Public Transport Infrastructure Manual (PTIM)

2015

TRANSLink

Queensland Government

Department of Transport and Main Roads – TransLink Division Public Transport Infrastructure Manual. Published by Department of Transport and Main Roads – TransLink Division 2020.

Disclaimer

Contact

Phone: 13 12 30
Web: translink.com.au
Mail: GPO Box 50
Brisbane Qld 4001

Contents

Chapter 1 – Background and application

1.1 *PTIM* structure

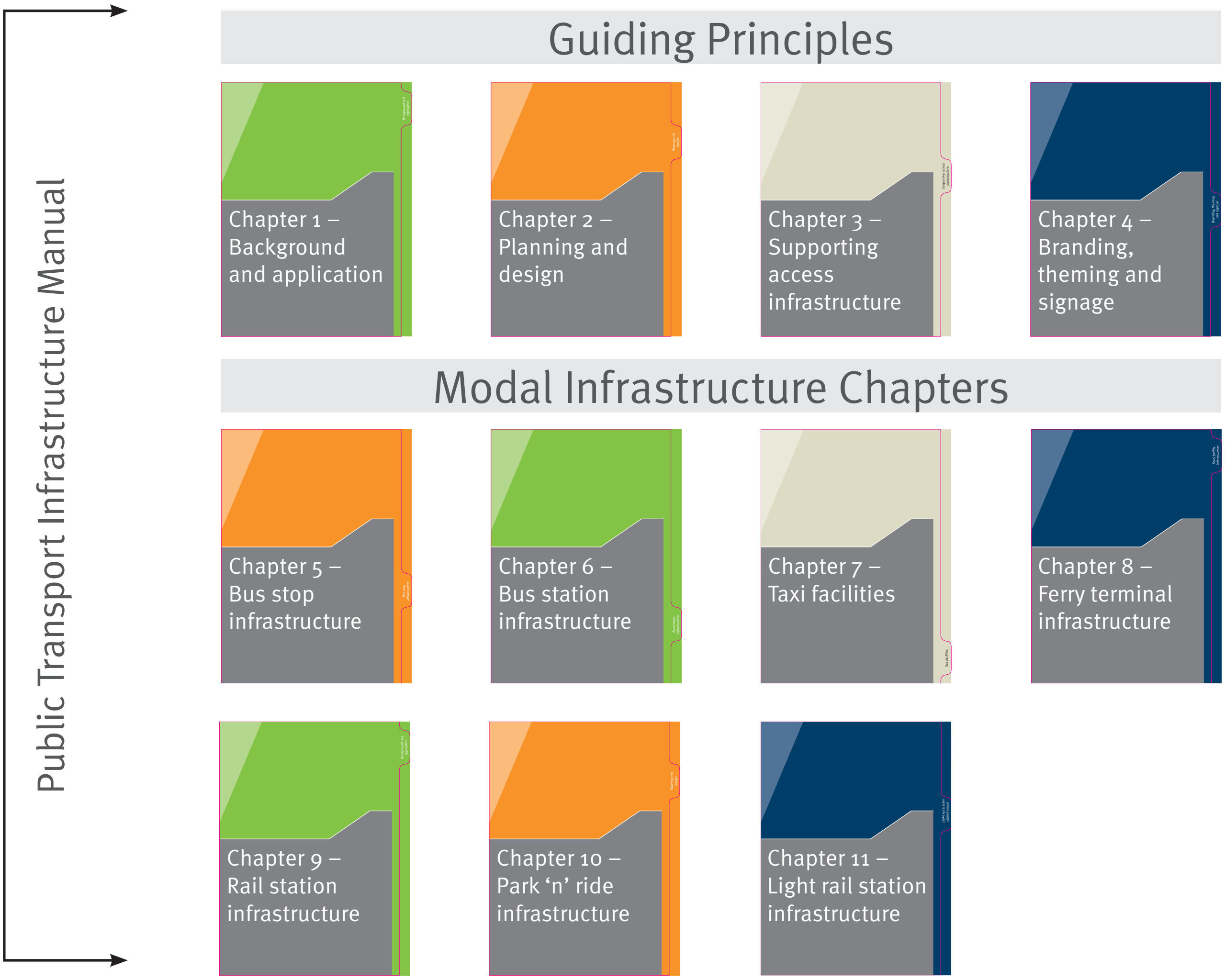
1.1.1 Introduction

The *Public Transport Infrastructure Manual* is relevant to developers of public transport infrastructure, those planning public transport provision and development assessment. The document is divided into two main sections:

- Guiding principles for public transport development
- Modal infrastructure chapters.

Figure 1.1 below illustrates this structure.

Figure 1.1 –
Public Transport Infrastructure Manual PTIM overview



NOTE: The figure indicates the documents currently available and which can be downloaded from the TransLink website www.translink.com.au.

1.2 Abbreviations

AFC	Automatic Fare Collection
AHRC	Australian Human Rights Commission
AS	Australian Standards
AS/NZS	Australian/New Zealand Standards
ATIA	Australian Taxi Industry Association
ATM	Automatic Teller Machine
AVVM	Add Value Vending Machine
BCA	*Building Code of Australia*
BCC	Brisbane City Council
BRT	Bus Rapid Transit
CBD	Central Business District
CCTV	Close Circuit Television
CPAS	Customer Public Address System
CPTED	Crime Prevention through Environmental Design
DDA	*Disability Discrimination Act 1992*
DNPRSR	Department of National Parks, Recreation, Sport and Racing
DRT	Demand Responsive Transport
DSAPT	*Disability Standards for Accessible Public Transport 2002*
ETS	Electronic Ticketing System
HAT	highest astronomical tide
HOV	High Occupancy Vehicle
ITS	Intelligent Transport System
LED	Light emitting diode
LGA	Local Government Authority
LOS	Level-of-Service
LRT	Light Rail Transit
LUP	Land Use Plans
MaaS	Mobility-as-a-Service
MBP	Minimum Boarding Point
MLWM	Mean Low Water Mark
MLWS	Mean Low Water Springs
MHWM	Mean High Water Mark
MHWS	Mean High Water Springs
MSQ	Marine Safety Queensland http://www.msq.qld.gov.au/
MUTCD	Manual of Uniform Traffic Control Devices
NES	National Environmental Significance
NCC	*National Construction Code of Australia*

NTS	Not to scale
PDA	Priority Development Area
PT	Public Transport
PTIM	*Public Transport Infrastructure Manual*
PWD	Person with a disability
QLD	Queensland
QPS	Queensland Police Service
QR	Queensland Rail
QRR	Queensland Road Rules
SACID	Stand Alone Card Interface Device
SDM	*Station Design Manual*
SEQ	South East Queensland
SMP	Species Management Plan
TCQSM	*Transit Capacity and Quality of Service Manual*
TGSI	Tactile Ground Surface Indicator
TMR	Department of Transport and Main Roads
TOD	Transit-oriented development
WAT	Wheelchair Accessible Taxi

1.3 Glossary

Add Value Vending Machine (AVVM)	A self-serve electric ticketing fare machine consisting of a touch screen display, card reader and cash payment options, used to purchase paper tickets or perform a limited range of *go* card functions including displaying the card balance, transaction history, or adding value to the *go* card.
Amenity	Provision of a comfortable, interesting, high-quality environment, including: • high quality (visually-appealing) finishes that are durable, self-cleaning, vandal resistant and easy to maintain • use of materials and finishing consistent with those in adjacent public transport facilities • interesting internal and external views from paths • quality textured landscapes and architecture • public art and community literacy elements where applicable.
Booked hire service	Booked hire services are commonly known as ride-booking, ride-sourcing and ride-sharing services. Booked hire vehicles cannot be hailed and are instead pre-booked using booking options provided by the service provider. For example, an app platform which can be used to connect a driver with commuters or people wishing to travel with/without a private vehicle to share a trip and travel together.
Branding	The TransLink logo, ellipse device and name style and where applicable, the Queensland Coat of Arms.
Bus Rapid Transit (BRT)	A form of mass transit which utilises buses operating at a higher capacity and frequency than conventional bus networks. BRT typically features a unique identity with segregated right-of-way measures such as dedicated road corridors (referred to as busways) or HOV lanes. BRT infrastructure such as stations and busway corridors can be at surface grade, elevated or below ground level. BRT is often characterised as offering the quality of metro rail systems with the flexibility of buses.
Bus feeder	Local or neighbourhood bus services which operate within lower urban density neighbourhood communities and provide transport connections for passengers wanting to interchange with more frequent line-haul services along designated high-frequency services routes or corridors.
Bus layover	Waiting location for vehicles (commonly at stations) to adjust time between services, enable driver change-over, or scheduled rest/meal break, or commence a new service route.
Bus stop	A collector point for pedestrians along a public transport route that allows for boarding and alighting, that also includes a portion of the roadway for the stopping of a bus. Refer *Transport Operations (Road Rules) Regulation 2009* for further detail.
Bus station	Public transport infrastructure which acts as a central departure and/or destination point where passengers board and alight a bus.
Busway	A route especially designed and constructed for, and dedicated to, the priority movement of buses for public transport purposes. Busways can be either at-grade or grade-separated (i.e. elevated over the surrounding development). Refer *Transport Infrastructure Act 1994* for further detail.

Crime Prevention Through Environmental Design (CPTED)	An approach using multidisciplinary urban design principles to reduce the incidence and perception of crime in the built environment.
Cycle lane	An on-road special purpose lane for the exclusive use of bicycles.
Cycle track	A physically separated bicycle-only facility with clear bicycle priority at intersections.
Demand responsive transport (DRT)	DRT refers to a type of public transport, that is distinct from fixed-route scheduled passenger transport services. DRT typically does not operate to a specific timetable, offering a flexible shared transport service designed to enable customers to travel within their local area when buses and trains aren't available, or to provide access to a trunk service fixed route.
Dredging	The process whereby solid matter is disturbed (moved, removed, or extracted, transported or relocated) from the bed of any waterway. Disturbed bed material is termed dredge spoil which can be disposed of to sea (sea dumping to marine disposal area, including side casting), or to land, such as for environmental enhancement), or beneficial reuse.
Equivalent access	A process, often involving the provision of direct assistance, under which an operator or provider is permitted to vary the equipment or facilities that give access to a public transport service, so long as an equivalent standard of amenity, availability, comfort, convenience, dignity, price and safety is maintained. It does not include a segregated or parallel service.
Facility	Any form of infrastructure used for a particular purpose for public transport (i.e. a whole station is considered to be a facility, and a bicycle cage or park 'n' ride is also defined as a facility).
Ferry terminal	A ferry terminal (jetty, pontoon, or landing) is a structure, which enables passengers to safely and efficiently board or disembark a scheduled ferry service. A ferry is defined as a ship, boat, barge or hovercraft. Refer *Transport Operations (Passenger Transport) Act 1994* for further detail.
Freeboard	The vertical distance between the still water level and the top of a floating structure or vessel.
Fruin Level-of-Service (LOS)	Based on the literature by J. Fruin (1987) *Pedestrian Planning and Design*. Fruin defines the required level-of-service by outlining the quantified area needed for pedestrians to comfortably walk, queue, wait or travel through pedestrians spaces (such as station platforms, elevators, stairways, walkways and other public spaces).
Future-proofing	The specific provision made for the possible expansion of infrastructure and services due to potential or anticipated increase (or decrease) in future passenger demand.
Gangplank	A narrow, moveable platform or ramp forming a bridge by which to board or leave a vessel.
Gangway or ramp	A structure which provides passenger access between a walkway or shore and a floating structure or vessel.
Grade separation	The infrastructure provision for public transport corridors to offer the highest level of travel priority by operating exclusively (either vertically or horizontally) from other transport modes, in order to minimise disruption (that is, busways, rail lines and stations typically feature grade-separated treatments so that they are not in conflict with private vehicle traffic).
Hail 'n' ride service	A hail 'n' ride service is a service operated by a bus that follows set routes, but may stop for passengers at any safe point on the route.
High Occupancy Vehicle (HOV) Lane	A lane along a road corridor which is dedicated for use by high-occupancy vehicles such as buses or private cars with more than one occupant.

High water mark	The ordinary (mean) high water mark at Spring tides.
Independent stop	A type of bus stop which is designed for one or a particular set of pre-designated services. Independent stops are characterised by individually laid out platforms with designated stopping areas for buses. This is in contrast to a lead stop set-up which features one stop along a platform which all buses pull up to if servicing the stop or station.
Infrastructure	In this manual the term infrastructure is defined as any item in the TransLink network that has been designed, constructed, installed or any fixture or fitting required for the appropriate function of a public transport system (that is, but not limited to – seats, platforms, stairs, overpasses, shelters, signage, furniture, information and display devices, security devices, enhancements, vehicle arrangement requirements, pedestrian infrastructure, cycle infrastructure and parking infrastructure).
Intelligent Transport Systems (ITS)	The general term for electronic infrastructure used at public transport stops and stations to assist customers and operators with the operation and function of the transport system. ITS can include but is not limited to, security cameras (CCTV), real-time-information, public address systems, and other public transport information.
Kiss 'n' ride	Vehicle drop-off or pick-up zone for passengers arriving from, or leaving for, a public transport service (also includes taxis).
Lead stop	A bus stop which is designed to have a single platform boarding point for passengers where bus vehicles platoon behind each other as opposed to independent designated stops for different services. Lead stop situations are typical for bus stops with a high-frequency of services passing through and are designed to reduce dwell times.
Level-of-Service (LOS)	The measure of effectiveness by which traffic engineers determine the quality of service on elements of transport infrastructure. The level-of-service in this manual predominately specifies the amount of space required for acceptable pedestrian waiting areas (see Fruin Level-of-Service).
Livery	The distinctive design and visual appearance of public transport vehicles. Livery has been specifically designed by TransLink so that vehicles are instantly recognisable as being part of the TransLink network.
Lowest astronomical tide (LAT) and highest astronomical tide (HAT)	These are the lowest and highest levels which can be predicted to occur under average meteorological conditions and any combination of astronomical conditions.
Functional station design	Fundamental design objectives which define how a station should function and operate/perform (with emphasis on the spatial relationship between human to human and human to built environment interaction) to satisfy the requirements of the intended customer (i.e. the passenger) and the TransLink network.
Mean High Water Mark (MHWM)	The position where the plan of the mean of all ordinary local high tides intersects the foreshore.
Mean Low Water Mark (MLWM)	The position where the plane of the mean of all ordinary local low tides intersects the foreshore.
Micro-mobility	Also known as micro-transit, this refers to a form of alternative transportation (i.e. to cars, trains, buses) that includes electric scooters and bicycles. Typically used in cities or communities as a “first and last mile transport” option or for convenient travel over short distances.

Mobility-as-a-Service (MaaS)	MaaS is a total mobility solution focused on the individual's lifestyle and travel needs. It is a move from traditional models of individuals owning and organising their transport, to a subscription-based service model whereby individuals access transport services as required. MaaS integrates planning, booking and payment, and provides more transport and payment options across multiple transport modes such as car and ride share, with public and even active transport options. TMR has recognised that MaaS could provide more end to end, personalised and seamless transport options as part of the wider integrated network.
Mode	The particular type of vehicle used on a transport service such as train, bus, and light rail (can also include the private car).
Modular infrastructure	Infrastructure which has been designed and assembled into a prefabricated kit of parts (for example shelters and seating) allowing for minimal construction, efficient maintenance, ease of modification and potential expansion (thus minimising level of disturbance to a site). Modular infrastructure also allows for uniformity in infrastructure design which ensures high legibility for passengers using the public transport system.
Mooring	A detached or freestanding structure to which a vessel is moored.
Park 'n' ride	Commuter car parking area at public transport stops and stations for accessing public transport services. Generally also accommodates kiss 'n' ride zones.
Pontoon	A floating platform used for access to the water or a vessel.
Public address system	An electronic communication device (generally located at stations) used for informing public transport patrons of public transport messages, warnings and other information.
Public passenger vehicle	This means any of the following vehicles used to transport members of the public: • a bus • a ferry • a taxi • a fixed track vehicle • an aircraft • a limousine • a booked hire vehicle • another vehicle used to provide a public passenger service • a vehicle classified by regulation as a public passenger vehicle. Refer to *Transport Operations (Passenger Transport) Act 1994*
Public transport service	A form of travel provided by high-occupancy vehicles (for example, bus, train or ferry) along set paths of travel and at scheduled intervals during a day. A public transport service, also known as scheduled passenger service, can be operated by governments or private organisations and provides equitable access to transport for the whole community as opposed to private transport which only provides transport to the individual or passengers given consent. Refer *Transport Operations (Passenger Transport) No. 43, 1994* for further detail.
qconnect	A Queensland Government initiative providing improved public transport services and greater connectivity between services throughout regional, rural and remote Queensland. The *qconnect* brand signifies integration of transport modes and operators across Queensland.
Rail station	Public transport infrastructure which acts as a central departure and/or destination point where passengers board and alight a fixed-track vehicle.

Rapid transit	A form of public transport which involves very high passenger demand resulting in high-quality infrastructure with very frequent services. A distinctive feature of rapid transit is the travel priority given through grade-separated treatments (such as busways or rail corridors).
Real-time	The ability to monitor and communicate, using global positioning technology, up-to-date information for expected performance of public transport services based on their distance away from a specific location.
Reclamation	An area of dry land that was previously submerged land but now is enclosed by seawalls that alter the natural line of the foreshore.
Signage	The use of a consistent signage suite that has been developed to create seamless identification of public transport infrastructure for a range of different modal facilities, to improve overall network legibility and wayfinding.
Shared path	A pedestrian and bicycle facility that gives pedestrians priority under Queensland Road Rules.
State transport corridor	Land on which any of the following public transport infrastructure is situated, if the infrastructure is, or is to be, used for providing a scheduled passenger service, including buses or busway, light rail or rail transport infrastructure. Refer *Planning Regulation 2017, Schedule 24* for further detail.
Stand Alone Card Interface Device (SACID)	An electronic device (usually placed at the entry/exit and key decision points of stations) used by passengers to validate a go card at the commencement and end of their trip so that their trip fare can be calculated.
Station	Public transport infrastructure which acts as a central departure and/or destination point where passengers board and alight a vehicle (e.g. bus, ferry, fixed-track vehicle, etc.). Stations provide passengers with the key point of connection between a scheduled passenger transport service and a desired destination (or transfer point enroute to a destination). Refer to *Transport Operations (Passenger Transport) Act 1994* for details.
Station formation	A key step in the planning and design process as defined in the *PTIM* of taking a generic station layout and configuring this to meet the specific function and site requirements.
Supporting access infrastructure	The infrastructure which provides the key connection between a TransLink stop or station and the immediate surrounding environment. In this manual, this includes pedestrian, bicycle, bus feeder, kiss 'n' ride and park 'n' ride infrastructure.
Tactile Ground Surface Indicator (TGSI)	Raised ground surface texture treatments (usually paving) used by people with vision impairments to navigate their way in the built environment. TGSIs assist users by providing warning and directional information, and typically consist of square tiles with raised profiles laid in logical locations.
Theming	The specific design language created through the use of the TransLink infrastructure colour palette and structural design features and finishes.
The Premises Standards	The *Disability (Access to Premises-Buildings) Standards 2010*
The Transport Standards	The *Disability Standards for Accessible Public Transport 2002 (DSAPT)*
Transit-oriented development (TOD)	Transit-oriented development promotes the creation of sustainable communities around public transport stations. In this manual, it provides effective land use and transport integration; high accessibility to public transport network; high quality public space and streets; higher density residential, retail, commercial and community uses or ideally, a mix of these where appropriate.
TransLink	TransLink is a division within the Department of Transport and Main Roads
Wayfinding	Involves a range of navigation techniques to assist the independent and safe movement of people from one place to another.

1.4 Reference materials and supporting information

The applicable information resources and references include (but are not limited to):

Legislation	
Commonwealth	• *Disability Discrimination Act 1992 (DDA)* • *Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)*

State	• *Anti-Discrimination Act 1991 (ADA)*
	• *City of Brisbane Act 2010*
	  – *City of Brisbane Regulation 2012*
	• *Coastal Protection and Management Act 1995 (Coastal Act)*
	  – *Coastal Protection and Management Regulation 2017*
	• *Environmental Protection Act 1994 (EP Act)*
	• *Fisheries Act 1994*
	• *Land Protection (Pest and Stock Route Management) Act 2002 (Land Act)*
	• *Vegetation Management Act 1999 (VM Act)*
	• *Marine Parks Act 2004*
	  – *Marine Parks Regulations 2006*
	• *Nature Conservation Act 1992 (NC Act)*
	• *Planning Act 2016*
	  – *Planning Regulation 2017*
	• *Rail Safety National Law (Queensland) Act 2017*
	• *Transport Infrastructure Act 1994*
	• *Transport Operations (Passenger Transport) Act 1994*
	  – *Transport Operations (Passenger Transport) Regulations 2018*
	  – *Transport Operations (Passenger Transport) Standard 2010*
	• *Transport Operations (Road Use Management) Act 1995*
	  – *Transport Operations (Road Use Management—Road Rules) Regulation 2009*
	• *Transport Planning and Coordination Act 1994*
	  – Transport Planning and Coordination Regulation 2005
	• *Transport Security (Counter Terrorism) Act 2008*
	• *Transport (Rail Safety) Act 2010*
	http://www.tmr.qld.gov.au/About-us/Corporate-information/Legislation.aspx

Disability Standards and Guidelines	
Standards and supplementary material	• *Disability (Access to Premises – Buildings) Standards 2010 (Premises Standards)* • *Disability Standards for Accessible Public Transport 2002 (Cth) (Transport Standards)* • *Disability Standards for Accessible Public Transport Guidelines 2004 (No. 3)*
Guidelines	• AusAID. (2013). *Accessibility Design Guide: Universal design principles for Australia's aid program* https://dfat.gov.au/about-us/publications/Documents/accessibility-design-guide.pdf • Australian Human Rights Commission. (2010) *Accessible bus stop guidelines* https://www.humanrights.gov.au/australian-human-rights-commission-accessible-bus-stops-guidelines • Australian Human Rights Commission (2013) *Guidelines on the application of the Premises Standards, Version 2 https://www.humanrights.gov.au/guidelines-application-premises-standards* • The Department of Infrastructure, Regional Development and Cities (2018) *The Whole Journey: A guide for thinking beyond compliance to create accessible public transport journeys.* Commonwealth of Australia
Australian Standards	
Access and mobility	• AS 1428.1-2009 - *Design for access and mobility - General requirements for access - New building work* • AS 1428.1-2009/Amdt 1-2010 - *Design for access and mobility - General requirements for access - New building work* • AS 1428.1-2009/Amdt 2-2017 - *Design for access and mobility - General requirements for access - New building work* • AS 1428.1-2001 (superseded) - *Design for access and mobility - General requirements for access - New building work* * • AS 1428.2-1992 (R2015) - *Design for access and mobility - Enhanced and additional requirements - Buildings and facilities* * • AS 1428.4-1992 (superseded) - *Design for access and mobility - Tactile ground surface indicators for the orientation of people with vision impairment* * • AS/NZS 1428.4:2002 (superseded) - *Design for access and mobility - Tactile indicator* • AS/NZS 1428.4.1:2009 - *Design for access and mobility - Means to assist the orientation of people with vision impairment - Tactile ground surface indicators* • AS/NZS 1428.4.1:2009/Amdt 1:2010 - *Design for access and mobility - Means to assist the orientation of people with vision impairment - Tactile ground surface indicators* • AS/NZS 1428.4.1:2009/Amdt 2:2014 - *Design for access and mobility - Means to assist the orientation of people with vision impairment - Tactile ground surface indicators* • AS 1428.4.2:2018 *Design for access and mobility - Means to assist the orientation of people with vision impairment - Wayfinding signs* • AS 1735.12-1999 - *Lifts, escalators and moving walks - Facilities for persons with disabilities* * • AS/NZS 3856.1:1998 - *Hoists and ramps for people with disabilities - Vehicle-mounted - Product requirements* * Edition of *AS1428* applicable at the time of the *Transport Standards/DSAPT* were developed.

Parking	• AS 2890.3-2015—*Parking Facilities—Bicycle parking facilities* • AS 2890.5–1993 —*Parking facilities—On-street parking* • AS/NZS 2890.1-2004—*Parking facilities—Off-street car parking* • AS/NZS 2890.6:2009 - *Parking facilities - Off-street parking for people with disabilities*
Signage and traffic control devices	• AS 1742.10-2009—*Manual of uniform traffic control devices—Pedestrian control and protection* • AS 1742.11-1999—*Manual of uniform traffic control devices—Parking controls* • AS 1742.19—*Manual of uniform traffic control devices - Bicycle Facilities, 2018* • AS 1742.12—*Manual of uniform traffic control devices - Bus, transit, tram and truck lanes, 2017*
Access and safety	• AS 4586-2013—*Slip resistance classification of new pedestrian surface materials* • AS 4586-2013/Amdt 1-2017 - *Slip resistance classification of new pedestrian surface materials* • AS 4663-2013—*Slip resistance measurement of existing pedestrian surfaces* • AS/NZS 3661.2-1994—*Slip resistance of pedestrian surfaces—Guide to the reduction of slip hazards*
Lighting	• AS/NZS 1158.3.1:2005 - *Lighting for roads and public spaces - Pedestrian area (Category P) lighting - Performance and design requirements* • AS/NZS 1158.3.1:2005/Amdt 1:2008 - *Lighting for roads and public spaces – Pedestrian area (Category P) lighting – Performance and design requirements* • AS/NZS 1158.3.1:2005/Amdt 2:2010- *Lighting for roads and public spaces – Pedestrian area (Category P) lighting – Performance and design requirements* • AS/NZS 1158.3.1:2005/Amdt 3:2013 - *Lighting for roads and public spaces – Pedestrian area (Category P) lighting – Performance and design requirements* • AS/NZS 1158.3.1:2005/Amdt 4:2015 - *Lighting for roads and public spaces – Pedestrian area (Category P) lighting – Performance and design requirements* • AS/NZS 1158.4:2015 - *Lighting for roads and public spaces - Lighting of pedestrian crossings* • AS/NZS 1680.2.1:2008 - *Interior and workplace lighting - Specific applications - Circulation spaces and other general areas*
Human factors	• AS 7470:2016 - *Human factors integration in engineering design - general requirements*
National Standards	
	• *Building Code of Australia Class 2 to Class 9 Buildings (NCC Volume 1)* Contains the regulations for commercial buildings • *Building Code of Australia Class 1 and Class 10 Buildings (NCC Volume 2)* Contains the regulations for residential buildings • *National Construction Code of Australia (NCC) 2019* https://ncc.abcb.gov.au/ncc-online/NCC
Australian Design Rules (ADR)	http://www.infrastructure.gov.au/roads/motor/design/ • *Vehicle Standard (Australian Design Rule 58/00 – Requirements for Omnibuses Designed for Hire and Reward) 2006*

Austroads	• Austroads. (2016). *Guide to Road Design, Part 3 – Geometric Design* (Publication No: AGRD03-16). Sydney: Austroads Ltd. • Austroads. (2017). *Guide to Road Design Part 4 – Intersections and Crossings – General* (Publication No: AGRD04-17). Sydney: Austroads Ltd. • Austroads. (2017). *Guide to Road Design Part 4A – Unsignalised and Signalised Intersections* (Publication No: AGRD04A-17). Sydney: Austroads Ltd. • Austroads. (2017). *Guide to Road Design Part 6A – Paths for Walking and Cycling* (Publication No: AGRD06A-17). Sydney: Austroads Ltd. • Austroads. (2016). *Guide to Traffic Management Part 8 – Local Area Traffic Management* (Publication No. AGTM08-16). Sydney: Austroads Ltd. • Austroads. (2017). *Guide to Traffic Management, Part 11 – Parking* (Publication No: AGTM11-17). Sydney: Austroads Ltd. • Austroads. (2019). *Guide to Traffic Management Part 12: Traffic Impacts of Development* (Publication No. AGTM12-19). Sydney: Austroads Ltd • Austroads. (2006). *Pedestrian–Cyclist Conflict Minimisation on Shared Paths and Footpaths* (Publication No: AP-R287/06). Sydney: Austroads Ltd. • Austroads. (2016). *Bicycle Parking Facilities: Guidelines for Design and Installation* (Publication No: AP-R1527-16). Sydney: Austroads Ltd. • Austroads. (2017). *Cycling Aspects of Austroads Guides* (Publication No: AP-G88-17). Sydney: Austroads Ltd. • Austroads. (2018). *Australasian Pedestrian Crossing Facility Selection Tool [v2.1.2].* Sydney: Austroads Ltd. • Austroads. (2018). *Australasian Pedestrian Facility Selection Tool [v2.0] User Guide.* Sydney: Austroads Ltd. • N.B. *Austroads' Guide to Traffic Engineering Practice* has been superseded. Relevant information is now in *Guide to Road Design 2009* (particularly Parts 4, 4A and 6A) and *Guide to Traffic Management*. Cycling Aspects of Austroads Guides provides a summary of cycling related information from all Austroad guides.
Queensland Government Publications	
	• Department of Infrastructure, Local Government and Planning (2017). *ShapingSEQ – South East Queensland Regional Plan.* Brisbane: Queensland Government • Queensland Government. (2007). *Crime Prevention Through Environmental Design Guidelines for Queensland – Parts A and B.* Brisbane: Queensland Government • Queensland Government. (2010). *Transit oriented development: guide for practitioners in Queensland.* Brisbane: Queensland Government • Queensland Government. (2010). *Transit oriented development: guide to community diversity.* Brisbane: Queensland Government • Queensland Government. (2010). *Transit oriented development: guide for development in a railway environment.* Brisbane: Queensland Government

Department of Transport and Main Roads	
	• Department of Transport and Main Roads. (2018). *Disability Action Plan 2018-2022.* Brisbane: Queensland Government. • Department of Transport and Main Roads. (2014). *Engineering Innovation within the Department of Transport and Main Roads.* Brisbane: Queensland Government. • Department of Transport and Main Roads. (2018). *Guide to Traffic Impact Assessment.* Brisbane: Queensland Government. • Department of Transport and Main Roads. (2017). *Manual of Uniform Traffic Control Devices (MUTCD).* Brisbane: Queensland Government • Department of Transport and Main Roads. (2019). *Queensland Transport Strategy – Our 30 Year Plan for Transport in Queensland.* Brisbane: Queensland Government • Department of Main Roads. *Road Planning and Design Manual (First edition).* Brisbane: Queensland Government http://www.tmr.qld.gov.au/business-industry/Technical-standards-publications/Road-planning-and-design-manual.aspx • Department of Transport and Main Roads. (2013). *Road Planning and Design Manual (Second edition).* Brisbane: Queensland Government. http://www.tmr.qld.gov.au/business-industry/Technical-standards-publications/Road-planning-and-design-manual-2nd-edition.aspx • Department of Transport and Main Roads. (2017). *Transport Coordination Plan 2017-2027.* Brisbane: Queensland Government.
Pedestrian	• Department of Main Roads. (2004). *Road Planning and Design Manual (First edition) – Chapter 5: Traffic Parameters and Human Factors.* Brisbane: Queensland Government. • Department of Main Roads. (2018). *Supplement Traffic and Road Use Management Volume 1 – Guide to Traffic Management Part 4: Network Management (2016).* Brisbane: Queensland Government • Department of Main Roads. (2018). *Supplement Traffic and Road Use Management Volume 1 – Guide to Traffic Management Part 5: Road Management (2014).* Brisbane: Queensland Government • Department of Main Roads. (2019). *Supplement Traffic and Road Use Management Volume 1 – Guide to Traffic Management Part 6: Intersections, Interchanges and Crossings (2017).* Brisbane: Queensland Government • Department of Main Roads. (2015). *Supplement Traffic and Road Use Management Volume 1 – Guide to Traffic Management Part 7: Traffic Management in Activity Centre (2015).* Brisbane: Queensland Government • Department of Main Roads. (2019). *Supplement Traffic and Road Use Management Volume 1 – Guide to Traffic Management Part 9 Traffic Operations (2016).* Brisbane: Queensland Government

Cycle	• Department of Transport and Main Roads. (2009). A *guide to signing cycle networks.* Brisbane: Queensland Government https://www.tmr.qld.gov.au/Travel-and-transport/Cycling/Research-and-resources/Technical-notes-for-planners-and-engineers • Department of Transport and Main Roads. (2019). *Guideline: Fencing and edging treatments for cycling infrastructure.* Brisbane: Queensland Government • Department of Transport and Main Roads. (2018). *Manual of Uniform Traffic Control Devices – Part 9 – Bicycle Facilities.* Brisbane: Queensland Government • Department of Main Roads. (2019). *Supplement Traffic and Road Use Management Volume 1 – Guide to Traffic Management Part 6: Intersections, Interchanges and Crossings (2017).* Brisbane: Queensland Government • Department of Transport and Main Roads. (2019). *Technical Guideline: Raised priority crossings for pedestrians and cycle paths.* Brisbane: Queensland Government • Department of Transport and Main Roads. (2015). *Technical Note 128: Selection and Design of Cycle Tracks.* Brisbane: Queensland Government. • Department of Transport and Main Roads. (2015). *Technical Note 139: Use of On-street Space (kerbside road space) for Safer Cycling.* Brisbane: Queensland Government
Passenger transport infrastructure	• Department of Transport and Main Roads. (2017). *Interim Guide to Development in a Transport Environment: Busway.* Brisbane. Queensland Government. • Department of Transport and Main Roads. (2015). *Guide to Development in a Transport Environment: Rail.* Brisbane: Queensland Government • Department of Transport and Main Roads. (2011). *Planning for Safe Transport Infrastructure at Schools.* Brisbane: Queensland Government. • Department of Main Roads. (2002). *Road Planning and Design Manual (First edition) – Chapter 20: Roadside Amenities. Brisbane: Queensland Government.*
Signage	• Department of Transport and Main Roads. (2016). *Signage Manual – Rail Stations.* Brisbane: Queensland Government • Department of Transport and Main Roads. (2016). *Signage Manual – Bus Network Infrastructure.* Brisbane: Queensland Government
General references	
Urban design/streets	• *Creating Places for People - An Urban Design Protocol for Australian Cities 2011* http://urbandesign.org.au/ • Institute of Public Works Engineering Australia, Queensland Division Inc. & Parsons Brinckerhoff. (2010) *Complete Streets: Guidelines for urban street design*. Fortitude Valley: IPWEAQ.
Pedestrian capacity	• Fruin, J.J. & Strakosch, G.R. (1987). *Pedestrian Planning and Design (revised).* Elevator World. • New Zealand Transport Agency. (2007). Pedestrian Planning and Design Guide. Wellington: Land Transport New Zealand • Roads and Traffic Authority. (2002). How to prepare a pedestrian access and mobility plan. Sydney: New South Wales Government. • Queensland Walks http://queenslandwalks.org.au

Cycle	• Cycling and Walking Australia and New Zealand https://www.cwanz.com.au/ • Pedestrian and Bicycle Transport Institute of Australasia www.pedbiketrans.com/
Public transport (bus, bus stations)	• Auckland Regional Transport Authority. (2009). *Bus Stop Infrastructure Design Guidelines.* Auckland: The Auckland Regional Transport Authority • NSW Transport State Transit. (2011). *State Transit Bus Infrastructure Guide (Second Issue).* Sydney: NSW Government www.statetransit.info/publications • Public Transport Authority. (2019). *Bus Stop Design Guidelines.* Perth: The Government of Western Australia • Public Transport Authority. (2015). *Supporting Technical Note – Bus Interchange Guidelines.* Perth: The Government of Western Australia • Transport Cooperative Research Program. (2013). *Transit Capacity and Quality of Service Manual (Third Edition).* Washington: Transportation Research Board • Transport for London. (2017). *Accessible Bus Stop Design Guidance.* London: Transport for London http://content.tfl.gov.uk/bus-stop-design-guidance.pdf • VicRoads. (2015). *Supplement to AS 1742.15:2000 Manual of uniform traffic control devices Part 12: Bus, transit, tram and truck lanes.* Kew: VicRoads www.vicroads.vic.gov.au
Public transport (rail, rail station)	• Queensland Rail. (2016). *Guideline: Station Design Manual MD-13-339.* Brisbane: Queensland Rail • Transport for London. (2012). *Station planning standards and guidelines.* London: Greater London Authority
Taxi	• Australian Taxi Industry Association (ATIA). *'Taxi Rank Design Specification April 2012'* www.atia.com.au • Taxi Council of Queensland www.tcq.org.au • VicRoads. (2006). *Taxi Rank Guidelines.* Kew. VicRoads www.vicroads.vic.gov.au/business-and-industry/design-and-management/design-standards-and-manuals/guidelines-for-public-transport
Human factors	• ISO 9241-210:2010 - *Human-centred design for interactive systems* • Rail Industry Safety and Standards Board. (2018). Guideline: *Integration of Human Factors in engineering design.* Brisbane: RISSB • Rail Industry Safety and Standards Board. (2019). Guideline: *Integration of Human Factors Across the Project Lifecycle.* Brisbane: RISSB • Rail Industry Safety and Standards Board. (2018). *Guideline: Systems Safety Assurance.* Brisbane: RISSB

1.5 Introduction

Public transport infrastructure is a critical component of operating an efficient and safe public transport system in Queensland. This *Public Transport Infrastructure Manual (PTIM)* establishes guidelines for the planning and design of public transport infrastructure.

The *PTIM* is developed and updated by the Department of Transport and Main Roads' TransLink Division. TransLink is responsible for the oversight of the public transport networks across Queensland.

For the purposes of this *PTIM* the following definitions apply:

Public transport means the carriage of a passenger by a public passenger service using a public transport passenger vehicle.

Public passenger transport infrastructure means infrastructure for, or associated with, the provision of public passenger transport, including, but not limited to a:

- transit terminal for public passenger services, including an airport terminal or coach terminal
- ferry terminal, jetty, pontoon or landing for ferry services
- bus stop, bus shelter, bus station or bus layovers
- busway station
- light rail station
- taxi rank, limousine rank or limousine standing area
- railway station
- vehicle parking and set-down facilities
- pedestrian and bicycle paths and bicycle facilities
- road on which a public passenger transport service operates.

Refer to the *Transport Planning and Coordination Act 1994* for further detail.

1.5.1 Purpose and objectives of the *PTIM*

Public transport infrastructure is a key component of providing quality customer access, convenience, safety and comfort.

The *PTIM* provides a practical framework to ensure TransLink's policy objectives are translated to the planning, design and delivery of public transport infrastructure.

The objectives of the *PTIM* are to:

- inform and guide the planning and design of public transport infrastructure across Queensland by providing a clear and consistent set of principles and guidelines
- encourage the use of best practice guidelines in the planning and design of public transport infrastructure
- ensure public transport infrastructure complies with relevant standards and regulations
- ensure a consistent approach is applied across the state, with consideration of local climatic and environmental characteristics.

1.6 Application of the *PTIM*

1.6.1 The intended audience of the *PTIM*

The *PTIM* is an overarching reference tool for the planning and design of public transport infrastructure in the TransLink network.

The *PTIM* is intended for use by professionals in the transport planning and delivery industry. This generally involves, but is not limited to, designers, planners, engineers, architects and other professionals involved in the planning, design and delivery of public transport infrastructure in Queensland.

1.6.2 Using the *PTIM*

The *PTIM* should be referred to before starting to plan new public transport infrastructure projects. It represents TransLink's overarching requirements for the planning, design and implementation of public transport infrastructure across the TransLink network. The TransLink network includes all public transport services across Queensland.

TransLink, in partnership with Local Government and in collaboration with relevant stakeholders and delivery partners, shall be consulted on the final design for new infrastructure and upgrade of existing facilities.


CityCat

1.7 Planning and design

1.7.1 Overarching considerations

There are overarching considerations that need to be incorporated into the planning and design of public transport infrastructure. Table 1.1 provides an overview of these considerations for all public transport infrastructure.

Table 1.1:
Overarching considerations for public transport infrastructure planning and design

Element	Consideration in public transport infrastructure planning and design
Urban design	Successful urban outcomes require quality planning, design and management of the built environment. *QDesign Queensland Urban Design Principles* (Queensland Government, 2018) outlines nine priority planning principles that should be considered in the planning and design of public transport infrastructure: • be climate responsive • be inspired by local place character, form and culture • work with and enhance natural systems, landscape character and biodiversity • create great places for people to live • deliver diverse development forms and density • embed opportunities for adaptation and change • lead by example • engage effectively.
Cross-agency planning	Infrastructure to access public transport stops and stations is often the responsibility of agencies other than TransLink, making cooperative cross-agency planning essential. The following principles should be applied: • define agency and stakeholder responsibilities at project inception • work with the local government and property owners to ensure public transport infrastructure is integrated with existing or planned facilities • consider local community needs and design appropriately to the local context.

Element	Consideration in public transport infrastructure planning and design
Crime Prevention through Environmental Design	• public transport infrastructure design needs to ensure passengers feel safe using public transport at any time of the day and night • apply creative urban design principles to reduce the incidence and perception of crime • include the presence of passive surveillance mechanisms and creation of defensible spaces to act as deterrents of crimes—for example, effective lighting, enhanced visibility, legible and clearly defined spaces, effective signage and wayfinding, and promoting activity. For details, refer to the current version of the government's *Crime Prevention through Environmental Design Guidelines for Queensland*.
Branding, theming and signage	Public transport infrastructure should be easy for passengers to identify and understand. This will be achieved by: • consistent look and feel of infrastructure to provide a recognisable appearance that sits comfortably with the surrounding community • consistent design language which is user-friendly, familiar and instils confidence in existing and potential passengers • modern, high-quality, open structures with a lightweight appearance and an approved colour palette. TransLink branding, theming and signage, including the TransLink colour palette, must be applied to all new and upgraded public transport infrastructure. For details of TransLink's infrastructure colour palette refer to *PTIM, Branding, theming and signage*. Where applicable, consult with stakeholders (i.e. local Government authority, Queensland Rail, GoldLinQ etc.) to determine any additional signage requirements.
Disability access	All public transport infrastructure must comply with relevant standards and guidelines for disability access (for example, Commonwealth *Disability Standards for Accessible Public Transport 2002*). Designs should incorporate: • most direct and convenient access from facility entry to boarding points • buildings or shore lines to facilitate clear and direct access, providing an effective means of wayfinding, and minimising the need for other additional aids, such as TGSI • measures to minimise barriers that deter people with disability from using passenger transport and to improve accessibility and wayfinding for all • use of consistent layouts, signage, wayfinding and design principles. For specific projects the project team will engage with the TMR Accessibility Reference Group.

Element	Consideration in public transport infrastructure planning and design
Environmental sustainability	TransLink and relevant stakeholders involved in public transport infrastructure projects have an obligation to comply with applicable state and commonwealth environmental and energy-efficiency standards for all public transport infrastructure. To support sustainability outcomes, public transport infrastructure should be designed to: • minimise impact on biodiversity and open space • reduce waste consumption and promote re-use and recycling of resources (for example, water use) • use environmentally-friendly devices and components within facilities • improve air quality and promote healthier travel options by providing appropriate access and cycle facilities. Refer to *PTIM, Supporting access infrastructure*.
Human factors	TransLink aims to incorporate human factors principles throughout planning and design to provide assurance to safe, effective and comfortable public transport systems and environments, for all users. This includes contextually-specific considerations for: • the physical effort and ability for a person to use a system or navigate and environment • the adequacy and comfort of ones' surroundings • the recognition and interpretation of interfaces and information • the level of support and/or sensory feedback one is offered, able and/or willing to receive • the understanding of the environment that a person is in, was in, and/or aims to get to • a person's various behavioural states under certain conditions • the various environmental and psychosocial conditions that one may be presented.
Environmental characteristics	When planning, designing and constructing public transport infrastructure, differing environmental characteristics and factors need to be considered (for example wet tropical, sub-tropical, dry arid): • design of infrastructure at any specific location must respond to specific regional characteristics • material selections and construction methods must consider the regional environmental characteristics.

Element	Consideration in public transport infrastructure planning and design
Engineering innovation	The Department of Transport and Main Roads' engineering innovation strategy, which encompasses the design and construction of public transport facilities, as follows: 1. *identify innovation and opportunities as an essential part of the business* 2. *develop and maintain capacity to facilitate and manage innovation* 3. *provide resources for innovation testing and assessment* 4. *improve by evaluating innovation and implementing learnings*. For further information on the Department's Engineering Innovation guidelines refer to the Queensland Government document *Engineering Innovation within the Department of Transport and Main Roads*.
Univeral design	Public transport infrastructure should incorporate the principles of universal design to support and enable a diverse range of customers to access and use the public transport network. According to the AusAID's *Accessibility Design Guide: Universal design principles for Australia's aid program*, the seven principles of universal design are: 1. equitable use 2. flexibility in use 3. simple and intuitive use 4. perceptible information 5. tolerance for error 6. low physical effort 7. size and space for approach and use.

The overall process that needs to be followed for planning and design of public transport infrastructure is illustrated in Figure 1.2.

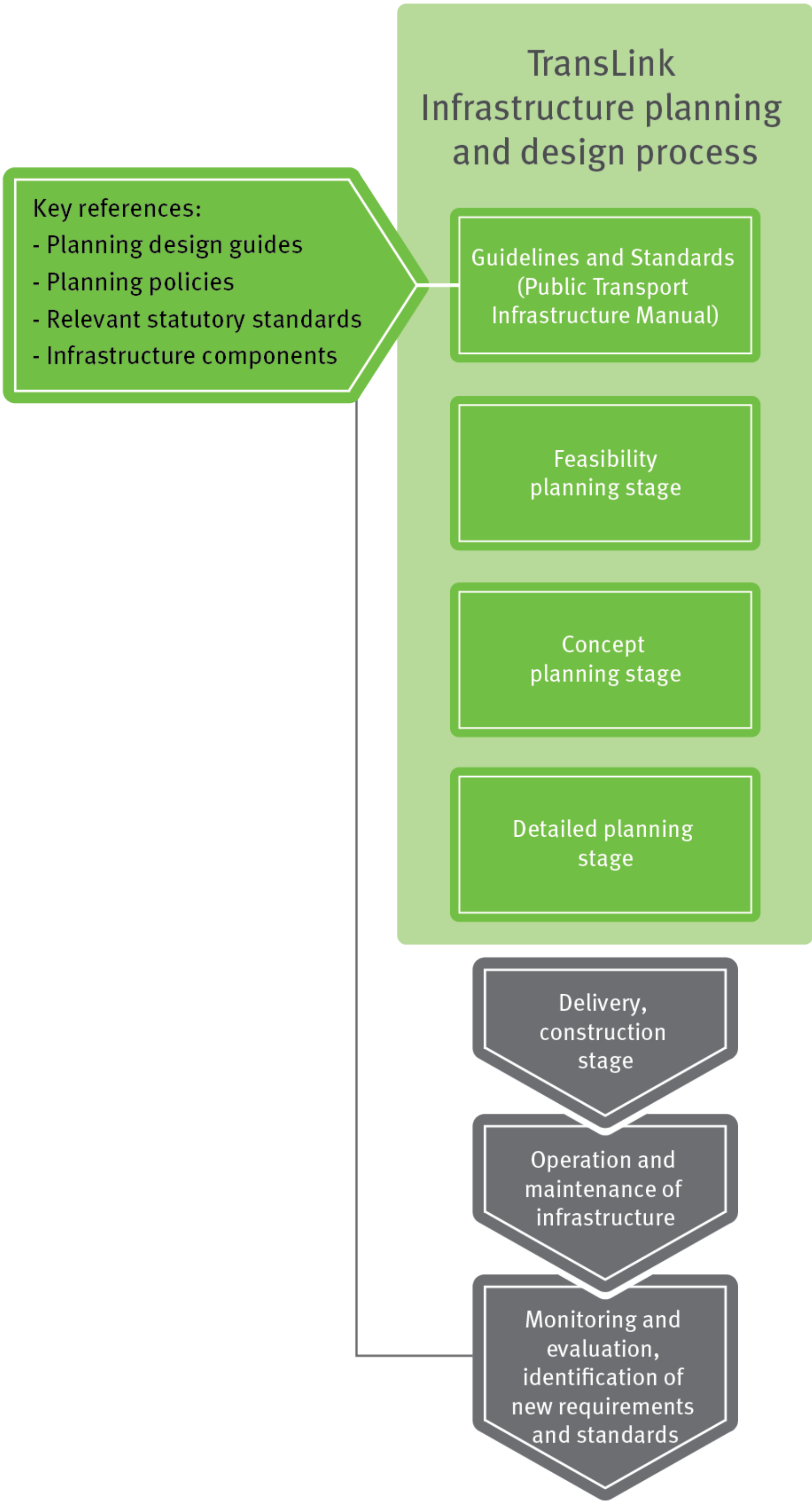


Figure 1.2 –
TransLink infrastructure planning and design process

Contents

Chapter 2 – Planning and design

2.1 Introduction

This section outlines the overarching design principles that should be applied to public transport infrastructure. It clearly sets out TransLink's expectations for consistent standards that must be applied to new and upgraded public transport infrastructure.

The planning, design and implementation of public transport infrastructure shall be guided by these design principles, whilst ensuring the context of the site/location is addressed to achieve the functional and operational needs of customers and services, as well as delivering accessible outcomes to the maximum extent possible.

2.2 Role of public transport infrastructure in the network

2.2.1 Public transport infrastructure network and hierarchy

Coverage and patronage are primary considerations in devising a public transport network. When planning the network decisions must be made regarding the relative importance and practicality of meeting these considerations. As a consequence there are two key service types:

- Coverage services - those designed to maximise access to public transport for the greatest area.
- Patronage services - those designed to achieve maximum ridership on key corridors or to and from key trip generators.

There are benefits and implications of each type of route, and they need to be balanced in their application across a network.

Coverage routes generally are less direct, have low frequency, connect to fewer major hubs and have lower patronage. They are intended to assist social inclusion and equity by providing access to transport. Patronage routes have higher frequency services, are direct and highly patronised. They connect a number and range of hubs and are intended to provide transport choice.

The following are important considerations when contemplating each service type:

Coverage services:

- Connector – These services generally are those coverage routes which are more frequent, more highly patronised and more direct, connecting prominent trip generators. A frequency of at least every 30 minutes is generally found on these routes.
- Local – These services connect people to their nearest transport hub. They are designed to allow travel for community members with limited travel options, and are designed to facilitate interchange with the broader network. They generally operate at 60 minute frequencies.

Patronage services:

- Rapid – These services are those which have a speed advantage in completing their trips, either through priority movement or have limited stop servicing.
- High-frequency – These routes operate at high (at least every 15 minutes) frequencies for extended periods, allowing a 'turn up and go' approach to travel. These routes attract ridership to public transport and are utilised along key movement corridors.

Coverage and patronage services:

- **Peak – These services are generally useful in servicing the markets such as commuter or school where demand only exists for a brief period and, as such, may only be in operation during peak travel periods. More information on school services is below.**

The Department of Transport and Main Roads (TMR) has established a hierarchy of transport facilities to assist with how public transport infrastructure sits within the network. Contact TransLink to assist in determining the hierarchy of facilities.

2.2.2 Access to public transport infrastructure

Providing safe and easy access to the public transport network is important to enhance the overall public transport trip and encourage greater use of the public transport network. TransLink supports access to public transport in the following order of priority:

- **walking**
- **cycling**
- **transferring from another public transport service**
- **taxis**
- **kiss 'n'ride**
- **park 'n' ride (including motorcycles).**

Access infrastructure provides the key connection between the public transport facility and the immediate surrounding environment.

TransLink will encourage as many people as possible to walk and cycle to relieve pressure on parking facilities (as well as help manage traffic congestion). This has the added benefit of supporting whole-of-government objectives for more sustainable transport and physically active communities.

Public transport infrastructure should be planned and designed to reflect TransLink's access hierarchy. For further details refer to the *PTIM, Supporting access infrastructure* Figure 3.1.

2.3 Integration of public transport infrastructure

Public transport infrastructure should be planned and designed to integrate with services to provide a seamless and connected journey for public transport users. The following sections detail some of the key design considerations for the planning and design of infrastructure.

2.3.1 Integration with land use

Integration with land use is critical for all public transport infrastructure, particularly in order to adequately cater for customers needs, ensures community access to services and contributes to reducing dependency on cars.

While other factors, such as operational capacity and network characteristics, influence the functionality of public transport infrastructure, ultimately the location is the key driver for passengers using the facility.

The majority of locality factors (for example population projections, demographics, major attractors and so on) for public transport infrastructure are led by the relevant land use plan for the location. This could include:

- regional plans
- local government land use plans
- transport strategies and plans.

Reference should also be made to the Queensland Government's development assessment processes and systems.

The overarching design guidelines within this chapter need to be applied giving consideration to site-specific characteristics to create an attractive, seamless integration with the surrounding environment.

In some cases, major public transport infrastructure (such as rail, busway, light rail or bus stations) is an integral part of supporting economic development of urban centres, and supports increased densities by encouraging transit-oriented developments (TOD).

TOD promotes the creation of sustainable communities focused around public transport infrastructure. A successful TOD should complement and integrate seamlessly with public transport, prioritising walkability and cycling of the precinct. For further detail regarding TOD projects and how they are to be planned and designed in the public transport context, refer to *Appendix 2-A*.

The proximity of transport facilities to attractive land use developments is vital, as urban consolidation is necessary for achieving increased public transport patronage and therefore justifying high-frequency services.

The following principles should be applied to the planning and design of public transport infrastructure:

- **stakeholder engagement:** partnering with stakeholders to support transit-oriented development opportunities
- **land use planning:** design is appropriate to surrounding community and considers potential future densities and land uses
- **legibility:** public transport facilities need to be easily identifiable in their built form
- **catchment area:** analyse the catchment area to inform existing and potential passenger volumes
- **permeability:** ensure there is high-quality, legible access between the surrounding environment and the transport facility as per the access hierarchy (refer to *PTIM, Supporting access infrastructure* Figure 3.1*)*, including pedestrian connectivity between activity nodes and the public transport station
- **infrastructure footprint:** the physical and operational footprint impacts of station facilities are optimised (for example vehicle access, stormwater runoff catchments)
- **safety and security:** station is located to promote customer safety and security, as well as minimise opportunity for crime or terrorism.

2.3.2 Bus route infrastructure

TransLink is committed to providing an environmentally sustainable, comfortable and safe experience for passengers across the network. As such, TransLink considers traffic calming devices used where existing bus routes or future possible routes are being planned to be in conflict with these objectives.

It is therefore the preference of TransLink for traffic calming devices to not to be used along any routes in its current or future network.

Traffic calming devices are not supported due to a number of reasons, namely: the risk to passenger safety and comfort in negotiating such devices; the possible injury and discomfort to drivers; delays in passenger journey times; decrease in service efficiency as a result of negotiating such devices; noise and air pollution for local residents; and an increase in vehicle maintenance and fuel consumption.

TransLink acknowledges that traffic issues may occur in certain areas, however the need for road humps or chicanes must be determined as a site-specific case for neighbourhood streets.

Additionally, TransLink does not support the use of traffic calming devices for through streets in new residential developments, especially those which may feature neighbourhood bus routes in the future.

In the case where traffic calming devices have been determined as absolutely necessary, TransLink must be consulted on the design and type of device used along existing and proposed bus routes.

2.3.3 Operational considerations

The design of public transport infrastructure needs to consider current and future capacity requirements.

The project scoping for public transport infrastructure should determine the timeframe to be considered in planning and design (for example should 10, 20 or 30 year demand forecasts be used to inform facility design). Depending on the site consideration and long-term public transport network plans, planning should consider provision for future expansion to increase capacity.

Using modular infrastructure in the design makes it easier to expand capacity in the future. Modular infrastructure design will also provide an overall cohesive design as expansion takes place.

2.3.3.1 Demand analysis

Capacity requirements should be determined early in the planning phase and give consideration to:

- future patronage and service growth
- future transport network and corridor connections
- demographics, including surrounding land use in the vicinity of the facility.

In determining future patronage and service growth the following factors should be considered:

- understanding the trip purpose that is attractors seen as origins-destinations, interchanging and so on.
- baseline daily and/or peak volumes (includes passengers and/or vehicles)
- any forecast future daily volume (includes passengers and/or vehicles)
- other volume-related demand factors, including:
  - length and scale of peak demand
  - breakdown between flows associated with boarding and alighting
  - timing factors, including whether it coincides with other peaks in the surrounding area
  - number of peak periods per day per direction
  - likely directional travel mode-share.
- special needs demand, including:
  - potential volumes of special needs users, disability groups, schools etc.
  - potential for land use scale, intensity or typology change.

TransLink may be able to provide basic information, such as:

- existing patronage
- targets and forecast demand
- volume and frequency of current and future services for the location or corridor
- previous performance against reliability measures such as on-time running.

In some cases, additional counts, surveys or demand forecasts may need to be undertaken due to the absence of data. TransLink should always be consulted regarding appropriate demand identification methodologies and data validity.

For further information in determining pedestrian capacity and Levels of Service (LOS) requirements refer to *Section 2.4.2.3*.

2.3.3.2 Other operational considerations for planning and design of infrastructure

There are numerous issues that need to be considered when planning public transport infrastructure. Table 2.1 summarises these issues and should be used as a checklist to ensure all the relevant considerations are included in the planning and design of new infrastructure.

Table 2.1:
Operational considerations for planning and designing public transport infrastructure

Factors influencing planning and design	What to consider
Land availability	• **Footprint –** Public transport infrastructure should not consume more space than needed for effective operations. • **Land constraints –** Design needs to consider land constraints in determining size, configuration and function of the infrastructure. Where land is available (for example, greenfield sites) it should be preserved to provide short and long-term demand. • Consider on-street designs where the station forms part of the normal main street setting in a city or town centre, particularly where this offers significant operational benefits for customer and operator.
Surrounding land use and attractors	• **Future land use –** Consider future land use and demographics in determining capacity requirements and design. • **Attractors –** Consider adjacent and nearby attractors in determining capacity. Other capacity factors (such as network and service operations, events) should also be considered.
Service frequency	• **Frequency –** The peak and off-peak frequency of services needs to be considered. • **Demand –** Patronage increases should be catered for (to the life of the facility as determined in the early stages of planning). Forecast patronage increases will require public transport facilities to be able to accommodate multiple services at higher frequencies. For example bus stations will require an adequate number of bus bays to minimise delay to services using the facilities. Rail stations may require the possible upgrade of both station and track to accommodate additional services. • **Access considerations –** Cycle parking, kiss ‘n’ ride bays will need to consider future demand requirements.
Public transport vehicle access	• **Maintain public transport vehicle accessibility –** Public transport infrastructure design should not constrain vehicle access from the surrounding access routes as this affects not only the number of services able to access a site, but also contributes to delays of other scheduled services. For example capacity restrictions at road intersections providing access to and from a bus facility are of great importance, as delays at intersections can greatly affect the operation of the facility and the use of the network itself.

Factors influencing planning and design	What to consider
Fare collection	• **Fare collection considerations –** The method of fare collection affects operational capacity of public transport facilities. For example prepaid ticketing procedures enable faster boarding, reduced dwell times and allow greater person throughput. • **Pre-paid fare collection –** Where pre-paid fare collection is applicable, this needs to be included in the design. This could include pre-paid ticketing systems, especially those with high level-of-service. The provision of ticketing systems will be determined by facility layout, size, public comfort and level-of-service requirements, and revenue protection strategies. The facility layout must consider the appropriate location of the paid/unpaid threshold (position of fare collection barriers-gates) as part of ensuring sufficient and safe circulation and queuing of passengers particularly in peak operational periods. • Contact TransLink for preferred fare payment options.
Mobility aids, wheelchairs, pram and bicycle boarding	• **Operational impacts –** Mobility aids, wheelchairs, prams and bicycles increase boarding times and can impact operational capacity of public transport infrastructure. This needs to be considered in demand forecasting. • **Accessible design –** Design must accommodate all public transport and comply with the *Disability Standards* and *Australian Standards*.
Platform and access area design	• **Design space –** Typically, platform areas and access paths, during peak periods, should be at a LOS C. Further guidance is available in John J. Fruin's *Pedestrian Planning and Design* publication. Seating and waiting areas should be separated so that they do not interfere with boarding and alighting, facility entrances and exits, information points or other pedestrian circulation points. • **Given the typical LOS C requirements, platform widths and lengths will vary depending on a range of design criteria including:** – the type and size of facility layout (for example, bus and rail stations function differently in terms of boarding and alighting of passengers. Rail stations will typically allow for boarding and alighting from numerous locations along a station platform, whereas buses will board from the front end of the platform in a lead stop situation or from independent stops. This warrants separate design considerations for queuing and waiting passengers) – the anticipated peak passenger demand (that is, boarding and alighting) – the type of public transport mode and stopping arrangement – the number and types of services expected to utilise the facility. • **Personal comfort –** Platform and access areas should be designed to be within the range of personal comfort during peak periods. The loading area must accommodate passenger movements when waiting, queuing and accessing services. Passengers boarding/alighting should not inhibit waiting passengers.
Supporting access infrastructure	• **High-quality supporting access infrastructure –** Planning and design should consider how passengers will access the infrastructure, and incorporate appropriate access facilities and infrastructure. For detailed guidance please refer to *PTIM, Supporting access infrastructure*.

2.3.4 Asset management

While the *PTIM* is primarily concerned with the immediate planning and design of infrastructure from concept design to delivery, the ongoing maintenance and management of individual components of infrastructure or an entire facility is an important aspect of the planning and design process.

Collaborative working agreements between relevant stakeholders involved in asset management should be established at the planning stage, to promote a whole-of-life approach to infrastructure management and to contribute towards a functional, high quality, safe and easy-to-use public transport network.

The following must be considered when planning and designing public transport facilities:

- site ownership and management and maintenance agreements
- the general requirements for durability, cleaning and maintenance of infrastructure components
- surveillance and access control of the facility
- cost-effectiveness, commonality and replacement of components
- approved suppliers of the materials and components
- access to water, electricity and other resources
- general operating costs (such as electricity, water and staff)
- statutory requirements for buildings and facilities
- requirements for staff.

The above is not a definitive list and other considerations may be required depending on site-specific circumstances.

Relevant operational stakeholders should be engaged in the planning and design process to ensure that the requirements of asset management by operators and /or owners have been considered. All components of station infrastructure to be maintained by TransLink should use materials and finishings consistent and compatible with existing infrastructure and of a standard approved by TransLink. In consultation with relevant operating and maintenance stakeholders, through TransLink, detailed maintenance manuals should be developed for all components and operation schedules within a station facility.

2.4 Functional design elements for public transport infrastructure

Ensuring that the arrangement of key components is correctly incorporated and will contribute towards quality outcomes for the overall facility design.

Each of the following principles described in this section should be incorporated into the design of public transport infrastructure.

2.4.1 TransLink architectural theme

Passengers find it easy to recognise, interpret and navigate public transport infrastructure.

Public transport infrastructure should be designed to:

- be legible within the built environment
- be contemporary
- have a consistent visual appearance
- address climatic conditions.

Infrastructure is one of the most recognisable parts of the TransLink network. A consistent 'look and feel' across the network will increase passenger confidence, with customers having clear expectations. Design elements can be tailored to meet specific operational and functional requirements at individual sites, while still maintaining a consistent 'look and feel' across the network.

The TransLink architectural theme provides the framework for establishing a coherent network of public transport infrastructure across the state. Infrastructure planning and design should:

- reflect the relative importance of the infrastructure in the overall public transport hierarchy
- comply with network standards for components such as structures, pavements, signage and wayfinding
- be based on the use of modular components to reduce cost, as well as for ease of maintenance and future capacity enhancement
- use common materials that emulate a lightweight appearance to deliver a modern, open and safe environment
- comply with applicable standards and regulations including:
  - *Disability Standards for Accessible Public Transport 2002 (Cth)*
  - *Disability (Access to Premises - Buildings) Standards 2010 (Cth)*
  - relevant *Australian Standards.*

See *PTIM, Background and application* Section 1.4.

2.4.2 Arrangement of space

Customers enjoy free flowing movement within the station.

Public transport infrastructure can include public and private spaces. Public spaces form the pathway from the point of entry to the point of departure.

Private spaces should not obstruct paths of travel, sightlines to points of entry, information and decision points, and waiting and seating areas.

Private spaces can include:

- retail and commercial areas
- maintenance and management facility areas
- communications and electrical cupboards.

2.4.2.1 Sequence of movement

The layout of a transport facility should consider the sequence of passenger movement. Passenger movement is in response to the progressive sequence of actions and decision points along the path of travel. Movement should be in a forward direction from the entry to the platform, as illustrated in Figure 2.1.

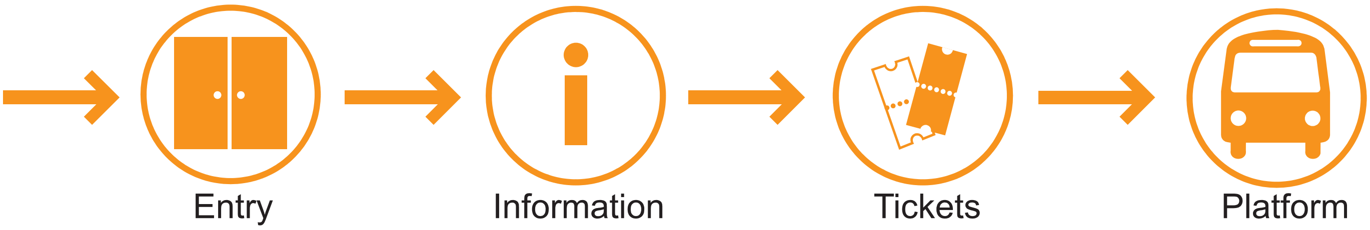


Figure 2.1 –
Sequence of movement

2.4.2.2 Circulation within public transport infrastructure

Table 2.2:
Principles of circulation

Type of circulation	Principles
Direct circulation	• Route between entry and boarding points should be as direct as possible. • Minimise turns in the path of travel and avoid turns greater than 180 degrees. • Changes of level should be through continuous straight flights of stairs or ramps and, if appropriate, escalators or lifts. Further: – if turning is required, landings are to be provided with necessary room for appropriate separation and manoeuvring, and – stairs circulating at 90-degree turns must adopt suitable measures to provide good sightlines for ascending and descending. See Figure 2.2.
Cross-path circulation	• Provide simple and clearly defined paths of travel that avoid conflict and maximise station capacity. • Paths of travel should be clearly established to meet the requirements of passengers on the dominant side of the pathway, away from the opposite flow path. • Avoid circulation systems that have people crossing the paths of others to access information, ticketing, amenities, platforms, ranks, seating, rubbish disposal and other requirements. See Figure 2.3.
Left-hand circulation	• Dominant movement pattern of pedestrians is based on the majority of travel undertaken on the left-hand side. • Circulation within the facility (including around components and amenities) should follow this convention for predictability and efficiency.
Vertical circulation	• Vertical circulation components such as stairs, ramps, lifts and escalators should be assembled together centrally. • Centralised location of components assists with convenient placement of public information. • All access components must comply with the relevant disability standards.

Type of circulation	Principles
Changing direction	• Changes in direction within circulation should only occur where there is sufficient space to allow passengers to maintain a sense of direction (use of transparent materials to enable views is preferable). • Appropriate space should be provided at information and decision points for people to avoid conflict with the flow path of travel to ensure comfortable and efficient movement.
Emergency evacuation circulation [1]	• Emergency evacuation considerations, including appropriate circulation paths, exits and assembly points, should cater for the maximum volume of people using the facility at any one time. • Effective signage and way-finding is a key consideration for public circulation in an emergency situation. This must be reviewed in the detailed design stage and receive approval by an emergency evacuation specialist. • Facilities which are structurally at-grade, elevated or below grade present different emergency and safety requirements that warrant project specific design investigation.

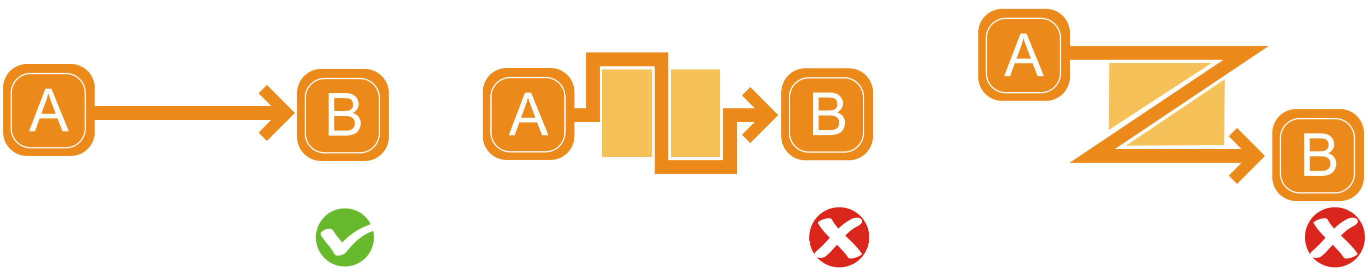


Figure 2.2 –
Direct circulation

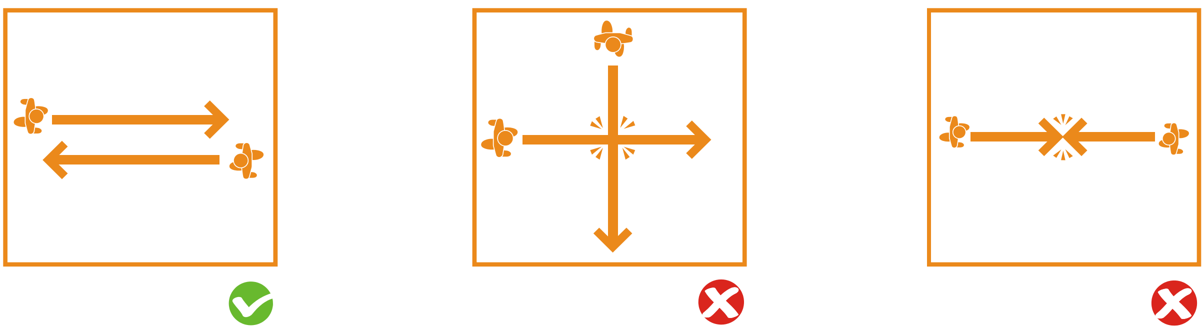


Figure 2.3 –
Cross-path circulation

[1] *The Building Code of Australia provides technical emergency and safety requirements and also cross references a range of Australian Standards.*

2.4.2.3 Density of occupation

The density of passengers to be accommodated should be within the range of personal comfort, and passengers should experience modest restrictions without coming into undesirable contact with any person. The public Level of Service (LOS) classification ranges from LOS A to F (Fruin, 1978, *Pedestrian Planning and Design*). Level A is the least crowded environment and Level F is the most crowded environment (and hence most undesirable). TransLink requires that an appropriate LOS be achieved for pedestrian areas to ensure comfortable pedestrian densities are not compromised during peak periods.

The areas of pedestrian occupation which typically require a LOS design response include:

- waiting and queuing areas including ticketing and information points such as information displays, fare machines, fare gates, and ticket validation equipment (SACIDS)
- seating
- walkways or other areas of circulation
- stairways
- overpasses
- lifts
- ramps
- escalators and travelators.

Note that the suitable LOS for different passenger areas of a station will warrant a different level of area allocation per pedestrian (for example the physical area of LOS C for stairways will be different from the LOS C for waiting areas). In addition to appropriate space allocation, all pedestrian areas of a station will comply with applicable disability standards.

For pedestrian horizontal travel (that is, walkways and overpasses) and platform waiting areas, TransLink typically prefers that a LOS C (between 0.65–0.9 square metres per person of personal space) be achieved as a minimum during peak periods. See Figure 2.4.

However, this preference may be subject to change depending on station and service functional arrangements.

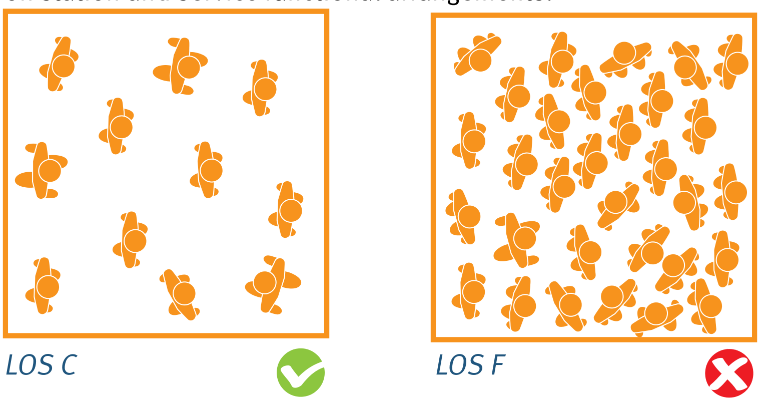


Figure 2.4 *–*
Density of occupation

2.4.3 Identifiable station entry and exit

Entry and exit points are clearly defined and highly legible to customers.

Clearly defined entry and exit points are essential; not only providing points of access, but also defining the station boundaries and where access infrastructure needs to link to the station from the surrounding built environment. See Figure 2.5. This is especially important where there are a multitude of competing uses and messages. For more information refer to the *PTIM, Supporting access infrastructure*.

Design considerations should include provision of entry plazas, information areas, station concourse, ticket office or facility, and fare gates.

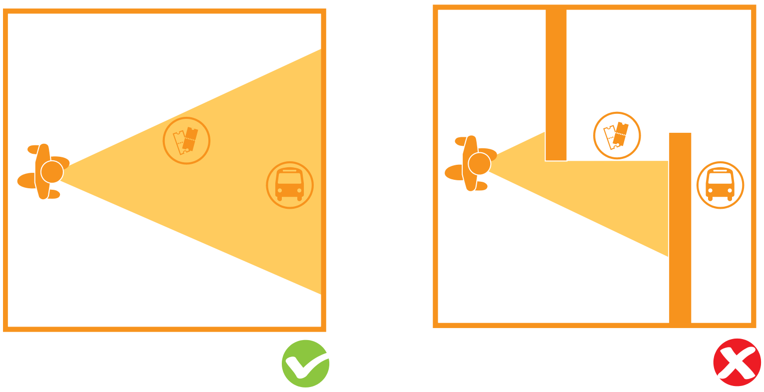


Figure 2.5 –
Identifiable entry/facility

2.4.4 Passive surveillance

Infrastructure is designed to provide passive surveillance and deter undesirable behaviour.

The physical environment of public transport facilities must be designed to include *Crime Prevention through Environmental Design (CPTED)* principles to reduce crime, property damage and anti-social behaviour associated with people gathering in public spaces. Creating defensible spaces that allow for surveillance from outside and within the facility will promote safe environments and will attract greater public use. For details on *CPTED* principles, refer to the current version of the Queensland Government's *Crime Prevention through Environmental Design Guidelines for Queensland.*

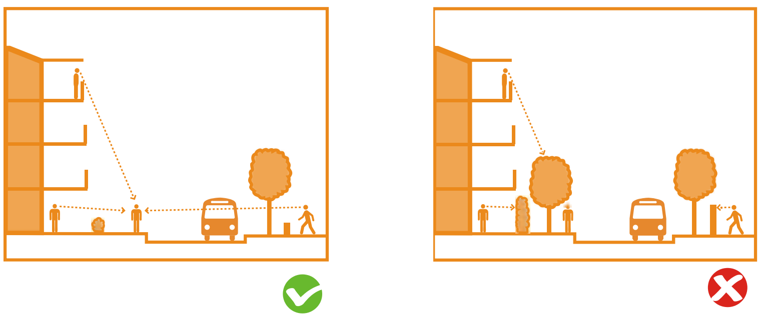


Figure 2.6 –
Passive surveillance

2.4.5 Climatic comfort and weather protection

Sun and weather protection is to be provided.

In developing the design of facilities the following should be considered:

- structures must provide sufficient physical width, length and height to achieve high-quality climatic comfort and weather protection for passengers to occupy this space
- passengers should be provided with appropriate protection with enclosed or covered station access points, public information and decision points, seating and waiting areas, and boarding and alighting areas
- consideration must be given to the management of sun, wind, rain, heat, glare and humidity.

An appropriate climate analysis should be included within the planning and design of public transport infrastructure to inform appropriate facility orientation and suitability for specific locations.

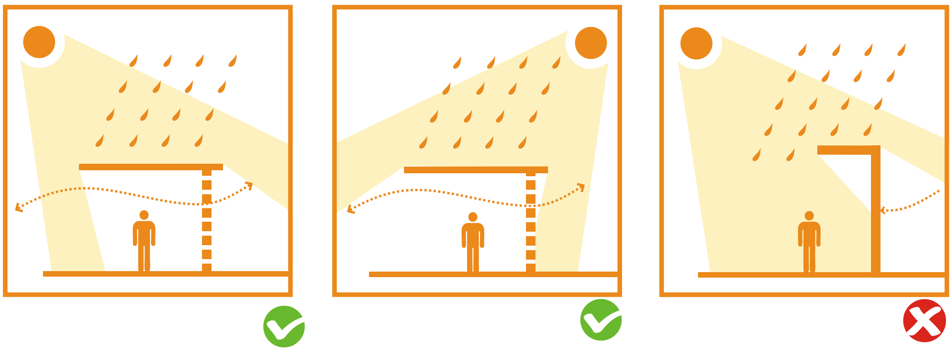


Figure 2.7 – Climatic comfort and weather protection

2.4.6 Functionality and simplicity

Maintain simplicity and provide a functional station design that passengers can easily interpret and use.

The design of structures, platforms, ranks, seating, signage, pavements and other components must be incorporated within the overall design process to achieve highly functional station design outcomes.

The design should provide a legible and pleasant environment that is uncluttered, with minimal concealed spaces.

2.4.7 Sustainable energy use and design

Sustainability is to be considered in developing all public transport infrastructure.

Design and delivery of public transport infrastructure will focus on sustainability through:

- facility design that is fit for purpose now and into the future, and adaptable to change
- contributing to attractive community spaces and a local sense of place
- commitment to a low environmental footprint and whole-of-life approach through all design, construction and maintenance activities
- increasing visibility of sustainable features, and undertaking a participatory approach to design to improve community awareness and support.

Details of TransLink sustainability requirements are included in Table 2.3.

Table 2.3:
Key environmental sustainability design considerations

Key sustainability consideration	Requirement where possible
Water management	• on-site rainwater collection and reuse • on-site run-off treatment (that is, scrubbing using permeable surfaces, detention basins and swales) • local flooding mitigation and flow maintenance.
Resource minimisation	• water – employ water-saving devices • energy – aim for energy-neutral infrastructure through minimisation of energy use and generation opportunities (for example, solar for feeding back into electrical supply) • materials – apply whole-of-life design approach—construction, operation, maintenance, cleaning, and decommissioning. Materials should favour renewables and recyclables • processes – avoid operational processes that generate waste, especially toxins and pollutants.

Key sustainability consideration	Requirement where possible
Habitat and physical environment	• protect habitat (that is space, physical elements such as tree hollows and burrows, movement paths) • maintain water flows to aquatic and other habitats • avoid acid sulphate soils • minimise fugitive emissions of air, surface and groundwater-borne pollutants.
Social sustainability	• present minimal harm to employees or public • promote social justice, inclusion and equity • contribute to improving social capacity and community interaction • enhance community experience and integrate facilities with the surrounding environment to enhance economic viability and social benefits.

2.4.8 Operations and maintenance

The components and materials that make up a public transport facility should be durable and meet their intended operational requirements. For further details on requirements refer to *Section 2.3.4*.

2.4.9 Cultural and heritage places

Heritage values are protected in the upgrade and delivery of public transport infrastructure.

Existing sites may contain components or structures of cultural or heritage significance. Such sites may require particular investigation and attention in the facility design. For example rail stations are commonly listed as having heritage significance and require careful consideration and approval with respect to structural design and modification. Sites with cultural features or significance may require permission or approval prior to commencement of any planning and design work.

TransLink recommends an appropriate level of assessment is undertaken by an expert assessor.

2.4.10 Signage

Signage contributes to a simple, coherent and integrated public transport system.

Signage forms a major component of design to assist with navigation to and around public transport infrastructure. Logical information, wayfinding signage and overall facility signage is important to achieving a consistent and recognisable public transport system. The use of universal/international symbols and indicators is always preferable for a consistent message for all users.

Signage needs to identify, orientate and explain. For further details of TransLink's signage requirements, refer to *PTIM*, *Branding, theming and signage*.

2.4.11 Intelligent Transport System (ITS)

The use of ITS, to enhance passenger benefits.

ITS functionality should be considered for all public transport facilities within the context of the broader transport systems management network. These functions include security cameras, real-time information, public address systems, incident management systems, and monitoring and communications systems.

ITS hardware and connection points are typically located in a communications room within the overall facility. These ITS or communications control rooms may be adjoined to other facilities, such as toilets or storerooms. They should be located in discreet locations within the facility environment, not impede public spaces or free flowing pedestrian access, and generally be signed as staff only.

The specific installation (including power/data conduits and security) and asset management schedule requirements for ITS components should be investigated on a site-specific basis prior to detailed design. Specialist ITS personnel should be commissioned when proceeding to design the ITS components.

For further information on specific site requirements for ITS provisions contact TransLink.

2.4.12 Real-time information

Passengers are able to access real-time information.

Real-time information provides accurate predictions for the next services departing from a stop or station. It allows passengers to make public transport choices based on actual travel time, not just scheduled times, which may vary depending on traffic or weather conditions.

Customers want accurate information, with research finding that some customers (especially new or infrequent users) can feel quite anxious about using public transport. Real-time technology, whether accessed via personal mobile devices or through real-time components at public transport stops and stations, provides access to accurate service information for customer reassurance.

2.4.13 Security infrastructure

Security infrastructure is used to enhance passenger safety and deter anti-social behaviour and crime.

Security infrastructure includes security cameras, lighting and other items used for the creation of safe and well-monitored waiting environments. The intent is to ensure a visually discreet, easily maintained system that provides surveillance to all public areas of the facility environment. Details on the specifications and management schedules for these systems will be established in collaboration with the facility owner and/or asset manager. Appropriate design, construction and installation requirements must be considered when planning for the inclusion of security infrastructure. The use of signage informing people of the presence of security infrastructure within a facility can further enhance personal safety and highlight the perceived risk of detection to potential offenders.

Security help points are typically located at platform mid-points and/or other waiting areas. Ultimately, the location of all these elements should be the subject of facility-specific design, as each site is likely to have a range of differing sightlines and movement patterns.

Counter-terrorism and CPTED design considerations should be explored on a site-by-site basis depending on facility location, level-of-service and potential security risk. Where applicable, facility design should strive towards universal standards for security and counter-terrorism measures.

For further information on transport security refer to TMR's website dealing with transport security and safety and the *Intergovernmental Agreement on Surface Transport Security and the Queensland Counter-Terrorism Strategy*.

2.4.14 Lighting

Lighting should ensure a safe, comfortable, and functional environment.

The intent for facility design is to use a range of high quality lighting fixtures, features and effects to ensure a safe and visually attractive environment. An appropriate amount of bright white artificial light (that is, luminance) must be adopted to give the environment a safe and open feel for customers who access and wait at facilities at night. This can be achieved through approved fluorescent or light emitting diode (LED) lighting to maximise energy-efficiency and lamp life.

Light fixtures, fittings and features should be robust, tamper-proof, discreet, and consistently themed, and should complement the architecture. Fixtures should generally be from proprietary ranges to assist in easy maintenance and replacement when required.

During appropriate daylight, the use of translucent materials and structures, that emulate an open and spacious design, helps to achieve a more naturally lit facility environment.

Lighting levels are required to meet current regulation standards for public transport facilities. For details regarding lighting requirements refer to individual infrastructure modal chapters. Generally, all lighting requirements for various public transport situations are covered within the *Disability Standards, Premises Standards* and *Australian Standards.*

2.4.15 Graffiti deterrents and treatments

Components are durable and resistant to graffiti and vandalism.

Public transport facilities are vulnerable to unwanted offences such as vandalism, abuse and careless use of infrastructure components. In line with specifying durable, self-cleaning and easily maintainable materials and finishes, all infrastructure components: furniture, lighting equipment, information devices, walls, floors, ceilings, balustrades, glass panels, screens, elevators, escalators and other components—coming into contact with the public must be resilient to acts of vandalism and graffiti. This may involve facility components being protected with anti-graffiti coatings or constructed from non-porous graffiti-resistant materials.

Other options include specific design and arrangement of platforms and structures to maximise natural surveillance in order to minimise the incidence of graffiti and anti-social behaviour. In some instances, appropriate planting of vegetation may be used, adjacent to structures or walls, to prevent access by vandals.

Furthermore, the moderate application of artwork that complements the station architecture and theming can also be used to deter graffiti.

2.4.16 Animal and pest problems

Design minimises potential for animal and pest problems.

Within the facility design there must be no, or minimal, horizontal ledges, overhangs, or concealed spaces where birds and animals are tempted to perch, nest and pollute the station facility. If cavities and horizontal surfaces are unavoidable, then appropriate measures are to be used to prevent animals and pests congregating and/or nesting. Designing ledges of structures to be angled (45° or greater) may be a solution that will deter birds from perching and nesting within the facility.

2.4.17 Landscape treatment

Incorporate landscaping into infrastructure design.

Landscape treatment is to be incorporated (where appropriate) in and around the initial facility design. Appropriate landscaping can complement the facility's architecture, enhance the identification of a particular location and integrate the facility with the surrounding environment.

It is preferred that plants used for landscaping are:

- drought resistant
- consistent with the surrounding natural environment (for example, local flora)
- unlikely to intrude upon the integrity of the facility environment
- unlikely to interfere with above and below ground services and utilities
- not toxic, highly allergenic or noxious weeds
- not known to produce thorns, barbs, stings or noxious secretions
- not likely to inhibit sightlines, passive surveillance or allow for potential offenders to hide.

2.4.18 Commerce and advertising

Investigate potential for commercial and advertising opportunities.

Commercial and advertising infrastructure opportunities for each facility must be investigated with owners, asset managers and relevant stakeholders. These assets provide customers with goods and services to improve their experience while using the public transport network, but also may provide a way for generating revenue to improve the overall network.

With regard to facility planning considerations, it may be appropriate to integrate the following:

- commercial vending machines
- commercial advertising
- retail outlets, such as cafes or coffee carts, newsagents and convenience stores.

Each of these are typically developed and operated by external parties under a TransLink agreement.

Endorsement of commercial infrastructure prior to facility design is required due to the allowances for operational requirements such as available space and services connections (for example, power, data and water).

2.4.19 Other enhancements

Consider other enhancements, such as public art.

Public art standards should be investigated and incorporated where applicable within substantial facility design to complement the infrastructure and the surrounding environment in which it is located. As with landscaping, artwork can enhance a location's identity, but in most cases warrants prior approvals from relevant stakeholders. Public art should not conflict with station architecture, colour scheme and branding.

Recycle bins may be incorporated adjacent to general waste bins to promote recycling, with appropriate recycling collection arrangements in place.

Wireless internet access options and connections may be investigated and incorporated within the facility to accommodate current technology and improve public convenience by allowing passengers to use electronic communications devices while waiting for services. As a minimum, preliminary requirements for inclusion should be allowed for in the design, for future application.

The facility owner and/or asset manager, and relevant stakeholders, should endorse all enhancements prior to the detailed design stage of the facility. Appropriate space and function must be identified to accommodate all additional enhancements.

Appendix 2-A

Transit-oriented development

What is a TOD project?

Transit-oriented development (TOD) promotes the creation of sustainable communities focussed around public transport infrastructure.

TOD is recognised by:

- effective land use and transport integration where a rapid and frequent transit service is available
- high accessibility to the public transport network
- public spaces where walkability and cycling are prioritised
- higher density residential, retail, commercial and community uses or ideally, a mix of these where appropriate.

A successful TOD should achieve:

- increased patronage on the public transport network
- greater mobility choice
- improved safety and activation
- improved community inclusivity and access
- opportunities to revitalise urban areas
- increased localised business and economic activity
- reduced travel times to reach employment, goods and services
- a balanced mix of uses
- maintained legibility of the public transport system.

Roles and responsibilities

TMR is a consent authority for developments that are adjacent to, connect with, or gain additional floor space ratio as a result of the transport access provided by the transport systems TMR provides.

TMR represents the interests of the public, and the potential and existing residents and owners of TODs with a focus on ensuring that the benefits arising from public investment in public transport infrastructure and systems is maximised through customer-centred design resulting in seamless, quality access. In doing so, developers directly benefit from improved access, which directly improves value.

Commencing collaboration prior to design ensures maximum compatibility precinct-wide with TMR assets. With early engagement questions regarding appropriateness, scale, detail or integration of access can be resolved before significant investment in design and detail occur, improving public outcomes.

TMR encourages innovation that improves customer satisfaction and access without impeding on base requirements of operational safety and efficiency.

TMR can:

- actively promote or initiate development through land release, with contingent expectations of design excellence and integration
- review and co-create market-led proposals with early engagement that maximises benefits to the public and the developer through customer-centred design
- use its review powers and consent authority through a TOD lifecycle to prevent poor public outcomes.

Where a TOD project interfaces with a rail station/ is within a railway (i.e. commercial corridor land), the railway manager, will be a key stakeholder, with additional standards to be adhered to and approvals required.

PTIM overview

An overview of the *PTIM* chapters and the elements within each that can assist in the planning and design of TOD projects is illustrated in Table 2.4.

For information on further resources to support the planning and design of TOD, please refer to the *PTIM, Background and application*.

Table 2.4:
PTIM overview

***PTIM* chapter**	Planning and design considerations
Chapter 1: Background and application	• describes roles for application of *PTIM* • provides reference material and supporting information • provides overarching considerations for public transport infrastructure.
Chapter 2: Planning and design	• details the integration of public transport infrastructure and land use • describes the importance of and methods of demand analysis to be considered • functional design elements for public transport infrastructure.
Chapter 3: Supporting access infrastructure	describes the principles, integration, design considerations and any supporting components of the following supporting access infrastructure: • pedestrian • cycle • bus feeder • taxi • kiss 'n' ride • park 'n' ride.
Chapter 4: Branding, theming and signage	• outlines the preferred requirements for public transport infrastructure signage, wayfinding and branding • details the requirements for compliance with relevant standards and regulations • to be adopted to ensure consistent and best practice infrastructure signage design and wayfinding is applied across the TransLink network.
Modal chapters (bus stop, bus station, ferry terminal, rail station, taxi, park 'n' ride)	• outlines the TransLink requirements for infrastructure developed for each mode • provides detailed requirements for compliance with relevant standards and regulations for infrastructure associated with each mode.

Understanding the customer

The integration of TOD with existing public transport infrastructure should achieve the best outcomes for customers.

Customer outcomes

TMR is focussed on achieving the following customer outcomes:

1. **Accessible, convenient transport:** access and use of the public transport network should be accessible, convenient, direct and legible
2. **Safe journeys for all:** customers should feel comfortable and safe when using public transport infrastructure
3. **Seamless, personalised journeys:** public transport infrastructure is to be designed for the customer, and needs to be convenient and responsive to their individual needs and expectations. Design is to consider all modes of access to ensure seamless interchanging and customer journeys
4. **Efficient, reliable and productive transport for people and goods:** ensure local access and integration with all modes is achieved and customers are able to move efficiently through the stop/station
5. **Sustainable, resilient and liveable communities:** provide a balance between movement and place creating vibrant places for the community. Public transport infrastructure should be designed as sustainable, long term assets that are fit-for-purpose now and into the future, and adaptable to change.

Customer needs

In order to provide an enjoyable, safe and comfortable customer experience, an understanding of who the customers are and their differing expectations and needs is required. As a minimum, all users, regardless of their ability or how frequently/infrequently they use the public transport network, require the following:

- short and direct paths to and within the stop/station
- minimal barriers between the stop/station and each access mode
- ease of circulation to/through the TOD project and public transport infrastructure
- CPTED/personal safety
- legible, clear and consistent wayfinding and information.

Additional specific expectations and needs of customers using public transport is provided in Table 2.5.

In addition to the customer's needs and expectations, property owners within the TOD precinct and operators of the public transport network also have requirements that will need to be considered when designing a TOD project. These are demonstrated in Table 2.6.

Sam's local TOD really supports his needs! Sam commutes to the local TOD station via the pedestrian footpath on his electric wheelchair. He really enjoys this and does not feel like his is getting in other people's way as the walkways are wide enough for his large wheelchair and other users to get past.

Upon arriving at the TOD, he can clearly see the entry to the station and where there is lift access to the platforms as there are many open spaces with clear signage and wayfinding. The real-time information provided allows him to know when his train is arriving at a location where there is sufficient time to reach the platform.

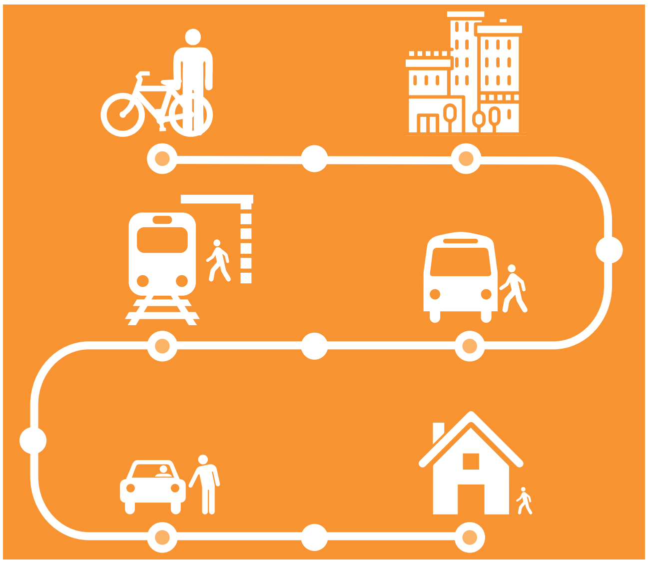
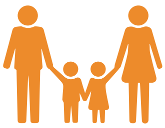


Table 2.5:
Customer outcomes

Customer types	Example(s)	Customer expectations or needs
Regular peak-hour commuters 	Customer who travels every business day to work or education frequently using the public transport network, and have strong familiarity with stop/station and routes through/via development.	• efficient entry and exit • legible/direct movement through TOD to/from stop/station • short and direct access between modes • convenient retail/food and drink facilities • dependent on escalators/elevators • information on service disruptions and ability to access alternative modes.
Off-peak travellers 	May include retired passengers, university students, families travelling with children, employees working shift or outside of regular business hours.	• easy, accessible, legible access and interchange • comfortable waiting areas.
First-timers/ infrequent users 	May include tourists business travellers, parents travelling with children, interstate guest visiting family. Customers might have luggage, prams or items unable to move easily.	• legible, clear and consistent wayfinding and information on schedule and surrounding area • easy to navigate • ramps and lifts etc. to navigate level changes • comfortable waiting areas including luggage facilities • convenient retail/food and drink facilities • direct access to park 'n' ride, kiss 'n' ride and taxi facilities.
Interchangers/ transferring customers 	Regular peak-hour commuter switching between modes. Might need to accommodate customers impacted due to a service disruption, or alighted at wrong stop/station.	• easy, legible interchange • multi-modal real-time information, signage and wayfinding • relationship between modes minimises delay, diversions, provides weather protection/shelter and the need to cross roads.
People with a disability 	Hearing impaired, vision impaired customer, pregnant women, customer with cognitive disability or permanent or short-term mobility issues.	• system that ensures equitable and direct access • allow users to get to their destination with minimum difficulty or stress • direct access to lifts/escalators and platforms • direct access to amenities • accessible parking • integrated and sensory wayfinding and signage.

Customer types	Example(s)	Customer expectations or needs
Precinct residents, employees and visitors 	May include TOD residents, employees, visitors and neighbours, bus/train driver, maintenance worker, local retail worker.	• comfortable, safe environment • generous spaces, noise/air quality • high quality design/visual outcome • contributes to development outcomes • agglomerates movements through key retail corridors.
Visitors/passer-bys 	May include non-travellers who use or pass through station/ interchange. e.g. Off-street going to the bathroom, buying a magazine from the kiosk, passing through the station, meeting a relative or friend.	• retail opportunities • access to short term parking and kiss 'n' ride facilities • real time information • comfortable waiting areas and meeting points • quality station amenity • avoidance of obstructions, public transport infrastructure impeding movement routes.

Table 2.6:
Stakeholder expectations and needs

Stakeholder	Example(s)	Stakeholder expectations or needs
Property owner	Owner of land/development rights	• high quality design/visual outcome • contributes to development outcomes • agglomerates movements through key retail corridors • allowance for loading/servicing, or operational access (building maintenance statements may be required) separate to pedestrian flows • clear maintenance and other responsibilities identified where facilities are integrated (shared spaces, lifts, escalators, access roads etc.) • maintain economic feasibility of integrated commercial opportunities.
Operators	Public transport operator, station manager	• allowance for loading/servicing, or operational/ maintenance access • future proofing for operational changes (e.g. layover nearby) and construction access for future upgrades • drivers' amenities

Understanding the site

Integration with public transport

A successful TOD features:

- seamless platform passenger movement between modes and services
- direct sightlines across the facility and maximise directness of travel routes through TOD
- minimised barriers to appropriate movement along desired travel paths
- intelligently managed pedestrian flows that promotes appropriate through-pedestrian traffic where capacity, behavioural conflicts and the integrity of pre-paid ticketing zones can be managed
- customer protection from weather.

To ensure a quality journey for passengers, its design should be user-friendly and easily interfaced with the various access modes passengers may use.

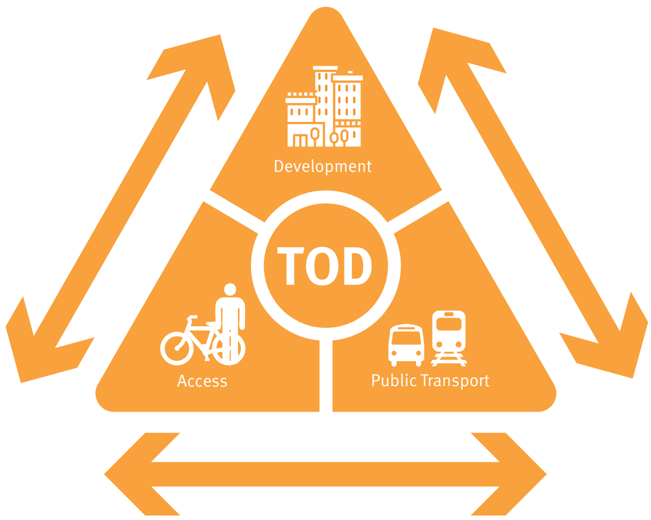


Figure 2.8:
TOD interface with public transport infrastructure

Integration with land use

TOD must be fully integrated with the public transport network by ensuring it, for example:

- prioritises customers of the public transport network
- does not create unnecessary conflict between users (i.e. it should separate vehicular access between cars, buses, service vehicles, kiss 'n' ride, park 'n' ride etc.)

- provides adequate queuing storage at all accesses including park 'n' ride
- provides adequate bus priority movements and swept paths
- separates pedestrian and cyclist movements and paths from vehicular traffic.

PTIM, Supporting access infrastructure Table 3.1 outlines the key principles for the integration of supporting access infrastructure within the surrounding environment and site and is applicable to TOD.

Refer to the *PTIM* modal chapters for bus stop, bus station, rail station, taxi facilities and park 'n' ride infrastructure to ensure due consideration to prioritising public transport infrastructure in TOD design has been incorporated.

Demand analysis

The design of TOD needs to consider the future patronage and service growth of the public transport network, corridor connections, the demand generated by the TOD itself and any planned intensification of land uses within and surrounding the TOD project.

A future focus for TOD design, will help build liveable, connected and sustainable public transport infrastructure, and communities that are agile and can embrace positive change.

Demand analysis should consider both existing and future planned land uses as this will affect the travel behaviour of public transport and TOD users, therefore influencing the scale and scope of access infrastructure required.

A greater level of future development should be expected where there is greater permeability in the street network, as this enables short and convenient access to the stop/station.

Some of the key challenges to be considered when understanding the future requirements are:

- protect area for future public transport connections
- consider additional kerbside space to accommodate additional/future public transport services
- design for development integration so that public transport stop/station capacity, operations and internal circulation requirements can be maintained or enhanced
- future passenger volumes may require grade-separated pedestrian walkways, separated entry/exit vehicle crossovers etc.
- ensuring the location of permanent elements do not impede plans to upgrade or expand public transport infrastructure
- incorporate proof-of-concept and other agile design approaches
- ensure infrastructure is designed in an agile manner that will suit changed transport customer behaviours without compromising user safety.

For further information in carrying out demand analysis and determining pedestrian capacity and Levels of Service requirements refer to *PTIM, Planning and design*.

Integration with other modes

In order to use public transport, passengers need to access it. TransLink supports access to public transport in the following order of priority when planning or designing infrastructure associated with public transport.

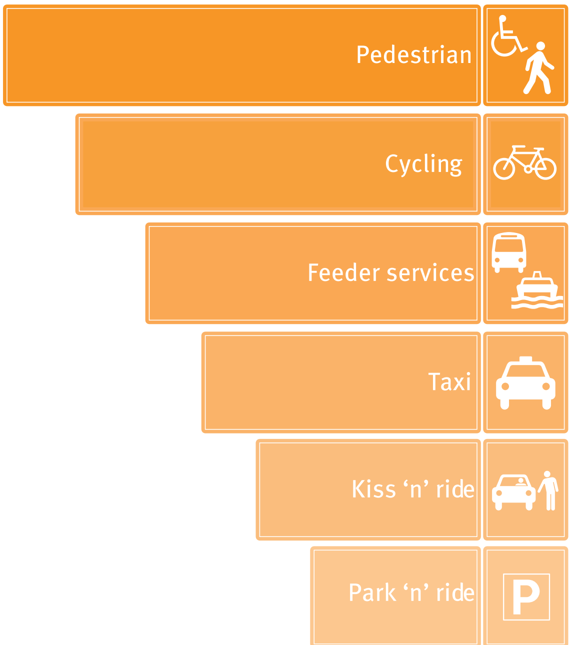


Figure 2.9:
TransLink access hierarchy

In many cases there will be a need or opportunity for shared multi-agency planning, provision and/or management to deal with overlaps in responsibility and land ownership. Co-operative planning should focus on acknowledging customer needs and objectives to create logical and coherent outcomes for the community.

Pedestrians

Pedestrian connections are critical to having a successful public transport network. To improve the liveability and sustainability of TOD communities, pedestrian infrastructure should be considered in terms of the following, with a focus on accessibility, continuity and integration:

- integrating the local and metropolitan pedestrian network with TOD and public transport infrastructure
- pedestrian access through TOD, including vertical circulation (i.e. stairs, ramps, lifts, escalators etc.)
- existing and future pedestrian demand using assessment methods previously agreed with TransLink and key stakeholders
- managing non-public transport activity.

Micro-mobility

Design of public transport infrastructure should consider accommodating journey start and end trip solutions, including micro-mobility. Designated storage areas may be required around stop/station for docked and undocked micro-mobility/rideable technology.

Cycling

Integrating cycling access with public transport dramatically increases the catchment areas of the public transport network. It also helps in reducing the impact of motor vehicle requirements providing a more accessible and safe environment for riders. All interface points between local bicycle networks and TransLink infrastructure through TOD projects must be functionally seamless with a focus on integrating with existing infrastructure. Connections must be direct, and legible with safe and convenient crossings.

Supporting access infrastructure

Supporting access infrastructure provides the key connection between public transport infrastructure, TOD and the immediate surrounding environment. Design of TOD projects should consider how customers access public transport using nearby feeder services, taxi facilities, kiss 'n' ride infrastructure and park 'n' ride infrastructure. The primary integration issue is to ensure passengers can transfer easily through TOD and readily identify the location of supporting access infrastructure upon exiting public transport facilities. This path must be accessible, direct and minimise the distance customers are required to walk.

Refer to Table 2.7 and *PTIM, Supporting access infrastructure* for detail on designing and incorporating feeder, taxi, kiss 'n' ride and park 'n' ride facilities. A detailed list of references to be used when designing and planning supporting access infrastructure is provided in *PTIM, Background and application* Section 1.4.

Table 2.7:
Supporting access infrastructure planning and design considerations

Consideration	Guideline description
Access paths	• path width to be compliant with Austroads *Guide to Road Design, Australian Standards* and *Disability Standards* and to cater for anticipated pedestrian and cyclist demands • pedestrian and cyclist demand relating to both TOD and public transport should be assessed to determine the spatial requirements (i.e. width of unobstructed paths and movement corridors). Refer to TMR *Traffic and Road Use Management (TRUM) Volume 1* and Austroads *Guide to Traffic Management* • area for assessment may include access paths, vertical transport, corridor widths, gatelines, run off requirements and location of storage facilities/ticketing facilities/retail uses etc. • consider desire lines from: – external key attractors to TOD and public transport infrastructure – parking structures within TOD to land uses – supporting access facilities to public transport infrastructure. • minimise pedestrian access path conflict with other transport modes, including cyclists • for cycle paths: – provide direct and convenient connections – minimise inter-modal conflict – specialist cycle design advice should be sought when designing cycle amenities including end-of-trip facilities – advice on standards and best practice to be sought through TMR *TRUM*, TMR Technical notes and Austroads *Cycling Aspects of Austroads Guides*.
Pedestrian crossings	• at-grade pedestrian crossings are preferred where safety and relative priority can be maintained. Refer to TMR *Manual of Uniform Traffic Control Devices, Part 10, Pedestrian Control and Protection, Austroads Guide to Traffic Management*, and *Australian Standards* etc. for design requirements • uncontrolled crossings (i.e. zebra crossings and shared zones), are preferred except where safety or capacity concerns exist • traffic should be diverted or de-prioritised where there are pedestrian concentrations. Where controlled crossings are necessary, this can be achieved by giving priority to the pedestrian movement and minimising waiting times for pedestrians • refer to Austroads *Australasian Pedestrian Crossing Facility Selection Tool [v2.1.2]* to inform pedestrian crossing facility type.

Consideration	Guideline description
Feeder infrastructure	• rail infrastructure is a focal point of access and egress to TOD, however it provides only linear access to stations on the rail route. Supplementary networks must be designed for in a way that emphasises easy, convenient access and minimises dependence on passenger vehicles. If this is not done then traffic congestion and pedestrian/vehicle conflicts are inevitable. By taking a precinct approach to attractor networks the travel task can be reduced and conflicts largely eliminated • where less direct interchange opportunities to feeder services can be provided, design should: – minimise the required walking distance – maintain direct sightlines across the facility and services – limit the need to cross roads and if crossing is required, incorporate appropriate treatments including wayfinding at key decision points • minimise vehicle/pedestrian conflict and ensure that any vehicle/pedestrian arrangements do not undermine the efficiency of bus services. • design of infrastructure associated with feeder services should also consider demand generated by TOD itself to ensure that the public transport infrastructure can accommodate any additional services triggered due to land use attraction and/or patronage growth. For example, office development within TOD generating additional commuter demand on the bus feeder network to the site.
Taxi facilities	• taxi facility capacity assessment to be undertaken as per *PTIM Taxi facilities*, noting that demands generated by both the TOD or public transport infrastructure may require additional capacity or a need to provide two separate ranks • taxi facilities should be provided parallel to the kerb and as close as possible to the entrance of the public transport infrastructure • provide clear, consistent and legible wayfinding and signage to ensure customers can easily identify the taxi facility location upon exiting the station • pedestrian footpaths adjacent to the taxi rank should provide clear space allowing adequate width for waiting passengers and passing pedestrians • direct access should be readily provided to the taxi facility from public transport infrastructure entrances, pedestrian pathways within the TOD project, and/or pedestrian footpaths on the road network • taxi facilities (including access paths, manoeuvring areas, ramps, waiting areas and surfaces) must comply with the requirements of the *Disability Standards* and relevant *Australian Standards*.
Kiss 'n' ride infrastructure	Kiss 'n' ride infrastructure should: • have a separate facility for TOD and public transport network access • clearly designate its use as a 'public' facility • where possible, segregate kiss 'n 'ride bays and their through-lanes from other traffic • minimise inter-modal conflict • provide direct connections to public transport infrastructure that are accessible, direct and legible and incorporate CPTED principles

Consideration	Guideline description
Kiss 'n' ride infrastructure (continued)	• be located at or near pedestrian crossings which then provide direct access to the primary stop/station entry point • have priority over park 'n' ride for proximity to the stop/station • meet the requirements of *Australian Standard AS2890.6* for accessible bays. These bays must be located as close as possible to the stop/station entrance and incorporate appropriate accessibility design features, such as kerb ramps and direct access.
Park 'n' ride infrastructure	Park 'n' ride parking should: • prioritise public transport customers • be separate (including its vehicular access point) to parking associated with the TOD project • have clear and legible wayfinding and signage • be consolidated • be compliant with *Australian Standards* and *Building Codes of Australia* • ensure commuters are not delayed by other circulating traffic associated with TOD • provide accessible parking bays and locate these close to the stop/station entry point • provide adequate queue storage at its access point • protect for the future implementation of access control devices (such as boom gates) and payment/validation infrastructure • minimise disruption to pedestrian and cycle movements at access points. Vehicular demand may require upgrades to road infrastructure on streets feeding the site. This may include intersection upgrades, carriageway reconfigurations, traffic calming or resurfacing. Analysis should also consider impacts from school peak (and associated bus movements). Refer to *PTIM, Park 'n' ride infrastructure* for further design detail.
Impact assessments	All users/modes are to be considered when planning and designing TOD projects, including (but not limited to) active transport impacts, public transport services impacts, development impacts on public transport infrastructure and vehicular traffic impacts. Refer to TMR's website for detailed guidance regarding applicable impact assessments that should be undertaken when planning and designing a TOD project. https://www.tmr.qld.gov.au/Community-and-environment/Planning-and-development/Planning-and-development-assessment-under-the-Planning-Act/Assessable-development

Functional design guidance

Simple and functional

Maintain simplicity and provide a functional design that minimises conflict between users and ensure passengers can easily interpret and use the space to access public transport infrastructure. The design of TOD should provide a legible and pleasant environment that is uncluttered, with minimal concealed spaces.

Appropriate space should be provided at information and decision points for people to avoid conflict with the flow path of travel to ensure comfortable and efficient movement during peak operations.

Legibility and visibility

Clearly legible and visible entry and exit points to public transport infrastructure is essential. These not only provide points of access, but also define the station boundaries where access infrastructure needs to link to the stop/station through TOD. This is especially important where there are a multitude of competing uses and messages. For more information refer to the *PTIM, Supporting access infrastructure.*

Safety and security

TOD should support access for all users to public transport infrastructure, increasing street activation and passive surveillance of these spaces, and contribute to the vibrancy of the street, deterring undesirable behaviour. The physical environment must be designed to include CPTED principles to reduce crime, property damage and anti-social behaviour associated with people gathering in public spaces.

High quality walking and bicycle connections to and from public transport nodes and adjoining uses (I.e. neighbourhoods, shopping centres and businesses) should be encouraged to achieve safe use during the day and after hours. Additionally, where appropriate, development should provide high-quality lighting that reinforces daytime and night-time presence and surveillance.

Signage and wayfinding

Signage forms a major component of design to assist with navigation to and around public transport infrastructure. Logical information, wayfinding signage and overall facility signage is important to achieving a consistent and recognisable public transport system. TOD design should incorporate signage and wayfinding:

- to ensure customers can easily recognise and find their way to public transport infrastructure, including fare machines and ticket offices.
- where line-of-sight to nearest decision point can be achieved considering signage height, colour contrast and orientation
- for multi-modal integration, maps and landmark information of wider TOD (and beyond) precinct
- using universal/international symbols and indicators.

For further details of TransLink's signage requirements, refer to *PTIM, Branding, theming and signage* and TransLinks's signage manuals for bus and rail stations.

Human factors

TransLink aims to incorporate human factors principles throughout planning and design to provide assurance to safe, effective and comfortable public transport systems and environments, for all users. The benefits of incorporating human factor principles into TOD design solutions ensure the following is considered:

- the physical effort and ability for a person to use a system or navigate and environment
- the adequacy and comfort of ones' surroundings
- the recognition and interpretation of interfaces and information
- the level of support and/or sensory feedback one is offered, able and/or willing to receive
- the understanding of the environment that a customer is in, was in, and/or aims to get to
- a customer's various behavioural states under certain conditions
- the various environmental and psychosocial conditions that one may be presented.

Accessibility and compliance

All infrastructure must meet the requirements of applicable *Disability Standards* and *Australian Standards*. It is not enough that the design is compliant or has compliant elements. The design of the precinct should be accessible to all its customers and accommodate them without the need for adaptation or specialised design.

Key accessibility and disability access design considerations to ensure accessible public transport infrastructure is available for everyone are described in *PTIM, Supporting access infrastructure* Section 3.3.

Seek advice and clarification on issues and current best practice from TransLink and relevant accessibility reference stakeholders.

Universal design

The philosophy of universal design considers the access outcomes for TransLink customers:

- the whole journey for the customer, regardless of preference or ability, to and through public transport
- infrastructure is continuously accessible
- customers can have direct access to the public transport network
- customers have confidence that the infrastructure will provide what they need for a seamless, continuous journey with no barriers to access.

TransLink recognises the importance of providing appropriate accessibility for customers as part of their door-to-door journey. Enabling a customer to navigate a continuously accessible path as part of the 'journey' helps to create an accessible network.

The Whole Journey: a guide for thinking beyond compliance to create accessible public transport journeys (Commonwealth of Australia, 2017) assists in enabling people with disability to genuinely participate in the community by promoting the importance of considering the accessibility of the whole of the passenger transport journey. TransLink sees this guide as a very important document and application of the principles presented in the guide will help to improve the accessibility of our customers' passenger transport journeys.

Specific considerations

Existing infrastructure

Construction of a TOD project must consider any existing infrastructure and continuation of that infrastructure through the construction period. For example, provision of temporary ticket offices or commuter car parking during the construction of TOD.

Returnable works

Should there be any infrastructure required as returnable works to TMR or other stakeholders, these need to be discussed and agreed on from the outset. Relevant stakeholders should be engaged in the planning and design process to ensure that the requirements of returnable works by operators and/or owners have been considered and that they will have been developed and designed to appropriate standards (note requirements may differ between stakeholders).

Railway operations

When a TOD project is adjacent to a railway, there are a number of additional matters that need to be considered including noise and amenity impacts, structures, preventing unauthorised access, dangerous goods and fire safety, stormwater and drainage, and collision protection etc.

All development, including volumetrically-titled development needs to be designed and constructed so that it does not cause disruption to railway services, damage to railway infrastructure or physical harm. Ensuring safe operation of railways can be achieved by:

- providing sufficient setbacks from rail infrastructure, including overhead line equipment and bridges
- maintaining existing railway access points or routes
- ensuring development can be maintained without access to the railway.

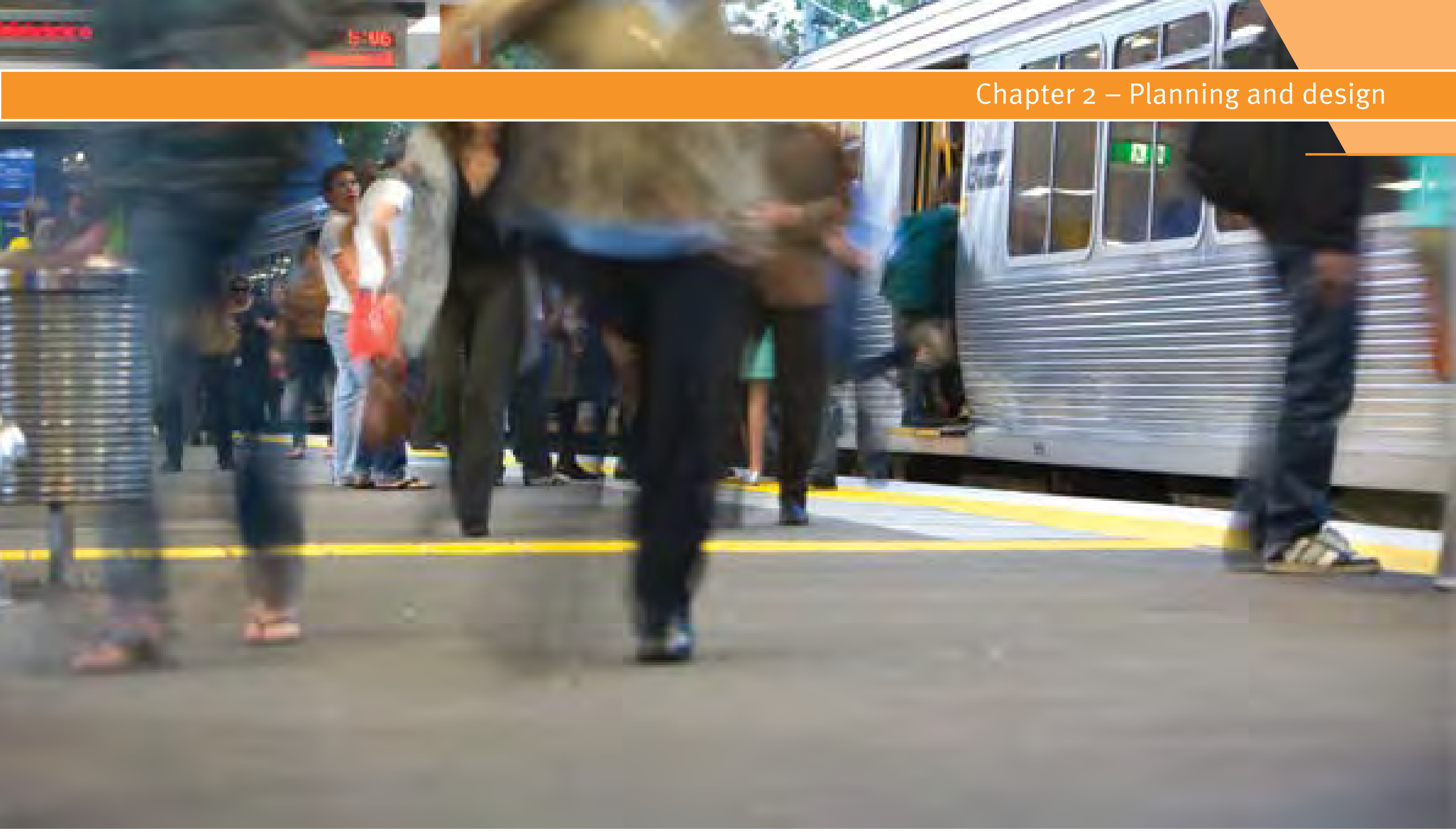
Further guidance regarding development in the vicinity of a railway is detailed in TMR *Guide for Development in a Transport Environment for Rail*.

Rail replacement bus

To ensure continuity and connectivity of the rail service, there may be need for a rail replacement bus service to access the rail station (e.g. planned maintenance, track closure, or unplanned disruption) or to supplement rail services. This may be provided in the form of a temporary bus stop (refer *PTIM, Bus stop infrastructure*) or at designated bus zone/kerbside space. Pedestrian access to the rail replacement bus must be compliant with accessibility standards, and provide for a seamless transition from rail to bus. Seek confirmation from TransLink on requirements for these services specific to the site.

Asset management

Collaborative working agreements between relevant stakeholders involved in asset management should be established at the planning stage, to promote a whole-of-life approach to infrastructure management and to contribute towards a functional, high quality, safe and easy-to-use public transport network. Refer to *PTIM, Planning and design* Section 2.3.4.



Contents

Chapter 3 – Supporting access infrastructure

3.1 Introduction

This section of the *PTIM* provides guidelines for delivering high quality, effective and efficient access infrastructure for public transport stops and stations within the TransLink network.

The first section discusses general principles for the planning and design of Supporting access infrastructure. Other sections provide guidelines specific to each key access mode:

- Walking – pedestrian access inside and outside of the immediate stop or station vicinity
- Cycling – on and off-road cycle infrastructure within the immediate stop or station vicinity
- Bus feeder – bus feeder access to service associated infrastructure
- Kiss 'n' ride – passenger set-down and pick-up infrastructure, and taxi access
- Taxi infrastructure
- Park 'n' ride – parking infrastructure for public transport commuters.

Delivery of infrastructure to access the public transport network will, in many cases, not be the responsibility of TransLink. For example, the provision of footpaths for walk-up access and cycle paths for cycle access is often the responsibility of local government.

Cooperative multi-agency planning is needed to create logical, coherent outcomes for communities and public transport passengers.

Where new public transport infrastructure is planned, consultation should take place with local government and property owners early in the planning phase to ensure integration with existing or planned community facilities.

3.1.1 Why is supporting access infrastructure important?

In order to use public transport, passengers need access to it. Supporting access infrastructure provides the key connection between the stop/station and the immediate surrounding environment. High quality access infrastructure, that is attractive to public transport users, is essential to the usability of any stop or station and the success of the TransLink network as a whole.

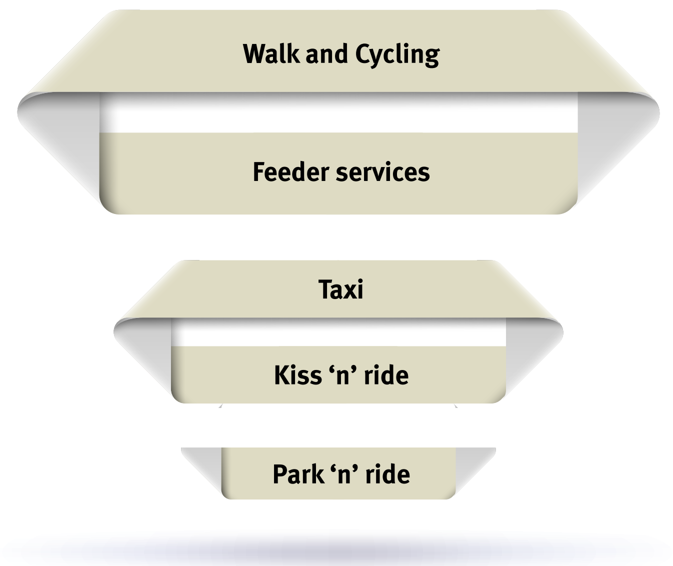
To ensure a quality journey for passengers, its design should be user-friendly and easily interfaced with the various access modes passengers may use (for example walking, cycling, driving). Access infrastructure should also be designed to minimise impacts on local communities while maximising community benefits.

3.1.2 TransLink policy and access hierarchy

TransLink's access hierarchy provides the framework for how various TransLink network access modes should be prioritised when planning or designing services or infrastructure. The access hierarchy is shown in Figure 3.1.

From an environmental and network operation viewpoint, walk-up and cycle access are the preferred modes for accessing the TransLink network, as illustrated in Figure 3.1. These access modes are followed in preference by bus feeder and kiss 'n' ride, with park 'n' ride generally being the least desirable mode. Supporting higher use of walk-up and cycle access minimises the need for excessive land requirements for parking at public transport stops and stations and reduces the amount of private vehicles on roads.

Figure 3.1 –
TransLink access hierarchy



3.2 Principles of supporting access infrastructure design

Infrastructure within the TransLink network should be planned and designed to ensure a seamless and connected journey for public transport users.

Planning for supporting access infrastructure should consider:

- integration with existing networks within surrounding land uses such as local government or privately-owned access paths, as well as shared passenger pick-up zones or bike storage facilities
- demand analysis (current and future)
- strategic design for potential future expansion
- other supporting components.

3.2.1 Integrating supporting access infrastructure

The role of access infrastructure is to support and enhance the ability of a public transport node to perform its role within the TransLink network and to allow convenient and efficient access to and from public transport services.

To achieve this effectively it requires:

- integration with TransLink facilities and local transport networks
- consideration of surrounding land uses
- cross-agency planning, provisions and asset management.

3.2.1.1 Network integration

The stop or station design intent is a critical factor in planning and configuring effective access infrastructure within the surrounding environment. Design intent can be requested from the infrastructure designer, and further guidance can be obtained from the overarching network hierarchy in the *PTIM* and the facility category as identified in the modal specific chapters.

Each access mode will require the application of site-specific integration techniques, however general principles for consideration are listed in Table 3.1.

Table 3.1:
Key principles for integration of Supporting Access Infrastructure

Principle	Consideration
Protecting the integrity of entry/exit points	• Managing congestion and inter-modal conflict at key access points. • Appropriately designed decision points at transition zones, with a focus on legibility and ease of navigation. • Simplicity and economy of movement to, from and through the stop or station and access infrastructure. • Minimising barriers to appropriate movement along desired travel paths.
Protecting the amenity of the site	• Minimising and mitigating the creation of residual spaces between facilities and components using alignment and urban and landscape design treatments. • Maintaining visual connection between decision points, dwell-points and activity points. • Managing non-public transport related pedestrian activity by promoting appropriate through pedestrian traffic where capacity, behavioural conflicts and the integrity of pre-paid ticketing zones can be managed. • Maintaining environmental quality by protecting from inter-facility impacts on micro-climate (shading, wind and solar access, air quality).

3.2.1.2 Cross-agency planning

It is essential to coordinate the integration of public transport infrastructure with surrounding access infrastructure. In many cases there will be a need or opportunity for shared multi-agency planning, provision and/or management to deal with overlaps in responsibility and land ownership. Cooperative planning should focus on acknowledging the individual needs and objectives in order to create logical, coherent outcomes for community and public transport passenger access.

When planning access infrastructure, consultation with the local government and property owners should be undertaken to ensure that any new facilities are integrated with and complement existing or planned community facilities, and vice versa.

3.2.1.3 Surrounding land uses

Surrounding land uses – both existing and future - will influence the function of a public transport facility and thus the type, scale and extent of Supporting access infrastructure required. Planning should consider:

- current wider land use context
- current surrounding uses
- current statutory designation
- strategic land use planning at local and state level
- town planning development applications, approvals and proposals on adjacent properties
- proposed or planned development opportunities on the public transport property itself
- opportunities to make use of other existing or new shared facilities in the surrounding area such as parking, access paths, cycle storage and end-of-trip amenities
- opportunities for transport oriented development.

Considerations for a variety of land uses are expanded upon in Table 3.2.

