

Planning for Safe Transport Infrastructure at Schools

Technical guidance for the provision of effective and safe transport infrastructure at schools

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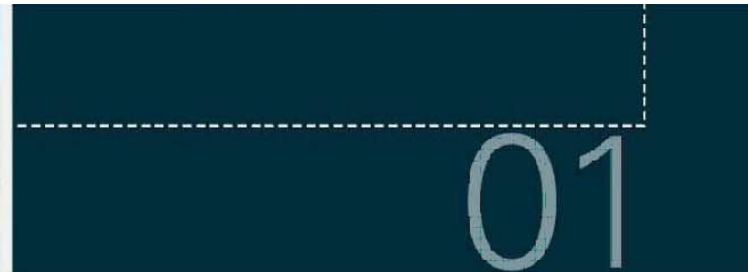
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1. Introduction

1.1 Purpose of this document

This *Planning for Safe Transport Infrastructure at Schools* technical guidance document has been prepared by the Department of Transport and Main Roads (TMR) to assist in the design and provision of effective and safe transport infrastructure solutions at schools in Queensland. It provides examples of best practice and practical solutions for school transport infrastructure, such as ideal pedestrian and cycling end-of-trip facilities, set-down and pick-up layouts for public transport and private vehicles, and modal separation.

The guide can be applied to the refurbishment and upgrading of transport assets at existing schools as well as to the provision of infrastructure at new schools. It focuses on the provision of transportation system assets at and around schools, but the design process should identify operational issues and resource demands required during the operational life of the asset.

1.2 Strategic and policy direction

Queensland is a fast-growing state, with a strong demand for high quality transport facilities at existing and new schools. It is estimated that Queensland's estimated resident population is approximately 4.6 million¹. Through the first three quarters of 2009-10, Queensland's population rose on average by slightly more than 1,800 persons per week. Queensland has recorded faster population growth than the average of the rest of Australia in each year since 1970–71.

Queensland's population has grown at an average annual rate of 2.3% over the past two decades, around double the 1.1% recorded in the rest of Australia².

To provide a framework for this high, and sustained, growth the Queensland Government released *Toward Q2: Tomorrow's Queensland* in September 2008, which articulates targets to be achieved by 2020 to address challenges such as climate change, ageing population, growing economy, social exclusion, unhealthy lifestyles and global competition.

¹ Office of Economic and Statistical Research website, <http://www.oesr.qld.gov.au>, December 2010

² Annual Economic Report year ended 30 June 2010, Office of Economic and Statistical Research

TMR aims to contribute significantly to the Queensland Government objectives outlined in *Toward Q2: Tomorrow's Queensland*. In turn, TMR's objectives align with, and demonstrate a contribution to, each of the government objectives. In terms of the *Planning for Safe Transport Infrastructure at Schools* technical guidance document, the most applicable of TMR's objectives are:

Strong: A sustainable transport system which promotes economic growth and enhances liveability

Healthy: A safe transport system leading to improved health and wellbeing for Queenslanders

Fair: An accessible transport system linking people to employment, education, services and social networks

Green: Transport-related impacts on the natural, cultural and built environments managed for the community

Smart: Enhanced capability and capacity of the transport and logistics-related industries

Enabling: Enhanced leadership and stakeholder relationships, improving transport outcomes for Queensland

Based upon TMR's objectives, the underlying principles and emphasis of *Planning for Safe Transport Infrastructure at Schools* are to:

- Give guidance for the provision of good quality transport infrastructure at, and in the vicinity of, schools;
- Provide guidance to the building of assets that contribute to the development of a sustainable school transport system that is sensitive to the geographic, social and demographic context of the community;
- Have regard to the appropriate modal priorities that align with TMR's objectives, which will often mean giving the highest priority to active transport facilities to, from and within school sites with less priority given to private vehicles, ultimately decreasing private vehicle school trips and increasing active transport school trips;

- Endeavour to separate transport modes, with an increased emphasis on building active transport facilities;
- Ensure that there is consistency and good connectivity, regardless of mode, to the existing (and future) local transport network;
- Achieve better connectivity of split school sites to facilitate safe student journeys between campuses with increased emphasis on avoiding split-campus schools;
- Provide secure end of trip facilities for active transport users;
- Reduce traffic congestion, particularly at main school entrance and major access points.

This document includes the following:

- Planning guidance with performance criteria and acceptable solutions;
- Recommendations for infrastructure with supporting technical drawings;
- Application matrix outlining issues/constraints and potential solutions;
- Resources consulted during the development of the guide.

