal breaks, change of destination information, layover) might take place. Bus dwell times may be longer at the terminus than at some other stops. Passenger numbers (both alighting and joining) may be higher at a terminus;

Interchange Stop – both bus-bus interchange (such as at Neutral Bay or Warringah Mall) and intermodal interchanges (such as Meadowbank and Rockdale railway stations). Passengers may transfer between bus routes or between buses and other modes. Dwell times may be longer to ensure modal connections are made, and the stop is generally more prominent in a network sense. Intermodal interchanges (bus-rail, bus-ferry) often have a higher standard of design and are often off-street;

Limited/Express Stops – some bus operational patterns establish skip-stop operations, with particular stops designated stopping places for express or limited stops (skip-stop) services. These stops become important locations for passenger origins and destinations, as well as transfers between skip-stop and all-stops services. These stops are often situated at important attractions (shopping centres and the like) and so serve passenger origins and destinations;

Standard Stop – provides for passenger pick up and set down for most bus services, but may be skipped by limited stops or express services;

Part-Time Stops – part-time stops only operate during certain periods of the day, for example, school stops operate during the morning and afternoon school peaks, and only on school days. It is important that part-time bus stops be clearly marked as such;

Special Stops – include stops for the following services: Sydney Explorer, Airport Express, Bondi to Bay Explorer, Star City Casino shuttle, and Nightride.

Set-Down Only Stop – a stop, usually towards the end of a bus route, where passengers are dropped off, but not picked up.

4.1.2 Location/Situation

The function or classification of a bus stop will also be influenced by its surrounding land use, traffic environment etc. Stops can be grouped within the following environments.

Town Centres/CBDs – these situations tend to have concentrations of passenger activity (picking up and setting down), convergence of bus routes, and potential for conflicts between buses, pedestrians, traffic and parking. More attention needs to be paid to the quality of passenger facilities in CBDs and town centres, the protection of bus zones from illegal use, and interaction between the transit operation and the operation of nearby retail and commercial activities. Bus services in CBDs and town centres need to be efficient, and there is usually competition for kerbspace allocation and vehicle access.

Regional Shopping Centres – important passenger origins and destinations, but usually found in different environments to CBDs and town centres (often in residential areas or on the fringes of CBDs or town centres). Access to regional shopping centres is usually car-oriented, with large supplies of car parking, major road connections and multiple car park accesses. Regional shopping centres can operate late at night (cinemas and late shopping), but a lack of adjacent complementary commercial and retail activities, and often inactive street frontages, present particular challenges for bus services and stop requirements. Regional shopping centres are often the focus of extensive bus feeder networks.

Neighbourhood Shopping Centres – important local destinations, but usually with a lower level of intensity and competition for kerbspace than town centres or regional shopping centres. Often strip development on a main street, which performs a traffic function as well as an access function. Neighbourhood shopping centres may have less intense levels of bus activity. Limited night-time activity.

Residential Areas – issues relevant in residential areas include impacts on adjacent residential amenity, night-time safety, personal security, and all-weather access to the stop. Waiting times at stops in residential areas may be longer than at higher-order stops.

Rural, Semi-Rural – these areas are rare within STA's contract area. Situations will present particular challenges including lower street and road standards, discontinuous footpaths and absence of kerbs, lower levels of activity, street lighting and surveillance, higher traffic speeds and possibly less frequent buses and more widely spaced stops.

Special Events – sporting grounds and stadia can present challenges for bus stop provision and facilities, including irregular use, periods of intense demand, conflicts with high traffic and pedestrian flows, crowd and queue management, special ticketing, and bus operations management.

Other location/situation issues include traffic, both volume and speed. Bus stops in a high speed traffic environment (>60 km/h) or on motorways or arterial roads will have different requirements to those in lower speed environments, and hence a different class of facilities might be required. Traffic management controls will also influence stops – such as transit lanes or other high occupancy lanes, intersections, traffic control etc.

Issues include:

— potential pedestrian safety issues arising from bus stops being located adjacent to high speed/high volume roads and the need to consider opportunities to site bus stops adjacent to safe crossing points, as passengers are usually looking for two-way travel;

— personal safety issues associated bus stops located on limited access roads or areas with low levels of passive security;

— safe bus access and egress from stops in high speed conditions, requiring attention to the to ability provide adequate diverge and merge conditions;

— the effect of stopping buses on the performance of Transit Lanes and Bus Lanes and the requirement to separate stopping buses from the main transit stream; and

— the siting of stops in the vicinity of bus priority measures such as queue jump lanes and "B" phases at traffic signals must be integrated with the facility to ensure that maximum priority is achieved.

4.2 Influences on Bus Stop Facilities

The provision of some bus stop facilities will not be influenced by the stop's location in the functional hierarchy. For instance, the Disability Discrimination Act is based on the premise that mobility impaired people should have equitable access to public transport, and so all bus stops need to be accessible in line with those standards. Similarly, for every stop, some measures for personal safety and security, such as lighting, will be warranted. Personal security concerns (and traffic safety concerns) are relevant across all stop classifications and situations and should be addressed in stop location and attention to design on a case by case basis.