Table 3.2:
Considerations for surrounding land uses

Land use context	Consideration
Major activity or shopping centre	• Minimise conflict between both the functions of the public transport facility and the activity centre, while capturing benefits of convenient and direct access to the centre by public transport for example: – encourage intra-modal and multi-modal interchange facilities where services intersect, while managing potential conflict between traffic movements – encourage public transport feeder interchange nodes while managing conflict between interchanging and destination movements – minimise conflict between pedestrian, cycle, kiss 'n' ride and local traffic movements. • Protect centre economic development through collaborative strategies to prevent public transport passengers using centre parking as a commuter parking facility. • Protect appropriate and convenient space for cycle amenities and kiss 'n' ride.
Consolidated, highly-urbanised environment (such as inner suburban developments)	• Interesting, convenient and direct pedestrian connections will be essential to capture maximum public transport patronage from the higher density walk-up catchment. • Access to the TransLink network by cycling may be of less importance where a stop or station is close to the dominant regional activity centre – however cycle movement in the broader surrounding area is an important consideration. • Kiss 'n' ride may be difficult to accommodate where there is likely to be competition for available space and infrastructure. • Park 'n' ride is not suitable in key centres due to high land values and long-term economic development goals for key centres.

Land use context	Consideration
Low-density, suburban developments and local activity centre environments	• Direct, interesting and convenient pedestrian links will be important to capture maximum patronage from the moderate-density walk-up catchment. • Cycle connections and parking will be highly desirable. • Intra-modal and multi-modal interchange facilities will be encouraged where service routes intersect. • Bus feeder facilities will be encouraged at selected sub-regional and district level activity centres. • Provision for kiss 'n' ride will likely be important for encouraging multi-purpose household trips. • Small park 'n' ride facilities may be appropriate, preferably away from main local activity centres or integrated with a suitable land use allowing parking capacity during business hours (such as a sporting facility).
Urban fringe or edge environments (such as end of public transport corridors)	• Demand for pedestrian access may be constrained by lower-density catchments, poor pedestrian access with a lack of infrastructure and low-density development. • Cycle amenities will be required but safety and security through natural surveillance may be limited, requiring additional management and operation. • Good access from arterial and distributor roads will be important for kiss 'n' ride. • Dedicated park 'n' ride facilities may be acceptable if away from designated activity centres but adjacent to good road access. These should be planned to accommodate staged (re-)development consistent with strategic land use planning. • Bus feeder services are required where there are high-frequency services with available carrying capacity.
Specific high-volume facilities	• Schools or major sporting facilities may need to cater for large volumes of people on a regular or irregular basis. • Public transport centres, long-haul bus stops or tourist destinations may need capacity for interchanging between coaches, mini-buses and taxis, and require a high level of signage and locality information.

3.2.1.4 Demand analysis

It is important when planning and designing infrastructure to identify the likely level of demand for the site. This can be undertaken using a range of analytical tools and methods. Consult, regarding appropriate demand identification methodologies and data validity.

Demand forecasts should consider both existing and future planned land uses as this will affect the transport behaviour of public transport users and, therefore, influence the scale and scope of access infrastructure required.

For example, future commercial and residential development around a currently low-density or green-field public transport location may result in increased local pedestrian and cycle activity, and increased numbers of public transport users. While the demand is not current, there may be a need for more extensive access infrastructure in the future.

As with any forecasting, there are external factors – such as fuel and energy prices, climate change, and local issues (for example, employment locations and policy changes) – that may have major impacts on the demand for public transport. This uncertainty and the long timeframes involved in these demand forecasts means it may be prudent to protect additional space for future expansion rather than provide additional capacity
up front.

Some transport models can provide information regarding demand for different access modes – however their inputs and assumptions should always be carefully understood and critiqued.

3.2.1.5 Operating environment

It is not only important to consider the operating environment for access infrastructure, but also integration with the operating environment of other public transport infrastructure. Providing certain amenities within supporting access infrastructure may help facilitate the role of the individual components, and may provide support to other facilities in the area.

Refer to the drawing in *Appendix 3-A* that illustrates the overarching design principles when using supporting access infrastructure.

Key operating environment considerations are outlined in Table 3.3.

Table 3.3:
Key operating environment considerations

Key consideration	Requirement description
Safety	• The performance of the supporting access infrastructure and its adjacent urban development against *CPTED* principles: – maximise passive and active surveillance activity – visual transparency and comprehensive coverage – appropriate lighting – bright white lighting for waiting spaces and paths – minimise hiding or concealed spaces and entrapment opportunities. • Suitable reporting, evidence gathering, response, repair and /or replacement procedures in the event of criminal activity against people or property. • Active and remote surveillance arrangements for the access infrastructure and its adjacent precincts: – clarify patrol and incident response procedures – electronic surveillance coverage – access to emergency-assist call points and public telephones. • Traffic arrangements – posted vehicle speeds (including motorised and cycle), geometry, sightlines and crossing arrangements. • Physical hazards – trip, catch, bump and fall hazards along with sharp and jagged edges.

Key consideration	Requirement description
Amenity	• Provision of a comfortable, interesting, high-quality environment, including: – shelter and weather protection (including sun and rain) for access and waiting areas – seating, rubbish bins and information – high quality (visually-appealing) finishes that are durable, vandal resistant and easy to maintain – use of materials and finishings consistent with those in adjacent public transport facilities – interesting internal and external views from paths and waiting areas – quality textured landscapes and architecture – public art and community literacy elements where applicable.
Efficient movement	• Promote fully-accessible entrances and pedestrian movements. • Minimise walk distance between modes. • Design direct links that discourage shortcuts across gardens, kerbs, islands etc. • Avoid conflict between cars and cycles. • Differentiate vehicle path by destination – that is, separate cycles, kiss 'n' ride and park 'n' ride movements as early as possible before reaching facility entrance.

3.2.1.6 Accessibility

All infrastructure must meet the requirements of applicable disability and *Australian Standards*. Seek advice and clarification on issues and current best practice from TransLink and relevant accessibility reference stakeholders.

Key accessibility and disability access design considerations are dealt with in 3.3 – Pedestrian infrastructure.

3.2.2 Sustainable energy use and design

Design and delivery of all TransLink infrastructure should be consistent with the sustainability objectives below and any applicable TransLink or Queensland Government policies on sustainability.

Design and delivery of public transport infrastructure will focus on sustainability through:

- facility design that is fit for purpose now and into the future, and adaptable to change
- contributing to attractive community spaces and a local sense of place
- commitment to a low environmental footprint and whole-of-life approach through all design, construction and maintenance activities
- increasing visibility of sustainable features, and undertaking a participatory approach to design to improve community awareness and support.

Details of TransLink sustainability requirements are included in Table 3.4.

Table 3.4:
Key environmental sustainability design considerations

Key sustainability consideration	Requirement where possible
Water management	• On-site rainwater collection and reuse. • On-site run-off treatment (that is scrubbing using permeable surfaces, detention basins and swales). • Local flooding mitigation and flow maintenance.
Resource minimisation	• Water – employ water-saving devices. • Energy – aim for energy-neutral infrastructure by minimising energy use and exploring generation opportunities (for example, solar for feeding back into electrical supply). • Materials – apply whole-of-life design approach (that is, construction, operation, maintenance, cleaning, and decommissioning). Materials should favour renewables and recyclables. • Processes – avoid operational processes that generate waste, especially toxins and pollutants.
Habitat and physical environment	• Protect habitat (that is space, physical elements such as tree hollows and burrows, movement paths). • Maintain water flows to aquatic and other habitats. • Avoid acid sulphate soils. • Minimise fugitive emissions of air, surface and groundwater-borne pollutants.
Social sustainability	• Present minimal harm to employees or public. • Promote social justice, inclusion and equity. • Contribute to improving social capacity and community interaction. • Enhance community experience and integrate facilities with the surrounding environment to enhance economic viability and social benefits.

3.2.3 Supporting components

Appropriate signage and way-finding is essential for orientation and the communication of information to passengers. The complexity of signage will vary with the scale and function of the stop or station and Supporting Access Infrastructure.

TransLink has guidelines for the development of signs provided at, or referring to, TransLink facilities, and for the use of visual elements such as logos, icons and colours. For further information refer to TransLink's *PTIM, Branding, Theming and Signage and Bus Network Infrastructure Signage Chapter.* These *PTIM* chapters do not identify specific enforceable regulatory signage such as 'no standing' or 'taxi' zones. These sign requirements should be applied as per general road signage.

The types of signage relevant to *Supporting access infrastructure* are outlined in Table 3.5.

Table 3.5:
Relevant signage for access infrastructure

Signage type	Guideline description
Identification	• Major facility identification signs should be visually distinctive and stand out in the surrounding environment. • Placement should be on major street frontages and entries. • They should clearly display the facility name, modes available from the facility and approved consistent logos.
Maps	• Maps are generally provided within the station information area and on bus stop markers – however, additional maps may be needed at other locations if visibility to local landmarks is constrained, the terrain is complex, or the site is exceptionally large. These should be located at landmarks that are easily identifiable and marked as information points.
Directional signage	• Directional signage should be subtle but readily visible for those looking for it – avoid cluttering views and over-signing. • Complex or visually constrained environments will warrant more directional signage than simple easily-navigated environments. • Directional signage should be placed with other signage or on built elements such as lighting poles, fences or other structures where opportunity allows.

Signage type	Guideline description
Regulatory, warning and prohibition signage	• Regulatory or warning signage should be suitable and visually discernible so as to catch attention without dominating or detracting from the aesthetics of the stop or station. • Standard TransLink warning and prohibition signs should be consistent in format and style with the *PTIM, Branding, Theming and Signage and Bus Network Infrastructure Signage Chapter*. • Regulatory signage may need to meet certain legal requirements to be enforceable. Refer to the appropriate guidelines and standards for placement and development of general road signs. • Regulatory or warning signage should, wherever possible, be placed on their own, away from other signs and not be placed on built elements such as lighting poles, structures and fences, unless acceptable under the applicable guidelines and standards.
Information signs	• Information signage will rarely be placed outside of the immediate stop or station area. Where this occurs within a TransLink supporting facility it will likely be in relation to the use of that specific facility or advance timetabling information (such as real-time). These will all be developed as per *PTIM, Branding, Theming and Signage Chapter* and placed according to precedent and need, while adhering to the design imperatives for the operating environment.
Way-finding	• Way-finding is considered more than signage and includes: – non-text or map-based indicators such as arrows, colours and shapes – subtle indicators such as lighting, paving patterns and contrast, paths, shore lines, vistas, structures and themes in the built environment.

3.3 Pedestrian infrastructure

Walking is the preferred and most important mode of access to the TransLink network. Pedestrian access is integral to all public transport infrastructure and, as such, some level of pedestrian infrastructure will be required in all cases.

This section explains how to provide good pedestrian infrastructure to enhance access to TransLink stops and stations.

Pedestrian infrastructure primarily refers to the movement (that is, paths), waiting and associated access infrastructure that supports their use in the TransLink network. It can also include end-of-trip amenities.

Pedestrian infrastructure should be considered in terms of:

- the local and metropolitan pedestrian network around a stop or station
- interface between the stop or station and the wider pedestrian network
- pedestrian access through other stop and station supporting facilities
- asset management.

3.3.1 Integration

3.3.1.1 Network integration

As most passengers access public transport by walking, pedestrian connections are critical to having a successful public transport network. High passenger volume stations should become a pedestrian focal point within their local community with high-quality pedestrian access infrastructure.

Planning and design of public transport infrastructure should identify the main directions of pedestrian flow into and out of the stop or station and ensure local pedestrian networks and public transport infrastructure are well integrated.

Focus should always be on integrating with existing and anticipated future infrastructure. Connections should be accessible, convenient, direct and legible. Elements for consideration include:

- inter-modal conflict – pedestrian crossings
- kerb ramps – connection, provision, quality and configuration
- path width, grade, continuity and alternative paths
- placement of other pedestrian infrastructure – rest points, railings, street furniture
- pedestrian walkway and waiting shade cover for sun and weather protection.

Pedestrian access infrastructure should be consistent with the adjacent stop or station area with a focus on accessibility, continuity and integration.

3.3.1.2 Adjacent land uses

As highlighted in the 3.2.1.3 – Surrounding land uses section, review nearby land uses and gauge potential pedestrian-related risks, impacts and needs that they may generate. In particular:

- identify any area-specific special accessibility and safety needs for example:
  - businesses or services visited by persons with mobility or vision impairments
  - primary, secondary, special, and tertiary education facilities
  - aged care facilities and hospitals
  - government offices and service centres
  - local, regional and state cultural facilities
  - services and businesses catering to non-English speaking persons
  - licensed venues, restaurants, concert venues, popular recreational parks.
- allow extra peak pedestrian capacity near facilities with sharp peaks such as schools or facilities catering for special events (active or off-site management in partnership with schools or event organisers can be effective)
- if large numbers of non-English speaking people are likely to be using the station, then identify the most commonly spoken languages where supplementary orientation information may be needed
- always use appropriate universal icons and symbols as per applicable disability and Australian Standards to ensure that signage is easily understood by all people
- if it is likely that inebriated people will regularly use or pass by the stop or station, design for more forgiving environments by assessing and addressing the additional risks with respect to:
  - durability, maintenance and cleaning of materials and furniture
  - impaired decision-making and depth perception (crossings and path geometry)
  - security, incident response and emergency service access.

3.3.2 Pedestrian demand analysis

It is important to identify likely pedestrian demand profiles for pedestrian access amenities.

In analysing demand forecasts and capacity needs, the variables that should be considered include:

- the size and nature of the likely catchment:
  - the reasonable walk-up catchment radius for a stop is typically 400 metres, with limited walk-up from within 800 metres
  - the reasonable walk-up catchment radius for a station is typically within 800 metres, with limited walk-up up to 1.2 kilometres
  - these are impacted by:
    - the surrounding environment that the stop or station operates within (for example terrain, land use, traffic and safety)
    - the permeability of the area (for example the actual distance travelled due to block size, mid-block paths or barriers)
    - climate (for example walking distances may be less where heat or inclement weather is more frequent).
- amount of interchanging transfers and average waiting time
- existing and future surrounding residential development intensity (population density, dwelling density) – apply current mode-shares and relevant targets to identify the project requirements
- pedestrian activity generated by adjacent land uses. (Large institutional and commercial land uses such as shopping or activity centres, universities and hospitals, sometimes collect privately-owned data on staff and visitor travel behaviour for their own site planning purposes. Broader mode share assumptions or policy targets can be applied to these to generate approximate incoming pedestrian volumes or future pedestrian activity targets.)

Emphasis should be placed on catering for peak demand. Explore this by identifying and mapping all pedestrian patronage to, from and through the site. Consider:

- links to nearby pedestrian attractions and key dispersion paths
- direct sightline connections compared with paths of least resistance
- consider any non-public transport based 'desired pedestrian paths' that might pass through site
- likely order of magnitude of pedestrian demand.

Pedestrian capacity should be based on LOS classification ranges for pedestrian design (as per Fruin 1978, Pedestrian Planning and Design).

3.3.2.1 Staging

The demand analysis should be used to inform staging opportunities for the delivery of pedestrian access infrastructure, as well as protect for any land requirements to cater for future demand. Some of the key issues to consider include:

- prioritising investment to protect for future connections while immediately providing for existing paths
- future volumes that may require grade-separated pedestrian walkways
- ensuring the location of pedestrian walkways and permanent elements does not impede future plans to upgrade or expand public transport infrastructure.

3.3.3 Design considerations

Table 3.6 outlines some of the key design considerations related to pedestrian access based upon applicable standards and guidelines for pedestrian movement and accessibility.

Table 3.6:
Design considerations for pedestrian access infrastructure

Considerations	Guideline description
Access paths	• Applicable disability and *Australian Standards* must be complied with for: – doorways and gateways – stairs, lifts, ramps and landings – pavement surfaces and use of TGSI (subject to audit). • If changes of grade are required to get to a stop or station, allow appropriate rest areas at regular intervals on walkways and ramps for mobility-impaired and aged persons. • Where severe grade changes or disproportionate ramp lengths are required, assisted vertical movement (for example, lifts and escalators) should be provided, as appropriate, as per applicable *Australian Standards*. • Crossover (kerb) ramps should minimise changes of direction except where geometry (depth, width or sightlines) is constrained. • Choose path materials that feature ease of cleaning and slip resistance in all weather conditions. • Design paths to avoid pooling or collection of detritus or other unwanted debris. • At-grade pedestrian paths should generally be designed to withstand occasional use by heavy vehicles. Paths where this is not reasonable should be clearly signed or made inaccessible to such vehicles.
Minimum path dimensions	• TransLink prefers a minimum path width of 1.8 metres. • Increase path width to accommodate handrails and barriers. • The minimum clearance from all infrastructure for a single wheelchair access is 1.2 metres. • Refer to applicable *Disability* and *Australian Standards* for required width for single direction and/or bi-directional path for allowing two wheelchairs to pass each other, and a 180-degree turn.

Considerations	Guideline description
Handrails and barriers	• Add handrails and barriers near dangerous edges including roadways, cycle paths, carriageway escarpments, batter slopes and walls, steep gradients and steps and through underpasses or tunnels. • Conform to the design requirements of applicable *Disability* and *Australian Standards*.
Lighting	• Lighting levels are required to meet current regulation standards for public transport facilities, and be consistent with applicable *Disability* and *Australian Standards.* For details regarding lighting requirements refer to the appropriate requirements within *AS/NZ 1158.3.1 2005 – Lighting for roads and public spaces* and the *DSAPT*. • Lighting quality (colour and lux) at waiting points will be consistent with platform lighting and should be bright white light. • Lighting along paths will be bright white light with a luminance as per applicable *Australian Standards.* • Reflective light spill guards may be used to minimise fugitive light in urban environments and concentrate it downwards to where it is required. • Luminance contrasts will be consistent with station areas including paths and must comply with a minimum contrast with background, as per applicable *Disability Standards*.
Hazards	• Objects must not protrude into any path of pedestrian travel within the envelope of travel. • Allow a minimum clearance of 1.2 metres (desirable 1.5 metres) from all infrastructure for single wheelchair access and manoeuvring (for example around poles, street furniture and raised service pits). • Remove or redesign the placement of sharp or pointed objects. • Avoid placing grates, grids, grills, service pits or other interruptions to a pavement surface within a pedestrian pathway or paved area. • Where pits must be placed in the path of travel: – they must be flush with the path surface as per Disability Standards – covers must meet the same anti-slip and load-bearing performance requirements as the path pavement.

Considerations	Guideline description
Surveillance	• Consider the use of camera surveillance coverage for paths through all access infrastructure. • Design access paths to be highly visible at all times to promote passive surveillance. • Underpasses should be avoided. However, if absolutely necessary, an appropriate design solution with necessary surveillance treatments may be accepted with TransLink and key stakeholder consultation.
Landscape treatment	• Choose plants that are: – unlikely to intrude upon a path at ground level or interfere with path integrity or above and below ground services and utilities – unlikely to regularly shed material that may make a path slippery – unlikely to significantly block views between 0.5 and 2.5 metres above ground level – drought resistant – consistent with local flora (use local genetic populations in natural areas of significant ecological value). • Avoid plants that are: – toxic, highly allergenic or noxious weeds – known to produce thorns, barbs, stings or noxious secretions – known to attract dangerous fauna.
Other	• Applicable *Disability* and *Australian Standards* must be complied with for: – seating along pedestrian access routes – signage and information, including the use of braille and accessibility symbols.

3.3.3.1 Crossings

Pedestrian movement is considered the priority movement within any TransLink facility. Accordingly, points of inter-modal confluence should be designed to favour unconstricted and efficient pedestrian movement except where safety or the reasonable capacity for other modes may be compromised. The following principles should be considered in planning crossings:

- At-grade pedestrian crossings are favoured in circumstances where safety and relative priority can be maintained – such as when all intersecting modes are operating in a low-speed, low-volume environment, with no insurmountable environmental or design constraints.
- Grade-separated crossings should be considered where at-grade crossings compromise safety to either mode or create unreasonable delays. This could be due to:
  - speed and volume constraints, as a result of:
    - high speed intersecting modes
    - high volume intersecting modes
    - high pedestrian peak volumes
  - environmental and design factors due to:
    - poor sightlines
    - steep approach gradients for intersecting modes
    - lack of space for adequate pedestrian capacity at kerb-side or in median refuges.
- All at-grade pedestrian crossings will meet or exceed minimum engineering and accessibility design standards.
- Uncontrolled crossings such as zebra crossings and shared zones are preferred, except where safety or capacity concerns exist based upon public transport facility functionality and operational requirements.
- Corresponding kerb ramps on a crossing should always be directly aligned.
- Where controlled pedestrian crossings are necessary, priority should be given to pedestrian movement to minimise waiting times within the signal period.
- Separate pedestrian crossings from cycle crossings except where no other option is available
  - where this occurs, provide wider kerb ramps and additional footpath waiting space at the crossing dwell-point and any median refuges.

Refer also to Department of Transport and Main Roads (DTMR) *Manual of Uniform Traffic Control Devices, Part 10, Pedestrian Control and Protection* (MUTCD).

3.3.4 Supporting components

The scope of supporting components will be dependent on the scale and functionality requirements of the public transport facility, and adjacent land uses that may affect the facility.

3.3.4.1 Signage and way-finding

Pedestrian access signage should be incorporated into the signage plan for a stop or station. Requirements for off-site directional signage should be presented to the stakeholder/s responsible for local pedestrian infrastructure, for consultation on quality and extent of signage provision.

In general, signage and way-finding for pedestrians should be implemented at a human scale following the principles previously outlined in Table 3.5.

3.3.4.2 Amenities

Amenities for pedestrians include items that are desirable to improve the experience of using the facility but are generally not considered an immediate necessity. Where applicable, all such components should be placed so as to allow clear visibility without compromising pedestrian safety. The components are included in
Table 3.7.

Table 3.7:
Amenities for pedestrian infrastructure

Considerations	Guideline description
Shelter from rain, sun and wind	• Consider the amount of natural shelter along paths and likely exposure. • Consider need for shelter at pedestrian dwelling points such as decision points or points of interest or activity. • Consider relationship between accessible parking bays and paths with shelter. Refer to *PTIM, Bus Stop* and *Bus Station Infrastructure* chapters for shelter design guidance.
Seating	• Non-discretionary seating (for example, seating required to meet applicable guidelines and standards such as at accessibility rest points). • Discretionary seating (for example, seating provided at the discretion of the designers – for example, additional seating at points of interest, viewing points or entry plazas depending on potential use and demand). • Seating should feature modern and pleasant design and complement TransLink architecture. • Seating should include backrests and armrests, and should be constructed from durable, easily maintained materials that allow drainage from liquids. • Seating must comply with applicable *Disability and Australian Standards*.
Rubbish bins and drinking fountains	• Consider provision at pedestrian dwell points on access paths that are remote from stop or station areas, or access facilities where these may already be provided. • Consider separate recycling bins.
Public art or community literacy installations	• Consider the potential for inclusion of such elements along pedestrian spaces where they may enliven a journey or enhance a site.
Vending machines and other retail activities or outlets	• Consider provision at pedestrian dwell points or on paths that are remote from stop or station areas, or where these may already have been provided. • Consider for areas with good passive surveillance or active security to minimise likelihood of vandalism and abuse. • Clearly establish installation, maintenance and asset management requirements before inclusion.

Considerations	Guideline description
Non public transport-based information points – static, dynamic and interactive	• Consider opportunities for these at pedestrian dwell points on access paths. • Possibly include interpretive signs, memorials, plaques or other local information if relevant. • Clearly establish installation and maintenance requirements and procedures before inclusion.
Advertising	• Consider appropriate provision at pedestrian dwell points on paths that are remote from stop or station areas or other access facilities. • Amenity and *CPTED* principles must not to be compromised. • Consider availability of adequate exposure necessary to meet market expectation and hence potential revenue generation.
Emergency call points	• Consider the provision of emergency call points at dwell points along extended paths. Monitoring arrangements need to be agreed in the early design stages. • Ensure electrical and communication connections are provided or allowed for if not immediately supplied.

3.4 Cycle infrastructure

Integrating cycling access with public transport dramatically increases the catchment areas of our services. The Queensland Cycle Strategy from TMR identifies 'Connect To' as a key priority: putting cycle links in place at key public transport stations and stops (up to five kilometres), supported by bicycle parking and end-of-trip facilities. This section explains how to provide good cycle infrastructure that enhances access to TransLink public transport infrastructure.

Cycle infrastructure in this section primarily refers to:

- Cycle routes which include:
  - off-road (that is, cycle, track, bike paths and associated elements)
  - on-road (that is, cycle lanes, shared lanes, signals, bike boxes – on-road refuges for cyclists provided at traffic lights or islands).
- End-of-trip amenities which include:
  - cycle storage – rails, racks, lockers, enclosures, centres
  - personal amenities – showers, change rooms, gear storage lockers
  - service centres.

For further guidance refer to Department of Transport and Main Road's *Technical Note 128: Selection and Design of Cycle Tracks.*

For the purposes of this chapter, 'high demand cycle storage' refers to a stop or station with high levels of cycle access and large-scale cycle storage components such as an enclosure or large banks of rails, racks or lockers. Amenities including higher-level end-of-trip components – such as showers, change rooms and gear storage lockers – are referred to as 'cycle centres'.

Cycle infrastructure should be considered in terms of:

- the local and metropolitan cycle network around a stop or station
- interface between the cycle network and the stop or station
- cycle access through other stop or station supporting facilities
- asset management.

3.4.1 Integration

3.4.1.1 Network integration

It is a TransLink policy objective to promote cycle connections to the broader network within the immediate area of a stop or station. All interface points between local cycle networks and TransLink infrastructure must be functionally seamless and focus should always be on integrating with existing infrastructure.

TransLink infrastructure should respond to existing and planned cycle networks by providing access directly to points where a transport corridor or a key high-frequency services route intersects a major cycle path.

Cycle networks provided by external parties should respond to TransLink stops and stations according to the volume of cycle activity generated.

Connections must be accessible, direct and legible. Particular elements that need focus include:

- inter-modal conflict – the need for dedicated or shared crossings, use of cycle lanterns (red and green cycle-crossing lights) and signals at controlled intersections
- kerb ramps – appropriate connection, shared or dedicated provision, quality, storage space, width and configuration
- path/lane width, grade, continuity and alternatives
- provision and/or placement of any end-of-trip amenity components – storage, water, other amenities
- connection to existing or planned shared or neighbouring cycle amenities.

3.4.1.2 Adjacent land uses

As detailed in the previous section, 3.2.1.3 – Surrounding land uses, review nearby land uses and gauge potential cycle-related risks, impacts, requirements and demand that they may generate. In particular, identify any area with specific cycle needs for example:

- businesses or services visited by large groups of cyclists
- primary, secondary, special, and tertiary education facilities
- popular recreational parks and cycle amenities.

Surrounding uses, along with state and local government cycle network planning and policy, will have significant bearing on the scale, nature and location of end-of-trip amenities.

High-demand cycle storage with end-of-trip amenities will generally be required for:

- high passenger volume stations located on or near major metropolitan cycle paths (on or off-road)
- principal and major activity centres. There are several factors to consider when trying to integrate end-of-trip amenities and major activity centres:
  - Cycle demand is often a mix of the activity centre and public transport based demand.
  - These demands can conflict and it may be better to locate commuter cycle storage away from the activity centre and closer to cycle paths. This can reduce spatial constraints and inter-modal conflict, but will require high-quality connection between the station, centre and amenities.
  - When demands are not in conflict, end-of-trip amenities may be shared providing there is available space and the ability to achieve functional partnering arrangements for delivery, maintenance and management.

General cycle storage will be required for stops and stations near a cycle path where demand is relatively moderate. The scale, nature and location will depend on demand profile and the level of security available. Where nearby land uses or public spaces provide better surveillance, these should be considered for the location of cycle storage, if agreement can be reached with the relevant stakeholders.

Sites near TransLink stops or stations that are earmarked for potential commercial operations should be identified to manage any potential conflicts with cycle infrastructure, while also capturing any opportunities for shared use.


Bicycle locker

3.4.2 Cycle demand analysis

To identify likely cycle demand profiles for a station or stop, undertake the following:

- identify links to nearby cycle paths and major cycle intersections.
- examine direct connections against paths offering the least resistance (that is, barriers), most convenience or most safety (including on and off-road).
  In particular consider:
  - existing and likely new planned paths
  - non-public transport based cycle paths that might pass the site
  - future cycle paths that may intersect with the site.
- identify and map actual, designated and future cycle routes to, from and past the site, in line with the department's Principal Cycle Network Plan.
- gauge the likely order of magnitude of cycle demand.

Estimates and/or extrapolations should be used alongside policy and applicable standards when determining what cycle access infrastructure is required. These policies are based upon expected or targeted peak demand and the desired shape of the cycle network.

In analysing cycle access infrastructure needs, the variables that should be considered include:

- the likely catchment:
  - a reasonable immediate ride-up catchment radius for all stops or stations with end-of-trip amenities is 2.5 kilometres or 10 minutes ride (whichever is less), while for premium stops and high passenger volume stations with end-of-trip facilities, up to 5 kilometres or 20 minutes ride can be expected
  - limited ride-up could be expected from up to 15 kilometres at high passenger volume stations where high-demand cycle storage with full amenities is available and there is a long distance commute to the nearest activity centre.
- these are impacted by:
  - the surrounding environment that the stop or station sits within – terrain, land use, traffic, safety
  - the permeability of the area – the actual distance travelled due to block size, presence or absence of mid-block paths or barriers
  - quality of cycle connections – safety, amenity, ease of access, continuity
  - climate – the propensity to cycle and the average distance cycled may be less where heat or inclement weather is more regular
  - the likely demographic of cycle user types and the varying needs of different cyclists
  - potential inclusion of cycle provision on buses and trains – consider frequency and capacity
  - provision of end-of-trip amenities
  - cycle activity generated by adjacent land uses
  - existing and future surrounding residential development (includes population density and dwelling density). Apply current mode-share and relevant targets to identify the potential demand requirements.

Refer to Austroads guidelines and the Department of Transport and Main Roads' *Technical Information for Cycling* for further information about cycle demand and forecasting.

3.4.2.1 Staging

Protect for future increase in demand for paths and storage capacity wherever possible. Where initial cycle volumes may not justify investment in cycle end-of-trip amenities, yet future volumes may be expected to potentially do so, it is important to design for the protection of the land requirements and expansion of infrastructure for future or extended amenities.

3.4.3 Design considerations

All stations, and some high passenger volume stops where major cycle paths are intersected, will require end-of-trip amenities ranging from cycle rails and racks to lockers, enclosures and possibly showering and associated amenities.

Key principles for design of cycle access infrastructure include:

- identifying the main directions of flow for cycle activity into and out of the stop or station facility area
- ensuring that access paths connect, provide appropriate capacity and are easily recognisable
- ensuring that adequate advance information is provided for decision (entry and turning) points
- providing direct and convenient connections that do not require cyclists to dismount until reaching the amenity
- minimising inter-modal conflict (in particular, cycle access should not inhibit or conflict with pedestrian movements)
- need for bus layover depending on service pattern and operation.

Refer also to the *PTIM, Bus Stop and Bus Station Infrastructure* chapters.

Specialist cycle design advice should be sought when designing cycle amenities. Advice on standards and current best practice can be sought through TransLink, other relevant government stakeholders and the Department of Transport and Main Roads' *Technical Information for Cycling*.

Table 3.8 outlines some of the key design considerations and requirements for cycle access.

Table 3.8:
Design considerations for cycle access infrastructure

Consideration	Guideline description
Access paths	• Changes in grade should be seamless and avoid excessive gradients. • Surface materials and finish should consider tyre traction in dry and wet weather. • Paths must be designed to avoid pooling of surface water and promote quick drainage during heavy rain events. • Appropriate handrails should be provided at preferred cycle crossing or other stopping points. • Crossover kerb ramps should be seamless. • Sightlines should not be obscured on approach to corners and intersections with other modes. • Entry and exit paths should be clearly visible utilising passive surveillance and security cameras (where applicable). • Vegetation should be planned and maintained to avoid the intrusion of plant matter into the envelope of movement for cyclists. • Avoid creating any unnecessary obstructions such as grates, grids, grills or pit covers. • Place utility service maintenance infrastructure, such as pits, in locations where access to them does not interrupt the flow of cycle activity.
Envelope of travel	• The minimum clearance for the envelope of cycle travel provided for a cyclist is 1 metre wide x 2.5 metres high and 1.75 metres long.

Consideration	Guideline description
Minimising inter-modal conflict	• Wherever reasonable, dedicated on and/or off-road paths for cyclists are preferred. • Include measures to slow cyclists when approaching potential points of conflict – for example intersections, blind curves. • Provide sufficient width – refer TMR Technical Note 133 Guidance on the widths of shared paths and separated bicycle paths. • Clearly sign where paths are to be specifically shared or exclusive. • Clearly identify any behavioural requirements that differ from the natural preferences (for example, if cyclists are required to dismount). • Clearly identify crossing arrangements (for example, if cyclists must cross with pedestrians or separately). • Cycle parking (whether in use or not) should not endanger pedestrians – particularly those who are partially sighted or blind – or obstruct the flow of pedestrian movements. • Cycle parking should not obstruct structures such as seating, traffic signals, street lighting, bollards and so on., or obstruct car doors from opening (where parking is allowed). • Cycle paths should avoid interaction with kiss ‘n’ ride bays: – where this is unavoidable, sufficient width should be provided for cyclists to pass on the right of any vehicle using such a facility – cyclists should be discouraged from passing on the left of a kiss ‘n’ ride bay, whether on or off-road.

Consideration	Guideline description
End-of-trip amenities	• The minimum provision of cycle storage is a single rack (1.7 metres x 0.6 metres). All new facilities should protect suitable vacant space for this provision. • Design cycle storage facilities based on location demand. This may include more individual bike rails, whether covered or not, than fully secure bike storage, or vice-versa. • Design of amenities requiring structures should be made of transparent materials to allow natural ventilation and passive surveillance, yet not detract from the public environment or TransLink's architectural theme. • Design of cycle parking should support any type of cycle without causing damage – both when the cycle is parked and if knocked accidentally. • Design of cycle parking should allow for both the front wheel and frame (and possibly the back wheel) of the cycle to be secured. • Minimise the need for cyclists to cross the paths of other modes when accessing end-of-trip amenities, particularly when moving to and from the platform waiting area. • Minimise the distance between the end-of-trip amenities and public transport boarding point. • Wherever possible, cyclists should be able to cycle to an end-of-trip amenity without dismounting. • Cycle parking should be spaced appropriately so that cyclists are not obstructed when locking their cycle. • Amenities should provide weather protection: – cycles and gear stored within lockers or an enclosure should not be affected by rain water – floors must drain away from the storage area with no pooling of water within enclosure or lockers.
Lighting	• Lighting must meet applicable lighting standards and be consistent with any adjacent lighting provided for pedestrians or motorised vehicles. Refer to the appropriate requirements within *AS/NZ 1158.3.1 2005 – Lighting for roads and public spaces*.

Consideration	Guideline description
Hazards	• Physically avoid proximity to, or creation of, hazards. In particular, consider: – kerb design, quality and proximity to routes – kerb drain placement and design – type of landscaping placement and impact on pavements and kinetic envelope for cyclists – railing and barrier design – proximity of unforgiving structures to kinetic envelope – building corners, poles and sign edges etc. – pavement design and quality – slip resistance, ridges /gaps and consistency – placement and design of TGSI – reduced tyre traction, interaction between cyclists and people with vision impairment – placement and quality of coverings for service pits. • If a stop or station is likely to be used regularly by people with mobility impairment, children, or inebriated people, implement measures that encourage cyclists to dismount in shared areas, and encourage pedestrians to exercise caution.

Consideration	Guideline description
Surveillance	• Amenities and connecting paths should be specifically covered by security camera infrastructure with the ability to survey movements between platforms, cycle storage and external entry/exit points. • Design of infrastructure and structures should be made of transparent materials to allow natural passive surveillance.
Other	• Require cyclists to dismount in any area where: – boarding or alighting occurs (for example at platforms) – pedestrian movement is either constrained or is clearly the dominant mode (for example through over/underpasses, ramps to platforms). • Provide for dismounted cyclists to move cycles to and from boarding and alighting points. • Discourage through cycle movements (non public transport-related) within the immediate stop or station area. • Consider off-site provision and active demand management of cycle facilities if space is limited.

3.4.3.1 Crossings

Pedestrian movement will always take precedence within shared parts of a stop, station or access infrastructure, and cyclists should be appropriately informed of this through signage. Cyclists will have priority on any designated cycle paths and, accordingly, pedestrians and motorists should be informed of this through appropriate signage.

In particular, the following should be considered with respect to cycle crossings associated with public transport infrastructure:

- cycle crossings meet or exceed minimum engineering design standards (as specified by Austroads).
- infrastructure design avoids configurations that are likely to generate conflict between dominant cycle movements and other modes.
- design treatments aim to slow cyclists on the approach to crossings (as specified by Austroads).
- pedestrian crossings are separated from cycle crossings, where possible. If separation is not possible:
    - provide wider kerb ramps and more footpath space at the kerbside dwell points and in any median refuges (as specified by Austroads), and require cyclists to dismount at such crossings.
    - corresponding kerb ramps on a crossing should be directly aligned to minimise changes of direction.

3.4.4 Supporting components

The scope for supporting components will be subject to the scale and functionality requirements of the public transport facility and any adjacent land uses which may impact on the facility.

3.4.4.1 Signage and way-finding

Signage and way-finding for cyclists should be implemented at a scale that allows for on-cycle navigation and information. Information specifically for cyclists, that does not need to be communicated en route, should be collated and provided at an end-of-trip amenity.

Cyclists may need to access some signage targeted more at pedestrians, such as information signs or facility maps, prior to accessing cycle storage amenities. Provision should be made to allow them to do so without creating undue hazard for pedestrians, other cyclists or vehicles.

The signage plan for a stop or station should include any signage associated with supporting cycle infrastructure amenities. A review of off-site directional signage requirements associated with a stop or station should be undertaken and presented to relevant key stakeholders responsible for local cycle infrastructure. Consultation should then proceed regarding the quality and extent of directional signage provision.

Refer to Table 4.1 *PTIM, Branding, Theming and Signage* Chapter for guidance on signage.

3.4.4.2 Amenities

Amenities for cyclists include items that are desirable for improving the experience of using the facility but that are generally not considered mandatory. All such components for cyclists should be concentrated around any designated end-of-trip amenities and placed so as to allow clear visibility without compromising pedestrian safety. The components are included in Table 3.9.

Table 3.9:
Amenity utilities for cycling infrastructure

Amenity utility	Consideration requirement/notes
Shelter from rain, sun and wind	• Consider need for shelter at cyclist dwelling points such as end-of-trip amenities. • Consider extent of shelter provided based on likely use patterns. for example, extension of shelter above enclosure entry points where a cyclist may need to dismount and open a bag to access a key or access card. • Consider the use of lighting within cycle enclosures for access during the evening period.
Seating	• At higher demand for end-of-trip amenities for cyclists, provide seating for cyclists to change their shoes.
Rubbish bins and drinking fountains	• Consider provision at end-of-trip amenities.
Gear storage	• Consider provision for gear storage at high-demand cycle amenities where cycle lockers are not in exclusive use.
Shower amenities	• Consider for inclusion where high volumes of cyclists will use as an end-of-trip activity or prior to catching a public transport service that operates at high frequencies. • Consider the inclusion where agreement can be sought between TransLink and relevant key stakeholders with regard to provision, management and ongoing maintenance.
Vending machine	• Consider provision at higher demand for end-of-trip amenities.
Non public transport-based information points – static, dynamic and interactive	• Consider opportunities for these at end-of-trip amenities to allow for dissemination of cycle-related information by government and relevant cycle reference groups. • Clearly establish installation, management, maintenance and usage conditions and arrangements before inclusion.
Advertising	• Consider provision at end-of-trip amenities where amenity and *CPTED* principles are not compromised and where adequate exposure is available to meet market expectation. This may be restricted to cycle-based services.
Emergency call points	• Consider the provision of emergency call points at (within and/or next to) end-of-trip amenities in case of security malfunction or other incidents. • Ensure electrical and communication conduits/connections are provided, or allowed for in future if not immediately supplied.

3.5 Bus feeder infrastructure

3.5.1 Network considerations

Interchanging can occur anywhere where two or more service routes intersect. However, its attractiveness will be determined by how conducive the TransLink network and the physical infrastructure are towards creating a convenient journey.

Increased provision of interchange opportunities, specifically when combined with higher-frequency services, can provide passengers with access to more destinations across the TransLink network.

Network planning can contribute to promoting interchanging by:

- wherever possible, providing the most direct interchange opportunities within a single stop or station facility – preferably by simply accessing adjacent platforms or even without the need to change platforms
- coordinating the timetables for key services to minimise inter-journey wait times, while allowing for sufficient time for passengers to interchange between services
- providing the highest reasonable frequency for cross-town and feeder services.

Generally, interchange facilities will be provided at transport network interchange nodes that are located at the convergence of many service routes with a high frequency service and/or activity centre.

3.5.2 Demand analysis

Strategic transport models will provide estimations of the level of expected interchanging at specific sites. These estimates should be reviewed in context with TransLink planning and network strategy.

3.5.3 Design considerations

Where there is likely to be a high demand for interchanging, stops/stations should provide additional passenger waiting capacity, and seamless intra and inter-platform passenger movement, in accordance with TransLink stop and station policy and guidelines.

Where less direct interchange opportunities are to be provided, apply pedestrian design consideration to maximise the convenience of the interchange movement by:

- minimising the required walking distance
- maintaining direct sightlines across the facility and services
- providing continuous and seamless high quality pedestrian connections within the facility
- identifying the interchanging opportunity within facilities
- providing route and timetable information for the corresponding facility
- ensuring high-frequency services are given priority over feeder services for direct and efficient access to a stop or station, to minimise their dwell and travel times.

Bus access roads and bays should consider:

- appropriate design for constant heavy vehicle use and manoeuvring
- surface materials designed for ease of cleaning and slip resistance in all weather conditions
- surfaces designed to avoid pooling or collection of detritus or other unwanted debris.

3.6 Kiss 'n' ride infrastructure

Kiss 'n' ride is preferred at stops and stations serving low-density residential areas where the level of public transport service is low.

This section explains how to provide good kiss 'n' ride infrastructure including:

- access from the road network around a stop or station
- interface between the stop or station and the kiss 'n' ride area
- the role of kiss 'n' ride as a key access point for people with mobility impairment
- the difference between set-down and pick-up (that is, waiting times)

Table 3.10 provides an overview of kiss 'n' ride infrastructure.

Table 3.10:
Kiss 'n' ride key elements

Consideration	Guideline description
Passenger set-down and pick-up bays	These can be for private vehicles or taxis, shared or dedicated, kerbside or on-site (off-street) and could include: • indented bays along a kerb-line • regular (non-indented) kerbside bays designated as passenger loading zone or very short-term parking • allocated angle parking bays within a parking lot facility associated with a park 'n' ride or activity centre – for example, very short-term (less than 10 minutes) parking.
Pedestrian and vehicle waiting areas	This can include: • storage bays and overflow allowances for waiting (pick-up) vehicles • waiting areas and amenity utilities for public transport passengers awaiting their ride • pedestrian access paths.

3.6.1 Integration

A key success factor for any kiss 'n' ride facility is the convenience with which it can be accessed and exited from. As many kiss 'n' rides are provided as kerbside services, it is important to consider their interaction with users of adjacent roads, pedestrian paths and cycle paths, particularly in relation to safety and efficiency.

The following considerations should be applied:

- **Access:** Direct vehicle access to and from arterial, sub-arterial and distributor roads is preferred. Connections between kiss 'n' ride infrastructure and stop or station facilities should be accessible, direct and legible, and incorporate *CPTED* principles.
- **Location:** Kiss 'n' ride activity should be accommodated within a formalised facility. Informal kiss 'n' ride activity should be discouraged, particularly where safety issues are likely to occur. If using local streets is the only option, the length of this use should be minimised and preferably contained to short sections:
  - Off-street or side-street kiss 'n' ride access is preferred where the ratio between traffic volume (kiss 'n' ride demand and passing traffic) and road capacity prevents efficient and safe vehicle ingress and egress.
  - On-street kiss 'n' rides are acceptable where the ratio of traffic volume (kiss 'n' ride demand and passing traffic) and road capacity allows free-flowing ingress and egress. Kerbside kiss 'n' rides should provide sufficient additional footpath space to avoid conflict with pedestrian movements.
- **Design:** Kiss 'n' ride infrastructure should not interrupt cycle movements, and should minimise the need to cross cycle paths.

Kiss 'n' ride access should be considered for:

- stops and stations outside of the inner city and in low-density residential areas
- some high frequency services and terminus stops with significant demand
- stops and stations serving activity centres within residential areas, particularly those used for interchanging.

3.6.1.1 *Adjacent land uses*

When planning kiss 'n' ride facilities, consideration should be given to any kiss 'n' ride activity needs associated with land uses in the relevant area which may impact on the public transport stop or station, such as:

- childcare centres
- primary, secondary, special, and tertiary education centres
- large office and business activity centres
- large retail and recreational activity centres
- sporting facilities.

In most cases, dedicated kiss 'n' ride facilities will directly relate to a stop or station. However, in some cases, the infrastructure may be shared between land uses (for example, adjacent shopping centre or education facility). In such situations it will be essential to:

- provide sufficient capacity
- establish clear responsibilities for provision, maintenance and security
- consider local parking supply management to ensure parking for businesses is maintained.

If it is likely that peak demand periods for the stop or station and the activity centre will conflict, and thereby impact capacity, general passenger set-down should not be combined.

3.6.2 Kiss 'n' ride demand analysis

The most important consideration is to cater to likely peak demand and protect for future expansions in peak demand. Where space is at a premium, there may be other strategies available such as queue management and active management.

Policy and strategy requirements will be used alongside any estimates and/or extrapolations to inform the development of kiss 'n' ride facilities. The variables to consider when analysing the need for kiss 'n' ride infrastructure include:

- the reasonable kiss 'n' ride catchment based on:
  - the type of surrounding land use and development
  - location with respect to other public transport options and activity centres
  - the surrounding traffic conditions
- the mix of potential kiss 'n' ride users and their differing needs
- existing and future development intensity such as population density and dwelling density
- activity generated by proximate land uses – for example a shopping or other activity centre
- mode share projections or broad target planning policies (which can be applied to generate approximate volumes or future targets).

Travel surveys should be conducted to capture passenger drop-off and pick-up activity for each individual site
for example:

- Behaviour at kiss 'n' ride infrastructure in the morning peak period is different to behaviour in the evening peak period. Dwell times are longer during the evening peak when the majority of vehicles are picking up passengers, as opposed to dropping off during the morning
- Kiss 'n' rides that also service an activity centre (for example a shopping centre) experience traffic activity outside the normal public transport peak periods
- Taxis setting down at dedicated ranks may wait for another fare, hence combining set-down and pick-up activity.

Design of kiss 'n' ride infrastructure needs to consider these variances.

The use of micro-simulation models, especially for complex park 'n' ride sites, can also be applied to understand the potential need for kiss 'n' ride. Consult TransLink for advice when identifying the need for kiss 'n' ride infrastructure at a particular stop or station.

3.6.2.1 Staging

If demand is likely to increase over time – and TransLink still considers it a priority – possible expansion of kiss 'n' ride capacity should be allowed for, either through lengthening longitudinal kerbside bays or providing additional specially-allocated angle or perpendicular parking bays.

Also consider provision of peak queuing space that does not impact on other stop or station access modes or safe and efficient movement in the immediate area.

Consider shared allocation arrangements on a physical or temporal basis if future demand is uncertain or likely to be seasonal or highly variable. For example, if a bay:

- is permanently shared between taxis and private passenger set-down
- is shared only at specific times and is dedicated to one use at other times
- changes its dedicated or shared allocation during specific time periods.

3.6.3 Design considerations

A kiss ‘n’ ride generally consists of a public transport platform-like waiting area. Sufficient capacity should be provided within this area to cater for any through pedestrian movements and movement of embarking and disembarking passengers between vehicles, waiting areas and/or access paths to the stop or station.

Key principles to consider:

- **Flow direction:** Identify the main directions of vehicle flow into and out of the stop or station facility area considering entry arrangements and the location of other Supporting Access Infrastructure, such as cycle amenities.
- **Pedestrian movements:** Ensure that pedestrian access routes to the stop or station connect to the kiss ‘n’ ride facility, provide appropriate capacity, comply with applicable accessibility requirements and are easily recognisable.
- **Information:** Ensure that public transport information is provided in adequate advance at kiss ‘n’ ride waiting areas and other decision points between the stop or station.
- **Personal security:** Apply *CPTED* principles to maximise pedestrian safety.
- **Safety:** Wherever possible, segregate kiss ‘n’ ride bays and their through-lanes from other traffic to help control movement and limit the complexity of vehicle movements in the area (for example, indented kerbside bays, separate access roads):
  - Promote safe and efficient movement by providing connections to and from the kiss ‘n’ ride that minimise inter-modal conflict and provide direct connection to platforms
  - Where there is the need for cross-vehicular (motorised or cycle) traffic, kiss ‘n’ ride (including taxi waiting areas) should be located adjacent to or near pedestrian crossings. These crossings should provide direct access to the primary stop or station entry point
  - Where a kiss ‘n’ ride is located within a larger park ‘n’ ride site, the kiss ‘n’ ride will have priority for proximity to the stop or station entry points.
- **Taxis:** Dedicated taxi facilities should be provided where passenger demand for taxis is expected to be high and there is likely to be conflict between taxi demand and general kiss ‘n’ ride demand. Where possible, dedicated taxi facilities should be shared or primarily associated with an adjacent land use such as an activity centre (for example, a shopping centre). Consider the need to provide a taxi call point or public telephone for dedicated taxi facilities. It will be necessary to make provision for the connection to communications infrastructure.

3.6.3.1 Accessibility

Kiss 'n' ride access and infrastructure should meet the applicable *Australian Standards* for parking bays for use by people with a disability. These bays must be located as close as possible to the stop or station entrance and incorporate appropriate accessibility design features, such as kerb ramps and direct access.

Planning and design of public transport infrastructure should give consideration to location-specific demand for facilities that cater for people with a disability.

Table 3.11 outlines some of the key design considerations and requirements for kiss 'n' ride access.

Table 3.11:
Design considerations for kiss 'n' ride access infrastructure

Consideration	Guideline description
Access paths and waiting amenities	• The provision of a waiting area consisting of a hardstand area with a suitable slip-resistant finish (as per accessibility and architectural design requirements). This is in addition to a minimum pathway allowance. Consideration to be given to appropriate LOS for this area. • Access pathways to stops or stations must meet the requirements outlined previously for pedestrian infrastructure. • The pathway will extend the full length of the facility, providing access to the full length of all bays. • Where the carriageway and waiting area/circulation paths are at different grades, additional width will be provided to accommodate kerb ramps, as per applicable *Australian Standards*. • Kerb ramps must be provided at the front or rear of each bay length as per applicable *Disability* and *Australian Standards*. • Minimise the distance between the kiss 'n' ride and bus stopping positions. Where possible, walking distance between the public transport boarding point and kiss 'n' ride area should not be more than 150 metres for pedestrians.
Dimensions/envelope	• Parking bay envelope will vary depending on configuration. • Applicable *Australian Standards* apply for: – non-parallel bays (meet off-street parking standards) – minimum kerbside bay width and length (including fully accessible bays for people with disabilities) – minimum height clearance – angle parking bay dimensions (require specific physical dimensions).

Consideration	Guideline description
Lighting	• Lighting should meet applicable platform lighting standards. • Lighting levels are required to meet current regulation standards for public transport facilities. For details regarding lighting requirements refer to the appropriate requirements within *AS/NZ 1158.3.1 2005 – Lighting for roads and public spaces*.
Hazards/minimising inter-modal conflict	• Consideration of slow vehicles entering and exiting a kiss 'n' ride facility when approaching potential points of conflict (for example intersections, blind curves, crossings). • Clearly identify crossing arrangements if kiss 'n' ride patrons are required to cross a carriageway of any sort. • Where a cycle access path runs parallel at-grade with a kerbside kiss 'n' ride bay, provide additional dedicated lane width to the right of the bay. • On no account should cyclists be encouraged to proceed on the left of a kiss 'n' ride bay, on or off-road. • Cycle paths should avoid interaction with kiss 'n' ride bays. • Under no circumstances should cycle paths be led through shared zones for accessible kiss 'n' ride bays.
Surveillance	• Where applicable, kiss 'n' ride areas and connecting paths should be specifically covered by security camera infrastructure (for example, CCTV) with the ability to survey movements between public transport platforms and a kiss 'n' ride area.

3.6.4 Supporting components

The scale of the public transport facility – and strategic direction from TransLink – will determine the scope for supporting components to be provided with kiss ‘n’ ride infrastructure.

3.6.4.1 Signage and way-finding

Signage and way-finding for kiss ‘n’ ride infrastructure should be implemented at a scale that allows for in-vehicle navigation and information. All information relevant to the use of kiss ‘n’ ride needs to be imparted on the approaching roadway. Any information about public transport services should be provided at the kiss ‘n’ ride waiting area or within the stop or station area.

Signage for kiss ‘n’ ride infrastructure should be incorporated into the overall stop or station signage plan. Undertake a review of off-site directional signage needs and present recommendations to the key stakeholders responsible for local road infrastructure. Consultation should proceed regarding the quality and extent of directional signage provision.

Refer to Table 4.1 *(Branding, Theming and Signage)* for guidance on signage.

3.6.4.2 Amenities

Amenities for kiss ‘n’ ride users are items that can improve the experience of using the facility however in practice are generally not specifically required. All such components for kiss ‘n’ ride should be concentrated around the waiting area and positioned for clear visibility without compromising pedestrian safety. Components for consideration are listed in Table 3.12.

Table 3.12:
Amenities for kiss 'n' ride infrastructure

Amenity	Consideration requirement/notes
Shelter from rain, sun and wind	• Consider need for shelter at kiss 'n' ride waiting points based on available alternative shelter and exposure of location. • Consider extent of shelter provided based on likely usage – for example, extension of shelter where waiting numbers peak in the evening period.
Seating	• Consider providing seating for people waiting at kiss 'n' ride pick-up points. • Allow appropriate space for wheelchair parking. • Seating must comply with applicable *Disability and Australian Standards*. • Seating positions should be sheltered where capacity of covered waiting area would not be compromised.
Rubbish bins and drinking fountains	• Consider providing at waiting areas if alternatives are not available nearby.
Vending machines and other retail activities or outlets	• Consider providing near kiss 'n' ride infrastructure. • Clearly establish installation, management, maintenance and usage conditions and arrangements before inclusion.
Non public transport-based information points – static, dynamic, interactive	• Consider opportunities at waiting areas to allow for dissemination of passenger notification information. • Clearly establish installation, management, maintenance and use conditions and arrangements before inclusion.
Advertising	• Consider providing at waiting areas where amenity and *CPTED* principles are not compromised and where adequate exposure is available to meet market expectation.
Emergency call points	• Consider the location of emergency call points at waiting areas. • Ensure electrical and communication connections are provided, or allow for in future if not immediately supplied.

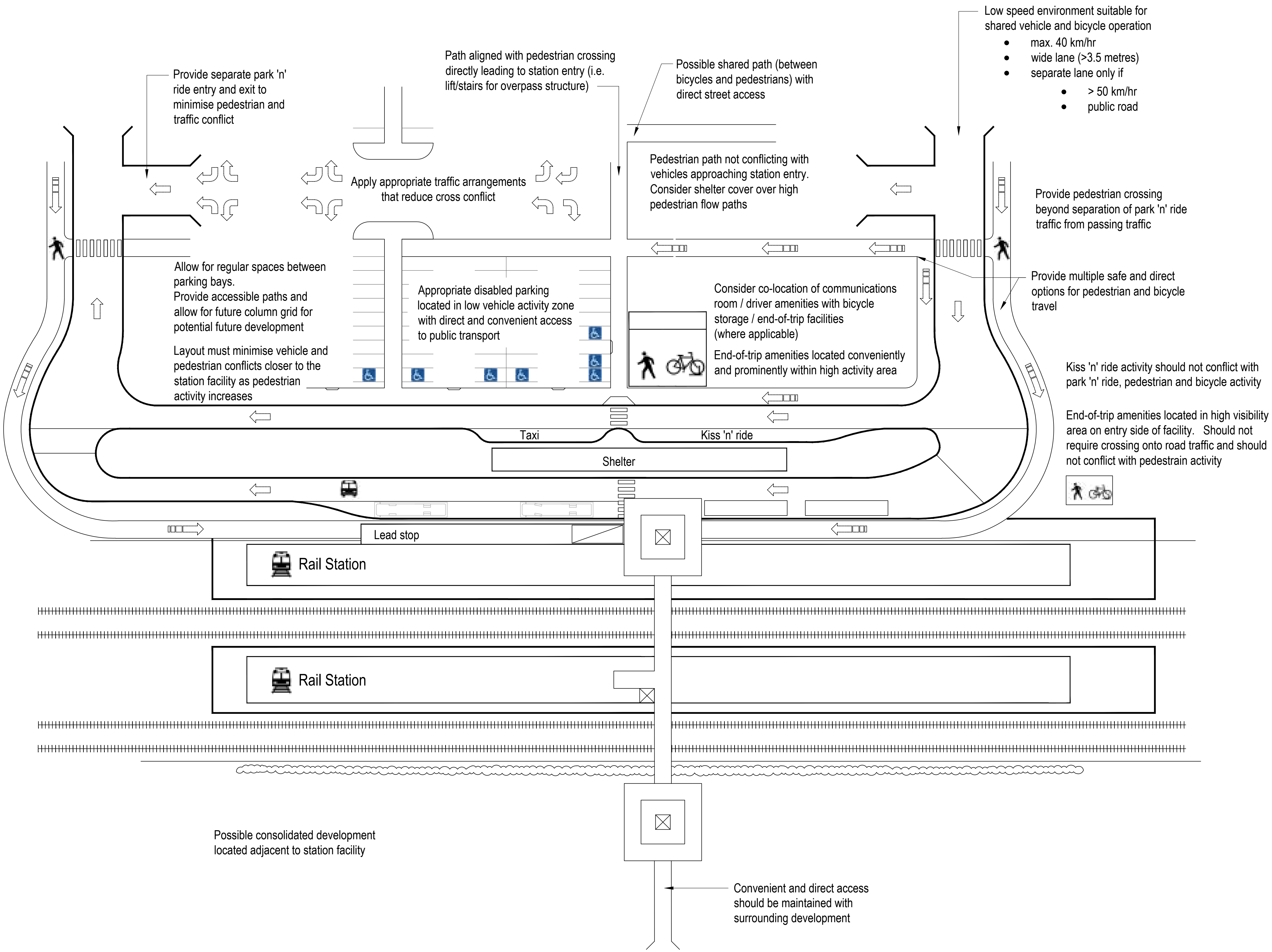
3.7 Park 'n' ride infrastructure

Park 'n' ride can be the first and last contact customers have with the public transport network on their journey. If a new park 'n' ride is to be developed or expansion to existing facilities is proposed, it should contribute to the long-term strategic planning intent for the public transport network, immediate precinct and surrounding community.

For detailed information regarding the planning and design of park 'n' ride infrastructure refer to *PTIM, Chapter 10 Park 'n' ride infrastructure*.

Appendix 3-A

This drawing provides design examples of access infrastructure components and layout.



TRANSLink | Queensland Government

SUPPORTING ACCESS INFRASTRUCTURE PRINCIPLES

SCALE :	Not to Scale		DRG 3-0101
DRAWN :		DATE : June 2014	A

Contents

Chapter 4 – Branding, theming and signage

4.1 Introduction

This chapter contains the branding, theming and signage considerations required for public transport infrastructure in the TransLink network.

Consistent infrastructure branding and theming, whether large or small, helps customers to instantly recognise, understand and link public transport.

4.1.1 Purpose and objectives

This *Branding, Theming and Signage* chapter references the provision of clear and consistent principles and guidelines for infrastructure signage across the TransLink network.

It will ensure that a consistent and high standard of network infrastructure is planned and delivered to meet the needs and objectives of the TransLink passenger transport system and passenger expectation.

The objectives of this section are to:

- outline the preferred requirements for public transport infrastructure signage and branding
- ensure best practice infrastructure signage design is applied across the state
- detail requirements for compliance with relevant standards and regulations.

4.1.2 Intended audience

This chapter is intended for use by professionals in the transport planning and delivery industry. This generally involves, but is not limited to, designers, planners, engineers, architects and other professionals involved in the planning, design and delivery of public transport infrastructure in Queensland.

4.1.3 Application of this chapter

This chapter must be used in conjunction with other modal chapters identified in the *PTIM*. It should be referred to before starting planning for new public transport infrastructure or upgrades to existing facilities.

It is intended that site-specific conditions be taken into consideration in the design and development process. TransLink, in partnership with Local Government and in collaboration with relevant stakeholders and delivery partners, shall be consulted on the final design for new infrastructure and upgrade of existing facilities.

Contact TransLink for current TransLink infrastructure signage manuals for details on signage specifications.

For the purposes of this chapter:

Branding refers to the use of logos and brands within the respective public transport network areas within Queensland. The TransLink logo and brand is used wherever the brand is operating with the exception of regional rail stations (outside SEQ) and some long distance bus services.

Where applicable, the Queensland Coat of Arms will be incorporated.

Theming refers to the specific design language created through the use of the TransLink infrastructure colour palette and architectural design features and finishes.

Signage refers to the use of a consistent signage suite that has been developed to create seamless identification of public transport infrastructure for a range of different modal facilities, to improve overall network legibility and way-finding.

Visual cues (including contextual and functional cues) in the design of a location can be used to indicate that the facility is for high-quality public transport. Contextual cues can be associated with particular places (for example, the prominence of built form) that people identify with, while functional cues are associated with particular uses (for example, signage, way-finding, seating and so on).

There may be the option for some variations to infrastructure design, such as special themed or 'signature' facilities, however design principles described in the *PTIM* must be followed to ensure quality outcomes for facility design. It is a requirement that the components used are:

- high quality
- easy to use and maintain
- comply with applicable standards and guidelines
- approved by TransLink and relevant stakeholders.

4.2 Branding and theming

TransLink's aim is to make the public transport network more connected for passengers by providing infrastructure that is easy to identify and understand. To promote a coherent and collective message, the look and feel of infrastructure should be consistent and distinctive as belonging to the TransLink network. TransLink can provide guidance on the appropriate use of design features and components.

Theming is projecting a consistent design language that is user-friendly, familiar and instils confidence in existing and potential passengers. Infrastructure theming assists customers to quickly identify certain facilities, and helps remove confusion when several brands and labels are used.

TransLink's infrastructure is characterised by modern, high quality, open structures with a lightweight appearance and an approved colour palette. Using a standard selection of lightweight components and a specific colour palette can reduce ongoing maintenance and material costs, as well as generate savings with initial procurement costs.

The TransLink infrastructure colour palette incorporates the use of minimal key colours, with natural tones, to represent a 'bush to beach' theme that complements Queensland's natural environment. The aim is to achieve simplicity within the overall facility environment, yet provide a common and sophisticated appearance that sits comfortably with the surrounding community. Figures 4.1 and 4.2 demonstrate how the 'bush to beach' theme translates to the TransLink infrastructure colour palette and architectural design features.

The TransLink infrastructure colour palette is to be used as the basis for all public transport infrastructure investments across Queensland. Consult TransLink for guidance on the specific application of the infrastructure colour palette (detailed in *Appendix 4-A*).

Infrastructure in South East Queensland has been developed using this colour palette. The adoption of this colour palette in regional Queensland will occur over time.

***Figure 4.1** –*
Bush to beach theme

***Figure 4.2** –*
Infrastructure theme

4.3 TransLink signage

TransLink has developed a clear and consistent signage suite to be applied to all public transport facilities within the TransLink network.

The TransLink signage suite will be applied to new and existing facilities in the TransLink network to provide a consistent look and feel, and further integrate public transport services for customers.

Signage must be included as part of the overall facility design. The signage, theming and colour palettes must complement each other to provide a sophisticated yet functional facility.

It is intended that the use of specialised professional signage design services be used within infrastructure design projects.

Contact TransLink for current TransLink infrastructure Signage Manuals.

4.3.1 Principles of signage

The principles outlined in Table 4.1 are considered important for effective signage of public transport infrastructure and services.

Table 4.1:
Signage principles

Consideration	Guideline description
Identify	Major facility identification signs should: • be visually distinctive • clearly display approved and consistent logos • display the facility name • display the symbol depicting modes of travel available from the facility.
Orientate	Directional information should include: • an information point explaining travel options • a locality map to help orientate the user • visible way-finding signage to platforms, ticketing, toilets, etc. • way-finding signage for the surrounding local area • the direction of travel for services using the facility.
Explain	Provide highly-visible and clear information such as: • timetables and route numbers • network maps showing all services using the stop/station • stop name and number, if applicable • locality map, if applicable • contact details for public transport network information • fare zone number where public transport is located, if applicable.

4.3.2 Naming conventions

It is important that the naming of public transport infrastructure within the network follows naming convention strategies and guidelines. The link between stop and station identification signage and other forms of information media (such as TransLink's Journey Planner information) aligns to create a consistent customer information experience and message. Contact TransLink for guidance and approval when naming public transport infrastructure.

4.3.3 TransLink's signage strategy

The TransLink infrastructure signage strategy builds on the approved colour palette to complement the overall facility environment. It aims to firstly identify the facility within the surrounding environment and secondly to make it easier for passengers to navigate to public transport boarding points by using colour recognition as follows:

- Resene 'Trinidad' (bright orange), or approved equivalent, is used as the primary background colour for identifying and directing to public transport. This would cover the entire movement of catching a public transport service (from station or facility identification through to boarding the vehicle).
- Resene 'Jon' (warm grey), or approved equivalent, is the secondary background colour used for all other messages. This represents signage for other facility components (for example, ticketing, toilets, information, cycling amenities, kiss 'n' ride, park 'n' ride, and so on).

TransLink has developed a suite of infrastructure signage designs for use in its network.

The following figures provide examples of signs to be used within TransLink's network facilities and regional infrastructure.

4.3.3.1 Station/park 'n' ride signage (TransLink)

Figure 4.3 –
Major station identification sign (8 or 9 metres high)

Figure 4.4 –
Major station identification sign (8 or 9 metres high)

Figure 4.7 –
Secondary/supporting station identification sign (roof/awning mounted)

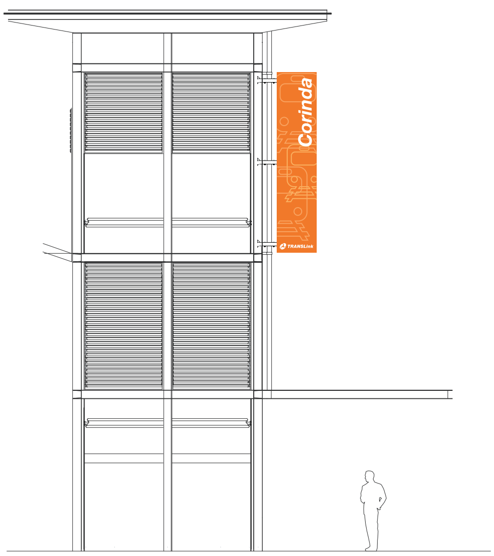


Figure 4.5 –
Secondary/supporting station identification sign (facility mounted)

Figure 4.6 –
Secondary/supporting station identification sign (post mounted)

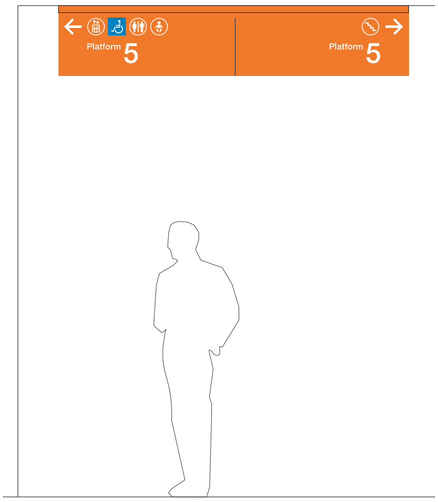


Figure 4.8 –
Directional sign (ceiling mounted)

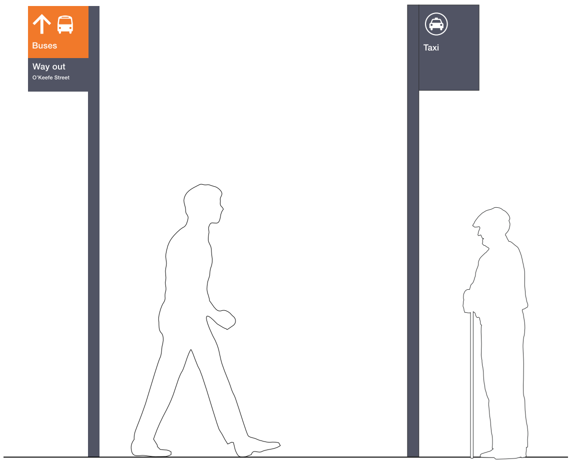


Figure 4.9 –
Minor directional sign and station facility identification sign

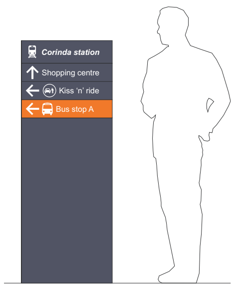


Figure 4.10 –
Directional sign (free standing)

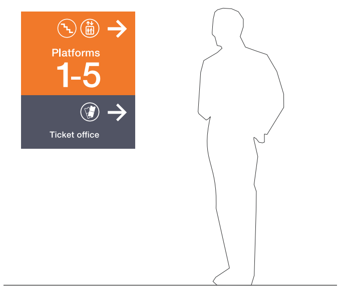


Figure 4.11 –
Directional sign (wall mounted)

Figure 4.12 –
Ticket office sign

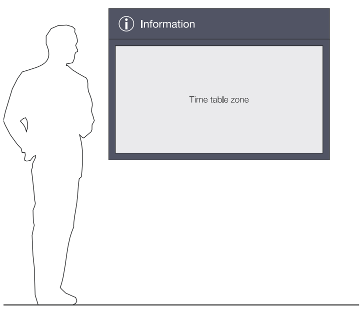


Figure 4.13 –
Information or timetable sign (wall mounted)

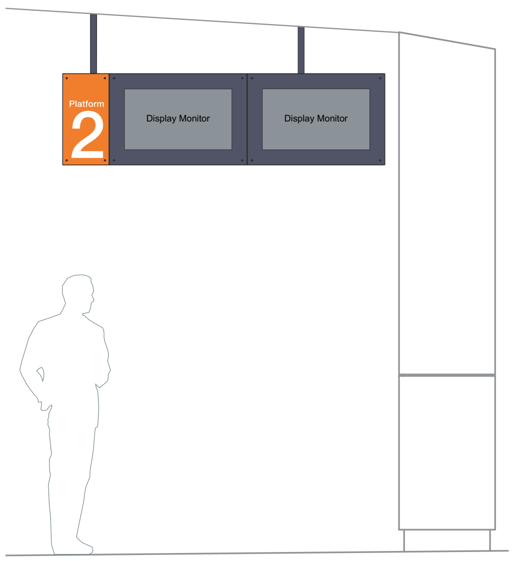


Figure 4.14 –
Passenger sign with passenger information display

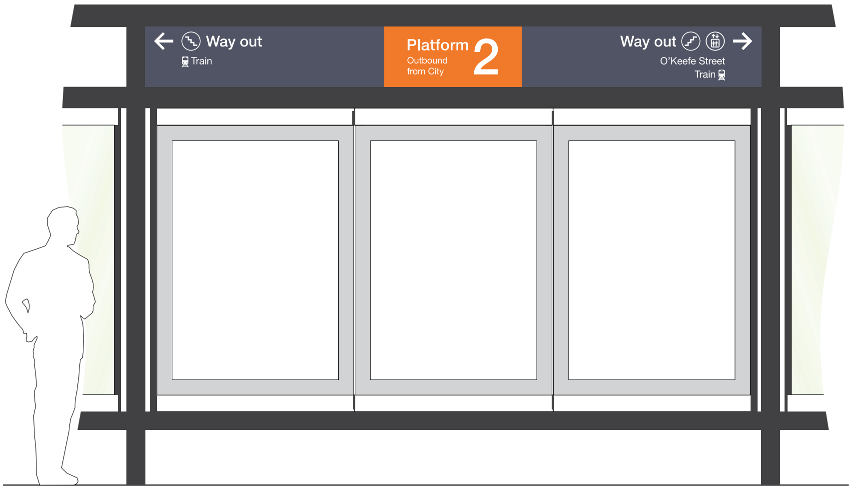


Figure 4.15 –
Directional signs with information displays

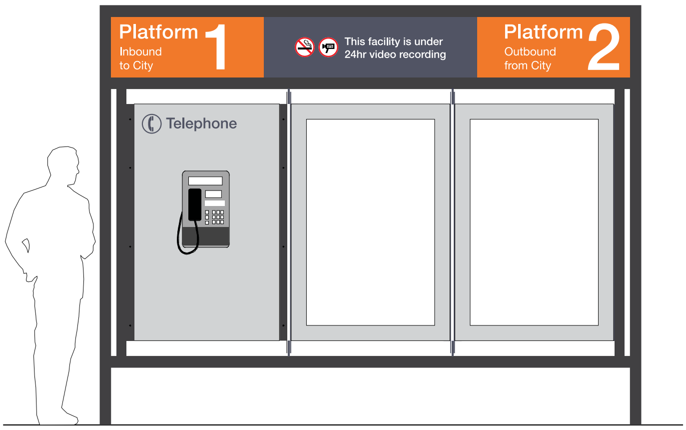


Figure 4.16 –
Platform and prohibition signs with information displays

Figure 4.17 –
Platform sign (bus station)

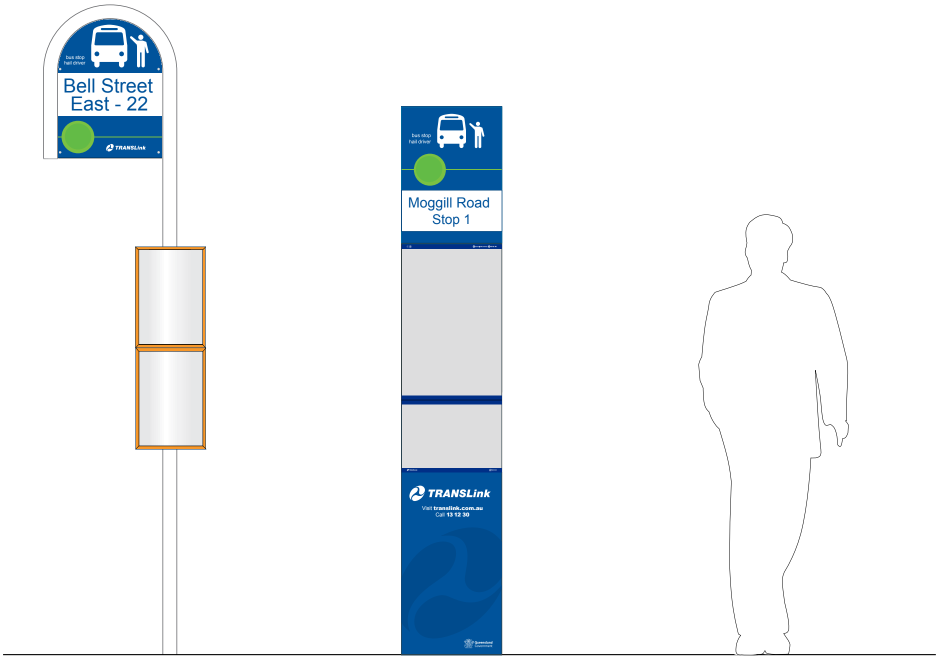


Figure 4.18 –
Bus stop signs

4.3.3.2 External facility signage

For instances where local area or precinct way-finding signage is not used, or not acceptable, TransLink has developed a consistent signage suite that aligns with the internal public transport facility signs. These external signs may be located a reasonable distance away from the public transport facility environment at local precinct congregation areas or decision points.

Consultation with local agencies and stakeholders is required to achieve a clear, consistent and easily understood signage representation for the community. For TransLink's external way-finding signage options refer to Figures 4.19 - 4.21.

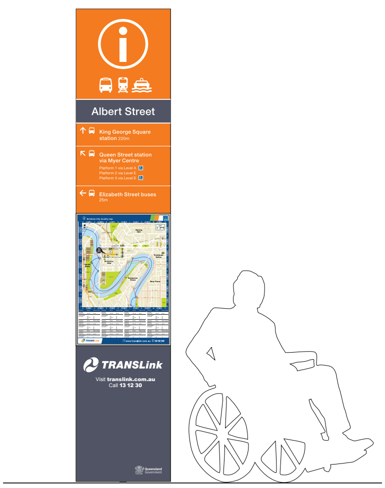


Figure 4.19 –
External directional and map sign

Figure 4.20 –
External major directional sign

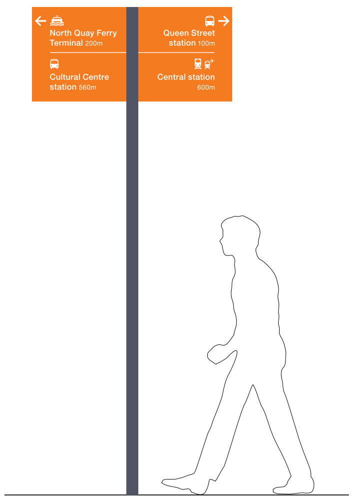


Figure 4.21 –
External minor directional sign


Capalaba
Park 'n' Ride
Platform 1
TRANSLink
Visit translink.com.au
Call 13 12 30

Appendix 4-A

Colour Palette

Table 4.2 outlines approved TransLink colours, materials and finishings recognised for theming and signage of TransLink infrastructure.

Table 4.2:
TransLink Infrastructure Colour Palette – March 2014

Colour sample	Generic colour name	Infrastructure signage			Printed material	Buildings and supporting facilities					
	Primary corporate colour selection	Vinyl products		Paint products	Ink products	Paint products	Powdercoat products	Tile / pavement products	Metal products	Glass products	Application and use
	Generic colour name	Propriety name and code**	Propriety name and code**	Propriety name and code**	Solid PMS # coated	Propriety name and code**	Propriety name and code**	Propriety name and code**	Propriety name and code**	Propriety name and code**	
	Primary signage colours										
	Orange	–	Translucent Vinyl - Arlon Orange 44	To match Resene Trinidad™ O61-167-048	PMS 151 C	–	–	–	–	–	Background colour for infrastructure signage (public transport service message)
	Light Orange	Opaque Vinyl - Arlon Light Orange 97	Translucent Vinyl - Arlon Tangerine 84	–	PMS 1375 C	–	–	–	–	–	TransLink logo colour on primary infrastructure signage
	Dark Grey	Opaque Vinyl - Arlon Dark Grey 52 (prefer paint product used)	–	To match Resene Jon™ N38-007-359	PMS 439 C	Resene Jon™ N38-007-359	PPG - Jon Grey AG529-6851	–	–	–	Background colour for infrastructure signage and signage structures
	Primary facility colours										
	Dark Grey (Bus Stations)	–	–	–	PMS 439 C	Resene Jon™ N38-007-359	PPG - Jon Grey AG529-6851	-	Bluescope Colorbond - Woodland Grey (bus)	–	Structural steelwork; TransLink bus stop shelters
	Dark Grey (Qld Rail Stations)	–	–	–	PMS Cool Gray 11c	Refer to Queensland Rail	–	–	–	–	Structural steelwork; posts; doors; window frames; roller shutters; painted down pipes (stainless steel if new)
	Aluminium	–	–	–	–	Clear Finish - Natural Anodised	PPG Anotec Silver Grey PE 521 / 6753 AN - (TBC)	–	–	–	Louvre profiles and products
	Stainless Steel	–	–	–	–	Natural	–	–	Stainless Steel	–	Downpipes; handrails; balustrades
	Secondary facility colours										
	Light Grey (Qld Rail Stations)	–	–	–	PMS Cool Gray 3c	Refer to Queensland Rail	–	–	–	–	Supporting facilities; building walls; soffits
	Light Grey (Bus Stations)	–	–	–	–	Resene Stack™ N65-003-154	–	–	–	–	Supporting facilities; buildings (driver amenities, public toilets, retail kiosks, etc.)
	Mid - dark Grey (Bus Stations)	–	–	–	–	Resene Cod Grey™ N31-007-245	–	–	–	–	Supporting facilities; buildings (driver amenities, public toilets, retail kiosks, etc.)
	Light - Mid Grey (Bus Stations)	–	–	–	–	Resene Tuna™ N39-008-260	–	–	–	–	Supporting facilities; buildings (driver amenities, public toilets, retail kiosks, etc.)
	Off White (Bus Stations)	–	–	–	–	Resene Rice Cake™ G94-010-092	–	–	–	–	Station structures; buildings; ceiling soffits
	Ancillary colour										
	Black	Opaque Vinyl - Arlon Black 03	–	–	–	Resene Nero™ N25-001-046	–	–	–	–	ITS including electronic PIDs and housings. Median, platform and precinct barrier fencing. Light poles (bus stations only). Supporting facilities doors and window frames.
	Ancillary components and parts										
	Toughened /laminated safety glass	–	–	–	–	–	–	–	–	Viridian VFloat Green	Structural safety glass for roofing and walls
	Platform surface finishes										
	Light Grey (Bus Stations)	–	–	–	–	–	–	Hanson 'Colorado' concrete	–	–	For concrete pavement on main platform and walkways. Honed concrete finish (sealed) with minimum R11 slip resistance
	Dark Grey (Bus Stations)	–	–	–	–	–	–	Hanson 'Racona' concrete	–	–	For concrete pavement under seats and bins. Honed concrete finish (sealed) with minimum R11 slip resistance
	Charcoal (Qld Rail Stations)	–	–	–	–	–	–	Refer to Queensland Rail	–	–	Pavement Colour
	Charcoal (Bus Stations)	–	–	–	–	–	–	Granito - TGSI Hazard / Directional Charcoal	–	–	Tactile Ground Surface Indicators (TGSI) to BCA and DDA requirements (for contrast with light pavement backgrounds)
	Yellow (mustard)	–	–	–	–	–	–	Granito - TGSI Hazard / Directional Canary Yellow	–	–	Tactile Ground Surface Indicators (TGSI) to BCA and DDA requirements (for contrast with dark pavement backgrounds)
	Sheet metal roof cladding										
	Off White	–	–	–	PMS Cool Gray 1c	–	–	–	Bluescope Colorbond - Surfmist	–	Sheet metal roofing and gutters
	Light Grey	–	–	–	PMS Cool Gray 7c	–	–	–	Bluescope Colorbond - Windspray	–	Sheet metal roofing and gutters
	Other special colour selection options (requires formal approval by TransLink)										
	Dark Metallic Grey	–	–	–	–	–	PPG Metallic Façade PE 545 / 668	–	Bluescope Colorbond - Façade	–	Sheet metal roofing; wall colour finish
	Toughened /laminated safety glass	–	–	–	–	–	–	–	–	Clear	Structural safety glass for roofing and walls

** Or equivalent and equally approved
Note: Consult TransLink for colour matching approvals. This colour palette presented is the base standard for TransLink facilities, however other complimentary colour palettes may be introduced (in addition) following consultation and approval from TransLink and it's Stakeholders.
It is intended that the base colour palette be used with the option of complimentary colours, artwork and plantings to create a modern and sophisticated facility environment that can be easily maintained.

Contents

Chapter 5 – Bus stop infrastructure

5.1 Introduction

5.1.1 Overview of the Bus Stop Infrastructure chapter

The Bus Stop Infrastructure chapter is a referenced component of the overarching *Public Transport Infrastructure Manual (PTIM)*. This *Bus Stop Infrastructure chapter* is to be used in conjunction with:

- ***PTIM, Background and application***, which establishes the rules for application of the entire Public Transport Infrastructure Manual
- ***PTIM, Planning and design***, which provides the overarching design guidelines and principles for public transport infrastructure across Queensland
- ***PTIM, Supporting access infrastructure***, which details the supporting access infrastructure required to support public transport stops, stations and related facilities
- ***PTIM, Branding, theming and signage***, which provides branding, theming and signage that should be used for identifying coherent public transport infrastructure throughout Queensland.

For information on further resources to support the planning and design of bus stops, please refer to the *PTIM, Reference materials and supporting information* chapter.

5.1.2 Purpose and objectives

The Bus stop infrastructure chapter will inform infrastructure design by providing a clear and consistent set of principles and guidelines for bus stops across the TransLink network.

It will ensure that a high standard of infrastructure is planned and delivered to meet the needs and objectives of the TransLink passenger transport system and passenger expectation. Ultimately, high-quality and consistent infrastructure will provide customers with a transport system that is coherent, functional and encourages passenger use.

The objectives of this chapter are to:

- ensure best practice infrastructure design is applied across the State
- outline the requirements for bus stop design
- detail requirements for compliance with relevant standards and regulations
- ensure the delivery of high-quality public transport infrastructure
- ensure the delivery of accessible infrastructure.

5.2 Application of the Bus Stop Infrastructure chapter

5.2.1 Intended audience

This chapter is intended for use by professionals in the transport planning and delivery industry. This generally involves, but is not limited to, designers, planners, engineers, architects and other professionals involved in the planning, design and delivery of public transport infrastructure in Queensland.

5.2.2 Application of this chapter

This chapter must be used in conjunction with overarching applications of the *PTIM*.

This chapter should be referred to before starting to plan new or upgrades to existing bus stops.

It details TransLink requirements for the planning and design of bus stop infrastructure across the TransLink network.

TransLink, in partnership with Local Government and in collaboration with relevant stakeholders and delivery partners, shall be consulted on the final design for new infrastructure and upgrade of existing facilities.

5.3 Principles of bus stop planning

5.3.1 What is a bus stop?

For the purposes of this chapter, a bus stop is defined as:

'a collector point for pedestrians along a public transport route that allows for boarding and alighting, that also includes a portion of the roadway for the stopping of a bus. '

A bus stop may include the following components:

- boarding point
- manoeuvring areas
- signs
- information
- tactile ground surface indicators (TGSIs)
- street furniture
- waiting areas
- allocated space
- access paths
- ramps
- surfaces
- handrails and grabrails
- stairs
- symbols
- lighting
- passing areas.

Not all components are included at all bus stops – a basic accessible bus stop may simply comprise a boarding point, signage and information (for example, hardstand including TGSI, J-pole, and timetable).

All bus stops must meet the minimum mandatory technical requirements outlined in the *Disability Standards for Accessible Public Transport 2002*, hereafter referred to as the *Transport Standards*. In addition, stops must also meet *Disability (Access to Premises—Buildings) Standards 2010* hereafter referred to as the *Premises Standards*, particularly where aspects of bus stop works requires building approval.

One aspect not listed but is consistent for all stops, is that a bus will need to park at the stop either on road or indented within a bay.

It is important that the design of infrastructure provided at bus stops is of a high quality and consistent standard so that passengers can access public transport conveniently. Additionally, the location of bus stops within the network is critical for passengers, bus operators, traffic management, fare zone boundaries and overall performance of the bus network.

While this chapter provides guidance on bus stop design standards, it is important to recognise that each bus stop site is unique with individual requirements and constraints to be taken into account.

5.3.2 Bus stop categories

The Department has established a hierarchy of transport facilities to assist with how public transport infrastructure sits within the network. Contact TransLink to assist in determining the hierarchy of facilities particular for bus stops as summarised by the four categories of bus stops according to patronage, location and key component requirements shown in Table 5.1.

Table 5.1:
Bus stop categories

Bus stop category	Description [1]	Generally located
Minimum boarding point	• Suburban, urban or rural sites with low customer demand (low/negligible boarding) • Generally outbound stops • Low frequency services • Can be used where likely patronage numbers are unknown	Constrained suburban sites Outbound stops Non urban areas
Regular stop	• Low density suburban or non-urban sites with low customer demand (low boarding) • Low frequency services	Suburban sites
Intermediate stop	• Suburban sites and near some attractors (e.g. commercial/retail uses) with moderate customer demand (moderate boarding) • Generally along main passenger transport corridors • Moderate frequency services	Main passenger transport corridors
Premium stop	• Sites near major attractors with high customer boarding demand • Corridors with high-frequency services • Used where there are interchange movements	Major attractors Interchanges Main passenger transport corridors

General minimum requirements for each stop type are outlined in the following sections. A detailed summary of the component requirements for each stop is in Table 5.9.

Should service changes occur, the stop type may need to be reviewed, triggering a bus stop upgrade in order to address changes to the bus stop function.

TransLink typical technical drawings for the bus stop types provide guidance detail on the elements of the bus stop layouts, which also address the requirements of the *Transport Standards* and are found in *Appendix 5-B* of this chapter.

[1] *The scale of patronage (low, medium, and high) can be determined on a regional basis with reference to the annual average boardings. Please refer to TransLink for guidance.*

5.3.3 Minimum boarding point

A minimum boarding point refers to a basic accessible bus stop, provided at locations with a low customer demand, or at outbound service stops (due to the majority of alighting occurring).

The minimum boarding point is typically installed in built-up suburban areas, or urban or rural sites of a low boarding customer demand. It should accord with the specifications prescribed under the *Transport Standards*, and include:

- Hardstand - Minimum Boarding point 2070 x 1540mm. TransLink's preferred minimum boarding point for manoeuvring, boarding and alighting sees a more generous hardstand of 2070 x 2070 mm
- Bus stop sign/marker (J-pole)
- Timetable information
- Tactile ground surface indicators (TGSI).

Reference should be made to the minimum level of performance of a basic bus stop given in Bus stop components section of this chapter.

Note that the installation of the minimum boarding point may be considered where new stops are installed as a result of a service change/improvement where likely patronage numbers are unknown, and where the site's context is such that significant levels of boarding are unlikely to occur.

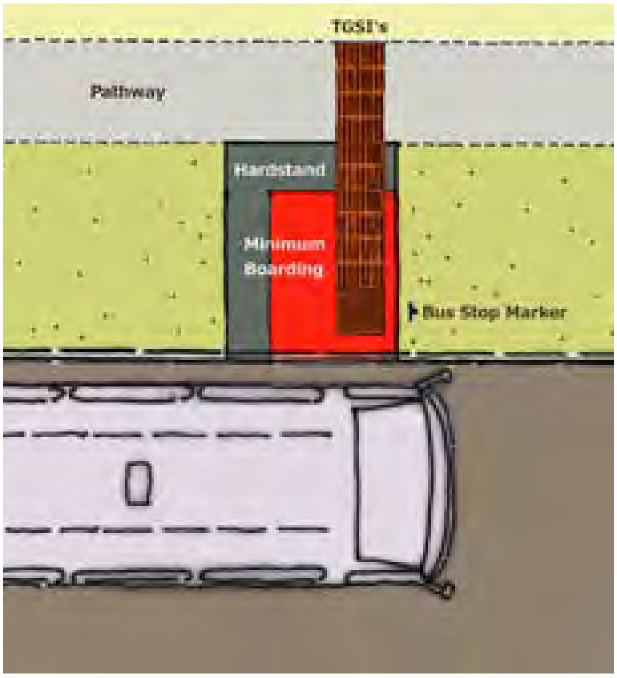


Figure 5.1 –
Minimum boarding point with existing kerb

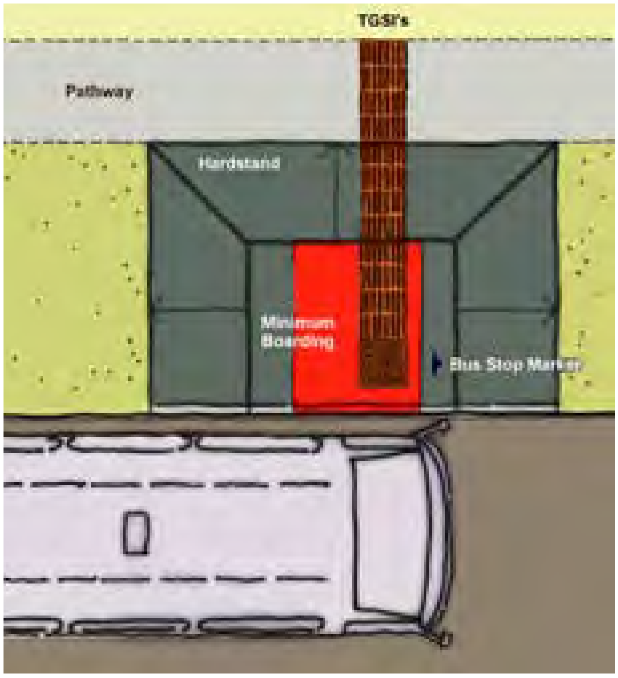


Figure 5.2 –
Minimum boarding point without existing kerb

5.3.4 Regular stop

Regular stops typically service locations with low customer demand.

These stops typically have low-frequency bus services, hence the need to provide an adequate passenger waiting area.

Generally located in low density suburban or non-urban areas, these stops will include a minimum level of supporting components, including:

- Hardstand (including Minimum Boarding Point)
- Bus stop sign/marker (J-pole)
- Timetable information
- Seating
- TGSI

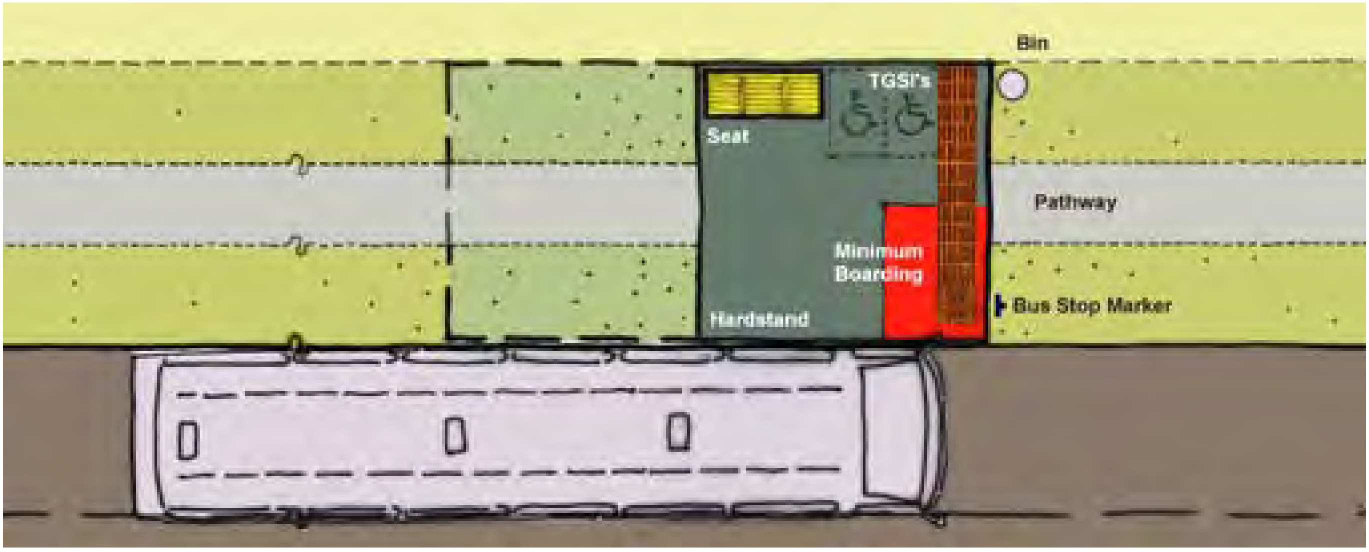


Figure 5.3 – Regular stop

5.3.5 Intermediate stop

These stops may have moderate-frequency bus services and are predominantly located in suburban areas or along main passenger transport corridors.

Intermediate stops typically service locations where there is moderate customer demand.

These stops are also ideally located where adequate supporting access infrastructure is provided/available (for example, footpaths to/from adjacent land uses or to nearby attractors).

A moderate level of supporting components is considered for these stops, including:

- Hardstand (including Minimum Boarding Point)
- Bus stop sign/marker (J-pole)
- Timetable information
- Shelter with seating
- TGSI

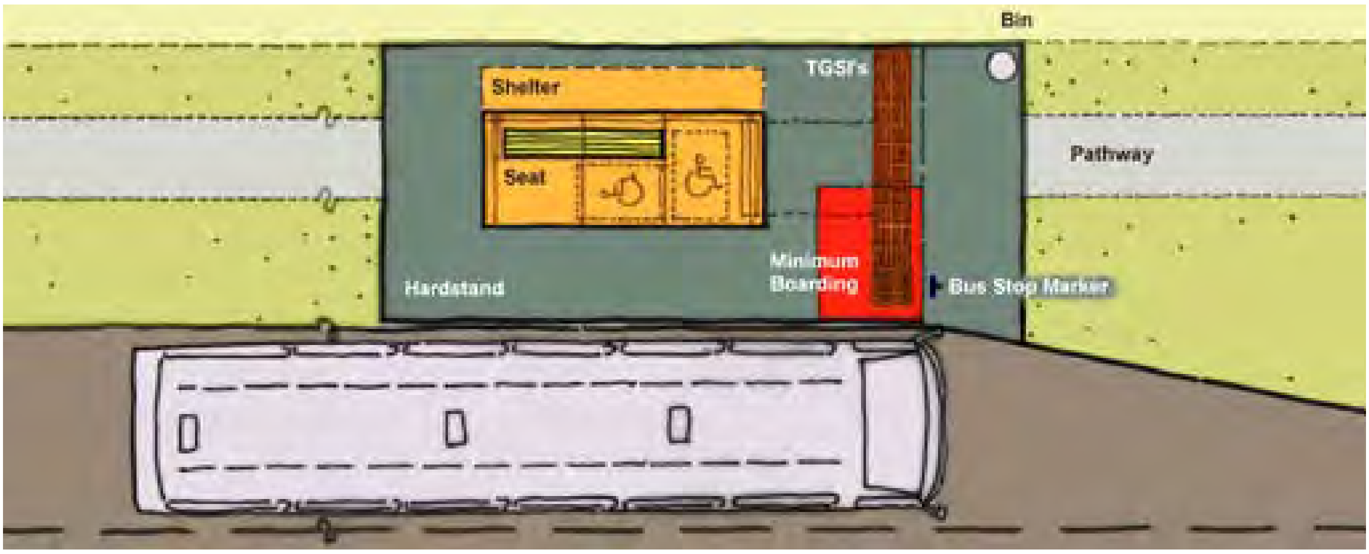


Figure 5.4 –
Intermediate stop

5.3.6 Premium stop

Premium stops are predominantly located at major attractions (such as shopping centres, places of employment, and near community or health facilities) and/or along corridors with high-frequency services. Consideration of appropriate integration with surrounding land uses is recommended where this category of bus stop is proposed. These stops require adequate supporting access infrastructure, specifically footpaths to/from adjacent land uses and to nearby attractors.

These stops can serve locations which have a high level of customer demand (boarding).

This type of stop should also be used where interchanging between services is expected to occur or where it is part of supporting access infrastructure such as park 'n' ride facilities *refer PTIM, Supporting access infrastructure.*

Premium stops can generally be supported by bus priority measures such as bus queue jumps, bus lanes or HOV lanes where these assist in supporting the high frequency service requirements within the corridor.

Premium Stops will contain a high level of supporting components, including:

- Hardstand (including minimum boarding point)
- Bus stop sign / marker (blade)
- Timetable information
- Shelter including seating
- TGSI
- Bin

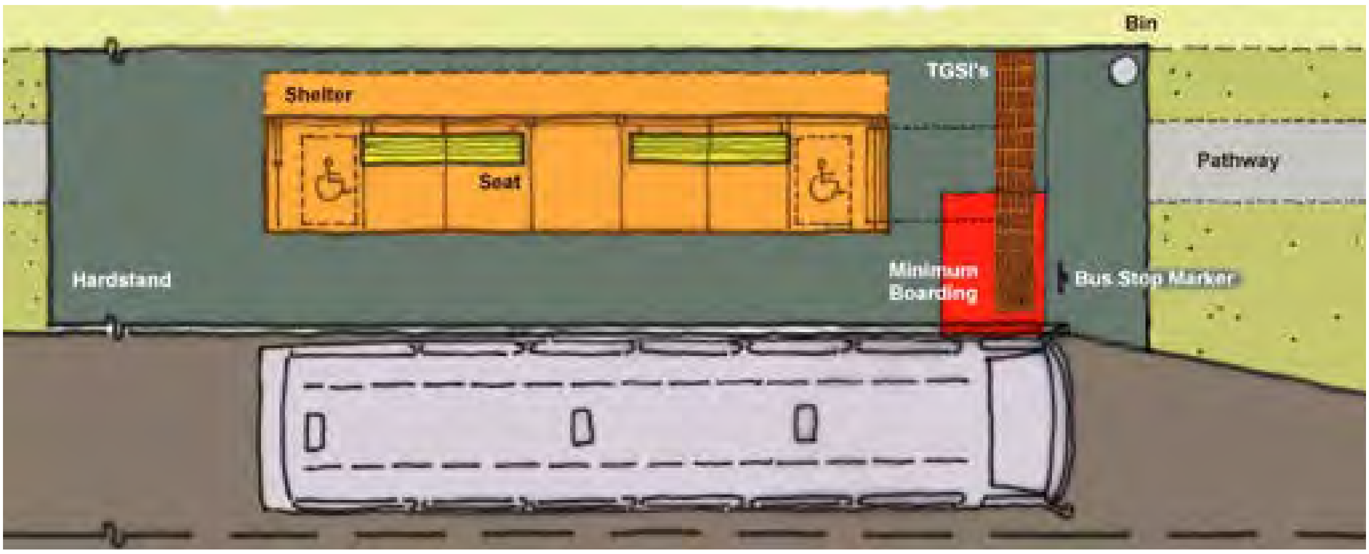


Figure 5.5 –
Premium stop

5.4 Bus stop planning and design process

The bus stop planning and design processes outlined in this section provide step-by step guides for:

- providing new bus stops
- relocation of existing bus stops to address service improvements
- upgrading existing bus stops to comply with the *Transport Standards* (and *Premises Standards* where relevant).

TransLink has developed these processes in consultation with local governments.

5.4.1 New bus stop

Figure 5.6 illustrates the steps for identifying an appropriate bus stop location for a new facility.

This process is likely to be followed in lieu of a service change/improvement or new route, or where the need to provide a bus stop 'pair' has been identified by either local government or TransLink.

5.4.2 Upgrading a bus stop

Figure 5.7 illustrates the steps for upgrading an existing bus stop facility currently in use on the network.

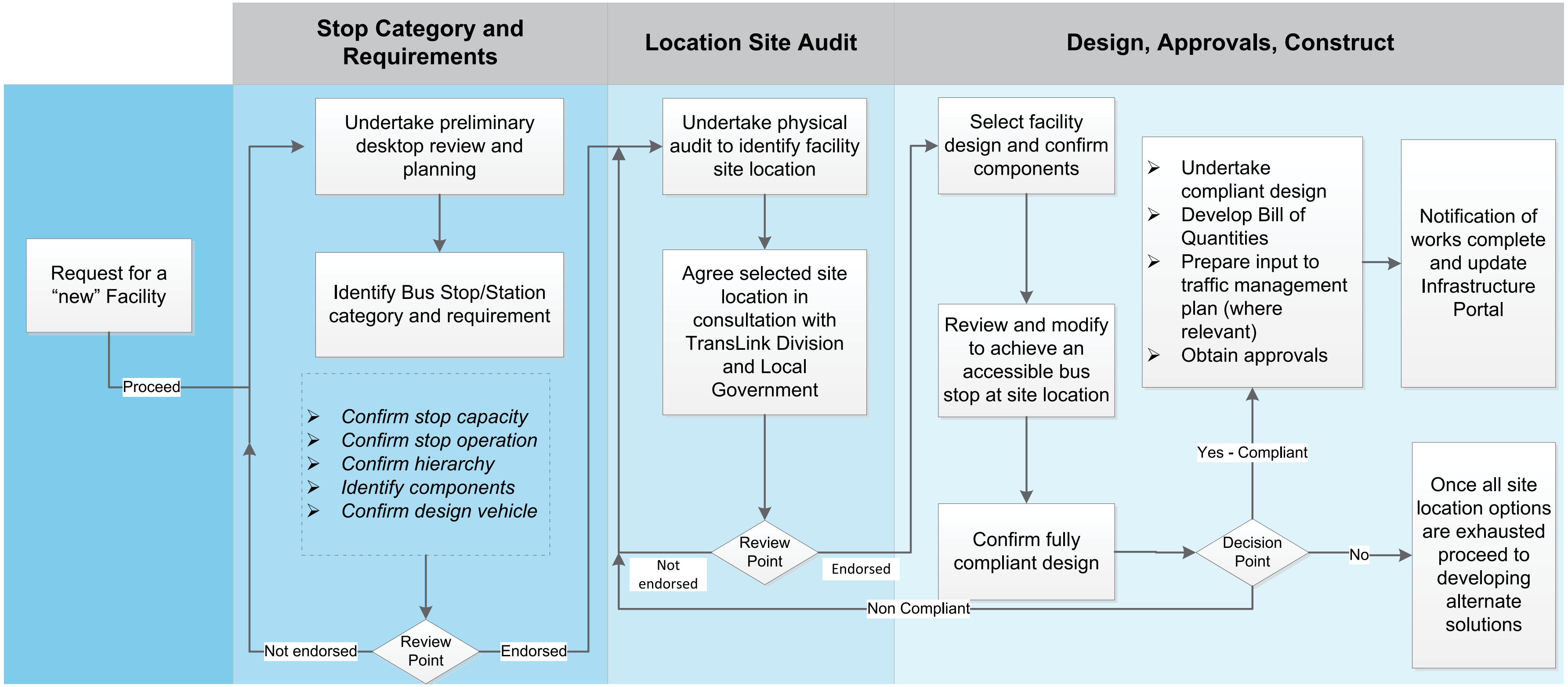
This guide recognises the need for the provider or operator to undertake a physical preliminary site assessment/audit of the bus stop facility to ascertain its current level of compliance in relation to the disability standards. This ensures the provider/operator has an appropriate level of understanding of the specific site characteristics, context and constraints. It also provides sufficient data for determining how to address the accessibility issues of the stop that is, either through equivalent access, temporary exemption, or meeting compliance to the maximum extent possible where a case for unjustifiable hardship is identified.

It is the provider's responsibility to determine the extent of the bus stop zone and passenger waiting area that is to be audited[1] and the appropriate qualification for undertaking compliance assessments and audits.

Contact TransLink for additional guidance on achieving compliance of bus stop infrastructure in the network.

1 *An example of an appropriate extent of the bus stop zone could include an approach distance to the bus stop sign and an exit distance beyond it, as per the minimum outlined in the Queensland Road Rules for stopping prohibitions at a bus stop. A longer zone may need to be assessed subject to the hierarchy of stop being audited, length of waiting area and number of loading bays. TransLink in partnership with Local Government are available to assist with determining with the extent of the bus stop zone.*

Figure 5.6 –
TransLink flow chart 1 – New Facility



Request identified through:

1. Complaints
2. Infrastructure Portal
3. TransLink service upgrades
4. Local Government
5. Other agencies
6. Operators
7. Ministerial

TransLink to advise on the appropriate Infrastructure Hierarchy

Consider:

- Patronage/ridership
- Surrounding land use and locality context
- Service frequency
- Interchange/transfer movements

Review agreed bus stop category (refer to *Table 5.1*) with Local Government and suitability new facility is to be paired with an existing stop.

Investigate and fully document site audit opportunities and constraints.

Determine if a fully compliant stop as prescribed in the *Transport Standards* can be achieved specific to site characteristics.

Review site location, as required and modify to achieve accessibility.

Refer to this *PTIM* chapter for facility formation and relevant components. Application of Appendix 5-B for Technical Drawings and layouts by bus stop category.

Consider:

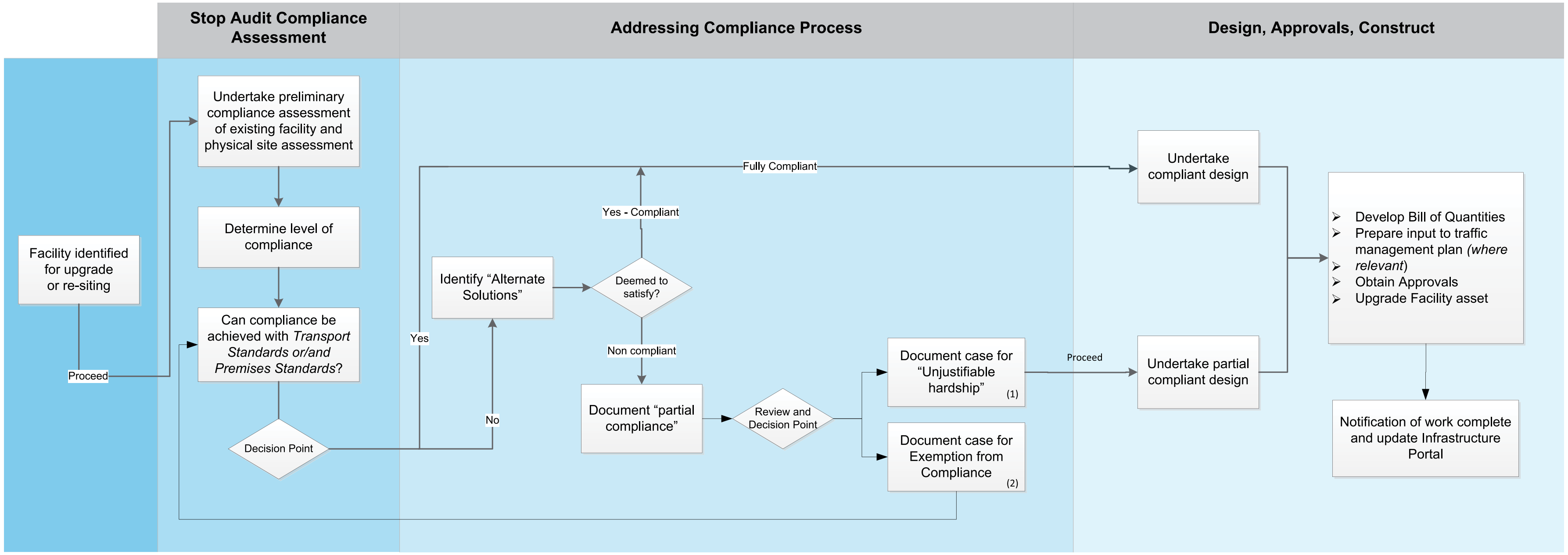
- Bus stop configuration
- Bus bay length
- Bus zone
- Bus components

Application of TransLink *Passenger Transport Guidelines on Achieving Infrastructure Accessibility*' to achieve a compliant stop within parameters of site location.

Decision point: Compliant facility?

- Y-Proceed
- N-Proceed to develop alternate Solutions' for a partial compliant facility as per TransLink flow chart 2 - Upgrades flowchart.

Figure 5.7 –
TransLink flow chart 2 - Upgraded facility



Request identified through:

1. Complaints
2. Infrastructure Portal
3. Action plan program
4. Local Government
5. Other agencies
6. Operators
7. Ministerial

Preliminary compliance assessment undertaken if required. Provider to determine existing level of compliance.

Decision Point:

Assessability to achieve compliance within parameters of existing site conditions.

Refer to the Disability Standards with Regards to investigating '*Alternate Solutions*' options:

(a) Equivalent access including direct assistance Transport Standards s33.3, Premises Standards s3.2.

(b) Exemption from compliance Transport Standards s33A.1, Premises Standards s5.1.

(c) Unjustifiable Hardship Transport Standards s33.7, Premises Standards s4.1.

Application of TransLink '*Passenger Transport Guidelines on Achieving Infrastructure Accessibility*' guidelines and compliance framework.

Document '*Alternate Solutions*' and assess risk and suitability to Proceed. Refer to Local Government processes for decision making with regards to 'partial compliance'.

(1) Complete Addressing compliance of Passenger Transport Infrastructure in Queensland Form (liaise with TransLink Division).

(2) Refer to AHRC for making an application for Temporary Exemption under the DDA 1992 (Cth).

Undertake development of fully or partial compliant design of facility.

Obtain approvals and upgrade asset in accordance with design.


TRANSLink
Townsville City
bus hub

5.5 Bus stop environment

5.5.1 Integration with land use

A bus stop is not interpreted as simply a location for boarding and alighting a bus, but instead as the key connection between the surrounding land use and a public transport service (that is, as a point of interchange between a walk trip and a public transport trip).

The key considerations in the placement of a bus stop include:

- accessibility and equitable access
- proximity to surrounding services and facilities
- frequency or types of the bus service
- routing and future service expectations and network growth.

Reference should also be made to the Queensland Government's development assessment processes and systems.

In addition, other special stops such as hail 'n' ride, long distance coach and temporary facilities make up the network and facilitate access to public transport services across the community.

5.5.2 Accessibility and compliance

TransLink requires that the relevant standards and guidelines for disability access are followed, along with the engagement of relevant disability reference groups, where required.

The legislative requirements of the Commonwealth Disability Discrimination Act 1992 (DDA), sets out the responsibilities of the Department with regards to access to public transport, with the specifics and details given in the Disability Standards:

- *Disability Standards for Accessible Public Transport 2002 (Transport Standards)*
- *Disability (Access to Premises – Buildings) Standards 2010 (Premises Standards).*

5.5.2.1 Application to bus stops

Providers and operators should generally refer to the *Transport Standards* for the planning and design of infrastructure, such as bus stops, where building approval does not apply.

Where a bus stop requires building approval (for example, provision of a bus stop shelter) the *Premises Standards* will apply to the bus stop. This is typically the case for a public transport interchange facility, or a bus stop that is provided as part of a larger building development.

Specifically, the *Premises Standards* applies to bus shelters at bus stops where the shelter is classed as either a:

- class 9b building, that is an assembly building, or
- class 10a building, that is a non-habitable building – a structure used to provide shelter.

The *Transport Standards*[2] and *Premises Standards*[3] specifically reference the *Australian Standards AS1428* 1, 2 and 4. The Australian Human Rights Commission (AHRC) Guidelines state that 'compliance with those referenced *Australian Standards* is compliance with the *Transport Standards*'.

2 *s1.6 of the Transport Standards*

3 *PartA3, sA3.1 Table 1 of the Premises Standards*

5.5.3 Operational considerations for the planning and design of bus stops

There are numerous issues that need to be considered when planning bus stops and their infrastructure.

Table 5.2 provides more detail on the key issues for consideration, and should be used as a checklist for the planning and design process.

Table 5.2:
Considerations for planning and designing bus stop infrastructure.

Factors influencing planning and design	What to consider
Catchment and spacing	• Stop spacing is ideally 400-800m in an urban environment (approx. 5-10 minute walk and average walking speed 5km/h). • Inner city and densely built up areas may warrant a spacing of less than 400 metres. • Express or high-frequency services may use greater than 800m spacing, similar to rail or busway station spacing. • In rural or less densely built-up areas, stop spacing will vary based on the need to maximise service coverage. • Quality and ease of access that is available through the street network (that is, permeability of the surrounding street network). • TransLink in consultation with the relevant stakeholders will determine the most appropriate locations for bus stops taking into account the present and future TransLink network requirements specific to a local government area and customer needs (that is, demographics, ridership types).

Factors influencing planning and design	What to consider
Location	• Ensure safe sightlines for vehicles, bus operators and passengers. Keep stops away from tight horizontal curves or vertical curves (road crests or sags) that create 'blind spots'. It is the responsibility of the provider to check and confirm sight lines are adequate and meet the relevant standards. • Ensure bus drivers and waiting passengers are clearly visible to each other. • Ensure buses can pull up safely on-road and have ease of manoeuvrability. In High Occupancy Vehicle (HOV) lanes, consider including indented bus bays. • Posted speed limit particularly for kerb side/on-road facilities. • Choose sites where there is sufficient pavement area for pedestrians to safely walk past the bus stop area (and shelter, if required). • Provide convenient boarding and alighting for passengers by locating stops: – close to community facilities and services that attract a high proportion of people with a disability – close to significant attractors (for example, shopping centres, commercial premises, places of employment, educational facilities) – close to other stops (and in some cases stations) to minimise walking if transferring between services. • Provide safe access for passengers by locating stops: – Close to dedicated pedestrian road crossings away from facilities with high parking turnover – away from dense foliage and other objects that hinder direct sightlines – in well-lit areas or where access to power for future lighting is possible. • Bus stops should be located in pairs so that boarding and alighting happens in close proximity, with the opposite stop clearly visible. • When locating mid-block, paired bus stops should ideally be staggered in a tail-to-tail arrangement with sufficient space between stops to ensure vehicles can pass and passengers can safely cross behind the buses at the stops. Where new infrastructure has the opportunity to do so, a reasonable attempt must be made to protect for any planned or upgraded infrastructure by local government or other state government agencies. Consideration should also be given to locations where an access path does not exist along the road/street where a bus stop is located. Discussion with local government should be undertaken on the appropriateness for customers to travel along the road carriageway (subject to the street environment and hierarchy) to access the bus stop boarding point. Provision of kerb ramps and safe crossing facilities may need to be identified to ensure the bus stop is accessible.

Factors influencing planning and design	What to consider
Intersections and pedestrian crossings	• It is preferable that a bus stop is located: – near existing pedestrian crossing facilities (for example, dropped kerbs, refuge islands, signals) – downstream of a pedestrian crossing facility – where there is minimal conflict with parking areas and other potential traffic hindrances – to provide sufficient sight distance so buses can safely re-enter/merge with the traffic lane. • Bus stops near intersections should: – generally be located on the far side of an intersecting street (to assist bus movements, reduce delays, and provide clearer sightlines of intersecting vehicles) – be located on approach to an intersection in situations where the stop will service through services and services turning at the intersection or where known future development may require a service change and in order to minimise re-siting of infrastructure – not be sited opposite to an intersection street (that is, at a T-intersection). • Locating a bus stop close to an intersection requires consideration on a case-by-case basis, particularly where a 'bus zone' is to be established. Frequency of services and dwell-time are of particular importance to ensure the stop's location causes the least interference with intersection operations. • Refer Table 5.3 Queensland Road Rules stopping prohibition.

Factors influencing planning and design	What to consider
Access	• Ideally, bus stop planning and design should be done in conjunction with planning for appropriate access infrastructure (that is, walking, cycling, and so on). See *PTIM, Supporting access infrastructure*. • When upgrading or re-siting existing stops, or providing new bus stop infrastructure, consideration should be given to: • **Pedestrian infrastructure** – interface of the stop with the wider pedestrian network (that is, consideration of desire-lines) – provision of appropriate pedestrian crossing facilities – kerb ramps – connection, quality and configuration – accessible path width, grade, continuity and alternative paths – need and placement of pedestrian infrastructure such as rest points, railings, street furniture – pedestrian walkway and waiting shade cover for sun and weather protection. • **Cycle Infrastructure** – interface of the stop with the wider cycle network (that is, consideration of cycle desire-lines) – need for dedicated or shared crossings – kerb ramps – appropriate connection, shared or dedicated provision, quality, storage space, width and configuration (wider kerb ramps are preferred when pedestrians and cyclists share crossings) – path/lane width, grade, continuity and alternatives – provision and/or placement of end-of-trip amenity components (for example, storage, water, other amenities) – connection to existing or planned shared or neighbouring Cycle amenities. Refer also to the TMR's *Road Planning and Design Manual, Technical Note 128: Selection and Design of Cycle Tracks* for guidance on the provision of cycle paths at bus stops.

Factors influencing planning and design	What to consider
Capacity	• Vehicle capacity is related to both the capacity of the individual loading areas and their design. • Consider both known and potential future numbers of bus services that are likely to serve the stop at any one time. • Bus dwell time and clearance time at the bus stop influences the stop loading area capacity and therefore the likely number of loading areas required. (Dwell time is proportional to the boarding and alighting time of customers, and is influenced by the type of fare payment.) • Nearby traffic signals can influence the number of buses into or out of a stop, and bus arrival profiles (that is, random or platoon). • When calculating the bus stop vehicle capacity of a bus stop, consult TransLink for appropriate assumptions. Where there are timetables for the operating strategy (existing or forecast), a 'clock-face' type approach to understanding how the frequency of services influence the amount of space required at a stop is suggested as the ideal methodology to assess capacity. Also consider referring to the Transit Capacity and Quality of Service Manual (3rd Edition) (TCQSM) for guidance.

Table 5.3:
Queensland Road Rules stopping prohibition

Minimum distances	Non-signalised intersection[4]	Signalised intersecton[4]	Non-signalised pedestrian crossing[5] (except at an intersection)	Signalised pedestrian crossing[6] (except at an intersection)	Children's crossing[7]
Far side	10m	20m	10m	3m	10m
Approach	10m	20m	20m	10m	20m

Refer to *Transport Operations (Road Use Management – Road Rules) Regulation 2009* for current details.

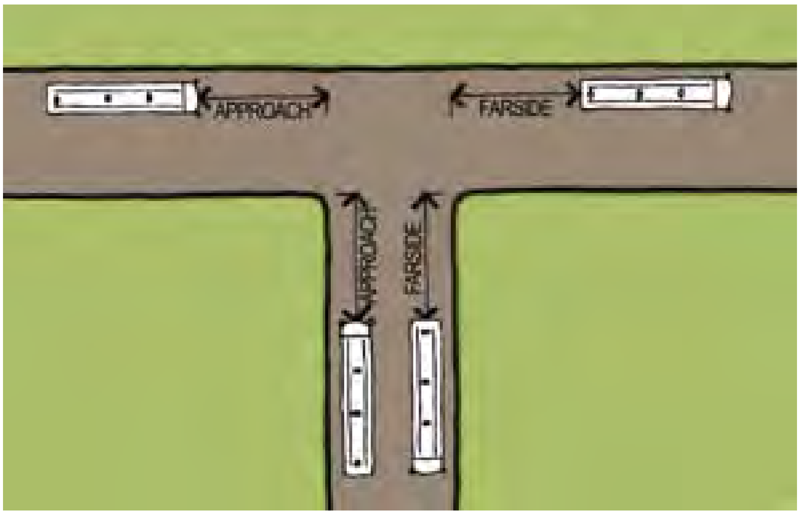


Figure 5.8 –
Signalised intersection

Figure 5.9 –
Non-signalised pedestrian crossing

4 *Queensland Road Rules Section 170 refers to both signalised and unsignalised intersection*

5 *Queensland Road Rules Section 172 refers to an un-signalised crossing such as a zebra crossing*

6 *Queensland Road Rules Section 173 and Section 174 refers to a midblock signalised intersection for pedestrians or bicycles respectively*

7 *Queensland Road Rules Section 171 refers to children crossing stopping prohibition distances. Refer to MUTCD Part 10, Figure 3 for a typical layout of a Children's crossing in Queensland.*

5.6 Bus stop formation

The bus stops' layout and technical drawings are designed to meet the requirements of all buses operating in the TransLink bus network and are to comply with all standards applicable to bus stop planning and design, in particular the *Transport Standards*.

5.6.1 Bus stop configuration

The appropriate configuration of bus stops is subject to site-specific requirements, operational constraints and local government requirements as the provider of the bus stop. In determining the location and appropriate bay configuration, the provider should consider:

- traffic speed
- traffic volume
- curvature of the road and sightlines
- adjoining land uses.

TransLink in partnership with Local government shall be consulted to assist in determining the most appropriate configuration.

Table 5.4 details the typical bus stop arrangements and TransLink's preference for their provision in the network.

Table 5.4:
Bus stop arrangements

Bus bay configuration	Description
Indented bus bay	• Will require sufficient pavement area for buses to stop safely and efficiently out of main traffic stream. • Will accommodate minimum of one bus for regular and intermediate stop types and two buses for premium stop type (subject to identified stop capacity requirements). • Requires buses to stop out of traffic stream. Acceptable gaps must be available in through-traffic stream to enable bus to re-enter. • May be appropriate at high-loading stops, or if the stop is used as a timing point or bus drive change-over point. • Length of bay tapers (for accelerating and braking) dependent on traffic speed (typically 60km/hr). Minimum 1:7 on approach, and minimum 1:5 on departure. Longer tapers may be required for higher traffic speed environments. • Bus bay width to be minimum 3m. • Typically considered for intermediate or premium stop types.
Kerbside bus bay	• Most common configuration. • Allows bus to conveniently pull up to stop (preferably out of main traffic stream). • Will accommodate minimum of one bus for regular and intermediate stop types and two buses for premium stop type (subject to identified stop capacity requirements). • Can be readily increased to address changing capacity of type of bus utilising stop. • Kerbside bay typically preferred for a regular bus stop type, and intermediate stop type.
Open bus bay	• Variant on the indented bus bay but is located at an intersection. • Allows buses to drive straight into or out of the stop. • Will accommodate minimum of one bus for regular and intermediate stop types and two buses for premium stop type. • Requires implementing a ‘turn left only, buses excepted’ lane at intersection. • This arrangement is site specific for all bus stop types. Liaison with the appropriate local road authority is recommended.

Bus bay configuration	Description
Kerb outstand[8]	• An alternative arrangement that may help provide sufficient width for boarding /alighting or to address adjacent parking abutting the bus stop. • Sees a built-out kerb line either the full or part length of bus accommodating both front and rear bus doors • Keeps bus in traffic stream. • Design to consider drainage, impact to cyclists. • Subject to local government requirements and standards.

[8] *Also known as a 'bus stop boarder', 'kerb outstand' or 'in-line bus stop'. For further details refer to: VicRoads' Bus stop guidelines 2006; Transport for London's Accessible Bus Stop design guidance 2006; or Auckland Regional Transport Authority's Bus Stop Infrastructure Design Guidelines 2009.*

The following should also be considered alongside the bus stop configuration for the site:

- If kerbside parking lanes are provided, there are few advantages to indented bays except in the case where public transport priority or HOV lane conditions are implemented
- Where on-road cycle lanes are required, refer to the current *Department of Transport and Main Roads' Road Planning and Design Manual*, *Technical Note 128: Selection and Design of Cycle Tracks* and/or the relevant local authority for guidance.