1.3 Children's vulnerability as road users

This guide recognises that the cognitive and perceptual abilities of children are not as developed as those of adults, which results in children being less able to judge danger and cross roads as safely as adults.

Children are at risk around school areas because they are small, can't be easily seen by drivers, are more prone to running, have difficulty judging vehicle speeds and gaps, and have poorer perceptive skills than adults.

The road safety skills of children do improve somewhere around the age of 10 years (year 4 or 5), but even then their understanding of risks are not fully developed much later until adulthood. It is therefore important for designers to appreciate that children are not 'little adults' and the transport system around schools should be forgiving of human error and minimise the level of unsafe user behaviour. Designers should also recognise that children, in particular, are fallible and will always make mistakes, but they should not be penalised with death or serious injury when they do make mistakes.

1.4 Summary of background research

A great deal of background research was undertaken during the preparation of *Planning for Safe Transport Infrastructure at Schools*. A summary of the key findings from the literature review undertaken is given below.

A. Active transport (cycling, scooters, walking and other)

The following key findings, while derived from active transport literature generally, are also considered relevant to the school environment.

Pathwidths

- Desirable width for footpaths is 1.8m;
- Minimum width for on-street bicycle lanes is 1.2m and desired width is 1.5m;
- Minimum width for two-way off-street bicycle paths is 2.0m; Desirable width for off-road shared paths is 2.5m, 3.0m and 3.5m for local access, commuter and recreational paths respectively; Minimum width for overpasses is 2.5m and desirable width is 3.0m; Minimum width for underpasses is 3.0m and a minimum vertical clearance of 2.4m (3.0m preferred).

Path location

- All active transport paths within the school environment should be separated from other modes of transport, particularly near main school entrances with direct routes connecting all transport modes to the school main entrance;
- Priority access and location should be given to active transport at schools with least priority given to private vehicle access.

Crossing facilities

- Generally use kerb extensions at all school crossing facilities;
- Central refuge islands are generally not appropriate at school crossing facilities due to large volumes of pedestrians;
- Children's crossings in school zones require crossing supervisors; At-grade crossing facilities should ideally not be located on heavily trafficked and/or four-lane roads.

Connectivity

- Active transport paths at schools should be located so that access is available from all adjacent residential areas;
- Dedicated active transport paths should extend to the school site boundary in at least two or more different directions.

Bicycle storage

- Bicycle parking for primary schools range from a minimum of five cycle storage spaces for each class to 1 space per three students (year 4 or higher);
- Bicycle parking for secondary schools range from 5% to 10% of building users to 1 space per 3 students and 1 space per 10 staff; Early research by TMR suggests 1 space per 5 students over Year 4 for bicycle parking.

B. Public transport, including school buses

Location

- Ideally bus stop locations at schools are on-street kerbside or on-street indented bus bays;
- Bus stops at schools should be located on down-stream sides of pedestrian crossings and ideally at mid block locations;
- Bus stops and car parking at schools should be separated at both on- and off-street locations, with medians separating buses and private vehicles (if off-street);
- Adequate space within the bus stop is required to allow buses to overtake lead buses when necessary;
- Roads and driveways in and around schools that are to be used by buses shall have a longitudinal gradient of no more than 8%;
- Bus stops internal to the school site, in a shared parking arrangement, are generally not recommended due to potential conflicts with other modes of transport.

Connectivity

- Bus stop areas should be connected with pathways that keep users from conflicting with active modes of transport and provide the most direct route to and from the school.

Amenities

- If students are required to wait for buses, then proper shading and shelter should be provided.

C. Private vehicle

- For private vehicle travel, there are three key user groups at schools: Pick-up/drop-off (short term – 2 minute duration of stay);
- Short term parking (approximately 15 minute duration of stay);
- Longer term parking including staff/visitors/special user groups such as preparatory and special education units.

Parking supply

- Parking supply rates vary considerably depending on the source and location of the data and separate rates of supply should apply to each user type.

Parking design

- Should generally be in accordance with AS2890.1, with different configurations and operation for each user group.

Parking operation

- Should avoid issues and conflict with external road network components and other user groups and transport modes.
- Appropriate queue storage at entry and exit to each car park should be provided.

D. Transport location criteria for schools

Road frontage

- New school sites should be selected with access frontage to appropriate road types, i.e., collector and access streets, and should be selected to capitalise on the opportunities afforded by multiple frontages;
- Site location should promote active transport and safety; Topography should encourage and promote active transport;
- Barriers preventing active transport and posing safety hazards should be avoided;
- Should be located adjacent to existing and planned active transport networks and, adjacent to land uses which are compatible with and support the integration of the school site with these networks.