The sorts of bus stop facilities which need to respond to stop function therefore are:

- bus zone – from kerbside provision to bus bays, blisters and off-street facilities;
- pavement – in more intense operations concrete pavement may be desirable to avoid deformation of or damage to conventional flexible pavements;
- bus stop identification signs – from inverted J poles to inverted U poles;
- bus zone delineation – from "bus zone" roadside signs to markings on the road;
- shelters;
- seating;
- transport information – from simple timetables and route maps to network maps, locality maps, chronological displays and real-time information; and
- public telephones.

Bus stop facilities and their design requirements are described in Section 1 of the Style Guide.

5. Classification of Stops

Table 5.1 summarises bus stop classification based on location/situation and operational influences, and indicates the requirements for bus stop facilities in response to those influences.

Table 5.1: Classification of Bus Stops and Requirements for Bus Stop Facilities

Situation	Operational Environment	Facility																	
		Bus Zone Type				Zone Delineation		Concrete Pavement	Identification Signage		Shelter	Seating	Information						Telephone
		Kerbside	Indented Bay	Blister	Off-Street	Signs	Road Markings		J Pole	U Pole			Timetable/ Route Map	Dest'n Guide (1)	Network Map	Locality Map	Chrono (2)	Real Time	
CBD/Town Centre	Terminus	✔	✔		✔	✔	✔	✔		✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
	Interchange — Bus-Bus	✔	✔		✔	✔	✔	✔		✔	✔	✔	✔	✔	✔	✔		✔	✔
	— Intermodal	✔	✔		✔	✔	✔	✔		✔	✔	✔	✔	✔	✔	✔		✔	✔
	Express Stop	✔	✔	✔	✔	✔	✔	✔		✔	✔	✔	✔	✔	✔	✔		✔	✔
	Standard Stop	✔	✔	✔	✔	✔	✔		✔		✔	✔	✔	✔	✔	✔		✔	✔
	Part-time Stop	✔			✔	✔			✔				✔			✔			
	Special Stop	✔	✔		✔	✔	✔			✔	✔	✔	✔	✔		✔		✔	✔
	Set-Down Only	✔	✔	✔	✔	✔	✔		✔							✔			
Regional Shopping Centre	Terminus	✔	✔		✔	✔	✔	✔		✔	✔	✔	✔		✔		✔	✔	✔
	Interchange — Bus-Bus	✔	✔		✔	✔	✔	✔		✔	✔	✔	✔		✔			✔	✔
	— Intermodal	✔	✔		✔	✔	✔	✔		✔	✔	✔	✔		✔			✔	✔
	Express Stop	✔	✔	✔	✔	✔	✔	✔		✔	✔	✔	✔		✔			✔	✔
	Standard Stop	✔	✔	✔	✔	✔	✔		✔		✔	✔	✔		✔				
	Part-time Stop	✔			✔	✔			✔				✔						
	Special Stop	✔	✔		✔	✔	✔			✔	✔	✔	✔	✔		✔		✔	✔
	Set-Down Only	✔	✔	✔	✔	✔	✔		✔							✔			
Neighbour-hood Shopping Centre	Terminus	✔	✔	✔		✔	✔	✔		✔	✔	✔	✔						✔
	Interchange — Bus-Bus	✔	✔			✔			✔		✔	✔	✔		✔				✔
	— Intermodal	✔	✔		✔	✔			✔		✔	✔	✔		✔				✔
	Express Stop	✔	✔	✔		✔	✔		✔		✔	✔	✔						✔
	Standard Stop	✔	✔	✔		✔			✔		✔	✔	✔						
	Part-time Stop	✔				✔			✔				✔						
	Set-Down Only	✔				✔			✔							✔			
Residential Area	Terminus	✔	✔		✔	✔		✔		✔	✔	✔	✔		✔				✔
	Interchange — Bus-Bus	✔	✔		✔	✔				✔	✔	✔	✔		✔				✔
	— Intermodal	✔	✔		✔	✔				✔	✔	✔	✔		✔				✔
	Express Stop	✔	✔			✔			✔		✔	✔	✔						✔
	Standard Stop	✔	✔			✔			✔		✔	✔	✔						
	Part-time Stop	✔				✔			✔				✔						
	Set-Down Only																		
Rural/ Semi-Rural	Terminus	✔			✔	✔			✔		✔	✔	✔		✔		✔		
	Standard Stop	✔				✔			✔		✔	✔	✔						
	Part-time Stop	✔				✔			✔				✔						
Special Events	Terminus	✔	✔		✔	✔	✔	✔		✔			✔		✔				
	Express Stop	✔	✔		✔	✔	✔	✔		✔			✔		✔				
	Standard Stop	✔	✔			✔	✔		✔				✔		✔				
	Special Stop	✔	✔		✔	✔	✔			✔			✔	✔		✔		✔	✔
	Set-Down Only	✔	✔		✔	✔	✔	✔	✔										

Note: (1) Cross-reference of major destinations to all bus routes serving them from a particular stop
(2) Chronological listing of bus routes passing a stop to common destinations.