5.6.1.1 Kerb at stop

The *Transport Standards* Part 8.1(2) states that where a kerb is installed at a bus stop it must be at least 150mm higher than the road surface. This enables an operator to design its on-board ramps accordingly to ensure that the slope of the boarding ramp (that is, the interface between the bus stop infrastructure and the bus) does not exceed the maximum inclines noted in *Transport Standards* Part 6.4.

A kerb at a bus stop should therefore:

- allow for safe, efficient passenger set down and pick up
- meet the minimum *Transport Standards* height of 150mm
- be a barrier kerb (avoid semi-mountable kerb types).

5.6.2 Bus stop operation

The operation type influences the length of the bus stop zone/bay and the requirements of the bus zone and bus area. Bus stop operation types are described in Table 5.5.

Unless nose to tail operations have been specifically identified (that is, lead stop), independent stop configuration operations should be adopted for bus stop design purposes.

TransLink should be consulted on the preferred operation prior to commencing bus stop design.

Table 5.5:
Bus stop operation type

Bus Bay Operation	Description
Single bus	• Accommodate at least a single bus manoeuvring. • Typical for low or moderate frequency bus services.
Nose to tail/ platooning at lead stop	• Single boarding point for customers where buses platoon behind each other. • Typical for corridors with high-frequency services. • Minimum additional length per bus needs to be added for this type of manoeuvring to occur. • Dependent entry operation such that bus can exit behind another bus however can not pull in front or around a parked bus.
Independent stop	• Designed to address one or a pre-designated set of services. • Requires additional minimum length per bus to allow for efficient and safe independent manoeuvring.

5.6.3 Design vehicles for bus stops

The current fleet in service in the TransLink network varies by operator across the state. Subtle differences in fleet dimensions are likely and need to be considered during the design of accessible bus stops.

For design purposes, a standard rigid bus is typically 12.5 metres in length. Other buses in use include 14.5 metre long rigid buses and 18 metre articulated bus, and 12.5 metre double-decker buses. An approximate width allowance is 3 metres and height 3.5 metres (4.5 metres for double-decker).

Bus door locations must be kept free from all roadside infrastructure. Signposts, trees, tree-grates, planter boxes/landscaping, electrical poles/posts, and other street furniture must be at least 600mm from the kerb, along the length of the bus stop area.

Table 5.6 illustrates the estimated door position (metres from the front of the bus) for the different bus types. This can be used to determine the required length of hardstand, and position of other bus stop components to ensure accessible boarding and alighting of passengers.

Table 5.6:
Estimated bus door position

Typical bus and length	Estimated door position (metres)																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Rigid bus (12.5m)	■	■					■	■										
Rigid bus (14.5m)	■	■				■	■	■										
Articulated three door bus (18m)	■	■			■	■	■					■	■	■				
Rigid bus double-decker (12.5m)	■	■					■	■										

Source: Estimate based upon typical bus fleet dimensions provided by Brisbane City Council.

5.6.3.1 *Bus stop length requirements*

Both the design bus type and type of stop operation will influence the required bus stop length. For on-road bus stops, the length should be able to accommodate a standard or long rigid bus, or an articulated bus, and address adjacent parking abutting the bus stop so that a bus can pull up parallel to the kerb with a maximum distance of 200mm from the rear door to the kerb (ideally).

For indented stops, TransLink prefers a 1:7 approach taper and 1:5 departure taper. Other taper configurations can be considered on a site-specific basis, and should meet applicable standards or local government requirements. It should be noted that a reduction in approach or departure taper would increase the minimum required length of the indented bus stop.

Table 5.7 outlines bus bay length requirements for on-road (non-indented) and indented bus stops for a single bus allowance.

The following formula can be used to calculate an initial bus bay length when considering a multiple bus operation. Calculated lengths should be confirmed through undertaking a vehicular swept path assessment to take into consideration other site characteristics (for example, narrower adjacent lane widths).

Length of bus bay = L + (BL + a) x (n - 1)

Where:

- '*L*' is the bus bay length for a single bus
- '*BL*' is the length of bus
- '*a*' is the additional length for other bus stop operations
- '*n*' is the number of buses

Table 5.7:
Minimum bus stop length requirements

Typical bus type and length	On-road stop [9] (single bus allowance)	Indented stop [10] (single bus allowance)	Additional length for space between buses (multiple bus operation)
Rigid bus (12.5m)	Bus bay length : 25m (L) Departure length: 10m **Total: 35m**	Taper in: 21m (1:7) Bus bay length: 15m (L) Taper out: 15m (1:5) **Total: 51m**	Nose-to-tail: 5m (a) Independent: 12m (a)
Rigid bus (14.5m)	Bus bay length : 27m (L) Departure length: 10m **Total: 37m**	Taper in: 21m (1:7) Bus bay length: 17m (L) Taper out: 15m (1:5) **Total: 53m**	Nose-to-tail: 5m (a) Independent: 12m (a)
Articulated bus (18m)	Bus bay length: 30m (L) Departure length: 10m **Total: 40m**	Taper in: 21m (1:7) Bus bay length: 20m (L) Taper out: 15m (1:5) **Total: 56m**	Nose-to-tail: 5m (a) Independent: 12m (a)
Rigid bus double-decker (12.5m)	Bus bay length: 25m (L) Departure length: 10m **Total: 35m**	Taper in: 21m (1:7) Bus bay length: 15m (L) Taper out: 15m (1:5) **Total: 51m**	Nose-to-tail: 5m (a) Independent: 12m (a)

As noted in Table 5.7, additional length is required to accommodate multiple buses at the bus stop, either in nose-to-tail or independent operation.

Example:

Two 12.5m rigid buses using an independent on road stop configuration. Stop area for a 12.5m bus is 25m and additional length for independent operations is 12m. Therefore:

Length of bus bay =
25 + (12.5 + 12) x (2 – 1) = 49.5 metres.

[9] *Queensland Road Rules (QRR) Section 183 and 195 set a minimum approach length of 20 metres and departure length of 10 metres, for on-road stops. However, TransLink's preferred length is 25 metres minimum for a 12.5m bus.*

[10] *Refer to current Austroads and RPDM Guide to Road Design Part 3: Geometric Design, and TMR's Road Planning Design Manual: A Guide to Queensland Practice Chapter 20 for guidance for the requirements for partially or fully indented bus bays*

5.7 Bus stop components

This section details the components that need to be considered at bus stops within the TransLink network.

All building and construction components of stop design (for example, shelters) are to comply with relevant building codes and Australian Standard requirements.

TransLink should be consulted on infrastructure component inclusions for each bus stop.

Figure 5.10 illustrates the range of components to be considered in the planning and design of bus stops.

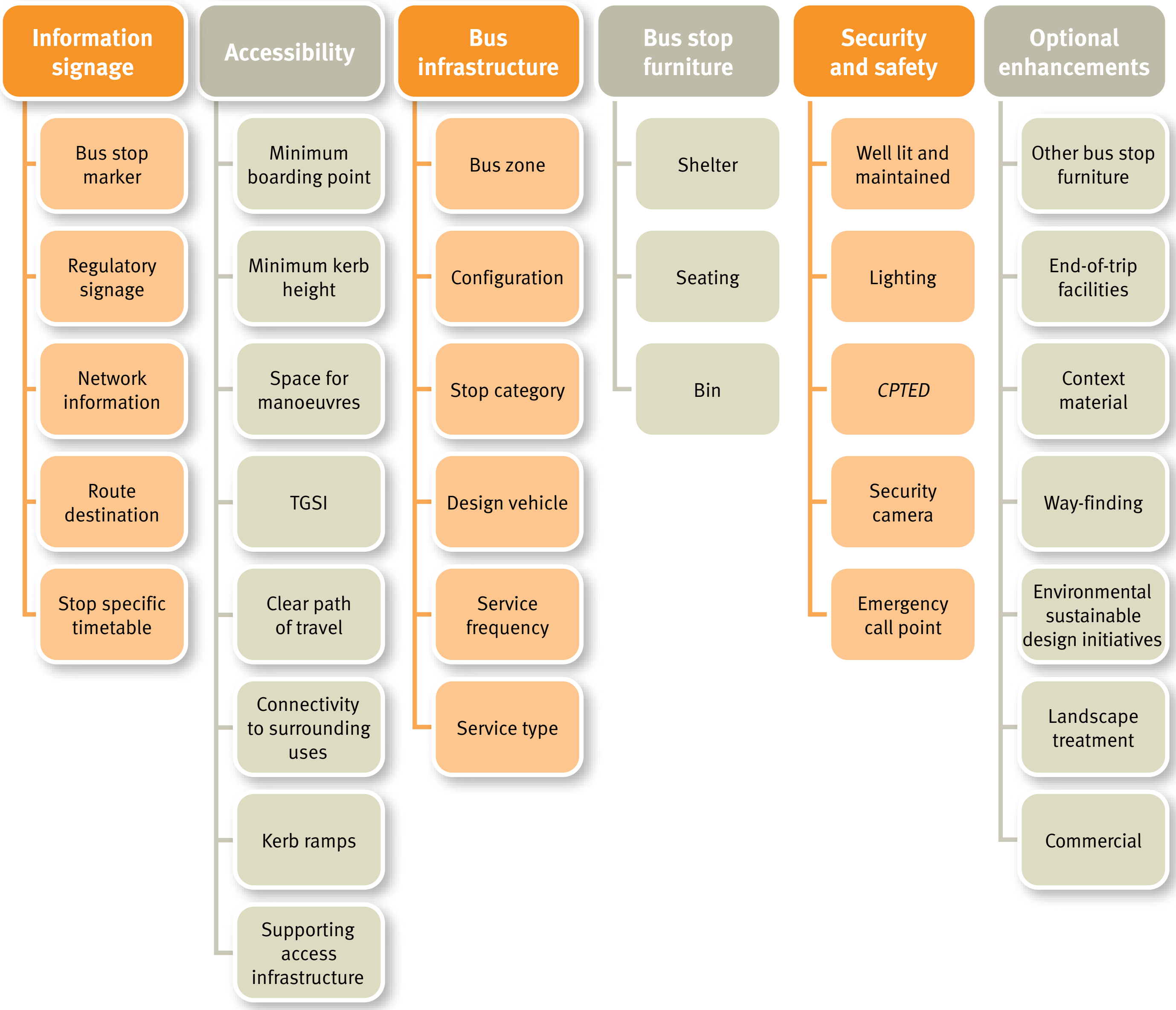


Figure 5.10 –
Key bus stop components

Required components will vary according to different bus stop types. These are detailed in Table 5.8 where:

- **M** is mandatory (component must be included, legislatively required)
- **P** is preferred (component will be included unless directed by the provider of the bus stop in response to site constraints)
- **S** is site-specific response (component may be required or desirable subject to specific stop function and/or site requirements)
- **O** is optional (component may be optional or applicable to specific regions across the state)
- **-** is not applicable (component does not apply to the stop type)

Table 5.8:
TransLink required components

Category	Stop Component	Min B. Point	Regular stop	Intermediate stop	Premium stop
Information					
Stop marker	J-Pole	M	M	M	-
	Blade	-	-	-	M
Regulatory sign and line-marking	Bus zone signs	S	S	P	M
	Marked bus zone	S	S	P	M
Network information	Network and locality map	-	-	S	M
Stop-specific information	Stop-specific timetable	P	P	M	M
	Routes serving the stop	P	P	M	M
	Route destination/diagram	P	P	M	M
	Real time passenger information	-	S	S	P
Accessibility					
Access	Minimum boarding point, including TGSIs	M	M	M	M
	Hardstand area	M	M	M	M
	Minimum kerb height 150mm	M	M	M	M
	Barrier type kerb	P	P	P	P
	Accessible clear path of travel	M	M	M	M
Local connectivity	Connecting footpath to/from bus stop (with dropped kerbs where required)	P	P	P	M
	Kerb ramp	S	S	S	S
	Pedestrian crossing /refuge	S	S	P	P

Category	Stop Component	Min B. Point	Regular stop	Intermediate stop	Premium stop
Supporting access facilities	Cycle parking/storage	-	S	S	S
	Kiss 'n' ride	-	-	S	S
	Park 'n' ride	-	-	S	S
Bus stop furniture					
	Shelter *(See Note 1)*	-	-	M	M
	Seating	-	S	M	M
	Rubbish bin	-	S	P	M
Security and safety					
	Well-lit or nearby street lighting	P	P	P	M
	Lighting in shelter	-	-	P	P
	CPTED principles	M	M	M	M
	Security cameras	-	-	-	S
	Emergency call points	-	-	-	S
Optional enhancements					
Other bus stop furniture	Drinking fountain	-	-	S	S
	Fare machine (AVVM) (and/or future provision for)	-	-	-	O
	Shopping trolley bay(s) / storage	-	-	S	S
Context material	Public art	-	-	S	S
	Historical material	-	-	S	S
Other way-finding information	Braille tactile signage	-	-	S	S
	Way-finding signage	-	-	S	S
	Public address system and hearing augmentation	-	-	-	S
Commercial	Vending Machine (third party)	-	-	-	O
	Advertising panel	-	-	-	S

Category	Stop Component	Min B. Point	Regular stop	Intermediate stop	Premium stop
Environmental sustainable design initiatives	• Sensors on light fittings, low energy LED fittings	-	-	S	S
	• Solar panels/photovoltaic cells on shelter roof and/or bus stop marker	-	-	S	S
Landscape treatment	• Approach side (location)	S	S	S	S
	• Departure side (location)	S	S	S	S
	• Feature landscaping	-	O	O	O

Note 1 – Refer to Table 5.11, for typical bus stop type and shelter selection.

5.7.1 Component selection

Table 5.9 provides an overview of TransLink requirements in choosing bus stop components. All stop components must comply with relevant *Disability* and *Australian Standards*.

A detailed list of the standards and other references applicable to the components listed in Table 5.9 can be found in the *PTIM, Information references and resources*.

Table 5.9:
TransLink requirements for bus stop components

Element	Consideration
Stop signage/ stop marker	• The bus stop identification marker can be a J-pole or blade sign. • The stop marker: – directs passengers to where they should wait to board the bus – guides the bus driver to the optimal stop position for passengers to board and alight safely. • The bus stop marker provides the control point to set out the layout of the rest of the bus stop (for example, customer waiting area). Its position should: – line up with the front of the bus when the vehicle is at the stop and ready for boarding and alighting – preferably not be directly adjacent to the front door of a property (to maintain privacy for local residents) – preferably not cause the bus to block a property's driveway when stopped for boarding and alighting – avoid placing the bus stop zone over stormwater drains and pits – be close to street lighting. • Stop marker must comply with TransLink's signage guidelines (refer to the *PTIM, Branding, theming and signage*). It should provide highly-visible and clear information about services including (where applicable): – timetables clearly showing site-specific departure times with destination names or frequency of service(s) – route number(s) of services using the stop or station – network map identifying all services using the stop or station – stop name and number – contact details for public transport network information – fare zone number where public transport is located – unique stop identifier for bus stop location purposes. • Where appropriate to the bus stop type and site context, the stop signage should provide directional information regarding public transport and supporting components, including: – an information point explaining travel options (for example, where services go and the type of services available—where appropriate, this can include alternative transport such as taxis) – a locality map to help orientate the user – visible way-finding signage to direct customers to other public transport services and other points of interest (for example, ticketing, toilets, other end-of-trip facilities) – way-finding signage for the surrounding local area (that is, adjacent streets and places of interest) – the direction of travel for services using the stop or station.

Element	Consideration
Bus zones	• The bus stop zone will be: – formalised with barrier kerb and channelling (where possible) – kept clear of kerb ramps and kerb openings – kept clear of electricity poles and electricity pits – kept clear of tree foliage (minimum height of 4.5 metres) – kept clear of all infrastructure and plantings for at least 600 millimetres from the kerb – located where there is good drainage to prevent pooling of water or other low lying ground problems – located to avoid stormwater drains and pits, and drains where this could become an obstacle for passengers boarding the bus – located away from driveways to avoid buses restricting private property accesses • A bus zone is the length of road to which a bus zone sign applies. • Use bus zone signs where more than one bus may be required to use the bus stop, or where other competing road requirements exist (such as on-street parking). • A bus stop zone should not be less than 30 metres, and typically be located within 20 metres approaching the bus stop marker, and 10 metres on the far side of the stop marker[11]. However, TransLink's preferred approach length is 25 metres for a 12.5m bus. • The approach length should reflect the design bus utilising the stop and the proposed type of operation. • Refer to bus stop length requirements in this chapter in Table 5.7.

11 *Bus Zones: refer to Queensland Road Rules section183 and 195*

12 *Waiting: Where the mandatory longitudinal gradient of 1:40 is not able to be met, reference should be made to Figure 5.6 and 5.7 of this chapter for guidance on how to proceed.*

Element	Consideration
Accessibility including passenger waiting area	• Consists of the whole pavement space used by the bus stop and, importantly, the space available for waiting and boarding/alighting a bus service. • The bus stop passenger waiting area must comply with the *Transport Standards*. It should: – provide accessible and safe access to the bus stop boarding point and buses servicing the stop – allow for easy manoeuvring of wheelchairs and prams – where access paths/walkways adjoin the bus stop boarding point, provide a compliant access ramp not exceeding maximum gradient and length – be maintained with at least 1.2 metres (preferably 1.5 metres) of clear access, around and between all infrastructure and obstructions – be maintained with bus stop boarding points that are flat and stable with a maximum gradient of 1:40 across both longitudinal and cross-fall direction – address the longitudinal gradient of the adjacent road/street to ensure safe boarding and alighting at the bus stop[12]. – where possible, be kept free from clutter produced from other street furniture—especially in the spaces used for waiting, access and/or boarding and alighting – allow passengers to easily access and view timetables and public transport information without being obstructed by other objects (for example, bin) – allow for sufficient pedestrian through-flow and not clash with waiting passengers – be located to minimise exposure to direct sunlight and other environmental conditions (that is, wind and weather) for waiting passengers – be free from drainage pits, to prevent buses from splashing pooled water when approaching the stop – be able to allow for efficient runoff and drainage to prevent water from pooling on the bus stop boarding and alighting areas and waiting areas (where applicable). • TGSIs are mandatory for the minimum boarding point. TGSIs should: – guide customers with vision impairment to the boarding point and warn of hazards – be perpendicular to the kerb and across the full width of the access path to the shore line – have a minimum 30% contrast between the TGSI and surrounding ground surface. – be kept clear of furniture and hazards (minimum 300mm clearance). • When not located near a pedestrian-accessible intersection, a pedestrian refuge (or similar) should be located nearby for safe and convenient access. • Kerb ramps are to be provided as required, facilitating access to a crossing or boarding point. • Minimum kerb height of 150mm is to be provided to meet the slope requirements when a bus ramp is deployed (that is, gradient of less than 1 in 8, enabling wheelchair users to board without assistance or 1:4 where assisted) • Where no kerb is provided along a verge/street, a barrier type kerb (upright kerb) should be provided at the minimum boarding point.

<table>
<tr><th>Element</th><th>Consideration</th></tr>
<tr><td>Bus stop furniture</td><td>
All street furniture should:

comply with the Transport Standards and, where applicable, the Premises Standards
be located clear of the bus stop boarding area and access path
be set back from the length of the corresponding bus zone (i.e. a minimum of 600mm from kerb face)
ensure minimum 30% luminance contrast against background (for example, flooring) where it abuts a continuous accessible path of travel

Shelters

Shelters are typically required for intermediate and premium stops.
TransLink and most local government providers have standing offer arrangements for the supply and installation of shelters at bus stops across the network. A suite of shelters is available with detailed drawings of each shelter type and guidance on shelter selection are provided in this chapter's 'Technical details' section and Appendix 5-A & B.
Shelters do not typically need to be provided at stops that are at the end-point/outbound routes.
Shelters should:

not protrude/encroach on the minimum boarding point or manoeuvring and circulation area
not obstruct an accessible path of travel/footpath
define the bus stop and provide protection from environmental conditions
maintain clear sightlines to the bus stop for passive surveillance (CPTED)
maintain clear sightlines to allow customers to easily hail approaching buses
incorporate seating and allocated spaces for wheelchair users
incorporate overhead lighting to maximum personal security.

Seating

Seating should be placed at least 500mm clear of the accessible path of travel, and preferably located at the rear of the stop.
It is preferable to orient seating so that passengers face towards the street when seated.
Seating should:

not intrude or encroach on the minimum boarding point or manoeuvring and circulation area
be easily maintained, durable and vandal resistant
be able to be bolted to hardstand (concrete) areas
include backrests and armrests as per the Transport Standards.

</td></tr>
</table>

<table>
<tr><th>Element</th><th>Consideration</th></tr>
<tr><td>Bus stop furniture</td><td>Bins
The location of bins should be clear of the minimum boarding point (a minimum 1.2m clear of other bus stop infrastructure).
If placed at the kerb, a minimum clearance of 600mm is required from the face of the kerb to the bin surface/face.
Bins should:
not obstruct boarding, alighting or an accessible path/footpath (500mm clear of access paths)
ensure minimum 30% luminance contrast against surrounding ground surface where it abuts a continuous accessible path of travel
be easily maintained, durable and vandal resistant
feature a bird-proof design
be mounted on a concrete hardstand.
TGSI should not lead to a bin.</td></tr>
<tr><td>Lighting</td><td>Utilise street lighting where possible – street lights should be a minimum 2.5m on the departure side of the bus marker to ensure buses avoid collision when exiting the stop.
Ensure vegetation does not obstruct lighting.
Incorporate additional CPTED principles.
Where lighting is required at a bus stop shelter, requirements will be dependent on the site-specific location of infrastructure.
Lighting at bus shelters must comply with the applicable requirements of lighting subcategory P6 within AS/NZ 1158.3.1 – Lighting for roads and public spaces.
Consider known or future users of the bus stop, particularly for elderly, vision impaired and its location adjacent to key attractors.</td></tr>
<tr><td>Other bus stop furniture and enhancements</td><td>Optional enhancements should:
comply with the Transport Standards and Australian Standards
be located clear of the bus stop boarding area and access path
ensure minimum 30% luminance contrast against background (for example, flooring) where it abuts a continuous accessible path of travel.
Ticket/fare machine (or future provision)
Ensure physical housing is recessed from accessible path of travel/footpath.
Drinking fountain
Ideally located adjacent to shelters.
Must be accessible for all users.</td></tr>
</table>

Element	Consideration
Other bus stop furniture and enhancements	**Shopping trolley bay(s)** • Considered the provision of bays when stops are located near shopping centre entries or exits. • Consultation with the shopping centre operator/owner is required to determine need and trolley collection management. • Locate bays so that their use does not conflict with pedestrian movements. • Consider *CPTED* principles. • Provide adequate capacity.
Supporting access infrastructure	**Cycle parking/storage** • Provide adequate capacity to meet known or anticipated future demand. • Refer to the *PTIM, Supporting access infrastructure*, for planning and design guidance for cycle facilities, including end-of-trip facilities at bus stops. **Kiss 'n' ride and Park 'n' ride** • Refer to the *PTIM, Supporting access infrastructure*, for additional guidance for these facilities at bus stops.
Environmentally sustainable design initiatives	**Solar panel** • If used, attached to shelter for powering lighting, including any associated hardware. • Should be located to maximise solar exposure and minimise visual impact. **Recycled materials** • Where possible, incorporate a recycling bin at bus stop. • Placement as per requirements of standard bins. • Arrange maintenance schedules /contracts.
Public art/context material	• Should be located within the bus stop extent (within hardstand area). • Must not obstruct access and movement of passengers. • Must not obstruct sightlines. • Should be developed in coordination with the relevant local authority. • Incorporate into furniture, if consistent with current TransLink and/or local authority standards, subject to approval.
Way-finding information	• Way-finding information should be included where appropriate to bus stop type, surrounding land uses, and context. • Braille tactile signage should be considered, where possible, as part of signage at a bus stop (must comply with the *Transport Standards*.) • Consider inclusion of a public address system and hearing augmentation, subject to bus stop requirements and customer needs.

Element	Consideration
Commercial	**Commercial vending machine** • Liaise with TransLink on the requirements, and appropriate placement at the bus stop. • Maximum of one commercial vending machine. • Locate adjacent to shelter, but clear of the minimum boarding point and any allocated spaces at the bus stop. **Advertising Panels** • Advertising panels can be considered, subject to road owner and/or local government approval, to offset the maintenance of the stop. Advertising panels should be coordinated and integrated into the shelter, where possible. • The amenity must be addressed as a first priority.
Landscape treatment	• Landscape treatment specifically encompasses vegetation (trees, shrubs, and ground covers), footpaths and street furnishings. • Vegetation must not: – obstruct sightlines between approaching bus and waiting passengers, shelters or seats – enter into the kinetic envelope of bus vehicle and bus stop area – obstruct passive surveillance at stop (*CPTED*) • Should be in accordance with local government requirements • Shrub and groundcover planting must be maintained at less than 500mm in physical height. • Tree trunks must be clear of vegetation for a minimum of 4.5m from underside of the tree canopy. • Trees are to be set back a minimum 600mm from face of kerb, and clear of the waiting area on both the approach and departure sides of the bus stop (particularly where seating/shelter is provided). • Where a shelter structure is not required, trees can be provided at bus stops for shade, in accordance with local authority standards.

5.8 Other bus stop types

5.8.1 Signature bus stop

Signature stops are distinct from TransLink's bus stop categories and components. These stops are typified by their distinguishable infrastructure design (such as shelters and platforms), and include a high level of supporting components.

Signature stops are typically located on specifically identified on corridors with high-frequency services and are generally supported by public transport priority measures (such as dedicated public transport corridors).

These stops are intended to service the network where there is a high customer demand and high-frequency services. They may be located, and provide key connections, between significant attractors (such as commercial and business districts).

As a minimum, signature bus stops should address the components and layout requirements for a premium bus stop.

TransLink should be approached with regards to the provision of this type and scale of bus stop infrastructure.

5.8.2 'Hail and ride' services

Parts of the TransLink network, including Sunshine Coast, Gold Coast, and Regional Queensland, operate on a 'hail and ride' basis. Typically no specific bus stop boarding point is provided, allowing a patron to signal the driver to stop the bus to board the service.

Experience in Australia and overseas has indicated that a 'hail and ride' service can benefit areas where there is sporadic customer demand along a route, and also assist with reducing the walking distance for accessing a service. 'Hail and ride' for a service, or sections of a route, is therefore considered appropriate where:

- services are lightly used (low patronage)
- patronage is scattered across the route/service
- local conditions are such that the installation of a fixed bus stop is considered difficult or sensitive (for example, environmental factors, or narrow pavements).

Under the *Transport Standards* section 8.4:

1. If a 'hail and ride' service is offered, passengers must be able to hail the service at nominated accessible boarding points where boarding devices can be deployed.
2. The boarding points must offer equal access to public transport services.

TransLink acknowledges the need to provide accessible infrastructure for patrons of such a service and recommends the following:

- The provision of accessible point needs to consider identified community need, adjacent land uses, and reasonable passenger catchment and permeability.
- An accessible point should provide sufficient width for passengers to load and unload and for boarding devices to be deployed.
- Identified accessible points must comply with the Transport Standards Part 33.
- Suitable information (for example, timetable, route map identifying accessible points) should be provided at identified locations along the route to reassure passengers of the 'hail and ride' service.
- A bus stop J-pole is not required.
- Placement of accessible points should be cognisant of the general requirements for locating a bus stop as discussed earlier in this chapter (that is, proximity and relationship to intersections, potential traffic hindrances, unobstructed waiting areas, good visibility and so on)
- The provider of the bus stop will need to ensure the identified accessible points have been considered with respect to determining compliance alongside the Equivalent Access or Unjustifiable Hardship routes.

5.8.3 Temporary bus stops

A bus stop is considered 'temporary' if that bus stop is designed and constructed with the intention that it will be removed, or otherwise not used, at a point in time after installation and commissioning.

Temporary bus stops may be required for:

- upgrading of an existing bus stop
- construction or disruption to the use of the footpath
- an event (for example, sporting event and concerts)
- rail replacement services
- bus service diversion.

The *Transport Standards* draw no distinction between permanent and temporary bus stops. Moreover, the *Transport Standards* do not make any explicit allowance for a bus stop to be exempt from accessibility compliance merely on the basis that the bus stop is temporary. *Appendix 5-A* provides a number of scenarios to assist with understanding the application of the *Transport Standards*.

Where temporary stops are proposed, TransLink would encourage consultation with relevant stakeholders to determine level of patronage, location and duration the temporary facility will be required.

5.8.4 School bus stops

There is no specific requirement for dedicated school bus stops to be fully compliant with the *Transport Standards*. Dedicated school bus services are exempt from having to provide wheelchair access[13] and it would follow that the bus stops that solely serve a dedicated school bus service also would be exempt. However, should urban bus services use the same bus stop, full compliance would be required.

Where new school stops are being developed, it is TransLink's preference that they comply with the disability access standards.

TransLink should be consulted regarding the requirements for the provision of services for existing or new schools, and particularly where bus stop provision proposes to serve both school and urban services. *Appendix 5-A* provides a number of scenarios to assist with understanding the application of the *Transport Standards* in relation to school bus stops.

Further information on design requirements for school bus stops can be found in:

- *TMR Road Planning and Design Manual: A Guide to Queensland Practice*
- *TMR Planning for Safe Transport Infrastructure at Schools – Technical Guidance for the provision of effective and safe transport infrastructure at schools (April 2011).*

[13] *The Transport Standards Parts 3, 6, 8, 9-12, 14, and s1.13 for definition*

5.8.5 Long-distance coach

A long-distance coach stop must comply with the *Transport Standards* and should use the same planning and design principles detailed in this chapter. More significant long-distance coach stops, for example a terminus or high patronage interchange, should refer to TransLink's *PTIM, Bus station infrastructure chapter.*

Table 5.10 details the key criteria to consider in planning and designing long-distance coach stops.

Table 5.10:
Long-distance coach planning and design criteria.

Criteria	Factors for consideration
Locality guidance	Placement of the stop should consider: • the external road network (determines the direction of vehicle flow within the interchange) • trip destinations (for example, shops, workplaces, educational institutions, hospitals and health clinics), which indicate likely pedestrian movement/desire lines • proximity and access to other passenger transport modes
Planning environment	A long-distance coach stop should be well organised and deliver: • passenger transport stops integrated into a surrounding activity centre (where applicable) • waiting areas that are clearly visible from the surrounding road network and adjacent buildings, and which provide clear views of passenger transport vehicle arrivals and departures • direct routes including high visibility, activity and surveillance along those routes • active frontages along pedestrian paths to the stop • appropriate kiss 'n' ride and park 'n' ride facilities • passenger transport information about the range of services provided • directional signage that is informative and not confusing • lighting that is well integrated with signage and passenger information and which maximises safety, especially at night.

Criteria	Factors for consideration
Operational environment	Location of the stop should consider the broader context of service planning and the coach companies' operational environment. For example: • the location of the stop in relation to subsidised long distance coach routes • co-location with other passenger transport modes, particularly urban buses, to facilitate passenger transfer and distribution • future coach service growth • assisting the bus industry to reduce the inefficiencies of dead-running • facilitating adherence to driving-hour requirements (fatigue management).

In general the stops should align with the component requirements of premium stops, including bus boarding areas and infrastructure. However, special consideration should be given to additional space/pavement requirements on the platform to allow for coach wheel chair lift deployment and access/storage of luggage.

Long-distance coach signage, including blade stop marker signs, should be compliant with the long distance coach signage criteria and colour scheme. Contact TransLink for relevant signage information and details.

5.8.5.1 Coach layover facilities

Determining the adequate number and design of coach layover spaces should consider:

- the number of coach operators and routes using the stop or interchange
- the larger size of coaches (12.5m and 14.5m length coaches)
- the ability of coaches to move independently of each other
- easy manoeuvring of vehicles into coach loading bays
- providing authorised access only
- operational timetables of coach routes which indicate driver rest breaks and recovery times.

Facilities for staff should take into consideration the following principles:

- separate male and female toilet and/or shower facilities accessible by a key, proximity card or combination lock (accessible from a separate door to the meal area)
- kitchen area with sufficient bench space, sink /wash-up area, heated and chilled water dispenser and at least four power outlets along the bench area
- provision for the installation of a refrigerator
- air conditioning
- safe pedestrian paths of travel to and from buses for drivers using the driver facility building
- provision for transport security requirements including security camera connectivity, on-site recording and potential connection to off-site operations centres
- internal duress alarm
- appropriate lighting outside and around the facility
- after hours security alarm
- lighting design cognisant of impact on commercial or residential properties.

5.9 Technical details

Appendix 5-B provides a series of technical drawings to assist bus stop planners and designers to meet the requirements detailed in this chapter. This section identifies the key drawings and supplies additional technical notes to assist with the planning and design process.

As previously noted, each bus stop facility will warrant site-specific treatment, depending on the individual site characteristics and constraints. The fundamental layout and design principles illustrated in the technical drawings should be adopted at all locations.

TransLink advises that specialist access personnel, as well as appropriate user groups, review the designs and layouts to achieve the most suitable outcome for each location. Where this is not possible, seek advice from TransLink.

5.9.1 Bus stop layouts

Minimum boarding point:

Technical drawings 5-0011 to 5-0012 address the general requirements of this type of stop.

There may be cases where there is no existing kerb at the identified site for a bus stop. In this instance, drawing 5-0012 provides guidance on the requirements for providing a raised minimum boarding point (that is, suitable ramps for customers to access the stop from existing/available access paths).

Note that level area of the minimum boarding point is arranged to include the bus stop sign. A bus stop sign installed on a ramp would result in its height and height of information not conforming with the *Transport Standards*.

Regular stops:

Technical drawings 5-0013 to 5-0015 address the general requirements of this type of stop. Note this drawing illustrates additional hardstand to the upstream of the bus stop sign. This is to allow access to information (for example timetable) where it is provided on both sides of the bus stop marker.

Drawing 5-0015 demonstrates variations to the layout and design of a regular bus stop to address various verge widths and constrained site situations.

Intermediate and premium stops:

Technical drawings 5-0021 to 5-0032 illustrate additional hardstand to the upstream of the bus stop sign. This is to allow access to information (for example, timetable) where it is provided on both sides of the bus stop marker.

Where such information is provided only on one side of the bus stop sign, then this additional width of hardstand does not need to be provided for.

TransLink will advise on the requirements for timetables (i.e. on one or both sides) for new and upgraded bus stops such that appropriate access can be provided.

Drawing 5-0025 illustrates variations to the layout and design of an intermediate bus stop to address various verge widths and constrained site situations.

Allocated space at bus stops:

The *Transport Standards* provides guidance on the provision of appropriate allocated space at a bus stop. Where a 'waiting area' exists at a bus stop, a provider is to provide the maximum achievable area for allocated spaces under the particular circumstances.

The *Transport Standards* s1.11 defines an allocated space as a three dimensional space that can accommodate a wheelchair or similar mobility aid.

Section 7.2 of the *Transport Standards* requires allocated space for a minimum of two wheelchairs to be available for passengers – a minimum 800mm x 1300mm[5] per space .

TransLink's technical drawings outline appropriate positions and locations for allocated spaces at a bus stop. These clearly demonstrate that the allocated space:

- must not encroach on the minimum boarding point
- be positioned such that customers using wheelchairs or mobility aids are able to enter/exit a bus and readily position themselves and their aids in the allocated space.

Note that the wheelchair icon marking shown on the drawings is not a requirement. It is shown on the drawings to ensure allowance for the space is made in the design of the stop.

5 *Transport Standards s7.2, s9.1, AS1428.2-1992 Clause 6.2. AHRC Guidelines s5.10, s5.11 and s4.14.*

6 *Transport Standards s3.2*


bus
queensland
Grand Central
Stop A
SUSHI

5.9.2 Bus stop signage and shelters

Bus stop identification markers:

All bus stop signage within the TransLink network must adhere to the requirements set out in the *PTIM, Branding, theming and signage*, and comply with the relevant standards.

TransLink will supply the required bus stop marker for stops that form part of its network. Figure 5.11 contains examples of TransLink bus stop markers.

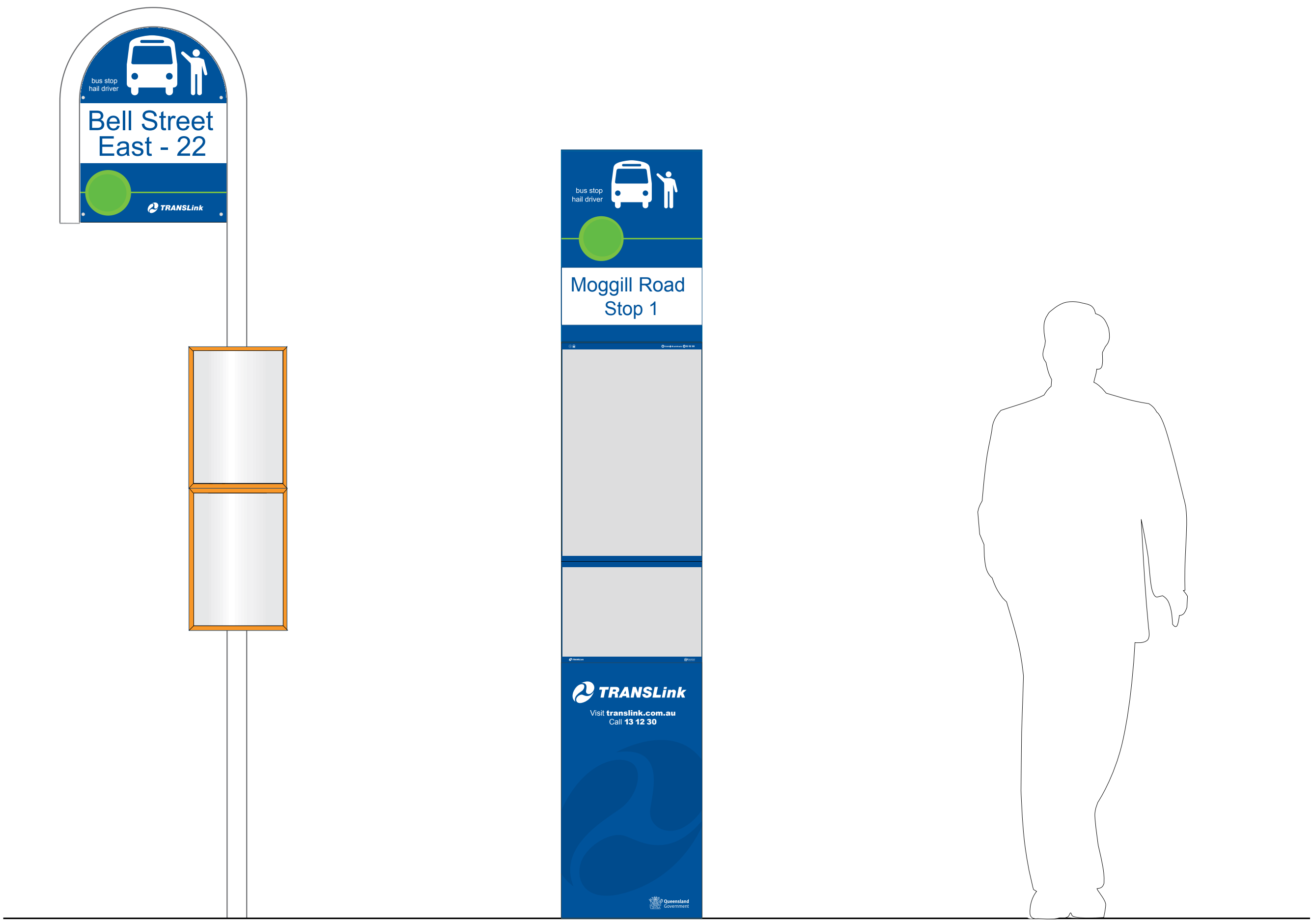


Figure 5.11 –
Bus stop identification markers

Bus stop shelters:

Drawing 5-0100 outlines the suite of shelters available and currently in use across the TransLink network. The selection of the appropriate shelter type and drawing references are indicated in Table 5.11 according to bus stop type.

Table 5.11:
Typical bus stop type and shelter selection.

TransLink bus stop type	TransLink shelter suite	Description of shelter	Drawing reference
Intermediate	Type 1A	Single module	5-0101
	Type 2A	Single module with rear lean rail	5-0201
	Type 3A	Single module with rear seat	5-0301
	Suburban	Single module with advertising panel	5-0401
		Single module without advertising panel	5-0402
Premium	Type 1B	Double module	5-0102
	Type 2B	Double module with rear lean rail	5-0202
	Type 3B	Double module with rear seat	5-0302

5.9.3 Cyclist Facilities

The movement of bike riders in and around bus stops must be considered during the design of any bus stop infrastructure. The first priority in relation to bicycle movements, when considering bus stop layout, is to avoid cross-over conflict points between buses and bicycles. To achieve this, the preferred bus stop layout transitions any on-road cycle facility to a cycle track/shared path on the approach to the bus stop. The cycle facility then runs behind the bus stop area. Drawing DRG 5-0041 illustrates the preferred layout for both non-indented and indented stops where the cycle facility which approaches the bus stop consists of a cycle track or on-road cycle lane. Drawing DRG 5-0043 illustrates the preferred layout for both non-indented and indented stops where the cycle facility which approaches the bus stop consists of a shared path.

As it is often quite difficult to provide preferred widths in brownfield sites, these drawings indicate the priority order of infrastructure element reductions which could be considered.

If the preferred layouts shown in the drawings mentioned above cannot be achieved, the layouts shown in Drawing DRG 5-0042 and DRG 5-0044 can be considered. These layouts position the cycle facility behind the boarding point hardstand. An alternative location for the shelter should be considered to optimise the available space while considering distance and ease of access to the boarding point.

Appendix 5-A

Example scenarios for the application of the Transport Standards

Temporary bus stops

Scenario 1: Temporary bus stops during major upgrading of permanent bus stop

Example:

A permanent public bus stop is being demolished and rebuilt.

A temporary bus stop in lieu of the permanent one is provided elsewhere for the duration of the construction works.

Response:

Given that the temporary bus stop will function as an ordinary, regular bus stop for the duration of its life, it would require full compliance with the *Transport Standards*. This includes a j-pole, level hardstand boarding point, tactile ground surface indicators etc. Publicly available, up-to-date information on the location of the bus stop would also be required.

Scenario 2: Temporary bus stops at a large event

Example:

A temporary bus stop is provided to serve large volumes of buses for a large, one-off sporting event. The bus stop will be removed after the conclusion of the event.

Response:

Particular attention needs to be given to providing an accessible boarding point, accessible waiting area and accessible paths of travel at such a bus stop. Given the high likelihood of long wait times, and possibly also long travelling distances between venues, it would be strongly recommended that the bus stop include seating and shelter for waiting passengers. This is the case even if removal of the bus stops is intended after the event in question. The service level identified for the event would influence these requirements.

The provision of both ample travel information in accessible formats and suitably trained staff/volunteers on-site would typically be essential to manage the volume of users (i.e. estimated event demand), and achieve compliance with the *Transport Standards*.

Scenario 3: Temporary bus stops during railway track-work over weekend

Example:

A railway line is shut down over the weekend for track work maintenance. The replacement buses only stop at the rail stations in lieu of regular rail services, and do not run along the regular bus routes. A temporary bus stop is provided at each rail station specifically for track-work service purposes only.

Response:

The *Transport Standards* apply, even though the track-work bus stops will only exist for the duration of the weekend work.

This particular scenario could potentially be quite disorienting or confusing for many users, particularly for a user with a vision-impairment. Such a user would need to, firstly, be cognisant that the trains are not operating and buses are being provided instead and, secondly, ascertain the location of the temporary bus stop that serves those buses. This could be made more difficult by the fact that, often, there will already be a permanent bus stop at the rail station that serves regular bus routes/services, but not the replacement buses.

In this scenario, particular attention would need to be given to providing:

- an accessible board point and accessible waiting area at each track-work bus stop
- seating and shelter for waiting
- suitably trained staff at the rail station and the temporary bus stop
- ample information in accessible formats.

Scenario 4: A permanent bus stop that is only used occasionally

Example:

There is a permanent bus stop located at a local sports stadium. The bus stop is within the grounds that surround the stadium, and is set back from the main road. The buses travelling to and from the stadium will stop at the bus stop when an event is held at the stadium. However, the stadium typically only hosts one public event a week. At all other times, the bus stop is not used by any regular public bus services.

Response:

The *Transport Standards* s1.23 captures this scenario. The fact that the bus stop is used only on an irregular basis does not exempt it from the application of the *Transport Standards*.

However, a key factor in this particular scenario is that the bus stop is not located on a public footpath but, rather, is within the grounds of the local sports stadium. This means that people (that is, potential customers) are unlikely to simply approach the bus stop and expect a bus to arrive.

Compliance via 'Equivalent Access' may require co-operation between the bus service provider and the operators of the stadium during the times when an event is held at the stadium. Otherwise, the specified design requirements of the *Transport Standards* will remain applicable at this bus stop.

Scenario 5: Shuttle service for a retirement village

Example:

A private mini-bus serves residents in a retirement village, taking them to and from local facilities (for example, shops and clubs). This bus service operates regularly. The mini-bus has the capability of stopping directly outside a particular village resident's house if necessary.

The retirement village operators own the shuttle bus vehicle.

Response:

If this shuttle service is solely for the use of retirement village residents, and a member of the public is not permitted to use the shuttle, the *Transport Standards* would not be applicable.

School bus stops

Scenario 6: School bus stops adjacent to school grounds

Example:

There is a bus stop on the footpath adjacent to a secondary school that only serves school students. The stopping pattern is such that buses set-down only in the morning and pick-up only in the afternoon. There is a written sign at the bus stop stating that it is for school use.

There are no other facilities at this bus stop.

Response:

A bus stop that is solely for the use of school students queries whether this is a public bus stop for the purposes of the *Transport Standards* s1.23.

The *Transport Standards* specifically exempts dedicated school buses from the provision of wheelchair access. It would seem to follow from this that a bus stop that solely serves a dedicated school bus service would also be exempt from wheelchair access compliance.

Full design compliance with the *Transport Standards* at a bus stop that solely serves school buses could possibly be misleading for a non-student user, particularly someone with a vision impairment. Full design compliance would typically entail provision of TGSIs on the footpath. A non-student user, that relies on TGSIs, would assume that the TGSIs lead to a bus stop that has regular services, yet no regular services would stop at this stop.

Please note however previous comments with regards to facilitating an accessible bus stop facility to address individual school needs.

Scenario 7: School bus run picking up/setting down school students near their homes

Example:

A bus picks up school students at specific locations near their individual homes. The pickup point is not signed. Locations may vary from year to year depending on the particular school catchment, enrolments and operator.

Response:

This scenario has similar issues as bus stops outside schools serving only school students. Query once again whether this is a public service, or whether it is more akin to a shuttle bus service.

Appendix 5-B

Layout and technical drawings

NOTES:

HARDSTAND

1 THE MANDATORY (COMPLIANT TO DSAPT) MINIMUM BOARDING POINT HARDSTAND AREA IS 1540MM X 2070MM, POSITIONED AS SHOWN ON THE TRANSLINK DRAWINGS. A LARGER HARDSTAND AREA IS PREFERRED AND IS DEPENDENT ON SITE SPECIFIC CONDITIONS.

2 THE MANDATORY LONGITUDINAL AND CROSS FALL GRADIENT AT BOARDING POINT IS MAXIMUM 1:40 FALL ACROSS THE BOARDING POINT AREA (SHOWN HATCHED). ALL OTHER HARDSTAND AND ADJACENT AREAS TO THE BUS STOP SHALL MEET APPLICABLE STANDARDS IN RELATION TO THE ADJACENT SITE CONDITIONS, AND TO PREFERABLY ACHIEVE A LONGITUDINAL AND CROSS FALL GRADIENT OF MAXIMUM 1:40 FALL.

3 HARDSTANDS SHALL BE MINIMUM 125MM THICK BROOM FINISHED (FOR SLIP RESISTANCE) GRADE N25 CONCRETE SL72 MESH PLACED CENTRALLY, OR, AS REQUIRED BY THE RELEVANT STATUTORY AUTHORITY. FOR SLAB THICKENING AT FURNITURE LOCATIONS, AND JOINT LAYOUT AND SPECIFICATIONS REFER TO LOCAL GOVERNMENT SPECIFIC REQUIREMENTS.

4 A CLEAR HARDSTAND ACCESS SPACE OF 1200MM MINIMUM IS REQUIRED BETWEEN AND AROUND ALL BUS STOP INFRASTRUCTURE (1500MM DESIRABLE).

ACCESS

5 WHERE BUS STOPS ARE LOCATED ALONG BICYCLE ROUTES, SHARED ACCESS PATHS SHOULD BE APPLIED AS PER LOCAL GOVERNMENT REQUIREMENTS OR WITH REFERENCE TO RELEVANT GUIDELINE DIMENSIONS GIVEN IN THE APPLICABLE STANDARDS, TMR GUIDELINES, AND AUSTROADS.

6 CIRCULATION OF WHEELCHAIRS SHOULD BE CONSIDERED AT EACH BUS STOP BASED ON SITE SPECIFIC CONDITIONS AND TO ADDRESS COMPLIANCE WITH DSAPT. LINE-MARKING OF THE 2No. ALLOCATED SPACES (PWD WAITING ZONES) IS NOT REQUIRED.

7 TACTILE GROUND SURFACE INDICATORS (TGSI) SHOULD PREFERABLY BE INSTALLED AS SHOWN ON THE TRANSLINK DRAWINGS. WHERE THERE IS A PATHWAY ACCESSING A BUS STOP, DIRECTIONAL TGSI SHALL BE INSTALLED FOR THE FULL WIDTH OF THE PATH OF TRAVEL OVER A MINIMUM 600MM DEPTH AND PERPENDICULAR TO THE DIRECTION OF TRAVEL WHEN APPROACHING. DIRECTIONAL TGSI SHALL BE USED ACROSS THE OPEN SPACE FROM THE ACCESS PATHWAY DIRECTIONAL TGSI TO THE BOARDING POINT WARNING TGSI. TGSI TO EXTEND TO THE SHORELINE - I.E. BUILDING LINE, WALL, A FENCE, A KERB, OR A GRASS VERGE WHERE APPLICABLE.

8 THE COLOUR OF TGSI SHALL BE SELECTED BASED ON SITE SPECIFIC REQUIREMENTS. INTEGRATED TGSI SHALL HAVE A MINIMUM COLOUR CONTRAST OF 30% COMPARED TO THE AMOUNT OF LIGHT REFLECTED FROM THE SURFACE OF THE ADJACENT PATH OF TRAVEL. FOR EXAMPLE; FOR A LIGHT CONCRETE COLOURED PATH OF TRAVEL, DARK COLOURED (E.G. BLACK) TGSI MAY BE APPROPRIATE. FOR A BLACK BITUMEN PATH OF TRAVEL LIGHT COLOURED (E.G. WHITE OR YELLOW) TGSI MAY BE APPROPRIATE. THIS CONTRAST MUST BE MAINTAINED IN BOTH WET AND DRY CONDITIONS.

SHELTER

9 FOR OPTIONS OF SHELTER TYPES FOR INTERMEDIATE AND PREMIUM STOPS REFER TO TRANSLINK DRAWINGS. WHERE A SHELTER ABUTS A CONTINUOUS ACCESSIBLE PATH OF TRAVEL, ENSURE MINIMUM 30% LUMINANCE CONTRAST AGAINST BACKGROUND (E.G. FLOORING).

FURNITURE & SIGNAGE

10 FOR DETAILS OF BUS STOP SIGNAGE (J-POLE/BLADE) AND FOOTING DETAILS REFER TO TRANSLINK SIGNAGE MANUAL.

11 SETOUT OF BLADE SIGN (REFER TO THE PREMIUM STOP TRANSLINK DRAWING) IS POSITIONED AS SHOWN DUE TO BUS STOP OPERATIONS, AND ROAD SAFETY REQUIREMENTS AND IS NON-COMPLIANT WITH DSAPT. PLEASE LIAISE WITH TRANSLINK FOR DETAILS ON THIS REQUIREMENT.

12 BUS STOP SEAT SHOULD INCLUDE ANODISED ALUMINIUM BATTENS WITH ARMRESTS ALONG THE SEAT. SEATS SHOULD BE BOLTED TO HARDSTAND AREA, AND MADE FROM EASILY MAINTAINED MATERIALS. SEATS TO BE COMPLIANT WITH DSAPT. WHERE A SEAT ABUTS A CONTINUOUS ACCESSIBLE PATH OF TRAVEL, ENSURE MINIMUM 30% LUMINANCE CONTRAST AGAINST BACKGROUND (E.G. FLOORING).

13 BUS STOP BIN SHOULD BE AN 80 LITRE CIRCULAR CONSTRUCTION (SMALL SLOT PERFORATIONS) WHICH CAN BE EASILY MAINTAINED. BIN SHOULD INCLUDE A GALVANISED STEEL LINER AND A BIRD-PROOF LID. WHERE BIN ABUTS A CONTINUOUS ACCESSIBLE PATH OF TRAVEL ENSURE MINIMUM 30% LUMINANCE CONTRAST AGAINST BACKGROUND (E.G. FLOORING). BIN TO BE MINIMUM 500MM SETBACK FROM ACCESS PATHWAY.

ADDITIONAL REQUIREMENTS

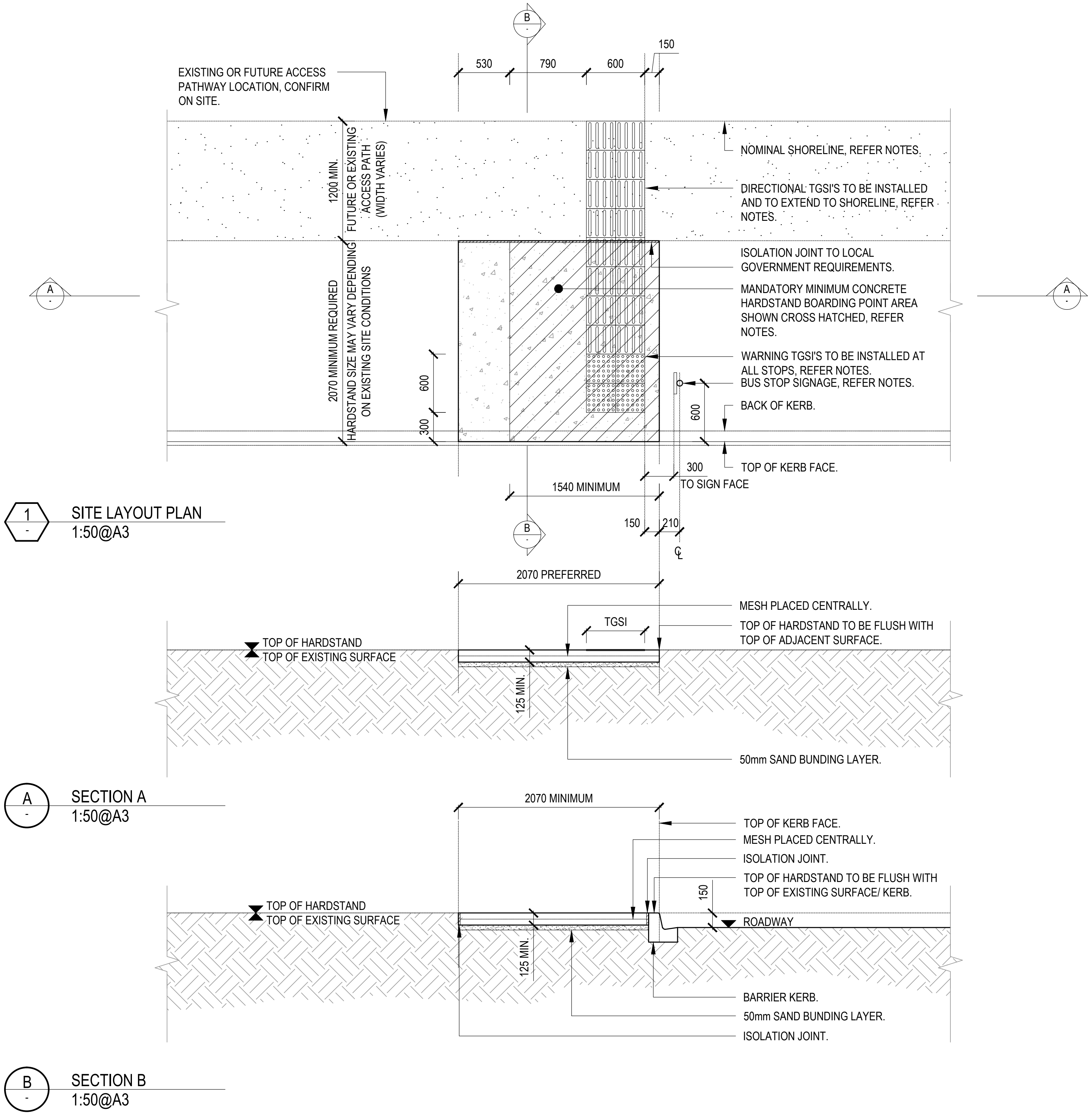
14 ALL BUS STOPS TO BE DSAPT COMPLIANT. FOR FURTHER GUIDANCE REFER TO THE RELEVANT STANDARDS, TRANSLINK GUIDANCE AND RELEVANT LOCAL GOVERNMENT REQUIREMENTS.

15 ALL BUS STOP COMPONENTS SHOULD BE POSITIONED IN CONSIDERATION OF RELEVANT ONSITE CONDITIONS WITH REFERENCE TO THE GUIDANCE CONTAINED WITHIN THE PTIM, AND FOR ADDITIONAL REQUIREMENTS AND DESIGN ALTERNATIVES REFER TO THE COMPONENTS TABLE CONTAINED IN THE PTIM.

16 REFER TO PTIM GLOSSARY FOR DEFINITIONS OF TERMS AND PTIM ABBREVIATIONS FOR DEFINITIONS OF ACRONYMS.

17 ALL DRAWING DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.

* DIMENSION TO BE CONFIRMED ON SITE IN RELATION TO SITE CONDITIONS.



TRANSLink | Queensland Government

PTIM, BUS STOP INFRASTRUCTURE CHAPTER

REGULAR STOP - MINIMUM BOARDING POINT - WITH EXISTING KERB

SCALE : AS SHOWN			DRG 5-0011
DRAWN : -	DATE : JULY 2013		A

NOTES:

HARDSTAND

1 THE MANDATORY (COMPLIANT TO DSAPT) MINIMUM BOARDING POINT HARDSTAND AREA IS 1540MM X 2070MM, POSITIONED AS SHOWN ON THE TRANSLINK DRAWINGS. A LARGER HARDSTAND AREA IS PREFERRED AND IS DEPENDENT ON SITE SPECIFIC CONDITIONS.

2 THE MANDATORY LONGITUDINAL AND CROSS FALL GRADIENT AT BOARDING POINT IS MAXIMUM 1:40 FALL ACROSS THE BOARDING POINT AREA (SHOWN HATCHED). ALL OTHER HARDSTAND AND ADJACENT AREAS TO THE BUS STOP SHALL MEET APPLICABLE STANDARDS IN RELATION TO THE ADJACENT SITE CONDITIONS, AND TO PREFERABLY ACHIEVE A LONGITUDINAL AND CROSS FALL GRADIENT OF MAXIMUM 1:40 FALL.

3 HARDSTANDS SHALL BE MINIMUM 125MM THICK BROOM FINISHED (FOR SLIP RESISTANCE) GRADE N25 CONCRETE SL72 MESH PLACED CENTRALLY, OR, AS REQUIRED BY THE RELEVANT STATUTORY AUTHORITY. FOR SLAB THICKENING AT FURNITURE LOCATIONS, AND JOINT LAYOUT AND SPECIFICATIONS REFER TO LOCAL GOVERNMENT SPECIFIC REQUIREMENTS.

4 A CLEAR HARDSTAND ACCESS SPACE OF 1200MM MINIMUM IS REQUIRED BETWEEN AND AROUND ALL BUS STOP INFRASTRUCTURE (1500MM DESIRABLE).

ACCESS

5 WHERE BUS STOPS ARE LOCATED ALONG BICYCLE ROUTES, SHARED ACCESS PATHS SHOULD BE APPLIED AS PER LOCAL GOVERNMENT REQUIREMENTS OR WITH REFERENCE TO RELEVANT GUIDELINE DIMENSIONS GIVEN IN THE APPLICABLE STANDARDS, TMR GUIDELINES, AND AUSTROADS.

6 CIRCULATION OF WHEELCHAIRS SHOULD BE CONSIDERED AT EACH BUS STOP BASED ON SITE SPECIFIC CONDITIONS AND TO ADDRESS COMPLIANCE WITH DSAPT. LINE-MARKING OF THE 2No. ALLOCATED SPACES (PWD WAITING ZONES) IS NOT REQUIRED.

7 TACTILE GROUND SURFACE INDICATORS (TGSI) SHOULD PREFERABLY BE INSTALLED AS SHOWN ON THE TRANSLINK DRAWINGS. WHERE THERE IS A PATHWAY ACCESSING A BUS STOP, DIRECTIONAL TGSI SHALL BE INSTALLED FOR THE FULL WIDTH OF THE PATH OF TRAVEL OVER A MINIMUM 600MM DEPTH AND PERPENDICULAR TO THE DIRECTION OF TRAVEL WHEN APPROACHING. DIRECTIONAL TGSI SHALL BE USED ACROSS THE OPEN SPACE FROM THE ACCESS PATHWAY DIRECTIONAL TGSI TO THE BOARDING POINT WARNING TGSI. TGSI TO EXTEND TO THE SHORELINE - I.E. BUILDING LINE, WALL, A FENCE, A KERB, OR A GRASS VERGE WHERE APPLICABLE.

8 THE COLOUR OF TGSI SHALL BE SELECTED BASED ON SITE SPECIFIC REQUIREMENTS. INTEGRATED TGSI SHALL HAVE A MINIMUM COLOUR CONTRAST OF 30% COMPARED TO THE AMOUNT OF LIGHT REFLECTED FROM THE SURFACE OF THE ADJACENT PATH OF TRAVEL. FOR EXAMPLE; FOR A LIGHT CONCRETE COLOURED PATH OF TRAVEL, DARK COLOURED (E.G. BLACK) TGSI MAY BE APPROPRIATE. FOR A BLACK BITUMEN PATH OF TRAVEL LIGHT COLOURED (E.G. WHITE OR YELLOW) TGSI MAY BE APPROPRIATE. THIS CONTRAST MUST BE MAINTAINED IN BOTH WET AND DRY CONDITIONS.

SHELTER

9 FOR OPTIONS OF SHELTER TYPES FOR INTERMEDIATE AND PREMIUM STOPS REFER TO TRANSLINK DRAWINGS. WHERE A SHELTER ABUTS A CONTINUOUS ACCESSIBLE PATH OF TRAVEL, ENSURE MINIMUM 30% LUMINANCE CONTRAST AGAINST BACKGROUND (E.G. FLOORING).

FURNITURE & SIGNAGE

10 FOR DETAILS OF BUS STOP SIGNAGE (J-POLE/BLADE) AND FOOTING DETAILS REFER TO TRANSLINK SIGNAGE MANUAL.

11 SETOUT OF BLADE SIGN (REFER TO THE PREMIUM STOP TRANSLINK DRAWING) IS POSITIONED AS SHOWN DUE TO BUS STOP OPERATIONS, AND ROAD SAFETY REQUIREMENTS AND IS NON-COMPLIANT WITH DSAPT. PLEASE LIAISE WITH TRANSLINK FOR DETAILS ON THIS REQUIREMENT.

12 BUS STOP SEAT SHOULD INCLUDE ANODISED ALUMINIUM BATTENS WITH ARMRESTS ALONG THE SEAT. SEATS SHOULD BE BOLTED TO HARDSTAND AREA, AND MADE FROM EASILY MAINTAINED MATERIALS. SEATS TO BE COMPLIANT WITH DSAPT. WHERE A SEAT ABUTS A CONTINUOUS ACCESSIBLE PATH OF TRAVEL, ENSURE MINIMUM 30% LUMINANCE CONTRAST AGAINST BACKGROUND (E.G. FLOORING).

13 BUS STOP BIN SHOULD BE AN 80 LITRE CIRCULAR CONSTRUCTION (SMALL SLOT PERFORATIONS) WHICH CAN BE EASILY MAINTAINED. BIN SHOULD INCLUDE A GALVANISED STEEL LINER AND A BIRD-PROOF LID. WHERE BIN ABUTS A CONTINUOUS ACCESSIBLE PATH OF TRAVEL ENSURE MINIMUM 30% LUMINANCE CONTRAST AGAINST BACKGROUND (E.G. FLOORING). BIN TO BE MINIMUM 500MM SETBACK FROM ACCESS PATHWAY.

ADDITIONAL REQUIREMENTS

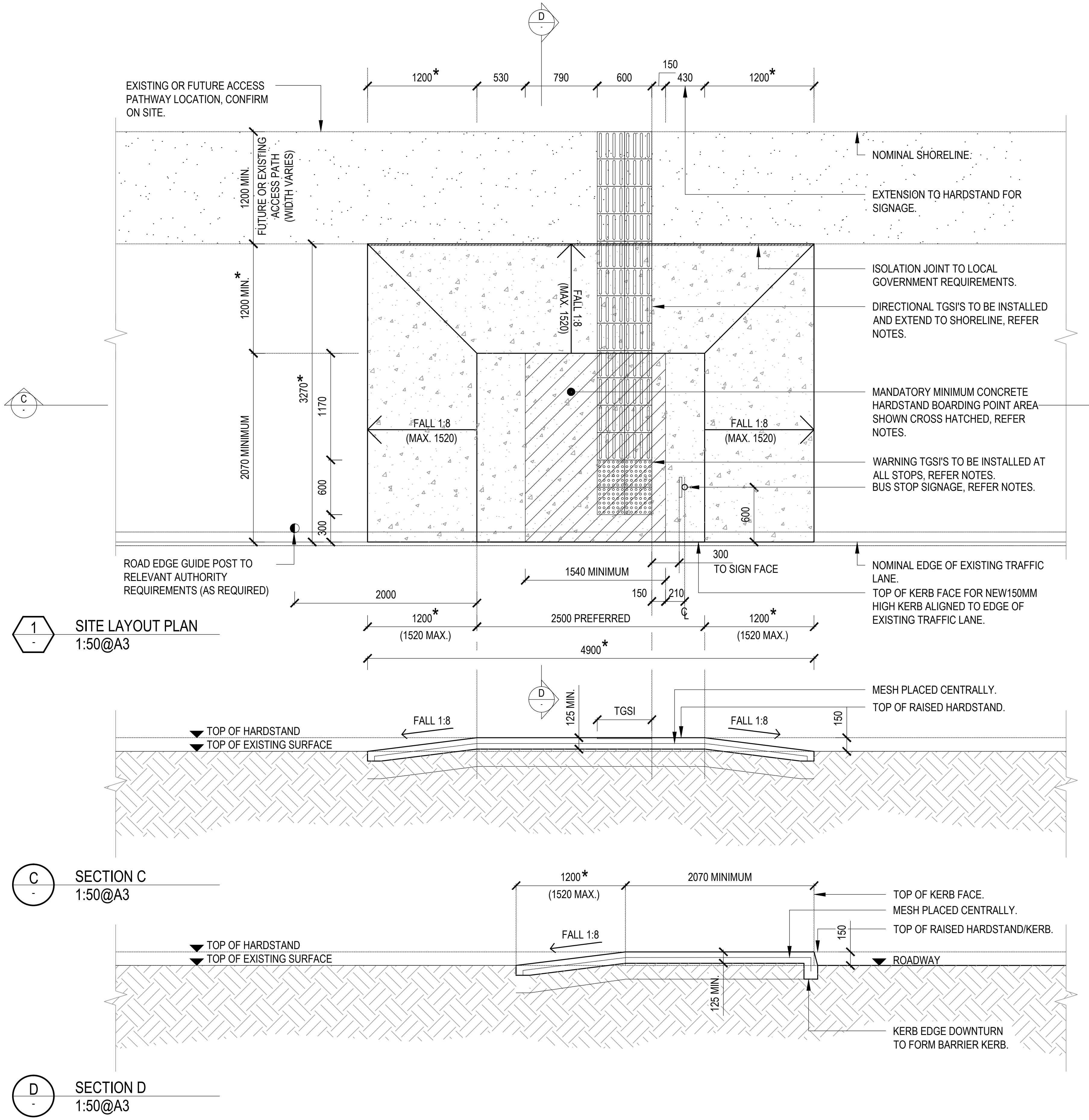
14 ALL BUS STOPS TO BE DSAPT COMPLIANT. FOR FURTHER GUIDANCE REFER TO THE RELEVANT STANDARDS, TRANSLINK GUIDANCE AND RELEVANT LOCAL GOVERNMENT REQUIREMENTS.

15 ALL BUS STOP COMPONENTS SHOULD BE POSITIONED IN CONSIDERATION OF RELEVANT ONSITE CONDITIONS WITH REFERENCE TO THE GUIDANCE CONTAINED WITHIN THE PTIM, AND FOR ADDITIONAL REQUIREMENTS AND DESIGN ALTERNATIVES REFER TO THE COMPONENTS TABLE CONTAINED IN THE PTIM.

16 REFER TO PTIM GLOSSARY FOR DEFINITIONS OF TERMS AND PTIM ABBREVIATIONS FOR DEFINITIONS OF ACRONYMS.

17 ALL DRAWING DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.

* DIMENSION TO BE CONFIRMED ON SITE IN RELATION TO SITE CONDITIONS.



1 SITE LAYOUT PLAN 1:50@A3

C SECTION C 1:50@A3

D SECTION D 1:50@A3

TRANSLink

Queensland Government

PTIM, BUS STOP INFRASTRUCTURE CHAPTER

REGULAR STOP - MINIMUM BOARDING POINT - WITHOUT EXISTING KERB

SCALE :	AS SHOWN		DRG 5-0012
DRAWN :	-	DATE : JULY 2013	A

NOTES:

HARDSTAND

1 THE MANDATORY (COMPLIANT TO DSAPT) MINIMUM BOARDING POINT HARDSTAND AREA IS 1540MM X 2070MM, POSITIONED AS SHOWN ON THE TRANSLINK DRAWINGS. A LARGER HARDSTAND AREA IS PREFERRED AND IS DEPENDENT ON SITE SPECIFIC CONDITIONS.

2 THE MANDATORY LONGITUDINAL AND CROSS FALL GRADIENT AT BOARDING POINT IS MAXIMUM 1:40 FALL ACROSS THE BOARDING POINT AREA (SHOWN HATCHED). ALL OTHER HARDSTAND AND ADJACENT AREAS TO THE BUS STOP SHALL MEET APPLICABLE STANDARDS IN RELATION TO THE ADJACENT SITE CONDITIONS, AND TO PREFERABLY ACHIEVE A LONGITUDINAL AND CROSS FALL GRADIENT OF MAXIMUM 1:40 FALL.

3 HARDSTANDS SHALL BE MINIMUM 125MM THICK BROOM FINISHED (FOR SLIP RESISTANCE) GRADE N25 CONCRETE SL72 MESH PLACED CENTRALLY, OR, AS REQUIRED BY THE RELEVANT STATUTORY AUTHORITY. FOR SLAB THICKENING AT FURNITURE LOCATIONS, AND JOINT LAYOUT AND SPECIFICATIONS REFER TO LOCAL GOVERNMENT SPECIFIC REQUIREMENTS.

4 A CLEAR HARDSTAND ACCESS SPACE OF 1200MM MINIMUM IS REQUIRED BETWEEN AND AROUND ALL BUS STOP INFRASTRUCTURE (1500MM DESIRABLE).

ACCESS

5 WHERE BUS STOPS ARE LOCATED ALONG BICYCLE ROUTES, SHARED ACCESS PATHS SHOULD BE APPLIED AS PER LOCAL GOVERNMENT REQUIREMENTS OR WITH REFERENCE TO RELEVANT GUIDELINE DIMENSIONS GIVEN IN THE APPLICABLE STANDARDS, TMR GUIDELINES, AND AUSTROADS.

6 CIRCULATION OF WHEELCHAIRS SHOULD BE CONSIDERED AT EACH BUS STOP BASED ON SITE SPECIFIC CONDITIONS AND TO ADDRESS COMPLIANCE WITH DSAPT. LINE-MARKING OF THE 2No. ALLOCATED SPACES (PWD WAITING ZONES) IS NOT REQUIRED.

7 TACTILE GROUND SURFACE INDICATORS (TGSI) SHOULD PREFERABLY BE INSTALLED AS SHOWN ON THE TRANSLINK DRAWINGS. WHERE THERE IS A PATHWAY ACCESSING A BUS STOP, DIRECTIONAL TGSI SHALL BE INSTALLED FOR THE FULL WIDTH OF THE PATH OF TRAVEL OVER A MINIMUM 600MM DEPTH AND PERPENDICULAR TO THE DIRECTION OF TRAVEL WHEN APPROACHING. DIRECTIONAL TGSI SHALL BE USED ACROSS THE OPEN SPACE FROM THE ACCESS PATHWAY DIRECTIONAL TGSI TO THE BOARDING POINT WARNING TGSI. TGSI TO EXTEND TO THE SHORELINE - I.E. BUILDING LINE, WALL, A FENCE, A KERB, OR A GRASS VERGE WHERE APPLICABLE.

8 THE COLOUR OF TGSI SHALL BE SELECTED BASED ON SITE SPECIFIC REQUIREMENTS. INTEGRATED TGSI SHALL HAVE A MINIMUM COLOUR CONTRAST OF 30% COMPARED TO THE AMOUNT OF LIGHT REFLECTED FROM THE SURFACE OF THE ADJACENT PATH OF TRAVEL. FOR EXAMPLE; FOR A LIGHT CONCRETE COLOURED PATH OF TRAVEL, DARK COLOURED (E.G. BLACK) TGSI MAY BE APPROPRIATE. FOR A BLACK BITUMEN PATH OF TRAVEL LIGHT COLOURED (E.G. WHITE OR YELLOW) TGSI MAY BE APPROPRIATE. THIS CONTRAST MUST BE MAINTAINED IN BOTH WET AND DRY CONDITIONS.

SHELTER

9 FOR OPTIONS OF SHELTER TYPES FOR INTERMEDIATE AND PREMIUM STOPS REFER TO TRANSLINK DRAWINGS. WHERE A SHELTER ABUTS A CONTINUOUS ACCESSIBLE PATH OF TRAVEL, ENSURE MINIMUM 30% LUMINANCE CONTRAST AGAINST BACKGROUND (E.G. FLOORING).

FURNITURE & SIGNAGE

10 FOR DETAILS OF BUS STOP SIGNAGE (J-POLE/BLADE) AND FOOTING DETAILS REFER TO TRANSLINK SIGNAGE MANUAL.

11 SETOUT OF BLADE SIGN (REFER TO THE PREMIUM STOP TRANSLINK DRAWING) IS POSITIONED AS SHOWN DUE TO BUS STOP OPERATIONS, AND ROAD SAFETY REQUIREMENTS AND IS NON-COMPLIANT WITH DSAPT. PLEASE LIAISE WITH TRANSLINK FOR DETAILS ON THIS REQUIREMENT.

12 BUS STOP SEAT SHOULD INCLUDE ANODISED ALUMINIUM BATTENS WITH ARMRESTS ALONG THE SEAT. SEATS SHOULD BE BOLTED TO HARDSTAND AREA, AND MADE FROM EASILY MAINTAINED MATERIALS. SEATS TO BE COMPLIANT WITH DSAPT. WHERE A SEAT ABUTS A CONTINUOUS ACCESSIBLE PATH OF TRAVEL, ENSURE MINIMUM 30% LUMINANCE CONTRAST AGAINST BACKGROUND (E.G. FLOORING).

13 BUS STOP BIN SHOULD BE AN 80 LITRE CIRCULAR CONSTRUCTION (SMALL SLOT PERFORATIONS) WHICH CAN BE EASILY MAINTAINED. BIN SHOULD INCLUDE A GALVANISED STEEL LINER AND A BIRD-PROOF LID. WHERE BIN ABUTS A CONTINUOUS ACCESSIBLE PATH OF TRAVEL ENSURE MINIMUM 30% LUMINANCE CONTRAST AGAINST BACKGROUND (E.G. FLOORING). BIN TO BE MINIMUM 500MM SETBACK FROM ACCESS PATHWAY.

ADDITIONAL REQUIREMENTS

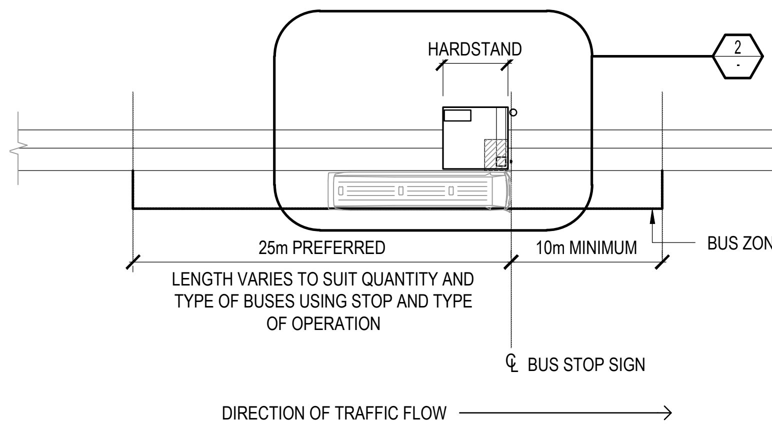
14 ALL BUS STOPS TO BE DSAPT COMPLIANT. FOR FURTHER GUIDANCE REFER TO THE RELEVANT STANDARDS, TRANSLINK GUIDANCE AND RELEVANT LOCAL GOVERNMENT REQUIREMENTS.

15 ALL BUS STOP COMPONENTS SHOULD BE POSITIONED IN CONSIDERATION OF RELEVANT ONSITE CONDITIONS WITH REFERENCE TO THE GUIDANCE CONTAINED WITHIN THE PTIM, AND FOR ADDITIONAL REQUIREMENTS AND DESIGN ALTERNATIVES REFER TO THE COMPONENTS TABLE CONTAINED IN THE PTIM.

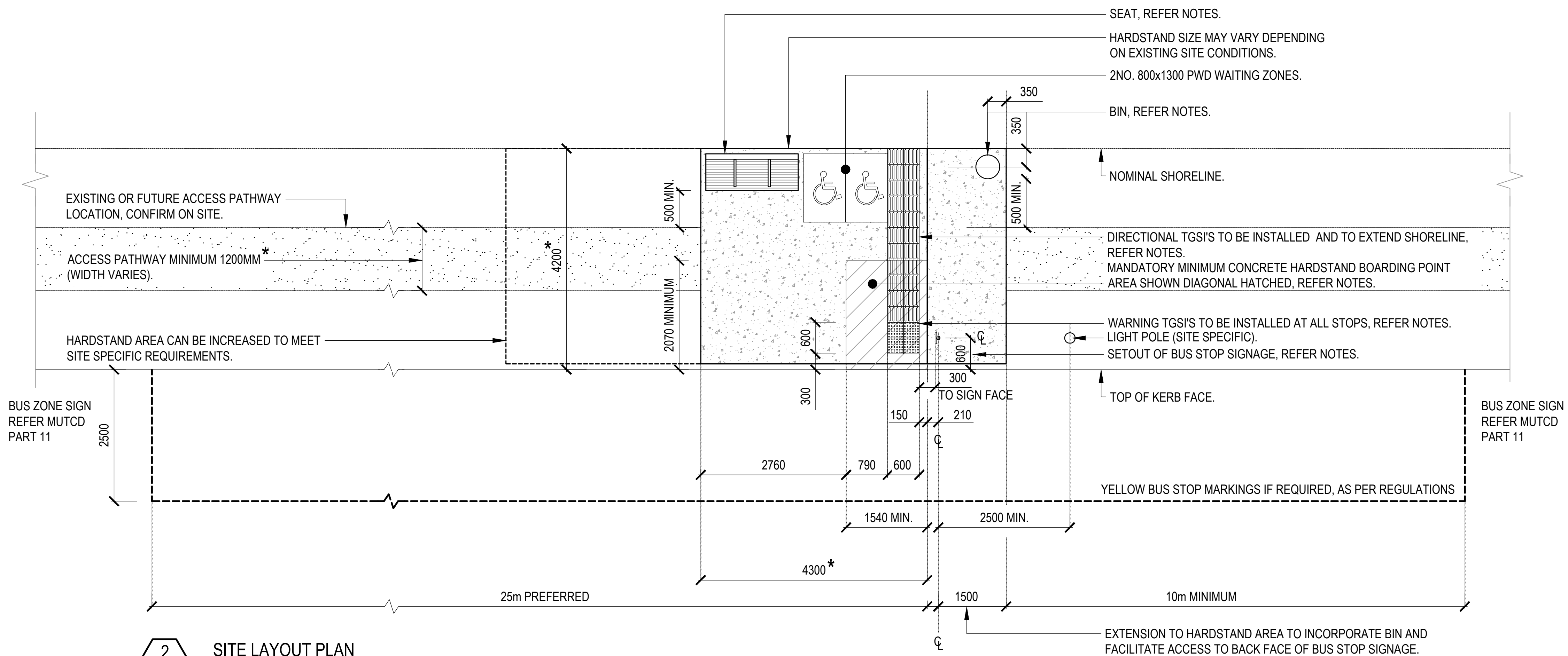
16 REFER TO PTIM GLOSSARY FOR DEFINITIONS OF TERMS AND PTIM ABBREVIATIONS FOR DEFINITIONS OF ACRONYMS.

17 ALL DRAWING DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.

* DIMENSION TO BE CONFIRMED ON SITE IN RELATION TO SITE CONDITIONS.



1 KEY PLAN
1:500@A3



2 SITE LAYOUT PLAN
1:100@A3

TRANSLink

Queensland Government

PTIM, BUS STOP INFRASTRUCTURE CHAPTER
REGULAR STOP - SITE LAYOUT - WITHOUT INDENTED BUS BAY

SCALE :	AS SHOWN		DRG 5-0013
DRAWN :	-	DATE : JULY 2013	A

NOTES:

HARDSTAND

1 THE MANDATORY (COMPLIANT TO DSAPT) MINIMUM BOARDING POINT HARDSTAND AREA IS 1540MM X 2070MM, POSITIONED AS SHOWN ON THE TRANSLINK DRAWINGS. A LARGER HARDSTAND AREA IS PREFERRED AND IS DEPENDENT ON SITE SPECIFIC CONDITIONS.

2 THE MANDATORY LONGITUDINAL AND CROSS FALL GRADIENT AT BOARDING POINT IS MAXIMUM 1:40 FALL ACROSS THE BOARDING POINT AREA (SHOWN HATCHED). ALL OTHER HARDSTAND AND ADJACENT AREAS TO THE BUS STOP SHALL MEET APPLICABLE STANDARDS IN RELATION TO THE ADJACENT SITE CONDITIONS, AND TO PREFERABLY ACHIEVE A LONGITUDINAL AND CROSS FALL GRADIENT OF MAXIMUM 1:40 FALL.

3 HARDSTANDS SHALL BE MINIMUM 125MM THICK BROOM FINISHED (FOR SLIP RESISTANCE) GRADE N25 CONCRETE SL72 MESH PLACED CENTRALLY, OR, AS REQUIRED BY THE RELEVANT STATUTORY AUTHORITY. FOR SLAB THICKENING AT FURNITURE LOCATIONS, AND JOINT LAYOUT AND SPECIFICATIONS REFER TO LOCAL GOVERNMENT SPECIFIC REQUIREMENTS.

4 A CLEAR HARDSTAND ACCESS SPACE OF 1200MM MINIMUM IS REQUIRED BETWEEN AND AROUND ALL BUS STOP INFRASTRUCTURE (1500MM DESIRABLE).

ACCESS

5 WHERE BUS STOPS ARE LOCATED ALONG BICYCLE ROUTES, SHARED ACCESS PATHS SHOULD BE APPLIED AS PER LOCAL GOVERNMENT REQUIREMENTS OR WITH REFERENCE TO RELEVANT GUIDELINE DIMENSIONS GIVEN IN THE APPLICABLE STANDARDS, TMR GUIDELINES, AND AUSTROADS.

6 CIRCULATION OF WHEELCHAIRS SHOULD BE CONSIDERED AT EACH BUS STOP BASED ON SITE SPECIFIC CONDITIONS AND TO ADDRESS COMPLIANCE WITH DSAPT. LINE-MARKING OF THE 2No. ALLOCATED SPACES (PWD WAITING ZONES) IS NOT REQUIRED.

7 TACTILE GROUND SURFACE INDICATORS (TGSI) SHOULD PREFERABLY BE INSTALLED AS SHOWN ON THE TRANSLINK DRAWINGS. WHERE THERE IS A PATHWAY ACCESSING A BUS STOP, DIRECTIONAL TGSI SHALL BE INSTALLED FOR THE FULL WIDTH OF THE PATH OF TRAVEL OVER A MINIMUM 600MM DEPTH AND PERPENDICULAR TO THE DIRECTION OF TRAVEL WHEN APPROACHING. DIRECTIONAL TGSI SHALL BE USED ACROSS THE OPEN SPACE FROM THE ACCESS PATHWAY DIRECTIONAL TGSI TO THE BOARDING POINT WARNING TGSI. TGSI TO EXTEND TO THE SHORELINE - I.E. BUILDING LINE, WALL, A FENCE, A KERB, OR A GRASS VERGE WHERE APPLICABLE.

8 THE COLOUR OF TGSI SHALL BE SELECTED BASED ON SITE SPECIFIC REQUIREMENTS. INTEGRATED TGSI SHALL HAVE A MINIMUM COLOUR CONTRAST OF 30% COMPARED TO THE AMOUNT OF LIGHT REFLECTED FROM THE SURFACE OF THE ADJACENT PATH OF TRAVEL. FOR EXAMPLE; FOR A LIGHT CONCRETE COLOURED PATH OF TRAVEL, DARK COLOURED (E.G. BLACK) TGSI MAY BE APPROPRIATE. FOR A BLACK BITUMEN PATH OF TRAVEL LIGHT COLOURED (E.G. WHITE OR YELLOW) TGSI MAY BE APPROPRIATE. THIS CONTRAST MUST BE MAINTAINED IN BOTH WET AND DRY CONDITIONS.

SHELTER

9 FOR OPTIONS OF SHELTER TYPES FOR INTERMEDIATE AND PREMIUM STOPS REFER TO TRANSLINK DRAWINGS. WHERE A SHELTER ABUTS A CONTINUOUS ACCESSIBLE PATH OF TRAVEL, ENSURE MINIMUM 30% LUMINANCE CONTRAST AGAINST BACKGROUND (E.G. FLOORING).

FURNITURE & SIGNAGE

10 FOR DETAILS OF BUS STOP SIGNAGE (J-POLE/BLADE) AND FOOTING DETAILS REFER TO TRANSLINK SIGNAGE MANUAL.

11 SETOUT OF BLADE SIGN (REFER TO THE PREMIUM STOP TRANSLINK DRAWING) IS POSITIONED AS SHOWN DUE TO BUS STOP OPERATIONS, AND ROAD SAFETY REQUIREMENTS AND IS NON-COMPLIANT WITH DSAPT. PLEASE LIAISE WITH TRANSLINK FOR DETAILS ON THIS REQUIREMENT.

12 BUS STOP SEAT SHOULD INCLUDE ANODISED ALUMINIUM BATTENS WITH ARMRESTS ALONG THE SEAT. SEATS SHOULD BE BOLTED TO HARDSTAND AREA, AND MADE FROM EASILY MAINTAINED MATERIALS. SEATS TO BE COMPLIANT WITH DSAPT. WHERE A SEAT ABUTS A CONTINUOUS ACCESSIBLE PATH OF TRAVEL, ENSURE MINIMUM 30% LUMINANCE CONTRAST AGAINST BACKGROUND (E.G. FLOORING).

13 BUS STOP BIN SHOULD BE AN 80 LITRE CIRCULAR CONSTRUCTION (SMALL SLOT PERFORATIONS) WHICH CAN BE EASILY MAINTAINED. BIN SHOULD INCLUDE A GALVANISED STEEL LINER AND A BIRD-PROOF LID. WHERE BIN ABUTS A CONTINUOUS ACCESSIBLE PATH OF TRAVEL ENSURE MINIMUM 30% LUMINANCE CONTRAST AGAINST BACKGROUND (E.G. FLOORING). BIN TO BE MINIMUM 500MM SETBACK FROM ACCESS PATHWAY.

ADDITIONAL REQUIREMENTS

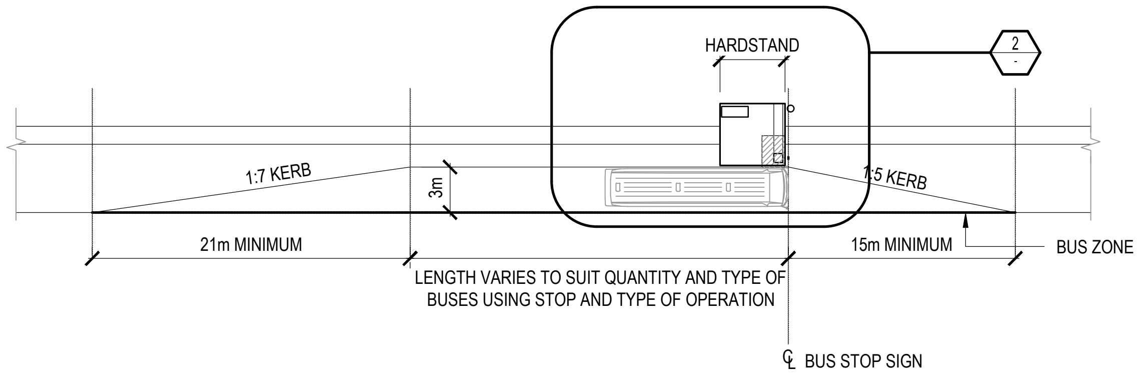
14 ALL BUS STOPS TO BE DSAPT COMPLIANT. FOR FURTHER GUIDANCE REFER TO THE RELEVANT STANDARDS, TRANSLINK GUIDANCE AND RELEVANT LOCAL GOVERNMENT REQUIREMENTS.

15 ALL BUS STOP COMPONENTS SHOULD BE POSITIONED IN CONSIDERATION OF RELEVANT ONSITE CONDITIONS WITH REFERENCE TO THE GUIDANCE CONTAINED WITHIN THE PTIM, AND FOR ADDITIONAL REQUIREMENTS AND DESIGN ALTERNATIVES REFER TO THE COMPONENTS TABLE CONTAINED IN THE PTIM.

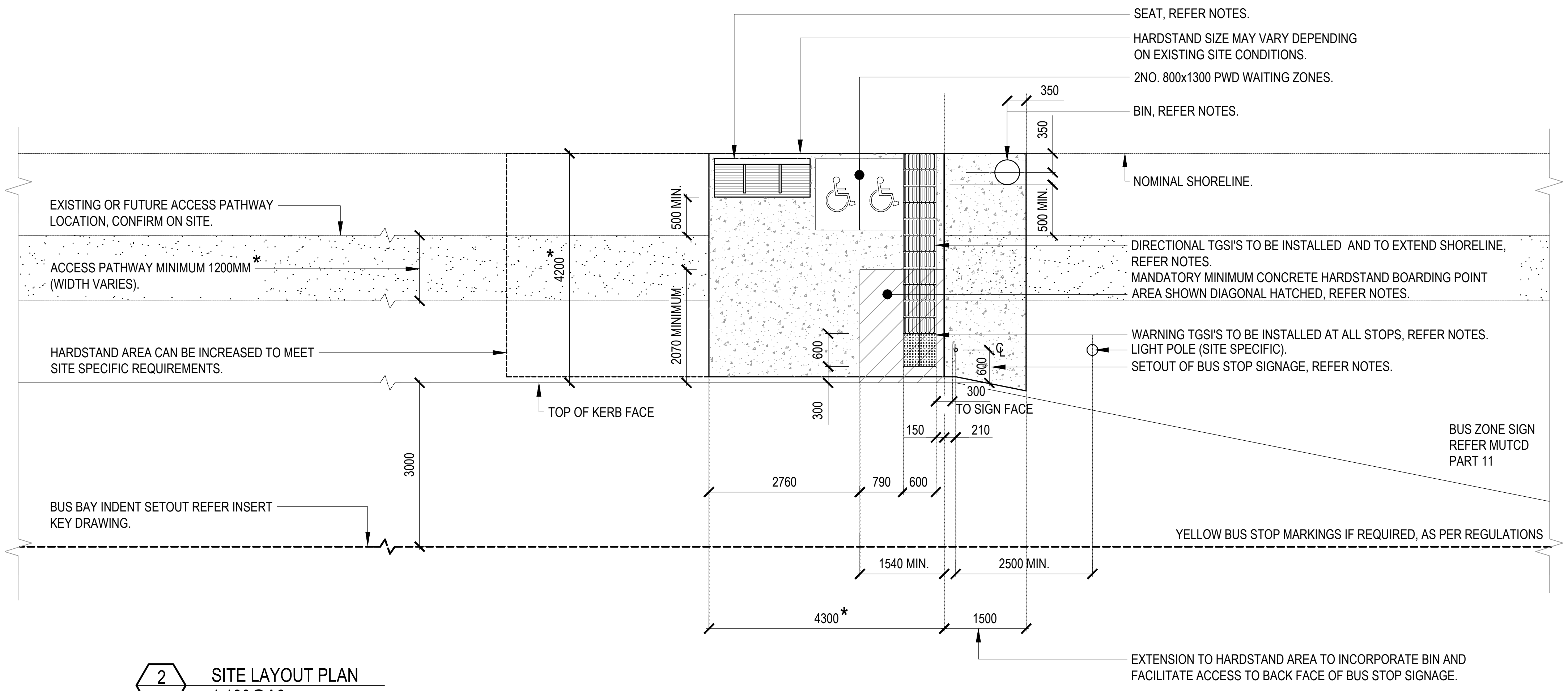
16 REFER TO PTIM GLOSSARY FOR DEFINITIONS OF TERMS AND PTIM ABBREVIATIONS FOR DEFINITIONS OF ACRONYMS.

17 ALL DRAWING DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.

* DIMENSION TO BE CONFIRMED ON SITE IN RELATION TO SITE CONDITIONS.



1 KEY PLAN
1:500@A3



2 SITE LAYOUT PLAN
1:100@A3

TRANSLink

Queensland Government

PTIM, BUS STOP INFRASTRUCTURE CHAPTER
REGULAR STOP - SITE LAYOUT - WITH INDENTED BUS BAY

SCALE :	AS SHOWN			DRG 5-0014
DRAWN :	-	DATE :	JULY 2013	A

NOTES:

HARDSTAND

1 THE MANDATORY (COMPLIANT TO DSAPT) MINIMUM BOARDING POINT HARDSTAND AREA IS 1540MM X 2070MM, POSITIONED AS SHOWN ON THE TRANSLINK DRAWINGS. A LARGER HARDSTAND AREA IS PREFERRED AND IS DEPENDENT ON SITE SPECIFIC CONDITIONS.

2 THE MANDATORY LONGITUDINAL AND CROSS FALL GRADIENT AT BOARDING POINT IS MAXIMUM 1:40 FALL ACROSS THE BOARDING POINT AREA (SHOWN HATCHED). ALL OTHER HARDSTAND AND ADJACENT AREAS TO THE BUS STOP SHALL MEET APPLICABLE STANDARDS IN RELATION TO THE ADJACENT SITE CONDITIONS, AND TO PREFERABLY ACHIEVE A LONGITUDINAL AND CROSS FALL GRADIENT OF MAXIMUM 1:40 FALL.

3 HARDSTANDS SHALL BE MINIMUM 125MM THICK BROOM FINISHED (FOR SLIP RESISTANCE) GRADE N25 CONCRETE SL72 MESH PLACED CENTRALLY, OR, AS REQUIRED BY THE RELEVANT STATUTORY AUTHORITY. FOR SLAB THICKENING AT FURNITURE LOCATIONS, AND JOINT LAYOUT AND SPECIFICATIONS REFER TO LOCAL GOVERNMENT SPECIFIC REQUIREMENTS.

4 A CLEAR HARDSTAND ACCESS SPACE OF 1200MM MINIMUM IS REQUIRED BETWEEN AND AROUND ALL BUS STOP INFRASTRUCTURE (1500MM DESIRABLE).

ACCESS

5 WHERE BUS STOPS ARE LOCATED ALONG BICYCLE ROUTES, SHARED ACCESS PATHS SHOULD BE APPLIED AS PER LOCAL GOVERNMENT REQUIREMENTS OR WITH REFERENCE TO RELEVANT GUIDELINE DIMENSIONS GIVEN IN THE APPLICABLE STANDARDS, TMR GUIDELINES, AND AUSTROADS.

6 CIRCULATION OF WHEELCHAIRS SHOULD BE CONSIDERED AT EACH BUS STOP BASED ON SITE SPECIFIC CONDITIONS AND TO ADDRESS COMPLIANCE WITH DSAPT. LINE-MARKING OF THE 2No. ALLOCATED SPACES (PWD WAITING ZONES) IS NOT REQUIRED.

7 TACTILE GROUND SURFACE INDICATORS (TGSI) SHOULD PREFERABLY BE INSTALLED AS SHOWN ON THE TRANSLINK DRAWINGS. WHERE THERE IS A PATHWAY ACCESSING A BUS STOP, DIRECTIONAL TGSI SHALL BE INSTALLED FOR THE FULL WIDTH OF THE PATH OF TRAVEL OVER A MINIMUM 600MM DEPTH AND PERPENDICULAR TO THE DIRECTION OF TRAVEL WHEN APPROACHING. DIRECTIONAL TGSI SHALL BE USED ACROSS THE OPEN SPACE FROM THE ACCESS PATHWAY DIRECTIONAL TGSI TO THE BOARDING POINT WARNING TGSI. TGSI TO EXTEND TO THE SHORELINE - I.E. BUILDING LINE, WALL, A FENCE, A KERB, OR A GRASS VERGE WHERE APPLICABLE.

8 THE COLOUR OF TGSI SHALL BE SELECTED BASED ON SITE SPECIFIC REQUIREMENTS. INTEGRATED TGSI SHALL HAVE A MINIMUM COLOUR CONTRAST OF 30% COMPARED TO THE AMOUNT OF LIGHT REFLECTED FROM THE SURFACE OF THE ADJACENT PATH OF TRAVEL. FOR EXAMPLE; FOR A LIGHT CONCRETE COLOURED PATH OF TRAVEL, DARK COLOURED (E.G. BLACK) TGSI MAY BE APPROPRIATE. FOR A BLACK BITUMEN PATH OF TRAVEL LIGHT COLOURED (E.G. WHITE OR YELLOW) TGSI MAY BE APPROPRIATE. THIS CONTRAST MUST BE MAINTAINED IN BOTH WET AND DRY CONDITIONS.

SHELTER

9 FOR OPTIONS OF SHELTER TYPES FOR INTERMEDIATE AND PREMIUM STOPS REFER TO TRANSLINK DRAWINGS. WHERE A SHELTER ABUTS A CONTINUOUS ACCESSIBLE PATH OF TRAVEL, ENSURE MINIMUM 30% LUMINANCE CONTRAST AGAINST BACKGROUND (E.G. FLOORING).

FURNITURE & SIGNAGE

10 FOR DETAILS OF BUS STOP SIGNAGE (J-POLE/BLADE) AND FOOTING DETAILS REFER TO TRANSLINK SIGNAGE MANUAL.

11 SETOUT OF BLADE SIGN (REFER TO THE PREMIUM STOP TRANSLINK DRAWING) IS POSITIONED AS SHOWN DUE TO BUS STOP OPERATIONS, AND ROAD SAFETY REQUIREMENTS AND IS NON-COMPLIANT WITH DSAPT. PLEASE LIAISE WITH TRANSLINK FOR DETAILS ON THIS REQUIREMENT.

12 BUS STOP SEAT SHOULD INCLUDE ANODISED ALUMINIUM BATTENS WITH ARMRESTS ALONG THE SEAT. SEATS SHOULD BE BOLTED TO HARDSTAND AREA, AND MADE FROM EASILY MAINTAINED MATERIALS. SEATS TO BE COMPLIANT WITH DSAPT. WHERE A SEAT ABUTS A CONTINUOUS ACCESSIBLE PATH OF TRAVEL, ENSURE MINIMUM 30% LUMINANCE CONTRAST AGAINST BACKGROUND (E.G. FLOORING).

13 BUS STOP BIN SHOULD BE AN 80 LITRE CIRCULAR CONSTRUCTION (SMALL SLOT PERFORATIONS) WHICH CAN BE EASILY MAINTAINED. BIN SHOULD INCLUDE A GALVANISED STEEL LINER AND A BIRD-PROOF LID. WHERE BIN ABUTS A CONTINUOUS ACCESSIBLE PATH OF TRAVEL ENSURE MINIMUM 30% LUMINANCE CONTRAST AGAINST BACKGROUND (E.G. FLOORING). BIN TO BE MINIMUM 500MM SETBACK FROM ACCESS PATHWAY.

ADDITIONAL REQUIREMENTS

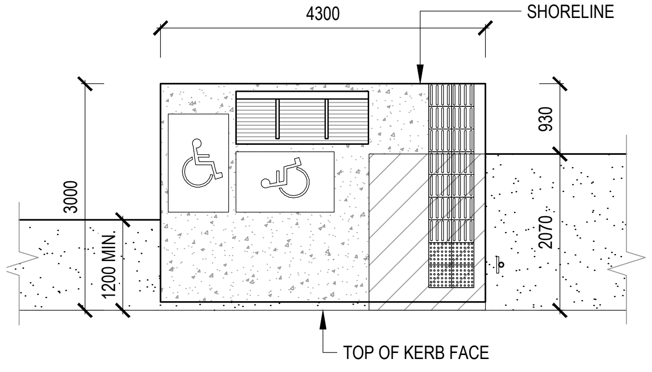
14 ALL BUS STOPS TO BE DSAPT COMPLIANT. FOR FURTHER GUIDANCE REFER TO THE RELEVANT STANDARDS, TRANSLINK GUIDANCE AND RELEVANT LOCAL GOVERNMENT REQUIREMENTS.

15 ALL BUS STOP COMPONENTS SHOULD BE POSITIONED IN CONSIDERATION OF RELEVANT ONSITE CONDITIONS WITH REFERENCE TO THE GUIDANCE CONTAINED WITHIN THE PTIM, AND FOR ADDITIONAL REQUIREMENTS AND DESIGN ALTERNATIVES REFER TO THE COMPONENTS TABLE CONTAINED IN THE PTIM.

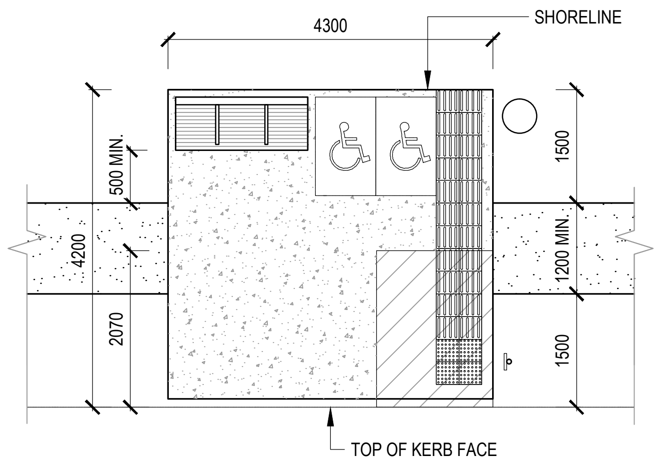
16 REFER TO PTIM GLOSSARY FOR DEFINITIONS OF TERMS AND PTIM ABBREVIATIONS FOR DEFINITIONS OF ACRONYMS.

17 ALL DRAWING DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.

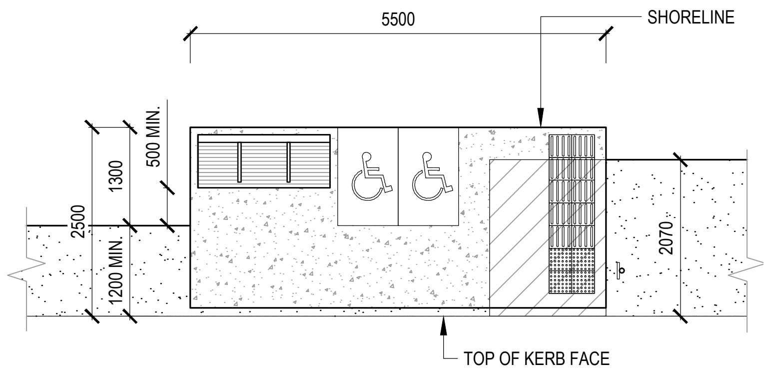
* DIMENSION TO BE CONFIRMED ON SITE IN RELATION TO SITE CONDITIONS.



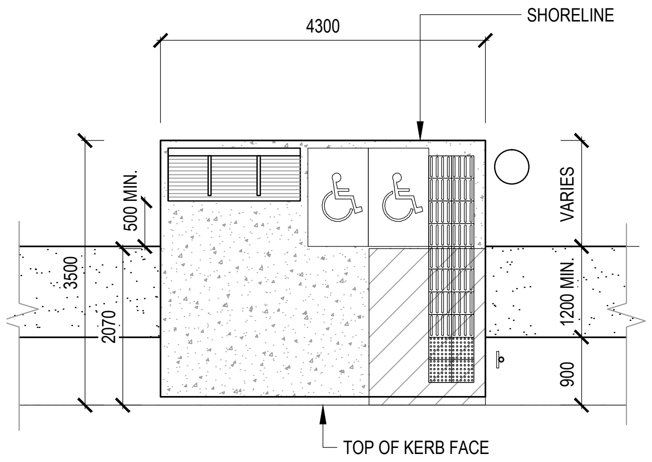
1 - CONSTRAINED SITE
1:100@A3



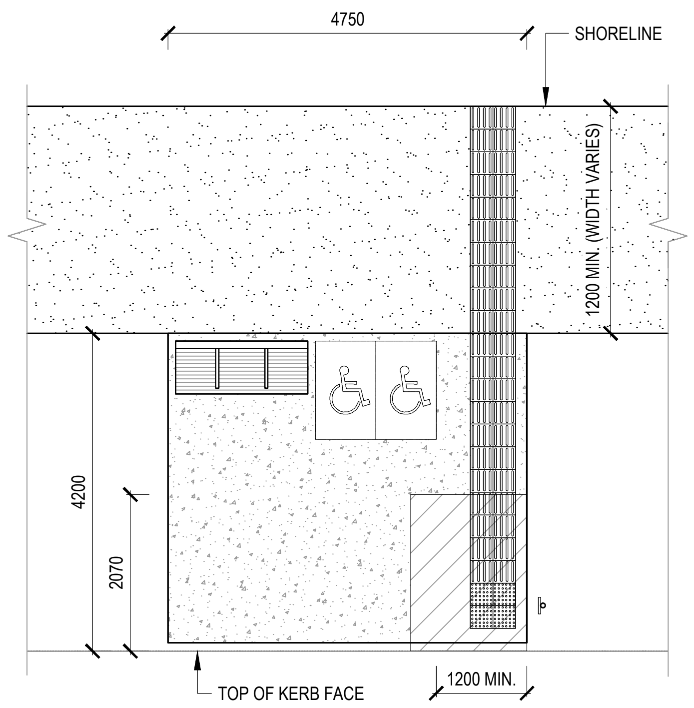
3 - HARDSTAND - MID/BACK FOOTPATH
1:100@A3



5 - CONSTRAINED SITE
1:100@A3



2 - HARDSTAND - MID/ FRONT FOOTPATH
1:100@A3



4 - HARDSTAND - SHARED ACCESS PATH BEHIND
1:100@A3

TRANSLink

Queensland Government

PTIM, BUS STOP INFRASTRUCTURE CHAPTER
REGULAR STOP - SITE LAYOUT - ACCESS EXAMPLES

SCALE : AS SHOWN

DRG 5-0015

DRAWN : -

DATE : JULY 2013

A

NOTES:

HARDSTAND

1 THE MANDATORY (COMPLIANT TO DSAPT) MINIMUM BOARDING POINT HARDSTAND AREA IS 1540MM X 2070MM, POSITIONED AS SHOWN ON THE TRANSLINK DRAWINGS. A LARGER HARDSTAND AREA IS PREFERRED AND IS DEPENDENT ON SITE SPECIFIC CONDITIONS.

2 THE MANDATORY LONGITUDINAL AND CROSS FALL GRADIENT AT BOARDING POINT IS MAXIMUM 1:40 FALL ACROSS THE BOARDING POINT AREA (SHOWN HATCHED). ALL OTHER HARDSTAND AND ADJACENT AREAS TO THE BUS STOP SHALL MEET APPLICABLE STANDARDS IN RELATION TO THE ADJACENT SITE CONDITIONS, AND TO PREFERABLY ACHIEVE A LONGITUDINAL AND CROSS FALL GRADIENT OF MAXIMUM 1:40 FALL.

3 HARDSTANDS SHALL BE MINIMUM 125MM THICK BROOM FINISHED (FOR SLIP RESISTANCE) GRADE N25 CONCRETE SL72 MESH PLACED CENTRALLY, OR, AS REQUIRED BY THE RELEVANT STATUTORY AUTHORITY. FOR SLAB THICKENING AT FURNITURE LOCATIONS, AND JOINT LAYOUT AND SPECIFICATIONS REFER TO LOCAL GOVERNMENT SPECIFIC REQUIREMENTS.

4 A CLEAR HARDSTAND ACCESS SPACE OF 1200MM MINIMUM IS REQUIRED BETWEEN AND AROUND ALL BUS STOP INFRASTRUCTURE (1500MM DESIRABLE).

ACCESS

5 WHERE BUS STOPS ARE LOCATED ALONG BICYCLE ROUTES, SHARED ACCESS PATHS SHOULD BE APPLIED AS PER LOCAL GOVERNMENT REQUIREMENTS OR WITH REFERENCE TO RELEVANT GUIDELINE DIMENSIONS GIVEN IN THE APPLICABLE STANDARDS, TMR GUIDELINES, AND AUSTROADS.

6 CIRCULATION OF WHEELCHAIRS SHOULD BE CONSIDERED AT EACH BUS STOP BASED ON SITE SPECIFIC CONDITIONS AND TO ADDRESS COMPLIANCE WITH DSAPT. LINE-MARKING OF THE 2No. ALLOCATED SPACES (PWD WAITING ZONES) IS NOT REQUIRED.

7 TACTILE GROUND SURFACE INDICATORS (TGSI) SHOULD PREFERABLY BE INSTALLED AS SHOWN ON THE TRANSLINK DRAWINGS. WHERE THERE IS A PATHWAY ACCESSING A BUS STOP, DIRECTIONAL TGSI SHALL BE INSTALLED FOR THE FULL WIDTH OF THE PATH OF TRAVEL OVER A MINIMUM 600MM DEPTH AND PERPENDICULAR TO THE DIRECTION OF TRAVEL WHEN APPROACHING. DIRECTIONAL TGSI SHALL BE USED ACROSS THE OPEN SPACE FROM THE ACCESS PATHWAY DIRECTIONAL TGSI TO THE BOARDING POINT WARNING TGSI. TGSI TO EXTEND TO THE SHORELINE - I.E. BUILDING LINE, WALL, A FENCE, A KERB, OR A GRASS VERGE WHERE APPLICABLE.

8 THE COLOUR OF TGSI SHALL BE SELECTED BASED ON SITE SPECIFIC REQUIREMENTS. INTEGRATED TGSI SHALL HAVE A MINIMUM COLOUR CONTRAST OF 30% COMPARED TO THE AMOUNT OF LIGHT REFLECTED FROM THE SURFACE OF THE ADJACENT PATH OF TRAVEL. FOR EXAMPLE; FOR A LIGHT CONCRETE COLOURED PATH OF TRAVEL, DARK COLOURED (E.G. BLACK) TGSI MAY BE APPROPRIATE. FOR A BLACK BITUMEN PATH OF TRAVEL LIGHT COLOURED (E.G. WHITE OR YELLOW) TGSI MAY BE APPROPRIATE. THIS CONTRAST MUST BE MAINTAINED IN BOTH WET AND DRY CONDITIONS.

SHELTER

9 FOR OPTIONS OF SHELTER TYPES FOR INTERMEDIATE AND PREMIUM STOPS REFER TO TRANSLINK DRAWINGS. WHERE A SHELTER ABUTS A CONTINUOUS ACCESSIBLE PATH OF TRAVEL, ENSURE MINIMUM 30% LUMINANCE CONTRAST AGAINST BACKGROUND (E.G. FLOORING).

FURNITURE & SIGNAGE

10 FOR DETAILS OF BUS STOP SIGNAGE (J-POLE/BLADE) AND FOOTING DETAILS REFER TO TRANSLINK SIGNAGE MANUAL.

11 SETOUT OF BLADE SIGN (REFER TO THE PREMIUM STOP TRANSLINK DRAWING) IS POSITIONED AS SHOWN DUE TO BUS STOP OPERATIONS, AND ROAD SAFETY REQUIREMENTS AND IS NON-COMPLIANT WITH DSAPT. PLEASE LIAISE WITH TRANSLINK FOR DETAILS ON THIS REQUIREMENT.

12 BUS STOP SEAT SHOULD INCLUDE ANODISED ALUMINIUM BATTENS WITH ARMRESTS ALONG THE SEAT. SEATS SHOULD BE BOLTED TO HARDSTAND AREA, AND MADE FROM EASILY MAINTAINED MATERIALS. SEATS TO BE COMPLIANT WITH DSAPT. WHERE A SEAT ABUTS A CONTINUOUS ACCESSIBLE PATH OF TRAVEL, ENSURE MINIMUM 30% LUMINANCE CONTRAST AGAINST BACKGROUND (E.G. FLOORING).

13 BUS STOP BIN SHOULD BE AN 80 LITRE CIRCULAR CONSTRUCTION (SMALL SLOT PERFORATIONS) WHICH CAN BE EASILY MAINTAINED. BIN SHOULD INCLUDE A GALVANISED STEEL LINER AND A BIRD-PROOF LID. WHERE BIN ABUTS A CONTINUOUS ACCESSIBLE PATH OF TRAVEL ENSURE MINIMUM 30% LUMINANCE CONTRAST AGAINST BACKGROUND (E.G. FLOORING). BIN TO BE MINIMUM 500MM SETBACK FROM ACCESS PATHWAY.

ADDITIONAL REQUIREMENTS

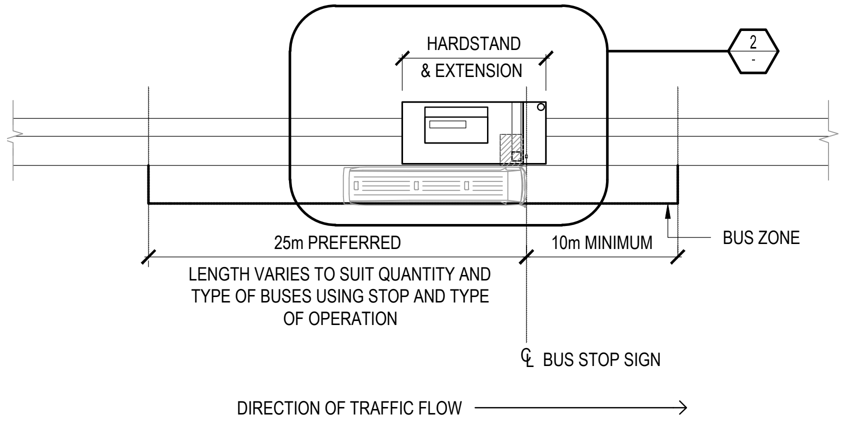
14 ALL BUS STOPS TO BE DSAPT COMPLIANT. FOR FURTHER GUIDANCE REFER TO THE RELEVANT STANDARDS, TRANSLINK GUIDANCE AND RELEVANT LOCAL GOVERNMENT REQUIREMENTS.

15 ALL BUS STOP COMPONENTS SHOULD BE POSITIONED IN CONSIDERATION OF RELEVANT ONSITE CONDITIONS WITH REFERENCE TO THE GUIDANCE CONTAINED WITHIN THE PTIM, AND FOR ADDITIONAL REQUIREMENTS AND DESIGN ALTERNATIVES REFER TO THE COMPONENTS TABLE CONTAINED IN THE PTIM.

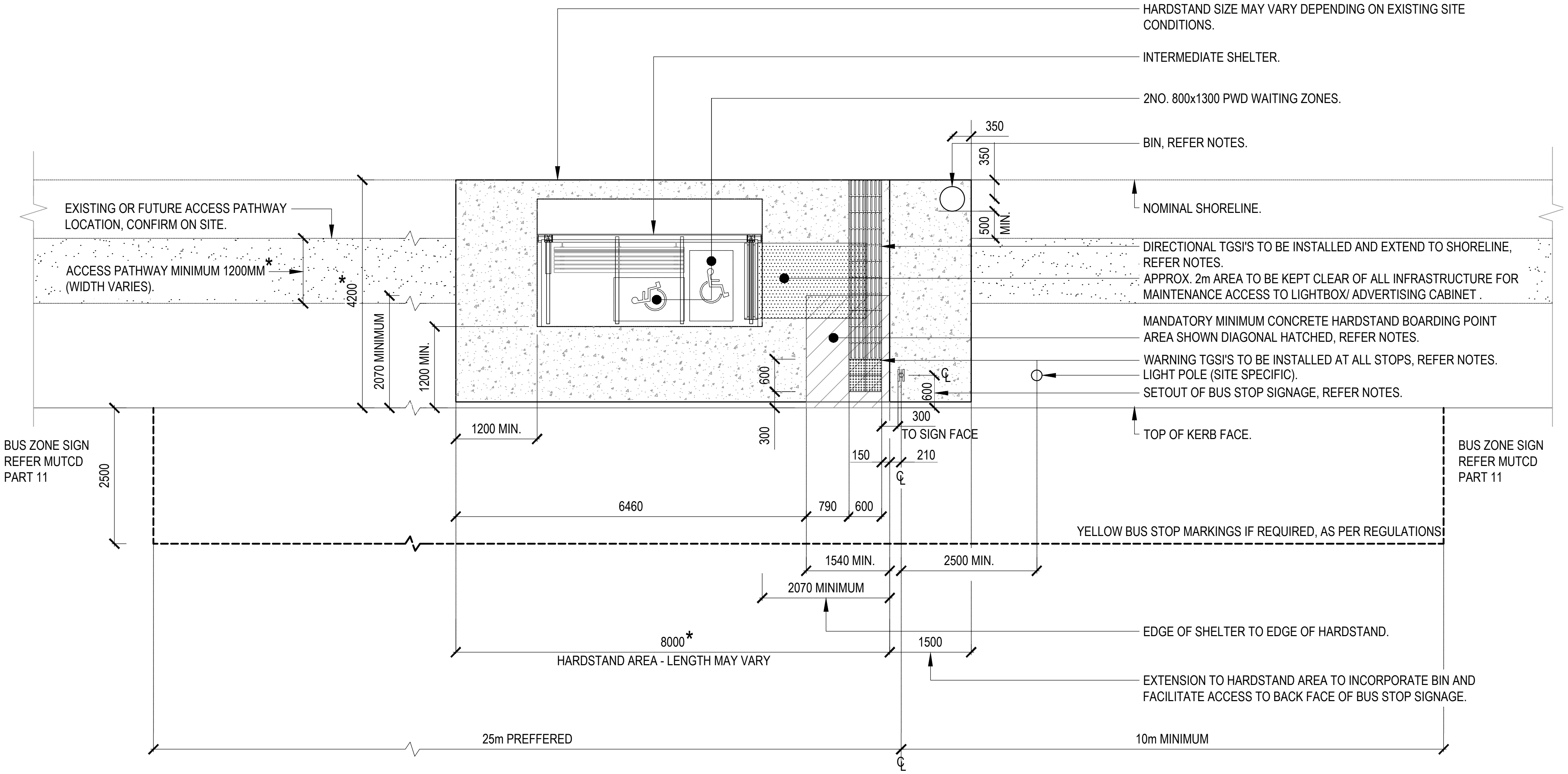
16 REFER TO PTIM GLOSSARY FOR DEFINITIONS OF TERMS AND PTIM ABBREVIATIONS FOR DEFINITIONS OF ACRONYMS.

17 ALL DRAWING DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.

* DIMENSION TO BE CONFIRMED ON SITE IN RELATION TO SITE CONDITIONS.



1 - KEY PLAN
1:500@A3



2 - SITE LAYOUT PLAN
1:100@A3

TRANSLink | Queensland Government

PTIM, BUS STOP INFRASTRUCTURE CHAPTER INTERMEDIATE STOP - SITE LAYOUT - WITHOUT INDENTED BUS BAY	
SCALE : AS SHOWN	DRG 5-0021
DRAWN : - DATE : JULY 2013	A

NOTES:

HARDSTAND

1 THE MANDATORY (COMPLIANT TO DSAPT) MINIMUM BOARDING POINT HARDSTAND AREA IS 1540MM X 2070MM, POSITIONED AS SHOWN ON THE TRANSLINK DRAWINGS. A LARGER HARDSTAND AREA IS PREFERRED AND IS DEPENDENT ON SITE SPECIFIC CONDITIONS.

2 THE MANDATORY LONGITUDINAL AND CROSS FALL GRADIENT AT BOARDING POINT IS MAXIMUM 1:40 FALL ACROSS THE BOARDING POINT AREA (SHOWN HATCHED). ALL OTHER HARDSTAND AND ADJACENT AREAS TO THE BUS STOP SHALL MEET APPLICABLE STANDARDS IN RELATION TO THE ADJACENT SITE CONDITIONS, AND TO PREFERABLY ACHIEVE A LONGITUDINAL AND CROSS FALL GRADIENT OF MAXIMUM 1:40 FALL.

3 HARDSTANDS SHALL BE MINIMUM 125MM THICK BROOM FINISHED (FOR SLIP RESISTANCE) GRADE N25 CONCRETE SL72 MESH PLACED CENTRALLY, OR, AS REQUIRED BY THE RELEVANT STATUTORY AUTHORITY. FOR SLAB THICKENING AT FURNITURE LOCATIONS, AND JOINT LAYOUT AND SPECIFICATIONS REFER TO LOCAL GOVERNMENT SPECIFIC REQUIREMENTS.

4 A CLEAR HARDSTAND ACCESS SPACE OF 1200MM MINIMUM IS REQUIRED BETWEEN AND AROUND ALL BUS STOP INFRASTRUCTURE (1500MM DESIRABLE).

ACCESS

5 WHERE BUS STOPS ARE LOCATED ALONG BICYCLE ROUTES, SHARED ACCESS PATHS SHOULD BE APPLIED AS PER LOCAL GOVERNMENT REQUIREMENTS OR WITH REFERENCE TO RELEVANT GUIDELINE DIMENSIONS GIVEN IN THE APPLICABLE STANDARDS, TMR GUIDELINES, AND AUSTROADS.

6 CIRCULATION OF WHEELCHAIRS SHOULD BE CONSIDERED AT EACH BUS STOP BASED ON SITE SPECIFIC CONDITIONS AND TO ADDRESS COMPLIANCE WITH DSAPT. LINE-MARKING OF THE 2No. ALLOCATED SPACES (PWD WAITING ZONES) IS NOT REQUIRED.

7 TACTILE GROUND SURFACE INDICATORS (TGSI) SHOULD PREFERABLY BE INSTALLED AS SHOWN ON THE TRANSLINK DRAWINGS. WHERE THERE IS A PATHWAY ACCESSING A BUS STOP, DIRECTIONAL TGSI SHALL BE INSTALLED FOR THE FULL WIDTH OF THE PATH OF TRAVEL OVER A MINIMUM 600MM DEPTH AND PERPENDICULAR TO THE DIRECTION OF TRAVEL WHEN APPROACHING. DIRECTIONAL TGSI SHALL BE USED ACROSS THE OPEN SPACE FROM THE ACCESS PATHWAY DIRECTIONAL TGSI TO THE BOARDING POINT WARNING TGSI. TGSI TO EXTEND TO THE SHORELINE - I.E. BUILDING LINE, WALL, A FENCE, A KERB, OR A GRASS VERGE WHERE APPLICABLE.

8 THE COLOUR OF TGSI SHALL BE SELECTED BASED ON SITE SPECIFIC REQUIREMENTS. INTEGRATED TGSI SHALL HAVE A MINIMUM COLOUR CONTRAST OF 30% COMPARED TO THE AMOUNT OF LIGHT REFLECTED FROM THE SURFACE OF THE ADJACENT PATH OF TRAVEL. FOR EXAMPLE; FOR A LIGHT CONCRETE COLOURED PATH OF TRAVEL, DARK COLOURED (E.G. BLACK) TGSI MAY BE APPROPRIATE. FOR A BLACK BITUMEN PATH OF TRAVEL LIGHT COLOURED (E.G. WHITE OR YELLOW) TGSI MAY BE APPROPRIATE. THIS CONTRAST MUST BE MAINTAINED IN BOTH WET AND DRY CONDITIONS.

SHELTER

9 FOR OPTIONS OF SHELTER TYPES FOR INTERMEDIATE AND PREMIUM STOPS REFER TO TRANSLINK DRAWINGS. WHERE A SHELTER ABUTS A CONTINUOUS ACCESSIBLE PATH OF TRAVEL, ENSURE MINIMUM 30% LUMINANCE CONTRAST AGAINST BACKGROUND (E.G. FLOORING).

FURNITURE & SIGNAGE

10 FOR DETAILS OF BUS STOP SIGNAGE (J-POLE/BLADE) AND FOOTING DETAILS REFER TO TRANSLINK SIGNAGE MANUAL.

11 SETOUT OF BLADE SIGN (REFER TO THE PREMIUM STOP TRANSLINK DRAWING) IS POSITIONED AS SHOWN DUE TO BUS STOP OPERATIONS, AND ROAD SAFETY REQUIREMENTS AND IS NON-COMPLIANT WITH DSAPT. PLEASE LIAISE WITH TRANSLINK FOR DETAILS ON THIS REQUIREMENT.