Split-campus schools

- To be avoided if at all possible;
- Schools often do not begin as a split-campus but can evolve into a split-campus over time;
- Appropriate crossing facilities include overpasses, underpasses and pedestrian actuated traffic signals.

E. Key findings of the case study review

The key findings based on the case study review undertaken can be summarised as follows:

Active transport

Kerb build outs are desirable at school crossings;

Wide footpath at high demand locations are important such as school entrances, adjacent bus stops and parent drop-off/pick-up zones;

It is desirable to have multiple access gates to the school;

Caged bicycle parking facilities are best practice with a direct path connection from the school gate;

Connectivity to the surrounding residential area is important to encourage active transport use.

Public transport, including school buses

1. Important to provide easy access for the bus at stops;
2. Bus stops should be separated from private vehicle areas;
3. The need for a shelter and seating at bus stops depend on the individual school operations.

Private vehicle

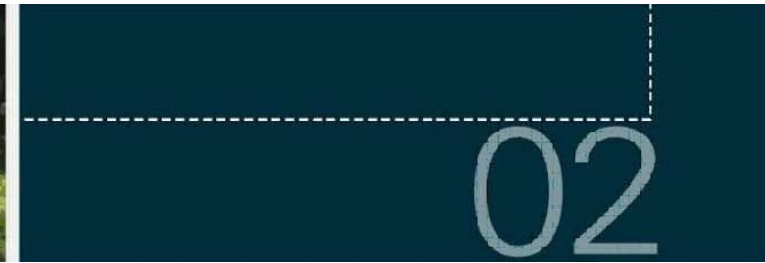
4. Car park location on the periphery of the school site is desirable;
5. Provision of a number of car park locations around the school site is desirable to cater for the different users;
6. The size of the car park to meet demand is important but also a balance to provide the correct number of spaces to meet demand and reduce overflow parking onto surrounding streets, whilst promoting active transport;
7. Pedestrian paths through car park should be physically separated, i.e., a raised path and not a painted path;
8. The layout of the car park is important for safe and efficient use of the car park. This is particularly important in parent drop-off areas;
9. It is important to provide pedestrian path connectivity from the car park to the school facilities.

Site location

1. Minor road access is most desirable for safety and to encourage connectivity to the surrounding residential catchment.

Splitcampusschools

1. The type of crossing type across roads at split campus schools needs to consider a range of factors such as demand by the school to cross, road hierarchy, road width, traffic volumes, speed desire lines etc;
2. Underpasses and overpasses need to be designed to be attractive and safe to encourage use.



2. Infrastructure Planning Guidance

2.1 Development outcome

The aim of this section is to provide the overall planning guidance to assist in planning and providing for safe school infrastructure. The planning guidance documented in this section provides the overall strategies and guidelines for each outcome proposed to be achieved for school infrastructure. Section 3.0 consequently supports this section with more detailed schedules and technical drawings. The guidelines documented below have been divided into five key outcome areas:

- **Outcome 1:** Active transport - provide infrastructure that promotes and supports active transport.
- **Outcome 2:** Public transport - provide safe infrastructure that promotes and supports the use of public transport.
- **Outcome 3:** Private vehicles - safe and appropriate infrastructure should be provided to cater for private vehicle access to the site.
- **Outcome 4:** Site selection - the location of the potential school site appropriately considers safe access by all modes of transport.
- **Outcome 5:** New split-campus schools - adequate infrastructure should be provided to minimise pedestrian and vehicular conflict.

The outcomes and recommended guidelines have been developed based on the research undertaken during the development of *Planning for Safe Transport Infrastructure at Schools*.