12 BUS STOP SEAT SHOULD INCLUDE ANODISED ALUMINIUM BATTENS WITH ARMRESTS ALONG THE SEAT. SEATS SHOULD BE BOLTED TO HARDSTAND AREA, AND MADE FROM EASILY MAINTAINED MATERIALS. SEATS TO BE COMPLIANT WITH DSAPT. WHERE A SEAT ABUTS A CONTINUOUS ACCESSIBLE PATH OF TRAVEL, ENSURE MINIMUM 30% LUMINANCE CONTRAST AGAINST BACKGROUND (E.G. FLOORING).

13 BUS STOP BIN SHOULD BE AN 80 LITRE CIRCULAR CONSTRUCTION (SMALL SLOT PERFORATIONS) WHICH CAN BE EASILY MAINTAINED. BIN SHOULD INCLUDE A GALVANISED STEEL LINER AND A BIRD-PROOF LID. WHERE BIN ABUTS A CONTINUOUS ACCESSIBLE PATH OF TRAVEL ENSURE MINIMUM 30% LUMINANCE CONTRAST AGAINST BACKGROUND (E.G. FLOORING). BIN TO BE MINIMUM 500MM SETBACK FROM ACCESS PATHWAY.

ADDITIONAL REQUIREMENTS

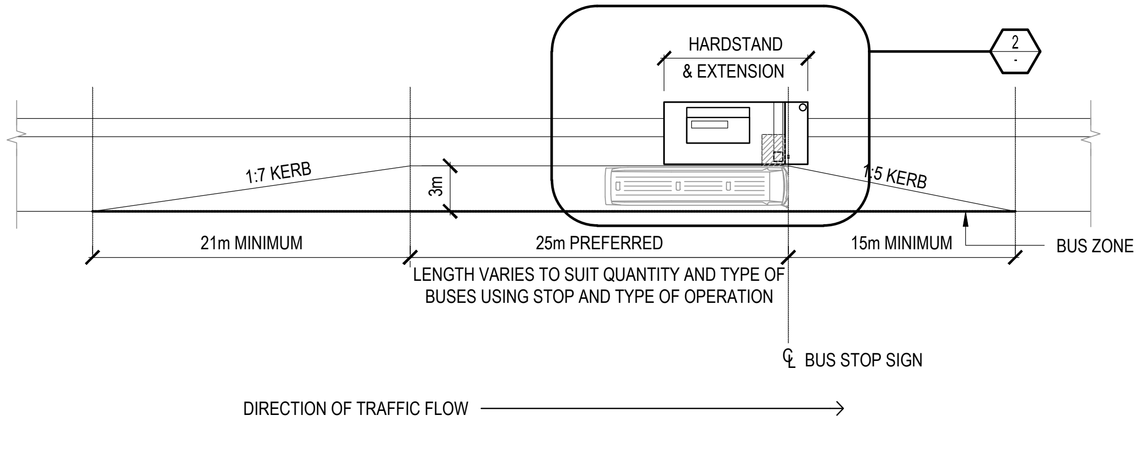
14 ALL BUS STOPS TO BE DSAPT COMPLIANT. FOR FURTHER GUIDANCE REFER TO THE RELEVANT STANDARDS, TRANSLINK GUIDANCE AND RELEVANT LOCAL GOVERNMENT REQUIREMENTS.

15 ALL BUS STOP COMPONENTS SHOULD BE POSITIONED IN CONSIDERATION OF RELEVANT ONSITE CONDITIONS WITH REFERENCE TO THE GUIDANCE CONTAINED WITHIN THE PTIM, AND FOR ADDITIONAL REQUIREMENTS AND DESIGN ALTERNATIVES REFER TO THE COMPONENTS TABLE CONTAINED IN THE PTIM.

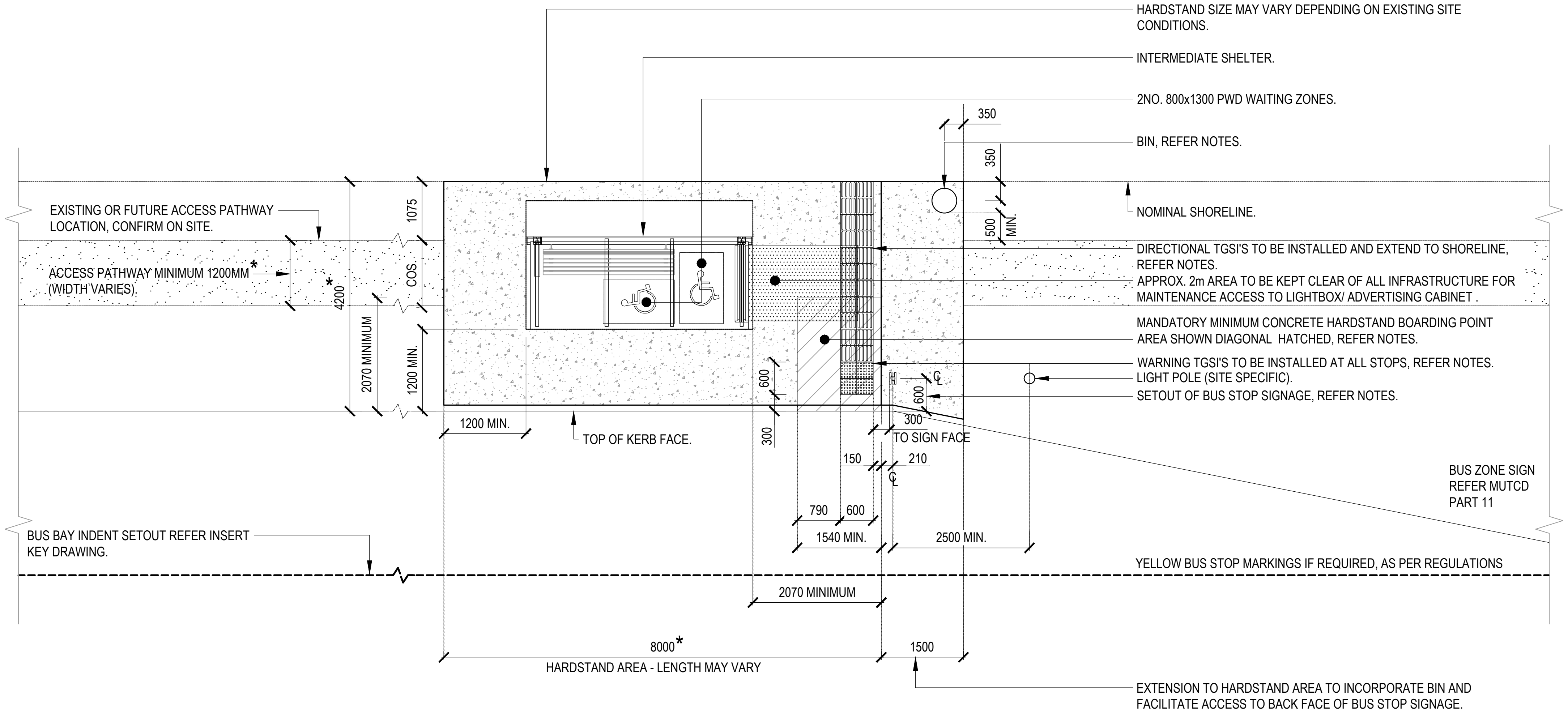
16 REFER TO PTIM GLOSSARY FOR DEFINITIONS OF TERMS AND PTIM ABBREVIATIONS FOR DEFINITIONS OF ACRONYMS.

17 ALL DRAWING DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.

* DIMENSION TO BE CONFIRMED ON SITE IN RELATION TO SITE CONDITIONS.



1 KEY PLAN
1:500@A3



2 SITE LAYOUT PLAN
1:100@A3

Queensland Government

PTIM, BUS STOP INFRASTRUCTURE CHAPTER INTERMEDIATE STOP - SITE LAYOUT - WITH INDENTED BUS BAY			
SCALE :	AS SHOWN		DRG 5-0022
DRAWN :	-	DATE : JULY 2013	A

NOTES:

HARDSTAND

1 THE MANDATORY (COMPLIANT TO DSAPT) MINIMUM BOARDING POINT HARDSTAND AREA IS 1540MM X 2070MM, POSITIONED AS SHOWN ON THE TRANSLINK DRAWINGS. A LARGER HARDSTAND AREA IS PREFERRED AND IS DEPENDENT ON SITE SPECIFIC CONDITIONS.

2 THE MANDATORY LONGITUDINAL AND CROSS FALL GRADIENT AT BOARDING POINT IS MAXIMUM 1:40 FALL ACROSS THE BOARDING POINT AREA (SHOWN HATCHED). ALL OTHER HARDSTAND AND ADJACENT AREAS TO THE BUS STOP SHALL MEET APPLICABLE STANDARDS IN RELATION TO THE ADJACENT SITE CONDITIONS, AND TO PREFERABLY ACHIEVE A LONGITUDINAL AND CROSS FALL GRADIENT OF MAXIMUM 1:40 FALL.

3 HARDSTANDS SHALL BE MINIMUM 125MM THICK BROOM FINISHED (FOR SLIP RESISTANCE) GRADE N25 CONCRETE SL72 MESH PLACED CENTRALLY, OR, AS REQUIRED BY THE RELEVANT STATUTORY AUTHORITY. FOR SLAB THICKENING AT FURNITURE LOCATIONS, AND JOINT LAYOUT AND SPECIFICATIONS REFER TO LOCAL GOVERNMENT SPECIFIC REQUIREMENTS.

4 A CLEAR HARDSTAND ACCESS SPACE OF 1200MM MINIMUM IS REQUIRED BETWEEN AND AROUND ALL BUS STOP INFRASTRUCTURE (1500MM DESIRABLE).

ACCESS

5 WHERE BUS STOPS ARE LOCATED ALONG BICYCLE ROUTES, SHARED ACCESS PATHS SHOULD BE APPLIED AS PER LOCAL GOVERNMENT REQUIREMENTS OR WITH REFERENCE TO RELEVANT GUIDELINE DIMENSIONS GIVEN IN THE APPLICABLE STANDARDS, TMR GUIDELINES, AND AUSTROADS.

6 CIRCULATION OF WHEELCHAIRS SHOULD BE CONSIDERED AT EACH BUS STOP BASED ON SITE SPECIFIC CONDITIONS AND TO ADDRESS COMPLIANCE WITH DSAPT. LINE-MARKING OF THE 2No. ALLOCATED SPACES (PWD WAITING ZONES) IS NOT REQUIRED.

7 TACTILE GROUND SURFACE INDICATORS (TGSI) SHOULD PREFERABLY BE INSTALLED AS SHOWN ON THE TRANSLINK DRAWINGS. WHERE THERE IS A PATHWAY ACCESSING A BUS STOP, DIRECTIONAL TGSI SHALL BE INSTALLED FOR THE FULL WIDTH OF THE PATH OF TRAVEL OVER A MINIMUM 600MM DEPTH AND PERPENDICULAR TO THE DIRECTION OF TRAVEL WHEN APPROACHING. DIRECTIONAL TGSI SHALL BE USED ACROSS THE OPEN SPACE FROM THE ACCESS PATHWAY DIRECTIONAL TGSI TO THE BOARDING POINT WARNING TGSI. TGSI TO EXTEND TO THE SHORELINE - I.E. BUILDING LINE, WALL, A FENCE, A KERB, OR A GRASS VERGE WHERE APPLICABLE.

8 THE COLOUR OF TGSI SHALL BE SELECTED BASED ON SITE SPECIFIC REQUIREMENTS. INTEGRATED TGSI SHALL HAVE A MINIMUM COLOUR CONTRAST OF 30% COMPARED TO THE AMOUNT OF LIGHT REFLECTED FROM THE SURFACE OF THE ADJACENT PATH OF TRAVEL. FOR EXAMPLE; FOR A LIGHT CONCRETE COLOURED PATH OF TRAVEL, DARK COLOURED (E.G. BLACK) TGSI MAY BE APPROPRIATE. FOR A BLACK BITUMEN PATH OF TRAVEL LIGHT COLOURED (E.G. WHITE OR YELLOW) TGSI MAY BE APPROPRIATE. THIS CONTRAST MUST BE MAINTAINED IN BOTH WET AND DRY CONDITIONS.

SHELTER

9 FOR OPTIONS OF SHELTER TYPES FOR INTERMEDIATE AND PREMIUM STOPS REFER TO TRANSLINK DRAWINGS. WHERE A SHELTER ABUTS A CONTINUOUS ACCESSIBLE PATH OF TRAVEL, ENSURE MINIMUM 30% LUMINANCE CONTRAST AGAINST BACKGROUND (E.G. FLOORING).

FURNITURE & SIGNAGE

10 FOR DETAILS OF BUS STOP SIGNAGE (J-POLE/BLADE) AND FOOTING DETAILS REFER TO TRANSLINK SIGNAGE MANUAL.

11 SETOUT OF BLADE SIGN (REFER TO THE PREMIUM STOP TRANSLINK DRAWING) IS POSITIONED AS SHOWN DUE TO BUS STOP OPERATIONS, AND ROAD SAFETY REQUIREMENTS AND IS NON-COMPLIANT WITH DSAPT. PLEASE LIAISE WITH TRANSLINK FOR DETAILS ON THIS REQUIREMENT.

12 BUS STOP SEAT SHOULD INCLUDE ANODISED ALUMINIUM BATTENS WITH ARMRESTS ALONG THE SEAT. SEATS SHOULD BE BOLTED TO HARDSTAND AREA, AND MADE FROM EASILY MAINTAINED MATERIALS. SEATS TO BE COMPLIANT WITH DSAPT. WHERE A SEAT ABUTS A CONTINUOUS ACCESSIBLE PATH OF TRAVEL, ENSURE MINIMUM 30% LUMINANCE CONTRAST AGAINST BACKGROUND (E.G. FLOORING).

13 BUS STOP BIN SHOULD BE AN 80 LITRE CIRCULAR CONSTRUCTION (SMALL SLOT PERFORATIONS) WHICH CAN BE EASILY MAINTAINED. BIN SHOULD INCLUDE A GALVANISED STEEL LINER AND A BIRD-PROOF LID. WHERE BIN ABUTS A CONTINUOUS ACCESSIBLE PATH OF TRAVEL ENSURE MINIMUM 30% LUMINANCE CONTRAST AGAINST BACKGROUND (E.G. FLOORING). BIN TO BE MINIMUM 500MM SETBACK FROM ACCESS PATHWAY.

ADDITIONAL REQUIREMENTS

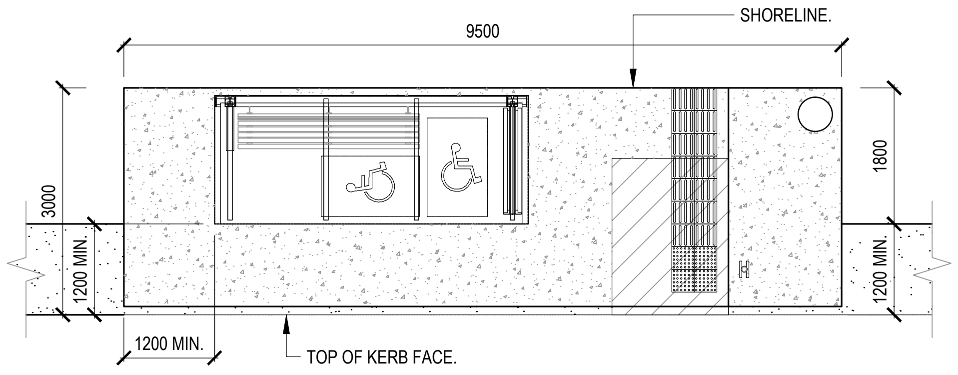
14 ALL BUS STOPS TO BE DSAPT COMPLIANT. FOR FURTHER GUIDANCE REFER TO THE RELEVANT STANDARDS, TRANSLINK GUIDANCE AND RELEVANT LOCAL GOVERNMENT REQUIREMENTS.

15 ALL BUS STOP COMPONENTS SHOULD BE POSITIONED IN CONSIDERATION OF RELEVANT ONSITE CONDITIONS WITH REFERENCE TO THE GUIDANCE CONTAINED WITHIN THE PTIM, AND FOR ADDITIONAL REQUIREMENTS AND DESIGN ALTERNATIVES REFER TO THE COMPONENTS TABLE CONTAINED IN THE PTIM.

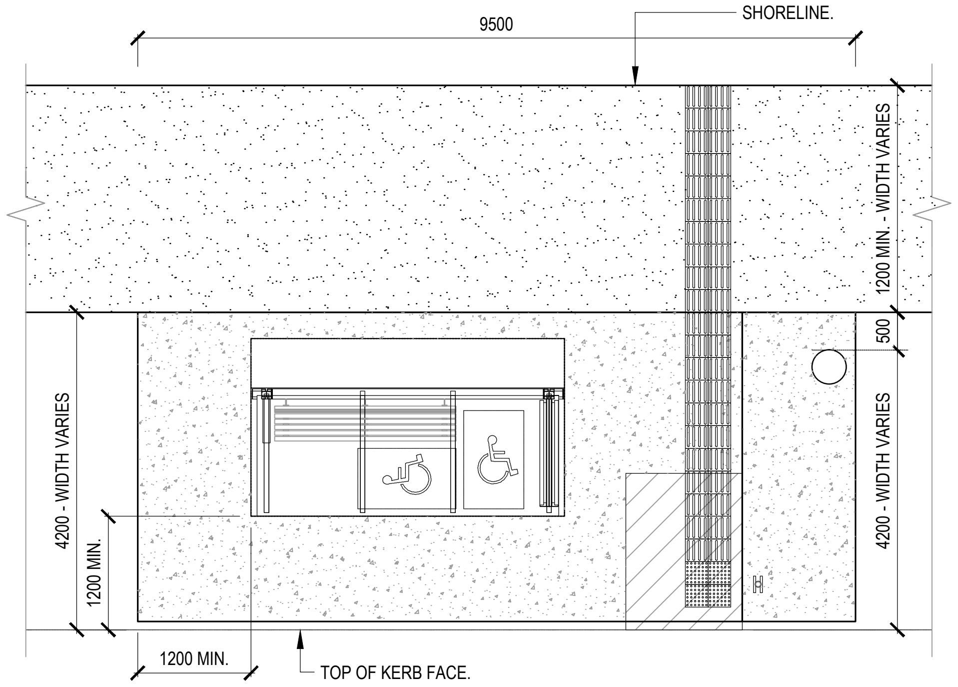
16 REFER TO PTIM GLOSSARY FOR DEFINITIONS OF TERMS AND PTIM ABBREVIATIONS FOR DEFINITIONS OF ACRONYMS.

17 ALL DRAWING DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.

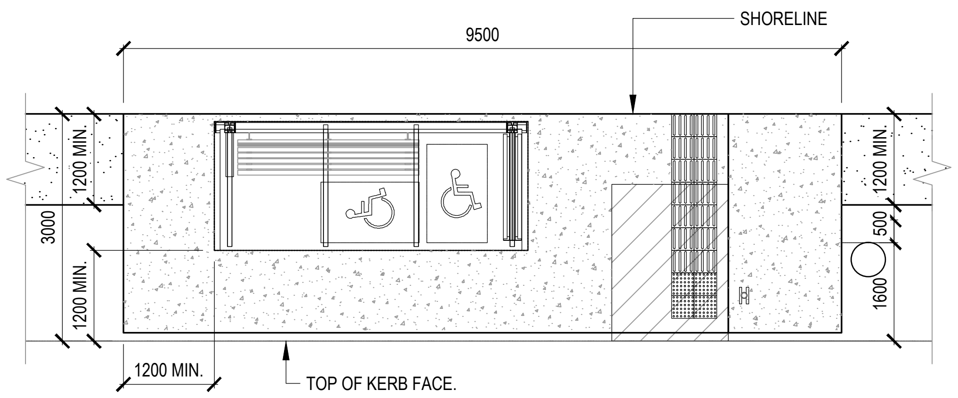
* DIMENSION TO BE CONFIRMED ON SITE IN RELATION TO SITE CONDITIONS.



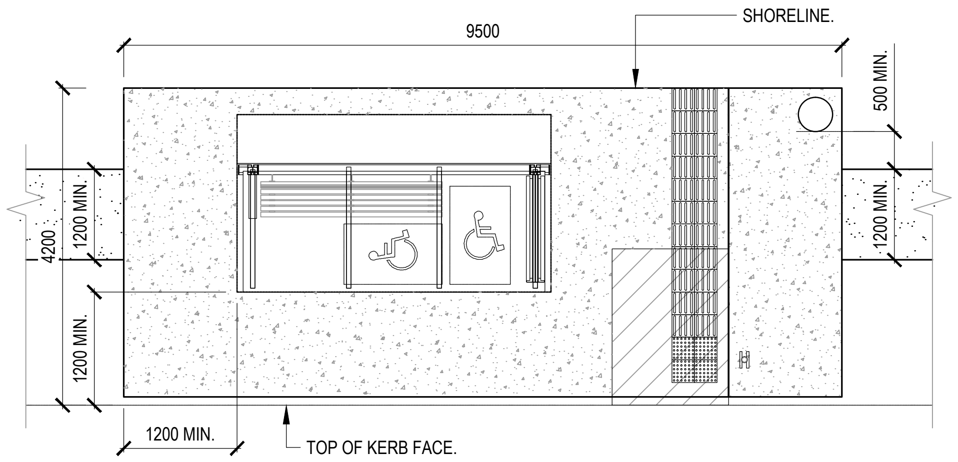
1 - CONSTRAINED SITE - FRONT/MID FOOTPATH
1:100@A3



3 - HARDSTAND - SHARED ACCESS PATH BEHIND/ TYPE 2 SHELTER
1:100@A3



2 - CONSTRAINED SITE - MID/BACK FOOTPATH/ TYPE 1 SHELTER
1:100@A3



4 - HARDSTAND - MID/BACK FOOTPATH/ TYPE 2 SHELTER
1:100@A3

TRANSLink | Queensland Government

PTIM, BUS STOP INFRASTRUCTURE CHAPTER
INTERMEDIATE STOP - SITE LAYOUT - ACCESS EXAMPLES

SCALE :	AS SHOWN		DRG 5-0025
DRAWN :	-	DATE : JULY 2013	A

NOTES:

HARDSTAND

1 THE MANDATORY (COMPLIANT TO DSAPT) MINIMUM BOARDING POINT HARDSTAND AREA IS 1540MM X 2070MM, POSITIONED AS SHOWN ON THE TRANSLINK DRAWINGS. A LARGER HARDSTAND AREA IS PREFERRED AND IS DEPENDENT ON SITE SPECIFIC CONDITIONS.

2 THE MANDATORY LONGITUDINAL AND CROSS FALL GRADIENT AT BOARDING POINT IS MAXIMUM 1:40 FALL ACROSS THE BOARDING POINT AREA (SHOWN HATCHED). ALL OTHER HARDSTAND AND ADJACENT AREAS TO THE BUS STOP SHALL MEET APPLICABLE STANDARDS IN RELATION TO THE ADJACENT SITE CONDITIONS, AND TO PREFERABLY ACHIEVE A LONGITUDINAL AND CROSS FALL GRADIENT OF MAXIMUM 1:40 FALL.

3 HARDSTANDS SHALL BE MINIMUM 125MM THICK BROOM FINISHED (FOR SLIP RESISTANCE) GRADE N25 CONCRETE SL72 MESH PLACED CENTRALLY, OR, AS REQUIRED BY THE RELEVANT STATUTORY AUTHORITY. FOR SLAB THICKENING AT FURNITURE LOCATIONS, AND JOINT LAYOUT AND SPECIFICATIONS REFER TO LOCAL GOVERNMENT SPECIFIC REQUIREMENTS.

4 A CLEAR HARDSTAND ACCESS SPACE OF 1200MM MINIMUM IS REQUIRED BETWEEN AND AROUND ALL BUS STOP INFRASTRUCTURE (1500MM DESIRABLE).

ACCESS

5 WHERE BUS STOPS ARE LOCATED ALONG BICYCLE ROUTES, SHARED ACCESS PATHS SHOULD BE APPLIED AS PER LOCAL GOVERNMENT REQUIREMENTS OR WITH REFERENCE TO RELEVANT GUIDELINE DIMENSIONS GIVEN IN THE APPLICABLE STANDARDS, TMR GUIDELINES, AND AUSTROADS.

6 CIRCULATION OF WHEELCHAIRS SHOULD BE CONSIDERED AT EACH BUS STOP BASED ON SITE SPECIFIC CONDITIONS AND TO ADDRESS COMPLIANCE WITH DSAPT. LINE-MARKING OF THE 2No. ALLOCATED SPACES (PWD WAITING ZONES) IS NOT REQUIRED.

7 TACTILE GROUND SURFACE INDICATORS (TGSI) SHOULD PREFERABLY BE INSTALLED AS SHOWN ON THE TRANSLINK DRAWINGS. WHERE THERE IS A PATHWAY ACCESSING A BUS STOP, DIRECTIONAL TGSI SHALL BE INSTALLED FOR THE FULL WIDTH OF THE PATH OF TRAVEL OVER A MINIMUM 600MM DEPTH AND PERPENDICULAR TO THE DIRECTION OF TRAVEL WHEN APPROACHING. DIRECTIONAL TGSI SHALL BE USED ACROSS THE OPEN SPACE FROM THE ACCESS PATHWAY DIRECTIONAL TGSI TO THE BOARDING POINT WARNING TGSI. TGSI TO EXTEND TO THE SHORELINE - I.E. BUILDING LINE, WALL, A FENCE, A KERB, OR A GRASS VERGE WHERE APPLICABLE.

8 THE COLOUR OF TGSI SHALL BE SELECTED BASED ON SITE SPECIFIC REQUIREMENTS. INTEGRATED TGSI SHALL HAVE A MINIMUM COLOUR CONTRAST OF 30% COMPARED TO THE AMOUNT OF LIGHT REFLECTED FROM THE SURFACE OF THE ADJACENT PATH OF TRAVEL. FOR EXAMPLE; FOR A LIGHT CONCRETE COLOURED PATH OF TRAVEL, DARK COLOURED (E.G. BLACK) TGSI MAY BE APPROPRIATE. FOR A BLACK BITUMEN PATH OF TRAVEL LIGHT COLOURED (E.G. WHITE OR YELLOW) TGSI MAY BE APPROPRIATE. THIS CONTRAST MUST BE MAINTAINED IN BOTH WET AND DRY CONDITIONS.

SHELTER

9 FOR OPTIONS OF SHELTER TYPES FOR INTERMEDIATE AND PREMIUM STOPS REFER TO TRANSLINK DRAWINGS. WHERE A SHELTER ABUTS A CONTINUOUS ACCESSIBLE PATH OF TRAVEL, ENSURE MINIMUM 30% LUMINANCE CONTRAST AGAINST BACKGROUND (E.G. FLOORING).

FURNITURE & SIGNAGE

10 FOR DETAILS OF BUS STOP SIGNAGE (J-POLE/BLADE) AND FOOTING DETAILS REFER TO TRANSLINK SIGNAGE MANUAL.

11 SETOUT OF BLADE SIGN (REFER TO THE PREMIUM STOP TRANSLINK DRAWING) IS POSITIONED AS SHOWN DUE TO BUS STOP OPERATIONS, AND ROAD SAFETY REQUIREMENTS AND IS NON-COMPLIANT WITH DSAPT. PLEASE LIAISE WITH TRANSLINK FOR DETAILS ON THIS REQUIREMENT.

12 BUS STOP SEAT SHOULD INCLUDE ANODISED ALUMINIUM BATTENS WITH ARMRESTS ALONG THE SEAT. SEATS SHOULD BE BOLTED TO HARDSTAND AREA, AND MADE FROM EASILY MAINTAINED MATERIALS. SEATS TO BE COMPLIANT WITH DSAPT. WHERE A SEAT ABUTS A CONTINUOUS ACCESSIBLE PATH OF TRAVEL, ENSURE MINIMUM 30% LUMINANCE CONTRAST AGAINST BACKGROUND (E.G. FLOORING).

13 BUS STOP BIN SHOULD BE AN 80 LITRE CIRCULAR CONSTRUCTION (SMALL SLOT PERFORATIONS) WHICH CAN BE EASILY MAINTAINED. BIN SHOULD INCLUDE A GALVANISED STEEL LINER AND A BIRD-PROOF LID. WHERE BIN ABUTS A CONTINUOUS ACCESSIBLE PATH OF TRAVEL ENSURE MINIMUM 30% LUMINANCE CONTRAST AGAINST BACKGROUND (E.G. FLOORING). BIN TO BE MINIMUM 500MM SETBACK FROM ACCESS PATHWAY.

ADDITIONAL REQUIREMENTS

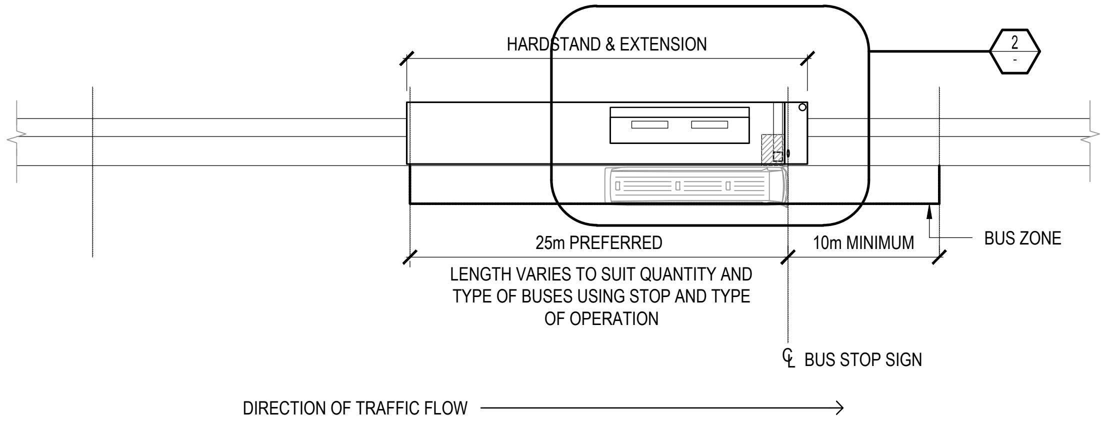
14 ALL BUS STOPS TO BE DSAPT COMPLIANT. FOR FURTHER GUIDANCE REFER TO THE RELEVANT STANDARDS, TRANSLINK GUIDANCE AND RELEVANT LOCAL GOVERNMENT REQUIREMENTS.

15 ALL BUS STOP COMPONENTS SHOULD BE POSITIONED IN CONSIDERATION OF RELEVANT ONSITE CONDITIONS WITH REFERENCE TO THE GUIDANCE CONTAINED WITHIN THE PTIM, AND FOR ADDITIONAL REQUIREMENTS AND DESIGN ALTERNATIVES REFER TO THE COMPONENTS TABLE CONTAINED IN THE PTIM.

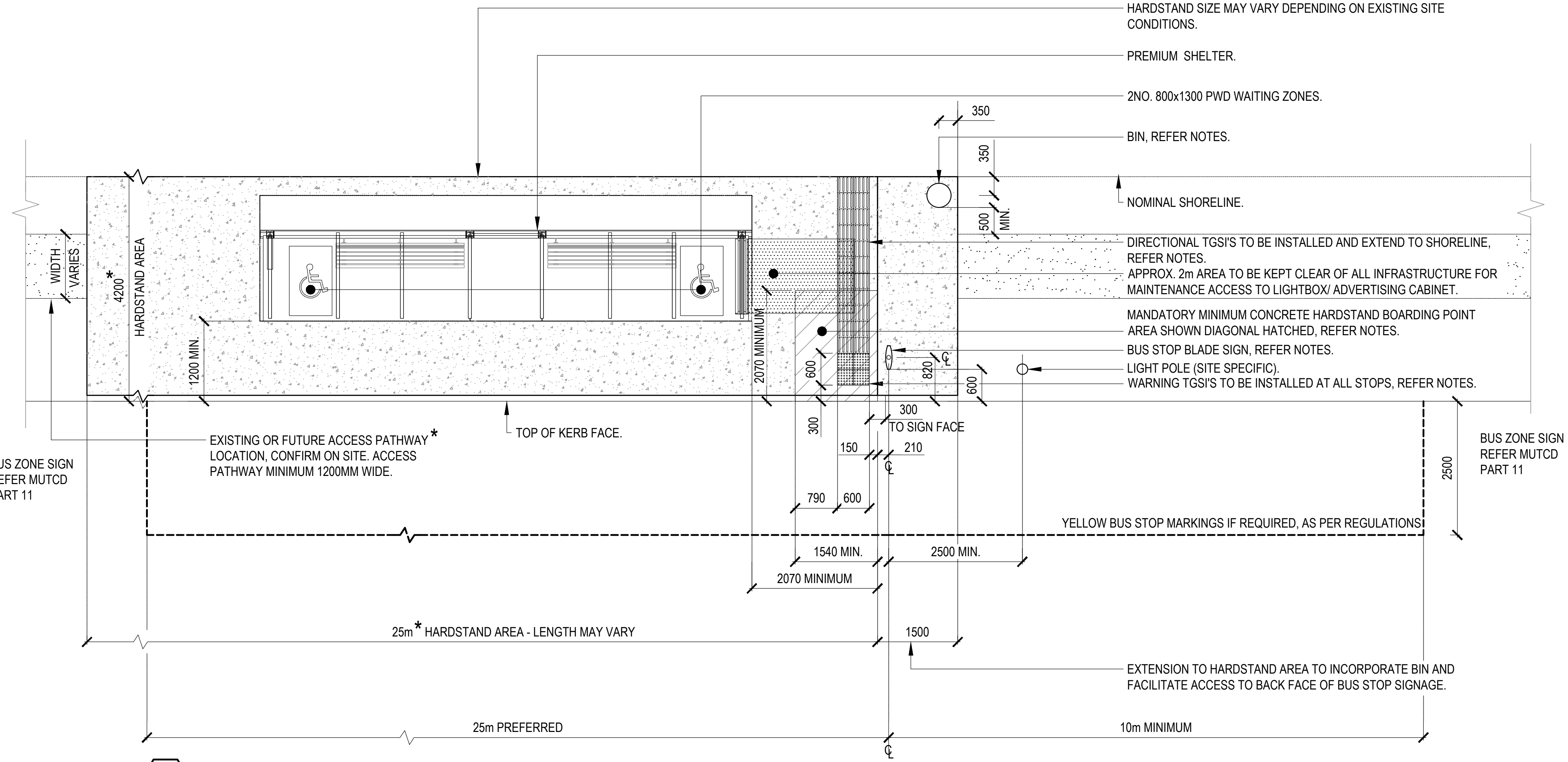
16 REFER TO PTIM GLOSSARY FOR DEFINITIONS OF TERMS AND PTIM ABBREVIATIONS FOR DEFINITIONS OF ACRONYMS.

17 ALL DRAWING DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.

* DIMENSION TO BE CONFIRMED ON SITE IN RELATION TO SITE CONDITIONS.



1 KEY PLAN
1:500@A3



2 SITE LAYOUT PLAN
1:100@A3

TRANSLink

Queensland Government

PTIM, BUS STOP INFRASTRUCTURE CHAPTER
PREMIUM STOP - SITE LAYOUT - WITHOUT INDENTED BUS BAY

SCALE :	AS SHOWN		DRG 5-0031
DRAWN :	-	DATE : JULY 2013	A

NOTES:

HARDSTAND

1 THE MANDATORY (COMPLIANT TO DSAPT) MINIMUM BOARDING POINT HARDSTAND AREA IS 1540MM X 2070MM, POSITIONED AS SHOWN ON THE TRANSLINK DRAWINGS. A LARGER HARDSTAND AREA IS PREFERRED AND IS DEPENDENT ON SITE SPECIFIC CONDITIONS.

2 THE MANDATORY LONGITUDINAL AND CROSS FALL GRADIENT AT BOARDING POINT IS MAXIMUM 1:40 FALL ACROSS THE BOARDING POINT AREA (SHOWN HATCHED). ALL OTHER HARDSTAND AND ADJACENT AREAS TO THE BUS STOP SHALL MEET APPLICABLE STANDARDS IN RELATION TO THE ADJACENT SITE CONDITIONS, AND TO PREFERABLY ACHIEVE A LONGITUDINAL AND CROSS FALL GRADIENT OF MAXIMUM 1:40 FALL.

3 HARDSTANDS SHALL BE MINIMUM 125MM THICK BROOM FINISHED (FOR SLIP RESISTANCE) GRADE N25 CONCRETE SL72 MESH PLACED CENTRALLY, OR, AS REQUIRED BY THE RELEVANT STATUTORY AUTHORITY. FOR SLAB THICKENING AT FURNITURE LOCATIONS, AND JOINT LAYOUT AND SPECIFICATIONS REFER TO LOCAL GOVERNMENT SPECIFIC REQUIREMENTS.

4 A CLEAR HARDSTAND ACCESS SPACE OF 1200MM MINIMUM IS REQUIRED BETWEEN AND AROUND ALL BUS STOP INFRASTRUCTURE (1500MM DESIRABLE).

ACCESS

5 WHERE BUS STOPS ARE LOCATED ALONG BICYCLE ROUTES, SHARED ACCESS PATHS SHOULD BE APPLIED AS PER LOCAL GOVERNMENT REQUIREMENTS OR WITH REFERENCE TO RELEVANT GUIDELINE DIMENSIONS GIVEN IN THE APPLICABLE STANDARDS, TMR GUIDELINES, AND AUSTROADS.

6 CIRCULATION OF WHEELCHAIRS SHOULD BE CONSIDERED AT EACH BUS STOP BASED ON SITE SPECIFIC CONDITIONS AND TO ADDRESS COMPLIANCE WITH DSAPT. LINE-MARKING OF THE 2No. ALLOCATED SPACES (PWD WAITING ZONES) IS NOT REQUIRED.

7 TACTILE GROUND SURFACE INDICATORS (TGSI) SHOULD PREFERABLY BE INSTALLED AS SHOWN ON THE TRANSLINK DRAWINGS. WHERE THERE IS A PATHWAY ACCESSING A BUS STOP, DIRECTIONAL TGSI SHALL BE INSTALLED FOR THE FULL WIDTH OF THE PATH OF TRAVEL OVER A MINIMUM 600MM DEPTH AND PERPENDICULAR TO THE DIRECTION OF TRAVEL WHEN APPROACHING. DIRECTIONAL TGSI SHALL BE USED ACROSS THE OPEN SPACE FROM THE ACCESS PATHWAY DIRECTIONAL TGSI TO THE BOARDING POINT WARNING TGSI. TGSI TO EXTEND TO THE SHORELINE - I.E. BUILDING LINE, WALL, A FENCE, A KERB, OR A GRASS VERGE WHERE APPLICABLE.

8 THE COLOUR OF TGSI SHALL BE SELECTED BASED ON SITE SPECIFIC REQUIREMENTS. INTEGRATED TGSI SHALL HAVE A MINIMUM COLOUR CONTRAST OF 30% COMPARED TO THE AMOUNT OF LIGHT REFLECTED FROM THE SURFACE OF THE ADJACENT PATH OF TRAVEL. FOR EXAMPLE; FOR A LIGHT CONCRETE COLOURED PATH OF TRAVEL, DARK COLOURED (E.G. BLACK) TGSI MAY BE APPROPRIATE. FOR A BLACK BITUMEN PATH OF TRAVEL LIGHT COLOURED (E.G. WHITE OR YELLOW) TGSI MAY BE APPROPRIATE. THIS CONTRAST MUST BE MAINTAINED IN BOTH WET AND DRY CONDITIONS.

SHELTER

9 FOR OPTIONS OF SHELTER TYPES FOR INTERMEDIATE AND PREMIUM STOPS REFER TO TRANSLINK DRAWINGS. WHERE A SHELTER ABUTS A CONTINUOUS ACCESSIBLE PATH OF TRAVEL, ENSURE MINIMUM 30% LUMINANCE CONTRAST AGAINST BACKGROUND (E.G. FLOORING).

FURNITURE & SIGNAGE

10 FOR DETAILS OF BUS STOP SIGNAGE (J-POLE/BLADE) AND FOOTING DETAILS REFER TO TRANSLINK SIGNAGE MANUAL.

11 SETOUT OF BLADE SIGN (REFER TO THE PREMIUM STOP TRANSLINK DRAWING) IS POSITIONED AS SHOWN DUE TO BUS STOP OPERATIONS, AND ROAD SAFETY REQUIREMENTS AND IS NON-COMPLIANT WITH DSAPT. PLEASE LIAISE WITH TRANSLINK FOR DETAILS ON THIS REQUIREMENT.

12 BUS STOP SEAT SHOULD INCLUDE ANODISED ALUMINIUM BATTENS WITH ARMRESTS ALONG THE SEAT. SEATS SHOULD BE BOLTED TO HARDSTAND AREA, AND MADE FROM EASILY MAINTAINED MATERIALS. SEATS TO BE COMPLIANT WITH DSAPT. WHERE A SEAT ABUTS A CONTINUOUS ACCESSIBLE PATH OF TRAVEL, ENSURE MINIMUM 30% LUMINANCE CONTRAST AGAINST BACKGROUND (E.G. FLOORING).

13 BUS STOP BIN SHOULD BE AN 80 LITRE CIRCULAR CONSTRUCTION (SMALL SLOT PERFORATIONS) WHICH CAN BE EASILY MAINTAINED. BIN SHOULD INCLUDE A GALVANISED STEEL LINER AND A BIRD-PROOF LID. WHERE BIN ABUTS A CONTINUOUS ACCESSIBLE PATH OF TRAVEL ENSURE MINIMUM 30% LUMINANCE CONTRAST AGAINST BACKGROUND (E.G. FLOORING). BIN TO BE MINIMUM 500MM SETBACK FROM ACCESS PATHWAY.

ADDITIONAL REQUIREMENTS

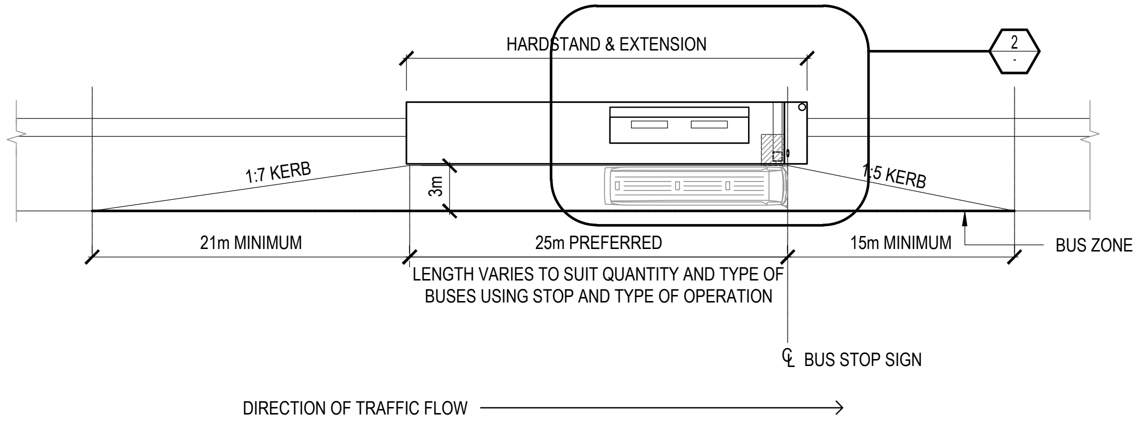
14 ALL BUS STOPS TO BE DSAPT COMPLIANT. FOR FURTHER GUIDANCE REFER TO THE RELEVANT STANDARDS, TRANSLINK GUIDANCE AND RELEVANT LOCAL GOVERNMENT REQUIREMENTS.

15 ALL BUS STOP COMPONENTS SHOULD BE POSITIONED IN CONSIDERATION OF RELEVANT ONSITE CONDITIONS WITH REFERENCE TO THE GUIDANCE CONTAINED WITHIN THE PTIM, AND FOR ADDITIONAL REQUIREMENTS AND DESIGN ALTERNATIVES REFER TO THE COMPONENTS TABLE CONTAINED IN THE PTIM.

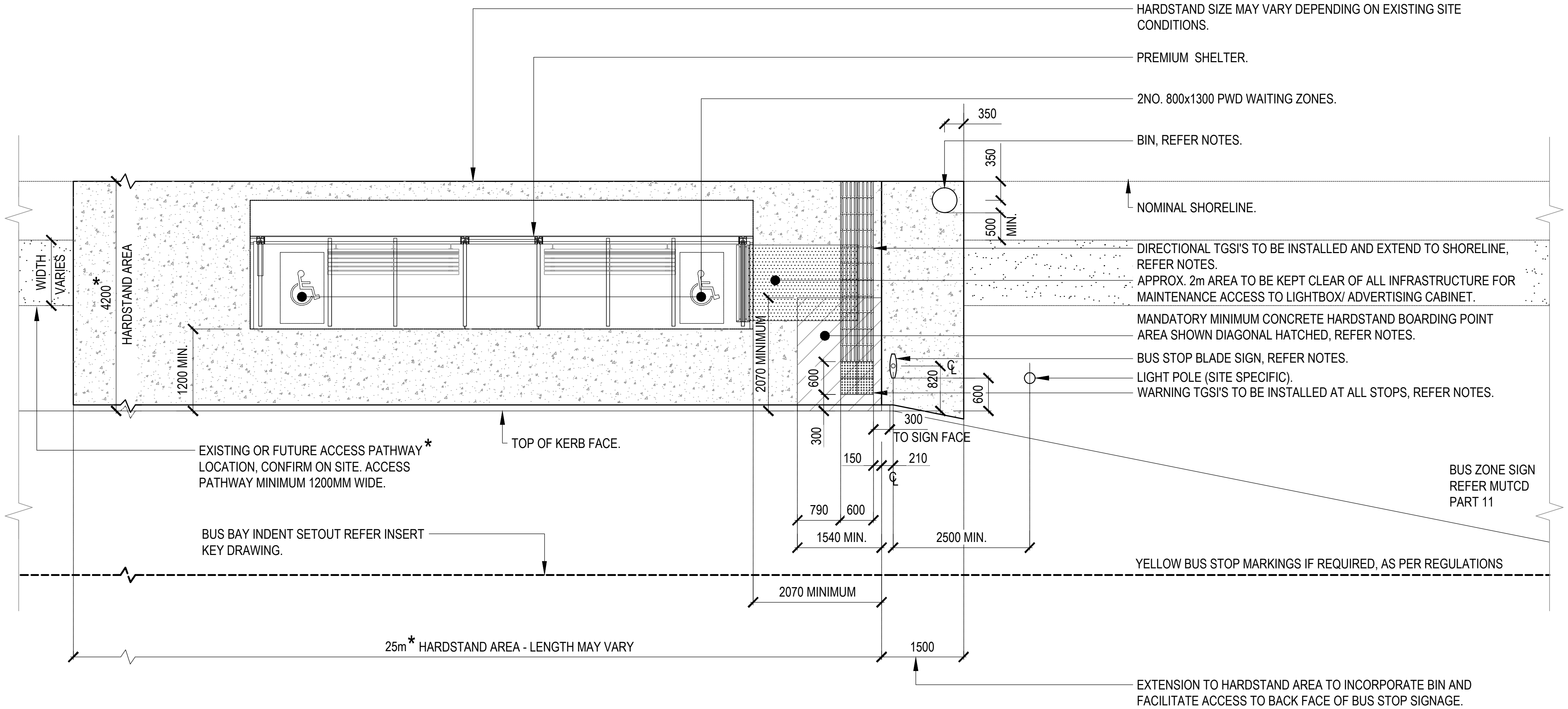
16 REFER TO PTIM GLOSSARY FOR DEFINITIONS OF TERMS AND PTIM ABBREVIATIONS FOR DEFINITIONS OF ACRONYMS.

17 ALL DRAWING DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.

* DIMENSION TO BE CONFIRMED ON SITE IN RELATION TO SITE CONDITIONS.



1 KEY PLAN
1:500@A3

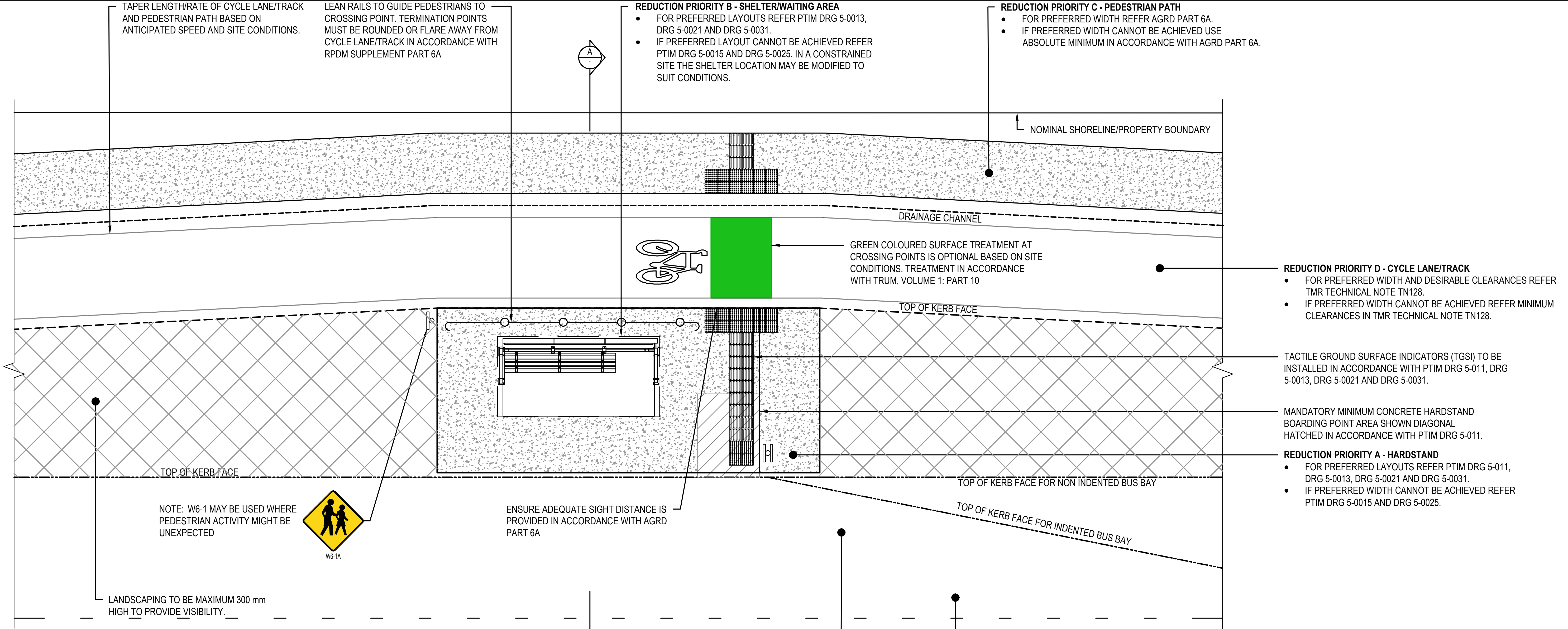


2 SITE LAYOUT PLAN
1:100@A3

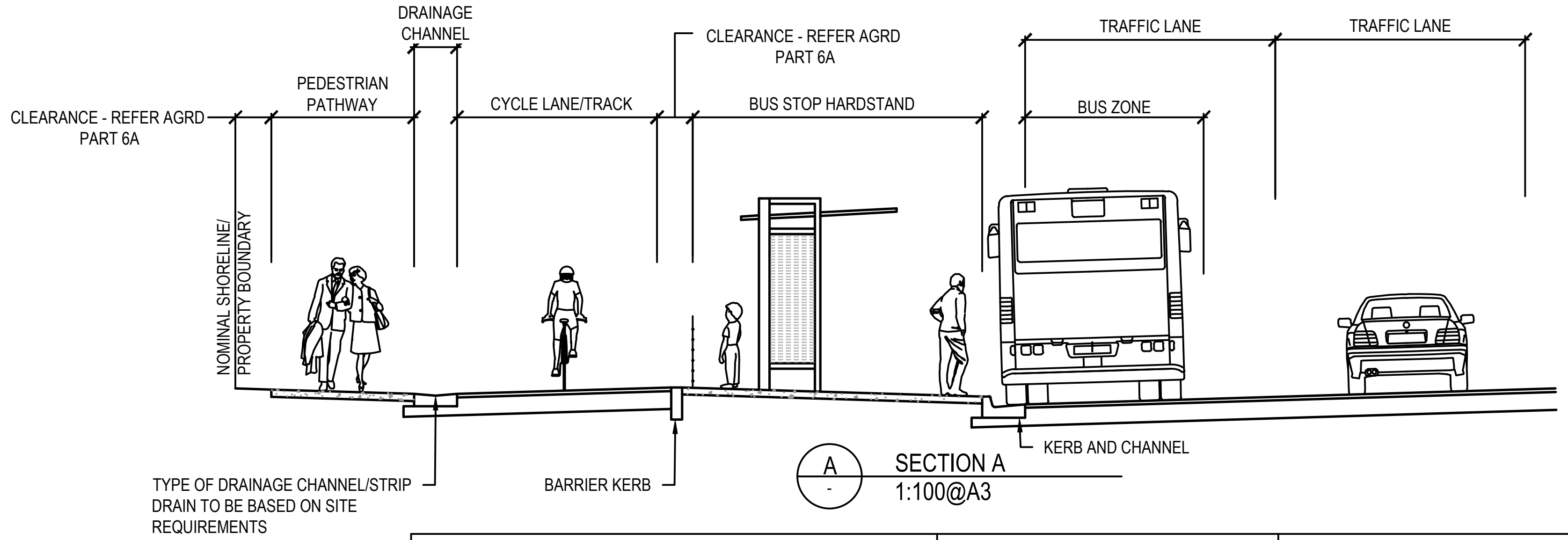
TRANSLink | Queensland Government

PTIM, BUS STOP INFRASTRUCTURE CHAPTER
PREMIUM STOP - SITE LAYOUT - WITH INDENTED BUS BAY

SCALE :	AS SHOWN		DRG 5-0032
DRAWN :	-	DATE : JULY 2013	A



1
SITE LAYOUT PLAN
1:100@A3



A
SECTION A
1:100@A3

NOTES:

GENERAL

1. ANY REDUCTION OF INFRASTRUCTURE ELEMENTS SHOULD BE CONSIDERED IN THE FOLLOWING ORDER
   - A) ALTERNATIVE HARDSTAND CONFIGURATION
   - B) ALTERNATIVE POSITION OF SHELTER/WAITING AREA
   - C) REDUCTION IN WIDTH OF PEDESTRIAN PATH
   - D) REDUCTION IN WIDTH OF CYCLE LANE/TRACK
   - E) REDUCTION IN WIDTH OF TRAFFIC LANE
2. ANY REDUCTION IN INFRASTRUCTURE ELEMENTS MUST NOT COMPROMISE ACCESS REQUIREMENTS AS DETAILED IN THE COMMONWEALTH DISABILITY STANDARDS FOR ACCESSIBLE PUBLIC TRANSPORT 2002.
3. ALL COMPONENTS SHALL COMPLY TO RELEVANT LOCAL COUNCIL STANDARDS.
4. IF THE LAYOUT SHOWN ON THIS DRAWING CANNOT BE ACHIEVED DUE TO SITE CONSTRAINTS REFER PTIM DRG SK 0403.
5. ONE-WAY CYCLE TRACKS ON EACH SIDE OF THE ROAD IS PREFERRED. IF THIS CANNOT BE ACHIEVED, THIS LAYOUT CAN BE MODIFIED TO SUIT A TWO-WAY CYCLE TRACK IN ACCORDANCE WITH CURRENT STANDARDS.

SHELTER/WAITING AREA

6. FOR OPTIONS OF SHELTER/WAITING AREA TYPES REFER PTIM DRG 5-0100.
7. SHELTER MUST NOT IMPEDE SIGHT LINES THROUGH BUS STOP AREA. CONSIDER SHELTER TYPES SIMILAR TO THE SUBURBAN SHELTER SHOWN IN PTIM DRG 5-0402.

CYCLE LANE/TRACK

8. CYCLE LANE/TRACK TO BE CONSTRUCTED WITH AC WEARING COURSE.

PEDESTRIAN PATH

9. PEDESTRIAN PATH TO BE CONCRETE AND CONSTRUCTED IN ACCORDANCE WITH TMR/LOCAL COUNCIL REQUIREMENT.

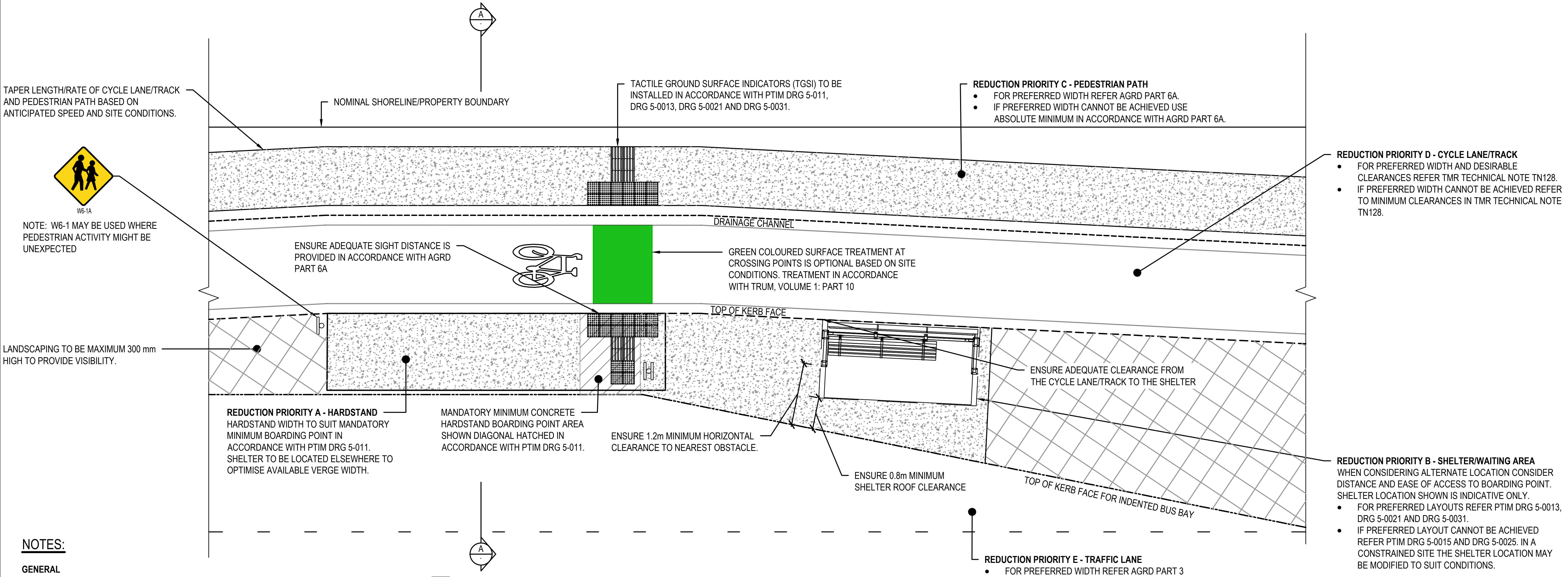
DRAINAGE

10. DRAINAGE PITS ARE TO BE LOCATED BASED ON SITE CONDITIONS TO MINIMISE FLOW WIDTHS AT CROSSING POINTS.
11. DRAINAGE TO BE CONSIDERED TO ENSURE FLOW WIDTHS ARE NOT EXCEEDED AND FLOWS ARE NOT CONCENTRATED ACROSS CYCLE LANE.

TRANSLink | Queensland Government

PTIM, BUS STOP INFRASTRUCTURE CHAPTER
CYCLE LANE/TRACK BEHIND BUS STOP

SCALE : AS SHOWN		DRG 5-0041	
DRAWN : -	DATE : SEPTEMBER 2019	A	



1 - CONSTRAINED SITE - ALTERNATIVE SHELTER LOCATION
1:100@A3

NOTES:

GENERAL

1. THIS LAYOUT SHOULD ONLY BE CONSIDERED IF THE LAYOUT SHOWN ON PTIM DRG SK 0401 CANNOT BE ACHIEVED DUE TO SITE CONSTRAINTS.
2. ANY REDUCTION OF INFRASTRUCTURE ELEMENTS SHOULD BE CONSIDERED IN THE FOLLOWING ORDER
   - A) ALTERNATIVE HARDSTAND CONFIGURATION
   - B) ALTERNATIVE POSITION OF SHELTER/WAITING AREA
   - C) REDUCTION IN WIDTH OF PEDESTRIAN PATH
   - D) REDUCTION IN WIDTH OF CYCLE LANE/TRACK
   - E) REDUCTION IN WIDTH OF TRAFFIC LANE
3. ANY REDUCTION IN INFRASTRUCTURE ELEMENTS MUST NOT COMPROMISE ACCESS REQUIREMENTS AS DETAILED IN THE COMMONWEALTH DISABILITY STANDARDS FOR ACCESSIBLE PUBLIC TRANSPORT 2002.
4. ALL COMPONENTS SHALL COMPLY TO RELEVANT LOCAL COUNCIL STANDARDS.
5. ONE-WAY CYCLE TRACKS ON EACH SIDE OF THE ROAD IS PREFERRED. IF THIS CANNOT BE ACHIEVED, THIS LAYOUT CAN BE MODIFIED TO SUIT A TWO-WAY CYCLE TRACK IN ACCORDANCE WITH CURRENT STANDARDS.

SHELTER/WAITING AREA

6. FOR OPTIONS OF SHELTER/WAITING AREA TYPES REFER PTIM DRG 5-0100.
7. SHELTER MUST NOT IMPEDE SIGHT LINES THROUGH BUS STOP AREA. CONSIDER SHELTER TYPES SIMILAR TO THE SUBURBAN SHELTER SHOWN IN PTIM DRG 5-0402.
8. LEAN RAILS TO GUIDE PEDESTRIANS TO CROSSING POINT MAY BE ADDED ALONG THE HARDSTAND IF HIGH VOLUMES OF PEDESTRIANS ARE EXPECTED. TERMINATION POINTS MUST BE ROUNDED OR FLARE AWAY FROM SHARED PATH IN ACCORDANCE WITH RPDM SUPPLEMENT PART 6A.

CYCLE LANE/TRACK

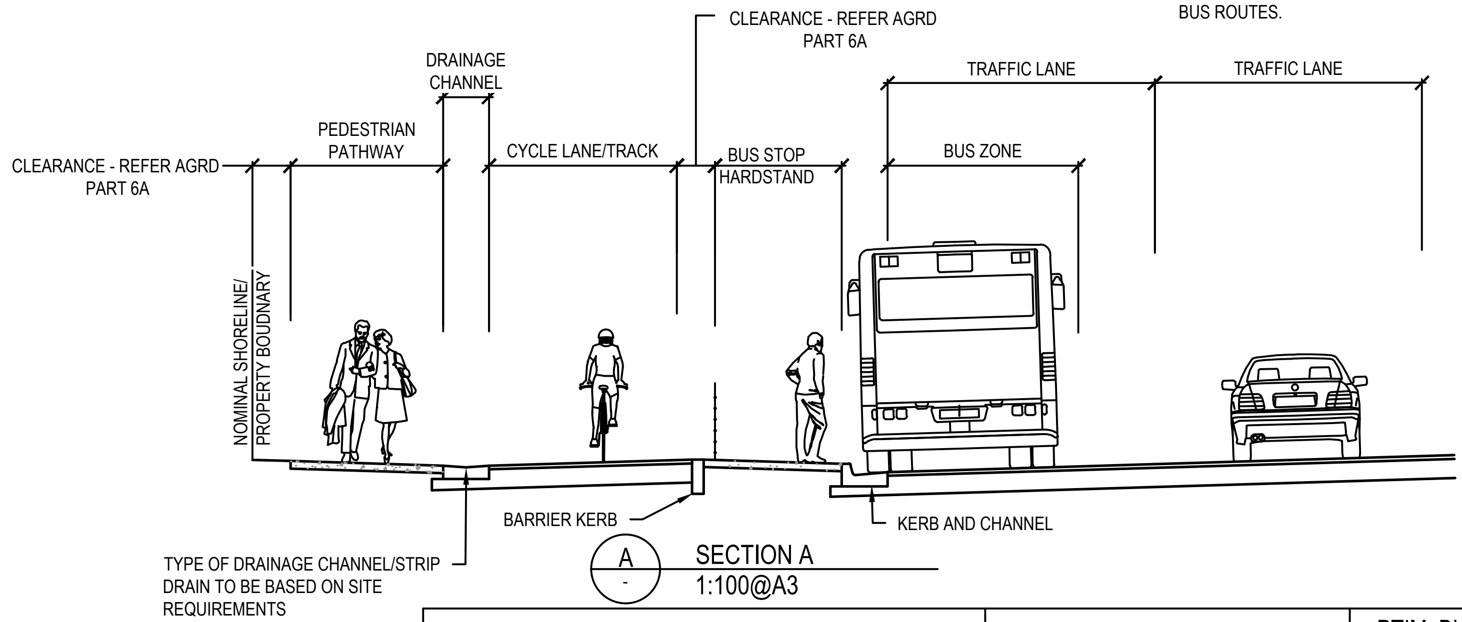
9. CYCLE LANE/TRACK TO BE CONSTRUCTED WITH AC WEARING COURSE.

PEDESTRIAN PATH

10. PEDESTRIAN PATH TO BE CONCRETE AND CONSTRUCTED IN ACCORDANCE WITH TMR/LOCAL COUNCIL REQUIREMENT.

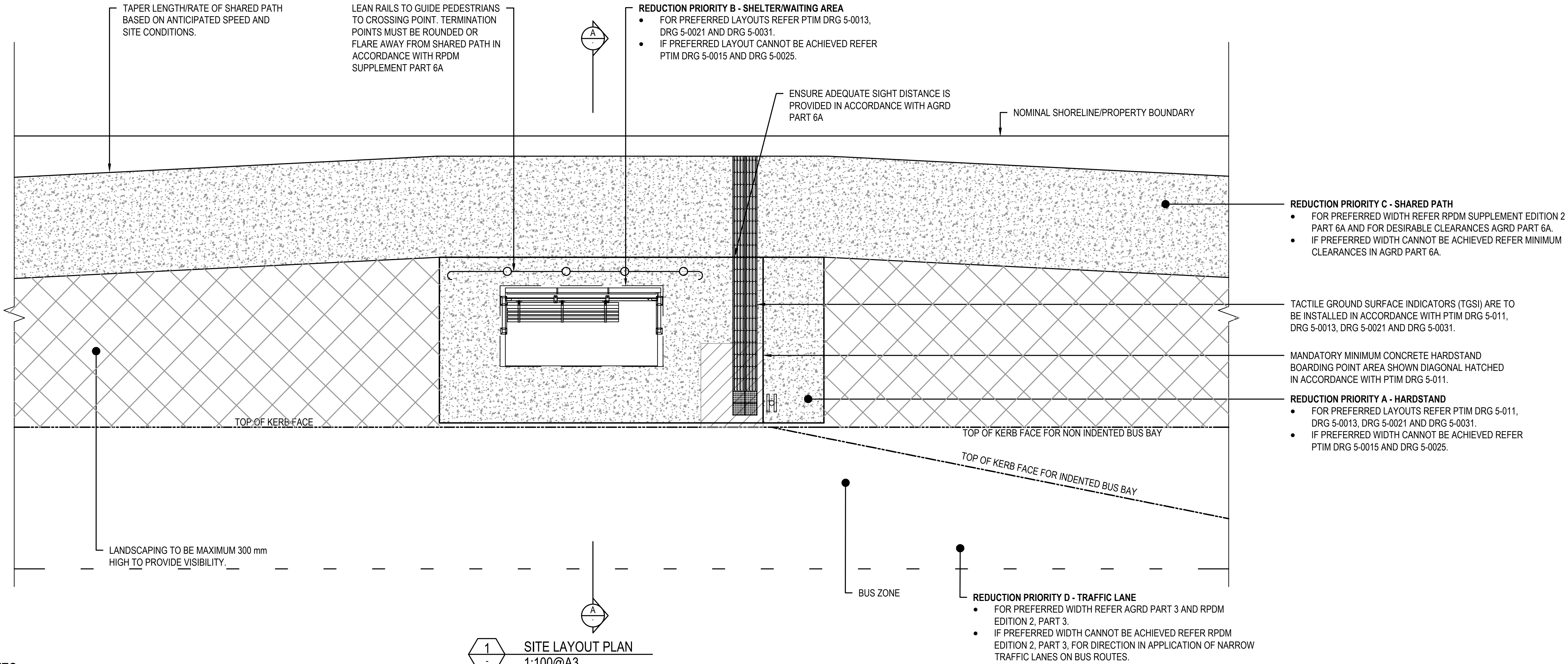
DRAINAGE

11. DRAINAGE PITS ARE TO BE LOCATED BASED ON SITE CONDITIONS TO MINIMISE FLOW WIDTHS AT CROSSING POINTS.
12. DRAINAGE TO BE CONSIDERED TO ENSURE FLOW WIDTHS ARE NOT EXCEEDED AND FLOWS ARE NOT CONCENTRATED ACROSS CYCLE LANE.



A - SECTION A
1:100@A3

TRANSLink	Queensland Government	PTIM, BUS STOP INFRASTRUCTURE CHAPTER CYCLE LANE/TRACK BEHIND BOARDING HARDSTAND - ALTERNATE SHELTER LOCATION EXAMPLE	
		SCALE : AS SHOWN	DRG 5-0042
		DRAWN : -	DATE : SEPTEMBER 2019 A



1 SITE LAYOUT PLAN
1:100@A3

NOTES:

GENERAL

1. ANY REDUCTION OF INFRASTRUCTURE ELEMENTS SHOULD BE CONSIDERED IN THE FOLLOWING ORDER
   - A) ALTERNATIVE HARDSTAND CONFIGURATION
   - B) ALTERNATIVE POSITION OF SHELTER/WAITING AREA
   - C) REDUCTION IN WIDTH OF SHARED PATH
   - D) REDUCTION IN WIDTH OF TRAFFIC LANE
2. ANY REDUCTION IN INFRASTRUCTURE ELEMENTS MUST NOT COMPROMISE ACCESS REQUIREMENTS AS DETAILED IN THE COMMONWEALTH DISABILITY STANDARDS FOR ACCESSIBLE PUBLIC TRANSPORT 2002.
3. ALL COMPONENTS SHALL COMPLY TO RELEVANT LOCAL COUNCIL STANDARDS.
4. IF THE LAYOUT SHOWN ON THIS DRAWING CANNOT BE ACHIEVED DUE TO SITE CONSTRAINTS REFER PTIM DRG SKT 0803.
5. ONE-WAY CYCLE TRACKS ON EACH SIDE OF THE ROAD IS PREFERRED. IF THIS CANNOT BE ACHIEVED, THIS LAYOUT CAN BE MODIFIED TO SUIT A TWO-WAY CYCLE TRACK IN ACCORDANCE WITH CURRENT STANDARDS.

SHELTER/WAITING AREA

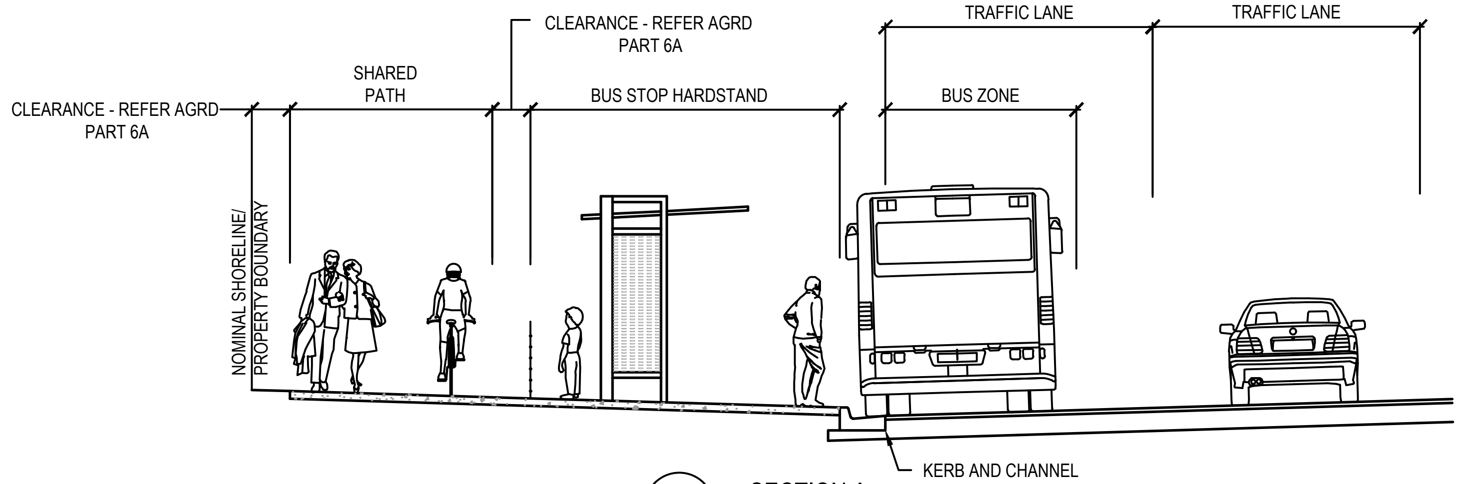
6. FOR OPTIONS OF SHELTER/WAITING AREA TYPES REFER PTIM DRG 5-0100.
7. SHELTER USED MUST NOT IMPEDE SIGHT LINES THROUGH BUS STOP AREA. CONSIDER SHELTER TYPES SIMILAR TO THE SUBURBAN SHELTER SHOWN IN PTIM DRG 5-0402.

SHARED PATH

8. SHARED PATH TO BE CONCRETE AND CONSTRUCTED IN ACCORDANCE WITH TMR/LOCAL COUNCIL REQUIREMENT.

DRAINAGE

9. DRAINAGE PITS ARE TO BE LOCATED BASED ON SITE CONDITIONS TO MINIMISE FLOW WIDTHS AT CROSSING POINTS.

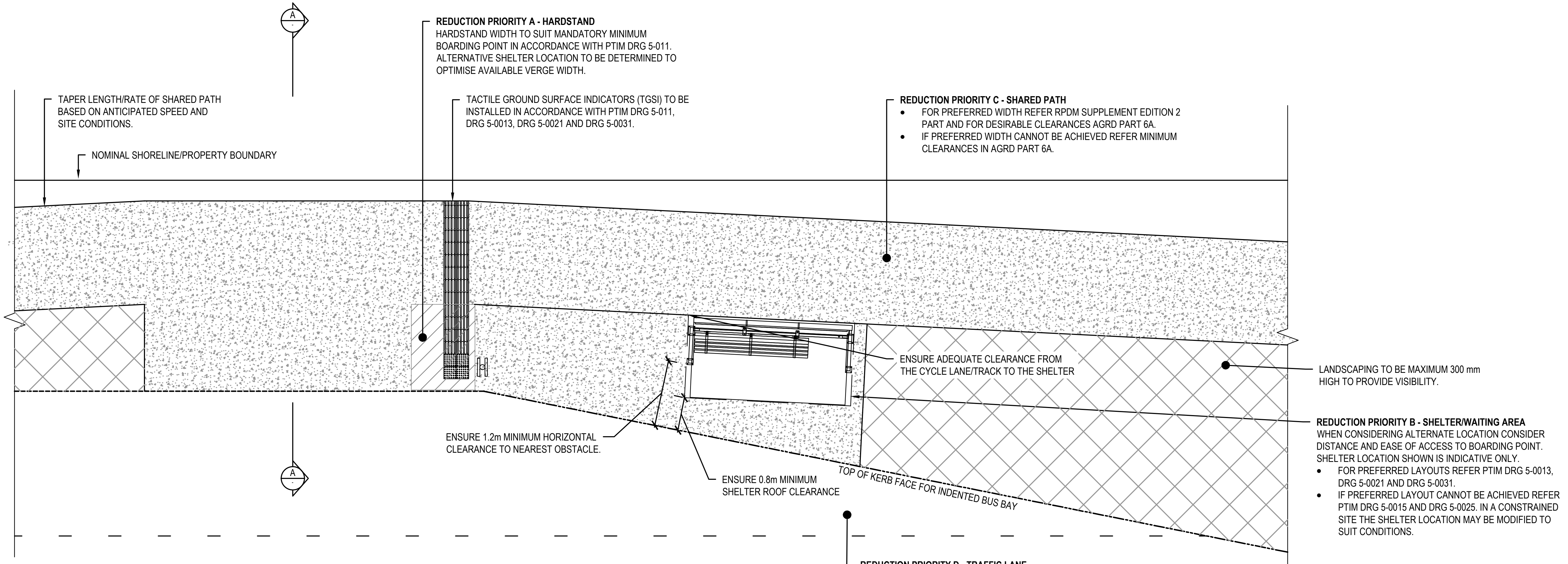


A SECTION A
1:100@A3

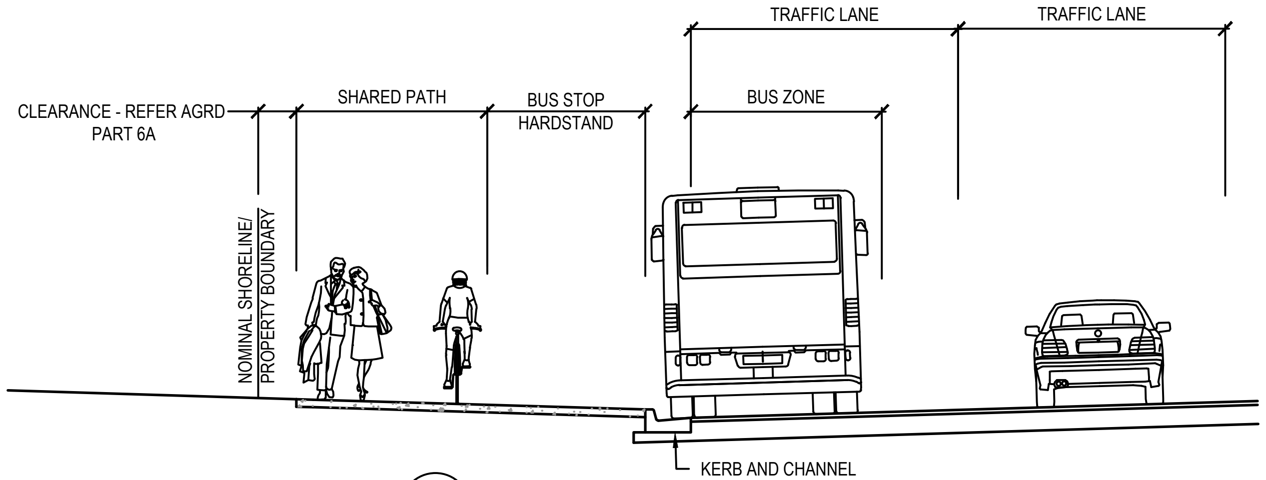
TRANSLink | Queensland Government

PTIM, BUS STOP INFRASTRUCTURE CHAPTER
SHARED PATH BEHIND BUS STOP

SCALE :	AS SHOWN		DRG 5-0043
DRAWN :	-	DATE : SEPTEMBER 2019	A



1 CONSTRAINED SITE - ALTERNATIVE SHELTER LOCATION
1:100@A3



A SECTION A
1:100@A3

NOTES:

GENERAL

1. THIS LAYOUT SHOULD ONLY BE CONSIDERED IF THE LAYOUT SHOWN ON PTIM DRG SK 0801 CANNOT BE ACHIEVED DUE TO SITE CONSTRAINTS.
2. ANY REDUCTION OF INFRASTRUCTURE ELEMENTS SHOULD BE CONSIDERED IN THE FOLLOWING ORDER
   A) ALTERNATIVE HARDSTAND CONFIGURATION
   B) ALTERNATIVE POSITION OF SHELTER/WAITING AREA
   C) REDUCTION IN WIDTH OF SHARED PATH
   D) REDUCTION IN WIDTH OF TRAFFIC LANE
3. ANY REDUCTION IN INFRASTRUCTURE ELEMENTS MUST NOT COMPROMISE ACCESS REQUIREMENTS AS DETAILED IN THE COMMONWEALTH DISABILITY STANDARDS FOR ACCESSIBLE PUBLIC TRANSPORT 2002.
4. ALL COMPONENTS SHALL COMPLY TO RELEVANT LOCAL COUNCIL STANDARDS.

SHELTER/WAITING AREA

5. FOR OPTIONS OF SHELTER/WAITING AREA TYPES REFER PTIM DRG 5-0100.
6. SHELTER MUST NOT IMPEDE SIGHT LINES THROUGH BUS STOP AREA. CONSIDER SHELTER TYPES SIMILAR TO THE SUBURBAN SHELTER SHOWN IN PTIM DRG 5-0402.

SHARED PATH

7. SHARED PATH TO BE CONCRETE AND CONSTRUCTED IN ACCORDANCE WITH TMR/LOCAL COUNCIL REQUIREMENT.

DRAINAGE

8. DRAINAGE PITS ARE TO BE LOCATED BASED ON SITE CONDITIONS TO MINIMISE FLOW WIDTHS AT CROSSING POINTS.

TRANSLink | Queensland Government

PTIM, BUS STOP INFRASTRUCTURE CHAPTER
SHARED PATH BEHIND BOARDING HARDSTAND - ALTERNATE SHELTER LOCATION EXAMPLE

SCALE :	AS SHOWN		DRG 5-0044
DRAWN :	-	DATE : AUGUST 2019	A

NOTES:

HARDSTAND

1 HARDSTAND/SLAB DESIGN TO BE SUITED TO SITE SPECIFIC REQUIREMENTS.

2 HARDSTAND/ SLAB DESIGN TO BE SUITED TO GRADIENTS NOT GREATER THAN 2% FALL PRIOR TO MECHANICAL SHIMS.

3 SHELTER FOOTING DESIGN BY OTHERS AND TO LOCAL GOVERNMENT REQUIREMENTS.

SHELTER & SITE LAYOUT

4 FOR FURTHER INFORMATION AND GUIDANCE ON BUS SHELTER LOCATIONAL REQUIREMENTS AND SITE PLACEMENT REFER TO THE PTIM SITE LAYOUT DRAWINGS.

5 SHELTER STRUCTURE COLOUR TO BE RESINE JON

6 SHELTER PAINTWORK TO MEET RELEVANT AUSTRALIAN STANDARDS INCLUDING BUT NOT LIMITED TO AS3715, AS2311, AS2312.

FURNITURE, SIGNAGE & LIGHTING

7 FOR DETAILS OF BUS STOP SIGNAGE REFER TO TRANSLINK SIGNAGE MANUAL.

8 BUS STOP SEAT SHOULD INCLUDE ANODISED ALUMINIUM BATTENS WITH ARMRESTS ALONG THE SEAT. SEATS SHOULD BE BOLTED TO HARDSTAND AREA, AND MADE FROM EASILY MAINTAINED MATERIALS. SEATS TO BE COMPLIANT WITH DSAPT. WHERE A SEAT ABUTS A CONTINUOUS ACCESSIBLE PATH OF TRAVEL, ENSURE MINIMUM 30% LUMINANCE CONTRAST AGAINST BACKGROUND (E.G. FLOORING).

9 LIGHTING DESIGN TO COMPLY WITH THE RELEVANT STANDARDS AND BE COMPLIANT WITH DSAPT.

ADDITIONAL REQUIREMENTS

10 ALL MEASUREMENTS AND DIMENSIONS SHALL HAVE AN APPLIED TOLERANCE OF 3MM.

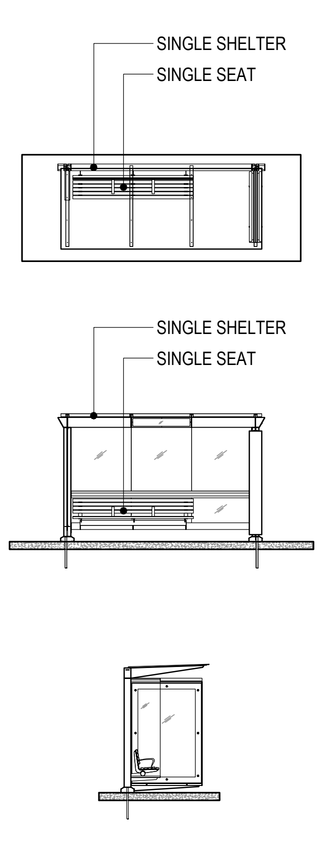
11 SHELTER MANUFACTURER TO PROVIDE ENGINEERING CERTIFICATION FOR SHELTER CONSTRUCTION

12 ALL BUS STOPS TO BE DSAPT COMPLIANT, FOR FURTHER GUIDANCE REFER TO THE RELEVANT STANDARDS, TRANSLINK GUIDANCE AND RELEVANT LOCAL GOVERNMENT REQUIREMENTS.

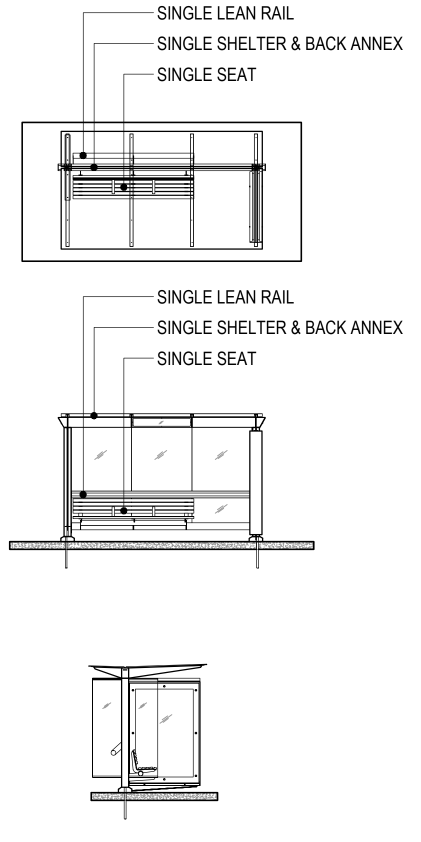
13 ALL BUS STOP COMPONENTS SHOULD BE POSITIONED IN CONSIDERATION OF RELEVANT ONSITE CONDITIONS WITH REFERENCE TO THE GUIDANCE CONTAINED WITHIN THE PTIM, AND FOR ADDITIONAL REQUIREMENTS AND DESIGN ALTERNATIVES REFER TO THE COMPONENTS TABLE CONTAINED IN THE PTIM.

14 REFER TO PTIM GLOSSARY FOR DEFINITIONS OF TERMS, AND, PTIM ABBREVIATIONS FOR DEFINITIONS OF ACRONYMS.

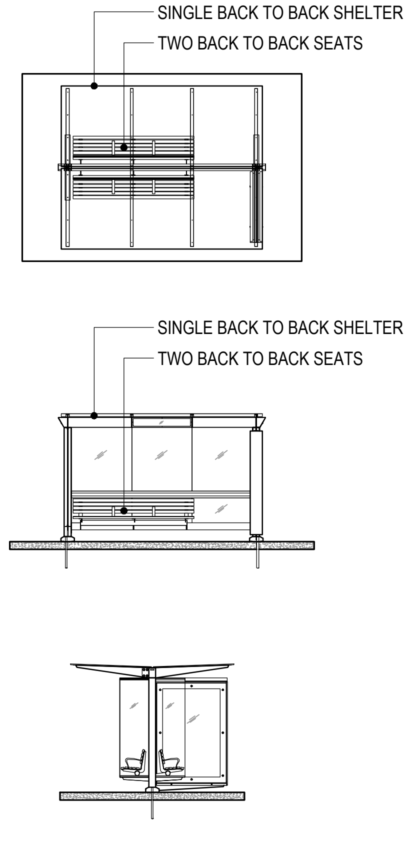
15 ALL DRAWING DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.



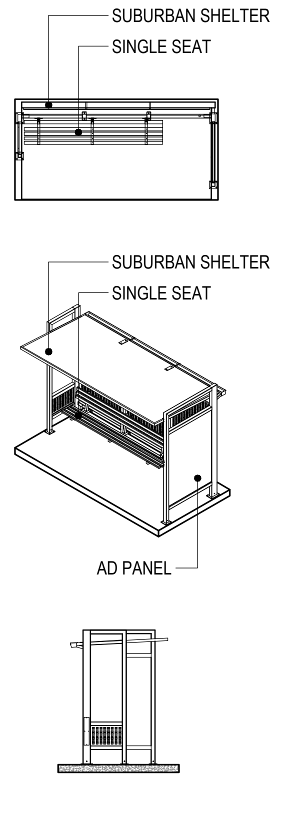
SHELTER TYPE 1A
REFER DRAWING 5-0101



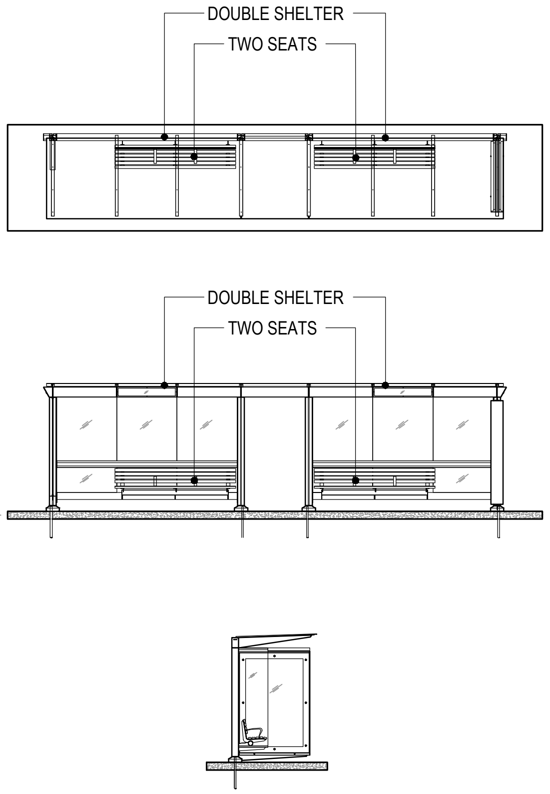
SHELTER TYPE 2A
REFER DRAWING 5-0201



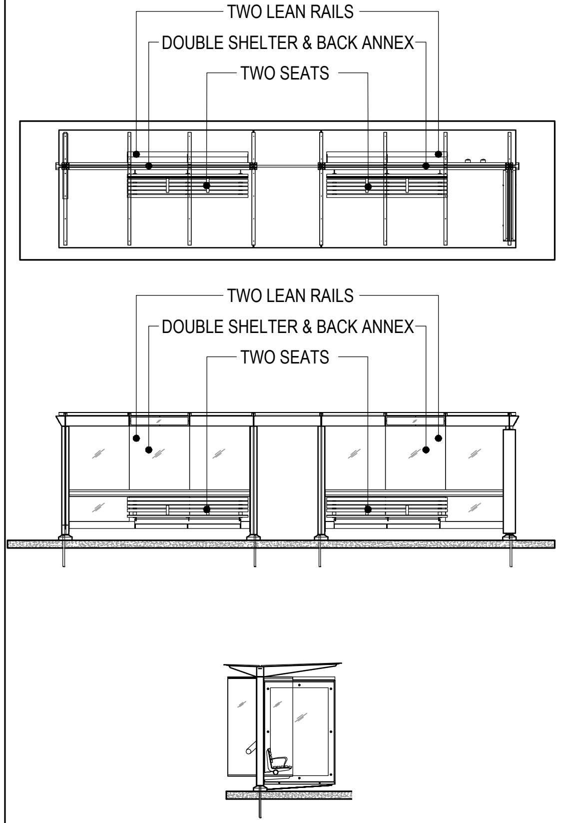
SHELTER TYPE 3A
REFER DRAWING 5-0301



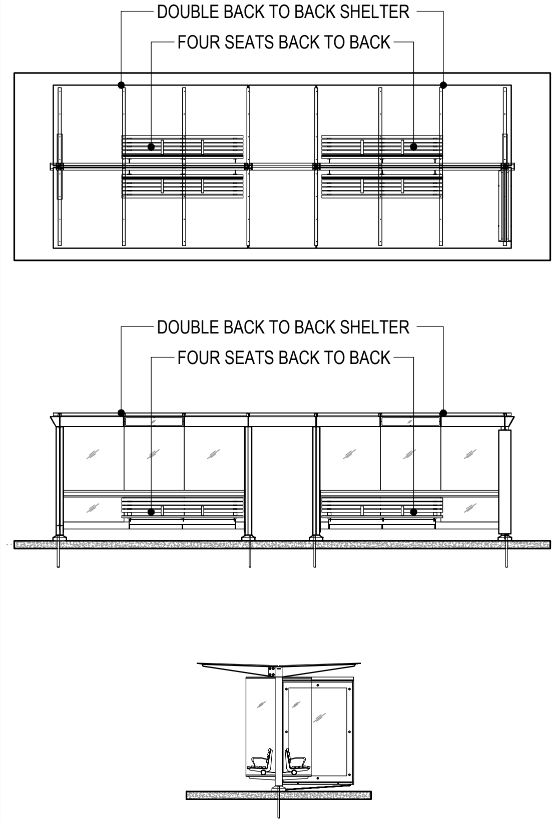
SUBURBAN SHELTER
REFER DRAWING 5-0401



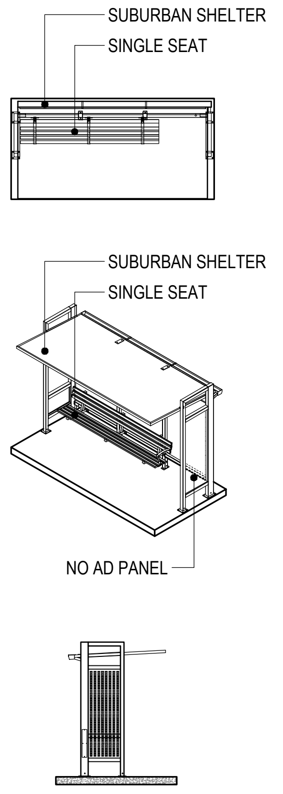
SHELTER TYPE 1B
REFER DRAWING 5-0102



SHELTER TYPE 2B
REFER DRAWING 5-0202



SHELTER TYPE 3B
REFER DRAWING 5-0302



SUBURBAN SHELTER
REFER DRAWING 5-0402

TRANSLink | Queensland Government

PTIM, BUS STOP INFRASTRUCTURE CHAPTER
BUS SHELTER DESIGNS - OVERVIEW

SCALE :	AS SHOWN	NTS	DRG 5-0100
DRAWN :	-	DATE : JULY 2013	A

NOTES:

HARDSTAND

1 HARDSTAND/SLAB DESIGN TO BE SUITED TO SITE SPECIFIC REQUIREMENTS.

2 HARDSTAND/ SLAB DESIGN TO BE SUITED TO GRADIENTS NOT GREATER THAN 2% FALL PRIOR TO MECHANICAL SHIMS.

3 SHELTER FOOTING DESIGN BY OTHERS AND TO LOCAL GOVERNMENT REQUIREMENTS.

SHELTER & SITE LAYOUT

4 FOR FURTHER INFORMATION AND GUIDANCE ON BUS SHELTER LOCATIONAL REQUIREMENTS AND SITE PLACEMENT REFER TO THE PTIM SITE LAYOUT DRAWINGS.

5 SHELTER STRUCTURE COLOUR TO BE RESINE JON

6 SHELTER PAINTWORK TO MEET RELEVANT AUSTRALIAN STANDARDS INCLUDING BUT NOT LIMITED TO AS3715, AS2311, AS2312.

FURNITURE, SIGNAGE & LIGHTING

7 FOR DETAILS OF BUS STOP SIGNAGE REFER TO TRANSLINK SIGNAGE MANUAL.

8 BUS STOP SEAT SHOULD INCLUDE ANODISED ALUMINIUM BATTENS WITH ARMRESTS ALONG THE SEAT. SEATS SHOULD BE BOLTED TO HARDSTAND AREA, AND MADE FROM EASILY MAINTAINED MATERIALS. SEATS TO BE COMPLIANT WITH DSAPT. WHERE A SEAT ABUTS A CONTINUOUS ACCESSIBLE PATH OF TRAVEL, ENSURE MINIMUM 30% LUMINANCE CONTRAST AGAINST BACKGROUND (E.G. FLOORING).

9 LIGHTING DESIGN TO COMPLY WITH THE RELEVANT STANDARDS AND BE COMPLIANT WITH DSAPT.

ADDITIONAL REQUIREMENTS

10 ALL MEASUREMENTS AND DIMENSIONS SHALL HAVE AN APPLIED TOLERANCE OF 3MM.

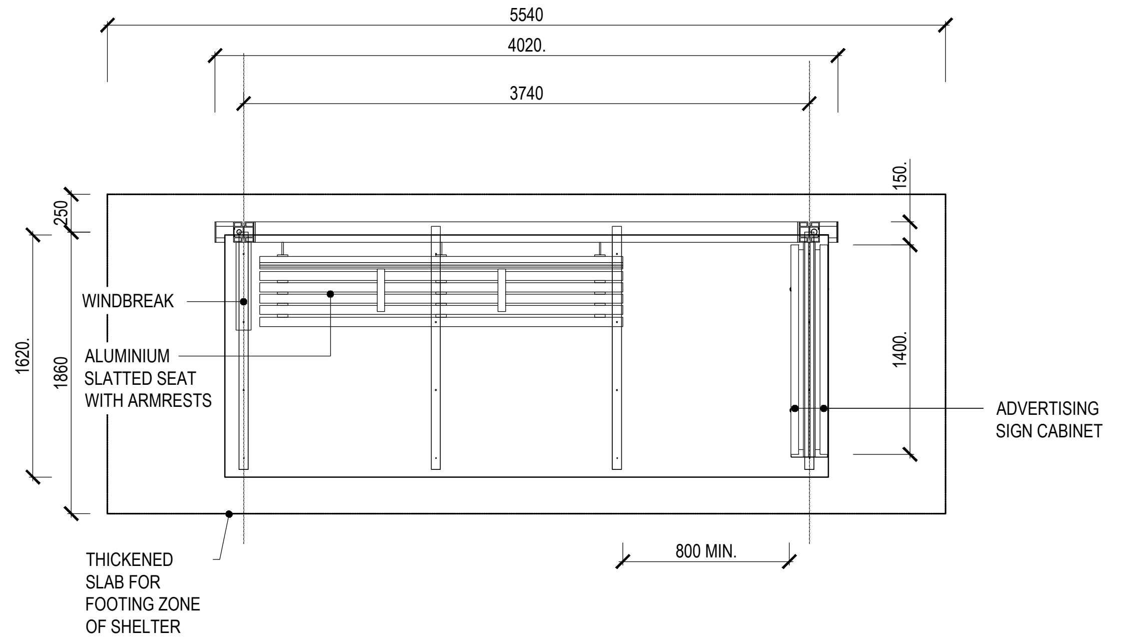
11 SHELTER MANUFACTURER TO PROVIDE ENGINEERING CERTIFICATION FOR SHELTER CONSTRUCTION

12 ALL BUS STOPS TO BE DSAPT COMPLIANT, FOR FURTHER GUIDANCE REFER TO THE RELEVANT STANDARDS, TRANSLINK GUIDANCE AND RELEVANT LOCAL GOVERNMENT REQUIREMENTS.

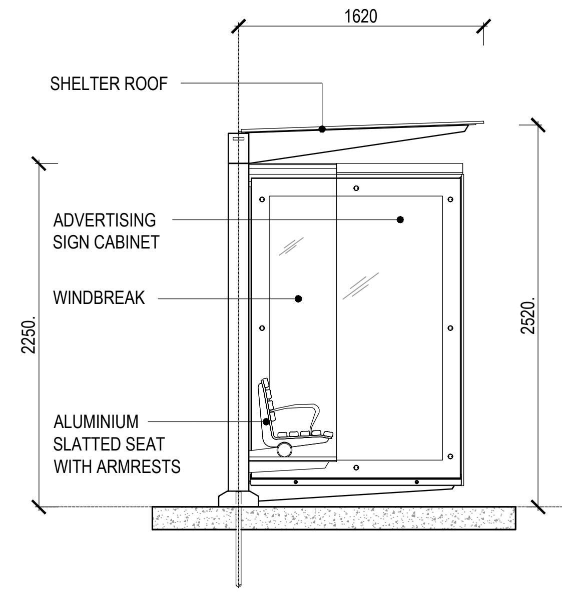
13 ALL BUS STOP COMPONENTS SHOULD BE POSITIONED IN CONSIDERATION OF RELEVANT ONSITE CONDITIONS WITH REFERENCE TO THE GUIDANCE CONTAINED WITHIN THE PTIM, AND FOR ADDITIONAL REQUIREMENTS AND DESIGN ALTERNATIVES REFER TO THE COMPONENTS TABLE CONTAINED IN THE PTIM.

14 REFER TO PTIM GLOSSARY FOR DEFINITIONS OF TERMS, AND, PTIM ABBREVIATIONS FOR DEFINITIONS OF ACRONYMS.

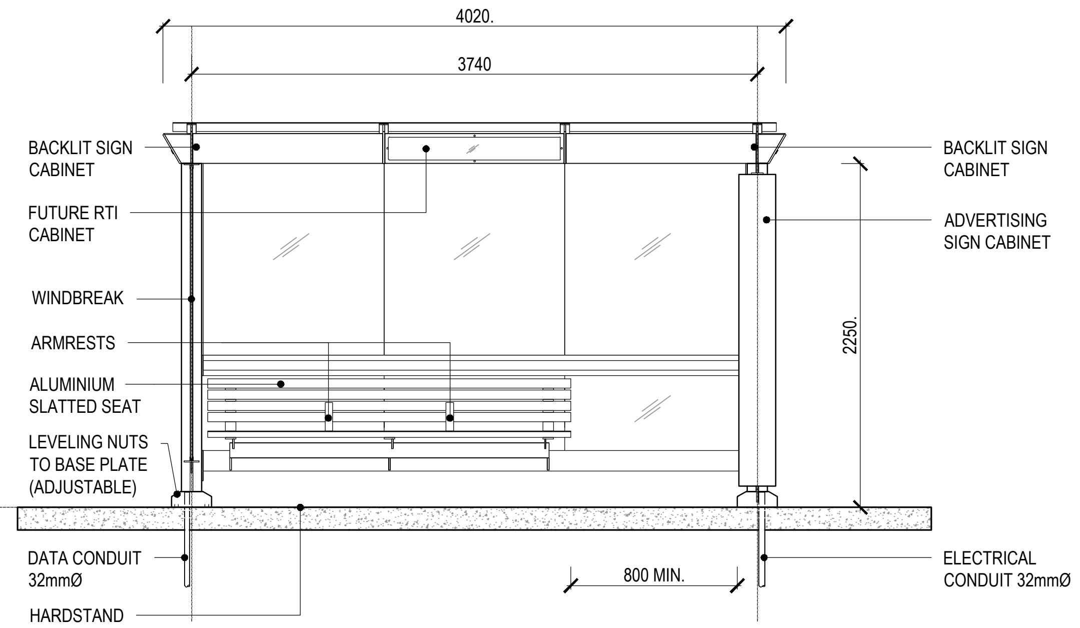
15 ALL DRAWING DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.



1 - SHELTER PLAN
1:50@A3



2 - SIDE ELEVATION
1:50@A3



3 - FRONT ELEVATION
1:50@A3

TRANSLink	Queensland Government	PTIM, BUS STOP INFRASTRUCTURE CHAPTER BUS SHELTER DESIGNS - TYPE 1A
		SCALE : AS SHOWN — DRG 5-0101
		DRAWN : - — DATE : JULY 2013 — A

NOTES:

HARDSTAND

1 HARDSTAND/SLAB DESIGN TO BE SUITED TO SITE SPECIFIC REQUIREMENTS.

2 HARDSTAND/ SLAB DESIGN TO BE SUITED TO GRADIENTS NOT GREATER THAN 2% FALL PRIOR TO MECHANICAL SHIMS.

3 SHELTER FOOTING DESIGN BY OTHERS AND TO LOCAL GOVERNMENT REQUIREMENTS.

SHELTER & SITE LAYOUT

4 FOR FURTHER INFORMATION AND GUIDANCE ON BUS SHELTER LOCATIONAL REQUIREMENTS AND SITE PLACEMENT REFER TO THE PTIM SITE LAYOUT DRAWINGS.

5 SHELTER STRUCTURE COLOUR TO BE RESINE JON

6 SHELTER PAINTWORK TO MEET RELEVANT AUSTRALIAN STANDARDS INCLUDING BUT NOT LIMITED TO AS3715, AS2311, AS2312.

FURNITURE, SIGNAGE & LIGHTING

7 FOR DETAILS OF BUS STOP SIGNAGE REFER TO TRANSLINK SIGNAGE MANUAL.

8 BUS STOP SEAT SHOULD INCLUDE ANODISED ALUMINIUM BATTENS WITH ARMRESTS ALONG THE SEAT. SEATS SHOULD BE BOLTED TO HARDSTAND AREA, AND MADE FROM EASILY MAINTAINED MATERIALS. SEATS TO BE COMPLIANT WITH DSAPT. WHERE A SEAT ABUTS A CONTINUOUS ACCESSIBLE PATH OF TRAVEL, ENSURE MINIMUM 30% LUMINANCE CONTRAST AGAINST BACKGROUND (E.G. FLOORING).

9 LIGHTING DESIGN TO COMPLY WITH THE RELEVANT STANDARDS AND BE COMPLIANT WITH DSAPT.

ADDITIONAL REQUIREMENTS

10 ALL MEASUREMENTS AND DIMENSIONS SHALL HAVE AN APPLIED TOLERANCE OF 3MM.

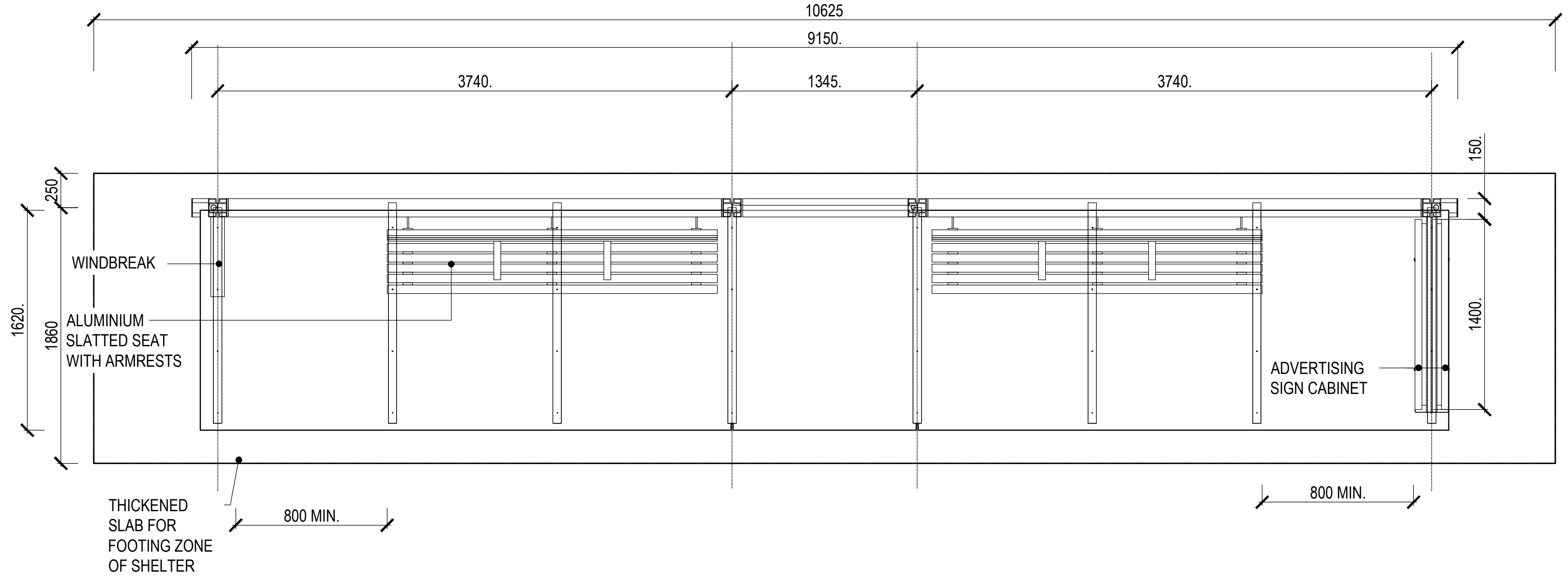
11 SHELTER MANUFACTURER TO PROVIDE ENGINEERING CERTIFICATION FOR SHELTER CONSTRUCTION

12 ALL BUS STOPS TO BE DSAPT COMPLIANT, FOR FURTHER GUIDANCE REFER TO THE RELEVANT STANDARDS, TRANSLINK GUIDANCE AND RELEVANT LOCAL GOVERNMENT REQUIREMENTS.

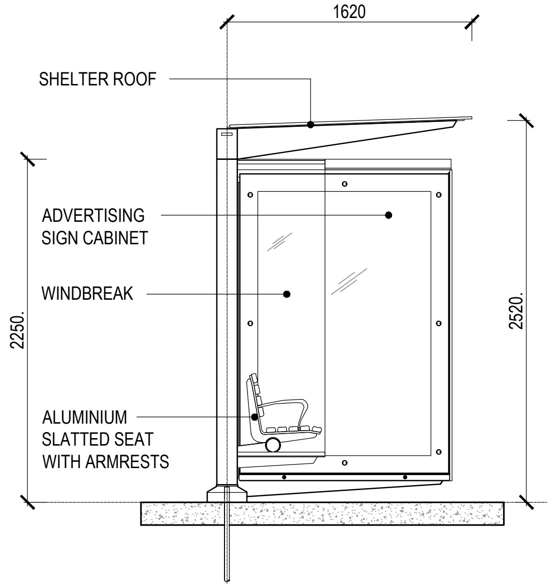
13 ALL BUS STOP COMPONENTS SHOULD BE POSITIONED IN CONSIDERATION OF RELEVANT ONSITE CONDITIONS WITH REFERENCE TO THE GUIDANCE CONTAINED WITHIN THE PTIM, AND FOR ADDITIONAL REQUIREMENTS AND DESIGN ALTERNATIVES REFER TO THE COMPONENTS TABLE CONTAINED IN THE PTIM.

14 REFER TO PTIM GLOSSARY FOR DEFINITIONS OF TERMS, AND, PTIM ABBREVIATIONS FOR DEFINITIONS OF ACRONYMS.

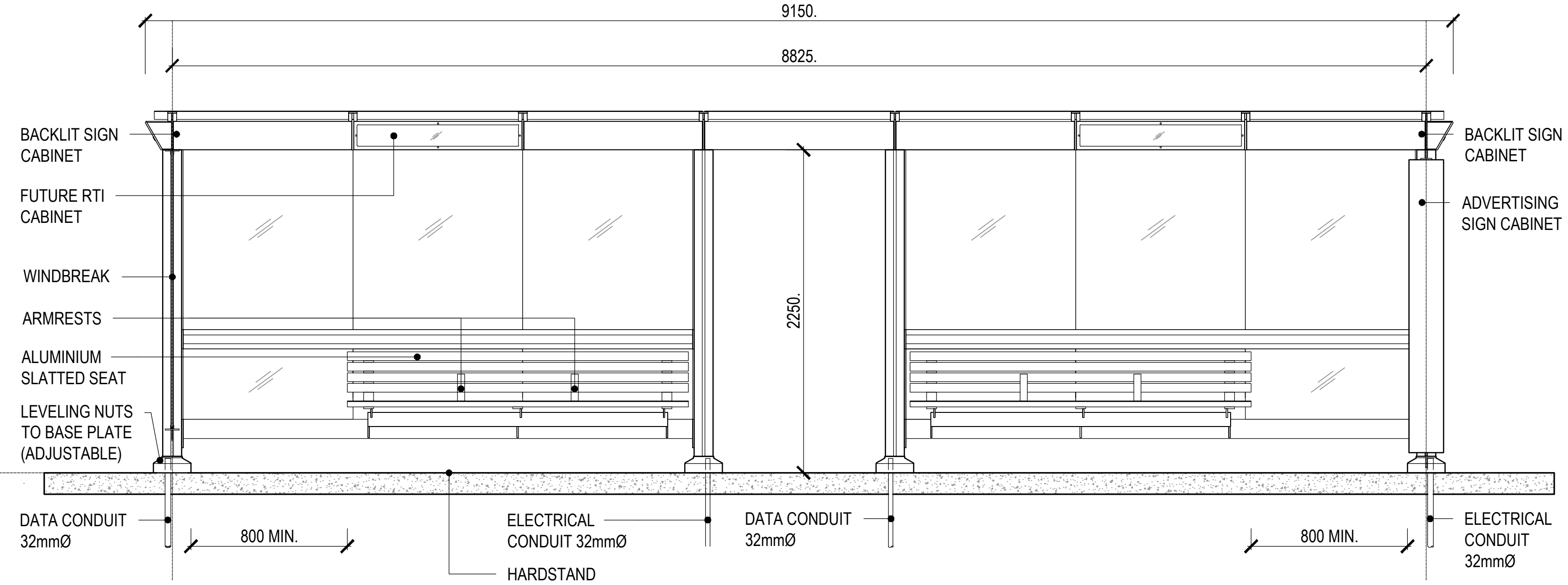
15 ALL DRAWING DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.



1 SHELTER PLAN
1:50@A3



2 SIDE ELEVATION
1:50@A3



3 FRONT ELEVATION
1:50@A3

TRANSLink	Queensland Government	PTIM, BUS STOP INFRASTRUCTURE CHAPTER BUS SHELTER DESIGNS - TYPE 1B	
		SCALE : AS SHOWN	DRG 5-0102
		DRAWN : - DATE : JULY 2013	A

NOTES:

HARDSTAND

1 HARDSTAND/SLAB DESIGN TO BE SUITED TO SITE SPECIFIC REQUIREMENTS.

2 HARDSTAND/ SLAB DESIGN TO BE SUITED TO GRADIENTS NOT GREATER THAN 2% FALL PRIOR TO MECHANICAL SHIMS.

3 SHELTER FOOTING DESIGN BY OTHERS AND TO LOCAL GOVERNMENT REQUIREMENTS.

SHELTER & SITE LAYOUT

4 FOR FURTHER INFORMATION AND GUIDANCE ON BUS SHELTER LOCATIONAL REQUIREMENTS AND SITE PLACEMENT REFER TO THE PTIM SITE LAYOUT DRAWINGS.

5 SHELTER STRUCTURE COLOUR TO BE RESINE JON

6 SHELTER PAINTWORK TO MEET RELEVANT AUSTRALIAN STANDARDS INCLUDING BUT NOT LIMITED TO AS3715, AS2311, AS2312.

FURNITURE, SIGNAGE & LIGHTING

7 FOR DETAILS OF BUS STOP SIGNAGE REFER TO TRANSLINK SIGNAGE MANUAL.

8 BUS STOP SEAT SHOULD INCLUDE ANODISED ALUMINIUM BATTENS WITH ARMRESTS ALONG THE SEAT. SEATS SHOULD BE BOLTED TO HARDSTAND AREA, AND MADE FROM EASILY MAINTAINED MATERIALS. SEATS TO BE COMPLIANT WITH DSAPT. WHERE A SEAT ABUTS A CONTINUOUS ACCESSIBLE PATH OF TRAVEL, ENSURE MINIMUM 30% LUMINANCE CONTRAST AGAINST BACKGROUND (E.G. FLOORING).

9 LIGHTING DESIGN TO COMPLY WITH THE RELEVANT STANDARDS AND BE COMPLIANT WITH DSAPT.

ADDITIONAL REQUIREMENTS

10 ALL MEASUREMENTS AND DIMENSIONS SHALL HAVE AN APPLIED TOLERANCE OF 3MM.

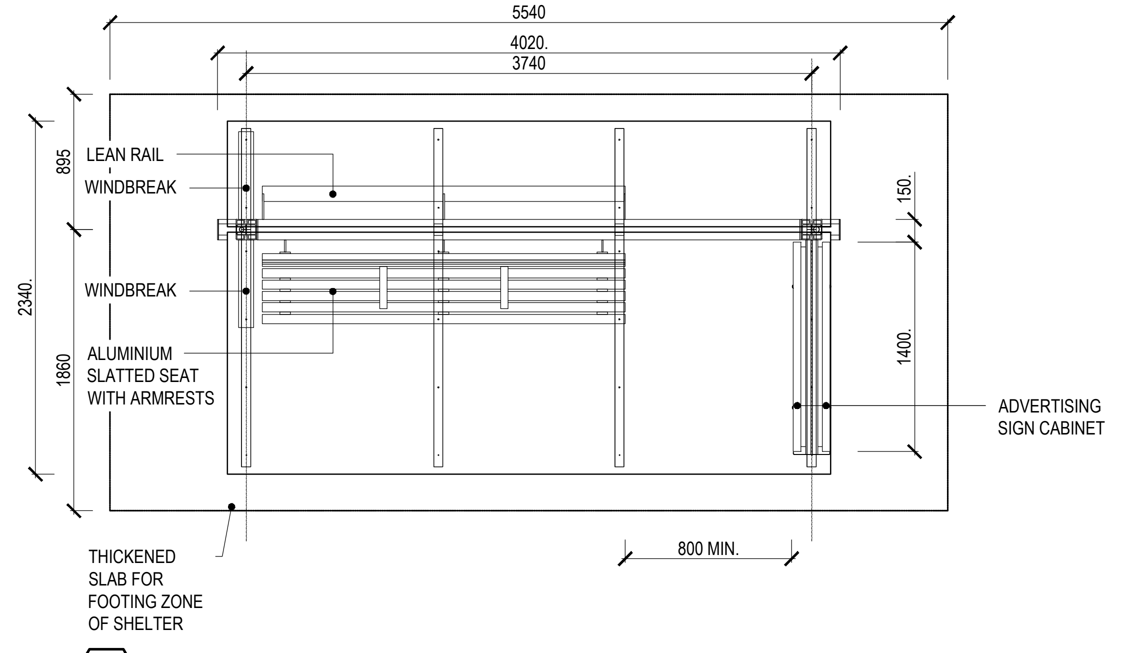
11 SHELTER MANUFACTURER TO PROVIDE ENGINEERING CERTIFICATION FOR SHELTER CONSTRUCTION

12 ALL BUS STOPS TO BE DSAPT COMPLIANT, FOR FURTHER GUIDANCE REFER TO THE RELEVANT STANDARDS, TRANSLINK GUIDANCE AND RELEVANT LOCAL GOVERNMENT REQUIREMENTS.

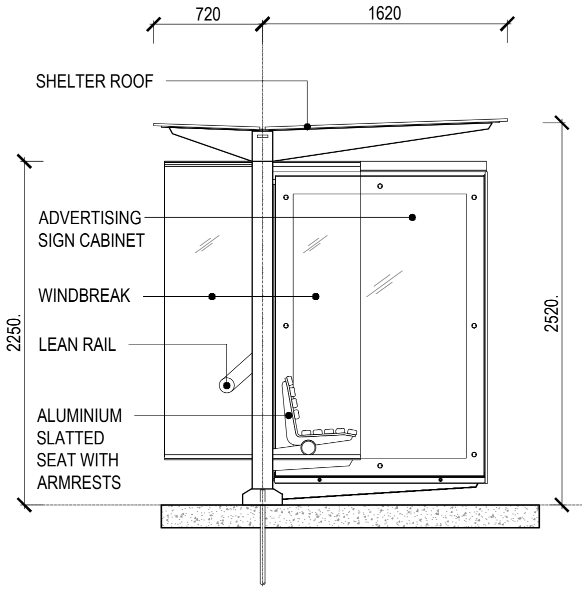
13 ALL BUS STOP COMPONENTS SHOULD BE POSITIONED IN CONSIDERATION OF RELEVANT ONSITE CONDITIONS WITH REFERENCE TO THE GUIDANCE CONTAINED WITHIN THE PTIM, AND FOR ADDITIONAL REQUIREMENTS AND DESIGN ALTERNATIVES REFER TO THE COMPONENTS TABLE CONTAINED IN THE PTIM.

14 REFER TO PTIM GLOSSARY FOR DEFINITIONS OF TERMS, AND, PTIM ABBREVIATIONS FOR DEFINITIONS OF ACRONYMS.

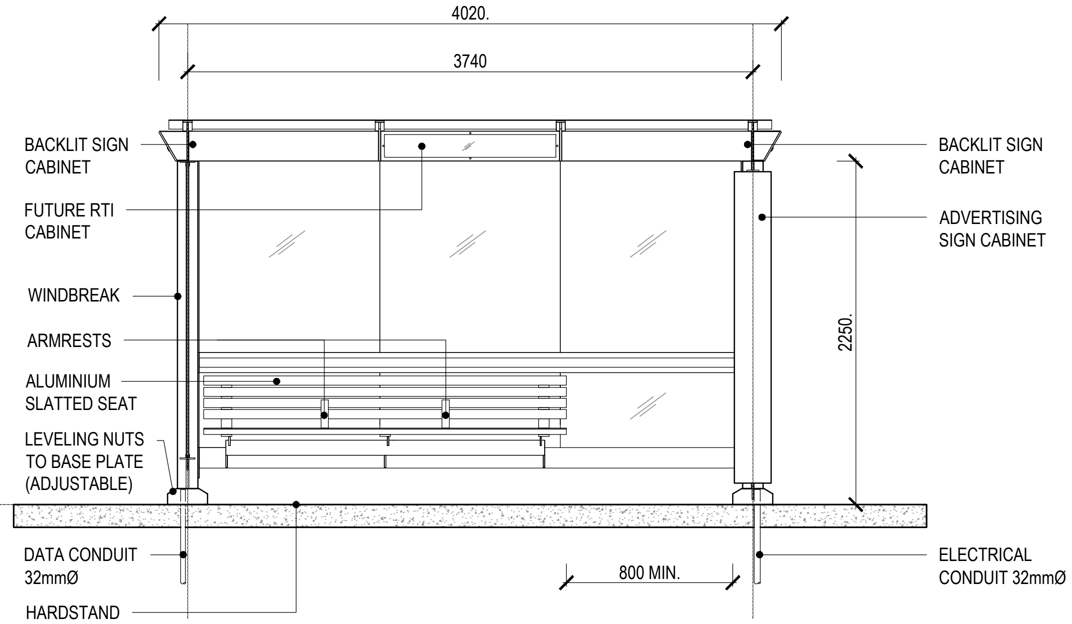
15 ALL DRAWING DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.



1 - SHELTER PLAN
1:50@A3



2 - SIDE ELEVATION
1:50@A3



3 - FRONT ELEVATION
1:50@A3

TRANSLink	Queensland Government	PTIM, BUS STOP INFRASTRUCTURE CHAPTER BUS SHELTER DESIGNS - TYPE 2A	
		SCALE : AS SHOWN	DRG 5-0201
		DRAWN : - DATE : JULY 2013	A

NOTES:

HARDSTAND

1 HARDSTAND/SLAB DESIGN TO BE SUITED TO SITE SPECIFIC REQUIREMENTS.

2 HARDSTAND/ SLAB DESIGN TO BE SUITED TO GRADIENTS NOT GREATER THAN 2% FALL PRIOR TO MECHANICAL SHIMS.

3 SHELTER FOOTING DESIGN BY OTHERS AND TO LOCAL GOVERNMENT REQUIREMENTS.

SHELTER & SITE LAYOUT

4 FOR FURTHER INFORMATION AND GUIDANCE ON BUS SHELTER LOCATIONAL REQUIREMENTS AND SITE PLACEMENT REFER TO THE PTIM SITE LAYOUT DRAWINGS.

5 SHELTER STRUCTURE COLOUR TO BE RESINE JON

6 SHELTER PAINTWORK TO MEET RELEVANT AUSTRALIAN STANDARDS INCLUDING BUT NOT LIMITED TO AS3715, AS2311, AS2312.

FURNITURE, SIGNAGE & LIGHTING

7 FOR DETAILS OF BUS STOP SIGNAGE REFER TO TRANSLINK SIGNAGE MANUAL.

8 BUS STOP SEAT SHOULD INCLUDE ANODISED ALUMINIUM BATTENS WITH ARMRESTS ALONG THE SEAT. SEATS SHOULD BE BOLTED TO HARDSTAND AREA, AND MADE FROM EASILY MAINTAINED MATERIALS. SEATS TO BE COMPLIANT WITH DSAPT. WHERE A SEAT ABUTS A CONTINUOUS ACCESSIBLE PATH OF TRAVEL, ENSURE MINIMUM 30% LUMINANCE CONTRAST AGAINST BACKGROUND (E.G. FLOORING).

9 LIGHTING DESIGN TO COMPLY WITH THE RELEVANT STANDARDS AND BE COMPLIANT WITH DSAPT.

ADDITIONAL REQUIREMENTS

10 ALL MEASUREMENTS AND DIMENSIONS SHALL HAVE AN APPLIED TOLERANCE OF 3MM.

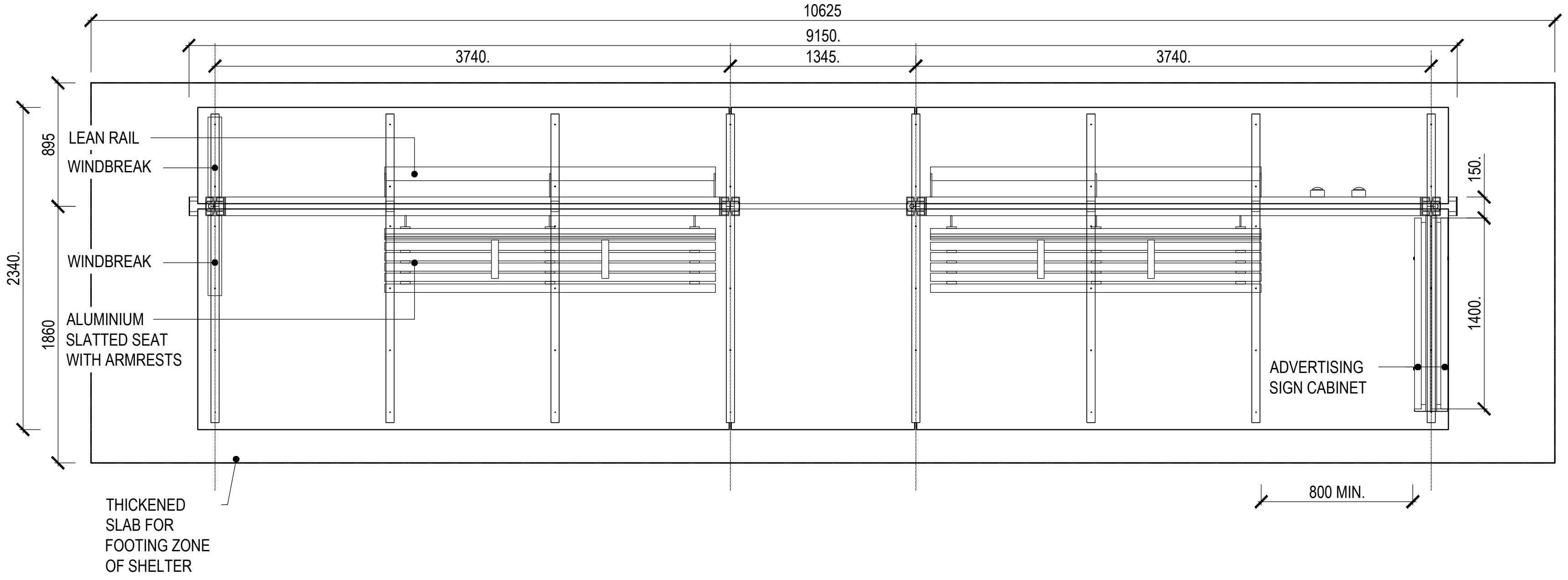
11 SHELTER MANUFACTURER TO PROVIDE ENGINEERING CERTIFICATION FOR SHELTER CONSTRUCTION

12 ALL BUS STOPS TO BE DSAPT COMPLIANT, FOR FURTHER GUIDANCE REFER TO THE RELEVANT STANDARDS, TRANSLINK GUIDANCE AND RELEVANT LOCAL GOVERNMENT REQUIREMENTS.

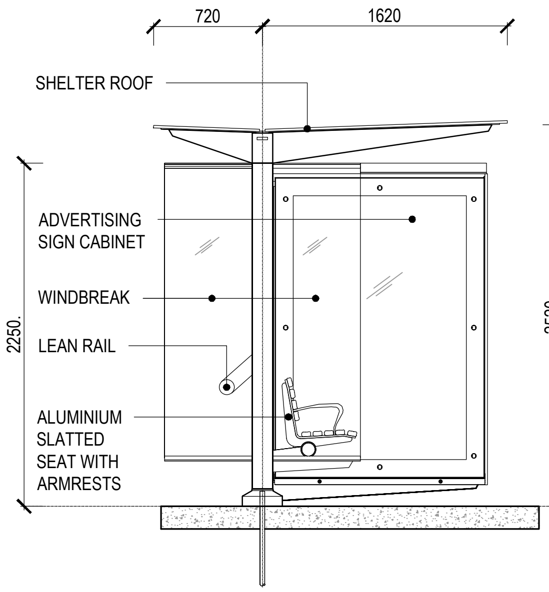
13 ALL BUS STOP COMPONENTS SHOULD BE POSITIONED IN CONSIDERATION OF RELEVANT ONSITE CONDITIONS WITH REFERENCE TO THE GUIDANCE CONTAINED WITHIN THE PTIM, AND FOR ADDITIONAL REQUIREMENTS AND DESIGN ALTERNATIVES REFER TO THE COMPONENTS TABLE CONTAINED IN THE PTIM.

14 REFER TO PTIM GLOSSARY FOR DEFINITIONS OF TERMS, AND, PTIM ABBREVIATIONS FOR DEFINITIONS OF ACRONYMS.

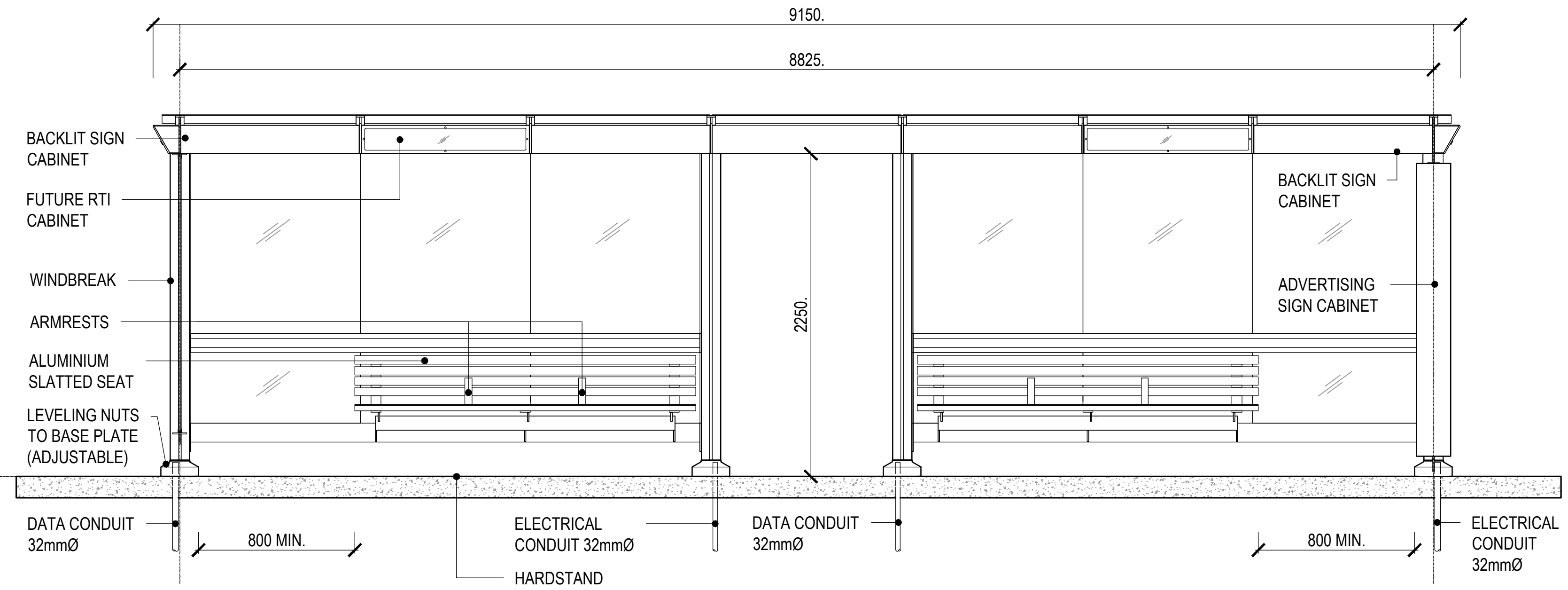
15 ALL DRAWING DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.



1 - SHELTER PLAN
1:50@A3



2 - SIDE ELEVATION
1:50@A3



3 - FRONT ELEVATION
1:50@A3

TRANSLink | Queensland Government

PTIM, BUS STOP INFRASTRUCTURE CHAPTER BUS SHELTER DESIGNS - TYPE 2B			
SCALE :	AS SHOWN		DRG 5-0202
DRAWN : -	DATE :	JULY 2013	A

NOTES:

HARDSTAND

1 HARDSTAND/SLAB DESIGN TO BE SUITED TO SITE SPECIFIC REQUIREMENTS.

2 HARDSTAND/ SLAB DESIGN TO BE SUITED TO GRADIENTS NOT GREATER THAN 2% FALL PRIOR TO MECHANICAL SHIMS.

3 SHELTER FOOTING DESIGN BY OTHERS AND TO LOCAL GOVERNMENT REQUIREMENTS.

SHELTER & SITE LAYOUT

4 FOR FURTHER INFORMATION AND GUIDANCE ON BUS SHELTER LOCATIONAL REQUIREMENTS AND SITE PLACEMENT REFER TO THE PTIM SITE LAYOUT DRAWINGS.

5 SHELTER STRUCTURE COLOUR TO BE RESINE JON

6 SHELTER PAINTWORK TO MEET RELEVANT AUSTRALIAN STANDARDS INCLUDING BUT NOT LIMITED TO AS3715, AS2311, AS2312.

FURNITURE, SIGNAGE & LIGHTING

7 FOR DETAILS OF BUS STOP SIGNAGE REFER TO TRANSLINK SIGNAGE MANUAL.

8 BUS STOP SEAT SHOULD INCLUDE ANODISED ALUMINIUM BATTENS WITH ARMRESTS ALONG THE SEAT. SEATS SHOULD BE BOLTED TO HARDSTAND AREA, AND MADE FROM EASILY MAINTAINED MATERIALS. SEATS TO BE COMPLIANT WITH DSAPT. WHERE A SEAT ABUTS A CONTINUOUS ACCESSIBLE PATH OF TRAVEL, ENSURE MINIMUM 30% LUMINANCE CONTRAST AGAINST BACKGROUND (E.G. FLOORING).

9 LIGHTING DESIGN TO COMPLY WITH THE RELEVANT STANDARDS AND BE COMPLIANT WITH DSAPT.

ADDITIONAL REQUIREMENTS

10 ALL MEASUREMENTS AND DIMENSIONS SHALL HAVE AN APPLIED TOLERANCE OF 3MM.

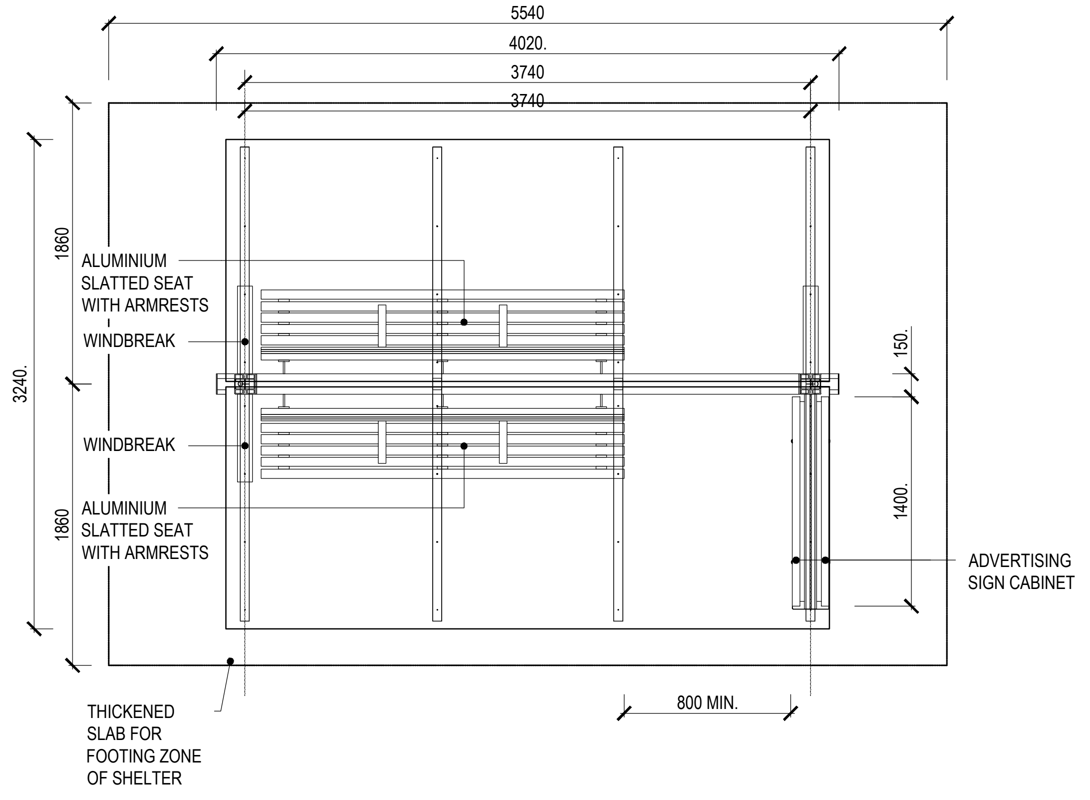
11 SHELTER MANUFACTURER TO PROVIDE ENGINEERING CERTIFICATION FOR SHELTER CONSTRUCTION

12 ALL BUS STOPS TO BE DSAPT COMPLIANT, FOR FURTHER GUIDANCE REFER TO THE RELEVANT STANDARDS, TRANSLINK GUIDANCE AND RELEVANT LOCAL GOVERNMENT REQUIREMENTS.

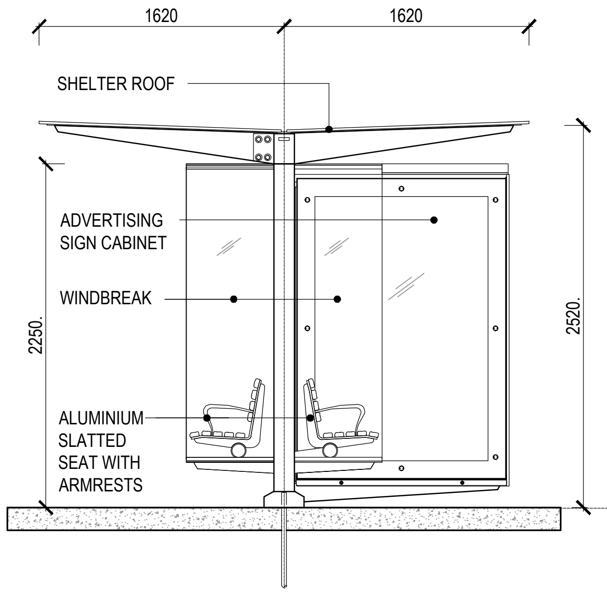
13 ALL BUS STOP COMPONENTS SHOULD BE POSITIONED IN CONSIDERATION OF RELEVANT ONSITE CONDITIONS WITH REFERENCE TO THE GUIDANCE CONTAINED WITHIN THE PTIM, AND FOR ADDITIONAL REQUIREMENTS AND DESIGN ALTERNATIVES REFER TO THE COMPONENTS TABLE CONTAINED IN THE PTIM.

14 REFER TO PTIM GLOSSARY FOR DEFINITIONS OF TERMS, AND, PTIM ABBREVIATIONS FOR DEFINITIONS OF ACRONYMS.

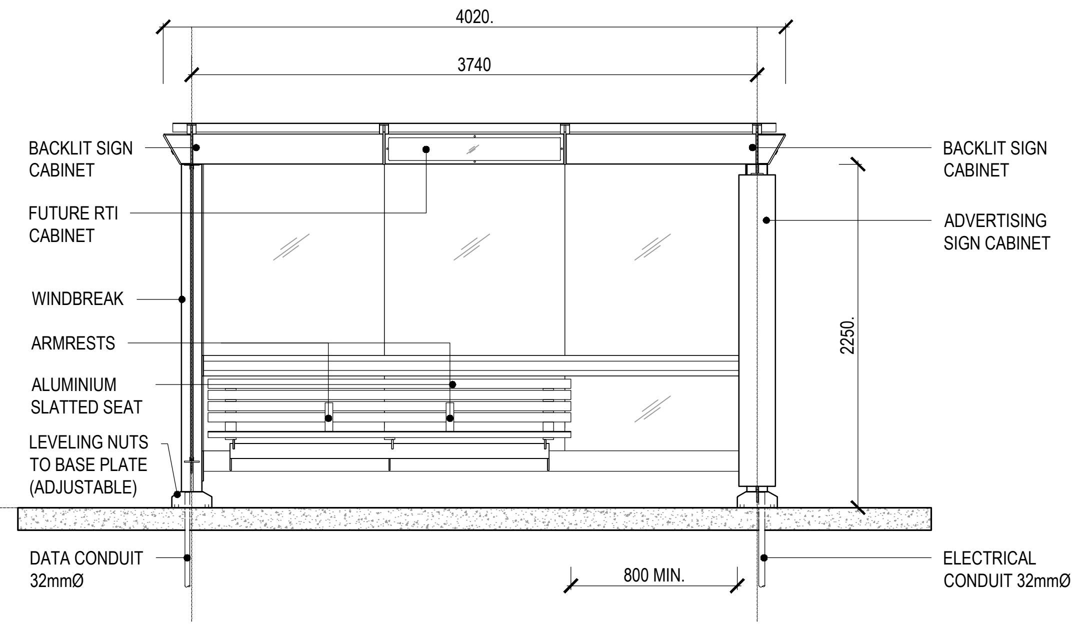
15 ALL DRAWING DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.



1 - SHELTER PLAN
1:50@A3



2 - SIDE ELEVATION
1:50@A3



3 - FRONT ELEVATION
1:50@A3

TRANSLink

Queensland Government

PTIM, BUS STOP INFRASTRUCTURE CHAPTER BUS SHELTER DESIGNS - TYPE 3A	
SCALE : AS SHOWN	DRG 5-0301
DRAWN : - DATE : JULY 2013	A

NOTES:

HARDSTAND

1 HARDSTAND/SLAB DESIGN TO BE SUITED TO SITE SPECIFIC REQUIREMENTS.

2 HARDSTAND/ SLAB DESIGN TO BE SUITED TO GRADIENTS NOT GREATER THAN 2% FALL PRIOR TO MECHANICAL SHIMS.

3 SHELTER FOOTING DESIGN BY OTHERS AND TO LOCAL GOVERNMENT REQUIREMENTS.

SHELTER & SITE LAYOUT

4 FOR FURTHER INFORMATION AND GUIDANCE ON BUS SHELTER LOCATIONAL REQUIREMENTS AND SITE PLACEMENT REFER TO THE PTIM SITE LAYOUT DRAWINGS.

5 SHELTER STRUCTURE COLOUR TO BE RESINE JON

6 SHELTER PAINTWORK TO MEET RELEVANT AUSTRALIAN STANDARDS INCLUDING BUT NOT LIMITED TO AS3715, AS2311, AS2312.

FURNITURE, SIGNAGE & LIGHTING

7 FOR DETAILS OF BUS STOP SIGNAGE REFER TO TRANSLINK SIGNAGE MANUAL.

8 BUS STOP SEAT SHOULD INCLUDE ANODISED ALUMINIUM BATTENS WITH ARMRESTS ALONG THE SEAT. SEATS SHOULD BE BOLTED TO HARDSTAND AREA, AND MADE FROM EASILY MAINTAINED MATERIALS. SEATS TO BE COMPLIANT WITH DSAPT. WHERE A SEAT ABUTS A CONTINUOUS ACCESSIBLE PATH OF TRAVEL, ENSURE MINIMUM 30% LUMINANCE CONTRAST AGAINST BACKGROUND (E.G. FLOORING).

9 LIGHTING DESIGN TO COMPLY WITH THE RELEVANT STANDARDS AND BE COMPLIANT WITH DSAPT.

ADDITIONAL REQUIREMENTS

10 ALL MEASUREMENTS AND DIMENSIONS SHALL HAVE AN APPLIED TOLERANCE OF 3MM.

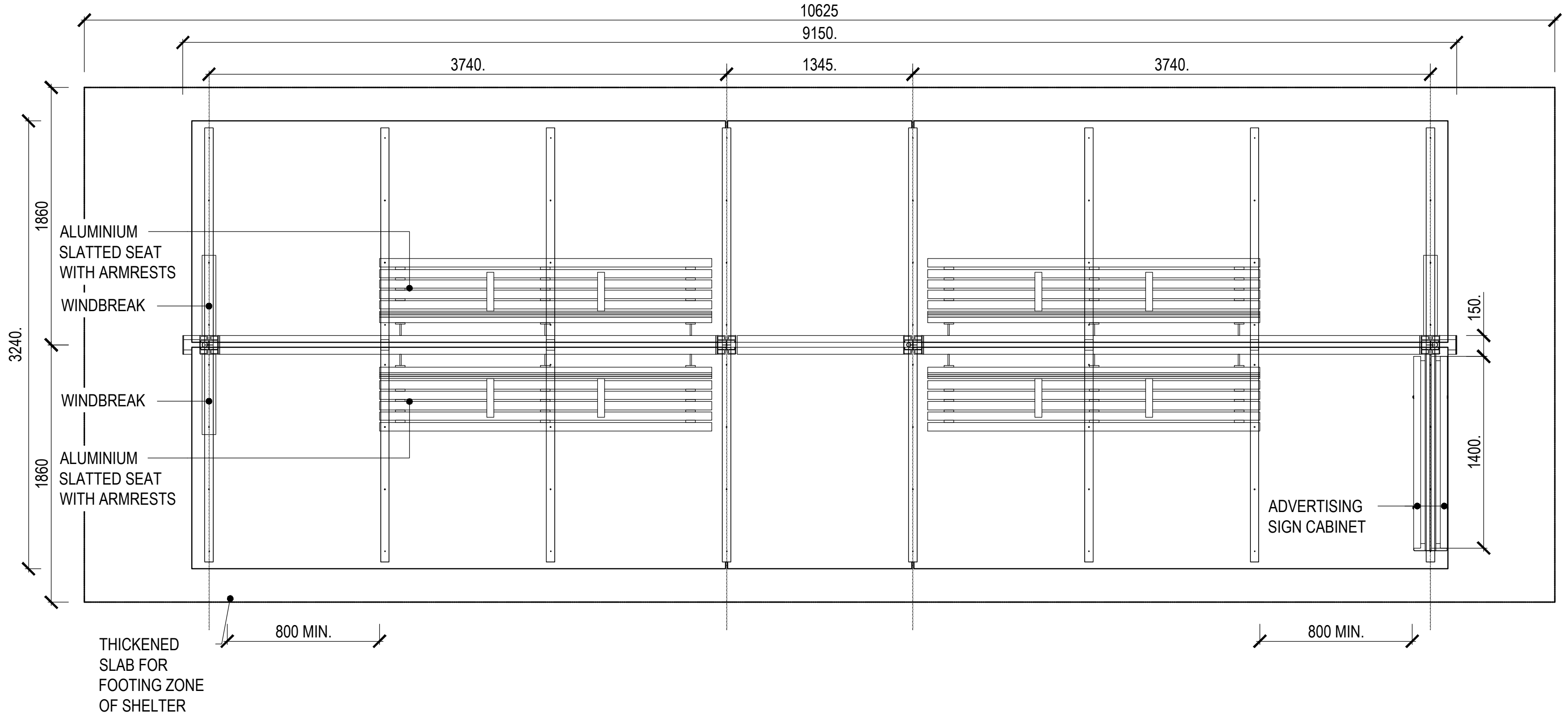
11 SHELTER MANUFACTURER TO PROVIDE ENGINEERING CERTIFICATION FOR SHELTER CONSTRUCTION

12 ALL BUS STOPS TO BE DSAPT COMPLIANT, FOR FURTHER GUIDANCE REFER TO THE RELEVANT STANDARDS, TRANSLINK GUIDANCE AND RELEVANT LOCAL GOVERNMENT REQUIREMENTS.

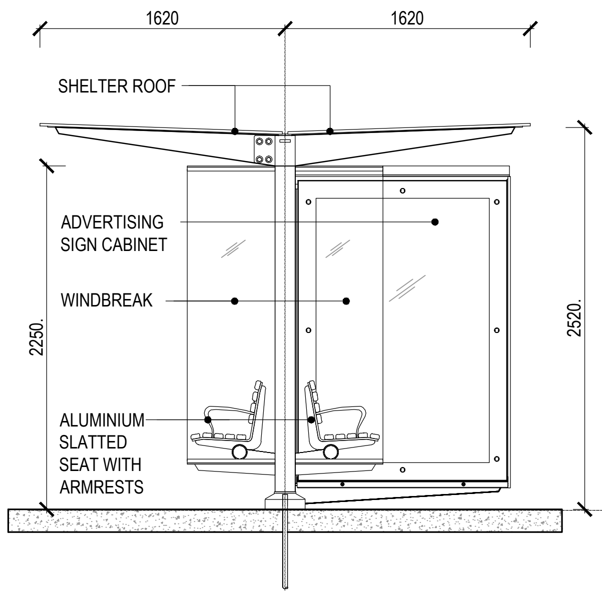
13 ALL BUS STOP COMPONENTS SHOULD BE POSITIONED IN CONSIDERATION OF RELEVANT ONSITE CONDITIONS WITH REFERENCE TO THE GUIDANCE CONTAINED WITHIN THE PTIM, AND FOR ADDITIONAL REQUIREMENTS AND DESIGN ALTERNATIVES REFER TO THE COMPONENTS TABLE CONTAINED IN THE PTIM.

14 REFER TO PTIM GLOSSARY FOR DEFINITIONS OF TERMS, AND, PTIM ABBREVIATIONS FOR DEFINITIONS OF ACRONYMS.

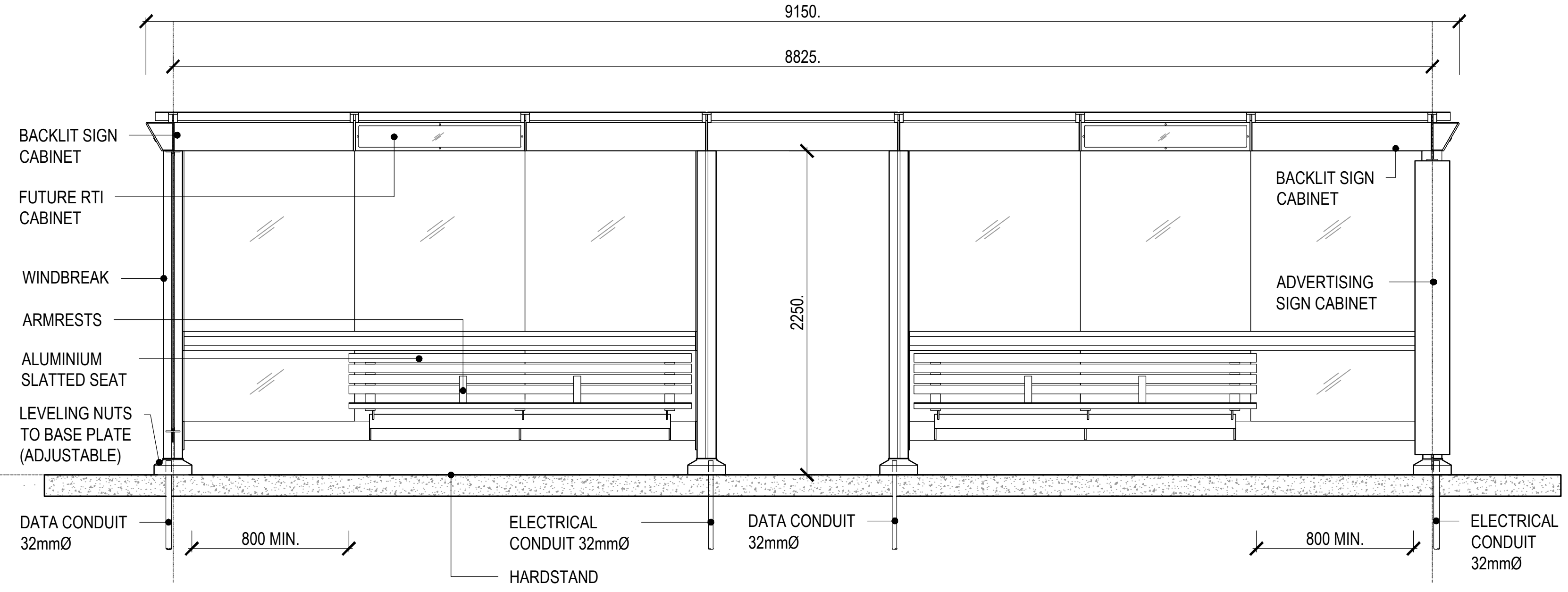
15 ALL DRAWING DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.



1 - SHELTER PLAN
1:50@A3



2 - SIDE ELEVATION
1:50@A3



3 - FRONT ELEVATION
1:50@A3

TRANSLink | Queensland Government

PTIM, BUS STOP INFRASTRUCTURE CHAPTER
BUS SHELTER DESIGNS - TYPE 3B

SCALE :	AS SHOWN		DRG 5-0302
DRAWN :	-	DATE : JULY 2013	A

NOTES:

HARDSTAND

1 HARDSTAND/SLAB DESIGN TO BE SUITED TO SITE SPECIFIC REQUIREMENTS.

2 HARDSTAND/ SLAB DESIGN TO BE SUITED TO GRADIENTS NOT GREATER THAN 2% FALL PRIOR TO MECHANICAL SHIMS.

3 SHELTER FOOTING DESIGN BY OTHERS AND TO LOCAL GOVERNMENT REQUIREMENTS.

SHELTER & SITE LAYOUT

4 FOR FURTHER INFORMATION AND GUIDANCE ON BUS SHELTER LOCATIONAL REQUIREMENTS AND SITE PLACEMENT REFER TO THE PTIM SITE LAYOUT DRAWINGS.

5 SHELTER STRUCTURE COLOUR TO BE RESINE JON

6 SHELTER PAINTWORK TO MEET RELEVANT AUSTRALIAN STANDARDS INCLUDING BUT NOT LIMITED TO AS3715, AS2311, AS2312.

FURNITURE, SIGNAGE & LIGHTING

7 FOR DETAILS OF BUS STOP SIGNAGE REFER TO TRANSLINK SIGNAGE MANUAL.

8 BUS STOP SEAT SHOULD INCLUDE ANODISED ALUMINIUM BATTENS WITH ARMRESTS ALONG THE SEAT. SEATS SHOULD BE BOLTED TO HARDSTAND AREA, AND MADE FROM EASILY MAINTAINED MATERIALS. SEATS TO BE COMPLIANT WITH DSAPT. WHERE A SEAT ABUTS A CONTINUOUS ACCESSIBLE PATH OF TRAVEL, ENSURE MINIMUM 30% LUMINANCE CONTRAST AGAINST BACKGROUND (E.G. FLOORING).

9 LIGHTING DESIGN TO COMPLY WITH THE RELEVANT STANDARDS AND BE COMPLIANT WITH DSAPT.

ADDITIONAL REQUIREMENTS

10 ALL MEASUREMENTS AND DIMENSIONS SHALL HAVE AN APPLIED TOLERANCE OF 3MM.

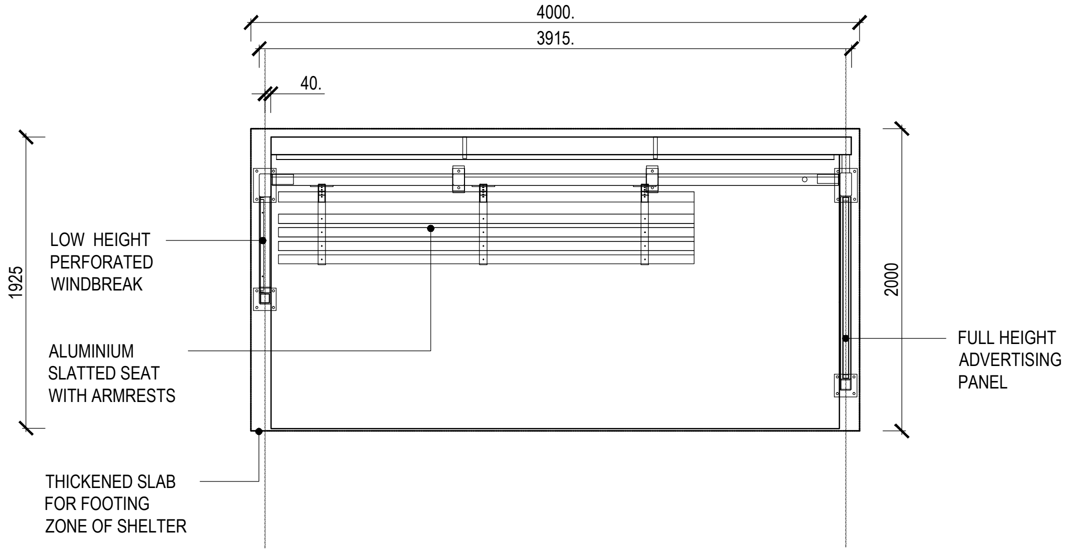
11 SHELTER MANUFACTURER TO PROVIDE ENGINEERING CERTIFICATION FOR SHELTER CONSTRUCTION

12 ALL BUS STOPS TO BE DSAPT COMPLIANT, FOR FURTHER GUIDANCE REFER TO THE RELEVANT STANDARDS, TRANSLINK GUIDANCE AND RELEVANT LOCAL GOVERNMENT REQUIREMENTS.

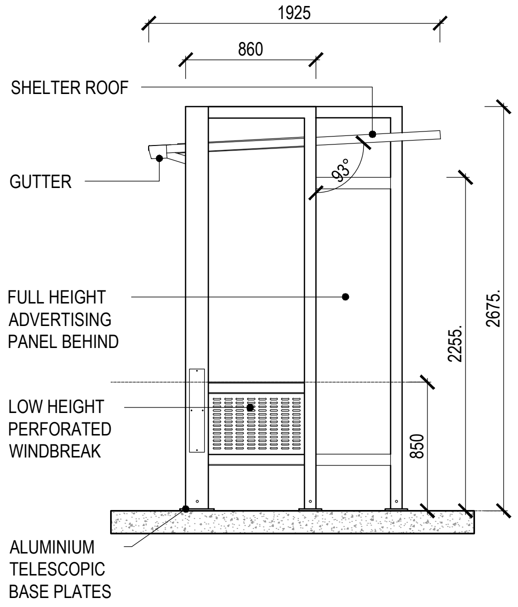
13 ALL BUS STOP COMPONENTS SHOULD BE POSITIONED IN CONSIDERATION OF RELEVANT ONSITE CONDITIONS WITH REFERENCE TO THE GUIDANCE CONTAINED WITHIN THE PTIM, AND FOR ADDITIONAL REQUIREMENTS AND DESIGN ALTERNATIVES REFER TO THE COMPONENTS TABLE CONTAINED IN THE PTIM.

14 REFER TO PTIM GLOSSARY FOR DEFINITIONS OF TERMS, AND, PTIM ABBREVIATIONS FOR DEFINITIONS OF ACRONYMS.

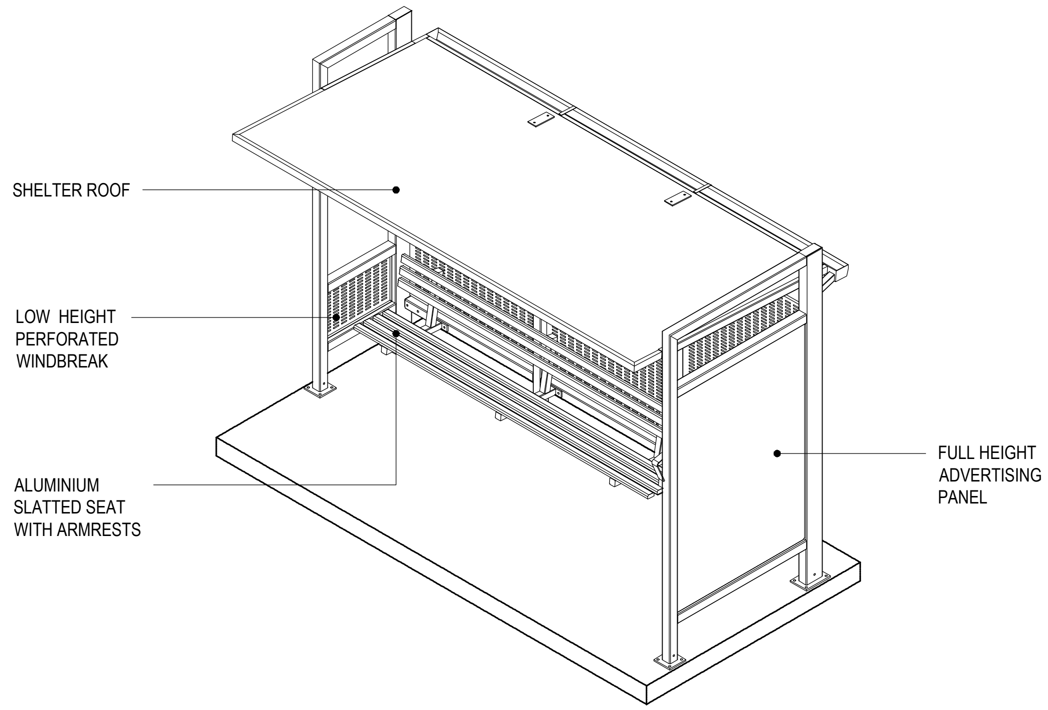
15 ALL DRAWING DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.



1 - SHELTER PLAN
1:50@A3



2 - SIDE ELEVATION
1:50@A3



3 - ISOMETRIC
NTS

TRANSLink	Queensland Government

PTIM, BUS STOP INFRASTRUCTURE CHAPTER
BUS SHELTER DESIGNS - SUBURBAN SHELTER WITH AD PANEL

SCALE :	AS SHOWN		DRG 5-0401
DRAWN :	-	DATE : JULY 2013	A

NOTES:

HARDSTAND

1 HARDSTAND/SLAB DESIGN TO BE SUITED TO SITE SPECIFIC REQUIREMENTS.

2 HARDSTAND/ SLAB DESIGN TO BE SUITED TO GRADIENTS NOT GREATER THAN 2% FALL PRIOR TO MECHANICAL SHIMS.

3 SHELTER FOOTING DESIGN BY OTHERS AND TO LOCAL GOVERNMENT REQUIREMENTS.

SHELTER & SITE LAYOUT

4 FOR FURTHER INFORMATION AND GUIDANCE ON BUS SHELTER LOCATIONAL REQUIREMENTS AND SITE PLACEMENT REFER TO THE PTIM SITE LAYOUT DRAWINGS.

5 SHELTER STRUCTURE COLOUR TO BE RESINE JON

6 SHELTER PAINTWORK TO MEET RELEVANT AUSTRALIAN STANDARDS INCLUDING BUT NOT LIMITED TO AS3715, AS2311, AS2312.

FURNITURE, SIGNAGE & LIGHTING

7 FOR DETAILS OF BUS STOP SIGNAGE REFER TO TRANSLINK SIGNAGE MANUAL.

8 BUS STOP SEAT SHOULD INCLUDE ANODISED ALUMINIUM BATTENS WITH ARMRESTS ALONG THE SEAT. SEATS SHOULD BE BOLTED TO HARDSTAND AREA, AND MADE FROM EASILY MAINTAINED MATERIALS. SEATS TO BE COMPLIANT WITH DSAPT. WHERE A SEAT ABUTS A CONTINUOUS ACCESSIBLE PATH OF TRAVEL, ENSURE MINIMUM 30% LUMINANCE CONTRAST AGAINST BACKGROUND (E.G. FLOORING).

9 LIGHTING DESIGN TO COMPLY WITH THE RELEVANT STANDARDS AND BE COMPLIANT WITH DSAPT.

ADDITIONAL REQUIREMENTS

10 ALL MEASUREMENTS AND DIMENSIONS SHALL HAVE AN APPLIED TOLERANCE OF 3MM.

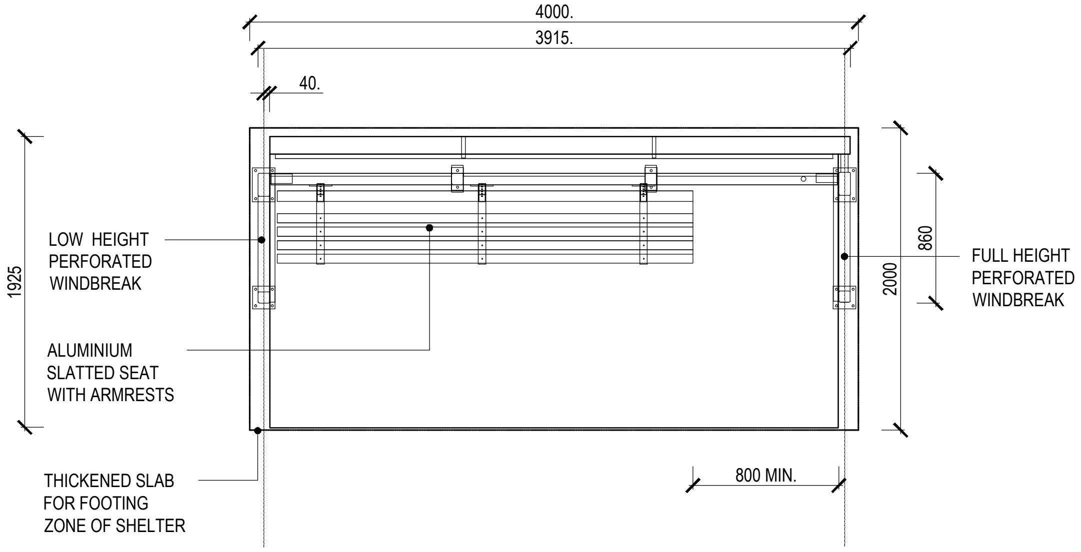
11 SHELTER MANUFACTURER TO PROVIDE ENGINEERING CERTIFICATION FOR SHELTER CONSTRUCTION

12 ALL BUS STOPS TO BE DSAPT COMPLIANT, FOR FURTHER GUIDANCE REFER TO THE RELEVANT STANDARDS, TRANSLINK GUIDANCE AND RELEVANT LOCAL GOVERNMENT REQUIREMENTS.

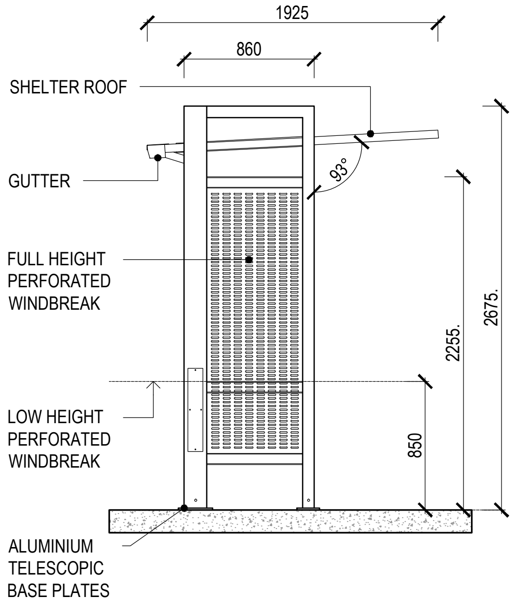
13 ALL BUS STOP COMPONENTS SHOULD BE POSITIONED IN CONSIDERATION OF RELEVANT ONSITE CONDITIONS WITH REFERENCE TO THE GUIDANCE CONTAINED WITHIN THE PTIM, AND FOR ADDITIONAL REQUIREMENTS AND DESIGN ALTERNATIVES REFER TO THE COMPONENTS TABLE CONTAINED IN THE PTIM.

14 REFER TO PTIM GLOSSARY FOR DEFINITIONS OF TERMS, AND, PTIM ABBREVIATIONS FOR DEFINITIONS OF ACRONYMS.

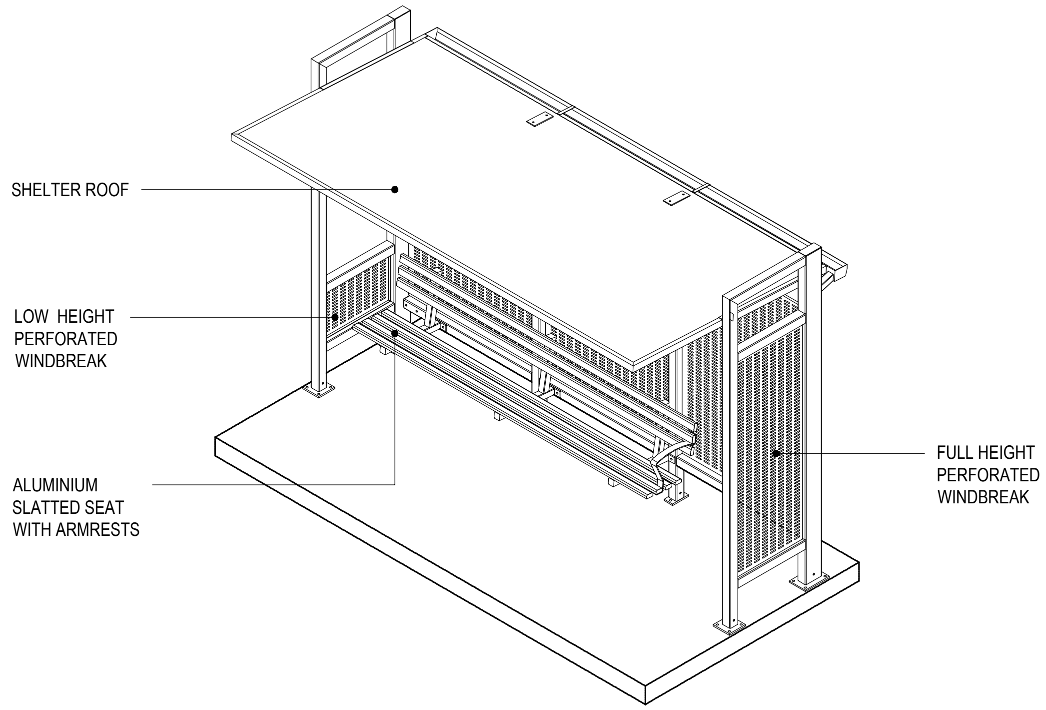
15 ALL DRAWING DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.



1 - SHELTER PLAN
1:50@A3



2 - SIDE ELEVATION
1:50@A3



3 - ISOMETRIC
NTS

TRANSLink | Queensland Government

PTIM, BUS STOP INFRASTRUCTURE CHAPTER BUS SHELTER DESIGNS - SUBURBAN SHELTER WITHOUT AD PANEL			
SCALE : AS SHOWN		DRG 5-0402	
DRAWN : -	DATE : JULY 2013	A	

Contents

Chapter 6 – Bus station infrastructure

6. Introduction

6.1 Overview of the Bus Station Infrastructure chapter

The *Bus Station Infrastructure chapter* is a referenced component of the overarching *Public Transport Infrastructure Manual (PTIM)*. This *Bus station infrastructure* chapter is to be used in conjunction with:

- ***PTIM, Background and application***, which establishes the rules for application of the entire *Public Transport Infrastructure Manual*
- ***PTIM, Planning and design***, which provides the overarching design guidelines and principles for public transport infrastructure across Queensland
- ***PTIM, Supporting access and infrastructure***, which details the supporting access infrastructure required to support public transport stops, stations and related facilities
- ***PTIM, Branding, theming and signage***, which provides branding, theming and signage that should be used for identifying coherent public transport infrastructure throughout Queensland.

For information on further resources to support the planning and design of bus stations, please refer to the *PTIM, References and resources*.

6.2 Purpose and objective

The *Bus station infrastructure* chapter will inform infrastructure design by providing a clear and consistent set of principles and guidelines for bus stations across the TransLink network.

It will ensure that a high standard of infrastructure is planned and delivered to meet the needs and objectives of the TransLink passenger transport system and passenger expectation. Ultimately, high-quality and consistent infrastructure will provide customers with a transport system that is coherent, functional and encourages passenger use.

The objectives of this chapter are to:

- ensure best practice infrastructure design is applied across the TransLink network
- outline the preferred requirements for bus station design
- detail requirements for compliance with relevant standards and regulations
- ensure the delivery of high-quality public transport infrastructure
- ensure the delivery of accessible infrastructure.

6.3 Application of the Bus Station Infrastructure chapter

6.3.1 Intended audience

This chapter is intended for use by professionals in the transport planning and delivery industry. This generally involves, but is not limited to, designers, planners, engineers, architects and other professionals involved in the planning, design and delivery of public transport infrastructure in Queensland.

6.3.2 Application of this chapter

This chapter must be used in conjunction with overarching applications of the *PTIM*.

This chapter should be referred to before starting to plan new or upgrades to existing bus stations.

It details TransLink requirements for the planning and design of bus station infrastructure across the TransLink network.

TransLink, in partnership with local government and in collaboration with relevant stakeholders and delivery partners, shall be consulted on the final design for new infrastructure and upgrade of existing facilities.

6.4 Principles of bus station planning

6.4.1 What is a station?

For the purpose of this chapter, a bus station is defined as:

'a high-quality passenger transport facility that acts as a central departure and/or destination point to accommodate high passenger volumes'.

Bus stations provide passengers with the key point of connection between transport services and a desired destination (or transfer point en route to a destination). Stations are normally located on corridors with high-frequency services and can be located from outer-suburban areas to inner-city areas.

Stations generally serve key catchment areas such as commercial and business districts and may contain a moderate to very high level of supporting infrastructure (for example, quality footpaths, kiss 'n' rides, public amenities, cycle amenities and park 'n' rides).

6.4.1.1 Bus station categories

TransLink has categorised bus stations based on infrastructure function and configuration. These categories must work in conjunction with the public transport infrastructure hierarchy in the *PTIM, Public Transport Infrastructure Planning and Design*. This will establish infrastructure hierarchy and function based on its locality.

Table 6.1:
Provides a brief description of the types of bus stations.

Bus station category	Description
Standard bus station	• Provide access to beginning and end of trip movement from multiple services • Typically not intended for interchanging between modes
Intra-modal bus station	• Destination or departure point for high-priority services • Key bus-to-bus interchange points in the network • Located on two or more bus corridors
Multi-modal station	• Provide transfers between different modes • Serve significant catchment areas • Where two or more public transport corridors come together with different modes
Contact TransLink for confirmation and assistance with determining the hierarchy and category of station infrastructure.	

6.5 Bus station environment

6.5.1 Integration with land use

Integration with land use is critical for all public transport infrastructure including bus station infrastructure, particularly in order to adequately cater for customers needs, ensures community access to services and contributes to reducing dependency on car.

While other factors such as operational capacity and network characteristics influence the functionality of public transport infrastructure, ultimately the location is the key driver for passengers using the facility.

The majority of locality factors (for example, population projections, demographics, major attractors) for public transport infrastructure are led by the relevant land use plan for the location. This could include:

- regional plans
- local government land use plans
- transport strategies and plans

Reference should also be made to the Queensland Government's development assessment processes and systems.

The overarching design guidelines within the *PTIM* need to be applied giving consideration to site-specific characteristics to create an attractive, seamless integration with the surrounding environment.

In some cases, major public transport infrastructure (such as bus stations) is an integral part of supporting economic development of urban centres, and supports increased densities by encouraging transit-oriented developments.

The proximity of transport facilities with complementary land use developments is vital, as urban consolidation is necessary for achieving increased public transport patronage and therefore justifying high-frequency services.

The following principles should be applied to the planning and design of bus station infrastructure:

- **stakeholder engagement:** partnering with stakeholders to support transit-oriented development opportunities
- **land use planning:** design is appropriate to surrounding community and considers potential future densities and land uses
- **catchment area:** analyse the catchment area to inform existing and potential passenger volumes
- **permeability:** ensure there is high quality, legible access between the surrounding environment and the transport facility as per the access hierarchy, including pedestrian connectivity between activity nodes and the public transport station
- **infrastructure footprint:** the physical and operational footprint impacts of station facilities are optimised (for example, vehicle access, stormwater runoff catchments)
- **safety and security:** station is located to promote customer safety and security, as well as minimise opportunity for criminal or terrorism activity.

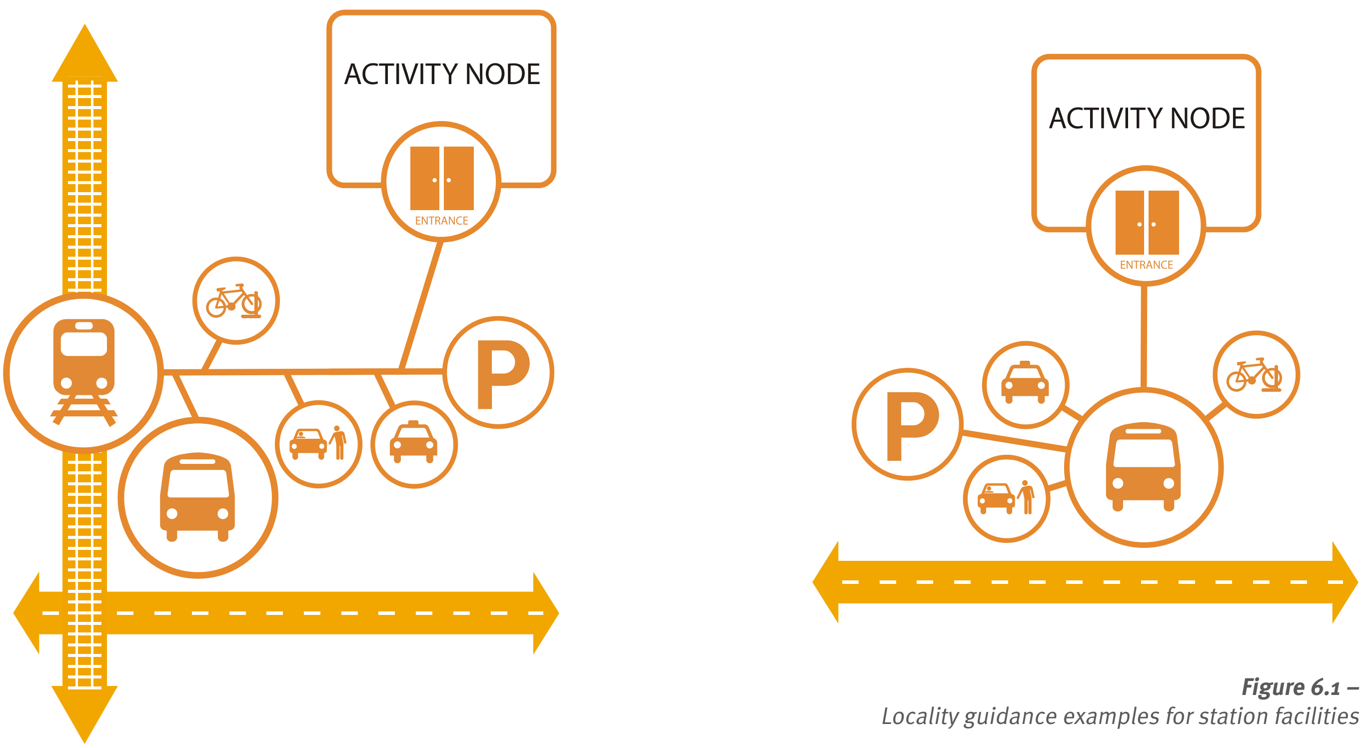


***Figure 6.1** –*
Locality guidance examples for station facilities

6.5.2 Accessibility and compliance

TransLink requires that the relevant standards and guidelines for disability access are followed, along with the engagement of relevant disability reference groups, where required.

The legislative requirements of the Commonwealth Disability Discrimination Act 1992 (DDA), sets out the responsibilities of the department with regards to access to public transport, with the specifics and details given in the Disability Standards:

- *Disability Standards for Accessible Public Transport 2002 (Transport Standards)*
- *Disability (Access to Premises – Buildings) Standards 2010 (Premises Standards)*

6.5.2.1 Bus station operational considerations

The design of public transport infrastructure needs to consider current and future capacity requirements.

The project scoping for public transport infrastructure should determine the timeframe to be considered in planning and design (for example, should 10, 20 or 30 year demand forecasts be used to inform facility design?). Depending on the site consideration and long-term public transport network plans, planning should consider provision for future expansion to increase capacity.

6.5.2.2 Demand analysis

Capacity requirements should be determined early in the planning phase and give consideration to:

- future patronage and service growth
- future transport network and corridor connections
- demographics, including surrounding land use in the vicinity of the facility.

In determining future patronage and service growth the following factors should be considered:

- baseline daily and/or peak volumes (includes passengers and/or vehicles)
- any forecast future daily volume (includes passengers and/or vehicles)
- other volume-related demand factors, including:
  - length and scale of peak demand
  - breakdown between flows associated with boarding and alighting
  - timing factors, including whether it coincides with other peaks in the surrounding area
  - number of peak periods per day per direction
  - likely directional travel mode-share
- special needs demand, including:
  - potential volumes of special needs users, disability groups, schools
  - potential for land use scale, intensity or typology change.

TransLink can provide basic information, such as:

- existing patronage
- targets and forecast demand
- volume and frequency of current and future services for the location or corridor
- previous performance against reliability measures such as on-time running.

In some cases, additional counts, surveys or demand forecasts may need to be undertaken due to the absence of data. TransLink should always be consulted regarding appropriate demand identification methodologies and data validity.

For further information in determining pedestrian capacity and Levels of Service (LOS) requirements refer to *PTIM, Planning and Design* chapter 2.4.2.3 – Density of occupation.

6.5.2.3 Other operational considerations for the planning and design of bus stations

There are numerous factors that need to be considered when planning bus station infrastructure. Table 6.2 summarises these issues and should be used as a checklist to ensure all the relevant considerations are included in the planning and design of new infrastructure.

Table 6.2:
Operational considerations for planning and designing bus station infrastructure

Factors influencing planning and design	What to consider
Land availability	• **Footprint -** Public transport infrastructure should not consume more space than needed for effective operations. • **Land constraints -** Design needs to consider land constraints in determining size, configuration and function of the infrastructure. Where land is available (for example greenfield sites) it should be preserved to provide short and long-term demand. Consideration should also be made for the use of suitable brownfield sites particularly where land is the property of the State. • The location of the facility should ideally also consider on-street designs where the station forms part of the normal main street setting in a city or town centre, particularly where this offers significant operational benefits for customer and operator.
Surrounding land use and attractors	• **Future land use -** Consider future land use and demographics in determining capacity requirements and design. • **Attractors -** Consider adjacent and nearby attractors in determining capacity. Other capacity factors (such as network and service operations, events) should also be considered. • Development or redevelopment opportunities created or enhanced by a bus station facility.
Service frequency	• **Frequency -** The peak and off-peak frequency of services needs to be considered. • **Demand -** Patronage increases should be estimated to assist in determining the possible life of the facility. Forecast patronage increases will require public transport facilities to be able to accommodate multiple services at higher frequencies. For example, bus stations will require an adequate number of bus bays to minimise delay to services using the facilities. • **Access considerations -** Cycle parking and kiss ‘n’ ride bays will need to consider future demand requirements.
Fare collection	• **Fare collection considerations -** The method of fare collection affects operational capacity of public transport facilities. For example, prepaid ticketing procedures enable faster boarding, reduced dwell times and allow greater person throughput. • **Pre-paid fare collection -** Where pre-boarding fare collection is applicable, this needs to be included in the design. This could include pre-paid ticketing systems, especially those with high level-of-service. The provision of ticketing systems will be determined by facility layout, size, public comfort and level-of-service requirements, and revenue protection strategies. The facility layout must consider the appropriate location of the Paid/Unpaid threshold (position of fare collection barriers-gates) as part of ensuring sufficient and safe circulation and queuing of passengers particularly in peak operational periods. Contact TransLink for preferred fare payment options.

Factors influencing planning and design	What to consider
Mobility aids, wheelchairs, pram and cycle boarding	• **Operational impacts -** Mobility aids, wheelchairs, prams and cycles increase boarding times and can impact operational capacity of public transport infrastructure. This needs to be considered in demand forecasting. • **Accessible design -** Design must accommodate all public transport and comply with the *Disability Standards for Accessible Public Transport 2002 (DSAPT)* and applicable *Australian Standards*.
Bus station vehicle access	• **Access constraints -** Station design should not be significantly constrained by access locations to the major road network, as this affects not only the number of services able to access a station, but also contributes to delays in scheduled services. Capacity restrictions at intersections providing access to and from the station facility are of great importance as delays at intersections can affect the operation of the station and the network itself. When approaching the provision of access between the station and surrounding road network, it is desirable that the following principles be followed: – Access to and from the surrounding road network is to be direct and limit circuitous routing for buses. – The geometric design and intersection control with the major road network should limit delay for services and provide bus priority measures. – If possible, limit or avoid interaction of pedestrian flow and other traffic (for example shopping centre traffic) with bus movement to ensure efficient operations and mitigate possible hazardous conflicts. There are various ways public transport vehicle access movements can be planned and designed. Access to bus stations may be in the form of a left-in-left-out arrangement, exclusively for buses, through the adoption of priority lanes and signalised intersections, or other solutions including real-time priority. • **Manoeuvrability -** The ability for buses to efficiently manoeuvre within a station will depend on vehicle type, size, and station configuration. Station design must consider current bus types and buses that are expected to use the station in the future. The turning circle for design bus manoeuvrability is to be assessed in the design phase, as follows: – Firstly, station function and vehicle operation requirements need to be determined, as different vehicles have different turning circle and sweep path requirements. – Once this has been determined, designers are required to source the appropriate turning and manoeuvring patterns for vehicles expected to operate in the facility. Contact TransLink to confirm the appropriate design vehicle.

Factors influencing planning and design	What to consider
Bus station vehicle access (continued)	– The manoeuvring requirements should be overlayed and incorporated into the preferred station formations. Refer to relevant standards for bus turning circle and manoeuvrability requirements. TransLink and relevant stakeholders will determine the stop configuration to be used at particular bus stations. Stations that adopt an independent bus stop configuration need to allocate sufficient distances between stops to allow vehicles to efficiently manoeuvre between stops. For bus stations with low speed environments, TransLink recommends that the turning and manoeuvring speeds be restricted to 15 kilometres per hour. Station design must not require buses to reverse when manoeuvring into and out of stops. Forward direction in and out of a bus stop is the required outcome. Speed humps are not preferred along TransLink bus routes. Where they are absolutely necessary, they are to be designed as an approved flat top speed hump. TransLink should be consulted when speed humps are considered for inclusion along TransLink bus routes and within facilities.
Pedestrian crossings	• **Type of crossing -** At-grade pedestrian crossings can affect the operating capacity of the bus station. Conflicts between pedestrians and general vehicle traffic should be avoided where possible to promote efficient operations and reduce the risk of accidents. Grade-separated pedestrian crossings should be provided at all high-volume stations with the use of stairs, escalators, ramps, lifts and/or bridges. The use of extensive ramp systems is not preferred as they can be too onerous for some customers, and in those cases lifts are the preferred option to meet disability access requirements. Medium and lower volume stations that do not have a high-speed vehicle through-lane, but a low-speed single passing lane, may include at-grade pedestrian crossings at specific locations. The crossings are to be well signed and marked, have good sightlines for pedestrians and bus operators, include kerb ramps, and be located where there are low vehicle speed limits. Signalised crossings may also be considered but are subject to site-specific review. • **Connectivity -** All pedestrian crossings should have clear and direct access to supporting infrastructure and surrounding facilities. The development of grade-separation should be carefully planned and incorporated in the early stages of the development planning. Where possible, the grade-separated structure should be integrated into the primary facility structure in order to minimise passenger travel.

Factors influencing planning and design	What to consider
Bus boarding and alighting	• **Inclusive design -** Low-floor fully-accessible buses generally reduce loading times, particularly in situations where a high percentage of passengers (such as people with disabilities, the elderly, people with prams and people with shopping or bulky goods) benefit from the easier vehicle access. • All new public transport vehicles are required to comply with *Disability Standards for Accessible Public Transport 2002 (DSAPT)* and applicable *Australian Standards.* • Mobility aids, wheelchairs and prams can have implications for loading times and potentially decrease the operational capacity of a station. However, it is imperative that stations are designed to accommodate all public transport users and ensure dignified and equitable access to all members of the community.
Platform and access area design	• **Design space -** Typically, platform areas and access paths, during peak periods, should be LOS C. Further guidance is available in *John J. Fruin's Pedestrian Planning and Design* publication. Seating and waiting areas should be separated so that they do not interfere with boarding and alighting, facility entrances and exits, information points or other pedestrian circulation points. Given the typical LOS C requirements, platform widths and lengths will vary depending on a range of design criteria including: – the type and size of facility layout (for example in some cases buses will board from the front end of the platform in a lead stop situation, and others from independent stops, warranting separate design considerations for queuing and waiting passengers) – the anticipated peak public demand (that is, numbers of passengers boarding and alighting) – the type and size of vehicle and stopping arrangement – the number of services expected to utilise the facility – additional capacities to cater for missed headways. • **Personal comfort -** Platform and access areas should be designed to be within the range of personal comfort during peak periods. The loading area must accommodate passenger movements when waiting, queuing and accessing services. Passengers boarding and alighting should not inhibit waiting passengers. **Sufficient space also needs to be provided for passengers to move to and away from loading and waiting areas.** • **Inclusive -** All public transport infrastructure must be designed to accommodate all public transport users and comply with relevant access and design standards.

Factors influencing planning and design	What to consider
Bus layovers and driver facilities	• **Efficiency -** The provision of bus layover facilities, or bus holding zones, at stations enables buses to wait until required to commence a new service. This has the potential to allow more efficient bus operations by decreasing the number of trips between the depots and operating services, and minimise dead running. Determining the required number of bus layover bays will generally be dependent on the proposed bus operations and types to be held at the particular station. TransLink will determine the number of spaces required, in consultation with bus operators, during the planning stage of a station. • **Amenities -** Depending on service scheduling, bus driver amenities (meal rooms and toilets) may need to be provided at stations that have a significant number of terminating services. The size of these facilities should align with the required quantity of bus layover services and bays. The structure must complement other components of the station and be located in a discrete location (that is, in close proximity to bus layover areas) to provide efficient driver access. • Layover often may need to be located off-site to facilitate compactness of station design and integration with adjacent/surrounding land uses. TransLink should give guidance on proximity, management and reliable access paths for off-site layover. Safe movement of drivers to and from layover and facilities needs to be planned and designed for.
Access infrastructure	• **High-quality access infrastructure -** Planning and design should consider how passengers will access the infrastructure, and incorporate appropriate access facilities and infrastructure. For detailed guidance refer to the *PTIM, Supporting access infrastructure* chapter.

6.5.3 Asset management

Bus stations are major elements of passenger transport infrastructure and they need to be managed and maintained to sufficient operational conditions suitable for passenger comfort and safety.

The station components need to be maintained and managed on an ongoing basis to ensure the effective operation of a facility. The framework for how a facility will be managed after the delivery of infrastructure needs to be considered within the planning and design process.

The following must be considered when planning and designing bus station facilities:

- the general requirements for durability, cleaning and maintenance schedules of infrastructure components
- surveillance and access control of the facility
- cost-effectiveness, commonality and replacement of components
- approved suppliers of the materials and components
- access to water, electricity and other resources
- general operating costs (such as electricity, water and staff)
- statutory requirements for buildings and facilities
- requirements for staff.

The above is not a definitive list and other considerations may be required depending on site-specific circumstances.

Relevant operational stakeholders should be engaged in the planning and design process to ensure that the requirements of asset management by operators and/or owners have been considered. All components of bus station infrastructure should use materials and finishings consistent and compatible with existing infrastructure and of an approved standard. In consultation with relevant operating and maintenance stakeholders, detailed maintenance manuals should be developed for all components and operation schedules within a station facility. These should be prepared as a part of the station project.


Noosa Junction
Public toilet
Public phone
Shared cyclist & pedestrian pathway
Shopping Centre
Car park
TRANSLink

6.6 Bus station formation

6.6.1 Understanding station layouts

This section provides schematic station layout arrangements that can be used as a starting point in the early station planning and design phase. The schematic layouts can be configured to meet site-specific constraints and operational requirements.

With each site having unique characteristics, a site-specific response needs to consider:

- the surrounding environment and land use
- functional and operational capacity requirements
- surrounding catchment demand from the wider transport network.

Station design shall be undertaken in conjunction with TransLink and key stakeholders.

6.6.2 Bus station layouts

TransLink has defined a range of generic bus station layouts to suit the needs of both passenger and public transport vehicle requirements. Each layout defined in this section would need to be tailored to meet operational and site requirements for specific stations. The details depicted in the station layout drawings such as bus layovers, crossings, amenity facility locations, etc., aim to represent possible best practice outcomes; however, not all stations will be able to achieve the depicted desired outcomes given site constraints.

In addition to the bus station layout itself, a range of supporting infrastructure (for example, pedestrian and cycle components, kiss ‘n’ ride, and park ‘n’ ride) needs to be incorporated to complement station functionality. Refer to the *PTIM, Supporting access infrastructure.*

6.6.2.1 Bus linear platform (mono-directional)

The layout is suited to:

- standard stations or intra-modal stations with intended transferring between services
- linear sites with reasonable length and adequate footprint width
- sites with vehicle access and egress locations at either end of the platforms
- stations located at-grade with lower speed limits and access from the surrounding road network
- a greater proportion of high frequency services compared to local and feeder services.

This layout comprises linear bays and passenger loading platforms located on either side of a through carriageway.

Buses run through the station in a single direction and use one entry and exit point. In most cases, depending on site constraints, the platform waiting areas for each bay (including shelters) will run parallel and have the same directional facing aspect.

Platform areas need adequate room for pedestrian movement, queueing and waiting areas. Pedestrian crossings will be positioned behind vehicle movements to minimise impact on station operations and ensure pedestrian safety.

Station design should use transparent and lightweight structures to promote passive surveillance.

Buses can either pull up at independent stops along the platform, or a lead-stop approach can be implemented.

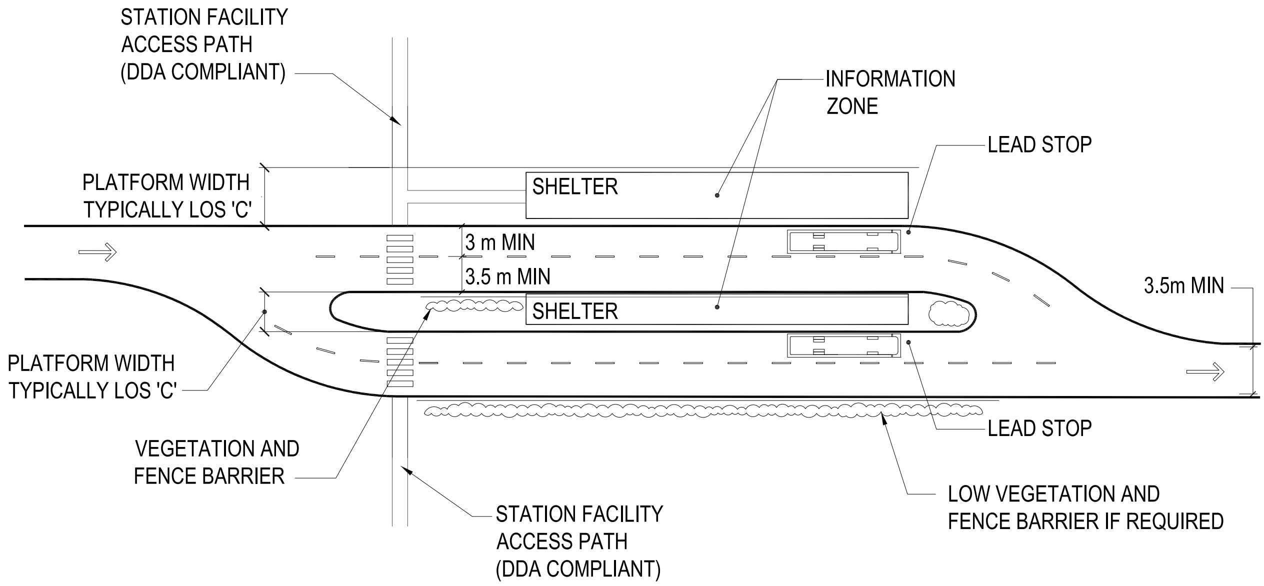


Figure 6.2 –
Bus linear platform schematic layout (mono-directional)

6.6.2.2 Bus linear opposing platform (bi-directional)

The layout is suited to:

- linear sites with reasonable length and adequate width
- sites with vehicle access and egress locations at either end of the platforms
- predominantly dedicated bus priority corridors (that is, transitways, busways) that may feature grade-separation where high-frequency services operate
- bus routes passing through stations with no intended transferring between services.

Linear bi-directional stations consist of a linear formation with bays and platforms located on either side of a through carriageway and services running in opposing directions.

Bi-directional platforms will face and run parallel to each other, with entry and exit at both ends. These bus stations are predominantly located on high-frequency services corridors and tend to be grade separated.

Pedestrian access will primarily be through grade-separated measures such as stairs, lifts and pedestrian overpasses.

Pedestrian access will generally require a site-specific response due to the lead-stop approach commonly used.

Pedestrian access will generally be located at the back end of the platform for the morning peak inbound services to assist with efficient passenger movements. This layout can offer high passive surveillance between platforms when designed with a transparent median barrier, whilst deterring pedestrians from crossing inappropriately.

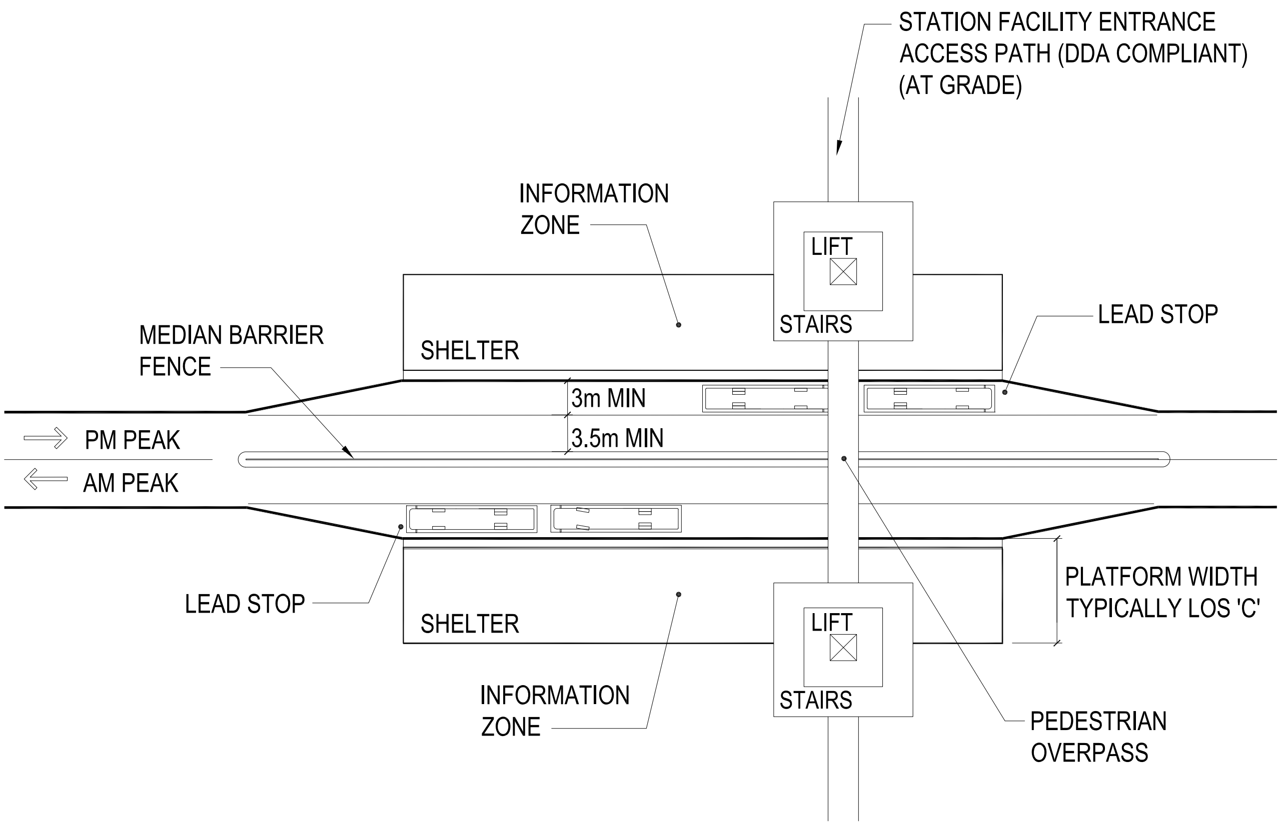


Figure 6.3 – Bus linear opposing platform (bi-directional)

6.6.2.3 Bus linear staggered platform (bi-directional)

The layout is suited to:

- linear sites with ample length and limited width
- sites with vehicle access and egress locations at either end of the platforms
- typically high-frequency services
- stations located at-grade and/or with access from surrounding road network
- bus routes not intended for high volume passenger transfers between services.

This station layout consists of an elongated linear platform arranged in a staggered configuration, and is suitable where space is limited.

The staggered platforms consist of a mid-block chicane so that the overall cross section requires three lanes instead of the more conventional four lanes. This station is suited to buses running in a bi-directional manner along a corridor, while a lead-stop approach is commonly employed.

Pedestrian access is typically at-grade while crossings are to be located directly in the middle of the station layout to ensure convenient and safe passenger movements. Effective passive surveillance is considered to be more difficult to achieve at these stations because of the greater distance between the ends of opposite platforms.

It should be noted that this layout is not compatible with LRT station operation.

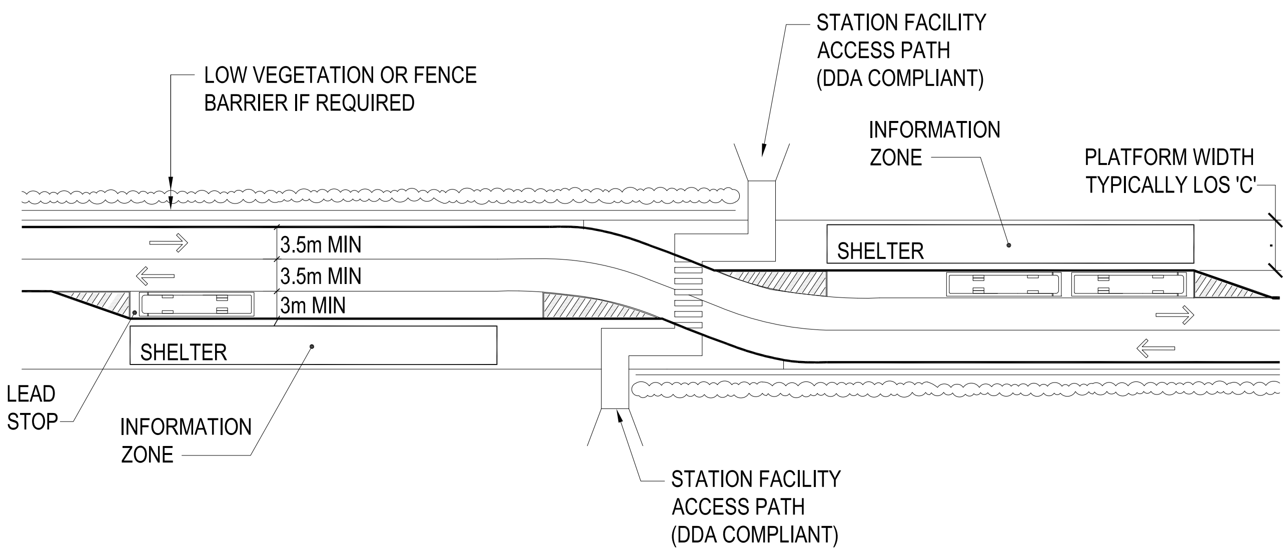


Figure 6.4 **–**
Bus linear staggered platform (bi-directional)

6.6.2.4 Bus island platform — at-grade and grade-separated (mono-directional)

The layout is suited to:

- standard stations or intra-modal stations requiring transfers
- feeder and terminating services where buses can easily access bus layover areas
- rectangular sites with ample width and limited length
- sites with limited or fixed vehicle access and egress locations to surrounding road networks
- a high proportion of local, feeder and terminating services, particularly for services needing to manoeuvre through the station.

This layout consists of an island platform where passenger platform areas are located in the middle of the station with bus stops located around the island perimeter. Independent stops, as opposed to a lead-stop approach, are generally used.

Depending on the location of vehicle access and egress to the surrounding road network, buses circulate in a single direction around the island platform and allow boarding from both sides.

Depending on site requirements and number of services, pedestrian access can be provided with at-grade or grade-separated treatments. The layout of the island platform provides for a central waiting point for passengers that enhances personal safety with optimal passive surveillance, maintains simplicity, and provides for convenient interchanging if required.

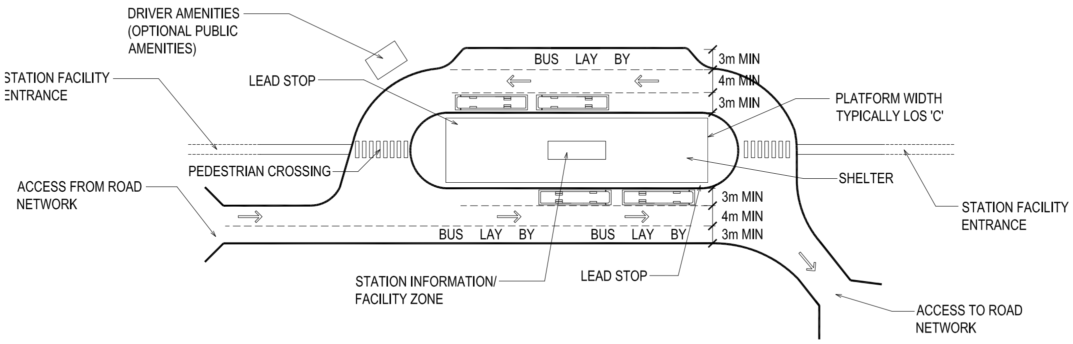


Figure 6.5 –
Bus island platform at-grade (mono-directional)

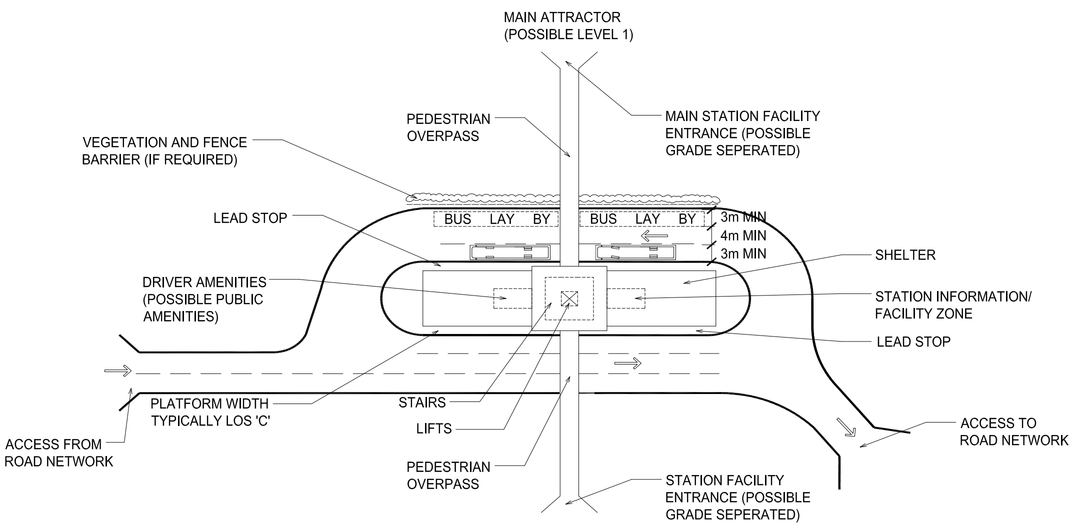


Figure 6.6 –
Bus island platform grade-separated (mono-directional)

6.6.2.5 Bus sawtooth platform (mono-directional)

The layout is suited to:

- compact site footprints with inadequate length to provide the appropriate number of vehicle bays in a linear arrangement
- sites with limited access and egress locations to surrounding road networks
- a high proportion of local feeder or terminating services compared to limited or no line haul services operating
- standard stations or intra-modal stations where passenger interchange occurs in significant volumes.

This layout consists of angled bus bays with passenger loading platforms located as either an island or linear loading style arrangement where buses manoeuvre forward into and out of bays. Bus circulation will be determined by the location of stops (around the island or outer perimeter) and access options from the surrounding road network.

Passenger access will predominantly be provided at-grade due to the slower speeds of buses manoeuvring in and out of the station.

Pedestrian crossings should be located at safe and convenient access points depending on the surrounding attractors and direction of bus circulation. Specific shelter design should be taken into consideration to ensure adequate coverage due to the unique platform layout.

It should be noted that the sawtooth station layout has the potential for increased manoeuvring times as well as posing safety risks for sightlines of bus operators and pedestrians.

Providing adequate shelter coverage at this type of station layout can be more complicated than more conventional layouts due to the nature of the sawtooth bays.

This station type is TransLink's least preferred station layout and should only be adopted if other layouts are unable to meet the site requirements.

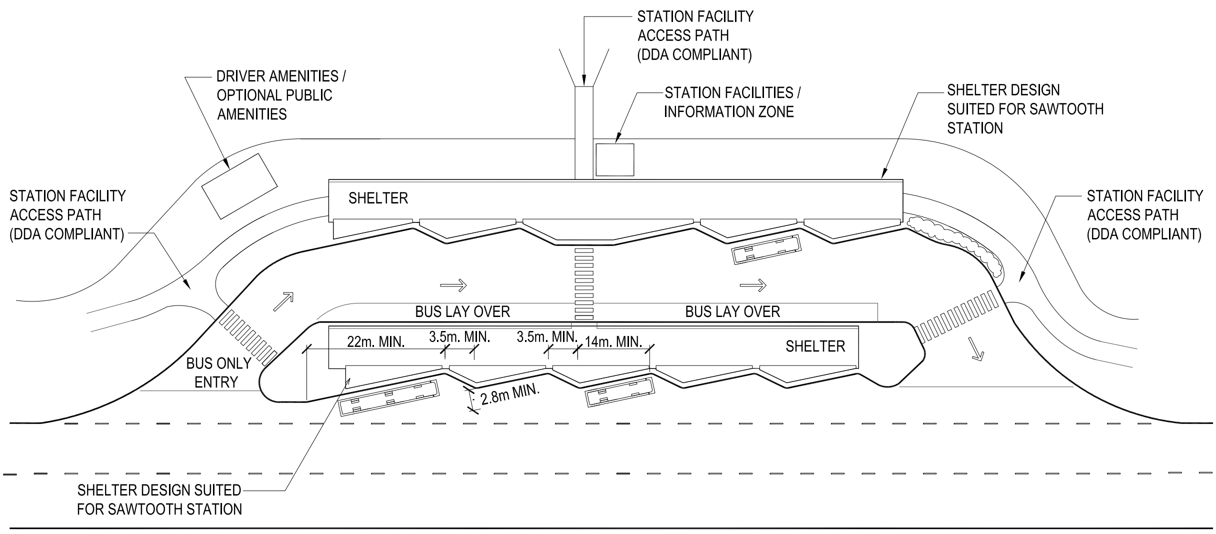


Figure 6.7 –
Bus sawtooth platform (mono-directional)

6.6.2.6 Rail and bus multi-modal platform

The layout is suited to:

- multi-modal stations offering complementary bus and rail transfers
- bus feeder or high frequency services
- sites with larger land area availability and/or significant surrounding attractors
- good access to rail corridor and surrounding road network (or dedicated bus corridors).

Any of the previous layouts can be used as a basis to design a multi-modal facility for bus passengers transferring to rail.

Bus and rail platforms need to be located to allow seamless transfer between different services. Platforms should be adjacent to, and preferably parallel to, one another to minimise connection distances, maintain easy navigation and enhance passive surveillance.

Successful integration with regard to connectivity will give the impression of one integrated station rather than two that have been retro-fitted. While the figure below shows a layout with both bus and rail stations at the same grade, multi-level station layouts can be explored (such as integrating bus station platforms above rail station platforms).

Ticketing and information facilities are to be easily accessed from station entry points and areas used to transfer between services. Platforms supporting peak inbound services should be given preference for all general station facilities (such as ticket window facilities and toilets).

Pedestrian access around the station should be through correct layout of crossings and/or grade-separated solutions (stairs, overpasses, lifts) where required.

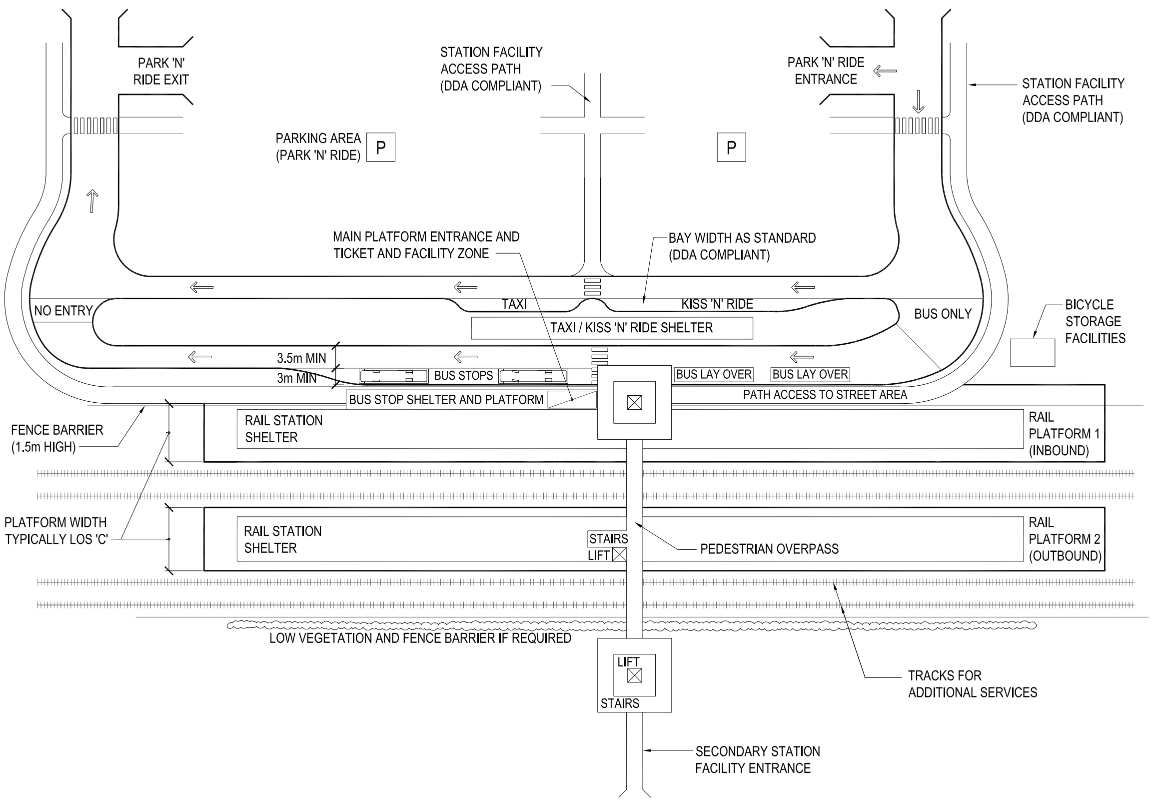


Figure 6.8 –
Bus linear opposing platform (bi-directional)


GRAND PLAZA 534
bus queensland
TRANSLink
PRT 031

6.6.2.7 Bus stop operation

The operation type influences the length of the bus stop zone/bay and the requirements of the bus zone and bus area. Bus stop operation types are described in Table 6.3.

Unless nose to tail operations (that is, lead stop operation) have been specifically identified, independent stop configuration operations should be adopted for bus stop design purposes.

TransLink should be consulted on the preferred operation prior to commencing bus stop design.

Table 6.3:
Bus stop operation type

Bus bay operation	Description
Single bus	• Accommodate at least a single bus manoeuvring • Typical for low or moderate frequency bus services
Nose-to-tail/platooning at lead stop	• Single boarding point for customers where buses platoon behind each other • Typical for high-frequency services services • Minimum additional length per bus needs to be added for this type of manoeuvring to occur
Independent stop configuration	• Designed to address one or a pre-designated set of services • Requires additional minimum length per bus to allow for efficient and safe independent manoeuvring

6.6.2.8 Design vehicles for bus stops

The current fleet in service in the TransLink network varies by operator across the state. Subtle differences in fleet dimensions are likely and need to be considered during the design of accessible bus stops.

For design purposes, a standard rigid bus is typically 12.5 metres in length. Other buses in use include 14.5 metre long rigid buses and 18 metre articulated bus, and 12.5 metre double-decker buses. An approximate width allowance is 3 metres and height 3.5 metres (4.5 metres for double-decker).

Bus door locations must be kept free from all roadside infrastructure. Signposts, trees, tree-grates, planter boxes/landscaping, electrical poles/posts, and other street furniture must be at least 600mm from the kerb, along the length of the bus stop area.

Table 6.4 illustrates the estimated door position (metres from the front of the bus) for the different bus types. This can be used to determine the required length of hardstand, and position of other bus stop components to ensure accessible boarding and alighting of passengers.

Table 6.4:
Estimated bus door position

Typical bus and length	Estimated door position (metres)																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Rigid bus (12.5m)	■	■					■	■										
Rigid bus (14.5m)	■	■				■	■	■										
Articulated three door bus (18m)	■	■			■	■	■					■	■	■				
Rigid bus double-decker (12.5m)	■	■					■	■										

Source: Estimate based upon typical bus fleet dimensions provided by Brisbane City Council.

6.6.2.9 Bus stop length requirements

Both the bus type and type of stop operation will influence the required bus bay length. For on-road bus stops, the length should be able to accommodate a standard or long rigid bus, or an articulated bus, and address adjacent parking abutting the bus stop so that a bus can pull up parallel to the kerb.

For indented stops, TransLink prefers a 1:7 approach taper and 1:5 departure taper. Other taper configurations can be considered on a site-specific basis, and should meet applicable standards or local government requirements. It should be noted that a reduction in approach or departure taper would increase the minimum required length of the indented bus stop bay.

Table 6.5 outlines the length requirements for on-road (non-indented) and indented bus stops for a single bus allowance.

Table 6.5:
Minimum bus stop length requirements

Typical bus type and length	On-road stop [1] (single bus allowance)	Indented stop [2] (single bus allowance)	Additional length for space between buses (multiple bus operation)
Rigid bus (12.5m)	Bus bay length : 25m (L) Departure length: 10m **Total: 35m**	Taper in: 21m (1:7) Bus bay length: 15m (L) Taper out: 15m (1:5) **Total: 51m**	Nose-to-tail: 5m (a) Independent: 12m (a)
Rigid bus (14.5m)	Bus bay length : 27m (L) Departure length: 10m **Total: 37m**	Taper in: 21m (1:7) Bus bay length: 17m (L) Taper out: 15m (1:5) **Total: 53m**	Nose-to-tail: 5m (a) Independent: 12m (a)
Articulated bus (18m)	Bus bay length: 30m (L) Departure length: 10m **Total: 40m**	Taper in: 21m (1:7) Bus bay length: 20m (L) Taper out: 15m (1:5) **Total: 56m**	Nose-to-tail: 5m (a) Independent: 12m (a)
Rigid bus double-decker (12.5m)	Bus bay length: 25m (L) Departure length: 10m **Total: 35m**	Taper in: 21m (1:7) Bus bay length: 15m (L) Taper out: 15m (1:5) **Total: 51m**	Nose-to-tail: 5m (a) Independent: 12m (a)

[1] *Queensland Road Rules* (QRR) Section 183 and 195 set a minimum approach length of 20 metres and departure length of 10 metres, for on road stops. However, TransLink's preferred length is 25 metres minimum for a 12.5m bus.

[2] Refer to current Austroads *Guide to Road Design Part 3: Geometric Design,* and TMR's *Road Planning Design Manual: A Guide to Queensland Practice* Chapter 20 for guidance for the requirements for partially or fully indented bus bays.

As noted in Table 6.5, additional length is required to accommodate multiple buses at the bus stop, either in nose-to-tail or independent operation.

The following formula can be used to calculate an initial bus stop bay length when considering a multiple bus operation. Calculated lengths should be confirmed through undertaking a vehicular swept path assessment to take into consideration other site characteristics (for example, narrower adjacent lane widths).

Length of bus bay =
L + (BL + a) x (n - 1)

Where:

- '*L*' is the bus bay length for a single bus
- '*BL*' is the length of bus
- '*a*' is the additional length for other bus stop operations
- '*n*' is the number of buses

For on-road stops (as per Table 6.5):

The bus bay length (*L*) is:

- 25m for a 12.5m bus
- 27m for a 14.5m bus
- 30m for a 18m bus.

For Indented bus stops (as per Table 6.5):

The bus bay length (*L*) – based on a 1:7 approach taper and 1:5 exit taper – is:

- 15m for a 12.5m bus
- 17m for a 14.5m bus
- 20m for a 18m bus.

The additional length for other bus stop operations (*a*) is:

- 5m for nose-to-tail
- 12m for independent operations.

Example:

Two 12.5m rigid buses using an independent stop configuration. Stop area for a 12.5m bus is 25m and additional length for independent operations is 12m.

Therefore:

Length of bus bay =
25 + (12.5 + 12) x (2 – 1) = 49.5 metres.

6.7 Functional design elements for bus stations

Ensuring that the arrangement of key components is correctly incorporated will contribute towards quality outcomes for the overall facility design.

Each of the following principles described in this section should be incorporated into the design of public transport infrastructure.

6.7.1 TransLink architectural theme

Passengers find it easy to recognise, interpret and navigate public transport infrastructure.

Public transport infrastructure should be designed to:

- be legible within the built environment
- be contemporary
- have a consistent visual appearance
- address climatic conditions

Infrastructure is one of the most recognisable parts of the TransLink network. A consistent 'look and feel' across the network will increase passenger confidence, with customers having clear expectations. Design elements can be tailored to meet specific operational and functional requirements at individual sites, while still maintaining a consistent 'look and feel' across the network.

The TransLink architectural theme provides the framework for establishing a coherent network of public transport infrastructure across the state. Infrastructure planning and design should:

- reflect the relative importance of the infrastructure in the overall public transport hierarchy
- comply with network standards for components such as structures, pavements, signage and way-finding
- be based on the use of modular components to reduce cost, as well as for ease of maintenance and future capacity enhancement
- use common materials that emulate a lightweight appearance to deliver a modern, open and safe environment
- comply with applicable standards and regulations Including:
  - *Disability Standards for Accessible Public Transport 2002 (Cth)*
  - relevant *Australian Standards*.

6.7.2 Arrangement of space

Customers enjoy free flowing movement within the station.

Public transport infrastructure can include public and private spaces. Public spaces form the pathway from the point of entry to the point of departure.

Private spaces should not obstruct paths of travel, sightlines to points of entry, information and decision points, and waiting and seating areas. Private spaces can include:

- retail and commercial areas
- maintenance and management facility areas
- communications and electrical cupboards.

6.7.2.1 Sequence of movement

The layout of a transport facility should consider the sequence of public movement. Public movement is in response to the progressive sequence of actions and decision points along the path of travel. Movement should be in a forward direction from the entry to the platform, as illustrated in Figure 6.9.

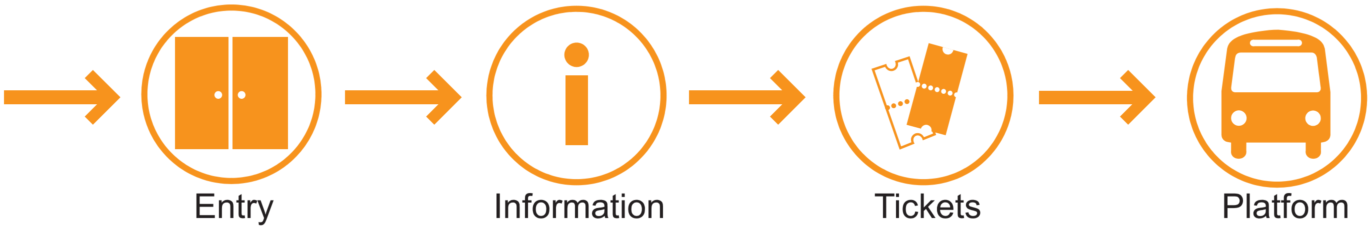


Figure 6.9 –
Sequence of movement

6.7.2.2 Circulation within public transport infrastructure

Table 6.6:
Principles of circulation

Type of circulation	Principles
Direct circulation	• Route between entry and boarding points should be as direct as possible. • Minimise turns in the path of travel and avoid turns greater than 180 degrees. • Changes of level should be through continuous straight flights of stairs or ramps and, if appropriate, escalators or lifts. – If turning is required, landings are to be provided with necessary room for appropriate separation and manoeuvring, and – Stairs circulating at 90-degree turns must adopt suitable measures to provide good sightlines for ascending and descending. See Figure 6.10.
Cross-path circulation	• Provide simple and clearly defined paths of travel that avoid conflict and maximise station capacity. • Paths of travel should be clearly established to meet the requirements of passengers on the dominant side of the pathway, away from the opposite flow path. • Avoid circulation systems that have people crossing the paths of others to access information, ticketing, amenities, platforms, ranks, seating, rubbish disposal and other requirements. See Figure 6.11.
Left-hand circulation	• Dominant movement pattern of pedestrians is based on the majority of travel undertaken on the left-hand side. • Circulation within the facility (including around components and amenities) should follow this convention for predictability and efficiency.
Vertical circulation	• Vertical circulation components such as stairs, ramps, lifts and escalators should be assembled together centrally. • Centralised location of components assists with convenient placement of public information. • All access components must comply with the relevant *Disability Standards.*

Type of circulation	Principles
Changing direction	• Changes in direction within circulation should only occur where there is sufficient space to allow passengers to maintain a sense of direction (use of transparent materials to enable views is preferable). • Appropriate space should be provided at information and decision points for people to avoid conflict with the flow path of travel to ensure comfortable and efficient movement.
Emergency evacuation circulation	• Emergency evacuation considerations, including appropriate circulation paths, exits and assembly points, should cater for the maximum volume of people using the facility at any one time. • Effective signage and way-finding is a key consideration for public circulation in an emergency situation. This must be reviewed in the detailed design stage and receive approval by an emergency evacuation specialist. • Facilities which are structurally at-grade, elevated or below grade present complex emergency and safety requirements that warrant project specific design investigation. *Note: The Premises Standards and the National Construction Code (NCC) including the Building Code of Australia (BCA) provide technical emergency and safety requirements for passenger transport facilities, as well as cross referencing to the relevant Australian Standards for design guidance.*

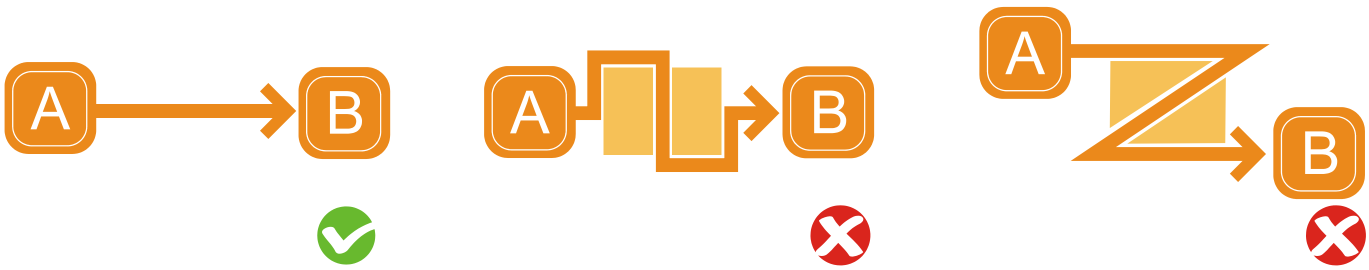


Figure 6.10 –
Direct circulation

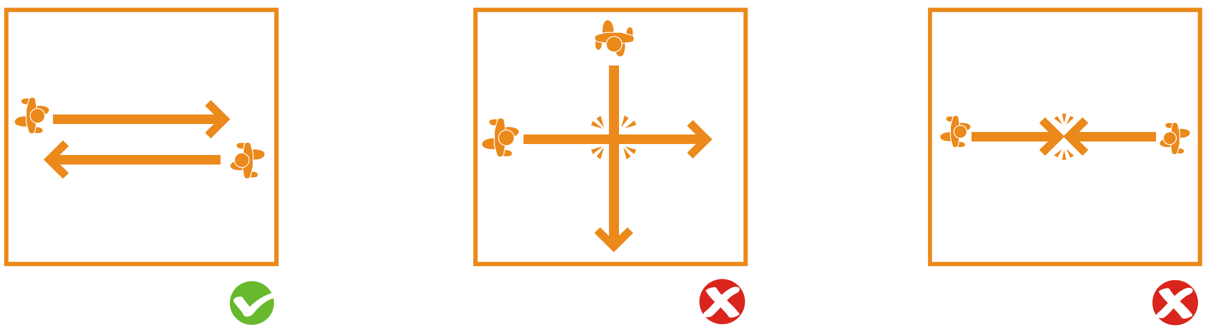


Figure 6.11 –
Cross-path circulation

6.7.2.3 Density of occupation

The density of passengers to be accommodated should be within the range of personal comfort, and passengers should experience modest restrictions without coming into undesirable contact with any person. The public level of service (LOS) classification ranges from LOS A to F (Fruin, 1978, *Pedestrian Planning and Design*). Level A is the least crowded environment and Level F is the most crowded environment (and hence most undesirable). TransLink requires that an acceptable LOS be achieved for pedestrian areas to ensure comfortable pedestrian densities are not compromised during peak periods.

The areas of pedestrian occupation which typically require a LOS design response include:

- waiting and queuing areas (including ticketing and information points such as information displays, fare machines, fare gates, and SACIDS)
- seating
- walkways or other areas of circulation
- stairways
- overpasses
- lifts
- ramps
- escalators and travelators.

Note that the suitable LOS for different pedestrian areas of a station will warrant a different level of area allocation per pedestrian (for example, the physical space of LOS C for stairways will be different from the LOS C for waiting areas). In addition to appropriate space allocation, all pedestrian areas of a station will comply with applicable Disability Standards.

For pedestrian horizontal travel (that is, walkways and overpasses) and platform waiting areas, TransLink typically prefers that a LOS C (between 0.65–0.9 square metres per person of personal space) be achieved as a minimum during peak periods.

However, this preference may be subject to change depending on station and service functional arrangements.

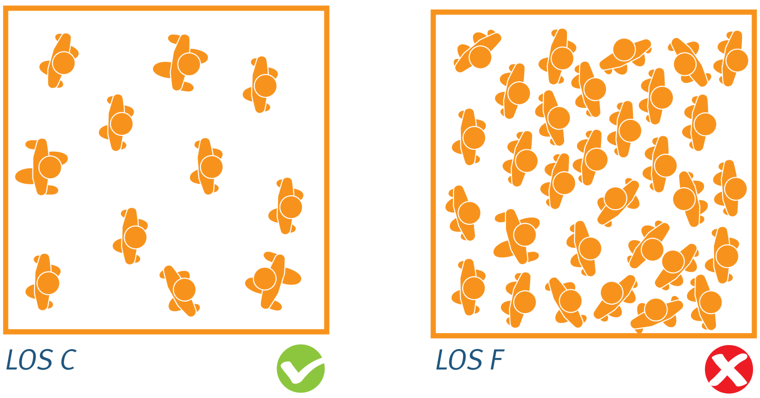


Figure 6.12 –
Density of occupation

6.7.3 Identifiable station entry and exit

Entry and exit points are clearly defined and highly legible to customers.

Clearly defined entry and exit points are essential; not only providing points of access, but also defining the station boundaries and where access infrastructure needs to link to the station from the surrounding built environment.

Design considerations should include provision of entry plazas, information areas, station concourse, ticket office or facility, and fare gates.

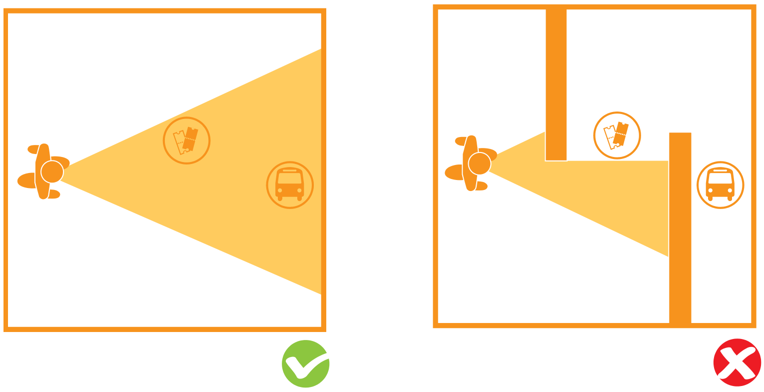


Figure 6.13 *–*
Identifiable entry/facility

6.7.4 Passive surveillance

Infrastructure is designed to provide passive surveillance and deter undesirable behaviour.

The physical environment of public transport facilities must be designed to minimise the possibility of crime, property damage and anti-social behaviour associated with people gathering in public spaces. Creating defensible spaces that allow for surveillance from outside and within the facility will promote safe environments and will attract greater public use. Refer to the current version of the Queensland Government's *Crime Prevention Through Environmental Design (CPTED)* guidelines.

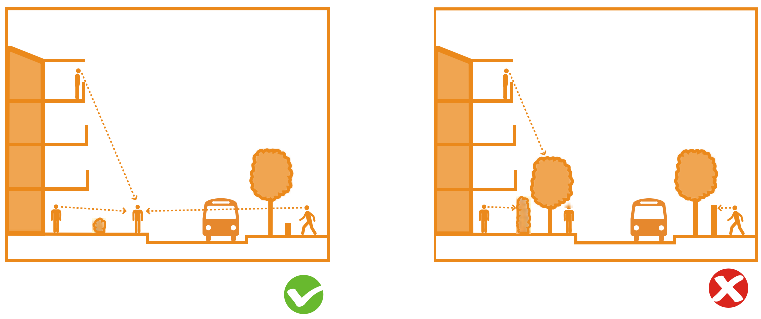


Figure 6.14 *–*
Passive surveillance

6.7.5 Climatic comfort and weather protection

Sun and weather protection is to be provided.

In developing the design of facilities the following should be considered:

- structures must provide sufficient physical width, length and height to achieve high-quality climatic comfort and weather protection for passengers to occupy this space
- passengers should be provided with appropriate protection with enclosed or covered station access points, public information and decision points, seating and waiting areas, and boarding and alighting areas
- consideration must be given to the management of sun, wind, rain, heat, glare and humidity.

An appropriate climate analysis should be included within the planning and design of public transport infrastructure to inform appropriate facility orientation and suitability for specific locations.

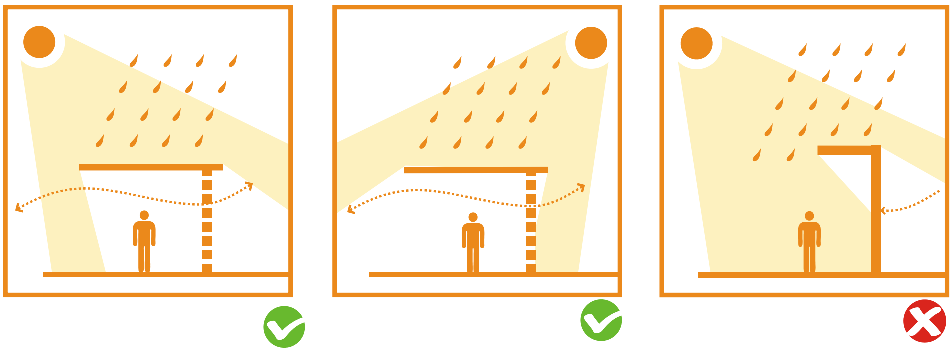


Figure 6.15 *–*
Climatic comfort and weather protection

6.7.6 Functionality and simplicity

Maintain simplicity and provide a functional station design that passengers can easily interpret and use.

The design of structures, platforms, ranks, seating, signage, pavements and other components must be incorporated within the overall design process to achieve highly functional station design outcomes.

The design should provide a legible and pleasant environment that is uncluttered, with minimal concealed spaces.

6.7.7 Sustainable energy use and design

Sustainability is to be considered in developing all public transport infrastructure.

Design and delivery of public transport infrastructure will focus on sustainability through:

- facility design that is fit for purpose now and into the future, and adaptable to change
- contributing to attractive community spaces and a local sense of place
- commitment to a low environmental footprint and whole-of-life approach through all design, construction and maintenance activities
- increasing visibility of sustainable features, and undertaking a participatory approach to design to improve community awareness and support

Details of TransLink sustainability requirements are included in Table 6.7.

Table 6.7:
Key environmental sustainability design considerations

Key sustainability Consideration	Requirement where possible
Water management	• On-site rainwater collection and reuse • On-site run-off treatment (that is, scrubbing using permeable surfaces, detention basins and swales) • Local flooding mitigation and flow maintenance
Resource minimisation	• Water - employ water-saving devices • Energy - aim for energy-neutral infrastructure through minimisation of energy use and generation opportunities (for example, solar for feeding back into electrical supply) • Materials - apply whole-of-life design approach—construction, operation, maintenance, cleaning, and decommissioning. Materials should favour renewables and recyclables • Processes - avoid operational processes that generate waste, especially toxins and pollutants

Key sustainability consideration	Requirement where possible
Habitat and physical environment	• Protect habitat (that is, space, physical elements such as tree hollows and burrows, movement paths) • Maintain water flows to aquatic and other habitats • Avoid acid sulphate soils • Minimise fugitive emissions of air, surface and groundwater-borne pollutants
Social sustainability	• Present minimal harm to employees or public • Promote social justice, inclusion and equity • Contribute to improving social capacity and community interaction • Enhance community experience and integrate facilities with the surrounding environment to enhance economical viability and social benefits

6.7.8 Operations and maintenance

The components and materials that make up a public transport facility should be durable and meet their intended operational requirements. For further details on requirements refer to 2.3.4 Asset Management section of the *PTIM, Public Transport Infrastructure Planning and Design*.

6.7.9 Cultural and heritage places

Heritage values are protected in the upgrade and delivery of public transport infrastructure.

Existing sites may contain components or structures of cultural or heritage significance. Such sites may require particular investigation and attention in the facility design. For example, rail stations are commonly listed as having heritage significance and require careful consideration and approval with respect to structural design and modification. Sites with cultural features or significance may require permission or approval prior to commencement of any planning and design work. TransLink recommends an appropriate level of assessment is undertaken by an expert assessor.

6.8 Bus station components

This section details the components that need to be included at bus stations. The use of quality components (including materials and furnishing) will support effective station operation by:

- providing a comfortable and safe passenger environment
- delivering robust infrastructure that minimises the need for maintenance.

All building and construction components of station design are to comply with relevant building codes and Australian Standard requirements.

TransLink in partnership with Local Government shall be consulted on infrastructure component inclusions for each facility.

The correct level of design components making up a facility will depend significantly on the role of the station in the TransLink network (that is, TransLink's hierarchy of transport facilities).

These are detailed in Table 6.8 where:

- **M** is mandatory (component must be included)
- **P** is preferred (component will be included subject to site constraints)
- **S** is site-specific response (may be required depending on the station purpose and requirements).

Table 6.8:
TransLink required components.

Category	Station component	Facility requirements
Information and signage		
	Signage (includes all relevant station identification, supporting components or infrastructure, and wayfinding)	M
	Stop identification sign	M
	Zone information	M
	Site-specific timetables with route destinations	M
	Public transport information (static timetables, locality maps, interchange information, other customer information)	M
	Real-time passenger information	P
	Public transport next service information facility	S
	Park 'n' ride/kiss 'n' ride wayfinding signage	S
	Public address system (including hearing augmentation)	S
Accessibility		
Surface transactions and access	Minimum boarding point, including TGSI	M
	Tactile Ground Surface Indicators (TGSIs)	M
	Pavements / hardstand area	M
	Kerbs	M
	Accessible clear path of travel	M
	Kerb ramps	M
	Ramp access	S
	Stairs and escalators	S
	Lifts and overpasses	S

Category	Station component	Facility requirements
Supporting access facilities	Cycle parking / storage	P
	Park 'n' ride	S
	Kiss 'n' ride and taxi facilities	P
	Shelters	M
	Ticketing/information office	S
	Fare machine (AVVM)	P
	Public toilets	S
	Driver amenities	S
Stop furniture		
	Shelters	M
	Seating and lean rails	M
	Rubbish bins	M
	Drinking fountain	P
Security and safety		
	Security cameras *	S
	Emergency call points (must coincide with CCTV)	P
	Lighting (bright white)	M
	CPTED principles	M
Fare collection		
	Ticketing / information office	S
	Fare machine (AVVM)	P
	Fare gates	S
Optional enhancements		
Context material	Public art	S

** Liase with TransLink on this requirement*

Category	Station component	Facility requirements
Customer facilities	Accessible toilet / public toilets	S
	Shopping trolley bay(s) / storage	S
Commercial and ancillary services	Vending machine (third party)	S
	Customer wireless internet access solutions	S
	Advertising allowances	P
	ATM	S
	Retail	S
Landscape treatments	Landscape treatment	P
Environmentally sustainable design initiatives	Energy-efficient applications	P
	Water-saving devices	P
	Renewable and recycled materials used for components	P
	Air quality solutions (air pollution)	S
	Noise quality solutions (noise pollution)	S
Operational facilities		
	Bus layover (bus holding zone)	S
	Driver layover amenities / storeroom	S

Note: All components are to be compliant with applicable Disability and Australian Standards. TransLink, with the assistance of relevant stakeholders, will determine facility hierarchy and final components required at facilities.

6.9 Choosing station components

Table 6.9 provides an overview of TransLink requirements in choosing station components. All station components must comply with relevant Disability and Australian standards.

Table 6.9:
TransLink requirements for station components

Element	Consideration
Materials and furnishing	• Common visual appearance by aligning structures, pavement, signage way-finding and other infrastructure with the TransLink architectural theme. • Design elements to be tailored to meet site-specific operational and functional requirements within the overarching TransLink theme. • Components are high quality, easy to use and maintain. • Modular and consistent facility components are used to facilitate future maintenance and expansion of infrastructure. • Materials (such as steel) for structure supports and beams should emulate a lightweight appearance to achieve a modern, open and safe environment. • Comply with all applicable standards and regulations. • Approved by TransLink and relevant stakeholders.

Element	Consideration
Pavements and access	• Address functional requirements of access for both pedestrians and public transport vehicles. **Pedestrian pavements** • Provide a consistent, attractive, durable, easily-maintained surface that is appropriately graded and sheltered. • Suitable for access, waiting and queuing, as well as accommodating the full range of furniture elements. • Integrate TGSIs and way-finding aids for persons with a vision impairment and comply with applicable Disability Standards. • External access paths and links to and from the transport station should be reviewed and considered in the planning and design phase to ensure direct and equitable access for all users. **Crossings** • Design should remove conflicts between pedestrians, general traffic and public transport vehicles. • At busy stations, grade-separated crossings between platforms may be needed. Lifts or escalators are the preferred options, depending on access requirements. Where possible, the grade-separated structure should be integrated into the primary facility structure in order to minimise passenger travel. • Where at-grade, pedestrian crossings will be signed, with good sightlines for pedestrians and drivers. Signalised crossings may also be considered but are subject to site-specific requirements. **Cycle access** • Separate or shared pedestrian and cycle paths shall be implemented where cycle use is promoted. **Other access requirements** • Requirements for service and emergency vehicles should also be considered. **Vehicle pavement design** • Vehicular pavement design must accommodate the loads and turning movements associated with all vehicle types expected to access the station. Concrete rather than asphalt should be used to minimise maintenance. • Overall pavement finish options must be endorsed by TransLink and relevant stakeholders. **Other** • Footing details for platform shelters and other facility infrastructure, as well as all pavements, need to meet current regulations and standards and be approved by a certified engineer.

Element	Consideration
Kerbs	• Provide the transition between the waiting environment and the vehicle pavements associated with the bus bays, layover areas and road access. • Will be extruded concrete in square-edged profile with a typical height of 150 millimetres from the road surface. The kerb should be engineered to withstand vehicle wheel impacts and loads. Refer *Typical Single and Double Platform Arrangements* drawing in *Appendix 6-A* of this chapter.
Ramps	• Provide a smooth transition between road and platform surface levels – and in any other instance where a transition between different levels is required. • Comply with applicable building and Disability Standards, with adherence to the particular construction details shown in the *Australian Standards*.
Stairs and escalators	• Escalators and stairs should not conflict with the direction of established horizontal pedestrian flow for those entering or leaving the flow of vertical travel. **Stairs** • Use where grade-separated treatments are necessary for access or movement within a station (such as over transit lanes). • Stairs should provide simple and safe transition between levels and comply with all applicable design standards (the proportion of treads to risers, landings, slip resistance, TGSIs, colour contrasts and hand rails/balustrades). • Stairs are typically accompanied by ramps for compliance, when required. • TransLink prefers design to accommodate LOS C based on pedestrian flow during peak periods, allowing for both ascending and descending movement. **Escalators** • Alternative to stairs for stations operating with consistently high volumes of passengers during peak periods, or stations that feature high levels of grade separation. • Should be co-located with stairs to offer passengers both options. • If the option of including bi-directional escalators is not available (due to site constraints or station capacity volumes not being sufficient), escalator travel should be given preference towards ascending passengers or the dominant peak flow. • Escalator width should be sufficient for passengers to queue in a single file by simply standing, while still allowing pedestrians who wish to walk (in the travel direction) to pass with minimal obstruction. • Escalators must comply with applicable structural Building And Disability Standards, and should be consistent with the overall station architectural design.

Element	Consideration
Lifts and overpasses	• Some stations will need a lift and overpass structure to connect platforms. • LOS C during peak is preferred for overpass walkways. • LOS D acceptable for lifts during peak periods. • Comply with applicable Disability Standards and *Australian Standards.* • Should appear to be of a lightweight modern structure, transparent to ensure passive surveillance, durable, easily cleaned (such as stainless steel finish). • Be consistent with the overall architectural look and feel of the station.
Signage	• Signage must comply with TransLink's signage guidelines. • Provide logical timetable displays, way-finding signage and overall facility signage. • Use universal icons, symbols and indicators. • Consult TransLink on the general inclusions and arrangement of signage at station facilities. For further information on TransLink's infrastructure signage refer to the *PTIM, Branding, Theming and Signage* chapter.

Element	Consideration
Way-finding including tactile ground surface indicators	• May include non-text or map-based indicators and themes to assist people to travel in their preferred direction. • Can incorporate handrails, tapping rails, building or shore lines, path widths, lighting, paving patterns, arrows, vistas, colours, shapes and TGSIs. • Can assist in aiding equitable access for all passengers, especially people with vision impairment. • Must comply with applicable Disability Standards and *Australian Standards*. • Good facility design will use buildings or shore lines to facilitate clear and direct access as an effective means to assist way-finding, and minimise the need for other additional aids. • TGSIs – Warning TGSIs identify hazards such as stairs, change of direction, or gradients. For bus stations, TransLink requires warning TGSIs to be provided along the front of each bus platform edge. Contact TransLink for requirements. – Directional TGSIs are used as a walking guide to bus stop boarding points and may be used to show the most appropriate and desirable route of travel through a station. However, good facility design will provide other preferred alternatives such as the use of shore lines, and consistent and logical use of spaces. – TGSIs must achieve or better the Disability Standard's minimum contrast required from the surrounding pavement surface colour. – Designs and layouts should be reviewed by specialist access personnel, as well as appropriate user groups, to achieve the most suitable outcome for each location – TGSI should not direct a passenger to a bin.

Element	Consideration
Handrails, balustrades and fencing	**Handrails** • Handrails are generally used in conjunction with ramps, stairs and walkways. • Can be used as a form of support and way-finding aid that is compliant with relevant standards. **Balustrades and fencing** • Provide vital separation between people and hazards where access is not permitted. • Should provide a visually attractive, semi-transparent, and functional system. Fencing can provide a discreet barrier between hazards, such as between two opposite platforms, to promote safe alternative access routes via dedicated crossings or overpasses. • Fencing should not be installed between the vehicle boarding and alighting space and the connecting platform, as this can pose a potential hazard by restricting passengers' ability to move safely between vehicles and platforms. • Fencing should be used at a minimum, and only installed where necessary while still able to promote an open station layout. • Provide a visually attractive, semi-transparent, and functional system, and be constructed from materials that are robust, contemporary and easily maintained. • TransLink's preference is the use of black coloured fencing to promote a discreet yet functional station facility. • All handrails, balustrades and fencing are to comply with applicable Disability Standards and Australian Standards.
Driver layover amenities/ storeroom	• May be required depending on the function of the station and services operating through the station. • Where needed, these amenities should be integrated within the station design and located adjacent to bus holding areas. Driver facilities should be separated from passenger areas. • Layover amenities should include: separate male and female toilets, seating and tables consistent with driver demand, a kitchenette and storeroom (refer to TransLink for typical inclusions and design layout). • Should appear as a seamless element within the overall composition of the station. • Consultation with TransLink is recommended to ascertain requirements for operational layover bays and driver facilities. TransLink will consult with the relevant operator to confirm current and forecast requirements.

Element	Consideration
Shelters	• Shelters and all facility structures should project a consistent design language that: – appears modern, light and spacious – is of a high quality and standard – is reflective of the Queensland sub-tropical climate – is reflective of TransLink's infrastructure theming and architectural design. • Structures at platforms must be cantilevered to provide an unobstructed kerb-line (free from posts or other structural supports) and can be single or double-sided cantilever, depending on platform layout. • Structures must provide complete weather protection during all parts of the day. • Passenger information displays, signage and way-finding can be attached to the cantilevered structure providing they do not obscure sightlines. • Shelter structures should include high-quality finishes with modern, durable, and easily maintained materials that are reflective of the overall station environment and climatic conditions (that is, sun, rain, natural light and airflow). • Examples of these materials include stainless and/or epoxy-painted hot-dipped galvanised steel, glazing, perforated or woven metal and aluminium. • Liaise with TransLink on the design and specification of existing bus station shelters that are currently installed and in use throughout the network.
Ticketing and public transport information	• Both ticketing and information amenities should be integrated within the design of the station structure and environment, and in locations that do not impede free flowing access paths and walkways. • Fare machines (such as AVVMs) issue TransLink's integrated transport fares/tickets for use on buses, trains and ferries. • Stations should have options for customers to purchase paper tickets and to validate electronic *go* cards. • Locate fare machines close to entrance points or nominated boarding points taking into consideration the sequence of movement and paid/unpaid areas. • For bus travel, *go* card scanning devices are located on-board the bus. Some bus stations may include manned pre-boarding ticketing facilities or staff. • Passenger transport information can consist of electronic kiosks and static or real-time displays. Information should be located in waiting areas and decision points within the station. Information should include bus timetables, maps, services, special events etc. • Electronic information displays should face passengers and be positioned at a comfortable viewing angle and height. Designers will need to determine the most suitable quantities and locations for electronic displays. • The location of ticketing and information amenities must be considered early in the design phase to incorporate appropriate security surveillance and power and data requirements.

Element	Consideration
Cycle storage	• Secure cycle storage and amenities are to be included in the design and layout of all stations. • Secure cycle storage facilities and cycle rails should be close to station platforms for a safe and easy transfer to passenger transport. • Cycle storage must be located in a visually-prominent position within or immediately adjacent to the station environment, to allow passive surveillance. • Materials used for these facilities should be secure, transparent, durable, easily cleaned and resistant to vandalism or abuse. • The amount of cycle storage provided will be determined by the size and location of the facility and availability of adjoining cycle access paths. • Consideration should be given to providing appropriate electrical conduits for lighting and in preparation for electronic card access and other future electronic requirements. For further details on cycle amenities, refer to the *PTIM, Supporting access infrastructure*.
Public Toilets	• Inclusion of public toilets will depend on the station location, level-of-service, staffing arrangements, asset management and passenger comfort and safety. • Toilet amenities must meet Disability Standards and Australian Standards. • Toilets should be located in visible and practical, yet discreet, locations and include security requirements. • Inclusion of toilet amenities must consider construction and installation requirements within station design, such as plumbing and drainage. Generally, a storeroom is included in the toilet facility building for storage of cleaning products and other items needed for station operation and maintenance.

Element	Consideration
Seating and lean rails	• Must be provided in quantities reflective of the expected waiting times and levels of anticipated patronage for the station. • Seating should be provided at all allocated waiting areas without impeding free flowing access paths and walkways. • Less seating may be provided at high-frequency service locations due to minimal passenger waiting times and high passenger volumes. • Seating and lean rails should be provided on platforms where passengers can easily see approaching public transport vehicles, typically where there is complete weather protection and where the environment is safe and well lit. They are typically positioned facing the conveyance and either at the rear of the single-sided platform and shelter or in the centre of a double-sided platform and shelter. • Seats should include backrests and armrests and be constructed from durable, easily cleaned and maintained materials that allow drainage from liquids. • Seating may be cantilevered to a wall or shelter structure to allow easier platform maintenance. • All furniture must offer appropriate contrast in colour with the immediate background. • Lean rails provide passengers with a convenient waiting option by allowing passengers to perch or lean, rather than be seated, when waiting for brief periods or where waiting space is limited. • Lean rails generally consist of a horizontal beam supported at either end by vertical posts, or the beam may be attached directly to a wall or station structure. Horizontal beams should be positioned at a height appropriate for the average person.
Bins	• Rubbish bins should be provided at all stations. • Bins are generally located close to waiting or congregation areas, seating, information displays, boarding points, cycle storage areas, and station entries and exits. • Use of bins at high passenger volume stations, such as regional facilities, may warrant careful consideration due to potential security risks. • Bins at particular stations should be designed to allow for detection of suspicious objects. They may be constructed from materials with an open gauge to provide transparency (with a transparent clear plastic liner) that is easy to maintain. • Bin design should aim to be vandal-proof, water-proof and bird-proof. The provision of recycling bins may also be an option and should be considered during the facility detailed design phase. • Recycle bins may be incorporated adjacent to general waste bins to promote recycling, with appropriate recycling collection arrangements in place.

Element	Consideration
Drinking fountains	• Drinking fountains may be provided at stations. • They are generally located close to waiting or congregation areas, seating, information displays, cycle storage areas, and station entries and exits. • Drinking fountains should be constructed from materials that are easy to maintain, and should include stainless steel water catchment and drainage. Furthermore, they must be designed to be accessible for people with disabilities.
Shopping trolley bays/ storage	• Where bus stations co-exist with shopping centres or other retail outlets, there may be the requirement to include appropriate, discreet, and easy to maintain shopping trolley bays or storage within or close to the facility. • The sitting of shopping trolly facilities needs to take into account potential conflict between buses and shopping trolley collection vehicles. • An agreement from the retail outlet to collect shopping trolleys on a regular basis is also required.
Ancillary services	• Key ancillary services can include vending machines, ATMs and other third-party services not directly concerning passenger transport. • Should be located in visually prominent locations, but not impede a passenger's ability to access and move through the station. • Inclusion and location of these services will depend on agreement with third-party stakeholders, station asset management and station designers, and will be determined on a site-specific basis. • Consideration should be given to the consolidation of ancillary services to reduce visual clutter and to provide a more integrated service for passengers. Generally, these facilities are positioned close to other passenger services such as fare machines, information displays and emergency call points. • Materials used for ancillary services should be consistent with other passenger facilities to achieve a visually integrated suite of services. Ancillary services should be considered early in the detailed design phase to incorporate relevant security, monitoring, power and data requirements.
Intelligent Transport System (ITS)	• ITS functionality should be considered for all public transport facilities within the context of the broader TransLink network and include security cameras, real-time information, public address systems, incident management systems, and monitoring and communications systems. • ITS hardware and connection points are typically located in a communications room within the overall facility. These ITS or communications control rooms may adjoin other facilities within the station, such as toilets or storerooms. They should be located in discreet locations within the facility environment, not impede public spaces or free flowing pedestrian access to the station, and be generally signed as '**staff only**'. • The specific installation (including power, conduits and security) and asset management schedule requirements for the inclusion of the ITS at each facility should be investigated on a site-specific basis prior to detailed design. Specialist ITS personnel should be commissioned when designing the ITS within the station environment.

Element	Consideration
Public address system	• A public address system should be integrated into the design of all station facilities. The aim is to provide a robust, functional and visually discreet system that can provide communicative information and be linked to the security system for warning in the event of an emergency. • The public address system is to be clearly audible and reverberate throughout the passenger waiting areas. Loudspeakers for the system should be distributed appropriately throughout the station and may be wall or ceiling mounted, depending on acoustic requirements. Speaker units should be mounted at an appropriate distance away from direct reach, or sit flush with station structures, to minimise potential vandalism and damage. • The possibility of background noise affecting the audibility of the address system should be treated with appropriate acoustic absorption techniques. Loudspeakers for the system should be distributed appropriately throughout the station. • Hearing augmentation or hearing loops should be included and linked with the public address and emergency systems to assist persons with hearing impairments.
Security	• Security infrastructure refers to security cameras and other items used for the creation of safe and well-monitored waiting environments. • Details on the specifications and management schedules for these systems will be established in collaboration with the facility owner and/or asset manager. • Appropriate construction and installation requirements must be considered when planning for the inclusion of security infrastructure. The use of signage informing people of the presence of security infrastructure within a facility can further enhance personal safety, and highlight the perceived risk of detection to potential offenders. • Security help points are typically located in the centre of platforms or other key waiting areas. Ultimately, the location of all these elements should be the subject of station specific design, as each site is likely to have a range of differing sightlines and movement patterns. • Counter-terrorism design considerations should be explored where possible on a site-specific basis, depending on station location, level-of-service and potential security risk. Where applicable, station design should strive towards universal standards for security and counter-terrorism measures. Liaise with the Emergency Management and Transport Security division in the Department for advice on including security and counter-terrorism measures at the earliest phase in the station planning.

Element	Consideration
Lighting	• Ambient lighting is to be provided for a safe, comfortable and functional station. • Feature lighting may highlight architectural features. • For day-time use, consider translucent materials to allow natural lighting. • For night-time, bright white artificial lighting should ensure a safe and visually attractive environment. • High quality light fixtures and fittings should be robust, tamper-proof, discreet and complement the station environment. • Use of common fixtures will improve maintenance and lower ongoing costs. • Provide lighting on pedestrian areas, roadways and station information. • Lighting at bus stations must comply with the applicable requirements of lighting subcategory P6 within *AS/NZ 1158.3.1 – Lighting for roads and public spaces.* • For additional disability compliance lighting requirements refer to the *Disability Standards for Accessible Public Transport 2002 (DSAPT).*
Graffiti deterrents and treatments	• All infrastructure components—furniture, lighting equipment, timetable and information devices, walls, floors, ceilings, balustrades, glass panels, screens, elevators, escalators and other components—coming into contact with passengers must be resistant to acts of vandalism and graffiti. This may involve components being applied with anti-graffiti coatings or constructed from non-porous graffiti-resistant materials. • The design and arrangement of platforms and structures should maximise natural surveillance in order to minimise the incidence of graffiti and anti-social behaviour. • In some instances, vegetation may be planted adjacent to structures or walls to prevent access by vandals. • The use of appropriate colours or artwork that complements the station architecture and theming can also deter graffiti.
Animal and pest problems	• Within the station there must be minimal horizontal ledges, overhangs, or concealed spaces where birds and animals are tempted to perch, nest and pollute the station facility. • If cavities and horizontal surfaces are unavoidable, then appropriate measures are to be used to prevent animals and pests congregating and/or nesting. This can include designing ledges of structures to be angled (approximately 45 degrees or greater) to make it uncomfortable for birds to perch.

Element	Consideration
Landscape Treatment	• Landscape treatment is to be incorporated (where appropriate) to complement the station architecture, enhance the identification of a particular location, and integrate the facility with the surrounding environment. It is preferred that plantings used for landscaping are: – drought resistant – consistent with the surrounding natural environment (for example, local flora) – unlikely to intrude upon the integrity of the station environment – unlikely to interfere with above and below ground services and utilities – not toxic, highly allergenic or noxious weeds – not known to produce thorns, barbs, stings or noxious secretions – not inhibiting sightlines, passive surveillance or allowing for potential offenders to hide.
Commercial opportunities	• Commercial opportunities are typically developed and operated by external companies under an agreed arrangement. • It may be appropriate to incorporate: – vending machines – commercial advertising – retail outlets, such as cafes, coffee carts, newsagents and convenience stores. • Endorsement of commercial facilities is required prior to detailed design to make allowance for space, power, data and conduits for installation.
Other enhancements	• Artwork can enhance a station identity and cultural significance of a place, and should be investigated where appropriate. • Public art should not conflict with station architecture, colour schemes, branding and access requirements. • Wireless internet access options and connections may be investigated and incorporated. • The facility owner and/or asset manager, along with relevant stakeholders, should endorse all enhancements prior to the detailed design stage of the facility.

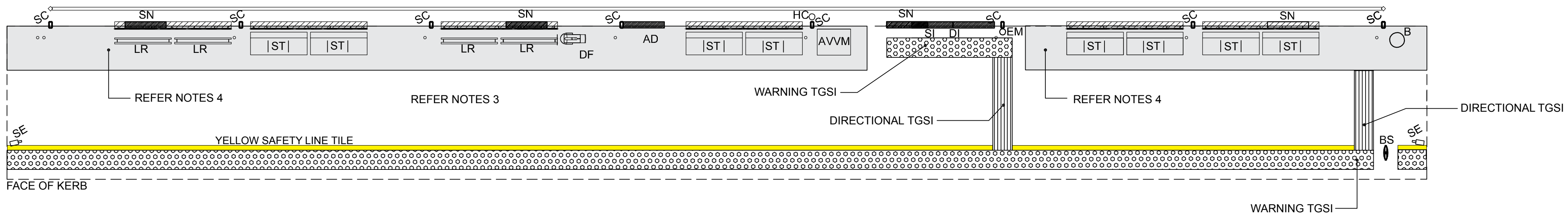
6.10 Technical details

Appendix 6-A provides design examples of bus station infrastructure. The specifications of components shown represent good practice, and consistent and modular design, as identified by TransLink.

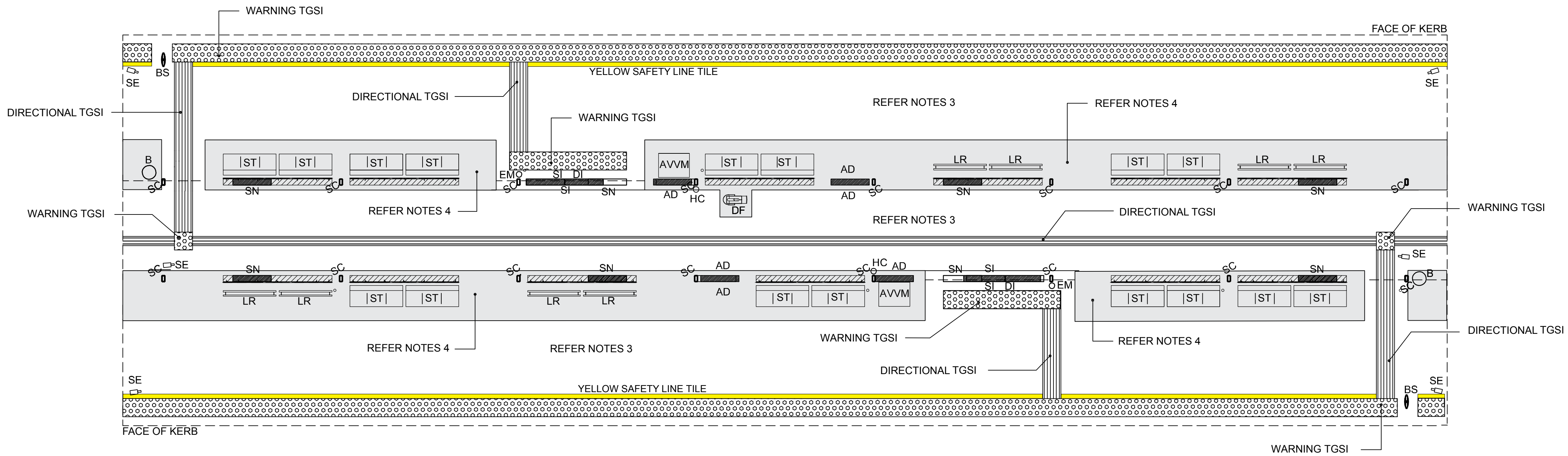
The specifications shown should be interpreted as a guide, with site-specific attention given to individual station locations and constraints.

Contact TransLink for design direction and more detailed specifications, prior to design commencement, to determine specific location requirements.

Appendix 6-A

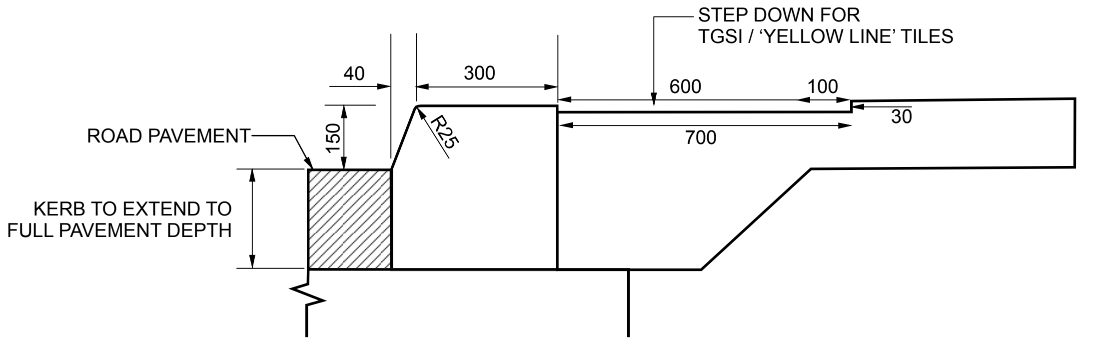


BUS STATION - SINGLE PLATFORM



BUS STATION - DOUBLE PLATFORM

MODIFIED TYPE 5 KERB SECTION - KERB ENGINEERED TO SUIT SITE CONDITIONS



NOTES

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
2. ALL MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE RELEVANT DISABILITY AND AUSTRALIAN STANDARDS.
3. HONED CONCRETE FINISH ON MAIN PLATFORMS & WALKWAYS - HANSON 'COLORADO' COLOUR (OR APPROVED EQUIVALENT) SEALED WITH MINIMUM R11 SLIP RESISTANCE.
4. HONED CONCRETE FINISH UNDER SEATS, BINS, ETC - HANSON 'RACONA' COLOUR (OR APPROVED EQUIVALENT) SEALED WITH MINIMUM R11 SLIP RESISTANCE.
5. YELLOW SAFETY LINE TILE: PLATFORM DELINEATING STRIP TILE SHALL BE 'CTA SLPDST112' IN 200MM X 100MM X 10MM FORMAT MANUFACTURED FROM TOUGHENED GLAZED PORCELAIN IN SAFETY YELLOW COLOUR PMS CODE 143C. LOCATED DIRECTLY BEHIND TGSI.
6. TACTILE GROUND SURFACE INDICATORS (TGSI) - GRANITO 'CHARCOAL' / 'BLACK' COLOUR PAVERS (OR APPROVED EQUIVALENT) SEALED WITH MINIMUM R11 SLIP RESISTANCE. TGSI TO MAINTAIN MINIMUM 30% LUMINANCE CONTRAST TO ADJACENT FINISHES.
7. CONCRETE KERB TO BE MODIFIED TYPE 5 KERB 300MM WIDE WITH NO COLOUR ADDITIVE.

LEGEND

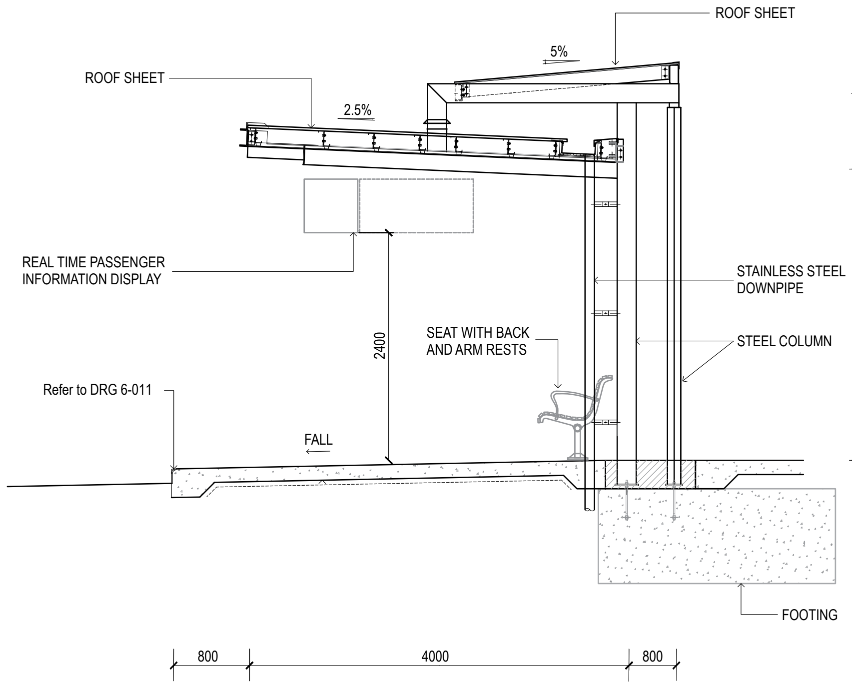
AD	ADVERTISING (FUTURE)
B	RUBBISH BIN
BS	BUS STOP SIGN
DI	DIRECTIONAL INFORMATION SIGN
SN	STATION NAME SIGN
SI	SERVICE INFORMATION DISPLAYS
EM	EMERGENCY CALL POINT
HC	HOSE COCK
PID	ELECTRONIC PASSENGER INFORMATION DISPLAY
SE	SECURITY CAMERA
SC	STEEL SHELTER COLUMN
ST	1750MM LONG SEAT WITH BACK & ARM RESTS
LR	1750MM LONG LEAN RAIL

THIS IS A INDICATIVE DESIGN ONLY. SITE CONDITIONS MAY VARY. DESIGN MUST BE CARRIED OUT TO SUIT ACTUAL LOCATION. DRAWING SHOWS TYPICAL PLAN, ELEVATIONS AND DETAILS ONLY

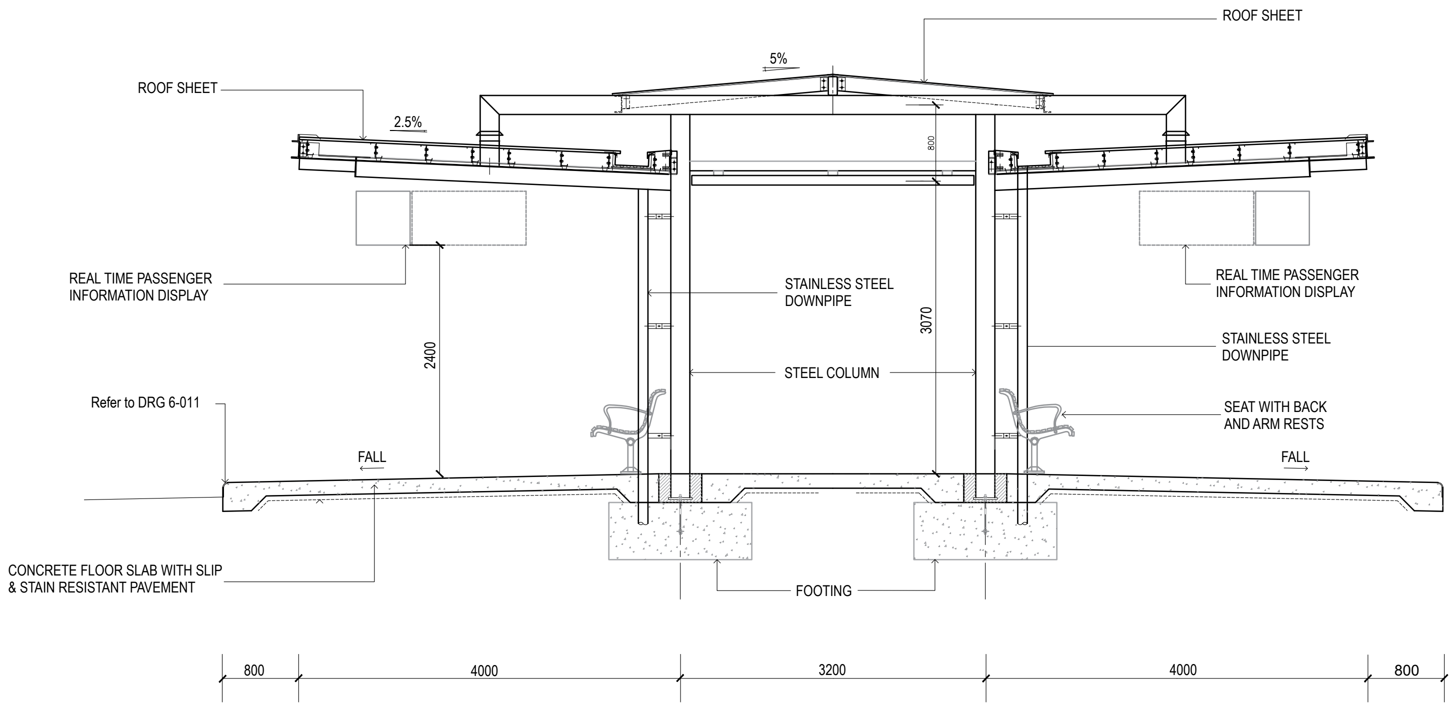
TRANSLink | Queensland Government

PTIM, BUS STATION INFRASTRUCTURE CHAPTER
TYPICAL SINGLE & DOUBLE PLATFORM REQUIREMENTS

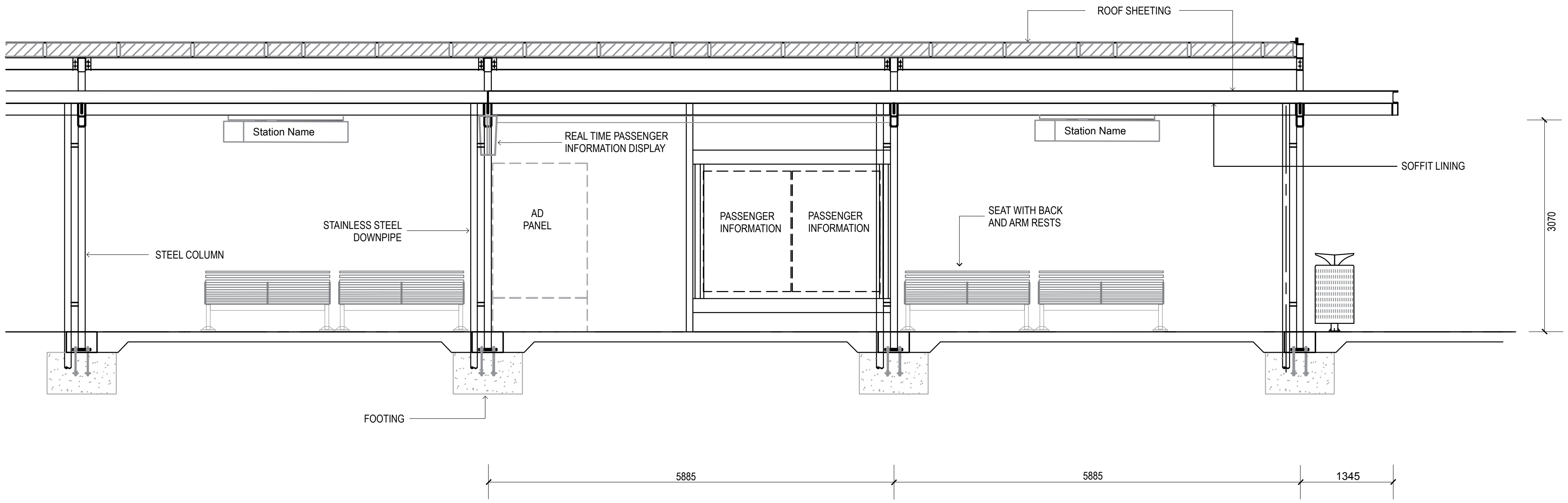
SCALE:	Not to Scale	DRG 6-011
	DATE: November 2014	A



END ELEVATION
SINGLE SHELTER



END ELEVATION
DOUBLE SHELTER WITH CENTRAL WALKWAY



FRONT ELEVATION

NOTES:

1. COLOUR AS PER TRANSLINK'S INFRASTRUCTURE COLOUR PALETTE.

2. STATION FACILITIES TO COMPLY WITH CURRENT DISABILITY STANDARDS.

3. STATION PLATFORMS TO USE CPTED PRINCIPLES.

4. REFER TO PTIM FOR GUIDANCE ON PLATFORM CAPACITY AND LOS

5. PAVEMENT TO BE SLIP AND STAIN RESISTANT.

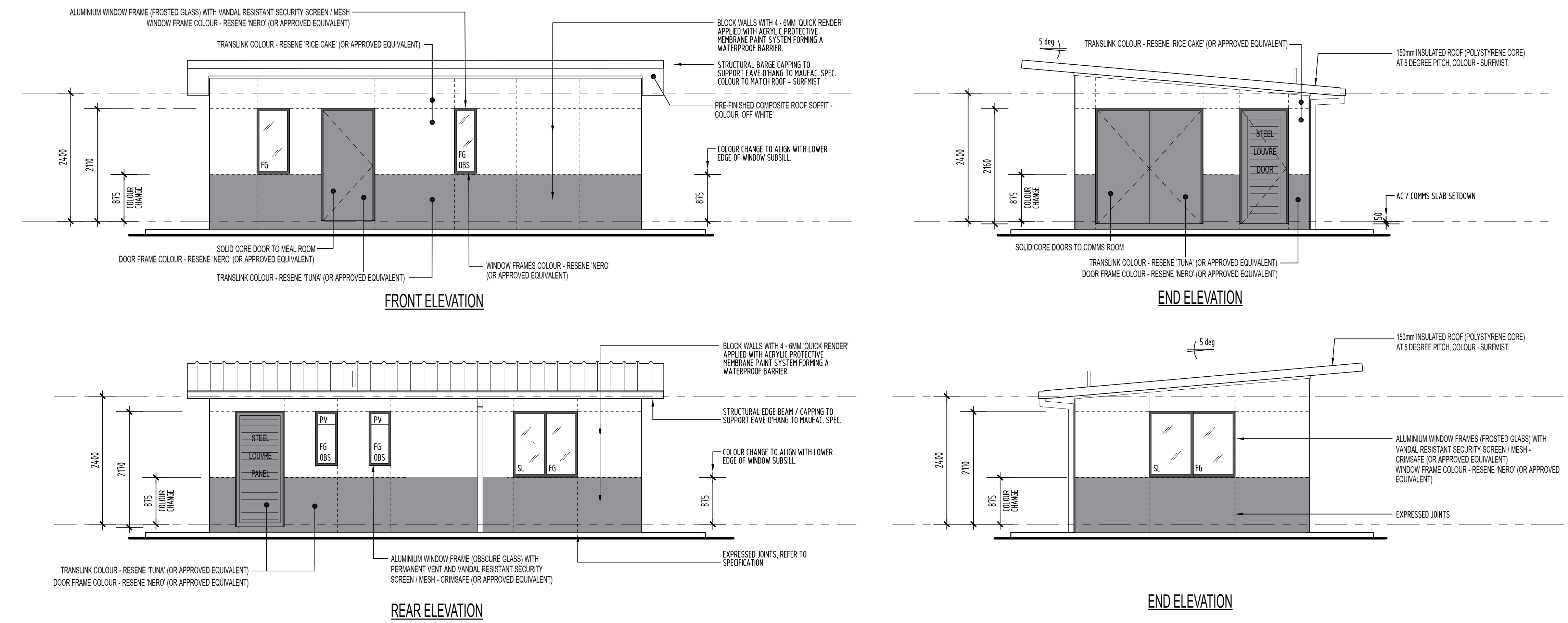
6. INSTALL APPROPRIATE CONDUITS FOR POWER AND DATA (INCLUDES SHELTER LIGHTING, REAL TIME INFORMATION DISPLAYS, SECURITY CAMERAS, SIGNAGE AND ADVERTISING PANELS).

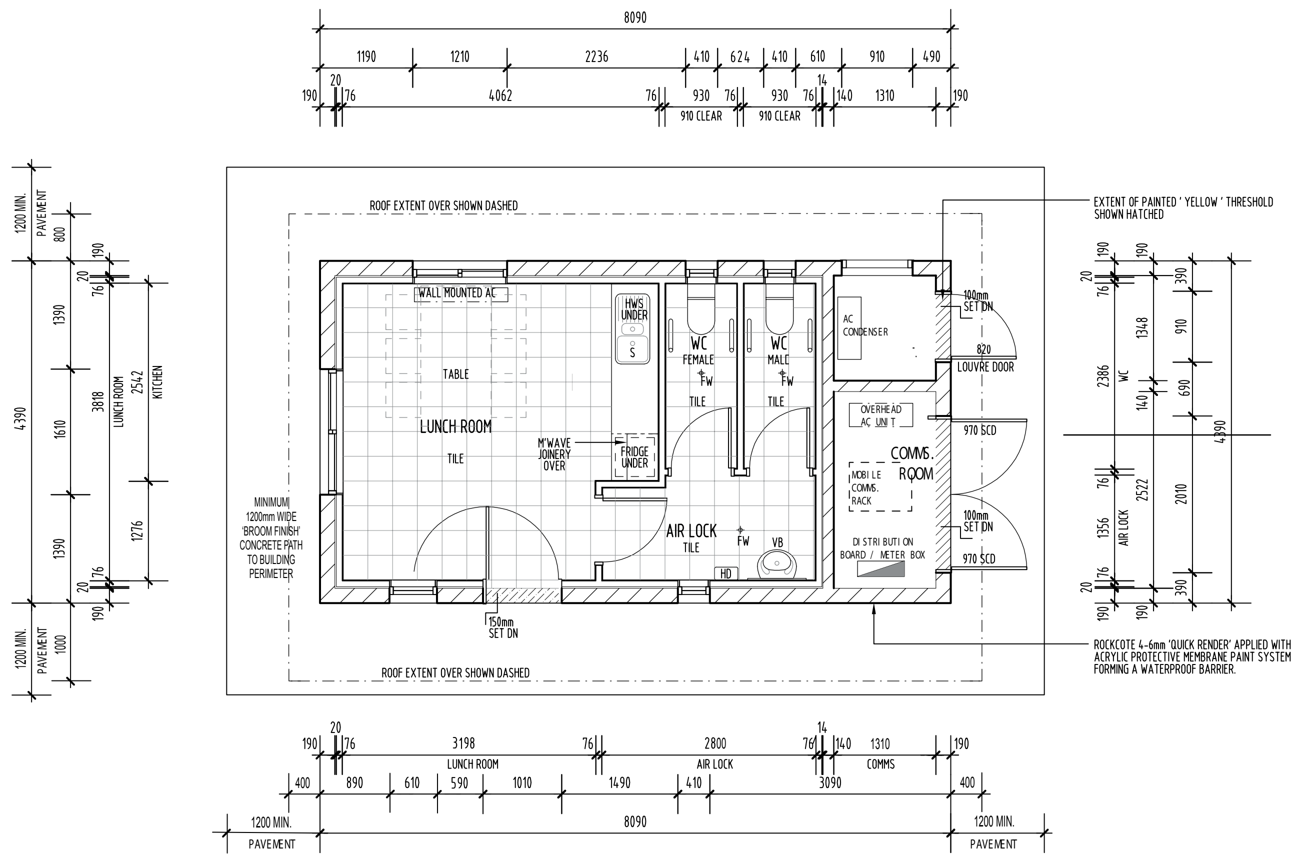
7. TGSI TO BE INSTALLED AS SHOWN ON TRANSLINK DRAWINGS. LAYOUT TO BE REVIEWED BY TRANSLINK

8. SEATS, BINS & DRINKING FOUNTAINS AS PER TRANSLINK'S GUIDELINES.

9. DIMENSIONS IN MM.

TRANSLink	Queensland Government	PTIM, BUS STATION INFRASTRUCTURE CHAPTER BUS STATION SHELTER (TYPICAL)
		SCALE: NOT TO SCALE — DRG 6-101
		DRAWN: — DATE: JULY 2009 — A





NOTES:

1. COLOURS AS PER TRANSLINK'S INFRASTRUCTURE COLOUR PALETTE.
2. COMPONENTS TO COMPLY WITH APPLICABLE DISABILITY STANDARDS.
3. COMPONENTS TO USE CPTED PRINCIPLES (WHERE APPLICABLE).
4. PAVEMENT TO BE SLIP AND STAIN RESISTANT.
5. INSTALL APPROPRIATE CONDUITS FOR POWER AND DATA (INCLUDING LIGHTING & SECURITY CAMERAS).
6. OPTION FOR ALTERNATIVE CONFIGURATION WHERE APPLICABLE
7. WC AREA MUST BE SEPARATED FROM LUNCH ROOM BY AIRLOCK
8. DIMENSIONS IN MM.

TRANSLink

Queensland Government

PTIM, BUS STATION INFRASTRUCTURE CHAPTER
DRIVER'S AMENITY ROOM (TYPICAL)

SCALE: Not to Scale		DRG 6-201
	DATE: JUNE 2014	A B C

NOTES:

1. COLOURS AS PER TRANSLINK'S INFRASTRUCTURE COLOUR PALETTE.

2. COMPONENTS TO COMPLY WITH APPLICABLE DISABILITY STANDARDS.

3. COMPONENTS TO USE CPTED PRINCIPLES (IF APPLICABLE).

4. PAVEMENT TO BE SLIP AND STAIN RESISTANT.

5. ENCLOSURE SHOULD BE FULLY SECURED AND VANDALISM RESISTANT.

6. COMPACT BICYCLE RACKS SHOULD ALLOW BICYCLES TO BE FULLY SECURED. RACKS TO PREFERABLY BE STAINLESS STEEL OR POWDER COATED FINISH.

7. COMPACT BICYCLE RACKS SHOULD BE SPACED APPROPRIATELY.

8. SHELTER MUST PROVIDE SUITABLE WEATHER PROTECTION

9. FLOOR MUST DRAIN AWAY WITH NO POOLING OF WATER.

10. INSTALL APPROPRIATE CONDUITS FOR POWER AND DATA (INCLUDING LIGHTING & SECURITY CAMERAS).

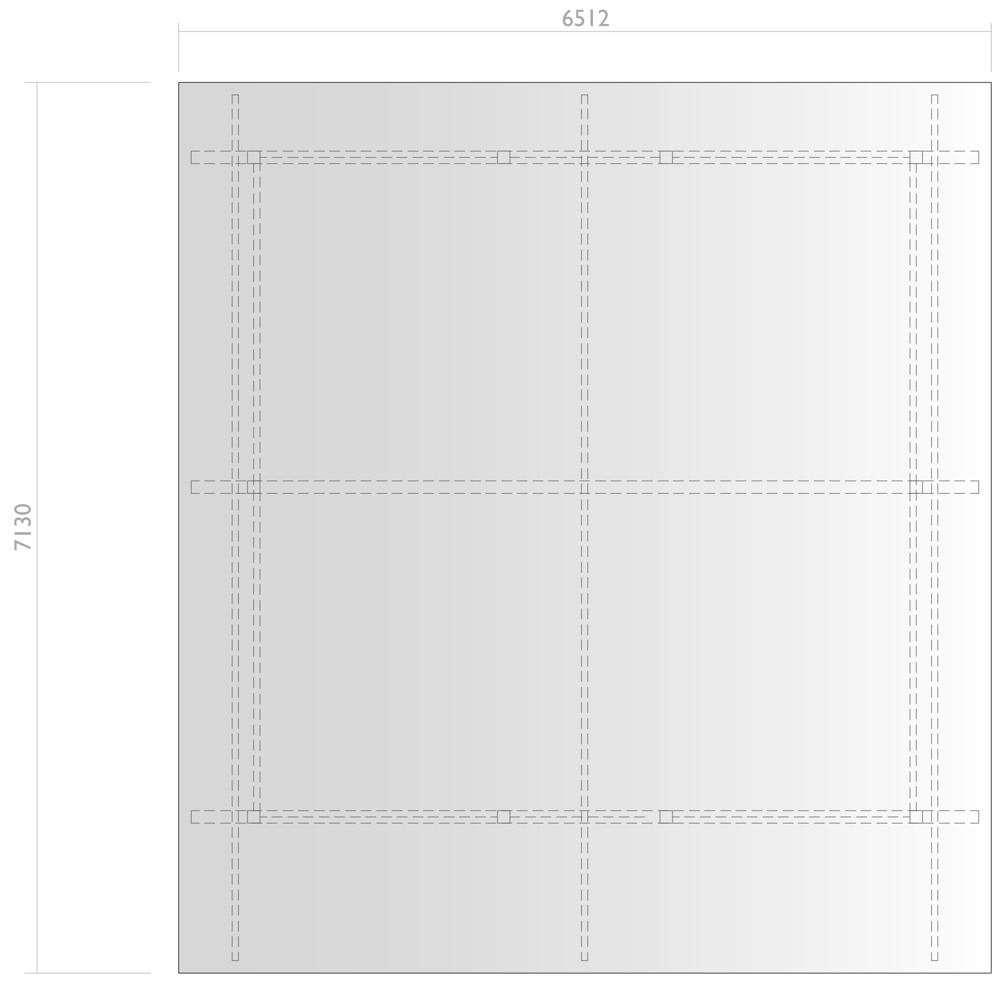
11. 75MM INSULATED ROOFSHEETING COLOURBOND SURFMIST. FASCIA TO MATCH ROOF COLOUR (ROOF PITCH TO BE ORIENTATED TO SUIT SITE).

12. ALL STEEL WORK TO BE POWDER COATED IN DARK GREY OR APPROVED EQUIVALENT.

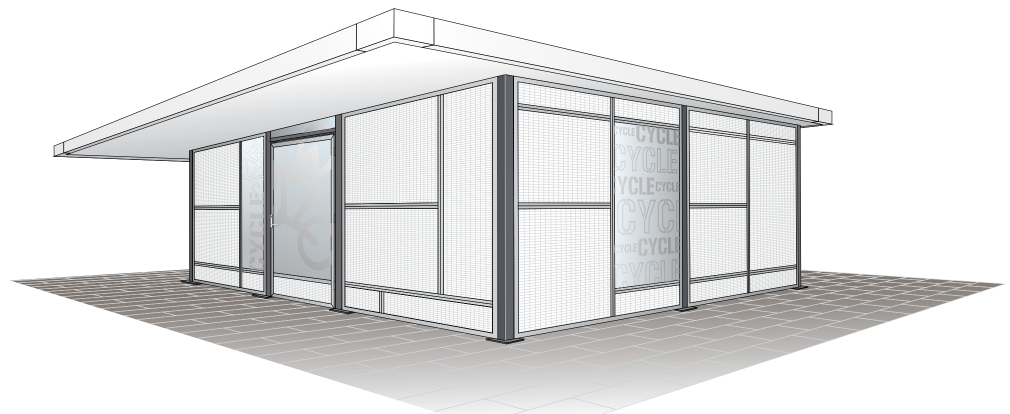
13. 2.5 THICK NO.4 FINISH 316 GRADE STAINLESS STEEL WITH ETCHED GRAPHICS (OR APPROVED EQUIVALENT). NOTE: PANEL MATERIAL AND GRAPHICS TO SUIT SITE AND DESIGN REQUIREMENTS.

14. SECURIFOR 358 MESH (OR APPROVED EQUIVALENT) TO BE POWDER COATED BLACK OR APPROVED EQUIVALENT DARK SHADE)

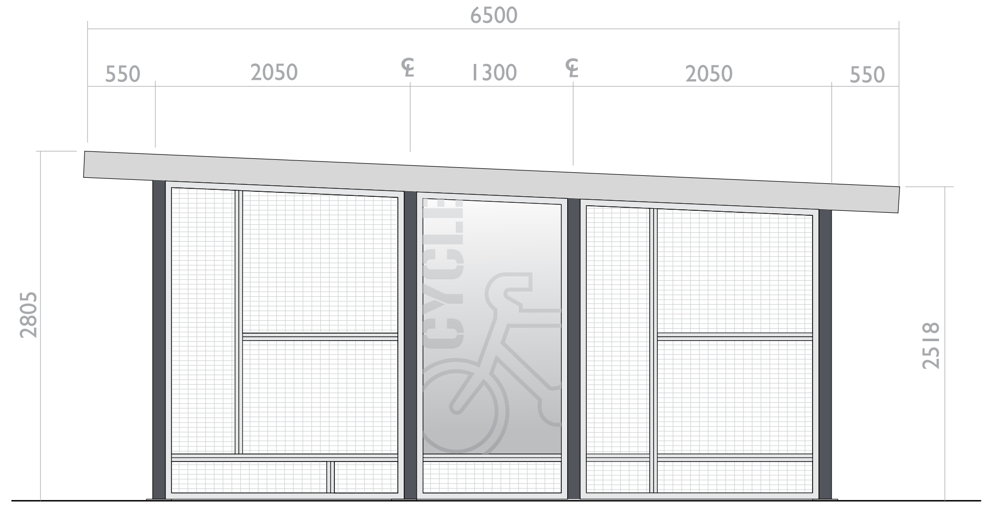
15. DIMENSIONS IN MM.



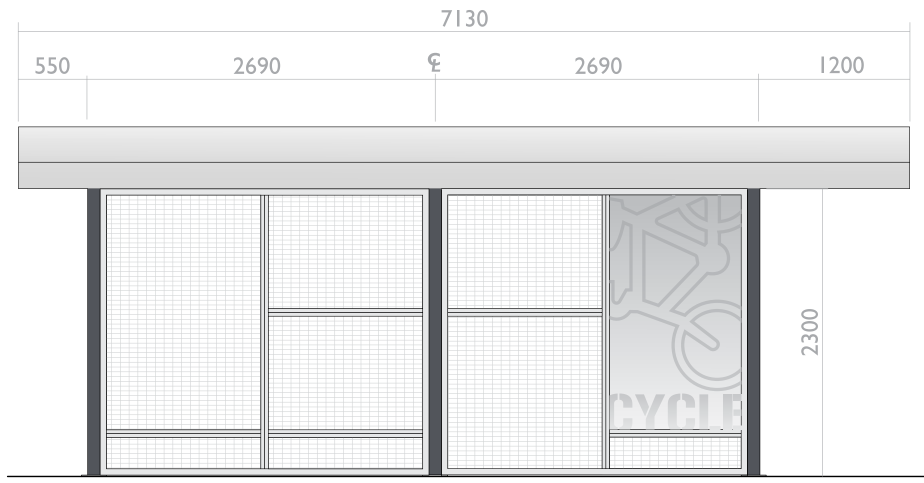
Top Elevation



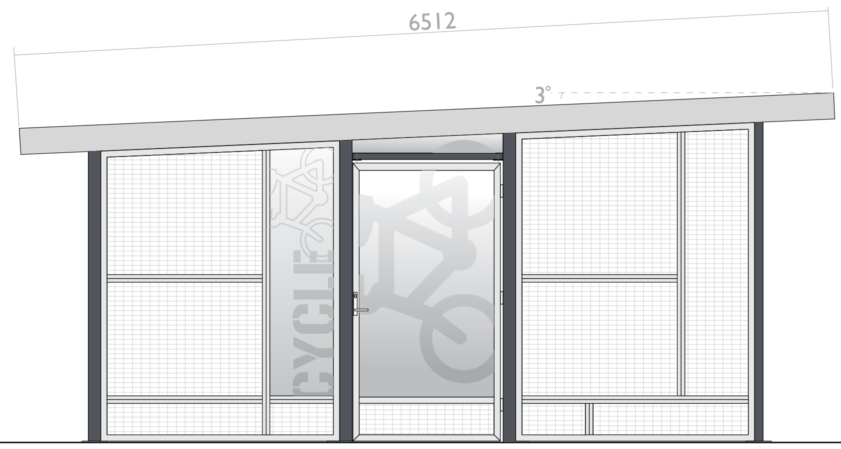
Front Right Elevation



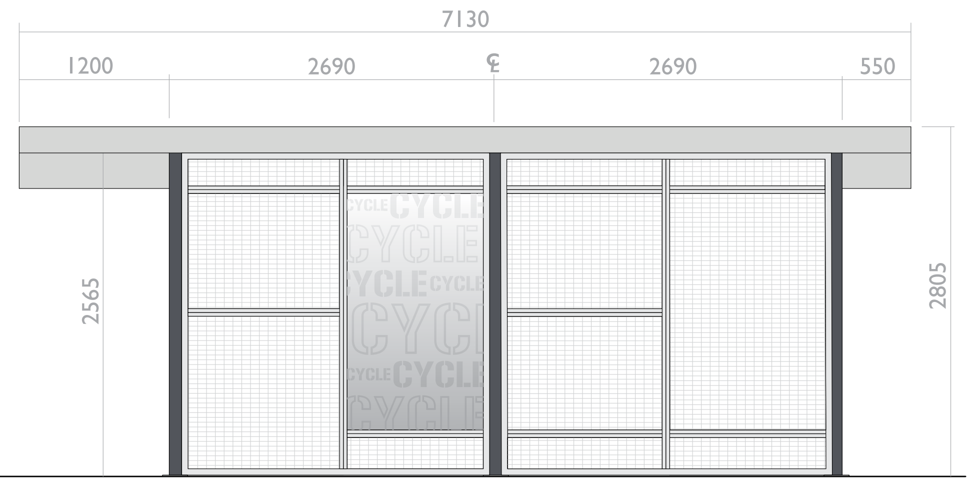
Rear Elevation



Left Elevation



Front Elevation



Right Elevation

TRANSLink	Queensland Government	PTIM, BUS STATION INFRASTRUCTURE CHAPTER BICYCLE ENCLOSURE (TYPICAL)
		SCALE: NOT TO SCALE — DRG 6-301
		DRAWN: — DATE: SEPT 2011 — A B

Contents

Chapter 7 – Taxi Facilities

7.1 Introduction

The *Taxi facilities chapter* is a referenced component of the overarching *Public Transport Infrastructure Chapter (PTIM).*

This *Taxi facilities chapter* is to be used in conjunction with:

- ***PTIM, Background and application***, which establishes the rules for application of the entire *Public Transport Infrastructure Manual*
- ***PTIM, Planning and design***, which provides the overarching design guidelines and principles for public transport infrastructure across Queensland
- ***PTIM, Supporting access and infrastructure***, which details the supporting access infrastructure required to support public transport stops, stations and related facilities
- ***PTIM, Branding, theming and signage***, which provides branding, theming and signage that should be used for identifying coherent public transport infrastructure throughout Queensland.
- For information on further resources to support the planning and design of bus stations, please refer to the *PTIM, References and resources.*

7.1.1 Purpose and objectives

The Taxi facilities chapter will inform the design of taxi facilities by providing a clear and consistent set of principles and guidelines.

The objectives of this chapter are to:

- establish guiding principles for the planning and design of taxi infrastructure
- ensure a consistent approach to provide high quality customer access, convenience, safety and comfort
- provide an overview of available standards for taxi facilities design.

7.2 Application of the Taxi facilities chapter

7.2.1 Intended audience

This chapter is intended for use by professionals in the transport planning and delivery industry. This generally involves, but is not limited to, designers, planners, engineers, architects and other professionals involved in the planning, design and delivery of public transport infrastructure in Queensland.

7.2.2 Application of this chapter

This chapter must be used in conjunction with overarching applications of the *PTIM*.

This chapter details TransLink requirements for planning and design, and should be referred to before starting to plan new taxi facilities.

It is important that taxi facilities are integral to the design of a development or planning precinct.

TransLink, in partnership with Local Government and in collaboration with relevant stakeholders and delivery partners, shall be consulted on the final design for new infrastructure and upgrade of existing facilities.

7.3 Principles of taxi facility planning

As a key part of a balanced transport network, taxi facilities need to be integral to other transport nodes such as rail, bus and busway stations, transport terminals, and sea and air ports. The primary integration issue is to ensure passengers can transfer easily between transport modes and readily identify the taxi facility location upon exiting public transport facilities.

7.3.1 What is a taxi facility?

The term ‘taxi facility’ refers to either ‘taxi ranks’ or ‘taxi bays’. For the purposes of this chapter these are defined as follows:

- **Taxi ranks** are designated pick up and drop off locations for passengers using a licensed[1] taxi service provider, and are exclusively for use by taxis. Taxi ranks are located at specific points on public road networks where demand warrants. They provide a safe and identifiable origin and destination location for passengers, and they provide a designated location where taxi operators can service patron needs.
- **Taxi bays** are designated bays and/or drop-off/pick-up areas (for example, outside hospital entrances, clubs and other large public or private facilities) rather than an actual rank that is located on the public road network. There may be joint use of taxi bay facilities by other vehicles for the same drop off/pick-up function.

7.3.2 What are taxi and limousine services?

7.3.2.1 Taxi services

Taxi services are a critical part of the passenger transport network, providing flexible, demand responsive 24-hour service. Traditional taxi services remain an essential part of a balanced transport system and are a key form of transport for those who cannot access other forms of public transport or drive independently. Taxi services ensure such passengers have access to other areas within their community when they need, and at a reasonable cost.

A taxi service can be booked, hailed by the public, or may ply or stand for hire on a road. Typically, when taxis are vacant and available for immediate hire, taxis stand at designated taxi ranks located at key points within taxi service areas.

The department is responsible for determining the maximum fares for Queensland taxis. The department is also responsible for the control and licensing of both taxi and limousine services.

Refer to TMR website for Queensland taxi fares, service area and maps.

[1] *By the Department of Transport and Main Roads*

7.3.2.2 Limousine services

A limousine service is an unscheduled passenger service provided by a luxury motor vehicle operating under a limousine service licence. The journey must be pre-booked and the fare agreed to before the journey begins.

The *Transport Operations (Road Use Management – Road Rules) Regulation 2009* includes a limousine in the definition of taxi; however the use of taxi ranks by limousines is prohibited under the *Transport Operations (Passenger Transport) Regulation 2005*.

Specifically:

- a limousine for hire must not ply or stand at a place unless the place is the limousine owner's premises or a limousine standing area or limousine rank
- a limousine standing area is a place approved by the department as a place where limousines may stand while waiting to attend a booking made earlier
- a limousine rank is a place approved by the department as a place where limousines may stand for hire to set destinations or areas for set fares.

7.4 Taxi facility planning and design

The process of planning and design for taxi facilities is illustrated in Figure 7.1.

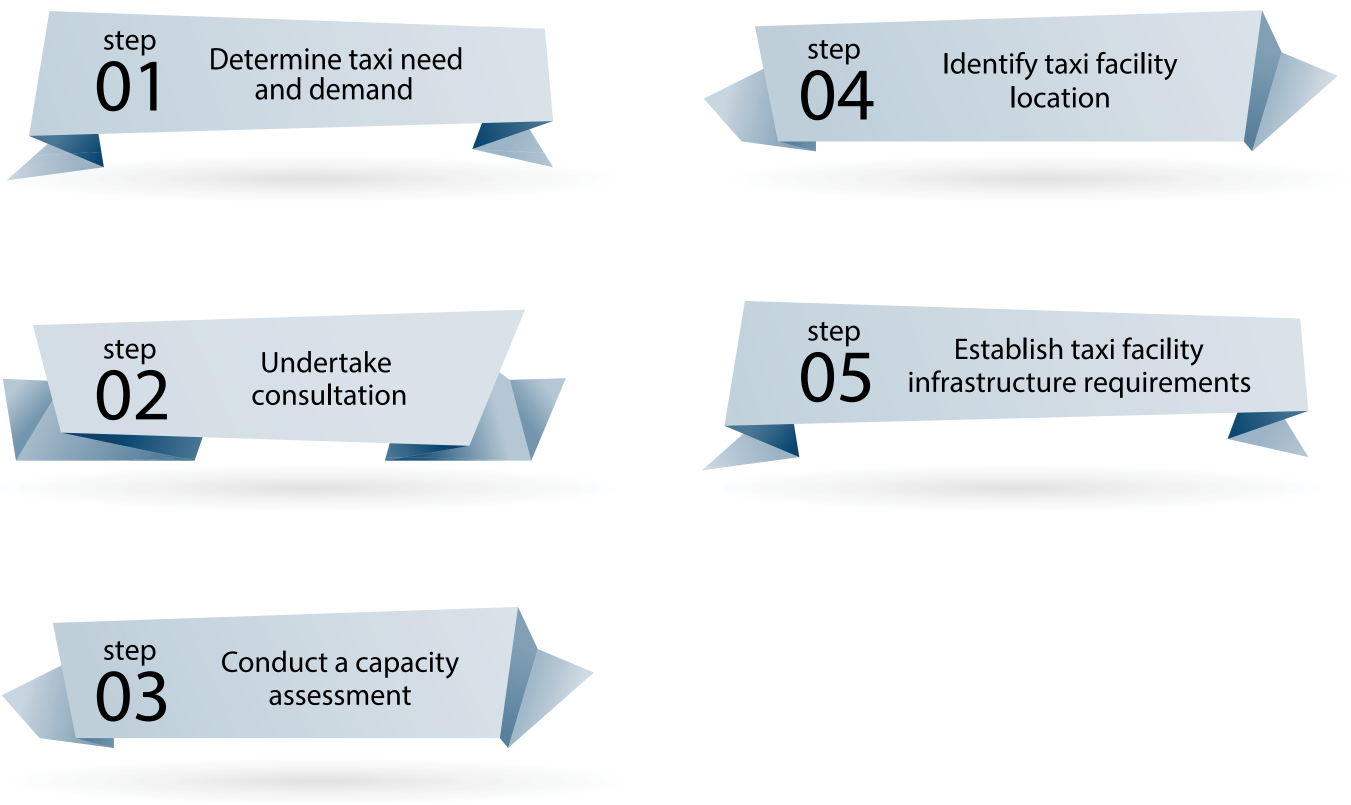


***Figure 7.1** – Taxi facility planning process*

7.4.1 Needs assessment

The first step in assessing the need for taxi facilities is the land use associated with proposed development.

The following list provides an indication of common land uses where taxi facilities are often provided and where demand is generated.

- Public transport facilities including rail stations, bus stations, busway stations, airports and ferry terminals
- Major shopping centres (over 10,000m2)
- Major sport, recreation and entertainment precincts
- Medical facilities such as hospitals and medical centres
- Bus park 'n' ride facilities
- Commercial precincts
- Food and drink precincts
- Accommodation facilities (for example, motel)
- Residential care facility (for example, nursing home)
- Clubs, casinos
- Tourist attractions
- Hotels
- Function facilities
- Mixed use developments
- Theatres
- Local shops

The demand for taxi services in these locations is based on a range of factors including:

- the need for short trips not served by alternative means
- lack of private transport options
- origin/destination locations are not serviced by scheduled public transport
- connection to scheduled bus services and rail services
- trips are outside operating hours for scheduled public passenger transport services
- luggage or shopping needs to be carried
- personal mobility is difficult

It is intended that taxi facilities be located to conveniently service such needs (that is, minimise passenger walking distances[2] and assist with passenger convenience and safety).

[2] *The Australian Taxi Industry Association (ATIA) recommends that the general acceptable standard practice for taxi rank location is a maximum 400 metres walking distance to a major venue entrance and exit. This distance equates to approximately a five-minute walking journey, which is a maximum distance that most people will find acceptable, however this distance may also depend on weather, topography and other characteristics.*

7.4.2 Demand assessment

Whilst there is a general understanding of ***need*** for taxi infrastructure, based on land use characteristics it is necessary to determine the ***demand profile*** for the particular location. This is required to forecast taxi facility vehicle capacity. The following demand characteristics should be analysed:

- catchment demographics including:
  - persons per household
  - age profile of catchment
  - household income
  - private vehicle ownership
- development type and operational hours
- density and types of surrounding development
- availability of car parking in the area
- availability and frequency of other public passenger transport options
- competing modes
- number of taxi licences in a given service area.

In all cases, the above factors need to be considered and a demand profile established to determine 'peak passengers per hour' for the proposed development.

Once a demand profile for a proposed development or changes to an existing development has been established, the impact on existing local factors also needs to be investigated. Factors that need to be addressed include:

- existing demand for taxis, including information obtained from taxi operators regarding current patronage and issues
- the location of existing taxi facilities and the number of parking spaces
- characteristics of existing development (relative to demand)
- number of taxi licences in the catchment area
- traffic impacts.

The outcomes of this assessment will need to include possible overall increase in taxi demand in the area, possible impacts on taxi licence numbers, and impacts on the existing road network.

It is also necessary to include in this assessment how taxi operations associated with the proposed development have been addressed relative to their interface with:

- the internal and/or external road network
- other public transport operations
- the entry and exit points of the proposed development.

7.4.3 Consultation

Taxi facility assessment requires targeted research and consultation to ensure site-specific issues are addressed.

This should include consultation with:

- local government
- taxi companies
- Taxi Council of Queensland
- Local Government Association of Queensland
- Department of Communities, Child Safety and Disability Services
- disability sector organisations
- Office of Liquor and Gaming Regulation
- Queensland Police Service (QPS)
- shopping centre managers.

This consultation is undertaken early to inform the planning process. Importantly, further consultation should be undertaken once planning outcomes and initial designs have been documented.

7.4.4 Taxi facility capacity

Once the demand for a taxi facility has been established, the number of required taxi parking spaces should be determined. Considerations should be given to the capacity of any existing facilities and the additional taxi demand that needs to be accommodated.

Firstly it must be understood that there is no standard number of taxi rank spaces that can be applied to a given development type, size or location. The expected number of passengers wanting the taxi service and the expected number of taxis arriving at the rank in the same period of time will determine the required capacity of a taxi facility. This queuing system requires individual characteristics of the proposed development to be investigated.

The two key factors that will determine taxi facility vehicle capacity are taxi arrival rates and dwell time.

7.4.5 Taxi facility location

Once it is established that a taxi facility needs to be included in a development, the optimal location needs to be determined in consultation with taxi operators and TransLink.

Preferably taxi facilities should be provided parallel to the kerb and adjacent to the main entrance of a development. Taxis provide an important door to door service for people who are often incapable of driving and therefore they should be in the most accessible location.

Location selection should consider:

- proximity of other taxi facilities in the area
- shortest walking distance to the attractor (there should not be barriers or pedestrian pinch points obstructing the way)
- the possible impact on adjacent properties including driveways and access points.

The location should:

A taxi facility should be located:

- as close as possible to the entrance of major trip generators
- close to other passenger transport to facilitate interchanging/transfers
- close to key community facilities and services
- where on-road, near intersections or side/minor roads, where possible, to maximise coverage and decrease distances that passengers have to walk
- where on-road, preferably on the far side of intersecting streets to assist with sightlines of intersecting vehicles and pedestrians, as well as assisting in taxi movement, refer to Queensland Road Rules stopping prohibition minimum distances.[3]
- so that roads and/or driveway access to the facility is as direct as possible
- allow priority for taxis exiting a development when carrying passengers
- so as to minimise conflict with parking/queuing private vehicles and buses

Pedestrian access, including disabled access, should be readily provided to the taxi facility from building entrances, pedestrian pathways within a development site, and/or pedestrian footpaths on the road network.

3 *Refer to Queensland Road Rules (QRR) Sections 170, 171, 172, 173 and 174.*

Taxi ranks should not be located:

- where signage indicates the road is reserved for other vehicle classes
- within 0.5m of a fire hydrant or 'FH' letter marking or indicators
- near sewer and electricity pits (where possible)
- in or near stormwater drains or pits (to prevent splashing water and reduce possible drain surcharge impacts).

For additional guidance on the siting of taxi facilities consider refering to *ATIA Taxi Rank Design Specification (2012)*.

7.4.6 Taxi arrival rates

The taxi industry and supply of taxi services is a commercial, demand-based model. It does not operate on timetables or specified routes. There is some integration with other transport operations where taxis might meet scheduled services such as with air, rail and port services and to a lesser degree, bus services. Taxi arrival rates influence both passenger queue lengths and taxi queue lengths or taxi rank capacity.

Passenger demand also varies between locations, depending on times of the day or night, weather conditions, school and school holiday times, and peak tourist times, to name a few. For example, at airports or rail stations, racecourses, sporting venues, and entertainment venues, passenger demand could be predictable relative to service times or venue events and timetables.

In other cases, such as shopping centres, demand can be less predictable. TransLink supports liasing with, for example, shopping centre management where they can assist with understanding demand profiles.

Demand characteristics influence taxi arrival rates greatly. For example, where there is a demand for taxi services at known peak times (depending on the nature of the development) you will often find taxis queued at a rank ready to pick up passengers. At other times there may be a queue of passengers. It is uncommon for these two queues to coincide except very briefly. Further, taxis do not always return to the same rank. The 'For Hire' route choice is driven by least time to the next fare.

Some of the key factors influencing taxi arrival rates include:

- taxi service area
- fare trip travel time
- fare trip length
- taxi service operating times
- number of taxi licences in a taxi service area
- road network congestion
- 'For Hire' taxi route choice (to find the next fare)
- location of other ranks
- opportunity to layover in non-taxi designated parking spaces.

7.4.7 Dwell time

The second key factor in determining taxi rank capacity is taxi dwell time (that is, how long a taxi might spend at a rank). This, of course, has a direct relationship with demand. In peak demand periods this might only be a minute or so. In other times a taxi might wait for extended periods. The need to be commercially viable will influence the latter dwell-time profile.

The ATIA *Taxi Rank Design Specification (2012)* suggests a reasonable assumption of a taxi dwell time during the peak hour of 10 minutes at a busy rank. However this should be used with caution, as every site will have specific characteristics such as:

- taxi licence area
- location of facility
- number of taxis in licence area.

7.4.8 Number of taxi bays

In establishing the number of taxi bays required for a development there are two deciding factors:

- peak passenger demand and taxi arrival rate, or
- taxi dwell time and taxi arrival rate.

The larger of the two numbers should be adopted as the required capacity of the taxi rank.

7.5 Functional design elements for taxi facilities

A taxi facility has basic requirements that assist with its effective use and safe operation. Taxi facility design should cater for current capacity and future growth requirements.

Table 7.1 includes details of the functional design elements that need to be considered when designing taxi facilities.

Table 7.1:
Functional design elements for taxi facilities

Design element	Considerations
Designing for vehicle needs	Taxis need to be able to stand and pull away from the taxi rank in a safe manner and have easy ingress and egress to and from the rank. When designing taxi ranks, the following vehicle needs should be considered: • The most suitable location is parallel to the kerb, allowing taxis at the head of the queue to exit easily and for other taxis to move forward. • Adequate room to access and egress the taxi, including enough space allocated for luggage to be loaded from the rear of the taxi. • Adequate vehicle swept paths for the largest-sized taxi anticipated at the facility (taxi accommodating persons with a disability). • Design should allow taxis to move in a forward direction at all times (no reverse movements). • Ingress and egress routes should cater for the main direction taxis would be expected to transport passengers to and from the rank. If the direction of the taxi rank is opposite to the predominant direction, provide safe u-turn facilities for taxis or a rank on the opposite side of the road with pedestrian access. • Areas with high taxi demands in a compressed time (for example, airports) may need a feeder rank and/or taxi holding facility. • The minimum length of a taxi rank is specified in *AS2890.5-1993 Parking facilities* as (5.4n + 1) metres where n is the number of taxis to be accommodated. • TransLink suggests that the minimum height clearance on taxi routes and facilities (primarily a concern under buildings or other infrastructure) is at a minimum height of 2.3m with a suggested preferred minimum of 2.6m to allow for wheelchair accessible taxis. • Avoid conflict with pedestrian, cyclist and other traffic.

Design element	Considerations
Passenger and driver safety	To ensure safe operation the following needs to be considered: • Driver and waiting customers need to have clear visibility to each other. • Maintain clear visibility around the taxi rank (that is, away from dense foliage and other objects that obstruct direct sightlines) and adhere to *CPTED* principles. • Locate the ranks on the left-hand side of the road to facilitate safer loading of passengers and increase driver security[5]. • Locate ranks where footpath widths are sufficient to accommodate passenger waiting and passing pedestrian traffic, or where footpaths can be easily widened.
Passenger facilities at the rank	Passenger waiting areas need to consider: • Waiting, queuing and boarding areas for passengers. • Signage[6] at the head of the vehicle queue stating it is a taxi rank (could include operating hours, the location of other nearby ranks, and telephone numbers of taxi companies serving the rank). • Pedestrian footpaths adjacent to the taxi rank should provide clear space allowing adequate width for waiting passengers and passing pedestrians. • Safe and convenient pedestrian access to the taxi rank clear of immovable objects that hinder passengers boarding taxis. • Kerbs adjacent to the taxi rank should be flush to assist passengers, including those with disabilities, the elderly or frail, to easily access taxis. • Passenger queuing facilities may be needed at higher demand areas and should be designed to ensure passengers at the back of the queue cannot enter taxis from the rear of the rank (queue). • Weather protection should be considered at taxi ranks on a case-by-case basis. Considerations should include frequency of taxi service (for example, more than 30 passenger pick ups per day), nearby land use (for example, transport interchange, or aged care facility) and existing nearby shelter (for example, building awnings). • Priority seating for users such as the elderly or frail, expectant mothers, parents with young children, and people with disabilities should be provided where appropriate.
Signage and way-finding	• In areas where it is not obvious that taxis ranks are provided, directional signage should be provided. • At transport interchanges and major facilities, such as shopping centres and airports, it is recommended that directional signage be installed within the facility to direct pedestrians to where a rank is located. Signage could also include information on walking distance and rank operating hours. Refer to the *PTIM, Branding, Theming and Signage* chapter for further details on signage.

Design element	Considerations
Provision for disability access	Taxi facilities (including access paths, manoeuvring areas, ramps, waiting areas and surfaces) must comply with the requirements of the Disability Standards and relevant *Australian Standards.* When designing taxi ranks the following should be applied: • space for at least one wheelchair accessible taxi (WAT) located at the front of the queue. The length of WAT spaces is to be 7.8m[7], with appropriate road line marking and signage to designate this space for a WAT. • where a taxi rank is more than four spaces (including the WAT space), an additional WAT space is to be provided at the end of the first four spaces. This pattern should be repeated for every four additional spaces. • other functional design elements to be incorporated include: – TGSI to direct vision-impaired passengers to the head of the rank – facilities designed at-grade (no kerb) to eliminate the need for kerb ramps – signage information accessible for people who are blind or have a vision impairment – where kerb ramps are included for wheelchair access requirements, these shall be located at the rear of a designated WAT space – in very high volume sites, such as airports or sporting venues, where a passenger queuing fence is installed, access to the front of the queue to access the WAT space is to be provided. Technical guidance regarding the location and placement of TGSI is provided in *AS/NZS 1428* [4] *Designing for access and mobility*.

Design element	Considerations
Security and safety	Site-specific needs will determine security requirements. Some general considerations include: • locate the facility at the hub of pedestrian activity for passive surveillance. • at passenger transport hubs, locate the facility adjacent to the station platforms. Consider lighting and security cameras provisions for the facility as part of station design. Requirements for lighting of public areas are outlined in *AS/NZS 1158 Lighting for roads and public spaces*. • locate facility so taxi passengers are generally not required to cross a road, especially at night. • taxi facilities with high use for late night travel may need to be established as 'secure' taxi ranks (usually Friday and Saturday nights and special events such as New Year's Eve). These ranks could include: – taxi rank marshalls and security guards to supervise passengers to queue in an environment that is free from unruly and inappropriate behaviour – an organised supply of taxis to the rank to meet demand – management of the flow of passengers and organisation of share rides as required – answers to customer queries about routes and fares – security camera surveillance.

4 *Refer to the relevant Australian Standard as referenced in the Transport Standards (AS 1428.4-2002 Designing for access and mobility - Tactile indicators) or the Premises Standard (AS/NZS 1428.4.1-2009 Design for access and mobility - Means to assist the orientation of people with vision impairment - Tactile ground surface indicators) as applicable.*

5 *Locating ranks on the left hand side ensures passengers can access the front seat of the taxi from the footpath. It is also generally accepted that taxi drivers, for their personal safety, do not want passengers sitting directly behind them out of sight – particularly if there is just one passenger. It is preferable for a single passenger to occupy either the front seat or, if in the back, to be diagonally opposite the driver.*

6 *Queensland Road Rules section 182 requires all taxi ranks to have a Taxi Zone sign (R5-21 as described in AS 1742.11 Manual of uniform traffic control devices: Part 11: Parking controls) located at the head of the taxi rank queue.*

7 *Refer to Australian Standard AS/NZS 2890.6 Parking facilities - Off-street parking for people with disabilities*

Contents

Chapter 8 – Ferry terminal infrastructure

8.1 Introduction

8.1.1 Overview of the Ferry terminal infrastructure chapter

The Ferry terminal infrastructure chapter is a referenced component of the overarching *Public Transport Infrastructure Chapter (PTIM)*.

This Ferry terminal infrastructure chapter is to be used in conjunction with:

- ***PTIM, Background and application,*** which establishes the rules for application of the entire *PTIM*
- ***PTIM, Planning and design,*** which provides the overarching design guidelines and principles for public transport infrastructure across Queensland
- ***PTIM, Supporting access and infrastructure,*** which details the supporting access infrastructure required to support public transport stops, stations, and related facilities
- ***PTIM, Branding, theming and signage,*** which provides branding, theming and signage that should be used for identifying coherent public transport infrastructure throughout Queensland.

For information on further resources to support the planning and design of ferry terminals, including specifically the integration with other modes please refer to *PTIM, Background and application* for reference materials and supporting information as well as *PTIM, Planning and design*.

8.2 Purpose and objectives

The Ferry terminal infrastructure chapter will inform infrastructure design by providing a clear and consistent set of principles and guidelines for ferry terminals across the TransLink and the greater Qld Government network.

Ultimately, high-quality and consistent infrastructure will provide customers with a transport system that is coherent, functional and encourages passenger use.

The objectives of this chapter are to:

- ensure best practice infrastructure design is applied across the State
- establish guiding principles for the planning and design of ferry terminal infrastructure
- ensure a consistent approach to the provision of high-quality customer access to ferry services, convenience, safety and comfort
- provide an overview of available standards for ferry terminal design.

8.3 Application of the Ferry terminal infrastructure chapter

8.3.1 Intended audience

This chapter is intended for use by professionals in the transport planning and delivery industry, and those specifically engaged with the marine passenger transport infrastructure.

This generally involves, but is not limited to, designers, planners, engineers, architects and other professionals involved in the planning, design and delivery of public transport infrastructure in Queensland.

8.3.2 Application of this chapter

This chapter is to be used in conjunction with overarching applications of the *PTIM*.

This chapter details TransLink requirements for planning and design, and should be referred to before starting to plan new or upgrades to existing ferry terminals.

TransLink, in partnership with Local Government and in collaboration with relevant stakeholders and delivery partners, should be consulted on the design for new infrastructure and the upgrade of existing terminals.

8.4 Principles of ferry terminal planning

Ferry facilities form a key component of the overall transport network. This water-based mode offers an efficient link for customers to access their destination as a transport mode on its own or in combination with land based modes, including active transport.

Given the locations of ferry terminals in Queensland, this mode often presents as a convenient mode to access community services, employment and higher education, cultural and tourist destinations.

The planning of ferry terminals, particular their location, should take into account the relevant land use and planning framework applicable to the area. This allows for strategic planning to be considered in addition to the existing land uses and built form, as part of enabling a 'whole-of-journey' approach to an integrated public transport service. Legislation particularly relevant to the planning and design of ferry terminals include:

- *Coastal Protection and Management Act 1995 (Coastal Act)*
- *Disability Discrimination Act 1992 (DDA)*
- *Disability Standards for Accessible Public Transport 2002 (Transport Standards)*
- *Environmental Protection Act 1994 (EP Act)*
- *Fisheries Act 1994 (Fisheries Act)*
- *Land Act 1994 (Land Act)*
- Local Planning Scheme
- *Marine Parks Act 2004 (Marine Parks Act)* and *Marine Parks Regulations 2006 (Marine Parks Reg)*
- *Nature Conservation Act 1992 (NC Act)*
- *Planning Act 2016* and *Planning Regulation 2017*
- Port Land Use Plan
- Priority Development Area – PDA Development Scheme or Interim Land Use Plan
- Priority Port Masterplan
- *Transport Operations (Passenger Transport) Act 1994*
- *Vegetation Management Act 1999 (VM Act).*

The exact triggers that may need to be assessed in detail for the proposed works will need to be determined on a project specific basis.

The Whole Journey: A guide for thinking beyond compliance to create accessible public transport journeys (Australian Government, 2017) assists in enabling people with disability to genuinely participate in the community by promoting the importance of considering the acessibility of the whole of the passenger transport journey. The Department of Transport and Main Roads (TMR) sees this guide as a very important document and application of the principles presented in the guide will help to improve the accessibility of our customers' passenger transport journeys. [1]

For a full list of relevant legislation, policy and guidelines, refer to *Appendix 8-A* and *PTIM, Background and application*.

[1] *Department of Transport and Main Roads (2018) Disability Action Plan 2018-2022 pp. 6*

8.4.1 What is a ferry terminal?

A ferry terminal (jetty, pontoon, or landing) is a structure, which enables passengers to safely and efficiently board or disembark a scheduled ferry service, where a ferry is defined as a ship, boat, barge and hovercraft. Refer *Transport Operations (Passenger Transport) Act 1994*.

For the purpose of the *PTIM*, ferry terminals and marine transport relate to those providing a specific passenger transport role, as opposed to freight or vehicle movement.

8.4.2 Ferry terminal categories

Unlike other public passenger transport facilities (e.g. bus stops) ferry terminals have not typically been categorised based on the infrastructure function and configuration. Generally, terminals have been tailored to the specific needs based on expected passenger demands and locality.

TransLink, through the *PTIM*, proposes to categorise ferry terminals to assist with their future provision within the network, and any upgrade of such terminals to ensure customer functional needs are met. See Table 8.1 for details of TransLink's categorisation of ferry terminals.

The categorisation of a ferry terminal will also need to respond to expected climatic conditions such as weather, tidal conditions and water wave patterns. Furthermore, guidance on level of patronage, or frequency of service, may need to be considered specific to the local government area where a service operates, due to the variance in patronage or service levels across the state.

Table 8.1:
Ferry terminal categories

Ferry terminal category	Description	Generally located
Local	• low usage or remote terminal • specific types of services	• very low patronage facility • low density residential areas • low no. of attractors • remote locations Examples include: • Thursday Island • Horn Island
Intermediate	• commuter role • moderate frequency transport services • moderate customer boarding • primary point of community access (e.g. for utilitarian trips)	• low to medium density residential areas • some attractors (retail, commercial) • minor tourist locations Examples include: • Victoria Point Jetty ferry terminal • North Stradbroke Island ferry terminal (Dunwich)
Premium	• regular services • interchange with other modes • high customer boarding demand requiring significant passenger waiting facilities, including significant coverage and canopy • management of customer movement/s during peak operations	• major destinations and tourist sites • major attractors and centres • multi modal interchange Examples include: • North Quay, Riverside, South Bank ferry terminals • Redland Bay Marina Wienam Creek ferry terminal

8.4.3 What is a ferry service?

A ferry service is a scheduled passenger service provided by a ferry on or over water, and includes a service provided by a water taxi. Refer *Transport Operations (Passenger Transport) Act 1994*.

There are several existing ferry services across the State that are currently operated by the local authority or private contractors. These provide a much needed service for:

- residents of island communities
- tourists accessing the islands
- customers of across/along-river public transport in Brisbane
- recreational travel.

See Figure 8.1 and 8.2 highlighting the location of ferry terminals across Queensland.

8.4.4 Who uses the ferry services?

TransLink customers using ferry services across the network include residents, tourists (domestic and international), commuters, school students, and customers using the service for recreational purposes or as part of other utilitarian trips (e.g. weekly shopping for island residents). How TransLink's customers access this mode of travel varies by location, adjacent land use, and trip purpose and may be predominantly by car in regional locations, and by foot in urban situations.

8.4.5 Roles and responsibilities

TransLink's role with respect to the planning and delivery of ferry terminals across the state is to provide guidance on:

- planning and designing terminals that meet passenger demand and capacity requirements
- integrating with other services
- designing accessible terminals that are easy to access and use by all
- achieving a consistent look-and-feel for all terminals across the network
- meeting specific needs of customers particularly those residing across the State's island communities.

Figure 8.1 –
Location of ferry terminals across Queensland

Figure 8.2 –
Inset maps of ferry terminals across Queensland

8.5 Ferry terminal environment

The process of planning and design for ferry terminals should focus on responding to surrounding land use, environmental constraints, passenger functions, current and future capacity requirements, and stakeholder engagement. As such, the planning process should:

- understand current and potential future vessel requirements
- understand the planning context specific to the site and specific triggers for assessment of the proposed works
- determine and understand proposed ferry route(s), terminal need and passenger demand
- understand both up-front and ongoing supporting infrastructure or works (such as dredging and seawall repairs)
- identify ferry terminal location including customer catchments and land value
- establish ferry terminal infrastructure requirements taking into account passenger functions and capacity requirements
- consult with community and key stakeholders.

Due to the geography of Queensland, the travel across water bodies (from commuter travel within cities to tourists accessing islands) is a factor of public transport planning. Ferries are generally linked to public and private transport networks, providing continuous routes and more options for passengers.

Given that an established ferry network is already in place for Queensland, the majority of ferry terminal works are anticipated to relate to upgrades of existing infrastructure for:

- interchange functions
- wharves as part of large development proposals on waterfront land
- changing passenger demands and requirements
- access improvements, including for people with disabilities
- local government, asset owner and service operator requirements
- new or upgraded vessels
- flood/cyclone mitigation and damage
- maintenance and end-of-life replacement
- to address specific community needs.

8.5.1 Understanding existing and future customers

8.5.1.1 Customer outcomes

TMR is focussed on achieving the following customer outcomes:

1. ***Accessible, convenient transport:*** access and use of the public transport network should be accessible, convenient, direct and legible
2. ***Safe journeys for all:*** customers should feel comfortable and safe when using and accessing the public transport network
3. ***Seamless, personalised journeys:*** ferry terminals are to be designed for the customer and need to be convenient and responsive to their individual needs and expectations. Design of ferry terminals to consider all modes of access to ensure a seamless interchange and journey for the customer
4. ***Efficient, reliable and productive transport for people and goods:*** ensures local access and integration with all modes is achieved and customers are able to move efficiently through the terminal. The terminal design balances in-service efficiency and on time running with customer needs
5. ***Sustainable, resilient and liveable communities:*** providing a balance between movement and place can create vibrant places for the community. Ferry terminals should be designed as sustainable, long term assets that are fit-for-purpose now and into the future, and adaptable to change.

8.5.1.2 Customer needs

The ferry terminal needs to provide an appropriate mix of functional elements to meet the needs of customers (not only using this mode, but interchanging/interfacing with other modes and the precinct). In addition the planning of a ferry terminal should address requirements for those users who may use the terminal for purposes other than for passenger transport (taking into consideration the location/context of the terminal).

As a minimum, all users, regardless of their ability or how frequently/infrequently they use the public transport network, require the following:

- short and direct paths to and within ferry terminal
- minimal physical barriers between ferry terminal and each access mode
- ease of circulation to/through ferry terminal
- Crime Prevention Through Environmental Design (CPTED)/personal safety
- legible, clear and consistent wayfinding and information.

Additional specific expectations and needs of customers using the ferry service is provided in Table 8-2.

Table 8.2:
Customer expectations and needs

Customer	Example(s)	Customer expectations and needs
Regular peak hour commuters	Customers who travel every business day to work or education frequently using the TransLink network including ferry services. These users have strong familiarity with the ferry terminal and routes through/via development.	• efficient entry and exit • short and direct access to connecting modes • information on service disruptions and ability to access alternative modes.
Off-peak travellers	May include retired passengers, university students, employees working shift or outside of regular business hours. May include families travelling with children on weekend.	• comfortable waiting areas • infrastructure supporting lower service frequency (e.g. seating, shelter) • personal safety in unmanned locations.
Infrequent users/first-timers	May include tourists, business travellers, parents travelling with children, interstate guests visiting family (e.g. typically includes discretionary travellers). Customers might have luggage, prams or items unable to move easily.	• wayfinding and information on surrounding area • easy to navigate • comfortable waiting areas including luggage facilities • convenient retail/food and drink facilities
Interchange/ transferring customers	Regular peak-hour commuter switching between modes. Might need to accommodate customers impacted due to a service disruption.	• easy, legible interchange • multi-modal real-time information and wayfinding • relationship between modes minimises delay, diversions, the need to cross roads.
People with a disability	Customers who are deaf, hard or hearing, blind or have low vision, customers with cognitive disability or permanent or short-term mobility issues.	• system that ensures equitable and direct access • minimum difficulty or stress to reach destination • ability to access services provided by different vessel types (e.g. pontoon design).
Recreational users	May include users that are mostly like to travel on the weekend, with little knowledge of the ferry network and may be purely a trip for enjoyment or sight-seeing. These users may account for a substantial component of ferry patronage.	• wayfinding and information on surrounding area • retail opportunities and activities
Visitors/ passers-by	May include non-travellers who use or pass through the ferry terminal/ interchange, where the terminal is a focal point supporting other activities. These users encourage beneficial passive surveillance and activate the terminal area.	• sufficient passing areas and use of gates to prioritise needs of travelling customers • designated areas adjacent to the terminal • comfortable waiting areas and meeting points • retail opportunities and activities

8.5.2 Understanding location selection

When choosing a site/location for a ferry terminal, the following should be considered:

- Integration with land use:
  - practical links to landside infrastructure and intermodal connections
  - proximity and connectivity to origin/destinations/attractors.
- Environmental conditions:
  - vessel size and requirements
  - water/river tidal levels and extreme water levels
  - flood/tidal currents
  - wave climate
  - wind climate
  - presence of habitats including sea grass, coral, mangroves
  - location of navigation channel
  - location of other berths
  - assessment of other vessel traffic.
- Geotechnical conditions such as:
  - presence of ground material affecting constructability (e.g. very deep and soft soil requiring deep foundations or stiff rock requiring drilling or blasting).

- Local site constraints such as:
  - above and below ground services
  - external stakeholders
  - cultural heritage
  - planning impacts.
- Long term maintenance requirements.

Ferry terminals are recommended to avoid the following locations, where possible:

- Within a navigation channel/waterway, due to increased risk of impact by other vessels. The berth can be located adjacent to the edge of the channel.
- Where exposed to significant waves, currents and flooding. Due to:
  - passenger safety embarking and disembarking from the ferry
  - high design loading requirement, which is likely to mean high cost
  - inherent risk of damage in a large extreme event (not designed for).
- Where dredging may be required as part of construction and maintenance works, resulting in impacts to environmentally sensitive areas.
- Near practical links to landside infrastructure and intermodal connections, due to increased transit requirement for passengers.

8.5.2.1 Integration with land use

As with other public passenger transport infrastructure, integration with land use is critical. This includes integration with active transport routes and other public transport infrastructure to enable community access to services and reduce dependency on cars. The location of the terminal should also consider the value of the land for use for such a specialised form of public transport particularly when terminals are being considered as part of private development proposals or access is for exclusive communities. On the other hand, a ferry terminal may create or enhance development or redevelopment opportunities.

The provision of a ferry terminal may encourage other unwanted activities such as fishing, climbing on structures, vandalism, risky behaviour (for example, jumping from structures into the water), and loitering to name a few. The design and management of the terminal should take into account the likelihood of such activities to ensure access for ferry customers is not impeded or made unduly unsafe, in addition to reducing ongoing maintenance costs (i.e. cleaning). In addition, due consideration should be given to adjacent marine businesses and their needs when locating the terminal.

Refer to *PTIM, Planning and design* for further information on integration with land use. The overarching design guidelines within the PTIM need to be applied giving consideration to site-specific characteristics to create an attractive, seamless integration with the surrounding environment, with regard for the value and use of waterfront land.

The planning of customer focussed ferry terminal infrastructure should consider feedback from all stakeholders (e.g. asset owner, operators, users and so on) and the local community to reflect the specific needs of location and land use of the area.

TransLink should be consulted with, regarding any proposals that seek to introduce additional ferry terminal infrastructure. An assessment of the most appropriate form of public passenger transport may need need to be carried out to ensure customer level of service can be addressed, and to confirm the service/ facility contributes to the wider network operations.

8.5.2.2 Integration with other modes

When interchanging, customers should be able to do so with minimal difficulty. The land side design of ferry terminals should allow for seamless passenger movement between access modes to encourage public transport use and to maximise the quality of the cusomter experience.

Existing and future active transport demand to from adjacent land uses, nearby attractors and events should inform the design integration of the land side fixed structure with that of the local and surrounding networks.

All interface points between local active transport networks and ferry terminal infrastructure should be functionally seamless and focus should always be on integrating with existing infrastructure. Connections must be direct, and legible with safe and convenient crossings.

For detailed guidance refer to PTIM, Supporting access infrastructure.

8.5.2.3 Integration with other services

The coordination with other public transport service providers/operators should also aim to achieve the best outcome for customers by reducing wait and transfer times, and should consider:

- integrated timetabling
- providing information about service changes, both scheduled and unscheduled
- developing late night travel solutions for customers.

8.5.2.4 Environmental conditions

Tidal range, extreme weather conditions and other environmental factors may compromise ferry operations and the safe use of a terminal for customers and operators. The planning and design of ferry terminals therefore needs to appropriately consider all environmental factors as well as alternate or/and complementary modes of travel for customers.

The siting of a ferry terminal should also seek to avoid locations that require capital and/or maintenance dredging or reclamation to be feasible. TMR in partnership with local government can assist in providing basic information where available including water-specific data such as tides, weather, water depth, need for dredging, environmental impacts and seawall information.

Habitat protection should also be considered in site selection. The presence of marine seagrass, coral, fish habitats, vegetation, mangrove, and movements paths should be determined with disturbance avoided.

8.5.3 Ferry terminal operational considerations

There are numerous factors that influence the planning and design for ferry terminal infrastructure.

Table 8.3 provides more detail on some key requirements for consideration, for the planning and design process.

In addition to the locational and operational considerations specific to ferry terminals discussed in this chapter, other relevant considerations are provided in *PTIM, Planning and design.*

Table 8.3:
Operational considerations for planning and designing ferry terminal infrastructure

Factors influencing planning and design	What to consider
Capacity and design life	The design of new and/or upgraded public transport infrastructure needs to consider current and future capacity requirements. This is particularly important for ferry terminals and services, which have higher infrastructure, fleet and operating costs than land public transport. Also: • Assess local passenger profile and their requirements, with a focus on access mode and trip purpose. • Incorporate the ferry terminal components applicable based on terminal category (refer Table 8.6).
Alternative transport modes and wider implication	• During early planning, there is a need to consider alternative transport modes that could meet access objectives. As this mode is typically considered a specialised service, an assessment should be undertaken to understand the wider network and customer opportunities as well as impacts from adding ferry facilities as part of developments.

Factors influencing planning and design	What to consider
Access area and infrastructure	• **Personal comfort** – terminal access areas (e.g. walkways, gangways and pontoons) should be designed to be within the range of personal comfort during peak operational periods. These must accommodate passenger movements when waiting, queuing and accessing services. Passengers boarding and alighting should not be inhibited by waiting passengers. Sufficient space also needs to be provided for passengers to move to and away from loading and waiting areas. • **Safety and security** - early planning and design consideration needs to incorporate measures such as provision of adequate sight lines, passive and active surveillance, security infrastructure and use of gates etc. to enhance passenger safety. • **Design space** – consideration should be given to an appropriate Fruin Level of Service for the design of the terminal waiting areas, walkways, gangways and pontoon. For pedestrian horizontal travel and platform waiting areas, TransLink typically prefers that a LOS C be achieved as a minimum during peak periods. Seating and waiting areas should ideally be separated so that they do not interfere with boarding and alighting, information points or other pedestrian circulation points. • **Inclusive** – all public transport infrastructure must be designed to accommodate all public transport users and comply with relevant access and design standards. Priority should be given to providing for independent access in accordance with the *Disability Standards*. Where the provision of independent access is not practical, the *Disability Standards* makes allowance for provision of 'direct assistance' as an alternative means of achieving full access – this is defined as constituting help given by an operator or provider [2]. • **Supporting access infrastructure** – planning and design should consider how passengers will access the terminal and incorporate appropriate supporting access infrastructure. For detailed guidance refer to the *PTIM, Supporting access infrastructure* Table 3.1.
Operator requirements	• **Mooring Vessel** – depending on the ferry service and agreement with operator, consideration may need to be given in the planning and design of where the vessel is moored outside of operational periods. • **Operator Amenities** – subject to agreements with operators, access to toilet facilities may need to be provided and should be considered. • **Operations manager** - liaison with operations manager to understand requirements of ongoing management and maintenance of the asset. • **Design vessel particulars** – ferry terminal infrastructure needs to consider a diverse range of design vessel particulars that may use the terminal. Refer to section *Design considerations for ferry terminals* in this chapter for further detail.
Emergency response vessels	• Ferry terminal design may need to consider the need to accommodate berthing and mooring of emergency response vessels required to respond to specific needs for a community (e.g. fire, ambulance, police).

8.6 Ferry terminal formation

8.6.1 Understanding terminal layouts

This section provides guidance on a typical ferry terminal layout. It is noted that the layout of a terminal should address site-specific constraints and operational requirements, and as such a site specific response needs to consider:

- the surrounding environment and general accessibility to land use
- functional and operational capacity requirements
- surrounding catchment demand from the wider transport network.

Ferry terminal design shall be undertaken in conjunction with a number of key stakeholders, including TMR, Maritime Safety Queensland, local government and ferry operators.

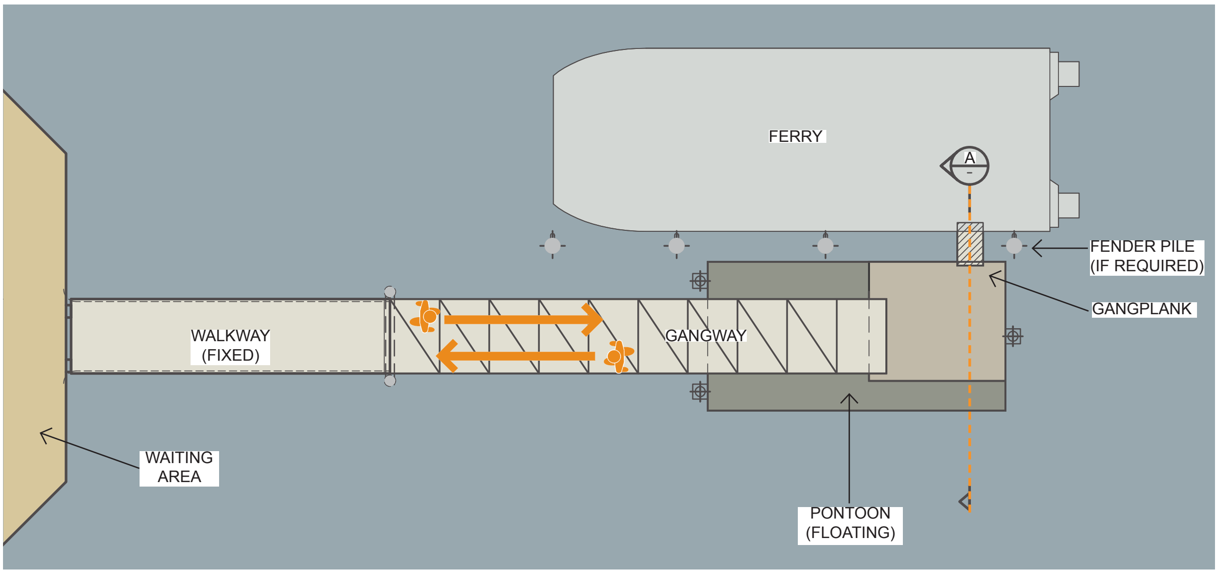
8.6.2 Ferry terminal elements

TransLink has not specifically defined a set of generic ferry terminal layouts, as the layout configuration is very much linked to the understanding of the environmental factors (such as wind direction) of the water to be crossed or traversed along and the ferry vessel.

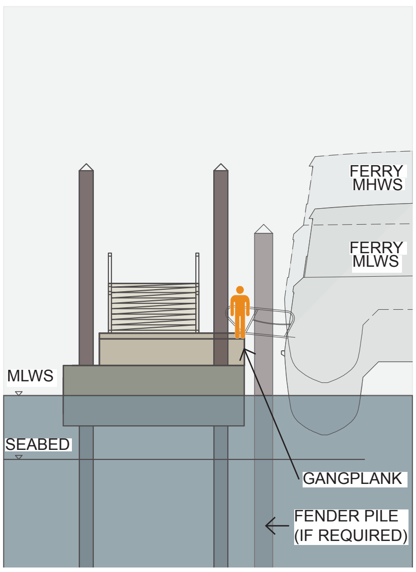
However, a typical terminal layout includes:

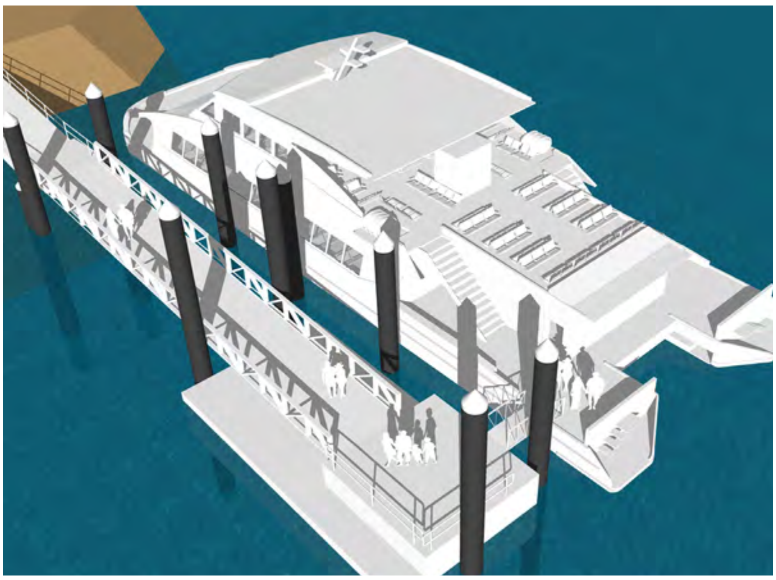
- access paths to/from broader precinct
- land side fixed structure waiting area
- walkway (fixed structure)
- gangway (floating)
- pontoon (floating)
- gangplank bridge (if required).

In addition to the layout itself of the terminal, as with other public transport modes, a range of supporting access infrastructure (for example, walk and cycle components, kiss 'n' ride or park 'n' ride) should be considered to complement the functionality of the terminal and delivery of an integrated and seamless transport network. Refer to *PTIM, Supporting access infrastructure*.



GENERAL ARRANGEMENT





SECTION

Figure 8.3 –
General arrangement and section of a typical ferry terminal layout

8.6.2.1 Land side fixed structure

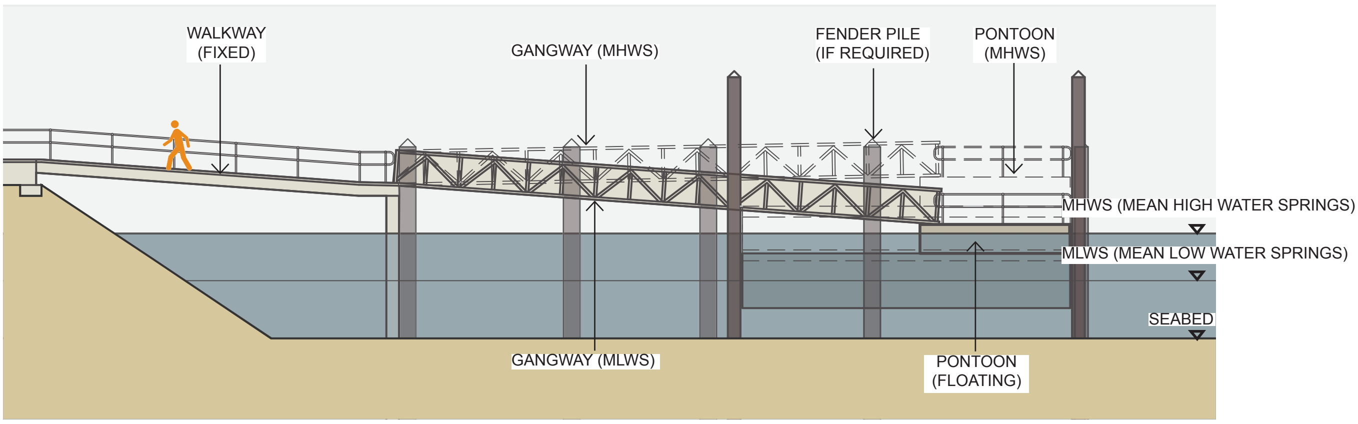
- Design and layout of this structure will need to take into consideration its specific transition into the surrounding environment, nearby/adjacent land uses, and associated activities. This should include the consideration of an accessible path of travel from surrounding precinct through to the pontoon for boarding the vessel.
- A waiting area as a minimum should include a shelter within appropriate seating and allocated spaces, service information and fares, and ticketing facilities where applicable. The shelter should provided to maximise protection from the elements for customer comfort and be positioned to commuters can easily see approaching vessels.
- This structure should offer a safe holding area for passengers away from the movement of embarking and disembarking passengers, particularly for less mobile passengers or younger passengers/families.
- Offer shelter from the elements, as well as appropriate level of seating including allocated spaces (to meet specific customer requirements and the *Disability Standards)*.
- Accommodate any proposed terminal building or ticket office (or other ancillary, retail or commercial uses where appropriate). It is noted that customers have the option to purchase or validate fares on board the vessel. Contact TransLink for preferred fare payment options when determining design.
- May consider facilities to support and enhance the use of bicycles as a means of access to/from the ferry terminal.
- May include features, or space to accommodate non-passenger users (for example, recreational uses).

8.6.2.2 Walkway

- The walkway typically provides a fixed connection between the land side structure and the gangway.
- It provides for the movement of passengers to and from the ferry vessel, as well as the movement of goods (as required based on customer type, location, site context).
- Width of walkway and its orientation/arrangement should be such that it meets objectives for the efficient movement of passengers as well as meeting the requirements of the *Disability Standards* (particularly with respect to the provision of ramps and resting landings). This may see wider walkways to accommodate both unloading and loading movements simultaneously (two-way flow) or where required due to luggage requirements (for example, associated with tourists, resorts or island communities).

8.6.2.3 Gangway

- The gangway connects with the fixed walkway and that of the terminal pontoon, and is designed to move according to tidal conditions. As with the walkway it provides for the movement of passengers to and from the ferry vessel, as well as the movement of goods. It should meet the requirements of the *Disability Standards*.
- The gangway should not be encouraged to be used for the queuing/waiting of passengers.



ELEVATION

***Figure 8.4** –*
Elevation of a typical ferry terminal layout

8.6.2.4 Pontoon

- The orientation, location and layout of the pontoon needs to consider the specific context of the site (for example, environmental factors, tidal conditions, wave/wind climate), vessel size and turning movements, operations, and number of berths. The height difference between the pontoon and the vessel (freeboard) also needs to be considered, with particular attention given to the slope of ramps for passengers with disabilities.
- Where the layout of the terminal sees passenger queuing and waiting proposed to occur on/at the pontoon, it needs to be sized to ensure sufficient stability, to meet passenger demand and movements, as well as providing seating, shelter and safety/service equipment.
- If space is available, it is encouraged to consider designing a terminal with passenger queuing and/or waiting to occur on land, supported by visible passenger information displays (e.g. real-time).
- Consideration should also be given to the storage of the gangplank (see below).

8.6.2.5 Gangplank

- To be sized to address passenger flow, cargo requirements, and the range of vessels servicing the terminal.
- Needs to provide safe and equitable transition for passengers from the pontoon to the vessel and should meet the requirements of the *Disability Standards*.
- Ideally the gangplank needs to be designed to enable manual handling, and the layout of the terminal should ensure it can be safely stowed when not in use.

8.6.2.6 Accessibility and compliance

It is important that the relevant standards and guidelines for disability access are followed, along with the engagement of relevant disability reference groups, where required. The legislative requirements of the Commonwealth *Disability Discrimination Act 1992 (DDA),* sets out the responsibilities of providers with regards to access to public transport, with the requirements identified in:

- *Disability Standards for Accessible Public Transport 2002 (Transport Standards)*
- *Disability (Access to Premises – Buildings) Standards 2010 (Premises Standards).*

TransLink also recognises the importance of providing appropriate accessibility for customers as part of their door-to-door journey. Enabling a customer to navigate a continuously accessible path as part of the 'journey' helps create an accessible network.

- The large tidal nature of some coastal locations can impact the accessibility of ferry terminals by changing ramp gradients for gangways. This may see the need for assisted access for people with a disability.
- The motion of ferry vessels on the water can cause gangplank movements, which may affect the accessibility of ferries. This may see the need for assisted access for people with a disability.
- The use of ferry terminals for fishing and other recreational uses can also present hazards and amenity impacts.
- Storm and flood resilience as well as other ferry-specific concerns should be considered in the design of terminals to ensure they remain accessible.

8.7 Functional design guidelines for ferry terminals

Ensuring that the arrangement of key components is correctly incorporated will contribute towards quality outcomes for the overall terminal design.

Each of the following principles described in this section should be incorporated into the design of public transport infrastructure.

8.7.1 TransLink architectural theme

Passengers find it easy to recognise, interpret and navigate public transport infrastructure.

Public transport infrastructure should be designed to:

- be legible within the built environment
- be contemporary
- consistent inclusion of components
- address climatic conditions
- meet customer needs.

Infrastructure is one of the most recognisable parts of the TransLink network. A consistent 'look and feel' across the network will increase passenger confidence, with customers having clear expectations. Design elements can be tailored to meet specific community, operational and functional requirements at individual sites.

The TransLink architectural theme provides the framework for establishing a coherent network of public transport infrastructure across the state. Infrastructure planning and design should:

- reflect the relative importance of the infrastructure in the overall public transport hierarchy
- align with network standards for components such as land side structures, pavements, signage and wayfinding particularly where integrated with other transport modes
- be based on the use of modular components to reduce cost, as well as for ease of maintenance and future capacity enhancement
- use common materials that emulate a lightweight appearance to deliver a modern, open and safe environment
- comply with applicable standards and regulations, including:
  - *Disability Standards for Accessible Public Transport 2002 (Cth)*
  - *Crime Prevention Through Environmental Design (CPTED)* guidelines
  - relevant *Australian Standards* (see *Section 8.11* in this chapter for relevant design references).

8.7.2 Arrangement of space

Customers enjoy free flowing movement within the terminal.

Public transport infrastructure may include public and private spaces. Public spaces form the pathway from the point of entry to the point of departure. Private spaces should not obstruct paths of travel, sightlines to points of entry, information and decision points, and waiting and seating areas. Private spaces can include:

- retail and commercial areas
- maintenance and management terminal areas
- communications and electrical cupboards.

8.7.3 Sequence of movement

The layout of a transport facility should provide for the sequence of passenger movement – which is in response to the progressive sequence of actions and decision points along the path of travel. Movement should be in a forward direction from the entry to the pontoon boarding point, as illustrated in Figure 8.5.

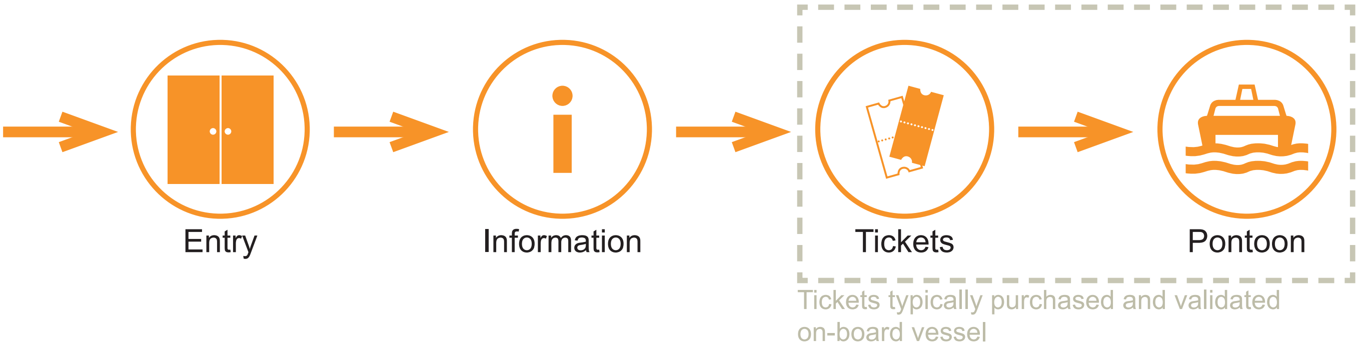


Figure 8.5 –
Sequence of Movement

8.7.4 Circulation within public transport infrastructure

Table 8.4:
Principles of circulation

Types of Circulation	Principles
Direct Circulation	• Route between entry and boarding points should be as direct as possible. • Minimise turns in the path of travel and avoid turns greater than 180 degrees. • Changes of level should be through ramps, or continuous straight flights of stairs. – If turning is required, landings are to be provided with necessary room for appropriate separation and manoeuvring. – Stairs circulating at 90-degree turns must adopt suitable measures to provide good sightlines for ascending and descending. See Figure 8.6.
Cross-path circulation	• Provide simple and clearly defined paths of travel that avoid conflict and maximise capacity. • Paths of travel should be clearly established to meet the requirements of passengers on the dominant side of the pathway, away from the opposite flow path. • Avoid circulation systems that have people crossing the paths of others to access information, ticketing, amenities, platforms, ranks, seating, rubbish disposal and other requirements. See Figure 8.7.
Left-hand circulation	• Dominant movement pattern of pedestrians is based on the majority of travel undertaken on the left-hand side. • Circulation within the terminal (including around components and amenities) should follow this convention for predictability and efficiency.
Vertical Circulation	• Vertical circulation components such as stairs, ramps and lifts should be assembled together centrally. • Centralised location of components assists with convenient placement of public information. • All access components must comply with the relevant *Disability Standards* to the maximum extent possible.

Types of Circulation	Principles
Changing direction	• Changes in direction within circulation should only occur where there is sufficient space to allow passengers to maintain a sense of direction (use of transparent materials to enable views is preferable). • Appropriate space should be provided at information and decision points for people to avoid conflict with the flow path of travel to ensure comfortable and efficient movement.
Emergency evacuation circulation	• Emergency evacuation considerations, including appropriate circulation paths, exits and assembly points, should cater for the maximum volume of people using the terminal at any one time. • Effective signage and wayfinding is a key consideration for public circulation in an emergency situation. • Facilities which are structurally at-grade, elevated or below grade present complex emergency and safety requirements that warrant project specific design investigation. • A Safety in Design review of the above should be undertaken with all relevant stakeholders. Note: The *Premises Standards* and the *National Construction Code* including the *Building Code of Australia* provide technical emergency and safety requirements for passenger transport facilities, as well as cross referencing to the relevant *Australian Standards* for design guidance.

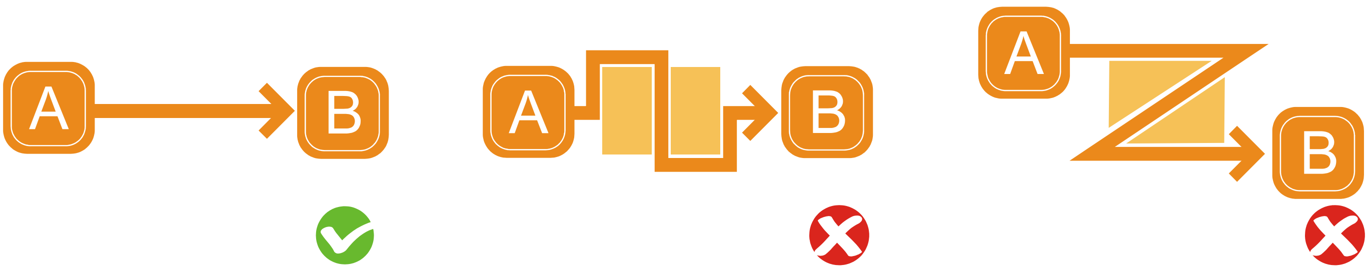


Figure 8.6 –
Direct circulation

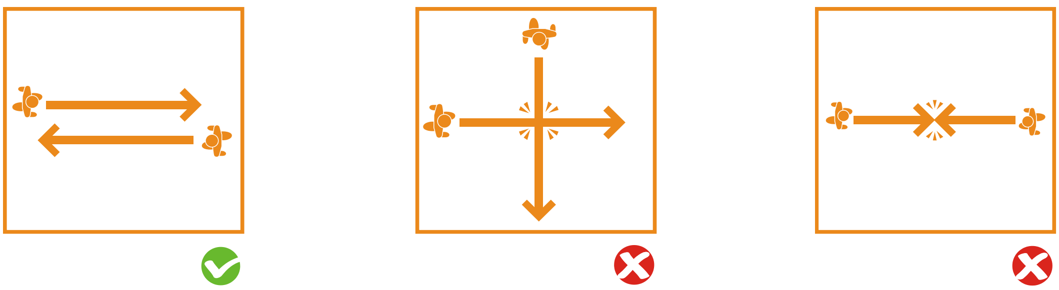


Figure 8.7 – *Cross-path circulation*

8.7.5 Density of occupation

Specific to ferry terminals, the management of the use of walkways and gangways for passenger flow to/from the vessel should be considered, either through appropriate scale of design (i.e. wider walkways and gangways), or management/holding of passengers whilst other passengers alight (disembark) the vessel. Refer to *PTIM, Planning and design* for further guidance.

8.7.6 Identifiable terminal entry and exit

Entry and exit points are clearly defined and highly legible to customers.

Clearly defined entry and exit points are essential; not only providing points of access, but also defining the ferry terminal/ infrastructure boundaries and where access infrastructure needs to link to the facility (for example, terminal building, or ferry walkway) from the surrounding built environment.

Design considerations should include where applicable, the provision of entry plazas, information areas, ticket office or terminal building, fare gates, or gates between recreational users and access to the pontoon.

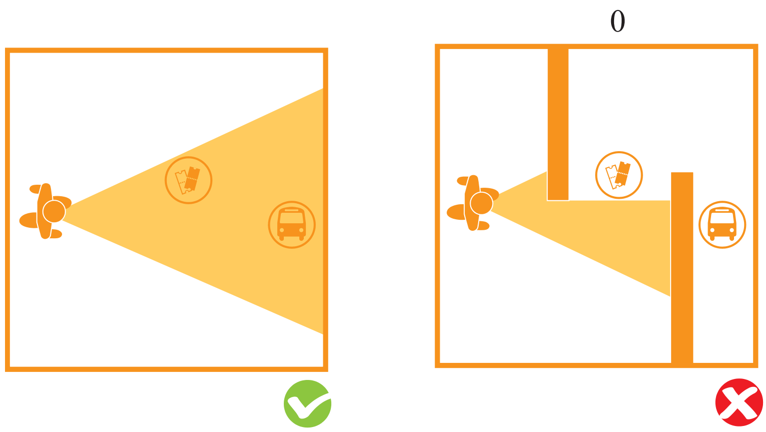


Figure 8.8 –
Identifiable entry/facility

8.7.7 Safety and security

Safety and security of customers and other users of the terminal, particularly at night may see the need to consider in addition to appropriate lighting levels, well monitored waiting environments, and access paths to and from the terminal that offer sufficient active and passive surveillance.

The need for 'gates' on the walkway of the terminal to close off access to the pontoon outside of operational hours, or to segregate recreational users of the terminal from waiting customers might also need to be considered and planned for early as part of the ferry terminal design.

8.7.7.1 Active surveillance

The safety and security measures employed to maximise actual and perceived safety for customers may consider the use of the following:

- security cameras in operational areas
- adequate lighting appropriate to the type/category of terminal
- visual monitoring of the terminal (or interchange).

8.7.7.2 Passive surveillance

Infrastructure is designed to provide passive surveillance and deter undesirable behaviour.

The physical environment of public transport facilities must be designed to minimise the possibility of crime, property damage and anti-social behaviour associated with people gathering in public spaces. Creating defensible spaces that allow for surveillance from outside and within the terminal will promote safe environments and will attract greater public use. Refer to the current version of the Queensland Government's *CPTED* guidelines.

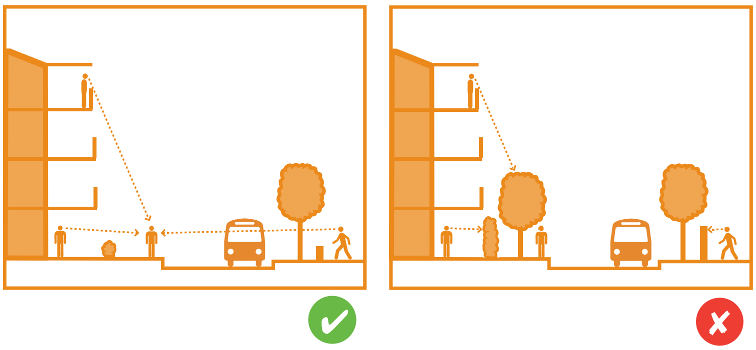


Figure 8.9 –
Passive surveillance

8.7.7.3 Anti-social behaviour, graffiti deterrents and treatments

Components are durable and resistant to graffiti and vandalism.

Public transport facilities are vulnerable to unwanted offences such as vandalism, abuse and careless use of infrastructure components. In line with specifying durable, self-cleaning and easily maintainable materials and finishes, all infrastructure components—furniture, lighting equipment, information devices, walls, floors, ceilings, balustrades, glass panels, screens, elevators, escalators and other components—coming into contact with the public must be resilient to acts of vandalism and graffiti. This may involve terminal components being protected with anti-graffiti coatings or constructed from non-porous graffiti-resistant materials.

Other options include specific design and arrangement of waiting areas and structures to maximise natural surveillance in order to minimise the incidence of graffiti and anti-social behaviour. In some instances, appropriate planting of vegetation may be used, adjacent to structures or walls, to prevent access by vandals. Furthermore, the moderate application of artwork that complements the terminal architecture and theming can also be used to deter graffiti.

Ferry terminals in particular may attract certain anti-social and risky behaviour which can be problematic for customers and operators, as well as potential of injury.

Measures to discourage the climbing of the ferry structure (e.g. shelter/roof) such as eliminating hand/foot holds, use of materials or curvature in the design should be considered. The use of gates and barriers to prevent access out of operational hours is recommended to deter risky behaviour.

8.7.8 Climatic comfort and weather protection

Sun and weather protection is to be considered for customers in both the waiting and walkway areas at ferry terminals.

In developing the design of terminals the following should be considered:

- structures must provide sufficient physical width, length and height to achieve high-quality climatic comfort and waves, spray, sun and weather protection for passengers to occupy this space
- passengers should be provided with appropriate protection with enclosed or covered access points, public information and decision points, seating and waiting areas, and boarding and alighting areas
- consideration must be given to the management of sun, wind, rain, waves, heat, glare and humidity.

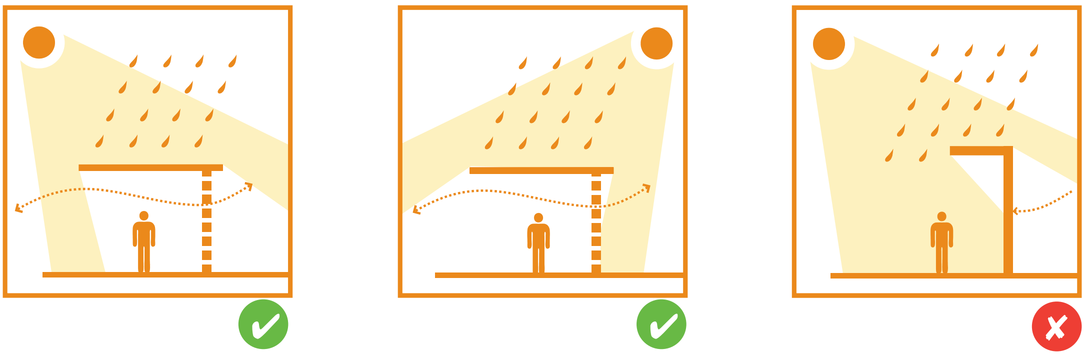


Figure 8.10 –
Climatic comfort and weather protection

8.7.9 Functionality and simplicity

Maintain simplicity and provide a functional ferry terminal design that passengers can easily interpret and use.

The design of structures, pontoons, seating, signage, pavements and other components must be incorporated within the overall design process to achieve highly functional design outcomes.

The design should provide a legible and pleasant environment that is uncluttered, with minimal concealed spaces.

8.7.10 Sustainable design

Sustainability is to be considered in developing all public transport infrastructure.

Design and delivery of public transport infrastructure will focus on sustainability through:

- terminal design that is fit for purpose now and into the future, and adaptable to change
- contributing to attractive community spaces and a local sense of place
- commitment to a low environmental footprint and whole-of-life approach through all design, construction and maintenance activities
- increasing visibility of sustainable features, and undertaking a participatory approach to design to improve community awareness and support.

Impact on the environment should be avoided and minimised in early planning stages such as during the site selection process. Design should seek to minimise its footprint and impact on environmental features in and adjacent to the site. For details of TransLink sustainability requirements, refer to *PTIM, Planning and design*.

8.8 Specific considerations for ferry terminals

A ferry terminal has complex marine and civil engineering design requirements as it is located in the harsh marine environment. To ensure that the terminal is fit for purpose, safe and provide for vessel operations there are a number of aspects to consider carefully in the design (this also includes upgrades and rehabilitation of existing terminals).

Specific design considerations to assist with the upgrade of or design of a new ferry terminal are summarised in Table 8.5.

Table 8.5:
Functional design elements for ferry terminals

Item	Example considerations (not limited to)
Design life	• return periods for various design events (e.g. annual recurrence intervals of 50, 100 years or more) and corresponding risk profile to be acceptable to owner • design environmental factors – tides – waves and spray – currents – flooding – erosion & scour allowance – siltation • climate change design approach • durability requirements due to harsh environments • maintenance requirements.

Item	Example considerations (not limited to)
Ferry operator requirements	• loading/unloading of passengers (including for people with disabilities, mobility devices, prams etc., as well as potential for gates to control passenger movements) • loading/unloading of cargo or other items • requirements for mooring vessel (access to securing mooring ropes) • vessel operation requirements (i.e. limits for waves, current, wind and passing vessel effects) • overnight mooring of vessel • maintenance of vessel • access to power, water or other services.
Berthing and mooring of the ferry vessels	• Note that different ferry vessels may use the terminal (with differing passenger and cargo requriements etc.) and thus the design shall be for the most adverse of all design vessel particulars (minimum dimension may govern some design aspects such as fender spacing).

<table>
<tr><th>Item</th><th>Example considerations (not limited to)</th></tr>
<tr><td>Berthing and mooring of the ferry vessels (continued)</td><td>• Vessel Particulars:
– loaded and unloaded displacement (not to be confused with Dead Weight Tonnage as DWT is loading capacity in volume based on density of water and does not include selfweight)
– length
– beam (width)
– loaded and unloaded draft
– loaded and unloaded freeboard
– mooring requirements
– berthing velocity.
• fender selection and spacing
• design safety factors
• safety issues with the zone between moving vessel moving and terminal (if pontoon)
• vessel operation requirements (i.e. limits for waves, current, wind and passing vessel effects)
• emergency response vessels (e.g. ambulance, police) requirements.</td></tr>
<tr><td>Gangplank</td><td>• freeboard range of design vessels (loaded/unloaded)
• surge, sway, heave, roll, pitch and yaw range of design vessels
• freeboard range of pontoon (loaded/unloaded)
• surge, sway, heave, roll, pitch and yaw range of pontoon
• wave action
• assessment of type of boarding for people with disabilities, mobility devices, prams etc.
• health and safety issues (e.g. manual lifting/handling).</td></tr>
<tr><td>Pontoon</td><td>• passenger requirements including seating and adjacent allocated spaces for mobility devices, signage, information etc.
• cargo requirements
• gangplank geometry requirements
• gangway operation requirements
• tidal range
• environmental climate during ferry operations (incl. assessment of water overtopping onto pontoon and if operations will be compromised in certain conditions)
• environmental climate in extreme event (survival of pontoon in extreme storm event)
• functional requirements.</td></tr>
</table>

Item	Example considerations (not limited to)
Pontoon (continued)	• stability requirements • strength requirements • maintenance requirement (incl. considering how pontoon can be removed for maintenance) • construction methodology such as logistics of prefabrication, transport and installation • safety issues with floating structure and movements • egress from water body (e.g. safety ladder) • requirements for power, water and other services • freeboard range of design vessels (loaded/unloaded) • surge, sway, heave, roll, pitch and yaw range of design vessels • freeboard range of pontoon (loaded/unloaded) • surge, sway, heave, roll, pitch and yaw range of pontoon • wave action.
Gangway	• loading/unloading of passengers (including for people with disabilities, mobility devices, prams etc.) • loading/unloading of cargo or other items • requirements for power, water or other services • tidal range and sea level rise • movement joint/end of gangway (including sliding plate and tactile indicators) • slip resistance • recreational use.
Walkway (fixed structure)	• loading/unloading of passengers (including for people with disabilities, mobility devices, prams etc.) • loading/unloading of cargo or other items • requirements for power, water or other services • tidal range and climate change factors • connection for end of gangway (including tactile indicators) • recreational use.
Waiting area	• passenger requirements, including seating and adjactent allocated spaces for mobility devices, signage, information, fare machine etc. • transition into adjacent environment (such as a road, bus stop, cycleway or other) • bicycle parking • health and safety issues • recreational use.

<table>
<tr><th>Item</th><th>Example considerations (not limited to)</th></tr>
<tr><td>Site specific studies to inform design</td><td>• passenger and cargo profile
• study of marine traffic at the proposed location
• geotechnical conditions
• topographic and hydrographic survey (note that different datums may be used such as Australian Height Datum on land and Chart Datum to sea)
• study of design environmental factors
– tides
– waves
– currents
– flooding
– erosion & scour
– siltation.
• study of climate change design factors
– sea level rise
– increase in storm activity
– increase in salinity
– other.</td></tr>
<tr><td>Weather cover/roof</td><td>• extent of cover required
• guttering
• anti-climb and egress if risk of climbing onto structure
• safety issues
• movements of floating parts.</td></tr>
<tr><td>Lighting</td><td>• minimum required lighting to facilitate early morning and evening operations
• appropriate lighting lux level [3]
• hours of operations
• Disability Standards requirements [4]
• potential impacts on marine life and habitats
• potential impacts on neighbouring residents.</td></tr>
</table>

3 *Liaise with TMR in partnership with local government to determine the appropriate level of lighting.*

4 *Refer Section 8.11. Note that effort should be made to comply with the Disability Standards to the maximum extent possible.*


NORTH QUAY

8.9 Ferry terminal components

This section details the components that need to be included at ferry terminals. The use of quality components (including materials and furnishing) will support effective ferry terminal operation by:

- providing a comfortable and safe passenger environment
- delivering robust infrastructure that minimises the need for maintenance.

All building and construction components of ferry terminal design are to comply with relevant building codes and *Australian Standard* requirements.

TransLink in partnership with Local Government and stakeholders shall be consulted on infrastructure component inclusions for each terminal.

The correct level of design components making up a terminal will depend significantly on the role of the facility in the TransLink network (that is, TransLink's hierarchy of transport facilities).

These are detailed in Table 8.6 where:

- **M** is mandatory (component must be included, that is if it is a statutory requirement and/or a requirement from TransLink)
- **P** is preferred (components will be included unless justification is provided and approved by the provider of the ferry terminal in response to site constraints)
- **S** is site-specific response (component may be required or desirable subject to specific terminal function and/or site requirements)
- **–** is not applicable (component does not apply to the terminal type/category).

Table 8.6:
Ferry terminal components

Category	Component	Minor terminal	Intermediate terminal	Premium terminal
Information				
Stop marker	Stop identification sign (including location, name)	M	M	M
Ferry terminal specific information	Fare information	S	M	M
	Site specific timetable	P	M	M
	Routes serving the terminal	S	M	M
	Route destination map	P	M	M
	Real-time passenger information	S	S	P
	Customer public address system (including hearing augmentation)	S	S	P
	Terminal/interchange wayfinding signage	S	S	S
Network information	Network map	S	P	M
	Locality map	S	S	M
Regulatory signage and line marking	Landside road access (e.g. Bus zone, taxi zone)	S	S	S
	Navigation aids	S	S	S
Supporting access infrastructure	Cycle enclosures/ parking	S	S	P
	Kiss ‘n’ ride and taxi facilities	S	S	S
	Park ‘n’ ride	S	S	S

Category	Component	Minor terminal	Intermediate terminal	Premium terminal
Accessibility				
General access	Manoeuvring area for wheelchairs [5]	M	M	M
	Clear path of travel	M	M	M
	TGSI	M	M	M
	Allocated space	M	M	M
	Ramp Access	M	M	M
Ferry access	Gangway (one way flow)	S	S	-
	Gangway (two way flow)	P	P	M
	Gang plank on pontoon	P	P	P
	Pontoon	P	P	P
Stop/terminal furniture				
	Shelter	P	M	M
	Seating and lean rails	M	M	M
	Bin	M	M	M
Fare collection				
	Fare machine	S	S	S
	Fare gates	S	S	S
	Ticket window/customer Service/Information kiosks	S	S	S
Safety and security				
	Security camera	S	S	S

5 *Refer to Transport Standards Part 3.1 and 3.2 for detail regarding the provision of circulation space and access for wheelchairs to turn when boarding*

Category	Component	Minor terminal	Intermediate terminal	Premium terminal
	Call point (coinciding with security cameras)	S	S	S
	Lighting [6]	M	M	M
	CPTED Principles	M	M	M
Ferry specific	Anti-climbing measures	P	P	P
	Gates	S	S	P
Optional enhancements				
Terminal furniture	Drinking fountain	S	S	P
	Shopping trolley bay(s)/ storage	S	S	S
Customer facilities	Toilet	S	S	S
	Parenting/carer facilities	S	S	S
	Fishing on structure management	S	S	S
Wayfinding	Precinct wayfinding signage	S	S	S
Landscape treatment	Landscape treatment	P	P	P
Commercial	Vending machine (third party)	S	S	S
	Advertising panels	S	S	S
	Retail	S	S	S
	Customer wireless internet access solutions	S	S	S

6 *Liaise with TMR in partnership with local government to determine the appropriate level of lighting*

Category	Component	Minor terminal	Intermediate terminal	Premium terminal
Operational facilities				
Overnight mooring	On buoy away from terminal	S	S	S
	At terminal	S	S	S

8.9.1 Choosing ferry terminal components

Table 8.7 provides an overview of TransLink requirements in choosing ferry terminal components. All components must comply with the relevant *Disability Standards and Australian Standards*. Consideration should be made to achieving an accessible outcome for the identified customers of the terminal.

For detail regarding TransLink requirements for other public transport infrastructure components not listed below refer to *PTIM, Planning and design* and *PTIM, Supporting access infrastructure,* or relevant modal chapter.

Table 8.7:
TransLink requirements for Ferry terminal components.

Element	Considerations
Materials and furnishing	• Common visual appearance by aligning structures, pavement, signage wayfinding and other infrastructure with the TransLink architectural theme (where agreed with local government/ asset owner). • Design elements to be tailored to meet site-specific operational and functional requirements within the overarching TransLink theme. • Components are suitable for the harsh environmental conditions, and easy to use and maintain. • Modular and consistent terminal components are used to facilitate future maintenance and expansion of infrastructure. • Comply with all applicable standards and regulations.

Element	Considerations
Signage and wayfinding	• Signage should comply with TransLink's signage guidelines where provided in the TransLink network, with agreement with local government/asset owner. • Provide logical timetable displays, wayfinding signage and overall terminal signage. • Use universal icons, international symbols where possible and indicators, and consider signage height, colour contrast and orientation. • Location of signage to consider line-of-sight to nearest decision point, multi-modal integration, maps and landmark information for wider precinct. • Consult TransLink on the general inclusions and arrangement of signage at public transport infrastructure facilities to assist with coordinating with wider precinct wayfinding and messaging to aid a user with their door-to-door journey. • For further information on TransLink's infrastructure signage refer to the *PTIM, Supporting access infrastructure* Table 3.5 and *PTIM, Branding, theming and signage*.
Shelter/Roof	• Shelters and all terminal structures should project a consistent design language that: – appears modern, light and spacious – is of a high quality and standard – is reflective of the Queensland sub-tropical climate – is reflective of TransLink's infrastructure theming and architectural design . • Shelter structure to be designed in accordance with the proposed terminal layout and location of where passenger/customer waiting is proposed to occur, with good sight lines to approaching vessels. This may include waiting areas, walkways and pontoons. • *Transport Standards* provides guidance on the provision of appropriate allocated space at infrastructure. Waiting areas should incorporate seating and allocated space for wheelchair users. • Structures must provide appropriate weather protection as far as reasonably practical. • Passenger information displays, signage and wayfinding can be attached to the structure providing they do not obscure sightlines. • Shelter structures should include high-quality finishes with modern, durable, and easily maintained materials that are reflective of the overall terminal environment and climatic conditions (that is, sun, rain, natural light and airflow). • For the prevention of anti-social/risky behaviour the shelter should consider an open design with appropriate anti-climbing features/measures.

Element	Considerations
Seating and lean rails	• Must be provided in quantities reflective of the expected waiting times and levels of anticipated patronage for the terminal. • Seating should be provided at all waiting areas, including allocated spaces for wheelchair and mobility device users, without impeding free flowing access paths and walkways. • Less seating may be provided at high-frequency service locations due to minimal passenger waiting times and high passenger volumes. • Seating and lean rails should be provided where passengers can easily see approaching public transport vehicles/vessels, typically where there is complete weather protection and where the environment is safe and well lit. • Seats should include backrests and armrests and be constructed from durable, easily cleaned and maintained materials that allow drainage from liquids. • Seating may be cantilevered to a wall or shelter structure to allow easier platform maintenance. • All furniture must offer appropriate luminance contrast in colour with the immediate background (as per the *Disability Standards*). • Lean rails provide passengers with a convenient waiting option by allowing passengers to perch or lean, rather than be seated, when waiting for brief periods or where waiting space is limited. Lean rails generally consist of a horizontal beam supported at either end by vertical posts, or the beam may be attached directly to a wall or station structure. Various heights of lean rails to be considered to accommodate differing customer needs.
Lighting	• Ambient lighting is to be provided for a safe, comfortable and functional station. • Feature lighting may highlight architectural features. • For day-time use, consider translucent materials to allow natural lighting. • For night-time, bright white artificial lighting should ensure a safe and visually attractive environment. • High quality light fixtures and fittings should be robust, corrosion-proof, tamper-proof, and discrete and complement the ferry terminal/interchange environment. • Use of common fixtures will improve maintenance and lower ongoing costs. • Provide lighting on pedestrian areas, roadways and terminal information. • Luminance contrasts will be consistent with terminal/interchange areas including paths and must comply with a minimum contrast with background as per *Disability Standards.* • Design should minimise 'glare' particularly to ensure safe ferry operations (i.e. driver approach to terminal and docking) and to minimise obtrusion for nearby residents/ surrounding properties. • Lighting must comply with the applicable requirements of lighting subcategory P6 within *AS/ NZ 1158.3.1 – Lighting for roads and public spaces.* • For additional disability compliance lighting requirements refer to the *Disability Standards for Accessible Public Transport 2002 (Transport Standards).*

Element	Considerations
Security and Safety	• Security infrastructure refers to security cameras and other items used for the creation of safe and well-monitored waiting environments. • Details on the specifications and management schedules for these systems will be established in collaboration with the terminal owner and/or asset manager. • Appropriate construction and installation requirements must be considered when planning for the inclusion of security infrastructure. The use of signage informing people of the presence of security infrastructure within a terminal can further enhance personal safety, and highlight the perceived risk of detection to potential offenders. • Security help points are typically located in key waiting areas. Ultimately, the location of all these elements should be the subject of terminal specific design, as each site is likely to have a range of differing sightlines and movement patterns. • Counter-terrorism design considerations should be explored where possible on a site-specific basis, depending on the location, level-of-service and potential security risk. Where applicable, terminal design should strive towards universal standards for security and counter-terrorism measures. Liaise with the appropriate division in TMR for advice on including security and counter-terrorism measures at the earliest phase in the terminal planning. • Gates – should the terminal be located adjacent to land uses where the structure of the ferry terminal could be used by the general public (recreational users) out of operational hours, or for activities that impede the day to day use and capacity for customers boarding and alighting from the ferry vessel, the use of a "gate" may need to be considered to close off access to the gangplank and pontoon. This may need to be considered and planned for early as part of the terminal design.
Drinking fountains	• Drinking fountains may be considered at the terminal or as part of an interchange/integration with other modes. • They are generally located close to waiting or congregation areas, seating, information displays, cycle storage areas, and station entries and exits.
Trolley bays/ storage	• Where the terminal co-exists with specific commercial/retail outlets, or where the service is used for the transport of cargo, or goods (for example, residents' weekly shop), there may be the requirement to include appropriate, discreet, and easy to maintain trolley bays or storage within or close to the terminal. • The siting of trolley bays/storage needs to take into account potential conflict with other modes of transport and where applicable trolley collection vehicles. • An agreement from the retail or other operators to collect trolleys on a regular basis is also required.
Bins	• Rubbish bins, of type/specification agreed by asset owner/maintainer, should be provided at all terminals. • The location of rubbish bins should consider positioning close to waiting or congregation areas, seating, information displays, boarding points, cycle storage areas, and interchange/terminal entries and exits. • For ferry terminals, consideration needs to be given to a location appropriate for access for collection arrangements.

Element	Considerations
Operational facilities	Overnight mooring of vessel – operator requirements with regards to the berthing or mooring of a vessel are to be incorporated in the design of the terminal. • Mooring at the terminal: – Consider need for gates on terminal to restrict access outside of operational hours. – Consider provision of additional mooring equipment for night mooring in potential onerous conditions. • Mooring on/off shore mooring point: – Consideration of practical location and time for vessel to access terminal at commencement of operations. – Consider environmental factors for mooring point design.

8.10 Asset management

Ferry terminals are major elements of passenger transport infrastructure and they need to be managed and maintained to sufficient operational conditions suitable for passenger comfort and safety. These terminals are located in areas of extreme corrosion potential and are susceptible to tidal and flooding impacts which should be addressed in design life planning and asset management.

The terminal components need to be inspected, maintained and managed on an ongoing basis to ensure the effective operation of a terminal. The framework for how a terminal will be managed after the delivery of infrastructure needs to be considered within the planning and design process.

The following must be considered when planning and designing ferry terminal terminals:

- the increased requirements for marine durability, cleaning and maintenance schedules of infrastructure components
- surveillance and access control of the terminal
- cost-effectiveness, commonality and replacement of components
- approved suppliers of the materials and components
- access to water, electricity and other resources, for cleaning and maintenance purposes
- general operating costs (such as electricity, water and staff)
- statutory requirements for buildings and terminals
- Requirements for staff.

The above is not a definitive list and other considerations may be required depending on site-specific circumstances.

Relevant operational stakeholders should be engaged in the planning and design process to ensure that the requirements of asset management by operators and/or owners have been considered.

All components of ferry terminal infrastructure should use materials and finishing consistent and compatible with existing infrastructure and of an approved high quality standard and durability appropriate for a marine environment.

In consultation with relevant operating and maintenance stakeholders, detailed maintenance manuals should be developed for all components and operation schedules within a ferry terminal. These should be prepared as a part of the ferry terminal project.

8.10.1 Operations and mantenance

The components and materials that make up a public transport facility should be durable and meet their intended marine operational requirements.

For further details on general operations and maintenance requirements refer to *PTIM, Planning and Design* Section 2.3.4 in addition to *Section 8.11* of this chapter which provides design reference guidance.

8.10.2 Decommissioning and demolition

Where an existing ferry terminal is to be decommissioned or demolished (either as part of the provision of new infrastructure, or due to end of life), the following should be considered:

- Reuse of materials as marine habitat – to create an artificial reef.
- Consultation with community on opportunities for the sustainable reuse of materials, for example as public art.
- Disposal as land fill – when all other uses/avenues have been exhausted.

The timing of the decommissioning or/and demolition of ferry terminal infrastructure should where applicable consider the program for commissioning new infrastructure to ensure customer transport needs are met and the transition managed.

8.11 Technical details

Appendix 8-A provides further detail on the relevance of specific Planning legislation, policies and guidelines for ferry terminal planning and design. Reference should be made to *PTIM, Background and application* Section 1.4.

Contact TMR for general advice with the planning and design of ferry terminal infrastructure and to assist with site specific component selection and location within the terminal design.

8.11.1 Design references

The following outlines relevant design references specific to ferry terminals. The *PTIM* notes that the exact design criteria has to be assessed in detail on a project specific basis. Refer to *PTIM, Background and application Section 1.4* for other specific design references.

- Accessibility Standards:
  - *Disability Standards* and guidelines. See *PTIM, Background and application* Section 1.4 for details.
  - Various referenced *Australian Standards*, in particular *AS 1428 – Design for access and mobility* suite of standards.
- *AS 4997-2005 – Guidelines for the Design of Maritime Structures*. This standard is intended to cover the design of near-shore coastal and estuarine structures (including ferry terminals):
  - Berthing and mooring of vessels
  - Jetties
  - Wharves
  - Dolphins
  - Floating berths
  - Seawalls
  - Breakwater structures
  - Boat and barge ramps
  - Building substructures above water
  - Structural design (reference to relevant AS)
  - Piling
- *AS 4997* makes reference to other specific applicable standards such as:
- *AS 2159 – Piling – Design and installation*
- *AS 4100 – Steel structures*
- *AS 5100 – Bridge design*
- *AS/NZS 1158 – Lighting for roads and public spaces*
- *AS 3600 – Concrete structures*
- *AS 2312 – Protective coatings*
- *AS 3962-2001: Guidelines for Design of Marinas.* This *Australian Standard* is intended to cover the design of near-shore coastal and estuarine structures (including ferry terminals), namely: Floating pontoons; and Berth layout (marina Scale).

Appendix 8-A

Legislation, policies and guidelines

Legislation, policies, and guidelines	Purpose and relevance
Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)	The *EPBC Act* applies to actions which are likely to have a significant impact on matters of National Environmental Significance (NES). The eight (8) matters of NES protected under the *EPBC Act* are: • world heritage properties • national heritage places • wetlands of international importance (listed under the RAMSAR Convention) • listed threatened species and ecological communities • migratory species protected under international agreements • Commonwealth marine areas • the Great Barrier Reef Marine Park • nuclear actions (including uranium mines). Works carried out within an NES area (e.g. wetland area) will need to be assessed with regards to their impact on the matters of NES. The project may require referral to the Australian Department of Environment to determine whether it would be a 'controlled action', and if any approval under the *EPBC Act* would be required.

Legislation, policies, and guidelines	Purpose and relevance
Planning Act 2016* and *Planning Regulation 2017	The *Planning Act 2016* and *Planning Regulation 2017* are administered by the Department of State Development, Manufacturing, Infrastructure and Planning (DSMIP) and are the primary State legislation for land use planning, development assessment and related matters. Under section 6 of the *Planning Regulation*, government supported transport infrastructure is exempt from local planning approvals. The Planning Regulation defines government supported transport infrastructure as infrastructure for transport that is for public use and is: • funded, wholly or partly, by the State or Commonwealth; or • provided by a person, other than under a development approval or infrastructure agreement, on conditions that – are agreed to by the Government; and – are intended to support the commercial viability of the infrastructure.
Transport Infrastructure Act 1994 (TI Act).	This Act provides a framework for integrated planning and management of an efficient transport infrastructure network. This Act sets out the provisions for creating port authorities and identifying strategic port land to be regulated by a port authority. Section 285 of the *TI Act* requires each Port Authority to prepare Land Use Plans (LUP) for approval by the Minister of Transport. Development located in the Strategic Port Land is assessed against the Land Use Plan, and the Port authorities are considered the assessment manager for development undertaken wholly on strategic port land.
Environmental Protection Act 1994 (EP Act)	The objective of the *EP Act* is to protect Queensland's environment while allowing for development that improves the total quality of life, in a way that maintains the ecological processes on which life depends. The *EP Act* nominates environmental protection policies which deal with Air, Noise, Waste Management and Water. They provide guidelines and quality objectives including environmental indicators, ambient and emission standards for contaminants and outline management practices to enhance and protect environmental values. During the construction phase, mitigation measres to protect the receiving environment, including adjacent residents, will be relevant. These may include measures to reduce erosion and protect receiving water quality, mitigate construction noise and air quality impacts and reduce construction waste.
Coastal Protection and Management Act 1995 (Coastal Act)	The objectives of the *Coastal Act* are to protect the environmental, heritage and recreational values of Queensland's coasts. Development within coastal areas is regulated under the *Planning Act* and associated regulations. It is likely that ferry terminals will be located within a Coastal Management District. They may also be located within erosion prone areas and storm tide hazard areas. These matters will need to be addresses as part of any permit applications.

Legislation, policies, and guidelines	Purpose and relevance
Fisheries Act 1994 (Fisheries Act)	This act provides for the management, use, development and protection of fisheries resources and fish habitats and the management of aquaculture activities for related purposes. Fish habitat areas and marine plants are protected under this Act. Where the development of ferry terminals require the disturbance of fish habitat or marine plants, the need for a permit is triggered under the *Planning Act* and *Planning Regulation*.
Vegetation Management Act 1999 (VM Act)	The *VM Act* regulates the clearing of 'remnant' and 'regulated regrowth' vegetation (however it is noted that exemptions under the *Nature Conservation Act 1992*, the *Lane Act 1994* and the *Forestry Act 1959* exist). Whilst clearing of remnant and regulated regrowth vegetation will generally require a permit, Schedule 21 of the *Planning Regulation 2017* provides for exempt clearing work. This includes government supported transport infrastructure. Schedule 24 of the *Planning Regulation* provides the definition for government supported transport infrastructure. Depending on the activities that are required and interpretation of the definitions, clearing for government support transport infrastructure is exempt from the *Vegetation Management Act*.
Marine Parks Act 2004 (Marine Parks Act)* and *Marine Parks Regulations 2006 (Marine Parks Reg)	The *Marine Parks Act* provides for the declaration, zoning, management and permit requirements within marine parks. Works that involve the installation and/or operation of structures within a Queensland Marine Park will require a permit to be issued from the Department of National Parks, Recreation, Sport and Racing (DNPRSR).
Nature Conservation Act 1992 (NC Act)	The *NC Act* provides for the dedication, declaration and management of protected areas, protection of wildlife and its habitat in association with ecologically sustainable use of such wildlife. The *NC Act* and associated regulations define flora and fauna species that are endangered, vulnerable or near threatened and provide for the protection of these species and their habitats and/or breeding places. Where such species or their habitats require removal, those impacts must be managed through fauna spotter-catcher surveys during clearing works, in accordance with the Species Management Program (SMP).
Land Act 1994	This Act provides a framework for the allocation of State land as either leasehold, freehold or other tenure. Permits may be acquired under this Act for the occupation of a reserve, road or unallocated State land. Development undertaken in, on, or over tidal land generally requires authorisation under this act to occupy/use State land. The Act also regulates the opening and closing of State and local roads and land dealings relating to changes in land tenure. Permits to occupy or other tenure instruments for the use or occupation of unallocated State land, reserves or roads.
Local Planning Scheme	The local planning scheme documents the local government's strategic plans for and identifies development provisions that apply to specific developments and areas. Development permits may be required under the local planning scheme and will require assessment the planning scheme or specific codes within the planning scheme.

Legislation, policies, and guidelines	Purpose and relevance
Local Government Act 2009	Section 28 of the *Local Government Act 2009* and section 29 of the *City of Brisbane Act 2010* provides the power for local governments to make and enforce local laws that are necessary or convenient for the good rule and government of their local government area. The *Local Government Act* empower local governments to make local laws that are suitable to their particular needs and resources and that achieve the purpose and principles of local government.
City of Brisbane Act 2010	This act provides a framework for the City of Brisbane's day to day operations and long-term plans. It provides for the way in which the Brisbane City Council is constituted and its responsibilities and powers. The act states that the council has the exclusive right to provide a ferry service across a watercourse if the land that forms both banks of the watercourse is in Brisbane. The council may lease the right to provide this ferry service and can make local laws for managing and regulating the use of ferries operated or leased by it.
Port Land Use Plan (if any)	Port authorities of Strategic Port Land are required to prepare Land Use Plans in accordance with the *TI Act*. Development wholly within a Strategic Port Land area is assessed against the Port Land Use Plan instead of the local government planning scheme.
Priority Development Area (PDA) Development Scheme or Interim Land Use Plan (if any)	PDAs are declared by the Queensland Government. Once an area is declared, an Interim Land Use Plan is effective. Development located within a PDA is assessed against the Interim Land Use Plan instead of the local planning scheme. A Development Scheme for the PDA is required to be implemented within 12 months of the declaration. The adoption and implementation of the Development Scheme superseded the Interim Land Use Plan. The Interim Land Use Plan or Development Scheme identifies assessable and exempt development, and development provisions that apply to various works located within the PDA.
Priority Port Masterplan	Abbott Point, Brisbane, Gladstone, Hay Point/Mackay, and Townsville Ports have been identified as priority ports. The Queensland Government is leading the preparation of masterplans for the priority ports. The objective of the port masterplanning is to optimise existing infrastructure whilst addressing issues beyond strategic port land including marine and land-based impacts, port and supply chain capacity and connectivity, and environmental and community values.

Appendix 8-B

Stakeholders

TransLink shall work in partnership with and assist the asset owner, local government authority, and other agencies with the implementation of the *PTIM, Ferry terminal infrastructure* by the following actions:

- reviewing the Chapter to ensure it remains up to date and relevant
- supporting and communicating the importance of customer focussed features, including accessibility and wayfinding at ferry terminals
- providing recommendations to ensure compliance with the Chapter where this contributes to consistent customer outcomes for the TransLink network.

Stakeholders involved in the planning, design, approvals, operation and maintenance of ferry terminals in Queensland include:

Organisation	Key public transport responsibilities
Maritime Safety Queensland	A branch of TMR within Customer Services, Safety and Regulation Division, which are responsible for: • improving maritime safety for shipping and recreational craft through regulation and education. • minimising vessel-sourced waste and responding to marine pollution. • providing essential maritime services such as aids to navigation and vessel traffic services. • encouraging and supporting innovation in the maritime industry.
Department of Environment and Heritage Protection	A department of the Queensland Government responsible for: • protecting and managing parks, forests and the Great Barrier Reef for current and future generations • enhancing Queensland's ecosystems • protecting significant heritage places • aim to avoid, minimise or mitigate impacts to the environment.

Organisation	Key public transport responsibilities
Public Transport Operators	• Operators are responsible for ensuring safe passenger transport and are allocated a specific contract area within Queensland to operate services
Department of State Development, Manufacturing, Infrastructure and Planning (Economic Development Queensland)	Economic Development Queensland • Declares Priority Development Areas (PDA) (e.g. Toondah Harbour) and provides assessment frameworks and development standards. • Articulates a vision for an integrated public transport system for the PDA • Delegates development assessment and relevant administrative powers to council. State Assessment and Referral Agency • Assesses (or provides advice on) development applications which include matters where there are state government interests. This includes development within coastal management districts, development impacting on marine plants, etc.
Local Government	• owns and maintains ferry terminal infrastructure in most circumstances. • plans and delivers ferry terminal infrastructure in some circumstances as part of other local government capital works projects • provides input and feedback to State Government departments on projects and programs.
TMR	• responsible for the coordination of transport services, infrastructure and management, transport policy and planning in Queensland Translink's role within TMR is to: • plan and design an accessible, efficient and connected passenger transport network that is simple for customers to understand and identify • responsible for enhancing customers' experience, ticketing, public transport information and infrastructure TransLink has State-wide responsibility for: • trains, buses, ferries and trams across South East Queensland • active transport, such as walking and cycling • taxi regulation • long distance rail, coaches and regional air services • buses in Cairns, Mackay, Toowoomba and Townsville • regional services • demand responsive transit

Contents

Chapter 9 – Rail station infrastructure

9.1 Introduction

9.1.1 Overview of the Rail station infrastructure chapter

The Rail station infrastructure chapter is a referenced component of the overarching *Public Transport Infrastructure Manual (PTIM)*.

This Rail station infrastructure chapter is to be used in conjunction with:

- ***PTIM, Background and application,*** which establishes the guidelines for application of the entire *PTIM*
- ***PTIM, Planning and design,*** which provides the overarching design guidelines and principles for public transport infrastructure across Queensland
- ***PTIM, Supporting access infrastructure,*** which details the supporting access infrastructure required to support public transport stops and stations
- ***PTIM, Branding, theming and signage,*** which provides branding, theming and signage that should be used for identifying coherent public transport infrastructure throughout Queensland

External to the *PTIM*, the following documents should be referred to when planning and designing new or upgraded rail stations:

- **Queensland Rail, *Station Design Manual,*** which details general and specific design requirements for new and upgraded rail stations across Queensland Rail's City Network.
- **Department of Transport and Main Roads (TMR), *Guide to Development in a Transport Environment: Rail*,** which provides important information for those involved in the planning, design or delivery of development in the vicinity of railways in Queensland.

For information on further resources to support the planning and design of rail stations, including specifically the integration with other modes please refer to *PTIM, Background and application*.

9.1.2 Purpose and objectives

The Rail station infrastructure chapter will inform infrastructure design by providing a clear and consistent set of principles and guidelines for stations on the rail network.

It will ensure that a high standard of infrastructure is planned and delivered to meet the needs and objectives of the TransLink passenger transport system and passenger expectations. Ultimately, high-quality and consistent rail station infrastructure will provide customers with a transport system that is safe, convenient, coherent, functional and encourages passenger use.

The objectives of this chapter are to:

- ensure design incorporates a focus on achieving customer needs and enhancing their experience
- ensure a consistent approach to maximise customer access, convenience, safety, comfort, efficiency, reliability and accessibility
- ensure best practice infrastructure design is applied consistently across the rail network
- consolidate and standardise the existing guiding principles for the planning and design of rail station infrastructure
- provide an overview of available standards for rail station design
- detail TransLink's requirements for compliance with relevant standards and regulations
- ensure the delivery of quality, accessible and compliant rail stations
- to promote rail station design principles which achieve sustainability, inclusiveness and flexibility.

9.1.3 Roles and responsibilities

The roles and responsibilities of the key stakeholders for the planning and design of rail stations are described in Table 9.1. As shown, the planning, provision, management and operation of public transport is the core responsibility of the State government, with most responsibilities carried out by TransLink (a division of TMR).

TransLink will work in partnership with and assist the asset owner, Queensland Rail, and local governments to:

- reviewing the Chapter to ensure it remains up to date and relevant
- supporting and communicating the importance of customer focussed features of the Chapter to relevant stakeholders
- providing recommendations to ensure compliance with the Chapter.

Table 9.1:
Roles and responsibilities

Organisation	Key public transport responsibilities
TMR	• responsible for the coordination of transport services, infrastructure, management, transport policy and planning in Queensland • manages the Rail Transport Service Contract with Queensland Rail, on behalf of the State of Queensland. TransLink's role within TMR is to: • plan and design an accessible, efficient and connected passenger transport network that is simple for customers to identify, understand and use • be responsible for enhancing customers' experience, ticketing, public transport information and infrastructure. TransLink has State-wide responsibility for managing service contracts to deliver public transport services for: • trains, buses, ferries and light rail across South East Queensland • active transport, such as walking and cycling • taxi regulation • long distance rail, coaches and regional air services • buses in Cairns, Mackay, Toowoomba and Townsville • regional services • demand responsive transit.
Queensland Rail	• statutory authority established under the *Queensland Rail Transit Authority Act 2013 (Qld)* • under the *Transport Infrastructure Act 1994 (Qld)*, Queensland Rail performs the role of railway manager and railway operator. Queensland Rail has the following principal functions: • managing railways • delivers passenger and rail infrastructure services across the State funded through the Rail Transport Service Contract • responsible for upgrading and maintaining existing rail stations. Refer to the *Queensland Rail Transit Authority Act 2013 (Qld)* for further details.

9.2 Application of the Rail station infrastructure chapter

9.2.1 Intended audience

This chapter is intended for use by professionals in the transport planning and delivery industry. This generally involves, but is not limited to, designers, planners, engineers, architects, developers, contractors, private operators and others involved in the planning, design and delivery of rail station projects in Queensland. This may involve professionals charged with protecting the State's existing and future transport infrastructure assets.

9.2.2 Application of this chapter

This chapter must be used in conjunction with overarching applications of the *PTIM*.

This chapter details TransLink requirements for planning and design and should be referred to before starting to plan new rail stations or upgrades, including intermodal connections, neighbourhood and active transport connections, and safety improvements, to existing rail stations. This is particularly important where rail stations are affected by, or a catalyst for, urban development.

For existing sites, direct application of the approaches outlined in this chapter may not be feasible due to existing physical site constraints. The application of *PTIM* may therefore vary to achieve TMR's customer outcomes when undertaking an upgrade.

TransLink, in partnership with Queensland Rail, local governments and in collaboration with relevant stakeholders and delivery partners, shall be consulted on the design for new infrastructure and upgrade of existing rail stations.

9.2.3 Planning, legislation, policies and guidelines

TMR provides specific guidance through *Guide to Development in a Transport Environment: Rail (2015)* for those involved in the planning, design or delivery of development in the vicinity of railways in Queensland.

Queensland Rail is to be included in the detailed design process, with reference to its guideline *Station Design Manual*.

See *PTIM, Background and application* for specific detail on relevant planning references, and relevance to rail station infrastructure and rail corridors.

9.3 Principles of rail station infrastructure planning

9.3.1 What is the rail station precinct?

The rail station precinct comprises three distinct zones including:

1. **Local precinct:** where the rail station integrates with the surrounding land uses and street context.

   Rail stations should not sit in isolation to the community, they should be considered in the context of their surrounding precinct, including how they will be accessed by all transport modes. Rail stations, successfully integrated with the community, can create precincts that are attractive places for economic development and social interaction.

   The planning and design of rail station infrastructure should reflect the local precinct in which it resides. This includes connections to its cultural or heritage significance, the surrounding physical environment and integrate well with the adjacent land uses.

2. **Access and interchange:** location that passengers use to gain access to/from the rail station and transfer between other transport modes such as bikes, buses, taxis etc.

   Supporting access infrastructure is required to ensure passengers can interchange seamlessly between the rail station and different modes. Where accommodating customer transfers at street level, an unobstructed accessible route and close proximity of other modes to a rail station's entry and exits will improve the ease and comfort of these movements. For rail stations with concourses, ticketing areas and platforms underground, the location and design should ensure these are easily recognisable and identifiable as part of the public transport integrated network.

3. **Rail station:** where passengers dwell at a platform, use amenities, buy tickets, board and alight public transport vehicles etc.

   Once within the rail station, consideration of the "paid areas" as well as the "unpaid areas" is essential to aid in defining the spatial requirements to accommodate customer, and staff needs and the legibility of the passenger movements between these zones.

   The zones comprising the rail station precinct are illustrated in Figure 9.1.

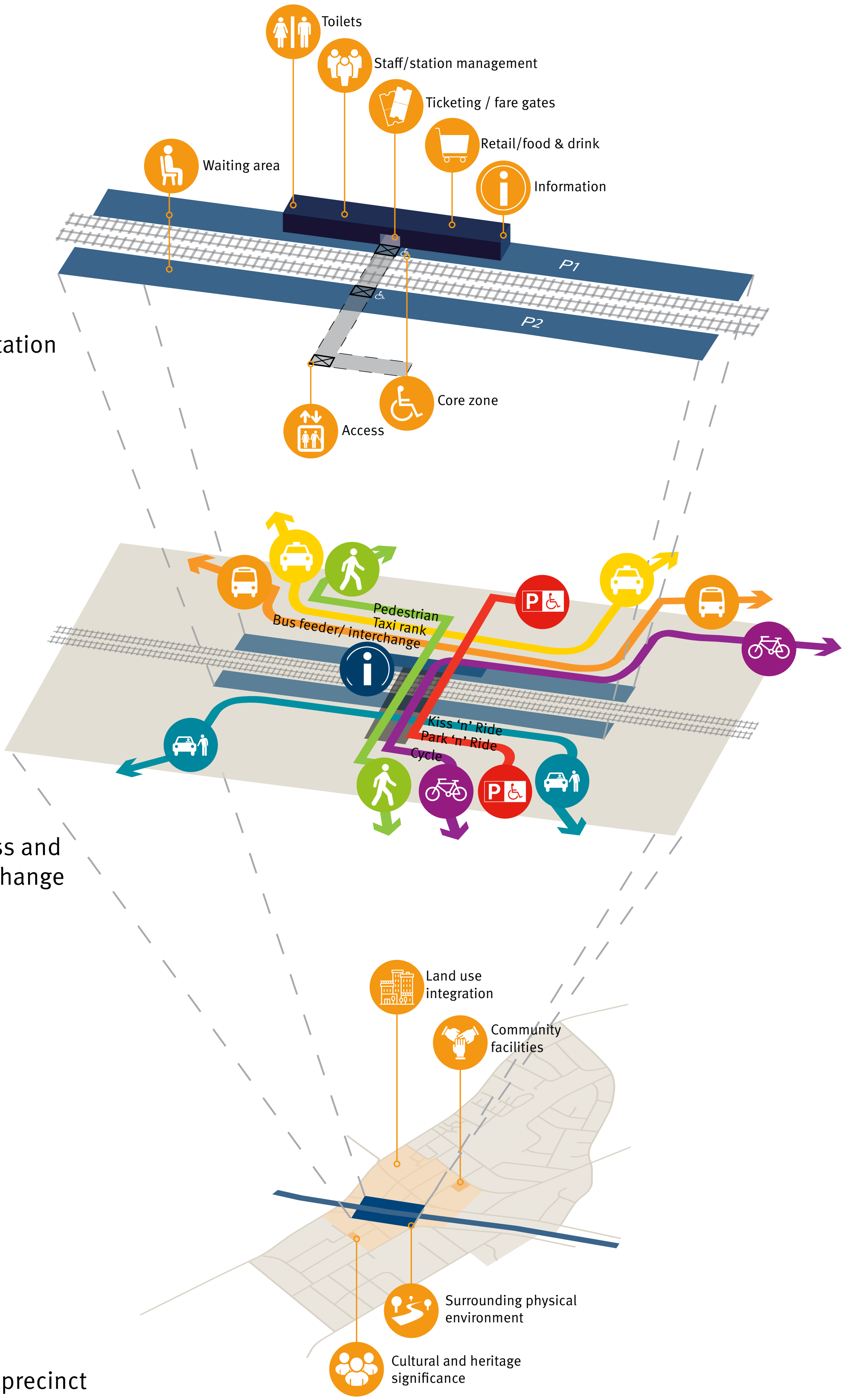
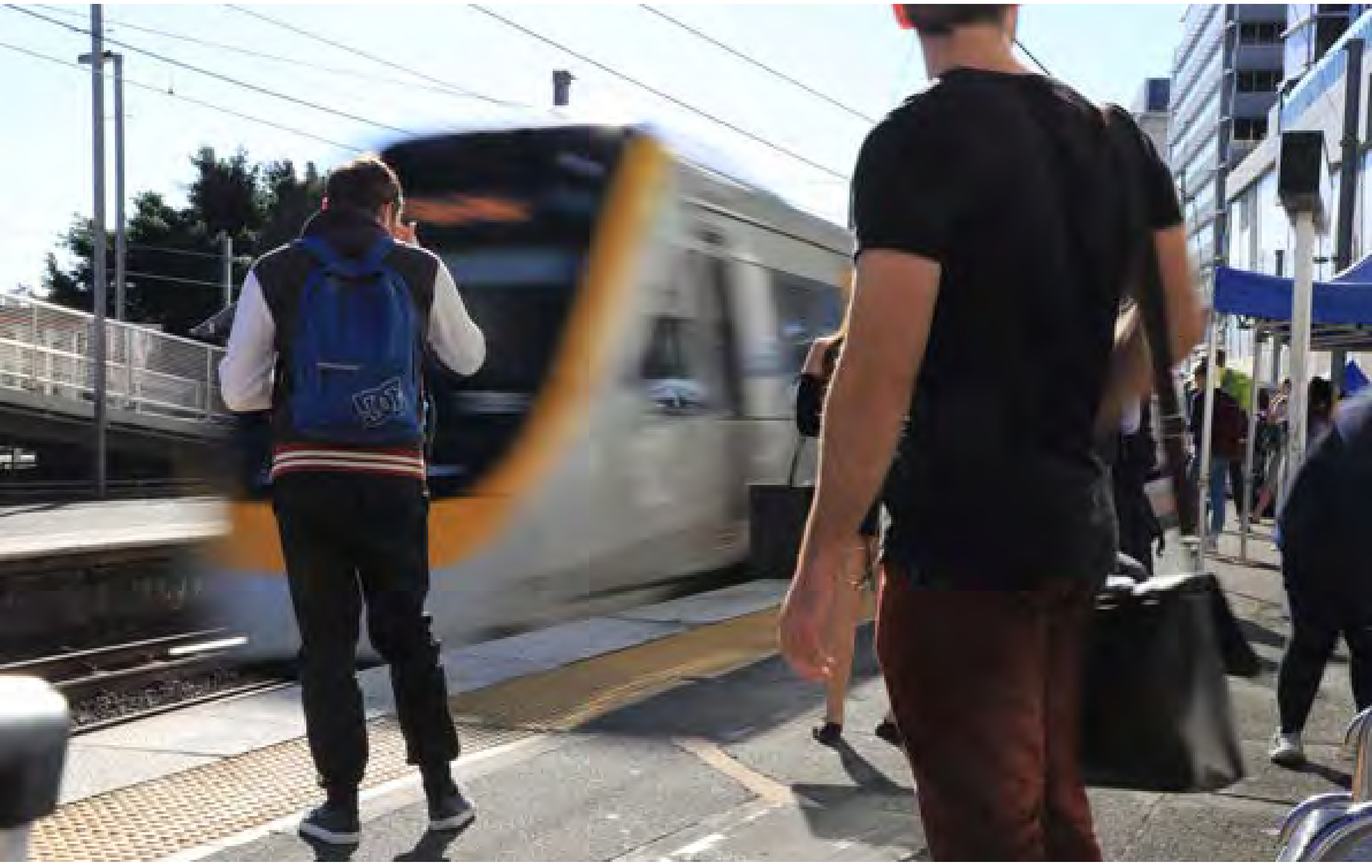


Figure 9.1 – Rail station precinct

9.3.2 Rail station categories

The five categories of rail station provided by Queensland Rail *Station Design Manual*, are identified below, and for the purposes of the *PTIM* have been defined below in terms of the level of infrastructure and multi- modal connections:

1. **Premium** – key destination rail stations with multi train line and multi-modal connections, high level of facilities and finishes
2. **Interchange** – multi-train line and multi-modal connector rail stations for high priority services located in principal and major activity centres
3. **Commuter** –multi-modal access infrastructure including bus feeder, kiss 'n' ride and park 'n' ride, station designed to provide efficient peak commuter demand
4. **Local** –minimal rail station infrastructure and facilities with limited multi-modal connections
5. **Regional** - limited rail station infrastructure and facilities with multi-modal connections including long distance coach.



9.3.2.1 Premium

The key elements that define a premium or flagship rail station are described as follows:

	Description
Customer	commuters, off-peak, first-time, infrequent, long-distance, tourists, events persons with disability, travelling with children, travelling with luggage high patronage
Precinct	key destination place within metropolitan city centre, for example South Bank and Roma Street stations commercial (and retail) opportunities large residential communities clusters of knowledge, tourism, entertainment, health, creative and cultural activities
Operation	high frequency services intramodal interchange intermodal interchange 24 hour or first-to-last service staff presence

So that customers can get to their destinations using the rail network with minimum difficulty and stress, they can expect the following conditions when accessing a premium rail station:

Must haves

1. high quality, accessible, efficient and direct access to connecting modes and between platforms
2. legible, clear and consistent way-finding and information
3. timetable information for multiple lines and feeder connections
4. customer services and general information booths
5. ticket purchasing facilities / gates
6. passenger security

Desired

7. place making elements in the context of the local environment
8. convenient retail/food and drink shop/facilities
9. luggage storage
10. comfortable waiting areas

9.3.2.2 Interchange

The key elements used to describe an interchange rail station are:

	Description
Customer	commuters, off-peak, first-time, infrequent, long-distance, tourists, events persons with disability, travelling with children, travelling with luggage high patronage
Precinct	end-of-line destination/departure point principal and major activity centres, for example Helensvale, Caboolture and Springfield Central rail stations commercial and retail opportunities enhances connectivity for surrounding precincts
Operation	high frequency services intramodal interchange intermodal interchange may include 24 hour or first-to-last staff presence

Customers can expect the following conditions when accessing an interchange rail station:

Must haves

1. high quality, accessible, efficient and direct access to connecting modes and between platforms
2. minimal physical barriers to interchange
3. legible, clear and consistent way-finding and information for stop and interchange facilities
4. timetable information for multiple lines and feeder connections
5. customer services and general information booths
6. ticket purchasing facilities
7. passenger security

Desired

8. convenient retail/food and drink facilities
9. comfortable waiting areas

9.3.2.2 Commuter

The key elements that define a commuter rail station are described as follows:

	Description
Customer	commuters, off-peak, first-time, infrequent, tourists persons with disability, travelling with children higher patronage during peak periods
Precinct	local suburban catchment area commercial and retail opportunities district and neighbourhood activity centres, for example Albion and Newmarket rail stations enhances connectivity of local community
Operation	higher frequency of services during peak hour intermodal interchange weekday staff presence

Customers can expect the following conditions when accessing a commuter rail station:

Must haves

1. high quality, accessible, efficient and direct access to and within rail station
2. legible, clear and consistent way-finding and information for rail station
3. efficient ticket/gate access
4. timetable information for multiple lines and feeder connections
5. customer services and general information booths
6. ticket purchasing facilities
7. passenger security

Desired

8. convenient retail/food and drink facilities
9. comfortable waiting areas

9.3.2.4 Local

The key indicators of a local rail station are described as follows:

	Description
Customer	commuters, off-peak, first-time, infrequent, long-distance persons with disability, travelling with children, travelling with luggage low patronage
Precinct	suburban and regional areas neighbourhood and local activity centre, for example Mango Hill East, Wulkuraka and Ascot rail stations
Operation	low frequency weekday part-time staff presence or unattended

The conditions that customers expect at a local station are:

Must haves

1. high quality, accessible, efficient and direct access to and within rail station
2. legible, clear and consistent way-finding and information for rail station
3. timetable information
4. ticket purchasing facilities
5. passenger security

Desired

6. integration into local environment
7. convenient retail/food and drink facilities
8. comfortable waiting areas

9.3.2.5 Regional

The key indicators of a regional rail station are described as follows:

	Description
Customer	off-peak, first-time, infrequent, long-distance persons with disability, travelling with children, travelling with luggage low patronage
Precinct	regional centre, for example Townsville and Longreach rail stations remote and rural areas, for example Maryborough West
Operation	low frequency weekday part-time staff presence or unattended long distance rail services connections to long-distance coach services rail connection buses

Customer conditions that are expected at a regional station are:

Must haves

1. high quality, accessible, efficient and direct access to and within rail station
2. legible, clear and consistent way-finding and information for rail station
3. timetable information
4. ticket purchasing facilities
5. passenger security

Desired

6. integration into local environment
7. convenient retail/food and drink facilities
8. comfortable waiting areas

9.3.3 Rail services

The existing Queensland service categories and routes across the state are:

- Queensland Rail Travel network (long distance routes including coastal and outback services) and tourist trains [https://www.queenslandrailtravel.com.au/Planyourtrip/networkmap]
- Citytrain network (commuter services) [https://www.queenslandrail.com.au/forcustomers/stationsmaps/maps]

9.3.4 Who uses the rail service

TransLink customers using rail services across the rail network include frequent and infrequent users (for example, commuters/full-time workers, students, tourists, retirees, long distance travellers, and customers using the service for recreational purposes and events).

Customers may solely use rail stations for non-travelling purposes such as retail, cross-corridor access, meeting travelling users and other activities, and as such should be considered in the planning and design of a rail station and the rail station precinct. How TransLink customers access this mode of travel varies by location, adjacent land use, rail station facilities (e.g. mobility and accessibility) and trip purpose.

9.3.5 Access

9.3.5.1 Accessibility and compliance

TransLink requires that the relevant standards and guidelines for disability access are followed, along with the engagement of relevant disability reference groups, where required. The legislative requirements of the Commonwealth *Disability Discrimination Act 1992 (DDA)* sets out the responsibilities of the Department with regards to access to public transport, with the specifics and details given in the *Disability Standards*:

- *Disability Standards for Accessible Public Transport 2002 (DSAPT* or *Transport Standards)*
- *Disability (Access to Premises – Buildings) Standards 2010 (Premises Standards)*

For new stations it is not enough that a rail station is compliant, or has compliant elements. The design of the rail station precinct should be accessible to all of its customers and accommodate them without the need for adaptation or specialised design.

When upgrading existing stations, minimising barriers to the provision of direct and equitable access should be pursued.

9.3.5.2 Universal design

Public transport infrastructure should consider universal design to support and enable a diverse range of customers to access and use the public transport network. The philosophy of universal rail station design considers the access outcomes for TransLink customers:

- the whole journey for the customer, regardless of preference or ability, to and through the rail station is continuously accessible
- customers have direct access to the rail network
- customers have confidence that the rail station will provide what they need for a seamless, continuous journey with no barriers to access.

TransLink also recognises the importance of providing appropriate accessibility for customers as part of their door-to-door journey. Enabling a customer to navigate a continuously accessible path as part of the 'Journey' helps to create an accessible network.

The Whole Journey: a guide for thinking beyond compliance to create accessible public transport journeys (Commonwealth of Australia, 2017) assists in enabling people with disability to genuinely participate in the community by promoting the importance of considering the accessibility of the whole of the passenger transport journey. TransLink sees this guide as a very important document and application of the principles presented in the guide will help to improve the accessibility of our customers' passenger transport journeys.

Key accessibility and disability access design considerations are described in *PTIM, Supporting access infrastructure* Section 3.3. The principles of universal design are provided in *PTIM, Background and application.*

Station precinct amenities and facilities are to be designed to cater for a range of different customers with different needs and level of experience. For example

Customers who use a wheelchair:

- provision of lifts and ramps
- accessible fare gate openings
- platform height allows for ease of access into train at core zone.[1]
- unisex accessible toilet

Customers who are elderly or use mobility aids:

- short distance from accessible bays or kiss 'n' drop facility to the rail station and platform
- hearing loops

Customers who are blind or have low vision

- remove hazards/obstacles from path
- uncluttered and open environment
- clear wayfinding through use of colour contrast and tactile ground surface indicators (TGSI)
- access to audible messaging of information .

Customers travelling with luggage:

- provision of lifts and ramps
- accessible fare gate openings
- platform height allows for ease of access into train at core zone
- clear information for onward journey
- luggage storage areas.

Customers who are unfamiliar with the rail station or have mental health or anxiety issues or cognitive impairment:

- clear lines of sight
- orientation of signage and progressive/relevant signage for navigation through station and onward journey to the wider precinct
- consistent wayfinding
- consistent look and feel across rail network.

[1] *The core zone is a designated and identifiable area on the platform that includes, but is not limited to, an assisted boarding point, priority seating area, lighting, emergency phone, next train information, and enhanced CCTV coverage. Core zones also provide shelter and are identifiable by blue and white striped markings.*

9.4 Rail station environment

9.4.1 Understanding existing and future customers

9.4.1.1 Customer outcomes

TMR is focussed on achieving the following customer outcomes:

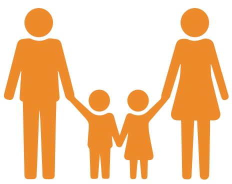
1. **Accessible, convenient transport:** access and use of the rail network should be accessible, convenient, direct and legible
2. **Safe journeys for all:** customers should feel comfortable and safe when using and accessing the rail network
3. **Seamless, personalised journeys:** rail stations are to be designed for the customer and need to be convenient and responsive to their individual needs and expectations. Rail stations to consider all modes of access to ensure a seamless interchange and journey for the customer
4. **Efficient, reliable and productive transport for people and goods:** ensures local access and integration with all modes is achieved and customers are able to move efficiently through the rail station. The station design balances in-service efficiency and on-time running with customer needs
5. **Sustainable, resilient and liveable communities:** providing a balance between movement and place can create vibrant places for the community. Rail stations should be designed as sustainable, long term assets that are fit-for-purpose now and into the future, and adaptable to change.

9.4.1.2 Customer needs

The expectations or needs of different customer types must be recognised and ideally validated for the location using customer research. As a minimum, all users, regardless of their ability or how frequently/ infrequently they use the public transport network, customers require the following:

- short and direct paths to and within the station
- minimal barriers between the station and each access mode
- Crime Prevention Through Environmental Design (CPTED)/personal safety
- legible, clear and consistent wayfinding and information.

Table 9.2:
Customer expectations and needs

Customer type	Example(s)	Customer expectations or needs
Regular peak-hour commuters 	Customers who travel every business day to work or education frequently using the rail network and have strong familiarity with rail station and routes through/via development.	• legible/direct movement through rail station • efficient transfer between platforms • efficient ticket/gate access • convenient retail food and drink facilities • information on service disruptions and ability to access alternative modes • dependability of escalator/elevators.
Off-peak travellers 	May include retired passengers, university students, families travelling with children, employees working shift or outside of regular business hours.	• easy, accessible, legible access and interchange • comfortable waiting areas • infrastructure supporting lower service frequency (e.g. seating, shelter) • personal safety in unmanned locations.
Infrequent users/first-timers 	May include tourists, business travellers, parents travelling with children, Interstate guests visiting family (e.g. typically includes discretionary travellers). Customers might have luggage, prams or items unable to move easily.	• easy to navigate • direct access to taxi, kiss 'n' ride and park 'n' ride facilities • comfortable waiting areas including luggage facilities • ramps and lifts etc. to navigate level changes • convenient retail/food and drink facilities.

Customer type	Example(s)	Customer expectations or needs
Interchangers/transferring customers 	Regular peak-hour commuter switching between modes. Might need to accommodate customers impacted due to a service disruption, or alighted at wrong rail station.	• easy, legible interchange • multi-modal, real-time information and wayfinding • minimal physical barriers to interchange/ transferring between modes • relationship between modes minimises delay, diversions and need to cross roads.
People with a disability 	Customers who are deaf, hard of hearing, blind or have low vision, customers with cognitive disability, permanent or temporary mobility disabilities.	• system that ensures equitable and direct access • allow users to get to their destination with minimum difficulty or stress • direct access to lifts/escalators to platforms • direct access to core zone and assisted boarding point • direct access to amenities.
Station visitors/passers by 	May include non-travellers who use or pass through rail station/ interchange. e.g. Buying a magazine from the kiosk, passing through the rail station, meeting a relative or friend.	• Retail opportunities • Access to short term parking, kiss 'n' ride facilities • Real time information • Quality rail station amenity • Avoidance of obstructions, public transport infrastructure impeding movement routes • Comfortable waiting areas and meeting points.

The rail station needs to provide an appropriate mix of functional elements to meet the needs of these customers (refer Table 9.2) and reflect the site-specific requirements of the rail station while still aligning with consistent design standards. For example, a large inner city may have the following needs over a regional facility:

- greater passenger capacity
- consideration to passenger growth and peak travel times
- more lines utilising the rail station
- more multi-modal connections
- greater demand for non-travelling customers who move through the rail station i.e. transit-oriented development (TOD) and mixed-use developments
- maintenance and end-of-life replacement
- to address specific community complaints.

In addition to the customer's needs and expectations, service providers for the rail network also have requirements that will need to be considered when planning and designing a rail station. These are demonstrated in Table 9.3.

Table 9.3:
Stakeholder expectations and needs

Stakeholder type	Example(s)	Stakeholder expectations or needs
Property owner	Owner of land/development rights	• high quality design/visual outcome • rail station contributing to development outcomes • allowance for loading/servicing, or operational access (building maintenance statements may be required) • maintain economic feasibility of integrated commercial opportunities.
Service providers	Public transport operator	• allowance for loading/servicing, or operational/maintenance access • future proofing for operational changes and construction access for future upgrades • facilities for staff • clear maintenance and other responsibilities identified where station components are integrated (for example, shared spaces, escalators, lifts, access roads etc.).

9.4.2 Understanding the site

This section provides guidance on the rail station environment considerations in the early planning and design phase. With each site having unique characteristics, a site-specific response needs to consider:

- understanding existing and future passenger demands
- the surrounding land uses
- integration with other modes
- land constraints.

The detailed design of rail stations should be based on the Queensland Rail publication, *Station Design Manual,* in conjunction with TransLink and key stakeholders.

9.4.2.1 Existing and future demands

The planning and design of rail stations should accommodate future growth and opportunities for the local and wider community. Demand analysis should be used to inform staging opportunities for the delivery of access infrastructure, as well as protect for any land requirements to cater for future customer demand.

Depending on the site consideration and long-term rail network plans, planning should consider provision for future expansion to increase capacity. Forecast patronage increases may potentially require public transport facilities to be able to accommodate additional future services (for example, new interchange services, higher frequency services, express services etc.).

The rail station precinct must have ample space and be appropriately designed to accommodate a range of passenger movements and the volume of anticipated passengers, including those waiting/dwelling, accessing public transport services (boarding/alighting), through movements and queuing.

Footpath space should cater for the anticipated pedestrian demands, movements and amenity, including congregation at surrounding intersections and around the entrances to the rail station.

Refer to Queensland Rail's *Station Design Manual* for specific design requirements and technical specifications of the platform, including the core zone, and access paths.

For further information in determining capacity and Levels of Service requirements refer to *PTIM, Planning and Design* and Queensland Rail *Station Design Manual*.

9.4.2.2 Integration with land use

As with other public passenger transport infrastructure, integration with land use is critical in supporting the following outcomes:

- adequately catering for customer needs
- ensuring essential community access to services
- supporting pedestrian and cycle movement networks
- contributing to reducing dependency on cars
- support economic development of communities.

Due to the mass transit role of trains, rail stations are often used as the backbone of public transport networks. Rail stations can be fed into by bus, light rail, ferry, and other private and public transport networks, providing an interconnected network for passengers.

Given that an established rail network is already in place for Queensland, the majority of works are expected to relate to upgrades of existing rail stations.

TransLink recognises that a major consideration for rail station infrastructure in the near future is likely to be the urban redevelopment around existing rail stations. As such, a key focus for the future should consider positive change of land use in precincts surrounding rail stations to complementary hub developments with a greater integration between different land uses. Many communities also have or develop strong connections with rail stations, reflecting the contribution and role the rail station and adjacent land uses offer (for example, community services, social interaction etc.).

Development surrounding rail stations should support access for all users to the public realm, increase street activation and passive surveillance of these spaces, and contribute to the vibrancy of the street. Additionally, where appropriate, development should provide high-quality lighting that reinforces daytime and night-time presence and surveillance.

Refer to *PTIM, Planning and design* for further detail regarding integration with land use, including TOD.

9.4.2.3 Integrations with other modes

Access connections to rail stations should be accessible, convenient, direct and legible.

Planning and design must consider how passengers will access the infrastructure with consideration to the TransLink access hierarchy presented in Figure 9.3, and incorporate appropriate access facilities and infrastructure. This includes pedestrian and cyclist facilities, interchange and bus feeders, taxi, kiss 'n' ride and park 'n' ride facilities.

The design should consider protecting the integrity of entry and exit points by:

- managing congestion and inter-modal conflict at key access points
- appropriately designing decision points at transition zones, with a focus on legibility and ease of navigation
- simplicity and economy of movement to, from and through the rail station and access infrastructure
- minimise barriers to appropriate movement along:
  - desired travel paths for design of new stations
  - primary travel path when upgrading existing stations.

Rail stations are to be designed so that they are easily identifiable as a station by customers. This is achieved through clearly defined entry and exit points, defining the rail station (or where applicable, interchange) boundaries and clearly demonstrating where access infrastructure links to the rail station from the surrounding built environment.

Design considerations should include provision of entry plazas, information areas, rail station concourse, ticket office or facility, and fare gates (where relevant to the size/scale of the rail station and its integration with other modes).

The design of rail stations should allow for seamless passenger movement between modes and services to encourage public transport use and to maximise the quality of the customer experience, in accordance with TransLink stop and station policy and guidelines.

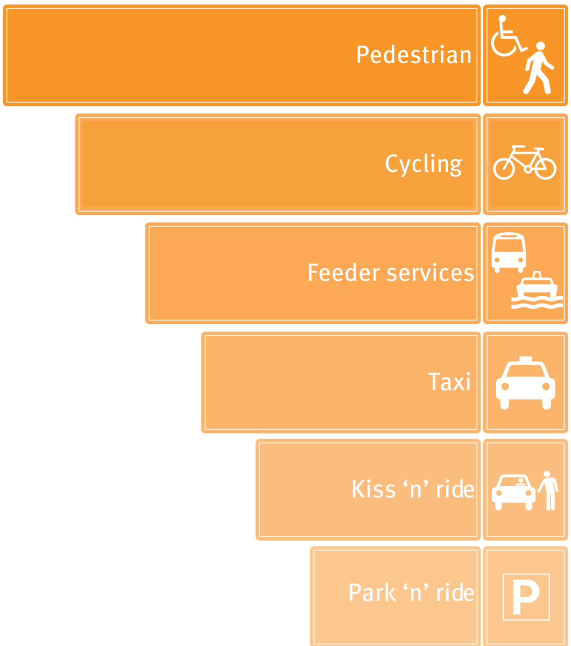


Figure 9.2 – TransLink's access hierarchy

Pedestrians

Pedestrians should have clear and direct access to supporting infrastructure and surrounding facilities.

Pedestrian infrastructure should be considered in terms of:

- interface between the rail station and the wider pedestrian network
- pedestrian access through the rail station, including vertical circulation (i.e. stairs, ramps, lifts, escalators etc.) and grade-separation (to be integrated into the primary facility structure where possible to minimise passenger travel)
- existing and future pedestrian volumes and pedestrian paths of travel to/from adjacent land uses and attractors and events, using methods previously agreed with TransLink and key stakeholders
- provision of a safe and convenient path of travel to/from station (i.e. minimise conflict with other access modes and minimise need to cross roads).

Pedestrian demand assessment:

- is to be carried out to determine spatial requirements (for example, width of unobstructed paths and movement corridors at surface or below ground levels, design of rail stations paid/unpaid areas)
- may include access paths, vertical transport, corridor widths, gatelines, concourse sizing, run off requirements and location of ticketing facilities/retail uses etc.
- to consider desire lines, through movements, conflicts with other demand (particularly in mixed-use developments/TOD) and how it interfaces with public transport passenger demand
- is to consider how underground transfer of passengers between rail services may result in a reduction in surface transfer pedestrian demand to other surface modes (i.e. bus, light rail etc.).

Refer to *PTIM, Planning and design*, Section 2.3.3.1 for further detail regarding demand analysis.

Micro-mobility

Design of rail stations should consider accommodating journey start and end trip solutions, including micro-mobility. Designated storage areas may be required around rail stations for docked and undocked micro-mobility/rideable technology.

Cycling

Integrating cycling access with public transport dramatically increases the catchment areas of the rail network.

When planning and designing cyclist infrastructure, the following should be considered:

- all interface points between local bicycle networks and TransLink infrastructure must be functionally seamless
- cycle infrastructure to integrate with existing infrastructure
- cycle connections must be direct, and legible with safe and convenient crossings
- minimise pedestrian access path conflict with cyclists
- specialist cycle design advice should be sought when designing cycle amenities including end-of-trip facilities.

Feeder services

Design of rail stations should consider nearby bus stops, light rail stops and feeder services to ensure that passengers can access the wider public transport network conveniently and safely and to their end destination.

For transferring and destination customers, bus stops should be close to the rail station entry/exit (ideally visible or within line of sight) and limit the need to cross roads.

Taxi facilities

As a key part of a balanced transport network, taxi facilities need to be integral to rail infrastructure. They are a key form of transport for those who cannot access other forms of public transport or drive independently. Taxi services ensure such passengers have access to other areas within their community when they need.

The design of taxi facilities within the rail station precinct must ensure passengers can transfer easily through the rail station and readily identify the taxi rank location upon exit.

Kiss 'n' ride

Passenger set-down facilities maximise access to the rail station for all users. Design of kiss 'n' ride infrastructure within the rail station precinct should:

- minimise potential for vehicle/pedestrian conflict
- provide accessible, direct and legible connections to rail station facilities
- not interrupt bicycle movements
- incorporate CPTED principles
- minimise the need to cross cycle paths.

Park 'n' ride

The integration between park 'n' ride infrastructure and rail stations is to consider the following:

- direct access to and from arterial, sub-arterial and distributer roads is preferred
- park 'n' ride should incorporate clear and legible wayfinding and signage to demonstrate that car parks are provided for public transport users
- customers are expecting more digital/real-time offerings from car park design. For example, incorporation of access control to existing park 'n' ride facilities or digital occupancy information for customers
- park 'n' ride access to minimise disruption to pedestrian and cycle movements
- vehicular demand may require upgrades to road infrastructure on streets feeding the site. This may include intersection upgrades, carriageway reconfigurations, traffic calming or resurfacing. Analysis should also consider impacts from school peak (and associated bus movements).

9.4.2.4 Land constraints

Design needs to consider land constraints in determining size, configuration and function of the infrastructure. Where land is available (for example greenfield sites) it should be preserved to provide for short and long-term demand. Consideration should also be made for the use of suitable brownfield sites particularly where land is the property of the State.

The location of the facility should ideally also consider on-street designs where the rail station forms part of the normal main street setting in a city or town centre, particularly where this offers significant operational benefits for customer and operator.

9.5 Functional design guidelines for rail stations

9.5.1 Sequence of movement

The layout of a transport facility should consider the sequence of public movement. Public movement is in response to the progressive sequence of actions and decision points along the path of travel from the entry to the boarding point on the platform, as illustrated in Figure 9.4.

The growth of integrated facilities can lead to conflicts between public and private spaces and the components needed to allow a clear movement sequence for travelling customers. The planning stage of a facility should acknowledge this conflict and aim to reconcile the different elements within an integrated facility, with clear signage and wayfinding, to allow for efficient public movement for both travelling and non-travelling customers.

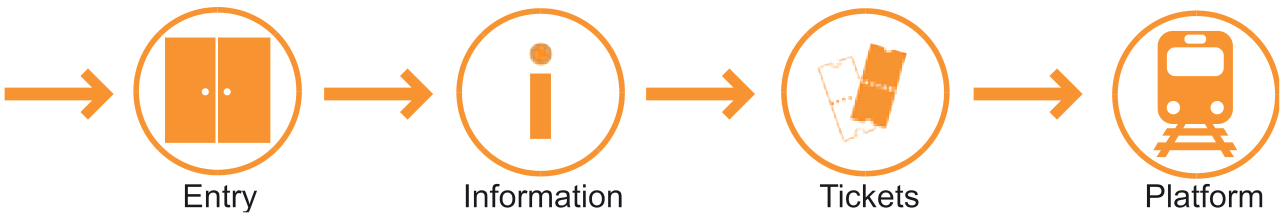
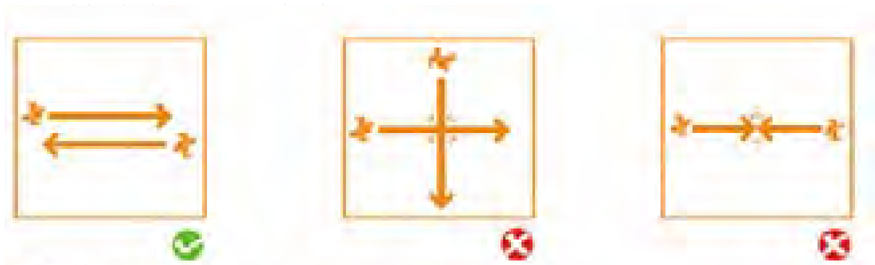


Figure 9.3 – Sequence of movement

9.5.2 Circulation within rail stations

Table 9.4:
Circulation within rail stations

Type of circulation	Principles
Direct circulation	• route between entry and boarding points should be as direct as possible • minimise turns in the path of travel and avoid turns greater than 180 degrees • changes of level should be through continuous straight flights of stairs or ramps and, if appropriate, escalators or lifts. Further: • if turning is required, landings are to be provided with necessary room for appropriate separation and manoeuvring – stairs and underpasses circulating at 90-degree turns must adopt suitable measures to provide good sightlines for ascending and descending  *Figure 9.4 – Direct circulation*
Cross-path circulation	• provide simple and clearly defined paths of travel that avoid conflict and maximise rail station capacity • paths of travel should be clearly established to meet the requirements of passengers on the dominant side of the pathway, away from the opposite flow path • avoid circulation systems that have people crossing the paths of others to access information, ticketing, amenities, platforms, ranks, seating,  *Figure 9.5 – Cross-path circulation*

Type of circulation	Principles
Left-hand circulation	• dominant movement pattern of pedestrians is based on the majority of travel undertaken on the left-hand side • circulation within the facility (including around components and amenities) should follow this convention for predictability and efficiency.
Vertical circulation	• vertical circulation components such as stairs, ramps, lifts and escalators should be assembled relative to the platform type, length of platform and location of the platform core zone, and may require multiple vertical transport 'banks' along a busy platform • co-location of components on a platform assists with convenient placement of public information and navigation • all access components must comply with the relevant *Disability Standards* • best practice rail station design has demonstrated the need to provide run-off spaces away from escalators, lifts, and stairways (as well as ticket gatelines) to ensure a clear landing area is provided that allows passengers to orientate themselves; make decisions/act; and where needed provide a reservoir for queuing in the event of a system failure/delay. The length of runoff required is dependent upon demand.
Changing direction	• changes in direction within circulation should only occur where there is sufficient space to allow passengers to maintain a sense of direction (use of transparent materials to enable views is preferable) • appropriate space should be provided at information and decision points for people to avoid conflict with the flow path of travel to ensure comfortable and efficient movement • as with vertical transport, best practice assessment has also demonstrated a need to provide for run-off spaces before any direction change.
Emergency evacuation circulation	• emergency evacuation considerations, including appropriate circulation paths, exits and assembly points, should cater for the maximum volume of people using the facility at any one time • effective signage and way-finding is a key consideration for public circulation in an emergency situation. This must be reviewed in the detailed design stage and receive approval by an emergency evacuation specialist • facilities which are structurally at-grade, elevated or below grade present different emergency and safety requirements that warrant project specific design investigation • integrated rail stations with adjacent private or public activities present complex emergency and safety requirements that warrant project specific design investigation • Note: The *Premises Standards* and the *National Construction Code* including the *Building Code of Australia* provide technical emergency and safety requirements for passenger transport facilities, as well as cross referencing to the relevant *Australian Standards* for design guidance.

9.5.3 Identifiable station entry and exit

Entry and exit points are clearly defined and highly legible to customers.

Clearly defined entry and exit points are essential; not only providing points of access, but also defining the rail station/precinct boundaries and where access infrastructure needs to link to the station from the built environment.

Design considerations should include provision of entry plazas, information areas, stop/station concourse, ticket office or facility, and fare gates (where relevant to the size/scale of the station and its integration with other modes).

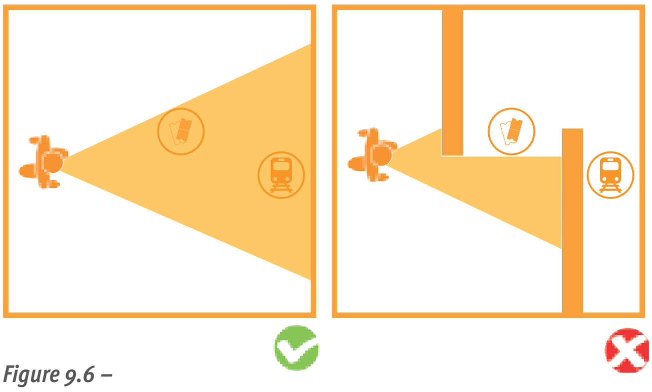


Figure 9.6 –
Identifiable entry/ facility

9.5.4 Safety and security

Safety and security of customers and other users of the station, particularly at night may see the need to consider in addition to appropriate lighting levels, well monitored waiting environments, and access paths to and from the station to supporting access infrastructure that offer sufficient active and passive surveillance.

9.5.4.1 Active surveillance

The safety and security measures employed to maximise actual and perceived safety for customers may consider the use of the following:

- security cameras in operational areas
- adequate lighting appropriate to the type/category of rail station
- visual monitoring of the station/precinct.

9.5.4.2 Passive surveillance

Infrastructure is designed to provide passive surveillance and deter undesirable behaviour.

The physical environment of public transport facilities must be designed to discourage the possibility of crime, property damage and anti-social behaviour associated with people gathering in public spaces. Creating defensible spaces that allow for surveillance from outside and within the facility will promote safe environments and will attract greater public use. Refer to the current version of the Queensland Government's *Crime Prevention Through Environmental Design* guidelines.

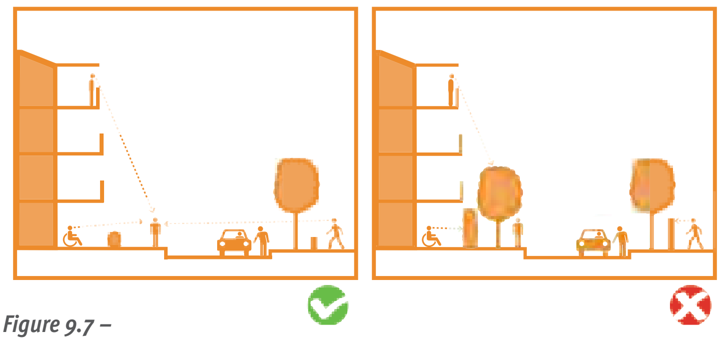


Figure 9.7 –
Passive surveillance example

9.5.4.3 Anti-social behaviour, graffiti deterrents and treatments

Components are durable and resistant to graffiti and vandalism.

Public transport facilities are vulnerable to unwanted offences such as vandalism, abuse and careless use of infrastructure components. In line with specifying durable, self-cleaning and easily maintainable materials and finishes, all infrastructure components - furniture, lighting equipment, information devices, walls, floors, ceilings, balustrades, glass panels, screens, elevators, escalators and other components - coming into contact with the public must be resilient to acts of vandalism and graffiti. This may involve terminal components being protected with anti-graffiti coatings or constructed from non-porous graffiti-resistant materials.

Other options include specific design and arrangement of waiting areas and structures to maximise natural surveillance in order to minimise the incidence of graffiti and anti-social behaviour. In some instances, appropriate planting of vegetation may be used, adjacent to structures or walls, to prevent access by vandals. Furthermore, the moderate application of artwork that complements the terminal architecture and theming can also be used to deter graffiti.

9.5.5 Climatic comfort and weather protection

Resilience to weather and climate should be considered when planning and designing rail stations, with high-quality climatic comfort and weather protection for customers to be provided.

Sun and weather protection is to be provided. In developing the design of facilities and their access, the following should be considered:

- structures must provide sufficient physical width, length and height to achieve high-quality climatic comfort and weather protection for the anticipated number of passengers expected to occupy this space
- passengers should be provided with appropriate protection with enclosed or covered rail station access points, public information and decision points, seating and waiting areas, and boarding and alighting areas
- consideration must be given to the management of sun, wind, rain, heat (including heat spots particularly on platforms or waiting areas), glare and humidity.

An appropriate climate analysis should be included within the planning and design of rail stations to inform appropriate facility orientation and suitability for specific locations.

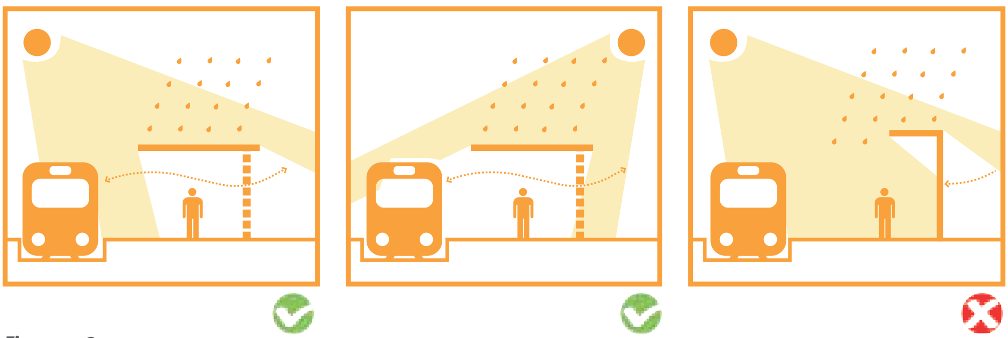


Figure 9.8 –
Climatic comfort and weather protection

9.5.6 Sustainable assets

Design and delivery of rail stations will focus on sustainability through:

- facility design that is fit for purpose now and into the future, and adaptable to change
- contributing to attractive community spaces and a local sense of place
- commitment to a low environmental footprint and whole-of-life approach through all design, construction and maintenance activities
- increasing visibility of sustainable features, and undertaking a participatory approach to design to improve community awareness and support
- identification and implementation of ecologically sustainable development initiatives.

Refer to Queensland Rail's *Station Design Manual* for further details regarding Environmental Planning and Management Framework used to verify and validate environmental design outcomes.

Table 9.5:
Sustainable considerations

Key sustainability consideration	Requirement where possible
Water management	• on-site rainwater collection and reuse • on-site run-off treatment (that is, scrubbing using permeable surfaces, detention basins and swales) • local flooding mitigation and flow maintenance.
Resource minimisation	• water - employ water-saving devices • energy - aim for energy-neutral infrastructure through minimisation of energy use and generation opportunities (for example, solar for lighting and for feeding back into electrical supply) • materials - apply whole-of-life design approach—construction, operation, maintenance, cleaning, and decommissioning. Materials should favour renewables and recyclables • processes - avoid operational processes that generate waste, especially toxins and pollutants.
Habitat and physical environment	• protect habitat (that is, space, physical elements such as movement paths) • maintain water flows to aquatic and other habitats • avoid acid sulphate soils • minimise fugitive emissions of air, surface and groundwater-borne pollutants.
Social sustainability	• present minimal harm to employees or public • promote social justice, inclusion and equity • contribute to improving social capacity and community interaction • enhance community experience and integrate facilities with the surrounding environment to enhance economic viability and social benefits.

9.5.7 Cultural and heritage places

The *PTIM* recognises that there are numerous sites throughout the rail network which have cultural or heritage significance, and as such, liaison with the State and Queensland Rail shall be undertaken at all stages of planning, design and delivery of rail station infrastructure as outlined in Queensland Rail *Station Design Manual*. Refer also to *PTIM, Planning and design* for further details.

9.5.8 Functionality and simplicity

Maintain simplicity and provide a functional rail station design that minimises conflicts between users and ensure passengers can easily interpret and use the space/transport infrastructure.

The design of structures, platforms, concourses, waiting areas, seating, signage, pavements and other components must be incorporated within the overall design process to achieve highly functional rail station design outcomes.

The design should provide a legible and pleasant environment that is uncluttered and easy to understand and navigate.

9.5.9 Wayfinding and signage

Signage forms a major component of design to assist with navigation to and around rail stations.

Logical information, wayfinding signage and overall facility signage is important to achieving a consistent and recognisable public transport system.

Rail station design should incorporate signage and wayfinding:

- to ensure customers can easily recognise and find their way to rail stations, including fare machines and ticket offices
- where line-of-sight to nearest decision point can be achieved considering signage height, colour contrast and orientation
- for multi-modal integration, maps and landmark information of wider precinct
- using universal/international symbols and indicators.

For further details of TransLink's signage requirements, refer to the *PTIM, Branding, theming and signage*.

9.6 Specific considerations for rail stations

9.6.1 Rail station platforms

Once passengers are over the paid threshold of the rail station, the design needs to consider how customers will access and use the platform.

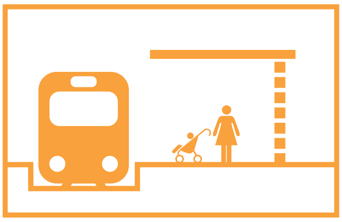


Figure 9.9 –
Single-side platform

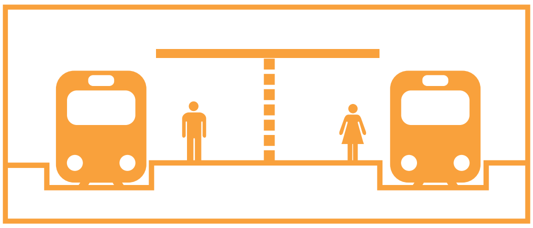


Figure 9.10 –
Island platform

Platforms generally provide for inbound or outbound services, and should:

- consider functional paths of travel connecting multiple transport modes
- allow for appropriate and safe customer movement and waiting areas
- include a core zone
- when directed, allow for future implementation of platform screen doors at the boarding and alighting points (for example, at event stations and inner-city stations).

The location and sizing of platforms are to be determined and confirmed through liaison with TransLink and Queensland Rail.

There are three main types of rail station platforms which are summarised below and should be selected based on track configuration, local topography, rail station category, customer demand and customer needs in relation to the surrounding land uses/types.

Further information on platform design can be found in the Queensland Rail publication, *Station Design Manual*.

Figure 9.11 –
Feeder interchange platform

Table 9.6:
Rail station platform type

Platform type	Description
Double-side platform(s) **Single-side platform**	• a platform(s) positioned to the side of a single or pair of rail tracks • good access/egress: – direct access from adjoining street or precinct, with opportunity for at-grade access • requires duplication of vertical transport for grade separated platforms
Island platform	• a single platform is positioned between two rail tracks • facilitates cross-platform transfers • acceptable access/egress: – requirement for track crossing or bridge overpass from adjoining street or precinct
Feeder interchange platform	• interchange between rail, bus and/or light rail networks • facilitates reduced transfer times between different modes • acceptable access/egress: – generally has a requirement for network crossing from adjoining street or precinct

9.6.2 Fare collection

The method of fare collection affects the operational capacity of rail station design. Automatic fare collection can be carried out through the incorporation of Stand Alone Card Interface Device (SACID), Add Value Vending Machine (AVVM) and fare gates. The provision of ticketing systems and ticket offices will be determined by rail station type, size, public comfort, level-of-service requirements, and revenue protection strategies. The facility layout must consider the appropriate location of the paid/unpaid threshold (position of fare collection barriers-gates) as part of ensuring sufficient and safe circulation and queuing of passengers particularly in peak operational periods.

Liaison with TransLink shall be undertaken to identify the requirements for installation of ticketing infrastructure at the rail station. This is required to address existing and future ticketing infrastructure needs (including the ability to incorporate fare gates at a future date, and smart ticketing), and installation requirements (for example, power, conduits, cabling, connections, and so on). Final approval of the design and installation of ticketing infrastructure must be sought from TransLink.

Liaison with TransLink and other stakeholders will also be required to determine the appropriate assessment methodology and level of service for the operation of the ticket gates (e.g. static or dynamic assessment to best practice standards).

9.6.3 Arrangement of space

Customers enjoy free flowing movement within the rail station.

Rail stations can include public and private spaces. Public spaces form the pathway from the point of entry to the point of departure. Rail station elements such as concourses, underpasses and overbridges can also form part of the public walking and cycle movement network. The boundaries between private and public spaces within the rail station can be blurred and will require sensitive approaches to planning for circulation, waiting and accommodation of private and public activities. This may require promoting appropriate through pedestrian traffic where capacity, behavioural conflicts and the integrity of pre-paid ticketing zones can be managed.

Private spaces should not obstruct paths of travel, sightlines to points of entry, information and decision points, and waiting and seating areas. Private spaces can include:

- retail and commercial areas
- maintenance and management facility areas
- communications and electrical cupboards

9.6.4 Flexible design

The design of rail stations and associated infrastructure needs to consider current and future capacity requirements. Some of the key issues to consider include:

- prioritising investment to protect for future public transport connections
- consider additional kerbside space to accommodate additional/future public transport services
- design for development integration so that rail station capacity, operations and internal circulation requirements can be maintained or enhanced
- future passenger volumes may require grade-separated pedestrian walkways, separated entry/exit vehicle crossovers etc.
- ensuring the location of permanent elements does not impede plans to upgrade or expand rail stations or the rail network.

There are several emerging technologies that change Queenslanders' reliance on personal cars and offer more integrated mobility solutions.

These emerging technologies and trends offer choice and dynamic travel options which need to be considered when designing rail stations:

- incorporate proof-of-concept and other agile design approaches in a time of high change
- ensure rail stations are designed in an agile manner that ensures it will be suited for changed transport customer behaviours.

9.6.5 Asset management

Rail stations are major elements of passenger transport infrastructure and they need to be managed and maintained to be fit-for-purpose, providing consistent customer communication, service standard and sufficient operational conditions suitable for passenger comfort and safety.

The rail station components need to be maintained and managed on an ongoing basis to ensure the effective operation of a rail station. The framework for how a rail station will be managed after the delivery of infrastructure needs to be considered within the planning and design process.

Relevant operational stakeholders should be engaged in the planning and design process to ensure that the requirements of asset management by operators and/or owners have been considered.

All components of rail station infrastructure should use materials and finishings consistent and compatible with existing infrastructure of an approved standard. In consultation with relevant operating and maintenance stakeholders, detailed maintenance manuals should be developed for all components and operation schedules within a rail station. These should be prepared as part of the rail station project.

For further details on asset management requirements refer to *PTIM, Planning and design*. For specific guidance with respect to rail stations, please refer to Queensland Rail publication *Station Design Manual*.

9.6.6 Rail station operations

Rail station design should not compromise the physical condition or operating performance of rail transport infrastructure and associated rail networks.

The following rail station operations can impact the design and layout of rail station infrastructure:

- **Frequency -** the peak and off-peak frequency of services needs to be considered
- **Hours of operation -** consider any additional requirements (i.e. lighting, security etc.) for rail stations whether they have 24/7 opening hours or first to last service hours of opening
- **Operational impacts -** mobility aids, wheelchairs, prams and bicycles increase boarding times and can impact operational capacity of rail stations and platforms. Additionally, insufficient pedestrian capacity or obstructions to pedestrian movements on platforms can affect on-time running
- **Rail replacement bus -** arrangements for replacement services during interruptions (e.g. planned maintenance, track closure, or unplanned disruption) or to supplement rail services
- **Event services -** during events, passenger demands can be high with a number of these being first-time visitors to the rail station. As such, the planning and design of rail stations that are envisaged to be used during events, should consider how comfort and security for passengers during peak event travel can be achieved; and ensure signage and wayfinding is clear and legible
- **Revenue protection -** fare collection equipment (for example, gatelines, SACID, AVVM) to be provided at entry/exit points to rail station. Location of fare collection equipment to consider passenger queuing and run-off.

Appendix 9-A

Design Considerations

The use of quality components (including materials and furnishing) will support effective rail station operation by:

- providing a comfortable and safe passenger environment
- delivering robust infrastructure that minimises the need for maintenance.

TransLink in partnership with Local Government and Queensland Rail shall be consulted on infrastructure component inclusions for each rail station. The correct level of design components making up a station will depend significantly on the role of the rail station in the TransLink network (that is, TransLink's hierarchy of rail stations).

Table 9.8 provides an overview of the requirements in choosing rail station components. All components must comply with the relevant *Disability Standards* to the maximum extent possible, *Australian Standards* and relevant building codes.

A detailed list of the standards and other references applicable to the components listed in Table 9.8 can be found in the *PTIM, Background and applicatio*n.

Table 9.8:
Design considerations for rail station components

Element	Consideration
Information and signage	
Signage and wayfinding	• station design must demonstrate consistency with TransLink and Queensland Rail design, branding and signage. Refer to *PTIM, Branding, theming and signage* and Queensland Rail's *Station Design Manual,* and ensure compliance with applicable *Disability Standards* and *Australian Standards* • incorporate signage and wayfinding: – to ensure that public transport information is provided in advance of decision points – to ensure customers can easily recognise and find their way to and within the station – to assist in aiding equitable access for all passengers, especially people with vision impairment • identify need for wider precinct wayfinding signage to enhance legibility of access to the station • consider signage height, colour contrast and orientation • consider use of universal / international symbols, icons and indicators • wayfinding may include non-text or map-based indicators and themes to assist people to travel in their preferred direction • physical infrastructure should be designed to be intuitive and minimise the need and reliance on extensive signage i.e. wayfinding can incorporate handrails, tapping rails, building or shore lines, path widths, lighting, paving patterns, arrows, vistas, colours, shapes and TGSIs • TGSIs: – warning TGSIs identify hazards such as stairs, change of direction, or gradients. For rail stations, TransLink requires warning TGSIs to be provided along the front of each platform edge and may be used to represent the yellow safety line. Contact TransLink for requirements – directional TGSIs are used as a walking guide to rail station platforms and may be used to show the most appropriate and desirable route of travel through a rail station. However, good facility design will provide other preferred alternatives such as the use of shore lines, and consistent and logical use of spaces – TGSIs must achieve or better the Disability Standard's minimum contrast required from the surrounding pavement surface colour – designs and layouts should be reviewed by specialist access personnel, as well as appropriate user groups, to achieve the most suitable outcome for each location – TGSI should not direct a passenger to obstructions.

Element	Consideration
Public transport information	• information amenities should be integrated within the design of the rail station structure and environment, and in locations that do not impede free flowing access paths and walkways • passenger transport information can consist of electronic kiosks and static or real-time displays. Information should be located in waiting areas and decision points within and on approach to the rail station. Information should include rail timetables, maps, services, special notices etc. with the message displayed appropriate for where the customer is within the precinct and relevant to where they are on their journey. For example, next service departure time displayed is directly related to the travel time required to walk to the platform for boarding • electronic information displays should face passengers and be positioned at a comfortable viewing angle and height. Designers will need to determine the most suitable quantities and locations for electronic displays • the location of information amenities must be considered early in the design phase to incorporate appropriate security surveillance and power and data requirements.
Station precinct	
Architecture	• while rail travel is typically more about the journey (and destination), it is important to consider the form, function and its relationship to the local community and wider precinct. Creation of an architectural landmark can promote sense of ownership, pride and joy to the community and users of the station • stations must not be designed to be purely functional • designers must attempt to create visual interest by integrating: – colour significant to the area – design elements from local flora and fauna – design elements highlighting site's cultural heritage and significance – the site's significance of place • station design should promote improved customer satisfaction.
Retail	• during design all opportunities to integrate or co-locate retail facilities must be explored in conjunction with TMR. These facilities must be designed so that they provide an enhanced user experience while prioritising public transport • retail facilities could be included where opportunity exists and be designed to provide an easily accessible and affordable shopping experience offering merchandise or services that users might require while traveling • facilities designed may range from space provision for future private investment or complete development with and opportunity to rent space for private operation • retail facilities may provide passive surveillance, activation and assistance while improving precinct safety • facilities may range from: – small news agent/coffee shop – small grocery store / mixed retail store – mixed-use development – Transit-Oriented Development (refer to *PTIM, Planning and design Appendix 2-A*).

Element	Consideration
Pavement and access	• Pedestrian pavements: – to be compliant with Austroads *Guide to Road Design* and *AS1428.1* – provide a consistent, attractive, durable, easily-maintained surface that is appropriately graded and sheltered – suitable for access, waiting and queuing, as well as accommodating the full range of furniture elements – integrate TGSIs and way-finding aids for persons with a vision impairment and comply with applicable *Disability Standards* – external access paths and links to and from the rail station should be reviewed and considered in the planning and design phase to ensure direct and equitable access for all users. • Crossings: – design should remove conflicts between pedestrians, general traffic and public transport vehicles, if any – at-grade pedestrian crossings are preferred where safety and relative priority can be maintained. Refer to TMR *Manual of Uniform Traffic Control Devices, Part 10, Pedestrian Control and Protection*, Austroads *Guide to Traffic Management*, and *Australian Standards* etc. for design requirements – uncontrolled crossings (i.e. zebra crossings and shared zones), are preferred except where safety or capacity concerns exist – traffic should be diverted or de-prioritised where there are pedestrian concentrations. Where controlled crossings are necessary, this can be achieved by giving priority to the pedestrian movement and minimising waiting times for pedestrians – refer to Austroads *Australasian Pedestrian Crossing Facility Selection Tool [v2.1.2]* to inform pedestrian crossing facility type – grade-separated crossings between platforms may be needed. Lifts or escalators are the preferred options, depending on access requirements. Where possible, the grade-separated structure should be integrated into the primary facility structure in order to minimise passenger travel. • Vehicle pavement design: – vehicular pavement design must accommodate the loads and turning movements associated with all vehicle types expected to access the rail station. Concrete rather than asphalt should be used to minimise maintenance – overall pavement finish options must be endorsed by Queensland Rail and relevant stakeholders. • Other: – footing details for platform shelters and other facility infrastructure, as well as all pavements, need to meet current regulations and standards and be approved by a certified engineer.

Element	Consideration
Materials and furnishings	• common visual appearance by aligning structures, pavement, signage way-finding and other infrastructure with the TransLink branding and theme (or as agreed with stakeholders) • design elements to be tailored to meet site-specific operational and functional requirements within the overarching TransLink theme • components are high quality, durable, easy to use and maintain • modular and consistent facility components are used to facilitate future maintenance and expansion of infrastructure • materials (such as steel) for structure supports and beams should emulate a lightweight appearance to achieve a modern, open and safe environment. • comply with all applicable standards and regulations including *Australian Standards* and the *National Construction Code* • approved by Queensland Rail and relevant stakeholders.
Handrails, balustrades and fencing	• Handrails: – handrails are generally used in conjunction with ramps, stairs and walkways – can be used as a form of support and way-finding aid that is compliant with relevant standards – a grabrail or handrail must be provided at fixed locations where passengers are required to pay fares, for example, AVVM and ticket window • Balustrades and fencing: – provide vital separation between people and hazards where access is not permitted – Fencing can provide a discreet barrier between hazards to promote safe alternative access routes via dedicated overpasses. Fencing can also be used to protect and secure Queensland Rail assets including the rail corridor and restricted areas – fencing should be used at a minimum, and only installed where necessary while still able to promote an open station layout – provide a visually attractive, semi-transparent, and functional system, and be constructed from materials that are robust, contemporary and easily maintained – consult Queensland Rail *Station Design Manual* for detail regarding fencing requirements at rail stations • all handrails, balustrades and fencing are to comply with applicable *Disability Standards* and *Australian Standards*

Element	Consideration
Access and interchange	
Supporting access facilities	• **Walking**: when designing pedestrian infrastructure, reference to *Austroads, Australian Standards, National Construction Code, Disability Standards* and *PTIM, Supporting access infrastructure*, Section 3.3 Pedestrian infrastructure should be made. • **Cycling**: refer to *PTIM, Supporting access infrastructure* for further detail regarding cycle infrastructure. Refer to Austroads guidelines and the TMR Technical Information for Cycling for further information about cycle demand and forecasting. Specialist cycle design advice should be sought when designing cycle amenities including end-of-trip facilities. Advice on standards and current best practice can be sought through TransLink, other relevant government stakeholders and the TMR Technical Information for Cycling. • **Bus stop and interchange**: design of rail stations should consider nearby bus stops and bus feeder services to ensure that passengers can access this public transport infrastructure conveniently and safely. For transferring and destination customers, bus stops should be close to where they want to go and limit the need to cross roads. Refer to *PTIM, Bus stop infrastructure* for detail on designing bus stops. • **Taxi**: as a key part of a balanced transport network, taxi facilities need to be integral to rail stations. The primary integration issue is to insure passengers can transfer easily through the rail station and readily identify the taxi facility location upon exiting public transport facilities. Refer to *PTIM, Taxi facilities* for detail on designing and incorporating taxi facilities. • **Personalised Public Transport (PPT): [placeholder]** • **Kiss 'n' ride:** direct vehicle access to and from arterial, sub-arterial and distributor roads is preferred. Connections between kiss 'n' ride infrastructure and rail station facilities should be accessible, direct and legible, and incorporate CPTED principles. Kiss 'n' ride activity should be accommodated within a formalised facility. Informal kiss 'n' ride activity should be discouraged, particularly where safety issues are likely to occur. Kiss 'n' ride infrastructure should not interrupt cycle movements, and should minimise the need to cross cycle paths. Refer to *PTIM, Supporting access infrastructure* for further detail regarding passenger set-down infrastructure. • **Park 'n' ride**: refer to *PTIM, Park 'n' ride infrastructure* for further detail regarding the planning and design of park 'n' ride facilities. Well-designed park 'n' ride facilities can improve access and customer reach to the rail network. • **Other access requirements**: requirements for service and emergency vehicles should also be considered. Refer to Queensland Rail, *Station Design Manual* for Queensland Rail service vehicle requirements.

Element	Consideration
Cycle storage	• secure cycle storage and amenities are to be included in the design and layout of all rail stations. These facilities must be scalable and accommodate future demand as required • secure cycle storage facilities and cycle rails should be close to rail station platforms for a safe and easy transfer to passenger transport • cycle storage must be located in a visually-prominent position within or immediately adjacent to the rail station environment, to allow passive surveillance • materials used for these facilities should be secure, transparent, durable, easily cleaned and resistant to vandalism or abuse • the amount of cycle storage provided will be determined by the size and location of the facility and availability of adjoining cycle access paths • cycle storage/enclosure may be required on either side of the rail corridor • consideration should be given to providing appropriate electrical conduits for lighting and in preparation for electronic card access and other future electronic requirements. • For further details on cycle storage facilities and amenities, refer to the *PTIM*, *Supporting access infrastructure,* Austroads *Cycling aspects of Austroads Guides,* TMR *Supplement Traffic and Road Use Management Volume 1, Manual of Uniform Traffic Control Devices* and technical notes. • Liaison with TMR and Queensland Rail should be carried out to confirm type and location of facilities. Cycle enclosures, if included, shall be designed in accordance with Queensland Rail *Station Design Manual.*
Station and platform	
Automatic Fare Collection equipment	• TransLink will provide and install electronic ticketing system (ETS)/ Automatic Fare Collection (AFC) equipment and is responsible for: the provision, installation, testing and commissioning of AFC equipment • ticketing amenities should be integrated within the design of the rail station structure and environment, and in locations that are easily accessible and visible, and do not impede free flowing access paths and walkways • the location of ticketing amenities must be considered early in the design phase to incorporate appropriate security surveillance and power and data requirements • fare machines issue TransLink's integrated transport fares/tickets for use on buses, trains, light rail and ferries: – Add Value Vending Machine (AVVM) - A self-serve electric ticketing fare machine consisting of a touch screen display, card reader and cash payment options, used to purchase paper tickets or perform a limited range of go card functions including displaying the card balance, transaction history, or adding value to the go card – Stand Alone Card Interface Device (SACID) – An electronic device (usually placed at the entry/exit and key decision points of rail stations) used by passengers to validate a go card at the commencement and end of their trip so that their trip fare can be calculated • locate AVVMs and SACIDs close to entrance points or nominated boarding points taking into consideration the sequence of movement and paid/unpaid areas, and maintaining a safe distance from any stairs or ramps. Locate AFC clear of other obstructions on the platform to maintain visible connectivity and access along the path of travel

Element	Consideration
Automatic Fare Collection equipment (continued)	• SACIDs are to be located: – away from platform access ramps to ensure there is a level queuing area for customers – clear of boarding and alighting queuing areas • locate AVVMs near the Help Point, within CCTV coverage and underneath canopy / shelter to provide weather protection for customers • a grabrail or handrail must be provided at fixed locations where passengers are required to pay fares, including AVVMs and ticket window • when fare gates are to be provided, they are to be located to control, in a single line, all customer flows at all entry and exit points within a rail station precinct. Design to consider a suitable location of a gate attendant so they have visual oversight along the length of the barrier line • should fare gates be installed on overpasses, subways or on platforms, consider space, capacity and queuing requirements • location of fare gates should also consider adequate provision of space for passenger run-on and run-off • the ticket office allows customers to purchase paper tickets, purchase / validate electronic go cards and provides a customer service function • liaison with TransLink shall be undertaken to identify the number, type and location of ticketing infrastructure needed based on current and forecast demand. TransLink will also provide the requirements for installation of ticketing infrastructure at the rail station. This is essential to address ticketing infrastructure needs, and installation requirements (for example, power, conduits, cabling, connections, and so on). Final approval of the design and installation of ticketing infrastructure must be sought from TransLink.
Public toilets	• inclusion of public toilets will depend on the rail station location, level-of-service, staffing arrangements, asset management and passenger comfort and safety • toilet amenities must meet *Disability Standards* and *Australian Standards* • toilets should be located in visible and practical, yet discreet, locations and include security requirements • inclusion of toilet amenities must consider construction and installation requirements within rail station design, such as plumbing and drainage.
Staff amenities / cleaning room	• depending on the rail station, staff amenities (kitchen and toilets) may need to be provided. Consultation with Queensland Rail is required to ascertain the need and requirements for these staff and operational facilities • refer to Queensland Rail's *Station Design Manual* for specific design requirements of these rail station components.

Element	Consideration
Stairs and escalators	• escalators and stairs should not conflict with the direction of established horizontal pedestrian flow for those entering or leaving the flow of vertical travel. • Stairs – use where grade-separated treatments are necessary for access or movement within a rail station (such as over rail lines) – should provide simple and safe transition between levels and comply with all applicable design standards (the proportion of treads to risers, landings, slip resistance, TGSIs, colour contrasts and hand rails/balustrades) – typically accompanied by ramps/escalators/lifts for compliance, when required – TransLink prefers design to accommodate LOS C based on pedestrian flow during peak periods, allowing for both ascending and descending movement. • Escalators – alternative to stairs for rail stations operating with consistently high volumes of passengers during peak periods, or rail stations that feature high levels of grade separation – should be co-located with stairs to offer passengers both options – if the option of including bi-directional escalators is not available (due to site constraints or rail station capacity volumes not being sufficient), escalator travel should be given preference towards ascending passengers or the dominant peak flow – escalator width should be sufficient for passengers to queue in a single file by simply standing, while still allowing pedestrians who wish to walk (in the travel direction) to pass with minimal obstruction – escalators must comply with applicable structural Building Standards and should be consistent with the overall rail station architectural design.
Ramp	• comply with applicable Building and *Disability Standards*, with adherence to the particular construction details shown in the *Australian Standards* and *National Construction Code*
Lifts and over/ underpasses	• some rail stations will need a lift and over/underpass structures to connect platforms. The number and size of lifts will need to be determined with consideration to likely pedestrian demands • minimum LOS C during peak is preferred for over/underpass walkways • LOS D acceptable for lifts during peak periods • comply with applicable *Disability Standards* and *Australian Standards* • should appear to be of a lightweight modern structure, transparent to ensure passive surveillance, durable, easily cleaned (such as stainless steel finish) • be consistent with the overall look and feel of the rail station • design of lift areas should also consider adequate provision of space for passenger run-on and run-off • design of lifts should consider a through-lift alignment that does not require passengers with a mobility aid to turn around to exit lift.

<table>
<tr><th>Element</th><th>Consideration</th></tr>
<tr><td>Platform</td><td>platform design should be uncluttered and sized to suit demand, pedestrian access and circulation requirements, seating needs and operational needs
design of station platform to consider the potential for future implementation of screen doors
refer to Queensland Rail Station Design Manual for detail regarding the design of rail station platforms.</td></tr>
<tr><td>Core zone and priority waiting</td><td>The core zone is a designated area on rail station platforms that include, but is not limited to, priority seating area, an assisted boarding point, emergency phone and service information.

Refer to Queensland Rail Station Design Manual for specific design requirements for core zones and priority waiting areas at rail stations.</td></tr>
<tr><td>Shelters</td><td>shelters and all facility structures should project a consistent design language that:
appears modern, light and spacious
is of a high quality and standard
is reflective of the Queensland sub-tropical climate
is reflective of TransLink's infrastructure theming and architectural design.
structures at platforms must be cantilevered to provide an unobstructed kerb-line (free from posts or other structural supports) and can be single or double-sided cantilever, depending on platform layout
structures must provide complete weather protection during all parts of the day to minimise head island effect on platforms and to improve customer waiting experience
passenger information displays, signage and way-finding can be attached to the cantilevered structure providing they do not obscure sightlines (including CCTV sightlines)
shelter structures should include high-quality finishes with modern, durable, and easily maintained materials that are reflective of the overall rail station environment and climatic conditions (that is, sun, rain, natural light and airflow)
the following areas to be sheltered and under cover:
all fare gate infrastructure other than SACIDs
core zone as defined in PTIM, Rail station infrastructure Section 9.3.5
circulation space in front of the ticket counter and AVVM
circulation space in front of each lift door linking through to the boarding point
path of travel from platform access to core zone.
liaise with Queensland Rail on the design and specification of existing rail station shelters that are currently installed and in use throughout the rail network.</td></tr>
</table>

Element	Consideration
Seating and lean rails	• must be provided in quantities reflective of the expected waiting times and levels of anticipated patronage for the rail station • seating should be provided at all allocated waiting areas without impeding free flowing access paths and walkways (i.e. set back from the path of travel by 500mm) • seating and lean rails should be provided on platforms where passengers can easily see approaching rail services, typically where there is complete weather protection and where the environment is safe and well lit. They are typically positioned facing the conveyance and either at the rear of the single-sided platform and shelter or in the centre of a double-sided platform and shelter • seats should be designed as per *AS 1428.5,* include backrests and armrests and be constructed from durable, easily cleaned and maintained materials that allow drainage from liquids • all furniture must offer appropriate contrast in colour with the immediate background • lean rails provide passengers with a convenient waiting option by allowing passengers to perch or lean, rather than be seated, when waiting for brief periods or where waiting space is limited • liaise with Queensland Rail on the design and specification of seating at rail stations and platforms.
Bins	• bins are generally located close to waiting or congregation areas, seating, information displays, boarding points, cycle storage areas, and rail station entries and exits • use of bins at high passenger volume rail stations, such as CBD and regional facilities, may warrant careful consideration due to potential security risks • bins at particular rail stations should be designed to allow for detection of suspicious objects. They may be constructed from materials with an open gauge to provide transparency (with a transparent clear plastic liner) that is easy to maintain • bin design should aim to be vandal-proof, water-proof and bird-proof. The provision of recycling bins may also be an option and should be considered during the facility detailed design phase • recycle bins may be incorporated adjacent to general waste bins to promote recycling, with appropriate recycling collection arrangements in place.
Drinking fountains	• appropriate water supply and drainage to the drink fountain required • they are generally located close to waiting or congregation areas, seating, information displays, cycle storage areas, and rail station entries and exits • drinking fountains should be constructed from materials that are easy to maintain, and should include stainless steel water catchment and drainage. Furthermore, they must be designed to be accessible for people with disabilities.
Shopping trolley bays / storage	• where rail stations co-exist with shopping centres or other retail outlets, there may be the requirement to include appropriate, discreet, and easy to maintain shopping trolley bays or storage within or close to the facility • an agreement from the retail outlet to collect shopping trolleys on a regular basis is also required.

Element	Consideration
Safety and security	
Intelligent Transport Systems (ITS)	• ITS functionality should be considered for all public transport facilities within the context of the broader TransLink network and include security cameras, real-time information, public address systems, incident management systems, and monitoring and communications systems • ITS hardware and connection points are typically located in a communications room within the overall facility. These ITS or communications control rooms may adjoin other facilities within the rail station, such as toilets or storerooms. They should be located in discreet locations within the facility environment and not impede public spaces or free flowing pedestrian access to the rail station • design of the facility must not attract attention • the specific installation (including power, conduits and security) and asset management schedule requirements for the inclusion of the ITS at each facility should be investigated on a site-specific basis prior to detailed design • refer to Queensland Rail, *Station Design Manual* for design and installation requirements of ITS within the rail station environment.
Public address system	• a public address system should be integrated into the design of all rail station facilities. The aim is to provide a robust, functional and visually discreet system that can provide communicative information and be linked to the security system for warning in the event of an emergency • the public address system is to be clearly audible throughout the passenger waiting areas. Loudspeakers for the system should be distributed appropriately throughout the rail station, including the core zone, and may be wall or ceiling mounted, depending on acoustic requirements. Speaker units should be mounted at an appropriate distance away from direct reach, or sit flush with rail station structures, to minimise potential vandalism and damage • the possibility of background noise affecting the audibility of the address system should be treated with appropriate acoustic absorption techniques. Loudspeakers for the system should be distributed appropriately throughout the rail station • hearing augmentation or hearing loops should be included and linked with the public address and emergency systems to assist persons with hearing impairments. These are to be located at ticket office, core zone, internal waiting areas and as per *AS 1428.5*.

Element	Consideration
Security	• security infrastructure refers to security cameras (CCTV) and other items used for the creation of safe and well-monitored waiting environments • details on the specifications and management schedules for these systems will be established by Queensland Rail. • appropriate construction and installation requirements must be considered when planning for the inclusion of security infrastructure. The use of signage informing people of the presence of security infrastructure within a facility can further enhance personal safety, and highlight the perceived risk of detection to potential offenders • security help points are typically located in the core zone. Ultimately, the location of all these elements should be the subject of rail station specific design, as each site is likely to have a range of differing sightlines and movement patterns. • counter-terrorism design considerations should be explored where possible on a site-specific basis, depending on rail station location, level-of-service and potential security risk. Where applicable, rail station design should strive towards universal standards for security and counter-terrorism measures. Liaise with the Emergency Management and Transport Security division in the Department for advice on including security and counter-terrorism measures at the earliest phase in the rail station planning.
Lighting	• ambient lighting is to be provided for a safe, comfortable and functional rail station • feature lighting may highlight architectural features • for day-time use, consider translucent materials to allow natural lighting • for night-time, bright white artificial lighting should ensure a safe and visually attractive environment • high quality light fixtures and fittings should be robust, tamper-proof, discreet and complement the rail station environment • use of common fixtures will improve maintenance and lower ongoing costs • provide lighting on pedestrian areas, roadways and rail station information • refer to Queensland Rail *Station Design Manual and AS/NZS 1158.3.1* for minimum lighting requirements • for additional disability compliance lighting requirements refer to *Disability Standards for Accessible Public Transport* (2002).
Graffiti deterrents and treatments	• all infrastructure components—furniture, lighting equipment, timetable and information devices, walls, floors, ceilings, balustrades, glass panels, screens, elevators, escalators and other components—coming into contact with passengers must be resistant to acts of vandalism and graffiti. This may involve components being applied with anti-graffiti coatings or constructed from non-porous graffiti-resistant materials • the design and arrangement of platforms and structures should maximise natural surveillance in order to minimise the incidence of graffiti and anti-social behaviour • in some instances, vegetation may be planted adjacent to structures or walls to prevent access by vandals • the use of appropriate colours or artwork that complements the rail station architecture and theming can also deter graffiti.

Element	Consideration
Animal and pest problems	• within the rail station there must be minimal horizontal ledges, overhangs, or concealed spaces where birds and animals are tempted to perch, nest and pollute the rail station facility • if cavities and horizontal surfaces are unavoidable, then appropriate measures are to be used to prevent animals and pests congregating and/or nesting. This can include designing ledges of structures to be angled (approximately 45 degrees or greater) to make it uncomfortable for birds to perch.
Optional enhancements	
Commercial opportunities	• commercial opportunities are typically developed and operated by external companies under an agreed arrangement • the placement of commercial opportunities needs to consider the active transport requirements of the station which should have first priority • it may be appropriate to incorporate: – vending machines, self-serve kiosks – commercial advertising – shared cycle, micro-mobility devices etc. • endorsement of commercial facilities is required prior to detailed design to make allowance for space, power, data and conduits for installation.
Landscape treatment	• landscape treatment is to be incorporated (where appropriate) to complement the rail station architecture, enhance the identification of a particular location, and integrate the facility with the surrounding environment. It is preferred that plantings used for landscaping are: – drought resistant – consistent with the surrounding natural environment (for example, local fora) – unlikely to intrude upon the integrity of the rail station environment – unlikely to interfere with above and below ground services and utilities – not toxic, highly allergenic or noxious weeds – not known to produce thorns, barbs, stings or noxious secretions – not inhibiting sightlines, passive surveillance or allowing for potential offenders to hide. • integrate subsoil and surface drainage with the landscape design.

Element	Consideration
Ancillary services	• key ancillary services can include vending machines, ATMs and other third-party services not directly concerning passenger transport • should be located in convenient locations, but not impede a passenger's ability to access and move through the rail station • inclusion and location of these services will depend on agreement with third-party stakeholders, rail station asset management and rail station designers, and will be determined on a site-specific basis • consideration should be given to the consolidation of ancillary services to reduce visual clutter and to provide a more integrated service for passengers. Generally, these facilities are positioned close to other passenger services such as fare machines, information displays and emergency call points • materials used for ancillary services should be consistent with other passenger facilities to achieve a visually integrated suite of services. Ancillary services should be considered early in the detailed design phase to incorporate relevant security, monitoring, power and data requirements.
Other enhancements	• artwork can enhance a rail station identity and cultural significance of a place, and should be investigated where appropriate • public art should not conflict with rail station architecture, colour schemes, branding and access requirements • wireless internet access options and connections may be investigated and incorporated • the facility owner and/or asset manager, along with relevant stakeholders, should endorse all enhancements prior to the detailed design stage of the facility.

Contents

Chapter 10 – Park ‘n’ ride infrastructure

10.1 Introduction

10.1.1 Overview of the Park 'n' ride infrastructure chapter

The Park 'n' ride infrastructure chapter is a referenced component of the overarching *Public Transport Infrastructure Manual (PTIM)*.

This *Park 'n' ride infrastructure* chapter is to be used in conjunction with:

- ***PTIM, Background and application,*** which establishes the rules for application of the entire *PTIM*
- ***PTIM, Planning and design,*** which provides the overarching design guidelines and principles for public transport infrastructure across Queensland
- ***PTIM, Supporting access infrastructure,*** which details the supporting access infrastructure required to support public transport stops, stations and related facilities
- ***PTIM, Branding, theming and signage,*** which provides branding, theming and signing that should be used for identifying coherent public transport infrastructure throughout Queensland
- ***PTIM, Bus station infrastructure,*** which informs infrastructure design by providing a clear and consistent set of principles and guidelines for bus stations throughout Queensland
- ***PTIM, Rail station infrastructure,*** which informs infrastructure design by providing a clear and consistent set of principles and guidelines for rail stations throughout Queensland

External to the *PTIM*, the following document should be referred to when planning and designing new or upgraded park 'n' ride infrastructure:

- **Queensland Rail, *Station Design Manual,*** which provides specific design guidelines for park 'n' ride at rail stations.

For information on further resources to support the planning and design of park 'n' ride commuter parking, please refer to the *PTIM, Background and application*.

10.1.2 Purpose and objectives

The Park ‘n’ ride infrastructure chapter will inform infrastructure design by providing a clear and consistent set of principles and guidelines for park ‘n’ ride commuter car parks across the TransLink network.

It will ensure that a high standard of infrastructure is planned and delivered with a focus on customers so that it meets the needs and objectives of the TransLink passenger transport system and passenger expectation. Ultimately, high-quality and consistent infrastructure will provide customers with a transport system that is coherent, functional and encourages passenger use.

The objectives of this chapter are to:

- ensure best practice infrastructure design is applied consistently across the State
- outlines the preferred requirements for park ‘n’ ride design
- detail requirements for compliance with relevant standards and regulations
- ensure the delivery of accessible infrastructure
- ensure the delivery of functional, fit-for-purpose and flexible (that is, able to accommodate changing needs and contexts of the community and surrounding land uses) park ‘n’ ride infrastructure.

10.2 Application of the Park ‘n’ ride infrastructure chapter

10.2.1 Intended audience

This chapter is intended for use by professionals in the transport planning and delivery industry. This generally involves, but is not limited to, designers, planners, engineers, architects, developers, contractors, private operators and others involved in the planning, design and delivery of park ‘n’ ride projects in Queensland. This may involve professionals charged with protecting the State’s existing and future transport infrastructure assets.

10.2.2 Application of this chapter

This chapter must be used in conjunction with overarching applications of the *PTIM*.

This chapter should be referred to before starting to plan new park ‘n’ ride or upgrades to existing park ‘n’ ride commuter car parks, and should be referred to when assessing development applications impacting on State’s transport infrastructure.

It details TransLink’s requirements for the planning and design of park ‘n’ ride infrastructure across the TransLink network.

TransLink, in partnership with the local government, relevant stakeholders including the asset owner and delivery partners, shall be consulted early regarding the project requirements and design considerations for both new park ‘n’ ride infrastructure and upgrade of existing facilities.

10.2.3 Planning legislation, policies and guidelines

See *PTIM*, *Background and application* for specific detail on relevant planning references, particularly national guidance including *Australian Standards* and Austroads publications and guides.

10.3 Principles of park ‘n’ ride planning

Park ‘n’ ride can be the first and last contact customers have with the public transport network on their journey. If a new park ‘n’ ride is to be developed or expansion to existing facilities is proposed, it should contribute to the long-term strategic planning intent for the public transport network, immediate precinct and surrounding community.

If planned well, park ‘n’ ride can:

- increase the accessibility, attractiveness and usage of public transport
- cater for customer needs enabling community access to services and increased social interaction
- extend the reach of the public transport network to generate new users, particularly in areas not well served by public transport, responding to that the diverse mobility needs of customers, population densities and land use patterns
- make public transport a more attractive option for those who don’t currently use it, or for those with mobility challenges
- directly integrate into the surrounding area, minimising impacts on land use and infrastructure (including pedestrian and bicycle path networks)
- reduce car parking demand in major destinations served by the public transport network, reducing congestion on roads.

Factors that can influence use of park ‘n’ ride:

- existing or proposed public transport services
- demand of the facility, including the profile over the duration of the day
- location of park ‘n’ ride
- convenience of access in relation to the path of the customer journey
- perceived safety
- efficiency of the public transport network.

10.3.1 Type of park ‘n’ ride

Park ‘n’ ride will typically be designed in three different configurations:

- at-grade
- multi-storey
- with mixed-use development (for example, transit-oriented development (TOD), shopping centre, office, community facilities etc.)

The appropriate configuration of park ‘n’ ride is subject to potential demand, site-specific requirements, land area constraints, surrounding existing and future land uses, and network strategy, with TransLink providing final advice on form and function.

All park ‘n’ ride should utilise urban design and landscaping treatments to enhance integration with the immediate site context (including streetscape and natural features of the site), and minimise visual impacts.

Refer to Table 10.1 for different types of park ‘n’ ride configurations, and the specific considerations that are related to each.

Table 10.1:
Park ‘n’ ride types

Type	Description	Specific considerations
At-grade	Typically large, ground level parking areas.	• ease of constructability • opportunity for horizontal or vertical expansion in future stages as demand increases/land uses change over time • opportunity for multi-use flexibility i.e. community markets on weekend etc. • opportunity to be re-developed as surrounding land uses change over time • proximity of stop / station • consider pedestrian access walking distance and directness of path to stop/station • impacts on existing infrastructure.
Multi-storey	Multi-storey car park.	• greater capacity of parking provision when land area is constrained • vertical circulation requirements for both vehicles and pedestrians to be considered i.e. ramps, stairs, lifts etc. • ensure direct access from parking bays to stop/station is available • opportunity for cycle enclosure/hub within structure (if not available at stop/station) • minimised exposure to climate and weather for public transport customers • Crime Prevention Through Environmental Design (CPTED)/ personal safety needs differ • opportunity for future implementation of smart carparking systems i.e. overhead vacant space guidance.
Mixed-use/ TOD	Park ‘n’ ride located within/adjacent to mixed-use development/TOD.	• can be at-grade or multi-storey form • located within/adjacent to mixed-use development precinct • may be basement parking under or enclosed by mixed-use development • ensure priority and safety is given to customers accessing the public transport network • ensure park ‘n’ ride clearly designated for public transport customers • greater street activation to be promoted. Refer to *PTIM, Planning and Design* Appendix 2-A for detailed information on integrating park ‘n’ ride with TOD.

10.3.2 Other park ‘n’ ride types

10.3.2.1 Temporary park ‘n’ ride

A park ‘n’ ride is considered ‘temporary’ if that park ‘n’ ride is designed and constructed with the intention that it will be removed, or otherwise not used, at a point in time after installation and commissioning. Temporary park ‘n’ ride may be required during:

- upgrade construction works to an existing park ‘n’ ride
- an event (for example, sporting event and concerts).

Where temporary park ‘n’ rides are proposed, TransLink would encourage consultation with relevant stakeholders to determine level of patronage, location and duration the temporary facility will be required.

When a park ‘n’ ride is to be utilised on a temporary basis, it should continue to be designed in accordance with *Disability Standards* and *Australian Standards*, particularly in regard to accessible design, access and egress design, internal layout and circulation, lighting, CCTV, parking aisle and bay dimensions, and designing for persons with disability.

10.3.2.2 Event impacts on park ‘n’ ride

The following will need to be considered for the design of park ‘n’ ride when it is known that they could be utilised for events i.e. sporting, concerts etc.:

- level of infrastructure required to cater for event parking demand
- overflow parking: where this is to be located and how it will be managed
- understanding the roles and responsibilities of asset owners, operators, and event organisers etc.

10.3.3 Universal design

The philosophy of universal design considers the access outcomes for TransLink customers:

- the whole journey for the customer, regardless of preference or ability, to and through public transport
- infrastructure is continuously accessible
- customers can have direct access to the public transport network
- customers have confidence that the infrastructure will have no barriers to access, and provide what they need for a seamless, continuous journey.

TransLink recognises the importance of providing appropriate accessibility for customers as part of their door-to-door journey. Enabling a customer to navigate a continuously accessible path as part of the ‘journey’ helps to create an accessible network.

The Whole Journey: a guide for thinking beyond compliance to create accessible public transport journeys (Commonwealth of Australia, 2017) assists in enabling people with disability to genuinely participate in the community by promoting the importance of considering the accessibility of the whole passenger transport journey. TransLink sees this guide as a very important document and application of the principles presented in the guide will help to improve the accessibility of our customers’ passenger transport journeys.

TransLink requires that the relevant standards and guidelines for disability access are followed, along with the engagement of relevant disability reference groups, where required. The legislative requirements of the Commonwealth *Disability Discrimination Act 1992 (DDA)* sets out the responsibilities of the Department with regards to access to public transport, with the specifics and details given in the *Disability Standards*:

- *Disability Standards for Accessible Public Transport 2002 (*DSAPT *or Transport Standards)*
- *Disability (Access to Premises – Buildings) Standards 2010 (Premises Standards)*

10.3.4 Roles and responsibilities

TransLink’s role with respect to the planning and delivery of park ‘n’ ride infrastructure across the state is to provide guidance on:

- planning and designing park ‘n’ ride infrastructure that meets passenger demand
- integrating with other public transport infrastructure and services
- designing accessible park ‘n’ ride facilities that are easy to access and can be used by all commuters
- achieving a consistent look and feel across the network
- meeting specific needs of customers in accordance with TransLink’s modal hierarchy (refer to *PTIM, Supporting access infrastructure* Section 3.1.2).

TransLink, in partnership with the local government and relevant stakeholders including the asset owner and delivery partners, shall be consulted early on the project requirements and design considerations for both new infrastructure and upgrade of existing facilities.

When the park ‘n’ ride is associated specifically with a rail station, Queensland Rail, will be a key stakeholder and will need to be consulted early in the planning and design phase. Queensland Rail, will work in partnership with TMR to facilitate access to the site, provide advice on specific park ‘n’ ride design, infrastructure and operational requirements (i.e. confirm if there is a need for staffing and/or maintenance parking bays, branding requirements, lighting, fencing, security requirements etc.), standards to be adhered to and relevant approvals.

10.4 Park ‘n’ ride environment

10.4.1 Understanding existing and future customers

10.4.1.1 Customer outcomes

TMR are focussed on achieving the following customer outcomes:

1. ***Accessible, convenient transport:*** Access and use of the public transport network should be accessible, convenient, direct and legible.
2. ***Safe journeys for all:*** Customers should feel comfortable and safe when using park ‘n’ ride infrastructure.
3. ***Seamless, personalised journeys:*** Park ‘n’ ride infrastructure is to be designed for the customer and should be convenient and responsive to their individual needs and expectations. Design of public transport infrastructure is to consider all modes of access to ensure a seamless interchange and journey for the customer.
4. ***Efficient, reliable and productive transport for people and goods:*** Ensures local access and integration with all modes is achieved and customers are able to move efficiently through public transport infrastructure.
5. ***Sustainable, resilient and liveable communities:*** Providing a balance between movement and place can create vibrant places for the community. Park ‘n’ ride infrastructure should be designed as sustainable, long term assets that are fit-for-purpose now and into the future, and adaptable to change.

10.4.1.2 Who uses park ‘n’ ride

In order to provide an enjoyable, safe and comfortable customer experience, an understanding of who the customers are and their differing expectations and needs is required. Table 10.2 provides examples of the specific elements that differ between users to guide early planning and design outcomes. It is noted however that as a minimum, all users, regardless of their ability or how frequently/infrequently they use the public transport network, require the following:

- short and direct paths to stop/station
- minimal physical barriers to reach stop/station
- minimised need to cross roads
- ease of circulation to/through park ‘n’ ride
- Crime Prevention Through Environmental Design (CPTED)/ personal safety.

Table 10.2:
Customer expectations and needs

Customer type	Example(s)	Customer expectation or needs
Regular peak-hour commuters	Customer who travels frequently to work or education using the public transport network that has strong familiarity with stop/station and routes through/via development.	• efficient entry and exit with priority access • minimise queues and delays • high frequency trunk services • real-time journey information.
Off-peak travellers	May include retired passengers, university students, families travelling with children, employees working shift or outside of regular business hours.	• available parking • clear and legible wayfinding and information.
First-timers / infrequent users	May include tourists, business travellers, interstate guest visiting family. Customers might have luggage, prams or items unable to move easily.	• clear and legible wayfinding and information from the external road network, stop/station precinct and within park 'n' ride • clear sight lines to stop/station entry and ticket facilities, ticket office etc.
People with a disability	Customers who are deaf, hard or hearing, blind or have low vision, customers with cognitive disability, permanent or temporary mobility disabilities.	• accessible parking • short and direct access to stop/station • clear and legible wayfinding and information.
Staff	On-site personnel, maintenance staff etc.	• allocated parking • facilities for staff • allowance for loading/servicing or operational access.

10.4.2 Understanding the site

When selecting a site/location, the following should be considered:

- current and future passenger demand
- staging
- integration with current and future land use
- integration with other modes
- land constraints
- land ownership
- environmental factors
- access
- proximity of land to the stop/station for a new facility.

10.4.2.1 Existing and future demands

TransLink will provide final advice on determining need and provision for park 'n' ride infrastructure. Generally, the type and scale of park 'n' ride infrastructure will primarily be based upon existing and future demands, informed by land use, network strategy, available space and site development planning. To ensure the design caters for existing and future park 'n' ride passenger demands, the following should be considered:

- opportunities for accommodating future growth as demand increases with changing land use
- opportunities for staging the delivery of infrastructure
- determine if there is a need for separated entry/exit vehicle crossovers etc.

10.4.2.2 Understanding future public transport services

Design of park 'n' ride to consider:

- additional kerbside space to accommodate additional/future public transport services
- ensure the location of permanent elements does not impede plans to upgrade or expand public transport infrastructure
- integration with public transport stop/station so that public transport capacity, operations and internal circulation requirements can be maintained or enhanced
- changes in the park 'n' ride network that may affect future site demands (for example, new facilities or expansions in other locations along the trunk public transport line).

10.4.2.3 Staging

A park 'n' ride development may be delivered in stages to suit various delivery mechanisms or potential for changes in capacity and/or site configuration at the stop or station. The project should prepare a strategic staging plan early in the planning process to protect for these anticipated changes.

Where horizontal expansion is planned:

- prepare a property procurement plan to ensure strategic land assembly
- clearly identify the future requirements under the development assessment process to protect the requirement and facilitate land assembly
- ensure that high-quality pedestrian access to the stop or station is provided
- assess the impact of the changes on surrounding local and internal traffic networks
- consider park 'n' ride layout design which can be seamlessly expanded into the next stage of development.

Where vertical expansion is planned:

- protect for a suitable column grid, footings and service utility connections based upon structural requirements for the number of levels that are to be constructed
- protect for vertical vehicle movement infrastructure (ramps) and ensure that they will be aligned with internal and/or external road networks
- protect for vertical person movement infrastructure (lifts, overpasses, stairs and escalators) and ensure that they will be aligned with stop or station pedestrian networks and design requirements
- assess and offset the impact of the additional infrastructure against long-term at-grade pedestrian and cycle connections to the stop or station
- plan for the operation of the park 'n' ride during construction stages.

It is also important to manage the intermittent peaks in demand as a park 'n' ride approaches capacity or while being constructed. Consider options for overflow parking that does not impact other stop or station access modes or affect safe and efficient movements in the immediate local area.

10.4.2.4 Integration with land use

The planning and design phase should identify any particular customer needs associated with nearby existing and planned land uses and how they can be addressed while still prioritising access to public transport.

For example:

- should park 'n' ride be planned with adjacent mixed-use development, immediate priority should be given to creating developments with active street frontages that are walking and cycling friendly.
- where future demand is uncertain or likely to be highly variable then consider shared allocation arrangements on a physical or temporal basis, for example, with:
  - parking purposes for other land uses that have complementary demand profiles
  - other complementary activities such as community markets
  - informal parking
  - operational facilities such as bus layover and stabling.

Where shared use of the park 'n' ride facility is expected or if the facility is not solely owned by TMR, consider:

- how the planning and design elements prioritise and promote the public transport function of park 'n' ride above other private vehicle functions
- ensuring the visual design clearly demonstrates that the park 'n' ride facility is available for customers wishing to access the public transport network
- the legibility, accessibility, and consolidation of park 'n' ride as opposed to a piecemeal design, particularly when park 'n' ride is provided within a TOD project.

Refer to *PTIM, Planning and design* Appendix 2-A for detail regarding integration with TOD.

10.4.2.5 Integration with other modes

Access connections to public transport infrastructure should be accessible, convenient, direct and legible to encourage public transport usage.

The design of park 'n' ride infrastructure should support TransLink's access hierarchy to public transport, prioritising access for walking, cycling, bus feeder services, taxi and kiss 'n' ride first. Where there is a need to balance park 'n' ride with a significant proportion of other access modes, extensive care is needed to ensure that the impact of the park 'n' ride is absolutely minimised. This can be done through design at the site (e.g. priority crossings, high quality bicycle parking, and/or high-quality interchange facilities). However, it is also likely to require considerations beyond the park 'n' ride's boundary (e.g. improvements to infrastructure or services). This is necessary to balance the unavoidable impacts of an expanded park 'n' ride (e.g. desire to switch to driving) with a need to support these sustainable modes for their full journey.

The design of park 'n' ride infrastructure should allow for seamless passenger movement between modes and services to encourage public transport use and to maximise the quality of the customer experience.

Refer to drawing in *PTIM, Supporting access infrastructure* Appendix 3-A that illustrates the overarching design principles for supporting access infrastructure including park 'n' ride.

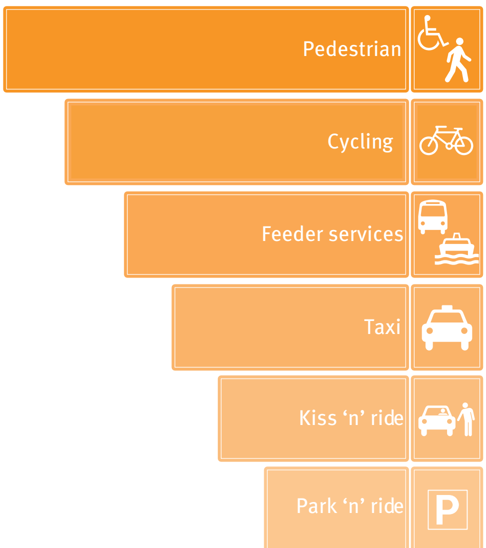


***Figure 10.1** –*
TransLink access hierarchy

The integration between park 'n' ride infrastructure, all access modes and stations is to consider the following:

- minimising and mitigating the creation of residual spaces between facilities and components using alignment and urban and landscape design treatments
- maintaining visual connection between decision points, dwell-points and activity points
- maintaining environmental quality by protecting from inter-facility impacts on micro-climate (shading, wind and solar access, air quality)
- minimise need for physical barriers between modes
- **pedestrians:** Pedestrian infrastructure should be considered in terms of:
  - interface between the park 'n' ride, station and the wider pedestrian network
  - pedestrian access through the park 'n' ride and to the station, including vertical circulation (i.e. stairs, ramps, lifts, escalators etc.)
  - where possible, take advantage of site topology to incorporate ramps and overpasses rather than lifts and stairs
  - existing and future pedestrian demand.

  To provide clear, convenient and accessible links within and to the park 'n' ride, analysis should be carried out to determine anticipated pedestrian desire lines and associated demands. This will inform where access paths and crossing points are to be provided and the minimum widths to cater for pedestrian demand.

- **cycling**: Integrating cycling access with public transport dramatically increases the catchment areas of the public transport network. All interface points between local bicycle networks and TransLink infrastructure (including cycle storage) must be functionally seamless and focus should always be on integrating with existing infrastructure. Connections must be direct, and legible with safe and convenient crossings
- **feeder services**: Design of park 'n' ride should consider nearby public transport stops and feeder services to ensure that passengers can access this public transport infrastructure conveniently and safely, minimising the need to cross roads
- **taxi facilities**: As a key part of a balanced transport network, taxi facilities should be integral to public transport infrastructure. The primary integration issue is to ensure passengers can easily identify the

taxi facility location upon exiting the station, and that the park ‘n’ ride does not conflict with access to the taxi facility

- **kiss ‘n’ ride**: Park ‘n’ ride should include kiss ‘n’ ride facilities as passenger set-down facilities maximise access to the station for all users. Connections between kiss ‘n’ ride infrastructure and stop/station facilities should be accessible, direct, legible, and incorporate CPTED principles. Kiss ‘n’ ride infrastructure should be located in close proximity to stop/station and should not interrupt bicycle movements minimising the need to cross cycle paths. Kiss ‘n’ ride should have direct access where possible, from the road network to minimise delay to pick-up/drop-off.

For detailed guidance refer to the *PTIM, Supporting access infrastructure chapter*.

10.4.2.6 Land constraints

Design needs to consider land constraints in determining size, configuration and function of the infrastructure. Additionally, park ‘n’ ride infrastructure should not consume more space than needed for effective operations.

Where land is readily available (for example greenfield sites) it should be preserved to provide for short and long-term demand. Consideration should also be made for the use of suitable brownfield sites particularly where land is the property of the State.

10.4.2.7 Cultural and heritage places

Existing sites may contain components or structures of cultural or heritage significance. Such sites may require particular investigation and attention in the facility design. Sites with cultural features or significance may require permission or approval prior to commencement of any planning and design work. TransLink recommends an appropriate level of assessment is undertaken by an expert assessor.

10.5 Functional design guidelines for park ‘n’ ride

10.5.1 Wayfinding and signage

Signage forms a major component of design to assist with navigation to and around park ‘n’ ride infrastructure. Logical information, wayfinding signage and overall facility signage is important to achieving a consistent and recognisable public transport system.

When developing a park ‘n’ ride, the design should incorporate public transport signage and wayfinding:

- to ensure that customers can easily recognise and find their way to public transport facilities, including fare machines and ticket offices
- where line-of-sight to nearest decision point can be achieved considering signage height, colour contrast and orientation
- using universal/international symbols and indicators.

For further details of TransLink’s signage requirements, refer to the *PTIM, Branding, theming and signage*.

10.5.2 Safety and security

Infrastructure is designed to provide passive surveillance and deter undesirable behaviour

The physical environment of kiss ‘n’ ride facilities must be designed to minimise the possibility of crime, property damage and anti-social behaviour associated with people gathering in public spaces. Creating defensible spaces that allow for surveillance from outside and within the facility will promote safe environments and will attract greater public use. Refer to the current version of the Queensland Government’s *Crime Prevention Through Environmental Design* guidelines.

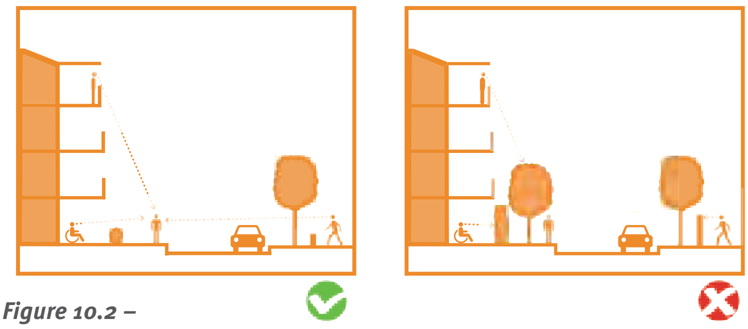


Figure 10.2 *–*
Passive surveillance example

Design of park ‘n’ ride should encourage passive surveillance. Park ‘n’ ride design should, for example, minimise visual obstructions, avoid planting or landscaping that can compromise passive surveillance, and ensure the location of bicycle parking/ motorcycle parking is close to main pedestrian paths or locations with adequate passive surveillance.

10.5.3 Climatic comfort and weather protection

Resilience to weather and climate should be considered when planning and designing park 'n' ride infrastructure, with high-quality climatic comfort and weather protection for customers accessing and utilising park 'n' ride facilities.

In developing the design of park 'n 'ride facilities, the following should be considered:

- any structures/shelters within the park 'n' ride or for pedestrians accessing the park 'n' ride, must provide sufficient physical width, length and height to achieve high-quality climatic comfort and weather protection for passengers
- consideration must be given to the management of sun, wind, rain, heat (including heat island effects within car park), glare and humidity.

An appropriate climate analysis should be included within the planning and design of park 'n' ride infrastructure to inform appropriate facility orientation and suitability for specific locations.

10.5.4 Sustainable assets

Design and delivery of park 'n' ride infrastructure will focus on sustainability through:

- facility design that is fit for purpose now and into the future, and adaptable to change
- contributing to attractive community spaces and a local sense of place
- commitment to a low environmental footprint and whole-of-life approach through all design, construction and maintenance activities
- increasing visibility of sustainable features and undertaking a participatory approach to design to improve community awareness and support.

Refer to *PTIM, Planning and design* for further details.

10.6 Specific considerations for park ‘n’ ride

10.6.1 Functional and simple layout

Maintain simplicity and develop a functional park ‘n’ ride infrastructure design that provides efficient movement, is easy to interpret and minimises conflict between users.

Park ‘n’ ride should consider all users, for example persons with disability and mobility impairments, staff and maintenance vehicles and emergency access. The resultant design should provide a legible and pleasant environment, minimising conflict between users. Informal park ‘n’ ride activity should be discouraged, particularly where safety, amenity and intrusion issues are likely to occur.

The design of a park ‘n’ ride should:

- first consider the area needed and circulation requirements of supporting access infrastructure in order of priority as per TransLink’s access hierarchy (i.e. walking, cycling, feeder services, taxi and kiss ‘n’ ride facilities prior to park ‘n’ ride)
- clearly identify entry and exit points from the road network that minimises impact on other modes of access (i.e. pedestrian and cycling infrastructure)
- provide clear and legible wayfinding and information, particularly to highlight that car parking area is provided for public transport users
- provide legible and clear circulation through the car park, allowing for the progressive filling of parking bays
- provide parking bay size and aisle widths appropriate for anticipated vehicle turnover
- include additional park ‘n’ ride bays for people with mobility impairments or other disabilities where:
  - demand is likely to approach or exceed capacity
  - higher than average demand might be expected (for example, a station serviced by routes that link to major clinical or community health facilities, or services for people with a disability).
- consider the use of a controlled access when conflicting volumes of users, regardless of mode, are high
- identify the need for operational requirements that could potentially share the site such as bus layovers and drivers amenities
- provide prominent and direct path to stop/station for safety and comfort of pedestrians
- minimise the need for the circulation roadway to cross pedestrian paths and cycle paths/lanes
- be accessed from arterial roads. If they are to be provided via local streets, the physical length required for access of this use should be minimised and preferably contained to short sections that relate directly to the stop/station facility
- include CCTV and lighting. Design of park ‘n’ ride should avoid park ‘n’ ride light spill impacts on the adjoining properties.

10.6.2 Visibility from the road network

Not all stations are easily accessible by private vehicle for most of their potential catchment. This can be due to poor road connections or simply because customers are unaware of the facility as it is not located on their commuting route or is difficult to see.

As such, direct access to and from arterial, sub arterial or distributor roads is preferred for park ‘n’ ride facilities:

- the use of controlled movements at access points should be assessed where the ratio of traffic volume (park ‘n’ ride and passing traffic) and road capacity prevents efficient and safe vehicle ingress and egress
- where demand is likely to peak sharply, consider the impact of queuing at entry and exit points.

Additionally, signage or access improvements should be considered where access or visibility of the facility is poor.

10.6.3 Visual impacts

The overall impact of park ‘n’ ride should not negatively impact on the surrounding local area’s character and sense of place. Park ‘n’ ride infrastructure can be designed to enhance and create attractive community places that support and promote economic development for the community. The design of park ‘n’ ride infrastructure must not hinder this relationship and should complement its surrounding local environment.

Therefore, consider specially designing park ‘n’ ride facilities so they are landscaped to help them integrate with the surrounding environment. For example, retaining or reinstating existing trees as shading elements within a car park can reduce heat island effects whilst minimising the day-to-day visual impact for customers and passers-by. For multi-storey car parks consider how the façade design can enhance the visual impact of the park ‘n’ ride facility.

10.6.4 Flexible design

There is a need to ensure park 'n' ride infrastructure is designed in an agile manner that can adapt to changes in the adjacent road network, land use development and associated demands and for changed transport customer behaviours. The design of park 'n' ride should consider:

- how planned road network changes could impact access/egress from park 'n' ride facility
- incorporating flexible design space to ensure it does not prevent future upgrade to multi-storey design
- future incorporation of demand management measures, including for example, access control at entry/exit points, improved access and integration with other modes and public transport services, and encouraging more sustainable modes of transport for access
- opportunities for future implementation of smart carparking systems i.e. vacant space guidance
- opportunities for future re-development i.e. integration with adjacent planned development/land use proposals
- incorporating proof-of-concept and other agile design approaches i.e. greater electric vehicle use may require charging stations at park 'n' ride, vehicle sharing parking spaces may need to be incorporated
- accommodating first and last mile trips solutions, including micro-mobility i.e. e-scooter
- providing designated storage areas may be required around stops/stations for docked and undocked micro-mobility/rideable technology.

10.6.5 Asset management

A summary of management arrangements should be prepared that clearly outlines responsibilities, exemptions, procedures and cost allocations associated with the management, operation and maintenance of the park 'n' ride facility.

For details on requirements refer to *PTIM, Planning and Design*.

10.6.6 Station operations

Consider any additional requirements (lighting, fencing, security etc.) for park 'n' ride infrastructure when the associated station has 24/7 operating hours or first to last service hours of opening.

Rail replacement bus arrangements are to be considered when designing and planning park 'n' ride infrastructure. Replacement services can be expected during interruptions (e.g. planned maintenance, track closure, or unplanned disruption) or to supplement rail services.

Refer to *PTIM, Bus station infrastructure* and P*TIM, Rail station infrastructure* for further detail regarding any additional requirements and considerations when designing park 'n' ride infrastructure adjacent to public transport stations.

10.7 Park ‘n’ ride components

This section details the components that need to be included at park ‘n’ ride facilities. TransLink in partnership with Local Government and Queensland Rail shall be consulted on infrastructure component inclusions for each park ‘n’ ride as each will have their own specific requirements or specifications.

These are detailed in Table 10.3 where:

- **M** is mandatory (component must be included)
- **P** is preferred (components will be included unless justification is provided and approved by the provider of the park ‘n’ ride in response to site constraints)
- **S** is site-specific response (component may be required or desirable subject to specific site function and/or requirements)
- **O** is optional (component may be optional or applicable to specific regions across the State)
- **-** is not applicable (component does not apply to the park ‘n’ ride type).

Table 10.3:
Park ‘n’ ride infrastructure components

Category	Park ‘n’ ride component	Facility requirements
Parking types	Accessible bays	M
	Motorcycle bays	P
	Staff/maintenance bays	P
	Other bay types: i.e. emergency, senior citizens, prams etc.	O
Supporting access facilities	Cycle enclosures/storage and end-of-trip facilitates	P
	Other public transport (for example bus stop)	S
	Taxi	P
	Kiss 'n' Ride	P

Category	Park 'n' ride component	Facility requirements
Connectivity	Accessible clear path of travel	M
	Connecting footpath to/from station/stop	M
	Connecting footpath to/from local path network	M
	Connecting cycle parking/storage to/from station/stop	M
	Connecting cycle parking/storage to/from local cycle network	M
Information	Wayfinding and signage	M
	Regulatory signage	M
	Network information	S
	Real-time information	S
Safety and security	Car park lighting	M
	Fencing	P
	CPTED Principles	M
	Security camera/CCTV	M
	Call point (must coincide with CCTV)	S
	Security identified surface transport operations (SISTO)	S
Other customer facilities	Rubbish bins	S
	Shopping trolley bay(s)/storage	S
	Seating	S
Environmental treatments	Landscape treatment	P
	Environmental sustainable design initiatives	P
	Noise attenuation	S
	Stormwater management	M
Operational Facilities	Rail replacement facility/services	S
	Maintenance access	S
	Station servicing (i.e. waste, retail etc.)	S

1.7.1 Component requirements and design considerations

Table 10.4 provides technical guidance for the design considerations, requirements and standards to be adopted. Key stakeholders are to be consulted with early during design, such as park ‘n’ ride asset owners and local authorities to ensure the appropriate standards are being applied.

When designing park ‘n’ ride infrastructure adjacent to a rail station, reference will also need to be made to the Queensland Rail, *Station Design Manual* requirements.

Table 10.4:
Design considerations for park ‘n’ ride infrastructure

Element	Minimum requirement	Design consideration
Parking layout	Parking layout elements (for example, roadway/ramp width, parking aisle width, height clearance, ramp gradients) are to be designed in accordance with *Australian Standards AS/NZS 2890.1, AS 2890.2 and AS/NZS 2890.6.* Use speed bumps (*AS/NZS 2890.1* Type 1 for at-grade, Type 2 for multi-storey) to limit vehicle speeds when parking aisle length is greater than 100m. Ensure design envelope of parking bays is kept clear of columns, walls and obstructions as per *AS/NZS 2890.1.* Blind aisles, if provided, are to be a maximum length of six 90° spaces plus 1m, unless turnaround provision included.	When determining spatial requirements of the park ‘n’ ride, first consider area needed and circulation requirements of supporting access infrastructure in order of priority as per TransLink’s access hierarchy (i.e. walking, cycling, feeder services, taxi and kiss ‘n’ ride facilities prior to park ‘n’ ride). Parking layout design should: • be legible and consolidated • avoid “X” shaped intersections within car park module and avoid where possible the use of blind/dead end aisles • minimise the mixing of traffic (between access modes and between land uses) when park ‘n’ ride is associated with mixed-use developments or is a shared facility • consider the largest design vehicle expected within car park (liaise with TransLink and service operator to confirm) • use space efficiently. For example, TransLink prefers the use of 90° car parking bays in large areas • facilitate progressive filling of spaces in a way that avoids the need for re-circulation to search for vacant spaces • utilise gentle vehicle ramps within multi-storey car park structures, potentially through ramped floors, to protect against the impact of lift failure.

Element	Minimum requirement	Design consideration
Parking bays	Parking bay size or envelope is to be designed in accordance with *AS/NZS 2890.1* User Class 1. The desired minimum width of 90° car parking bays is 2.5m. Service vehicle bays to be designed in accordance with *AS 2890.2*. As per Queensland Rail, *Station Design Manual* the number of motorcycle bays provided at rail station park 'n' ride, should equate to 5% of total parks, with a minimum of two and maximum of 20. If wheelstops are provided, they are to be designed in accordance with *AS/NZS 2890.1*.	• motorcycle parking bays are to be located where passive surveillance can be achieved, preferably close to the stop/station entrance. Liaise with TransLink and service operator to confirm: • staff and maintenance bay dimensions • any additional requirements for non-regular dedicated parking bays i.e. senior citizens parking, pram parking etc. • the number and type of maintenance vehicle bays required • the use of wheelstops. Queensland Rail preference at rail station park 'n' ride is to avoid the use of wheelstops. For all other park 'n' ride, wheelstops can be provided to control vehicle overhang over pedestrian access paths; prevent contact with a high obstruction; or prevent encroachment into adjacent parking bay.
Accessible parking bays	Persons with disability (PWD) parking to provided at 1 space per 50 total parking spaces as per the *Building Code of Australia (National Construction Code Volume 1)*. As per Queensland Rail, *Station Design Manual*, rail station park 'n' ride are to provide a minimum of two PWD bays. PWD bays to be designed as per *AS/NZS 2890.6*.	• PWD parking provision to be determined based on total number of car parks provided in the whole park 'n' ride as per below example: *An existing park 'n' ride of 130 spaces over two car parking areas, including 2 PWD spaces, is to be expanded by an additional 42 car parks. To determine the new minimum requirement of PWD the following calculation is carried out:* *130 (existing) + 42 (new) = 172 parking spaces* *172/50 = 3.44 PWD bays* *Round up to nearest integer, a minimum of four PWD parking spaces must be provided within the expanded park 'n' ride within close proximity to the station entrance.* • where multiple park 'n' ride sites are provided at a stop/station, PWD parking should be provided where short and direct access to the stop/station entry point is available i.e. can be provided in multiple parking areas • where accessible bays are away from the building, rest areas should be provided in accordance with *DSAPT* • a continuous accessible path of travel between stop/station and PWD parking bays is required.

Element	Minimum requirement	Design consideration
Access cross-over	Access type and width: • dependent on largest design vehicle, number of vehicles within car park and the hierarchy of the frontage road • to be determined using *AS/NZS 2890.1* and *AS 2890.2*. Minimum queuing distance to be determined using *AS/NZS 2890.1* to minimise spill back to adjacent road network. Access surface/design to be compliant with local government standards requirements.	• access to park 'n' ride facilities are to be easily recognisable by road users • access between different uses (i.e. park 'n' ride, bus feeder, mixed-use development, TOD development etc.) should be separated to minimise conflict between users • TransLink prefers vehicle entry and exit paths to be separated (i.e. entry/exit paths separated by a traffic island when provided at a single access point) • queued vehicles at park 'n' ride entry are oriented away from the immediate vicinity of the stop or station • protect for the potential implementation of demand management devices, such as boom gates and payment/validation infrastructure, at park 'n' ride entry points.
Access paths (pedestrians and cyclists)	• preferred minimum width of access paths is 1.8m for pedestrians only, and 2.5m when shared with cyclists • access paths to be consistent with Austroads and *Australian Standards* based on anticipated demand • access paths to be compliant with *AS 1428.1* where applicable (i.e. access provided from PWD bays) • where parking bays and circulation paths are at different grades, additional path width is to be provided to accommodate kerb ramps as per *Australian Standards* • preferred access path surface treatment is concrete. Design of surface treatment is to be as per asset owner requirements i.e. IPWEAQ *Standard Drawing RS-065* when located within TMR/ Queensland Rail property or local government standards if located on council land/road reserve. • access path slip resistance to be compliant with *AS 4586*.	• minimise need for vehicles accessing the park 'n' ride to cross paths with cyclists and/or pedestrians • avoid the need for cyclists and pedestrians to use parking aisles for access to end-of-trip amenities • where a cycle access path runs parallel at-grade with a park 'n' ride access road, provide additional dedicated lane width • facilitate safe and direct pedestrian access to the stop or station, noting TransLink prefers that pedestrian access paths be located between parking bay rows on the non-trafficked side of the bays • park 'n' ride entry and exit points should be located adjacent to or near pedestrian crossings that provide direct access to the primary stop or station entry point • avoid sharp turns and maintain sightlines (consider the visibility of objects such as poles, stop bars, handrails, barriers and sign posts) • under no circumstances should cycle paths be led through shared zones for accessible park 'n' ride bays.

Element	Minimum requirement	Design consideration
Pedestrian crossings (external)	• Refer to TMR *Manual of Uniform Traffic Control Devices, Part 10, Pedestrian Control and Protection*, Austroads *Guide to Traffic Management*, and *Australian Standards* etc. for design requirements of pedestrian crossing facilities • refer to Austroads *Australasian Pedestrian Crossing Facility Selection Tool [v2.1.2]* to inform pedestrian crossing facility type.	• at-grade pedestrian crossings are preferred where safety and relative priority can be maintained • uncontrolled crossings (i.e. zebra crossings and shared zones), are preferred except where safety or capacity concerns exist • traffic should be diverted or de-prioritised where there are pedestrian concentrations. Where controlled crossings are necessary, this can be achieved by giving priority to the pedestrian movement and minimising waiting times for pedestrians.
Kiss ‘n’ ride	• kiss ‘n’ ride is to include passenger set-down and pick-up bays designed in accordance with *AS 2890.1* parallel parking bay requirements and dependent on the aisle width and one-way/two-way operation • design pedestrian and vehicle waiting areas and pedestrian access paths as per *Australian Standards* • meet the requirements of *AS/NZS 2890.6* for accessible bays i.e. 7.8m x 3.2m parallel parking bay with adjacent shared area • include provision of shelter with seat within waiting area of kiss ‘n’ ride facility.	• minimise inter-modal traffic and local traffic movements • cycle paths should avoid interaction with kiss ‘n’ ride bays and any shared areas associated with accessible kiss ‘n’ ride bays • where possible, segregate kiss ‘n ‘ride bays and their through-lanes from other traffic • provide direct connections to public transport infrastructure that are accessible, direct and legible and incorporate CPTED principles • be located at or near pedestrian crossings which then provide direct access to the primary stop/station entry point • have priority over park ‘n’ ride for proximity to the stop/station • PWD bays must be located as close as possible to the stop/station entrance and incorporate appropriate accessibility design features, such as kerb ramps, shelter and direct access. For further detail on designing kiss ‘n’ ride, refer to *PTIM, Supporting access infrastructure.*
Traffic impact	Traffic impact assessment, where required, should be carried out by a qualified engineer as per TMR’s *Guide to Traffic Impact Assessment.*	Traffic generated by increasing or adding park ‘n’ ride to a station may need to be analysed to ensure any impacts on the surrounding road network can be appropriately mitigated. Liaise with TransLink to confirm the level of assessment required.

Element	Minimum requirement	Design consideration
Wayfinding and signage	The design of park 'n' ride, even when privately owned, must demonstrate consistency with TransLink and Queensland Rail design, branding and signage. Refer to *PTIM, Branding, theming and signage* and Queensland Rail's *Station Design Manual.* For customer specific guidance refer to TransLink *Rail Station Signage Manual* and *Bus Station Signage Manual.* For regulatory signs guidance refer to the TMR *Queensland Manual of Uniform Traffic Control Devices (MUTCD)* and *AS 1742*.	• incorporate signage and wayfinding as part of the overall signage plan for stop/station: – ensuring that public transport information is provided in advance of decision points between the park 'n' ride and the stop or station – ensuring customers can easily recognise and find their way to the stop/station – considering need for wider precinct wayfinding signage to enhance legibility of access to the site – considering signage height, colour contrast, orientation, using universal/international symbols and indicators.
Pavement surface and markings	Pavement marking to be provided in accordance with TMR *Queensland MUTCD* and *AS 1742*. Flexible asphalt pavement is the preferred pavement treatment for park 'n' ride. Pavement design to be as per Austroads *Guide to Pavement Technology* and TMR *Pavement Design Supplement.* Pavement design for the facility must take due consideration of the following: • pavement design life is for 20 years, whereby it is fit for purpose and performs its function without the need for replacement or major maintenance • traffic volumes entering the facility including type of vehicles accessing the facility (including any services vehicle requirements) • geotechnical conditions. Appropriate geotechnical investigation should be undertaken to inform pavement design and identify any latent conditions.	• surfacing material should be selected for: – ease of cleaning – slip resistance in all weather conditions – avoidance of pooling or collection of detritus or other unwanted debris • typically pavements should be designed to withstand occasional limited use by heavy vehicles. Areas where this is not reasonable should be clearly signed or made inaccessible to such vehicles • where the park 'n' ride involves the redevelopment of an existing site, considerations must be given for utilisation of existing pavements taking account of existing pavement conditions and remaining life, rearrangement of parking bays and clarity of pavement markings, materials, cost, constructability, operational and maintenance requirements.

<table>
<tr><th>Element</th><th>Minimum requirement</th><th>Design consideration</th></tr>
<tr><td>Fencing</td><td>When designing a park ‘n’ ride adjacent to a rail station, refer to Queensland Rail’s Station Design Manual for detailed fencing requirements compliant with the rail operator’s requirements.</td><td>liaise with TMR for further guidance and assessment requirements for fencing, barrier and edging for park ‘n’ ride infrastructure
fencing needs to consider interface with adjacent properties (for example, Queensland Rail’s land) and need to protect users or direct to safe crossing locations.</td></tr>
<tr><td>Lighting</td><td>lighting is to be provided at all pedestrian areas and circulation roads within public transport infrastructure and parking facilities. Lighting levels are required to meet the appropriate Australian Standards application within AS/NZ 1158.3.1 2005 – Lighting for roads and public spaces
when designing a park ‘n’ ride adjacent to a rail station, refer to Queensland Rail’s Station Design Manual for detailed lighting requirements compliant with the rail operator’s requirements.</td><td>lighting along pedestrian circulation paths should be consistent with all other pedestrian paths
minimise light spill to neighbouring properties by using spill guards
minimise light spill from headlights into adjacent properties and businesses that operate at night:
adopt appropriate fencing, such as double pailing
use plantings and circulation road/parking aisle geometry as the preferred treatment methods
avoid glare screens except where other options are not available
where glare screens are approved for use, ensure that they match the design theming and standards applied to the stop or station architecture.
consider lighting needs inside a multi-storey park ‘n’ ride including:
seasonal impacts on maintaining access for natural light
the impact on visual sightlines and reflectivity from headlights and down-lights.</td></tr>
<tr><td>Noise</td><td>Noise levels during operation and construction should comply with the relevant requirements of the Environmental Protection Act 1994, Environmental Protection (Noise) Policy 2008, Australian Standard AS2107:2016, TMR’s Road Traffic Noise Management Code of Practice Volumes 1 to 3 and local authority policy and design standards.</td><td>minimise reverberation and vibration from vehicle and vocally-generated noise
avoid surfaces and devices such as speed bumps that may cause wheel squeal or excessive noise
locate noisy operational equipment away from adjacent residential or business properties, or sound-proof the plant housing.</td></tr>
</table>

Element	Minimum requirement	Design consideration
Security and safety	When designing a park 'n' ride adjacent to a rail station, refer to Queensland Rail's *Station Design Manual* for detailed surveillance requirements compliant with the rail operator's requirements.	• liaise with TMR for further guidance and assessment requirements for security and safety • apply CPTED principles to maximise pedestrian safety, visual integration and the use of security infrastructure (for example, security cameras). • park 'n' ride facilities and connecting paths must be specifically covered by security infrastructure (for example security cameras) with the ability to survey movements between public transport platforms and the park 'n' ride.
Stormwater drainage	Stormwater drainage should generally be designed in accordance with the requirements of *Queensland Urban Drainage Manual (QUDM)* and the site specific requirements and conditions of the relevant local authority. When designing a park 'n' ride adjacent to a rail station, refer to Queensland Rail's *Station Design Manual* for detailed stormwater drainage infrastructure requirements.	• effective management of stormwater is a key consideration of the design in order to ensure that the quality and quantity of run-off is not adversely affected by the park 'n' ride facility • the key influences on the development of design of the stormwater include: – site levels – minimise the impact on the existing stormwater flow regime – the location of a suitable lawful point of discharge • stormwater drainage from parking areas should be captured and treated prior to release into local stormwater systems • consideration of low maintenance stormwater treatment and storage facilities • if practical, structures should capture stormwater and rainfall for re-use on-site • avoid field inlet pits for drainage within circulation aisle/road and access paths.
Landscape treatment	• landscaping treatments are to: – respond to the local landscape character of the area – meet the planting requirements of the local authority – meet the required offsets for utilities (both above ground and underground)	• provide a planting strategy that assists with wayfinding and legibility of place • tie-in landscaping treatments with the existing landscape palette of the area for design consistency • consider opportunity to increase shade by adding trees where possible, to provide better user experience

Element	Minimum requirement	Design consideration
Landscape treatment (continued)	– be unlikely to interfere with pedestrian movement, parking aisles, circulation road or parking bay integrity or intrude upon the travel path at ground level (for example, low groundcovers or native grasses where vehicle overhang is required at parking bays) – be consistent with local flora (use local genetic populations in natural areas of significant ecological value) – provide shading by proposing trees around stops/stations and pedestrian areas – comprise plants that are drought-resistant, low maintenance and robust.	• avoid plants that are: – toxic, highly allergenic or noxious weeds – known to produce thorns, barbs, stings or noxious secretions – known to attract dangerous fauna – likely to cause CPTED issues by creating hideaway spots.
General civil	• carry out “Dial Before You Dig” enquiries to understand existing utility infrastructure (i.e. gas, stormwater, electricity, telecoms, water, sewer) connections at the site at the commencement of planning and design project • geotechnical investigation should be considered to inform the design of earthworks, pavements, in-ground structures, in-ground infrastructure • traffic islands should have acceptable kerb height where overhang is designed as per *Austroads* and *Australian Standards*.	• flooding levels of the site should be considered in the planning and design of park ‘n’ ride • site levels must take consideration of interfaces with existing levels, accessibility requirements, provision for surface water run-off and impacts on existing public utility plant and infrastructure. • upon identification of public utility plant, in-ground services investigation (including ground penetrating radar and/or potholing) should be undertaken to verify location and identify any potential clashes with design.

Contents

Chapter 11 – Light rail station infrastructure

11.1 Introduction

11.1.1 Overview of the Light rail station infrastructure chapter

The Light rail station infrastructure chapter is a referenced component of the overarching *Public Transport Infrastructure Manual (PTIM)*.

This Light rail station infrastructure chapter is to be used in conjunction with:

- ***PTIM, Background and application,*** which establishes the guidelines for application of the entire *PTIM*
- ***PTIM, Planning and design,*** which provides the overarching design guidelines and principles for public transport infrastructure across Queensland
- ***PTIM, Supporting access infrastructure,*** which details the supporting access infrastructure required to support public transport stops and stations
- ***PTIM, Branding, theming and signage,*** which provides branding, theming and signage that should be used for identifying coherent public transport infrastructure throughout Queensland.

For information on further resources to support the planning and design of light rail stations, including specifically the integration with other modes please refer to *PTIM, Background and application*.

11.1.2 Purpose and objectives

The Light rail station infrastructure chapter will inform infrastructure design by providing a clear and consistent set of principles and guidelines for stations on the light rail network.

It will ensure that a standard of infrastructure is planned and delivered to meet the needs and objectives of the TransLink passenger transport system and passenger expectations. Ultimately, quality and consistent light rail station infrastructure will provide customers with a transport system that is safe, convenient, coherent, functional and encourages passenger use.

The objectives of this chapter are to:

- ensure design incorporates a focus on achieving customer needs and enhancing their experience
- ensure a consistent approach to maximise customer access, convenience, safety, comfort, efficiency, reliability and accessibility
- ensure infrastructure design is applied consistently across the light rail network
- consolidate and standardise the existing guiding principles for the planning and design of light rail station infrastructure
- provide an overview of available design standards
- detail TransLink's requirements for compliance with relevant standards and regulations
- to promote light rail station design principles which achieve inclusiveness, accessibility and flexibility.

11.1.3 Technical references

The following technical documents should be referred to when planning and designing new or upgraded light rail stations:

- **Department of Transport and Main Roads (TMR), *Guide to Development in a Transport Environment: Light Rail***, which provides important information for those involved in the planning, design or delivery of development in the vicinity of light rail infrastructure in Queensland
- **TMR, *Public Transport Conveyance Manual: Designing accessible vehicles, vessels, aircraft and rollingstock,*** which provides a practical framework to maximise universal accessibility when embarking or disembarking transport conveyances
- **TMR, *Road Safety Policy,*** which provides the policy direction to prioritise the safety of customers in the delivery of transport infrastructure
- **TMR, *Road Planning and Design Manual,*** is the primary reference for planning and design of roads and are to be read alongside the relevant Austroads technical requirement publications
- **TMR Technical Notes** are a suite of technical documents detailing additional TMR requirements in planning and design. They should be read alongside the relevant standard, manual or guideline
- **TMR, *Rail Station Signage Manual***, provides guidance to the provision of signs at rail stations within the TransLink network.

For full list of technical references refer to *PTIM, Background and Application*.

11.1.4 Roles and responsibilities

The roles and responsibilities of the key stakeholders for the planning and design of light rail stations are described in Table 11.1. As shown, the planning, provision, management and operation of public transport is the core responsibility of the State government, with most responsibilities carried out by TransLink (a division of TMR).

TransLink will work in partnership with and assist the asset owner, light rail managers, Queensland Treasury and local governments to:

- reviewing the Chapter to ensure it remains up to date and relevant
- supporting and communicating the importance of customer focussed features of the Chapter to relevant stakeholders
- providing recommendations to ensure compliance with the Chapter.

Table 11.1:
Roles and responsibilities

Organisation	Key public transport responsibilities
TMR including TransLink division	TMR is responsible for the coordination of transport services, infrastructure, management, transport policy and planning in Queensland. TransLink's role within TMR is to: • plan and design an accessible, efficient and connected passenger transport network that is simple for customers to identify, understand and use • be responsible for enhancing customers' experience, ticketing, public transport information and infrastructure. TransLink has State-wide responsibility for managing service contracts to deliver public transport services for light rail.
Light rail managers	Light rail managers have the following principal functions: • managing, maintaining and operating light rail transport infrastructure • responsible for managing works and activities in a light rail corridor.
Queensland Treasury	• responsible for regulating planning and development and responsible for administrating the Planning Act.
Local government	• responsible for land use planning and built environment as per local planning schemes • responsible for aligning complementary urban planning policies and strategic local planning with light rail to achieve urban outcomes, including catalytic land use changes, stronger land use integration and transit oriented development.

11.1.5 Glossary

Table 11.2:
Key light rail terms

Term	Definition
AFC	Automatic Fare Collection
AVVM	Add Value Vending Machine
CER	Communications Equipment Room
CPAS	Customer Public Address System
LRT	Light Rail Transit
LRV	Light Rail Vehicle
PTIM	Public Transport Infrastructure Manual
PTCM	Public Transport Conveyance Manual
PWD	Person With Disabilities
ROW	Right-of-Way
SACID	Stand Alone Card Interface Device
SISTO	Security Identified Surface Transport Operations
TGSI	Tactile Ground Surface Indicator
TLER	TransLink Equipment Room

11.2 Application of the Light rail station infrastructure chapter

11.2.1 Intended audience

This chapter is intended for use by professionals in the transport planning and delivery industry. This generally involves, but is not limited to, designers, planners, engineers, architects, developers, contractors, private operators and others involved in the planning, design and delivery of light rail station projects in Queensland. This may involve professionals charged with protecting the State's existing and future transport infrastructure assets.

11.2.2 Application of this chapter

This chapter must be used in conjunction with overarching applications of the *PTIM*.

This chapter details TransLink requirements for planning and design and should be referred to before starting to plan new light rail stations or upgrades, including intermodal connections, neighbourhood and active transport connections, and safety improvements, to existing light rail stations. This is particularly important where light rail stations are affected by, or a catalyst for, urban development.

For existing sites, direct application of the approaches outlined in this chapter may not be feasible due to existing physical site constraints. The application of *PTIM* may therefore vary to achieve TMR's customer outcomes whether undertaking works in a constrained or built up corridor, greenfield site or when undertaking and upgrade.

TransLink, in partnership with local governments and in collaboration with relevant stakeholders and delivery partners, shall be consulted on the design for new infrastructure and upgrade of existing light rail stations.

11.2.3 Planning, legislation, policies and guidelines

See *PTIM, Background and application* for specific detail on relevant planning references, and relevance to light rail station infrastructure and light rail corridors.

11.3 Principles of light rail station infrastructure planning

Light rail is a high-capacity, high-frequency public transport mode within urban corridors which can support liveable communities and enhance well-being and social inclusion. When light rail stations are planned and designed to allow customers of all ages and abilities to easily and safely interchange between modes, they can contribute to an accessible public transport journey.

11.3.1 What is the light rail station precinct?

The light rail station precinct comprises three distinct zones including:

1. **Local precinct:** area immediately surrounding the light rail station where people interact with adjacent and nearby land uses and activities.

   Light rail stations should be considered in the context of their surrounding precinct, including how they will be accessed by all transport modes. Light rail stations, successfully integrated with the community, can create precincts that are attractive places for economic development and social interaction.

   The planning and design of light rail station infrastructure should reflect the local precinct in which it is situated. This includes connections to its cultural or heritage significance, the surrounding physical environment and its integration with the adjacent land uses.

2. **Access and interchange:** location that passengers use to gain access to/from the light rail station and transfer between other transport modes such as bicycle, bus, kiss 'n' ride, taxi, passenger heavy rail.

   Supporting access infrastructure is required to ensure passengers can interchange seamlessly between the light rail station and different transport modes. Where accommodating customer transfers at street level, an unobstructed accessible route and close proximity of other modes to a light rail station's entry and exits will improve the ease and comfort of these movements. For light rail stations with concourses, ticketing areas and platforms underground, the location and design should ensure these are easily recognisable and identifiable as part of the public transport integrated network.

3. **Light rail station:** where passengers dwell at a platform, use amenities, buy tickets, board and alight light rail vehicles etc.

   The design of the station should allow the spatial requirements to accommodate customer demand, staff needs and the legibility, safe circulation and comfort of passenger movements along the platform.

The zones comprising the light rail station precinct are illustrated in Figure 11.1.

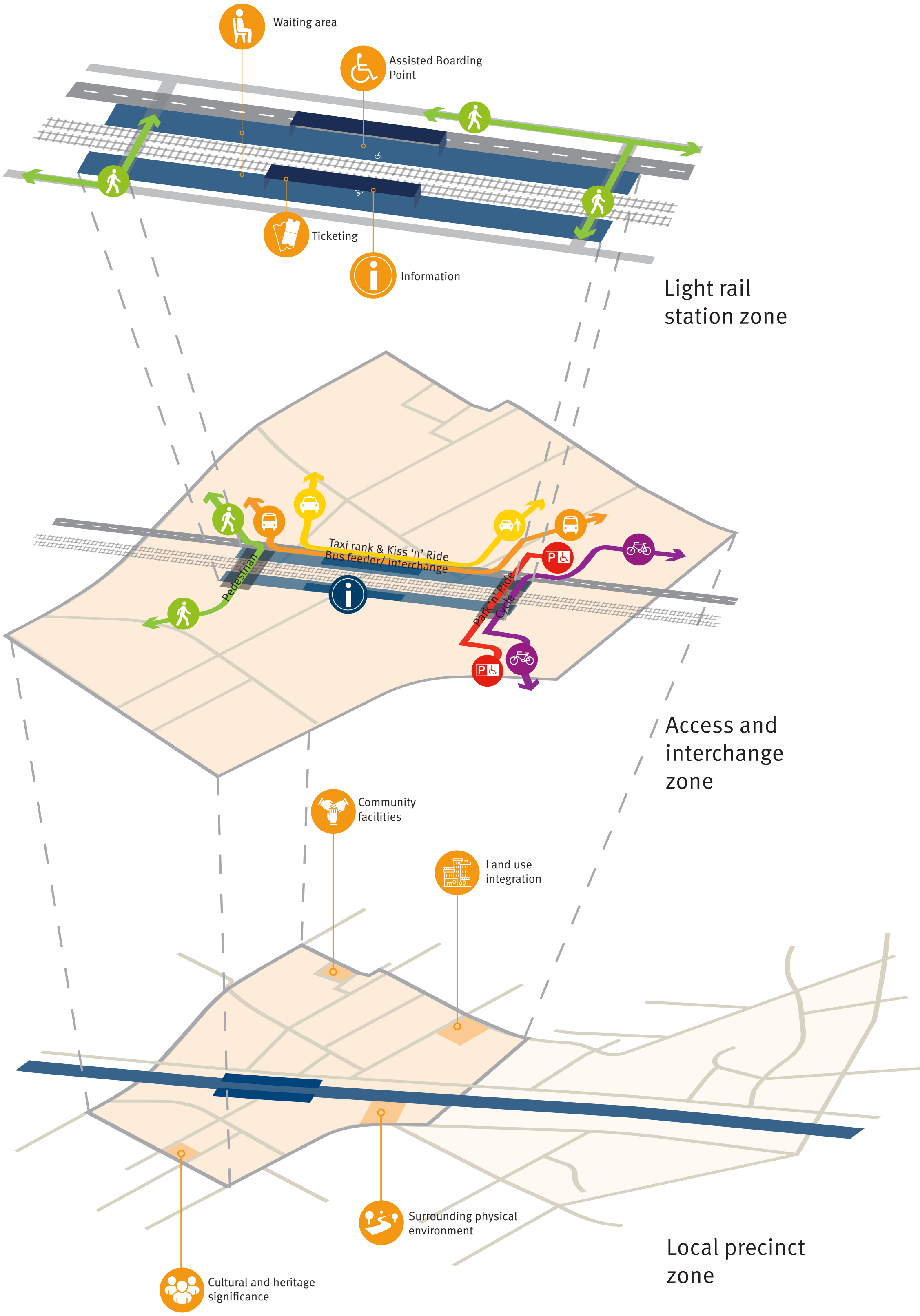


Figure 11.1 – Light rail station precinct zones

11.3.2 Light rail services

The existing Queensland service categories and routes across the state are currently located in the Gold Coast:

- G:link network, Gold Coast [https://ridetheg.com.au/stations/]

11.3.3 Who uses the light rail service?

TransLink customers using light rail services across the light rail network include frequent and infrequent users (for example, commuters/full-time workers, students, tourists, retirees, long distance travellers, and customers using the service for recreational purposes and events).

Customers may use light rail stations for non-travelling purposes such as retail, cross-corridor access, meeting travelling users and other activities, and as such should be considered in the planning and design of a light rail station and the light rail station precinct. How TransLink customers access this mode of travel varies by location, adjacent land use, light rail station facilities (e.g. mobility and accessibility) and trip purpose.

11.3.4 Light rail station categories

TransLink, through the *PTIM*, has developed the categorisation of light rail stations.

The hierarchy is based upon infrastructure function, station configuration and multi-modal connections. These categories must work in conjunction with the public transport infrastructure hierarchy in *PTIM*, *Planning and Design*. This will establish infrastructure hierarchy and function based on its locality and to ensure customer functional needs are met, particularly where integrated with wider public transport services.

1. **Major Interchange** – bespoke or terminus light rail stations which include high frequency multi-modal connections
2. **Local Interchange** – light rail stations which include multi-modal connections
3. **Standard** – typical light rail station infrastructure and facilities with limited multi-modal connections.

11.3.4.1 Major Interchange

The key elements that define a major interchange light rail station are described as follows:

	Description
Customer	commuters, off-peak, first-time, infrequent, long-distance, tourists, events persons with disability, travelling with children, travelling with luggage high patronage
Wider precinct	located within a key destination place adjacent to mixed use urban land uses (for example, knowledge, tourism, health, commercial, retail, residential and cultural) high pedestrian activity
Operation	high frequency services intermodal interchange with passenger heavy rail, high frequency bus services with reach to regional and long distance destinations. For example, University Hospital, Broadbeach South and Helensvale stations.

So that customers can get to their destinations using the light rail network with minimum difficulty and stress, they can expect the following conditions when accessing an interchange light rail station:

Must haves

1. accessible, efficient, safe and seamless access to connecting modes and between platforms
2. independent access to station and platform
3. legible, clear and consistent wayfinding and information
4. timetable information for feeder connections
5. customer services and general information displays
6. ticket purchasing facilities
7. Crime Prevention Through Environmental Design (CPTED) principles incorporated
8. comfortable waiting areas and shelter

Desired

9. urban design elements reflecting local context and environment
10. passenger loading zone, for example an accessible kiss 'n' ride.

11.3.4.2 Local Interchange

The key indicators of a local interchange light rail station are described as follows:

	Description
Customer	commuters, off-peak, first-time, infrequent, tourists persons with disability, travelling with children high patronage
Wider precinct	may be adjacent to an activity centre and employment hub mixed use urban land uses (for example, knowledge, tourism, health, commercial, retail, residential and cultural) high pedestrian activity
Operation	high frequency services intermodal interchange with other public transport services and connections to local destinations. For example, Southport, Griffith University and Parkwood stations.

The conditions that customers expect at a local interchange light rail station are:

Must haves

1. accessible, efficient, safe and seamless access to and within light rail station
2. independent access to station and platform
3. legible, clear and consistent wayfinding and information
4. customer services and general information displays
5. ticket purchasing facilities
6. CPTED principles incorporated
7. timetable information for feeder connections
8. comfortable waiting areas

Desired

9. urban design elements reflecting local context and environment
10. cycle parking facilities
11. passenger loading zone, for example an accessible kiss 'n' ride
12. direct access to adjacent bus stop.

11.3.4.3 Standard

The key indicators of a standard light rail station are described as follows:

	Description
Customer	commuters, off-peak, first-time, infrequent, long-distance persons with disability, travelling with children, travelling with luggage low to medium patronage
Wider precinct	residential neighbourhood, community facilities local activity centre for example Nerang Street, Broadwater Parklands, Queen Street stations nearby local bus stop
Operation	high frequency services feeder services available in the surrounding precinct primary means of access by pedestrians and cyclists.

The conditions that customers expect at a standard light rail station are:

Must haves

1. accessible, efficient, safe and direct access
2. independent access to station and platform
3. legible, clear and consistent wayfinding and information
4. timetable information
5. ticket purchasing facilities
6. incorporate CPTED principles

Desired

7. integration into local environment
8. comfortable waiting areas
9. cycle parking facilities.

11.4 Light rail station environment

11.4.1 Understanding existing and future customers

11.4.1.1 Customer outcomes

TMR is focussed on achieving the following customer outcomes:

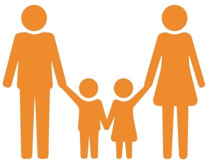
1. **Accessible, convenient transport:** access and use of the light rail network should be accessible, convenient, direct and legible
2. **Safe journeys for all:** customers should feel comfortable and safe when using and accessing the light rail network
3. **Seamless, personalised journeys:** Light rail stations are to be designed for the customer and need to be convenient and responsive to their individual needs and expectations. Light rail stations to consider all modes of access to ensure a seamless interchange and journey for the customer
4. **Efficient, reliable and productive transport for people and goods:** ensures local access and integration with all modes is achieved and customers are able to move efficiently through the light rail station. The station design balances in-service efficiency and on-time running with customer needs
5. **Sustainable, resilient and liveable communities:** providing a balance between movement and place can create vibrant places for the community. Light rail stations should be designed as sustainable, long term assets that are fit-for-purpose now and into the future, and adaptable to change.

11.4.1.2 Customer needs

The expectations or needs of different customer types must be recognised for the location using customer research. As a minimum, all users, regardless of their ability or how frequently/infrequently they use the public transport network, customers require the following:

- safe, direct and convenient paths to and within the station
- minimal barriers between the station and each access mode
- CPTED/personal safety
- legible, clear and consistent wayfinding and information
- inclusive and accessible design.

Table 11.3:
Customer expectations and needs

Customer type	Example(s)	Customer expectations or needs
Regular peak-hour commuters 	Customers who travel every business day to work or education frequently using the light rail network and have strong familiarity with light rail station and routes through/via development.	• legible/direct movement through light rail station • efficient transfer • efficient access • information on service disruptions and ability to access alternative modes.
Tourists 	Customers may need more information on local wayfinding and events. May include local, interstate and international tourists. These customers might have luggage, prams or items unable to move easily. English may not be their first language.	• easy to navigate • direct access to taxi, kiss ‘n’ ride and park ‘n’ ride facilities within the precinct • comfortable waiting areas • real-time information and easy-to-understand wayfinding • information about feeder services • ramps and lifts etc. to navigate level changes.
Off-peak travellers 	May include retired passengers, university students, families travelling with children, employees working shift or outside of regular business hours.	• easy, accessible, legible access and interchange • easy-to-understand wayfinding • comfortable waiting areas • infrastructure supporting lower service frequency (e.g. seating, shading) • personal safety in unmanned locations.
Infrequent users/ first-timers 	May include tourists, visitors, business travellers, parents travelling with children, Interstate guests visiting family (e.g. typically includes discretionary travellers). Customers might have luggage, prams or items unable to move easily.	• easy to navigate • direct access to taxi, kiss ‘n’ ride and park ‘n’ ride facilities within the precinct • comfortable waiting areas • real-time information and wayfinding • information about feeder services • ramps and lifts etc. to navigate level changes.
Interchangers/ transferring customers 	Regular peak-hour commuter switching between modes. Might need to accommodate customers impacted due to a service disruption, or alighted at wrong light rail station.	• easy, legible interchange • multi-modal, real-time information and wayfinding • information about feeder services • minimal physical barriers to interchange/ transferring between modes.

Customer type	Example(s)	Customer expectations or needs
People with a disability	Customers who are deaf, hard of hearing, blind or have low vision, customers with cognitive disability, permanent or temporary mobility disabilities.	• system ensures equitable and direct access • allow users to get to their destination with minimum difficulty or stress • direct access to ramps/lifts/escalators to platforms • direct access to assisted boarding point[1].

The light rail station needs to provide an appropriate mix of functional elements to meet the needs of these customers (refer Table 11.3) and reflect the site-specific requirements of the light rail station while still aligning with consistent design standards.

For example, a major destination such as a hospital may have the following needs over a standard facility:

- easy, accessible, legible access and interchange
- multi-modal connections
- consideration to first time users - simplicity, ease of use and attractiveness
- spatial arrangements to consider use by persons with a disability, whether permanent or temporary
- regular maintenance needs.

When planning and designing light rail stations, the following passenger activities should be considered:

- Boarding and alighting - passengers entering and exiting light rail vehicles
- Transfer within the light rail station - where passengers walk between the light rail platform to other modal platforms within the station, for example heavy passenger rail and bus services
- Station access & egress - where passengers enter or exit the light rail station to transfer to another transport mode, or to access their final destination
- Transfer within the interchange - where passengers are required to leave the station to access their next transport mode.

In addition to the customer's needs and expectations, light rail managers for the light rail network also have requirements that will need to be considered when planning and designing a light rail station. These are demonstrated in Table 11.4.

1 *The assisted boarding point is a designated and identifiable area on the platform that includes, but is not limited to, priority seating area, lighting, emergency phone, hearing augmentation loops, next train information, and enhanced CCTV coverage. Assisted boarding points also provide shelter and are identifiable by blue and white PWD markings.*

Table 11.4:
Stakeholder expectations and needs

Stakeholder type	Example(s)	Stakeholder expectations or needs
Property owner	Owner of land/development rights	• quality design/visual outcome • Light rail station contributes to desired or planned land use development outcomes • allowance for loading/servicing, or operational access (building maintenance statements may be required) • maintain economic feasibility.
Service providers	Public transport operator	• allowance for loading/servicing, or operational/maintenance access • future proofing for operational changes and construction access for future upgrades • facilities for staff at agreed locations [2] • clear maintenance and other responsibilities identified where station components are integrated (for example, shared spaces, escalators, lifts, access roads etc.).

11.4.1.3 Existing and future demands

The light rail station precinct must be appropriately designed to accommodate a range of passenger movements and the volume of anticipated passengers, including those waiting/dwelling, accessing public transport services (boarding/alighting), through movements and queuing.

The planning and design of light rail stations should accommodate future growth and opportunities for the local and wider community. Demand analysis should be used to inform staging opportunities for the delivery of access infrastructure, as well as protect for any land requirements to cater for future customer demand.

Forecast patronage increases may potentially require public transport facilities (for example, local bus stops, kiss 'n' ride, new cycle route) to be able to accommodate additional future services (for example, new interchange services, change in land use).

Footpath space should cater for the anticipated pedestrian demands around the entrances to the light rail station. Refer Section 11.4.2.5 and PTIM, Supporting Access Infrastructure for more detail addressing the requirements for users at the journey start and end within the light rail station precinct.

For further information in determining capacity and Levels of Service requirements refer to *PTIM, Planning and Design*.

2 *Locations for staff facilities to be agreed in line with operational requirements.*

11.4.2 Understanding the site

This section provides guidance on the light rail station environment considerations in the early planning and design phase. With each site having unique characteristics, a site-specific response needs to consider:

- the corridor the service will operate within
- understanding existing and future passenger demands
- the surrounding land uses
- integration with other modes
- land constraints.

11.4.2.1 Light rail corridor

Light rail transit offers the flexibility of operating within its own corridor/segregated alignment in areas with lower land use density and greater distances between stations, or shared/mixed with other vehicles or pedestrians in high land use intensity areas with closely spaced stations.

The preferred configuration needs to address the specific issues or opportunities within the environment it will be operating in, as well as the proposed operational efficiency, design speeds and customer objectives for the service.

This chapter recognises the following types of light rail transit corridors:

- Segregated corridor at-grade or grade separated (i.e. elevated sections)
- Dedicated right of way within the street
- Shared corridor with regular road traffic users (including other public transport)
- Light rail corridor with other public transport modes
- Light rail corridor with pedestrians.

Table 11.5 outlines the differing design considerations of the typical light rail corridors and alignments.

Table 11.5:
Light rail alignment characteristics

Corridor	Benefits	Considerations
Dedicated right of way with centre or side-running alignment	• ensures priority at intersections for light rail vehicles and improved reliability of service • opportunity for higher light rail running speed • at-grade segregated alignment offers opportunities for greater integration with land uses • median space can be allocated to stations or landscaping.	• may be opportunity for traffic priority with light rail in main movement at intersections • consider opportunity to concurrently run parallel pedestrian phases with light rail priority • consider opportunity for dedicated and protected right hand turns on strategic routes • may potentially require a larger corridor footprint • consider provision of safe and protected pedestrian access to station • consider legibility at intersections for general traffic • if grade-separated (elevated alignment), there may be less opportunity for integration with surrounding land use.
Shared corridor with general road traffic	• can be introduced in corridors with limited road width • may enable a shift from the corridor's movement function towards greater place outcomes in an urban environment.	• consider speed differentials between light rail vehicle and general traffic • consider conflict between on-road vehicles, private transport, buses, cyclists etc. and light rail • consider complementary urban design elements that support safe, comfortable and legible access to public transport services • consider provision for safe pedestrian access • consider the effect on other traffic when light rail pulls into stations.
Light rail corridor with pedestrians (including passengers)	• ability to have light rail service major pedestrian corridors in city centres, urban environments and community precincts • contribute to place making/transit oriented development opportunities as well as integration with built form.	• minimise conflict between pedestrians and light rail through design, delineation and demarcation (for example, formal signalised pedestrian crossings where higher speeds are proposed, or imposing reduced light rail vehicle speed limits) • consider speed differentials between light rail vehicle and pedestrians • consider access for logistics or servicing of land uses.

Corridor	Benefits	Considerations
Light rail corridor with other public transport modes	• opportunities to co-locate services for short durations in constrained corridors • opportunities for seamless interchange between modes.	• consider potential integration with bus services that are operating on limited stop/express priority services or where indented bus stop/bays are provided to maintain light rail priority and reliability • consider interface between modes at intersections and stops • consider type of infrastructure to address both vehicle needs/requirements • consideration of bus fleet dimensions, specifically height, for example, bus would need to be single decker • consider provision for safe pedestrian access.

11.4.2.2 Integration with land use

Public passenger transport infrastructure integration with land use enables the creation of better places, and supports the following outcomes:

- adequately catering for customer needs
- ensuring essential community access to jobs, facilities and services
- community health and well being and social inclusion
- contributing to reducing dependency on cars
- support economic development of communities.

The majority of locality factors (for example, population projections, demographics, major attractors) for public transport infrastructure are led by the relevant land use plan or urban renewal strategy for the location, precinct and corridor. These include:

- regional plans
- local government land use plans
- transport strategies and plans.

Reference should also be made to the Queensland Government's development assessment processes and systems.

The overarching design guidelines within the *PTIM* need to be applied giving consideration to site-specific characteristics to create an attractive, seamless integration with the surrounding environment.

In some cases, major public transport infrastructure is an integral part of supporting economic development of urban centres, and supports increased densities by encouraging TOD. This concept of changing the design emphasis from a place for transport to a place for the community reflects the focus on customer needs, for those who pass through the facility as well as those who live and work nearby.

Development surrounding light rail stations should support access for all users to the public realm, increase street activation and passive surveillance of these spaces, and contribute to the vibrancy of the street. Additionally, where appropriate, development should provide quality lighting that reinforces daytime and night-time presence and surveillance. The proximity of transport stations with complimentary land use developments is vital, as urban consolidation is necessary for achieving increased public transport patronage and therefore justifying high-frequency services.

The planning, design and operation of light rail infrastructure should see coordination between identified key stakeholders, including government and private transport operators and authorities, local councils, land owners, tenants, community, Emergency Services, event organisers and other relevant Authorities. This should include for example early co-ordination and engagement with key stakeholders, the sharing of essential information, participating in place making/branding, and coordinating and managing special events, passenger service disruption, maintenance, accident events and incidents.

Refer to *PTIM, Planning and design* for further detail regarding integration with land use, including TOD.

11.4.2.3 Integration with other modes

Light rail stations forms part of the integrated transport network. To maximise seamless connections and ease of use, access to light rail stations should be accessible, safe, convenient, direct and legible.

Planning and design must consider how passengers will access the infrastructure with consideration to the TransLink access hierarchy presented in Figure 11.2, and incorporate appropriate access facilities and infrastructure. This includes pedestrian and cyclist facilities, interchange (e.g. with passenger heavy rail) and bus feeders, taxi, kiss 'n' ride and park 'n' ride facilities.

The design should consider protecting the integrity of entry and exit points by:

- managing safety, congestion and intermodal conflict at key access points
- appropriately designing decision points at transition zones, with a focus on legibility and ease of navigation
- simplicity and economy of movement to, from and through the light rail station and access infrastructure

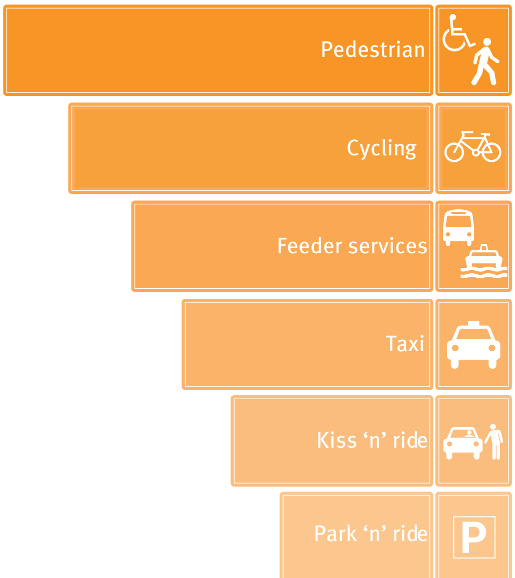


Figure 11.2 – TransLink's access hierarchy

- minimise barriers to appropriate movement along:
  - desired travel paths for design of new stations
  - primary travel path when upgrading existing stations.

Light rail stations are to be designed so that they are easily identifiable as a station by customers. This is achieved through clearly defined entry and exit points, light rail station (or where applicable, interchange) boundaries and use of clear wayfinding and signage to demonstrate where there are access infrastructure links to the light rail station from the surrounding built environment.

The design of light rail stations should allow for seamless passenger movement between modes and services to encourage public transport use and to maximise the quality of the customer experience, in accordance with TransLink stop and station policy and guidelines.

Pedestrian

Pedestrians should have clear and direct access to supporting infrastructure and surrounding facilities. Pedestrian infrastructure should be considered in terms of:

- interface between the light rail station and the wider pedestrian network
- pedestrian access through the light rail station, including vertical circulation (i.e. stairs, ramps, lifts, escalators etc.) and grade-separation (to be integrated into the primary facility structure where possible to minimise passenger travel)
- existing and future pedestrian volumes and pedestrian paths of travel to/from adjacent land uses and attractors and events, using methods prescribed in TMR technical guidance for walking
- provision of a safe and convenient path of travel to/from station (i.e. minimise conflict with other access modes) and light rail vehicle.

Pedestrian demand assessment:

- is to be carried out to determine spatial requirements (for example, width of unobstructed paths and movement corridors)
- may include access paths, vertical transport, corridor widths, gatelines, concourse sizing, run off requirements and location of ticketing facilities/ retail uses etc.
- to consider desire lines and dwelling areas of different movements through, to and pass the station and how it interfaces with public transport passenger movements. For example, waiting areas, on-street alfresco dining, conflicts with other demand (particularly in mixed-use developments/ TOD)
- is to consider pedestrian demands at each level of the facility.

Refer to *PTIM, Planning and design*, Section 2.3.3.1 for further detail regarding demand analysis.

Cycling

Integrating cycling access with public transport dramatically increases the catchment areas of the light rail network.

When planning and designing cyclist infrastructure, the following should be considered:

- all interface points between local bicycle networks and TransLink infrastructure must be functionally seamless
- cycle infrastructure to integrate with existing infrastructure
- cycle connections to/from the station must be direct, and legible with safe and convenient crossings
- minimise (where possible) access infrastructure conflict with cyclists. This will be dependent on the existing type of cycle facility (for example, on road cycle lane or off road separated path), whether it forms part of a designated cycle network, and whether users on this cycle infrastructure are accessing or passing the station. The TransLink access hierarchy is to be adopted when confirming priority at conflict locations.
- specialist cycle design advice should be sought when designing cycle amenities including wayfinding to end-of-trip facilities, particularly when provided as part of an interchange.

Micro-mobility

Design of light rail stations should consider accommodating journey start and end trip solutions, including micro-mobility. Designated storage areas may be required around light rail stations for docked and undocked micro-mobility/rideable technology.

Feeder services

Design of light rail stations should consider nearby or adjacent passenger heavy rail stations, bus stops/ stations, and feeder services to ensure that passengers can access the wider public transport network conveniently and safely and to their end destination.

For transferring and destination customers, connecting modes should be close to the light rail station entry/ exit (ideally visible or within line of sight) and limit the need to cross roads.

Passenger set-down

Passenger set-down facilities, including kiss 'n' ride, taxi ranks, maximise access to the rail station for all users. Design of kiss ‘n’ ride infrastructure within the light rail station precinct should:

- minimise potential for vehicle/pedestrian/cycle conflict
- provide accessible, direct and legible connections to rail station facilities
- incorporate CPTED principles.

Park ‘n’ ride

Refer to *PTIM, Park ‘n’ ride infrastructure* for detail regarding the planning and design of park ‘n’ ride infrastructure for public transport.

11.5 Functional design guidelines for light rail stations

Ensuring that the arrangement of key components is appropriately considered will contribute towards positive customer outcomes for the overall light rail station design. Each of the following principles described in this section should be incorporated into the design of public transport infrastructure.

11.5.1 Access

11.5.1.1 Accessibility and compliance

TransLink requires that the relevant standards and guidelines for disability access are followed, along with the engagement of relevant disability reference groups, where required. The legislative requirements of the Commonwealth *Disability Discrimination Act 1992 (DDA)* set out the responsibilities of the Department with regards to access to public transport, with the specifics and details given in the *Disability Standards*:

- *Disability Standards for Accessible Public Transport 2002 (DSAPT* or *Transport Standards)*
- *Disability (Access to Premises – Buildings) Standards 2010 (Premises Standards)*.

The design of the light rail station precinct should be accessible to all of its customers and accommodate them without the need for adaptation or specialised design. When upgrading existing stations, minimising barriers to the provision of unassisted and equitable access should be pursued.

11.5.1.2 Universal design

Public transport infrastructure should consider universal design to support and enable a diverse range of customers to access and use the public transport network. The philosophy of universal light rail station design considers the access outcomes for TransLink customers:

- the whole journey for the customer, regardless of preference or ability, to and through the light rail station is continuously accessible
- customers have direct access to the light rail network
- customers have confidence that the light rail station will provide what they need for a seamless, continuous journey with no barriers to access.

TransLink also recognises the importance of providing appropriate accessibility for customers as part of their door-to-door journey. Enabling a customer to navigate a continuously accessible path as part of the 'Journey' helps to create an accessible network.

The Whole Journey: a guide for thinking beyond compliance to create accessible public transport journeys (Commonwealth of Australia, 2017) assists in enabling people with a disability to genuinely participate in the community by promoting the importance of considering the accessibility of the whole of the passenger transport journey. TransLink sees this guide as a very important document and application of the principles presented in the guide will help to improve the accessibility of our customers' passenger transport journeys.

Key accessibility and disability access design considerations are described in *PTIM, Supporting access infrastructure* Section 3.3. The principles of universal design are provided in *PTIM, Background and application.*

Station precinct amenities and facilities are to be designed to cater for a range of different customers with different needs and level of experience.

The following list provides examples of what customers may expect or need, however the inclusion of these facilities within the station precinct will be dependent on station type (refer Section 11.7.1 for guidance regarding component selection).

Customers who use a wheelchair:

- provision of lifts and ramps
- platform height and gap to rollingstock, allows for ease of access into vehicle at assisted boarding point.
- unisex accessible toilet.

Customers who are elderly or use mobility aids:

- short distance from accessible bays or kiss 'n' drop facility to the light rail station and platform
- hearing loops.

Customers who are blind or have low vision

- remove hazards/obstacles from path
- uncluttered and open environment
- clear wayfinding through use of colour contrast and tactile ground surface indicators (TGSI)
- access to audible messaging of information
- hearing loops.

Customers travelling with luggage:

- provision of lifts and ramps
- accessible fare gate openings
- platform height and gap to rollingstock, allows for ease of access into vehicle at assisted boarding point
- clear information for onward journey.

Customers who are unfamiliar with the light rail station or have mental health or intellectual or cognitive impairment:

- clear lines of sight
- orientation of signage and progressive/relevant signage for navigation through station and onward journey to the wider precinct
- consistent wayfinding
- consistent look and feel across light rail network
- remove hazards/obstacles from path
- uncluttered and open environment.

11.5.2 TransLink architectural theme

Passengers find it easy to recognise, interpret and navigate public transport infrastructure.

Public transport infrastructure should be designed to:

- be legible within the built environment
- have a consistent visual appearance
- address climatic conditions.

Infrastructure is one of the most recognisable parts of the TransLink network. A consistent design language (i.e. 'look and feel') across the network will promote clearer customer recognition of public transport facilities, helping to increase passenger confidence. Design elements can be tailored to meet specific operational and functional requirements at individual sites, while still maintaining a consistent 'look and feel' across the network.

The TransLink architectural theme provides the framework for establishing a coherent network of public transport infrastructure across the state. Infrastructure planning and design should:

- reflect the relative importance of the infrastructure in the overall public transport hierarchy
- comply with network standards for components such as structures, pavements, signage and wayfinding
- be based on the use of modular infrastructure, with a prefabricated kit of parts utilised in design to reduce costs, as well as for ease of maintenance and future capacity enhancement
- use common materials that emulate a lightweight appearance to deliver a modern, open and safe environment
- comply with applicable standards and regulations Including *Disability Standards for Accessible Public Transport 2002 (Cth)* and relevant *Australian Standards*.

11.5.3 Sequence of movement

The layout of a transport facility should consider the sequence of public movement. Public movement is in response to the progressive sequence of actions and decision points along the path of travel from the entry to the boarding point on the platform, as illustrated in Figure 11.3.

The growth of integrated facilities can lead to conflicts between public and private spaces and the components needed to allow a clear movement sequence for travelling customers. The planning stage of a facility should acknowledge this conflict and aim to reconcile the different elements within an integrated facility, with clear signage and wayfinding, to allow for efficient public movement for both travelling and non-travelling customers.

11.5.4 Circulation within light rail station

For details regarding the principles of circulation within public transport infrastructure, refer to *PTIM, Planning and design*.

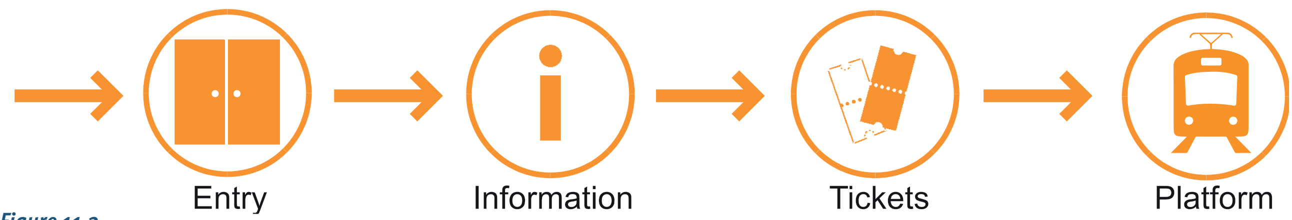


Figure 11.3 – Sequence of movement

11.5.5 Safety and security

Safety and security of customers and other users of the station, particularly at night may see the need to consider in addition to appropriate lighting levels, well monitored waiting environments, and access paths to and from the station to supporting access infrastructure that offer sufficient active and passive surveillance.

11.5.5.1 Active surveillance

The safety and security measures employed to maximise actual and perceived safety for customers may consider the use of the following:

- security cameras in operational areas
- adequate lighting appropriate to the type/category of light rail station
- visual monitoring of the station/precinct.

11.5.5.2 Passive surveillance

Infrastructure is designed to provide passive surveillance and deter undesirable behaviour.

The physical environment of public transport facilities must be designed to discourage the possibility of crime, property damage and anti-social behaviour associated with people gathering in public spaces. Creating defensible spaces (as far as reasonably practicable) that allow for surveillance from outside and within the facility will promote safe environments and will attract greater public use. Refer to the current version of the Queensland Government's *Crime Prevention Through Environmental Design* guidelines.

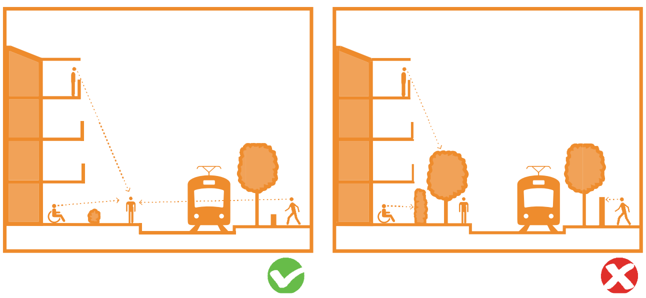


Figure 11.4 –
Passive surveillance example

11.5.5.3 Anti-social behaviour, graffiti deterrents and treatments

Components are durable and resistant to graffiti and vandalism.

Public transport facilities are vulnerable to unwanted offences such as vandalism, abuse and careless use of infrastructure components. In line with specifying durable, self-cleaning and easily maintainable materials and finishes, all infrastructure components coming into contact with the public must be resilient to acts of vandalism, littering and graffiti.

This can be achieved through design options such as maximising natural surveillance and using for example, landscaping treatments or artwork, to prevent access.

11.5.5.3 Road safety

Customers' safety on the road network needs to be considered as they access public transport infrastructure.

Access design to public transport infrastructure and services should consider the TMR *Road Safety Policy*. This policy focuses on achieving safety outcomes and benefits for their customers that reduce both the likelihood and severity of crashes on the road network through the Safe System approach.

The design of access intersections and adjacent road links should consider the interface of public transport customers and other road users, and what interventions can be incorporated to improve the safety outcomes for all users.

11.5.6 Identifiable station entry and exit

Entry and exit points are clearly defined and highly legible to customers.

Clearly defined entry and exit points are essential; not only providing points of access, but also defining the light rail station/precinct boundaries and where access infrastructure needs to provide a connection between the station and the built environment.

Design considerations for interchange light rail stations should include provision of entry plazas, information areas, station concourse, ticket facility, and fare gates (where relevant to the size/scale of the station and its integration with other modes).

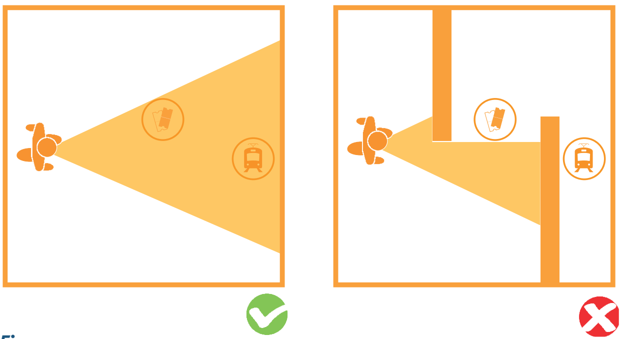


Figure 11.5 –
Identifiable entry/ facility

11.5.7 Climatic comfort and weather protection

Resilience to weather and climate should be considered when planning and designing light rail stations, with quality climatic comfort and weather protection for customers to be provided.

Sun and weather protection is to be provided. In developing the design of facilities and their access, the following should be considered:

- structures must provide sufficient physical width, length and height to achieve quality climatic comfort and weather protection for the anticipated number of passengers expected to occupy this space
- passengers should be provided with appropriate protection with covered light rail station access points, public information and decision points, seating and waiting areas, and boarding and alighting areas
- consideration must be given to the management of sun, wind, rain, heat (including heat spots particularly on platforms or waiting areas), glare and humidity.

An appropriate climate analysis should be included within the planning and design of light rail stations to inform appropriate facility orientation, shelter design and location suitability.

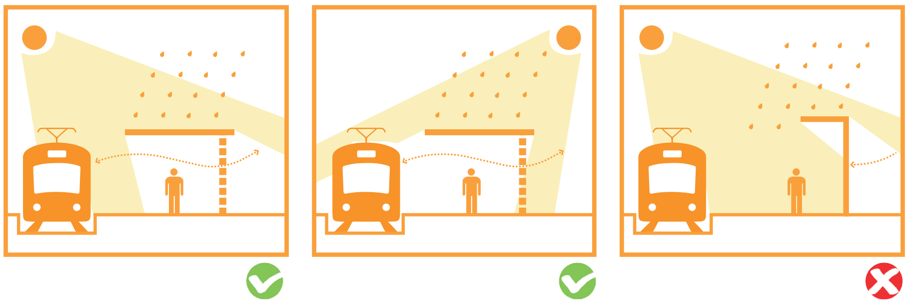


Figure 11.6 –
Climatic comfort and weather protection

11.5.8 Sustainable assets

Design and delivery of light rail stations will focus on sustainability through:

- facility design that is fit for purpose now and into the future, and adaptable to change
- contributing to attractive community spaces and a local sense of place
- commitment to a low environmental footprint and whole-of-life approach through all design, construction and maintenance activities
- increasing visibility of sustainable features, and undertaking a participatory approach to design to improve community awareness and support
- identification and implementation of ecologically sustainable development initiatives
- incorporate water sensitive urban design (WSUD) principles and use of hardy, drought tolerant landscape treatments to minimise irrigation and ongoing maintenance requirements.

Table 11.6:
Sustainable considerations

Key sustainability consideration	Requirement where possible
Water management	• on-site rainwater collection and reuse • stormwater mitigation strategies for example, on-site run-off treatments • local flooding mitigation and flow maintenance.
Resource minimisation	• water - employ water-saving devices • energy - aim for energy-neutral infrastructure through minimisation of energy use and generation opportunities (for example, solar for lighting and for feeding back into electrical supply) • materials - apply whole-of-life design approach—construction, operation, maintenance, cleaning, and decommissioning • processes - avoid operational processes that generate waste, especially toxins and pollutants.
Habitat and physical environment	• protect habitat (that is, space, physical elements such as movement paths) • maintain water flows to aquatic and other habitats • maintain water quality • avoid acid sulphate soils • minimise fugitive emissions of air, surface and groundwater-borne pollutants.
Social sustainability	• present minimal harm to employees or public • promote social justice, inclusion and equity • contribute to improving social capacity and community interaction • enhance community experience and integrate facilities with the surrounding environment to enhance economic viability and social benefits.

11.5.9 Cultural and heritage places

Heritage values are protected in the upgrade and delivery of public transport infrastructure.

Existing sites may contain components or structures of cultural or heritage significance. Such sites may require particular investigation and attention in the facility design. For example, railway stations and other passenger transport infrastructure can be listed as having heritage significance and require careful consideration and approval with respect to structural design and modification.

Sites with cultural features or significance may require permission or approval prior to commencement of any planning and design work.

TransLink recommends an appropriate level of assessment is undertaken.

11.5.10 Functionality and simplicity

The design should provide a legible and pleasant environment that is uncluttered and easy to understand and navigate.

Maintain simplicity and provide a functional light rail station design that minimises conflicts between users and ensure passengers can easily interpret and use the space/transport infrastructure.

The design of structures, platforms, concourses, waiting areas, seating, signage, pavements and other components must be incorporated within the overall design process to achieve highly functional light rail station design outcomes.

11.5.11 Wayfinding and signage

Signage forms a major component of design to assist with navigation to and around light rail stations.

Logical information, wayfinding signage and overall facility signage is important to achieving a consistent and recognisable public transport system.

Light rail station design should incorporate signage and wayfinding:

- to ensure customers can easily recognise and find their way to light rail stations, including fare machines and ticket offices
- where line-of-sight to nearest decision point can be achieved considering signage height, colour contrast and orientation
- for multi-modal integration, maps and landmark information of wider precinct
- using universal/international symbols and indicators.

For further details of TransLink's signage requirements, refer to the *PTIM, Branding, theming and signage*.

11.5.12 Arrangement of space

For details regarding the design and arrangement of space for public transport infrastructure, refer to *PTIM, Planning and design*.

11.5.13 Fare collection

The method of fare collection affects the operational capacity of light rail station design. Automatic fare collection can be carried out through the incorporation of Stand Alone Card Interface Device (SACID), AVVM and fare gates (as required). The provision of ticketing facilities will be determined by light rail station type, size, public comfort, level-of-service requirements, and revenue protection strategies. The facility layout must consider the appropriate location of the automatic fare collection facilities as part of ensuring sufficient and safe circulation and queuing of passengers particularly in peak operational periods.

Liaison with TransLink shall be undertaken to identify the requirements for installation of ticketing infrastructure at the light rail station. This is required to address existing and future ticketing infrastructure needs (including the ability to incorporate smart ticketing etc.), and installation requirements (for example, power, conduits, cabling, connections, and so on). Final approval of the design and installation of ticketing infrastructure must be sought from TransLink.

Liaison with TransLink and other stakeholders will also be required to determine the appropriate assessment methodology and level of service for the operation of the ticket facilities (e.g. static or dynamic assessment).

11.5.14 Flexible design

The design of light rail stations and associated infrastructure needs to consider current and future capacity requirements. Some of the key issues to consider include:

- prioritising investment to protect for future public transport connections
- consider additional kerbside space to accommodate additional/future public transport services where possible
- design for development integration so that light rail station capacity, operations and internal circulation requirements can be maintained or enhanced
- future passenger volumes may require grade-separated pedestrian walkways, separated entry/exit vehicle crossovers etc.
- ensuring the location of permanent elements does not impede plans to upgrade or expand light rail stations or the light rail network.

There are several emerging technologies that change Queenslanders' reliance on personal cars and offer more integrated mobility solutions.

These emerging technologies and trends offer choice and dynamic travel options which need to be considered when designing light rail stations:

- incorporate proof-of-concept and other agile design approaches in a time of high change
- ensure light rail stations are designed in an agile manner that ensures it will be suited for changed transport customer behaviours.

11.5.15 Asset management

Light rail stations are major elements of passenger transport infrastructure and they need to be managed and maintained to provide consistent customer communication, service standard and sufficient operational conditions suitable for passenger comfort and safety.

The light rail station components need to be maintained and managed on an ongoing basis to ensure the effective operation of a light rail station. The framework for how a light rail station will be managed after the delivery of infrastructure needs to be considered within the planning and design process.

Relevant stakeholders should be engaged in the planning and design process to ensure that the requirements (including Safety in Design requirements for maintenance) of asset management by operators and/or owners have been considered.

All components of light rail station infrastructure should use materials and finishings consistent and compatible with existing infrastructure of an approved standard.

In consultation with relevant operating and maintenance stakeholders, detailed maintenance manuals should be developed for all components and operation schedules within a light rail station. These should be prepared as part of the light rail station project.

For further details on asset management requirements refer to *PTIM, Planning and design*.

11.6 Specific considerations for light rail stations

11.6.1 Catchment and spacing

TransLink, in consultation with the local government, will determine the most appropriate spacing of light rail stations. This should take into account the present and future TransLink integrated transport network requirements specific to a local government area, customer needs (such as demographics and ridership types) and maximising service coverage, particularly in areas which are less densely built-up.

The size of the catchment of a light rail station is generally influenced by:

- the permeability of the surrounding street network that is the quality, walkability and ease of access available through the street network
- other barriers (e.g. rivers, infrastructure, topography)
- willingness of potential customers to walk/ride
- frequency and reliability of the service
- operating speed of the service
- proximity of connecting modal interchange opportunities
- how light rail supports/is supported by connected modes (for example, greater spaced light rail stations may require more bus feeder services to maximise coverage)
- proximity of land use/destination.

11.6.2 Location of light rail station

Table 11.7:
Location of light rail stations

Key consideration	Requirement where possible
Appropriate sightlines	• sightline requirements apply for light rail operators, waiting passengers, other pedestrians and road vehicles • they must be adequate and comply with the relevant standards.
Adequate footpath area	Sites must have the available space for sufficient pavement area so pedestrians can safely walk past the station area.
Convenient boarding and alighting	Locate stations to optimise access to the immediate catchment: • with platforms in pairs ideally directly opposite each other, so that boarding and alighting occurs in close proximity • enable access to surrounding land uses • close to community facilities and services that attract a high proportion of people with a disability • close to significant attractors (such as shopping centres, commercial premises, places of employment, residential areas, educational facilities, hospitals and other primary services) • enable integration with other modes • close to other public transport infrastructure and interchanges, as this will minimise walking if transferring between services and reduce interchange time penalties.
Safe access	Locate stations: • close to dedicated and protected pedestrian road crossings (for example, dropped kerbs, refuge islands, signals) • with appropriate separation, where possible, from driveway crossovers providing access to a high parking turnover facility • away from dense foliage and other objects that hinder direct sightlines.
Intersection design	• location of station preferred on the departure side to minimise conflict with turning vehicles (and their storage) and light rail vehicle delay • to consider priority measures for light rail vehicles, for example signal priority.
Provision for future infrastructure	Where applicable, a reasonable attempt must be made to protect for any planned or upgraded infrastructure by local government or other State government agencies.

11.6.3 Light rail corridor

A centre (or side) running alignment within a dedicated right of way corridor is the more typical arrangement in light rail networks. This is generally constrained by road widths and the required running lane sizes to accommodate light rail vehicles and other traffic.

- Light rail corridors should be delineated to show clearance to light rail transit infrastructure from adjacent road users
- It is preferential for light rail to have priority through traffic signals, and it is essential to have coordination between traffic signals to optimise phasing and timings.

11.6.4 Light rail station arrangement

The *PTIM* identifies a number of typical light rail station layouts that would need to be tailored to meet operational and site requirements for specific station in order to address customer needs.

- Station size, configuration and function is dependent upon several factors including:
- maintaining level of safety for travelling and non-travelling customers and road corridor users
- level of pedestrian activity for travelling and non-travelling customers
- context of the station within adjacent infrastructure and surrounding land uses and precincts (such as commercial, retail, and residential uses)
- terminus station
- adjacent road traffic volumes
- intersection spacing
- light rail corridor alignment
- land constraints
- topography i.e. elevated, grade-separated structure required.

Table 11.8 summarises passenger specific considerations associated with different station configurations.

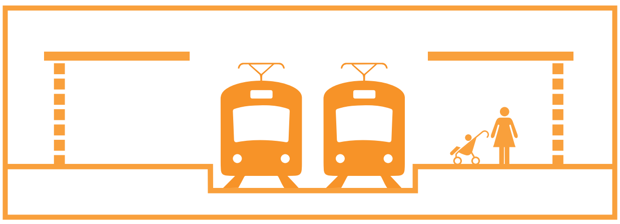


Figure 11.7
Single-side platform

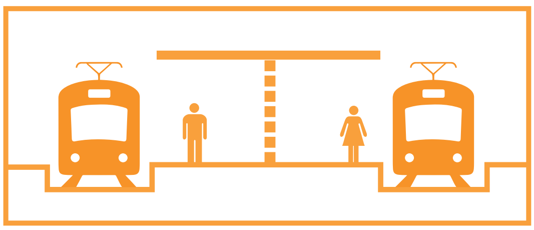
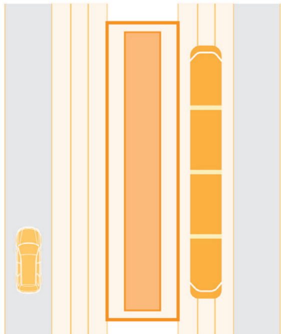
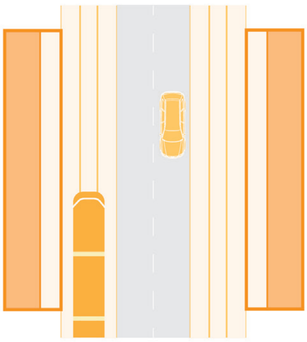
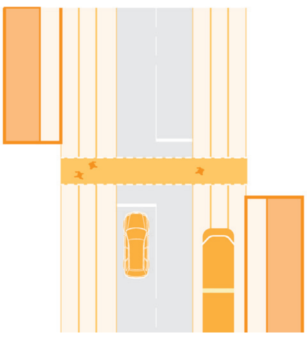


Figure 11.8 –
Island platform

Table 11.8:
Light rail station arrangement

Station type	Description
Centre island station 	• a single platform is positioned between two light rail tracks, allowing opportunity to rationalise canopy and platform furniture and cater for tidal passenger flows • access and egress: – passengers do not need to cross tracks and traffic lanes to access other platforms – opportunity for passengers to use pedestrian refuge at platform ends and a two-stage track crossing system – passengers need to cross tracks and traffic lanes to access station – passengers need to cross tracks and traffic lanes to access other modes.
Dual station (also known as Side Platform) 	• a platform(s) positioned to the side of a single or pair of light rail tracks • requires duplication of vertical transport for grade-separated platforms • access and egress: – Passengers can use a single point of access for both platforms enhancing safety as light rail driver is only required to assess a single location – direct access from adjoining street or precinct, with opportunity for at-grade access – passengers may need to cross tracks to access platform – passengers may need to cross traffic lanes to access platform. • opportunity for seamless transport integration (shared multimodal platforms) • greater opportunity for integration with the adjacent environment, including environmental and visual features • requires greater footprint to accommodate two platforms.
Dual station (staggered) 	• Single-side platforms located tail-to-tail with sufficient space between stations to ensure vehicles can pass and passengers can safely cross behind light rail vehicles at the stations • May be suitable in constrained urban corridors where there the road reserve has a limited width • Potential to result in longer station footprint • Passengers can use a single point of access for both platforms enhancing safety as light rail driver is only required to assess a single location • Opportunity to have flexibility to integrate with surrounding environment, maintain building accesses and servicing arrangements • Can be installed at intersections to utilise the 'dead' space required for right turns.

11.6.5 Platform footprint

This section highlights the need to assess platform footprints with a focus on the ease of movement for and safety of passengers. Due consideration should be made for both the layout and alignment in determining the platform size of certain light rail stations.

11.6.5.1 Platform width

Factors that should be included in determining light rail station platform dimensions include:

- accessibility requirements [refer to the *Disability Standards*]
- circulation space in front of fare payment machines (such as Add Value Vending Machine (AVVM))
- circulation space in front of emergency assistance phone
- circulation space in front of each lift door linking through to boarding point (as required)
- circulation space in front of station furniture
- assisted boarding point
- information zones and supporting infrastructure/ components
- ground space of canopy structure
- clearances from platform edge.

It should be noted that all platform widths need to be assessed in partnership with TransLink with a rationale based on the above factors. Typically absolute minimum platform widths can be used as a basis for design, specifically for standard station, where it is expected that appropriate demand analysis is undertaken for interchange stations.

Consideration of other uses (passing pedestrians) to be undertaken where the platform is part of an existing footpath environment.

11.6.5.2 Platform length

The light rail station platform length may vary, however the length of the platform must be greater than the length of the proposed light rail vehicle.

Subject to specific operational requirements or for capacity (depending on the service pattern), extending length at the station may need to be provided for introducing a turn-back or to accommodate an additional or broken down light rail vehicle.

11.6.6 Light rail station operations

Light rail station design should not compromise the physical condition or operating performance of light rail transport infrastructure and associated light rail networks. The following light rail station operations can impact the design and layout of light rail station infrastructure:

- **Frequency -** the peak and off-peak frequency of services needs to be considered
- **Hours of operation -** consider any additional requirements (i.e. lighting, security etc.) for light rail stations whether they have 24/7 opening hours or first to last service hours of opening
- **Operational impacts -** mobility aids, wheelchairs, prams and bicycles increase boarding times and can impact operational capacity of light rail stations and platforms. Additionally, insufficient pedestrian capacity or obstructions to pedestrian movements on platforms can affect on-time running
- **Night or replacement bus -** Night or replacement bus service provision should be considered early in the planning of a light rail service, and the location of proposed light rail stations. Ideally night and replacement bus stops should be located in close proximity to the light rail station so the customer can maintain ease of transition in terms of wayfinding and walking distance. TransLink shall be consulted with regards to the appropriate provision of infrastructure for night or replacement bus services, such that an appropriate level of infrastructure is provided to meet anticipated customer demand and management requirements
- **Event services -** during events, passenger demands can be high with a number of these being first-time visitors to the light rail station. As such, the planning and design of light rail stations that are envisaged to be used during events, should consider how comfort and security for passengers during peak event travel can be achieved; and ensure signage and wayfinding is clear and legible
- **Revenue protection -** fare collection equipment (for example, SACID, AVVM) to be provided at entry/exit points to light rail station. Location of fare collection equipment to consider passenger queuing and run-off.

11.6.7 Operator requirements

11.6.7.1 Depot

The location and size of depot sites should consider:

- maintenance activities and stabling the light rail vehicle fleet
- future expansion if further light rail transit routes or extensions are planned and additional light rail vehicles will be required
- topography to be almost flat, otherwise significant earthworks are required. For operational availability and reliability the site should not be flood prone
- should be located close to the light rail transit routes and positioned with operational efficiency in mind to minimise dead running of light rail vehicles when out of service
- driver and workforce facilities
- vehicle parking needs
- if located near residential areas, consider the need for noise impact mitigation measures during maintenance activities.

TransLink acknowledges that the above are operational considerations, and may not have a significant or direct effect on customer requirements at light rail facilities. However these are an important consideration in early light rail planning, particularly where in the long term it may influence customer experience of the service.

11.6.7.2 Maintenance vehicle access

The design of the public transport infrastructure should consider how maintenance vehicle access and parking will be achieved to ensure public transport vehicle accessibility, reliability and operation is not negatively impacted.

11.7 Light rail station components

11.7.1 Component selection for light rail stations

It is important that the design of infrastructure provided at light rail stations is of a consistent standard and quality so that a diverse range of passengers can access public transport conveniently and safely. These are detailed in Table 11.9 where:

- **M** is mandatory (component must be included)
- **P** is preferred (components will be included unless justification is provided and approved by the provider of the light rail station in response to site constraints)
- **S** is site-specific response (component may be required or desirable subject to specific light rail station function and/or site requirements)
- **O** is optional (component may be optional or applicable to specific regions across the state)
- **-** is not applicable (component does not apply to the light rail station type.

Table 11.9:
Light rail station infrastructure components

Category	Light rail station component	Standard	Local Interchange	Major Interchange
Information				
Station-specific information	Real time passenger information	M	M	M
	Information zone including signage, fare, zone, identification marker, routes etc. servicing the station	M	M	M
	Customer public address system (CPAS) (including hearing augmentation)	M	M	M
	Wayfinding	M	M	M
Regulatory	Statutory signage (refer to Manual of Uniform Traffic Control Devices, Part 10)	M	M	M
Network Information	Network Map	P	M	M
	Locality Map	P	M	M

Category	Light rail station component	Standard	Local Interchange	Major Interchange
Accessibility				
General Access	Full level access from station to light rail vehicle	M	M	M
	Platform/hardstand area	M	M	M
	Clear path of travel	M	M	M
	TGSI	M	M	M
Station Access including Circulation	Independent access to all platforms	M	M	M
	Independent cross corridor access	M	M	M
	Ramps (significant level difference/down from grade separation)	S	S	S
	Stairs and escalators	S	S	S
	Lifts and overpasses	S	S	S
	Allocated space (PWD waiting zone)	M	M	M
Supporting Access facilities	Cycle parking/enclosures (refer to *PTIM, Supporting access infrastructure*)	P	P	M
	Other public transport (for example bus stop)	S	P	M
	Kiss 'n' ride/passenger loading zone	P	P	M
	Taxi[3]	S	S	S
	Park 'n' ride	S	S	S
Local connectivity	Connecting footpath to/from station	M	M	M
	Kerb ramp	S	S	S
	Pedestrian crossing facility	P	P	P

3 *Where taxi bays are provided, they are to be accessible and located adjacent to an accessible entry to the station*

Category	Light rail station component	Standard	Local Interchange	Major Interchange
Station furniture				
	Canopy/Shelter	M	M	M
	Canopy coverage (%) [4]	30-50%	50-70%	70-100%
	Seating [5]	M	M	M
	Bin	P	M	M
Fare Collection				
	Add value vending machine	M	M	M
	Stand alone card interface device	M	M	S
	Fare gates	-	-	S
	Ticket window/customer Service window	-	-	S
	TransLink equipment room (TLER)	M	M	M
Security and safety				
	Platform lighting	M	M	M
	Lighting in shelter	P	P	P
	CPTED principles	M	M	M
	Security Camera/CCTV	M	M	M
	Help phone (CCTV monitored)	M	M	M
	Security identified surface transport operations (SISTO)	-	S	S

4 *The proportions of canopy coverage provided reflect the preferred outcome sought by TransLink*
5 *Including allocated space*

Category	Light rail station component	Standard	Local Interchange	Major Interchange
Optional enhancements				
Station furniture	Drinking fountain	O	O	P
	Shopping trolley bay(s)/storage	-	S	S
Customer facilities	Accessible toilet	-	P	P
	Parenting facilities[6]	-	S	P
Context material	Public art	S	S	S
	Historical material	-	-	O
Commercial	Vending machine (third party)	O	O	O
	Advertising panels	O	O	O
	Retail	O	O	O
Landscape treatment	Landscape treatment	P	P	M
Integrated transport requirements				
	Maintenance vehicle parking	M	M	M
	Night or replacement bus services	M	M	M

6 *Including baby change table*


Southport
touch

Appendix 11-A Design considerations

The use of quality components (including materials and furnishing) will support effective light rail station operation by:

- providing a comfortable and safe passenger environment
- delivering robust infrastructure that minimises the need for maintenance.

TransLink in partnership with the asset owner shall be consulted on infrastructure component inclusions for each light rail station. The correct level of design components making up a station will depend significantly on the role of the light rail station in the TransLink network (that is, TransLink's hierarchy of light rail stations).

Table 11.9 provides an overview of the requirements in choosing light rail station components. All components must comply with the relevant *Disability Standards* to the maximum extent possible, *Australian Standards* and relevant building codes.

A detailed list of the standards and other references applicable to the components listed in Table 11.10 can be found in the *PTIM, Background and application*.

Table 11.10*:*
Design considerations for light rail station components

Element	Consideration
Information and signage	
Signage and wayfinding	• station design must demonstrate consistency with TransLink design, branding and signage. Refer to *PTIM, Branding, theming and signage,* TMR *Rail Station Signage Manual* and ensure compliance with applicable *Disability Standards* and *Australian Standards* • incorporate inclusive signage and wayfinding: – to ensure that public transport information is provided in advance of decision points – to ensure customers can easily recognise and find their way to and within the station – to assist in aiding equitable access for all passengers, especially people with vision impairment. For example, through use of wayfinding beacons as an enhancement for blind and low vision passengers.

Element	Consideration
Signage and wayfinding (cont.)	• identify need for wider precinct wayfinding signage to enhance legibility of access to the station • consider signage height, colour contrast and orientation • consider use of universal/international symbols, icons and indicators • wayfinding may include non-text or map-based indicators and themes to assist people to travel in their preferred direction • physical infrastructure should be designed to be intuitive and minimise the need and reliance on extensive signage i.e. wayfinding can incorporate handrails, tapping rails, building or shore lines, path widths, lighting, paving patterns, arrows, vistas, colours, shapes and TGSIs • TGSIs: – warning TGSIs identify hazards such as stairs, change of direction, or gradients. For light rail stations, TransLink requires warning TGSIs to be provided along the front of each platform edge and may be used to represent the yellow safety line. Contact TransLink for requirements – directional TGSIs are used as a walking guide to light rail station platforms and may be used to show the most appropriate and desirable route of travel through a light rail station. However, good facility design will provide other preferred alternatives such as the use of shore lines, and consistent and logical use of spaces – TGSIs must achieve or better the Disability Standard's minimum contrast required from the surrounding pavement surface colour – designs and layouts should be reviewed by specialist access personnel, as well as appropriate user groups, to achieve the most suitable outcome for each location – TGSI should not direct a passenger to obstructions.
Public transport information	• information amenities should be integrated within the design of the light rail station structure and environment, and in locations that do not impede free flowing access paths and walkways • passenger transport information can consist of electronic kiosks and static or real-time displays. Information should be located in waiting areas and decision points within and on approach to the light rail station. Information should include light rail timetables, maps, services, special notices etc. with the message displayed appropriate for where the customer is within the precinct and relevant to where they are on their journey. For example, next service departure time displayed is directly related to the travel time required to walk to the platform for boarding • electronic information displays should face passengers and be positioned at a comfortable viewing angle and height. Designers will need to determine the most suitable quantities, locations, technology requirements and expectations, service levels and design intent for electronic displays and help phones • the location of information amenities must be considered early in the design phase to incorporate appropriate security surveillance and power and data requirements.

Element	Consideration
Station precinct	
Architecture	• while light rail travel facilitates the journey, it is important to consider the station form, function and its relationship to the local community and wider precinct. Creation of the station as a focal point can promote sense of ownership, pride and joy to the community and users of the station • stations must not be designed to be purely functional • designers must attempt to create visual interest by integrating: – colour significant to the area – design elements from local flora and fauna – design elements highlighting site's cultural heritage and significance – the site's significance of place. • station design should promote improved customer satisfaction, comfort and convenience.
Retail	• during design all opportunities to integrate or co-locate retail facilities must be explored in conjunction with TMR. These facilities must be designed so that they provide an enhanced user experience while prioritising public transport • retail facilities could be included where opportunity exists and be designed to provide an easily accessible and affordable shopping experience offering merchandise or services that users might require while travelling • facilities designed may range from space provision for future private investment or complete development with and opportunity to rent space for private operation • retail facilities may provide passive surveillance, activation and assistance while improving precinct safety • facilities may range from: – small news agent/coffee shop – small grocery store/mixed retail store – mixed-use development – Transit-Oriented Development (refer to *PTIM, Planning and design Appendix 2-A*).

<table>
<tr><th>Element</th><th>Consideration</th></tr>
<tr><td>Pavement and access</td><td>Pedestrian pavements:
to be compliant with Austroads Guide to Road Design and AS1428.1
provide a consistent, attractive, durable, easily-maintained surface that is appropriately graded and sheltered
suitable for access, waiting and queuing, as well as accommodating the full range of furniture elements
integrate TGSIs and wayfinding aids for persons with a vision impairment and comply with applicable Disability Standards
external access paths and links to and from the light rail station should be reviewed and considered in the planning and design phase to ensure direct and equitable access for all users.
Pedestrian crossings:
design should remove conflicts between pedestrians, general traffic and public transport vehicles, if any
at-grade pedestrian crossings are preferred where safety and relative priority can be maintained. Refer to TMR Manual of Uniform Traffic Control Devices, Part 10, Pedestrian Control and Protection, Transport Operations (Road Use Management - Road Rules) Regulation 2009, Austroads Guide to Traffic Management, and Australian Standards etc. for design requirements
uncontrolled crossings (i.e. zebra crossings and shared zones), are preferred except where safety or capacity concerns exist
traffic should be diverted or de-prioritised where there are pedestrian concentrations. Where controlled crossings are necessary, this can be achieved by giving priority to the pedestrian movement and minimising waiting times for pedestrians
refer to Austroads Australasian Pedestrian Crossing Facility Selection Tool [v2.1.2] to inform pedestrian crossing facility type
grade-separated crossings between platforms may be needed. Lifts or escalators are the preferred options, depending on access requirements. Where possible, the grade-separated structure should be integrated into the primary facility structure in order to minimise passenger travel.
Road design:
vehicular pavement design must accommodate the loads and turning movements associated with all vehicle types expected to access the light rail station. Concrete rather than asphalt should be used to minimise maintenance
overall pavement finish options must be endorsed by relevant stakeholders
appropriate road speed limits should be adopted considering the increased number of pedestrians and cyclists on the road network adjacent to stations .
Access intersections:
In line with the TMR Road Safety Policy, the following provisions are required at public transport infrastructure access:</td></tr>
</table>

<table>
<tr><th>Element</th><th>Consideration</th></tr>
<tr><td>Pavement and access (cont.)</td><td>

– unsignalised left turn slip lanes should be avoided, however if unavoidable, pedestrian crossing control shall be either two-aspect controlled signals or raised platform or zebra crossing
– at signalised intersections, pedestrian crossing shall be provided on all legs of the intersection.

Access design to provide adequate sight distance for entering and exiting traffic. Refer to TMR Road Planning and Design Manual Volumes 3, Part 4 and 4A and Austroads Guide to Road Design.
Other:
footing details for platform shelters and other facility infrastructure, as well as all pavements, need to meet current regulations and standards and be approved by a certified engineer.
</td></tr>
<tr><td>Materials and furnishings</td><td>

common visual appearance by aligning structures, pavement, signage wayfinding and other infrastructure with the TransLink branding and theme (or as agreed with stakeholders)
design elements to be tailored to meet site-specific operational and functional requirements within the overarching TransLink theme
components are durable, easy to use and maintain
kit of parts and consistent facility components are used to facilitate future maintenance and expansion of infrastructure
materials (such as steel) for structure supports and beams should emulate a lightweight appearance to achieve a modern, open and safe environment
comply with all applicable standards and regulations including Australian Standards and the National Construction Code
approved by relevant stakeholders.

</td></tr>
<tr><td>Handrails, balustrades and fencing</td><td>

Handrails:

– handrails are generally used in conjunction with ramps, stairs and walkways
– can be used as a form of support and wayfinding aid that is compliant with relevant standards
– a grabrail or handrail must be provided at fixed locations where passengers are required to pay fares, for example, AVVM and ticket window.

Balustrades and fencing:

– provide vital separation between people and hazards where access is not permitted
– Fencing can provide a discreet barrier between hazards to promote safe alternative access routes via dedicated overpasses. Fencing can also be used to protect and secure assets including the light rail corridor and restricted areas
– fencing should be used at a minimum, and only installed where necessary while still able to promote an open station layout
– provide a visually attractive, semi-transparent, and functional system, and be constructed from materials that are robust, contemporary and easily maintained.

all handrails, balustrades and fencing are to comply with applicable Disability Standards and Australian Standards.

</td></tr>
</table>

Element	Consideration
Access and interchange	
Supporting access facilities	• **Walking**: when designing pedestrian infrastructure, reference to *Austroads, Australian Standards, National Construction Code, Disability Standards* and *PTIM, Supporting access infrastructure*, Section 3.3 Pedestrian infrastructure should be made. • **Cycling**: refer to *PTIM, Supporting access infrastructure* for further detail regarding cycle infrastructure. Refer to Austroads guidelines and the TMR Technical Information for Cycling for further information about cycle demand and forecasting. Specialist cycle design advice should be sought when designing cycle amenities including end-of-trip facilities. Advice on TMR technical standards and publications relating to cyclists can be sought through TransLink, other relevant government stakeholders and the TMR Technical Information for Cycling. • **Bus stop and interchange**: design of light rail stations should consider nearby bus stops and bus feeder services to ensure that passengers can access this public transport infrastructure conveniently and safely. For transferring and destination customers, bus stops locations should limit the need to cross roads. Refer to *PTIM, Bus stop infrastructure* for detail on designing bus stops. • **Taxi**: as a key part of a balanced transport network, taxi facilities need to be integral to light rail stations. The primary integration issue is to ensure passengers can transfer easily through the light rail station and readily identify the taxi facility location upon exiting public transport facilities. Taxi bays are to be accessible and located so that connection to station and platform is accessible, direct, legible and minimises walking distance. Refer to *PTIM, Taxi facilities* for detail on designing and incorporating taxi facilities. • **Personalised Public Transport (PPT): [placeholder]** • **Kiss 'n' ride:** direct vehicle access to and from arterial, sub-arterial and distributor roads is preferred. Connections between kiss 'n' ride infrastructure and light rail station facilities should be accessible, direct and legible, and incorporate CPTED principles. Kiss 'n' ride activity should be accommodated within a formalised facility. Informal kiss 'n' ride activity should be discouraged, particularly where safety issues are likely to occur. Kiss 'n ride infrastructure is to include at least one accessible bay (number of accessible bays to be agreed in advance with TransLink with additional potentially required depending on surrounding land use i.e. hospital, aged car facility). The location of kiss 'n' ride infrastructure should aim to minimise the need for pedestrians to cross the road. Where this is not possible, pedestrian crossing infrastructure will be required. Kiss 'n' ride infrastructure should not interrupt cycle movements, and should minimise the need to cross cycle paths. Refer to *PTIM, Supporting access infrastructure* for further detail regarding passenger set-down infrastructure. **Park 'n' ride**: refer to *PTIM, Park 'n' ride infrastructure* for further detail regarding the planning and design of park 'n' ride facilities. Well-designed park 'n' ride facilities can improve access and customer reach to the light rail network • **Other access requirements**: requirements for service and emergency vehicles should also be considered.

Element	Consideration
Cycle storage	• cycle parking/enclosure facilities, when provided in the design and layout of light rail stations (refer Table 11.9) are to be scalable and accommodate future demands as required • secure cycle storage facilities and cycle rails should be close to light rail station platforms for a safe and easy transfer to passenger transport. The location of cycle parking facilities should, where possible, lead to and be in direct line of sight to the cycle route • cycle storage must be located in a visually-prominent position within or immediately adjacent to the light rail station environment, to allow passive surveillance • materials used for these facilities should be secure, transparent, durable, easily cleaned and resistant to vandalism or abuse • the amount of cycle storage provided will be determined by the size and location of the facility and availability of adjoining cycle access paths • cycle storage/enclosure may be required on either side of the light rail corridor • consideration should be given to providing appropriate electrical conduits for lighting and in preparation for electronic card access and other future electronic requirements • For further details on cycle storage facilities and amenities, refer to the *PTIM*, *Supporting access infrastructure,* Austroads *Cycling aspects of Austroads Guides,* TMR *Supplement Traffic and Road Use Management Volume 1, Manual of Uniform Traffic Control Devices* and technical notes • Liaison with TMR should be carried out to confirm type and location of facilities.
Station and platform	
Automatic Fare Collection equipment	• TransLink will provide and install electronic ticketing system (ETS)/Automatic Fare Collection (AFC) equipment and is responsible for: the provision, installation, testing and commissioning of AFC equipment • ticketing amenities should be integrated within the design of the light rail station structure and environment, and in locations that are easily accessible and visible, and do not impede free flowing access paths and walkways • the location of ticketing amenities must be considered early in the design phase to incorporate appropriate security surveillance and power and data requirements • TransLink will provide and install electronic ticketing system (ETS)/Automatic Fare Collection (AFC) equipment and is responsible for: the provision, installation, testing and commissioning of AFC equipment • ticketing amenities should be integrated within the design of the light rail station structure and environment, and in locations that are easily accessible and visible, and do not impede free flowing access paths and walkways • the location of ticketing amenities must be considered early in the design phase to incorporate appropriate security surveillance and power and data requirements fare machines issue TransLink's integrated transport fares/tickets for use on buses, trains, light rail and ferries: – Add Value Vending Machine (AVVM) - A self-serve electric ticketing fare machine consisting of a touch screen display, card reader and cash payment options, used to purchase paper tickets or perform a limited range of go card functions including displaying the card balance, transaction history, or adding value to the go card

Element	Consideration
Automatic Fare Collection equipment (cont.)	– Stand Alone Card Interface Device (SACID) – An electronic device (usually placed at the entry/exit and key decision points of light rail stations) used by passengers to validate a go card at the commencement and end of their trip so that their trip fare can be calculated. • locate AVVMs and SACIDs close to entrance points or nominated boarding points taking into consideration the sequence of movement and paid/unpaid areas, and maintaining a safe distance from any stairs or ramps. Locate AFC clear of other obstructions on the platform to maintain visible connectivity and access along the path of travel • SACIDs are to be located: – away from platform access ramps to ensure there is a level queuing area for customers – clear of boarding and alighting queuing areas. • locate AVVMs near the Help Point, within CCTV coverage and underneath canopy/shelter to provide weather protection for customers • a grabrail or handrail must be provided at fixed locations where passengers are required to pay fares, including AVVMs and ticket window • when fare gates are to be provided, they are to be located to control, in a single line, all customer flows at all entry and exit points within a light rail station precinct. Design to consider a suitable location of a gate attendant so they have visual oversight along the length of the barrier line • should fare gates be installed on overpasses, subways or on platforms, consider space, capacity and queuing requirements • location of fare gates should also consider adequate provision of space for passenger run-on and run-off • the ticket office allows customers to purchase paper tickets, purchase/validate electronic go cards and provides a customer service function • liaison with TransLink shall be undertaken to identify the number, type and location of ticketing infrastructure needed based on current and forecast demand. TransLink will also provide the requirements for installation of ticketing infrastructure at the light rail station. This is essential to address ticketing infrastructure needs, and installation requirements (for example, power, conduits, cabling, connections, and so on). Final approval of the design and installation of ticketing infrastructure must be sought from TransLink.
Public toilets	• inclusion of public toilets will depend on the light rail station location, level-of-service, staffing arrangements, asset management and passenger comfort and safety. Refer Table 11.9 for component requirements for each station type • toilet amenities must meet *Disability Standards* and *Australian Standards* • toilets should be located in visible and practical, yet discreet, locations and include security requirements • inclusion of toilet amenities must consider construction and installation requirements within light rail station design, such as plumbing and drainage.
Staff amenities/ cleaning room	• depending on the light rail station, staff amenities (kitchen and toilets) may need to be provided. Consultation with relevant stakeholders is required to ascertain the need and requirements for these staff and operational facilities.

Element	Consideration
Stairs and escalators	• escalators and stairs should not conflict with the direction of established horizontal pedestrian flow for those entering or leaving the flow of vertical travel • Stairs – use where grade-separated treatments are necessary for access or movement within a light rail station – should provide simple and safe transition between levels and comply with all applicable design standards (the proportion of treads to risers, landings, slip resistance, TGSIs, colour contrasts and hand rails/balustrades) – typically accompanied by ramps/escalators/lifts for compliance, when required – TransLink prefers design to accommodate LOS C based on pedestrian flow during peak periods, allowing for both ascending and descending movement. • Escalators – alternative to stairs for light rail stations operating with consistently high volumes of passengers during peak periods, or light rail stations that feature high levels of grade separation – should be co-located with stairs and lifts to offer passengers alternate and accessible options – if the option of including bi-directional escalators is not available (due to site constraints or light rail station capacity volumes not being sufficient), escalator travel should be given preference towards ascending passengers or the dominant peak flow – escalator width should be sufficient for passengers to queue in a single file by simply standing, while still allowing pedestrians who wish to walk (in the travel direction) to pass with minimal obstruction – escalators must comply with applicable structural Building Standards and should be consistent with the overall light rail station architectural design.
Ramp	• comply with applicable Building and *Disability Standards*, with adherence to the particular construction details shown in the *Australian Standards* and *National Construction Code*.
Lifts and over/ underpasses	• some light rail stations will need a lift and over/underpass structures to connect platforms. The number and size of lifts will need to be determined with consideration to likely pedestrian demands • identify measures for maintaining access for all users, including people with a disability, during a degraded state (for example, broken down lift) • minimum LOS C during peak is preferred for over/underpass walkways • LOS D acceptable for lifts during peak periods • comply with applicable *Disability Standards* and *Australian Standards* • should appear to be of a lightweight modern structure, transparent to ensure passive surveillance, durable, easily cleaned (such as stainless steel finish) • be consistent with the overall look and feel of the light rail station • design of lift areas should also consider adequate provision of space for passenger run-on and run-off.

Element	Consideration
Shelters	• shelters and all facility structures should project a consistent design language that: – appears modern, light and spacious – is quality and standard – is reflective of the Queensland sub-tropical climate – is reflective of TransLink's infrastructure theming and architectural design. • structures at platforms must be cantilevered to provide an unobstructed kerb-line (free from posts or other structural supports) and can be single or double-sided cantilever, depending on platform layout • structures must provide complete weather protection during all parts of the day to minimise head island effect on platforms and to improve customer waiting experience • passenger information displays, signage and wayfinding can be attached to the cantilevered structure providing they do not obscure sightlines (including CCTV sightlines) • shelter structures should include quality finishes with modern, durable, and easily maintained materials that are reflective of the overall light rail station environment and climatic conditions (that is, sun, rain, natural light and airflow) • the following areas to be sheltered and under cover: – all fare gate infrastructure other than SACIDs – assisted boarding point – circulation space in front of the ticket counter and AVVM – circulation space in front of each lift door linking through to the boarding point – path of travel from platform access to the assisted boarding point. • maintain clear sightlines for vehicle movements at nearby intersections (refer TMR *Road Planning and Design Manual 2nd Edition Volume 3*) when designing shelter structures.
Platform	• platform design should be uncluttered and sized to suit demand, pedestrian access and circulation requirements, seating needs and operational needs • design of station platform to consider the potential for future implementation of screen doors.
Assisted boarding point and priority waiting area	The assisted boarding point is a designated area on light rail station platforms that include, but is not limited to, priority seating area, an assisted boarding point, emergency phone and service information.
Drinking fountains	• appropriate water supply and drainage to the drink fountain required • they are generally located close to waiting or congregation areas, seating, information displays, cycle storage areas, and light rail station entries and exits • drinking fountains should be constructed from materials that are easy to maintain, and should include stainless steel water catchment and drainage. Furthermore, they must be designed to be accessible for people with disabilities.

Element	Consideration
Seating and lean rails	• must be provided in quantities reflective of the expected waiting times and levels of anticipated patronage for the light rail station • seating should be provided at all allocated waiting areas without impeding free flowing access paths and walkways (i.e. set back from the path of travel by 500mm) • seating and lean rails should be provided on platforms where passengers can easily see approaching light rail services, typically where there is complete weather protection and where the environment is safe and well lit. They are typically positioned facing the conveyance and either at the rear of the single-sided platform and shelter or in the centre of a double-sided platform and shelter • seats should be designed as per *AS 1428.5,* include backrests and armrests and be constructed from durable, easily cleaned and maintained materials that allow drainage from liquids • all furniture must offer appropriate contrast in colour with the immediate background • lean rails provide passengers with a convenient waiting option by allowing passengers to perch or lean, rather than be seated, when waiting for brief periods or where waiting space is limited
Bins	• bins are generally located close to waiting or congregation areas, seating, information displays, boarding points, cycle storage areas, and light rail station entries and exits • use of bins at high passenger volume light rail stations, such as CBD and regional facilities, may warrant careful consideration due to potential security risks • bins at particular light rail stations should be designed to allow for detection of suspicious objects. They may be constructed from materials with an open gauge to provide transparency (with a transparent clear plastic liner) that is easy to maintain • bin design should aim to be vandal-proof, water-proof and bird-proof. The provision of recycling bins may also be an option and should be considered during the facility detailed design phase • recycle bins may be incorporated adjacent to general waste bins to promote recycling, with appropriate recycling collection arrangements in place.
Shopping trolley bays/storage	• where light rail stations co-exist with shopping centres or other retail outlets, there may be the requirement to include appropriate, discreet, and easy to maintain shopping trolley bays or storage within or close to the facility • an agreement from the retail outlet to collect shopping trolleys on a regular basis is also required.

Element	Consideration
Safety and security	
Intelligent Transport Systems (ITS)	• ITS functionality should be considered for all public transport facilities within the context of the broader TransLink network and include security cameras, real-time information, public address systems, incident management systems, and monitoring and communications systems • ITS hardware and connection points are typically located in a communications room within the overall facility. These ITS or communications control rooms may adjoin other facilities within the light rail station, such as toilets or storerooms. They should be located in discreet locations within the facility environment and not impede public spaces or free flowing pedestrian access to the light rail station • design of the facility must not attract attention • the specific installation (including power, conduits and security) and asset management schedule requirements for the inclusion of the ITS at each facility should be investigated on a site-specific basis prior to detailed design.
Public address system	• a public address system should be integrated into the design of all light rail station facilities. The aim is to provide a robust, functional and visually discreet system that can provide communicative information and be linked to the security system for warning in the event of an emergency • the public address system is to be clearly audible throughout the passenger waiting areas. Loudspeakers for the system should be distributed appropriately throughout the light rail station, including the assisted boarding point, and may be wall or ceiling mounted, depending on acoustic requirements. Speaker units should be mounted at an appropriate distance away from direct reach, or sit flush with light rail station structures, to minimise potential vandalism and damage • the possibility of background noise affecting the audibility of the address system should be treated with appropriate acoustic absorption techniques. Loudspeakers for the system should be distributed appropriately throughout the light rail station • hearing augmentation, hearing loops, and the use of visual/non-auxiliary equivalents should be included and linked with the public address and emergency systems to assist persons with hearing impairments. These are to be located at ticket office, assisted boarding point, internal waiting areas and as per *AS 1428.5*.
Animal and pest problems	• within the light rail station there must be minimal horizontal ledges, overhangs, or concealed spaces where birds and animals are tempted to perch, nest and pollute the light rail station facility • if cavities and horizontal surfaces are unavoidable, then appropriate measures are to be used to prevent animals and pests congregating and/or nesting. This can include designing ledges of structures to be angled (approximately 45 degrees or greater) to make it uncomfortable for birds to perch.

Element	Consideration
Graffiti deterrents and treatments	• all infrastructure components—furniture, lighting equipment, timetable and information devices, walls, floors, ceilings, balustrades, glass panels, screens, elevators, escalators and other components (for example, landscape treatments) —coming into contact with passengers must be resistant to acts of vandalism, littering and graffiti. This may involve components being applied with anti-graffiti coatings or constructed from non-porous graffiti-resistant materials • the design and arrangement of platforms and structures should maximise natural surveillance in order to minimise the incidence of graffiti and anti-social behaviour • in some instances, vegetation may be planted adjacent to structures or walls to prevent access by vandals. Note, choice of vegetation is not to facilitate filling with rubbish • the use of appropriate colours or artwork that complements the light rail station architecture and theming can also deter graffiti.
Security	• security infrastructure refers to security cameras (CCTV) and other items used for the creation of safe and well-monitored waiting environments • details on the specifications and management schedules for these systems will be established by the relevant stakeholders • appropriate construction and installation requirements must be considered when planning for the inclusion of security infrastructure. The use of signage informing people of the presence of security infrastructure within a facility can further enhance personal safety, and highlight the perceived risk of detection to potential offenders • security help points are typically located in the assisted boarding point. Ultimately, the location of all these elements should be the subject of light rail station specific design, as each site is likely to have a range of differing sightlines and movement patterns • counter-terrorism design considerations should be explored where possible on a site-specific basis, depending on light rail station location, level-of-service and potential security risk. Where applicable, light rail station design should strive towards universal standards for security and counter-terrorism measures. Liaise with the Emergency Management and Transport Security division in the Department for advice on requirement for a security and risk assessment, and on including security and counter-terrorism measures at the earliest phase in the light rail station planning.
Lighting	• ambient lighting is to be provided for a safe, comfortable and functional light rail station • feature lighting may highlight architectural features • for day-time use, consider translucent materials to allow natural lighting • for night-time, bright white artificial lighting should ensure a safe and visually attractive environment • quality light fixtures and fittings should be robust, tamper-proof, discreet and complement the light rail station environment • use of common fixtures will improve maintenance and lower ongoing costs • provide lighting on pedestrian areas, roadways and light rail station information • refer to *AS/NZS 1158.3.1* for minimum lighting requirements • for additional disability compliance lighting requirements refer to *Disability Standards for Accessible Public Transport* (2002).

Element	Consideration
Optional enhancements	
Commercial opportunities	• commercial opportunities are typically developed and operated by external companies under an agreed arrangement • the placement of commercial opportunities needs to consider the active transport requirements of the station which should have first priority • it may be appropriate to incorporate: – vending machines, self-serve kiosks – commercial advertising – shared cycle, micro-mobility devices etc. • endorsement of commercial facilities is required prior to detailed design to make allowance for space, power, data and conduits for installation.
Landscape treatment	• landscape treatment is to be incorporated (where appropriate) to complement the light rail station architecture, enhance the identification of a particular location, and integrate the facility with the surrounding environment. It is preferred that plantings used for landscaping are: – Hardy, low maintenance and drought resistant species – Suited to local climatic conditions, soil condition and available root zone development volume – Consistent with and enhancing of existing amenity streetscape plantings and themes – At maturity, achieve required branch and canopy clearances above pedestrian areas, access points, CCTV coverage, lighting and adjacent infrastructure elements without need for ongoing maintenance intervention – Maximise shade where not in conflict with infrastructure, lighting, CCTV & passive surveillance sightlines and CPTED considerations – Unlikely to unduly attract or create refuge for fauna and vermin – Unlikely to drop large amount of litter (leaves, fruit, flowers, seed and so on) on pedestrian thoroughfares that may become a public safety hazard or maintenance problem. – Assist with graffiti management by providing dense screening to exposed and at-risk walls – Utilise WSUD principles where applicable – Species will not grow to encroach into pedestrian areas and other infrastructure elements requiring maintenance intervention. • integrate subsoil and surface drainage with the landscape design • refer to the TMR *Road Drainage Manual* and *Queensland Urban Drainage Manual (QUDM)* for technical guidance in relation to the management of drainage, stormwater runoff and water quality.

Element	Consideration
Ancillary services	• key ancillary services can include vending machines, ATMs and other third-party services not directly concerning passenger transport • should be located in convenient locations, but not impede a passenger's ability to access and move through the light rail station • inclusion and location of these services will depend on agreement with third-party stakeholders, light rail station asset management and light rail station designers, and will be determined on a site-specific basis • consideration should be given to the consolidation of ancillary services to reduce visual clutter and to provide a more integrated service for passengers. Generally, these facilities are positioned close to other passenger services such as fare machines, information displays and help phones • materials used for ancillary services should be consistent with other passenger facilities to achieve a visually integrated suite of services. Ancillary services should be considered early in the detailed design phase to incorporate relevant security, monitoring, power and data requirements.
Other enhancements	• artwork can enhance a light rail station identity and cultural significance of a place, and should be investigated where appropriate • public art should not conflict with light rail station architecture, colour schemes, branding and access requirements • wireless internet access options and connections may be investigated and incorporated • the facility owner and/or asset manager, along with relevant stakeholders, should endorse all enhancements prior to the detailed design stage of the facility.