Table 1: Active transport

Specific outcome	Probable solutions	Notes	Relevant infrastructure guidelines and standards
<p><u>Outcome 1:</u> Provide infrastructure that promotes and supports active transport</p>			
<p>S1 Safe and connected network of pedestrian and cycle facilities are provided within the site to link to crossing facilities and networks outside the site</p>	<p>P1.1 Widths of paths are provided in accordance with Schedule 1 (as shown in Section 3.1 of this guide).</p>	<p>Refer to Figure 1 to illustrate a typical hierarchical approach to path provision.</p>	<ul style="list-style-type: none"> • School Environment Safety Guidelines • Austroads Guide to Traffic Management • Austroads Guide to Road Design • TMR's Cycle Notes • Local Government planning scheme provisions • Manual of Uniform Traffic Control Devices (MUTCD) Part 9 and 10 • Queensland Cycle Strategy
	<p>P1.2 Pathways connect to existing and proposed surrounding cycle and pedestrian networks and crossing facilities.</p>	<p>This may involve multiple pathways from a number of the school boundaries and consequently additional pedestrian/cycle only entrances at these locations.</p>	<ul style="list-style-type: none"> • Local government pedestrian and cycle network plans and undertake an audit of existing facilities as part of new school design process should be examined. • Principal Cycle Network Plan (PCNP)
	<p>P1.3 Pathways have priority over motor vehicles and avoid crossing entrances to car parks and areas where vehicles pick-up and drop-off students.</p>	<p>Where crossings of vehicle entrances and areas cannot be avoided, the pathway should have priority over the vehicles and be designed to increase the awareness and visibility of the users.</p>	

Specific outcome	Probable solutions	Notes	Relevant infrastructure guidelines and standards
S1 Safe and connected network of pedestrian and cycle facilities are provided within the site to link to crossing facilities and networks outside the site	P1.4 The internal network of pathways meet the most direct route between buildings, amenities and entrance/exit points.	Also refer to P4.2 regarding egress of path at school boundary.	
	P1.5 A direct pathway between the bus stops, car park and school buildings is provided. The pathway between the bus stop and school buildings should not pass through areas where motor vehicles pick-up and drop-off students.	Vehicle/pedestrian interaction is not desirable and should be avoided.	
	P1.6 All pathways are constructed in accordance with AS1428 - Design for Access and Mobility.		<ul style="list-style-type: none"> • MUTCD Parts 9 and 10 • AS1428 Council Planning Schemes
	P1.7 On road bicycle facilities adjacent to school frontage are avoided.	Where on road facilities are provided for commuter cyclists, appropriate off street facilities should also be provided to complement these to cater for school cyclists.	<ul style="list-style-type: none"> • Austroads Guide to Traffic Management - All Parts • Austroads Guide to Road Design – All Parts • Local government design guidelines.
	P1.8 Development and pathways design incorporates Crime Prevention Through Environmental Design (CPTED) principles to minimise opportunities for crime/misbehaviour such as located to encourage casual surveillance, avoiding entrapment areas, placement and type of vegetation.	Further consideration should be given to lighting design, and the warrants for this considering the primary use of facilities is daytime based.	<ul style="list-style-type: none"> • Crime Prevention through Environmental Design - Guidelines for Queensland (Qld Government)

Specific outcome	Probable solutions	Notes	Relevant infrastructure guidelines and standards
S2 Bicycle parking is provided which is sufficient to meet the needs of users and is safe and accessible.	P2.1 The provision of bicycle parking for students, staff and visitors to be provided in accordance with Schedule 2.	Appropriate bicycle parking supply should be provided for all user groups to promote and encourage the use of active transport.	
	P2.2 Bicycle parking to be located within 100m of the main school entrance and in a location which allows surveillance across the day to prevent theft.	Examples of appropriate locations for bike parking shown in Figures 1 and 2. Crime Prevention Through Environmental Design principles should also be considered in locating bicycle parking.	<ul style="list-style-type: none"> • Crime Prevention Through Environmental Design – Guidelines for Queensland (Qld Government)
	P2.3 Secure bicycle parking is provided. Minimum infrastructure is bicycle racks which allow the user to lock their bike securely. Desirable level of service is a bicycle cage (Refer Figure 3)	Refer to Figures 1, 2 and 3 for examples of appropriate parking location and typical bicycle parking types.	<ul style="list-style-type: none"> • Austroads Guide to Traffic Management - All Parts • Austroads Guide to Road Design across - All Parts • AS2890 Parking Facilities • The Bicycle Parking Handbook, Bicycle Victoria • TMR Cycling Notes Part C3 and C4
	P2.4 A pathway connecting the bicycle parking to the entrance and internal network is to be provided. This should be no less than 2m wide (minimum width) and in accordance with Schedule 1.	Also refer to P4.2 regarding egress of path at school boundary	

Specific outcome	Probable solutions	Notes	Relevant infrastructure guidelines and standards
<p>S3 Appropriate support facilities are provided to increase the comfort, convenience and amenity for those walking or cycling.</p>	<p>P3.1 Major internal pathways and those immediately adjacent to the school boundary on the site provide lighting in accordance with AS1158 - Public Lighting Code.</p>	<p>Further consideration should be given to lighting design, and the warrants for this considering the primary use of facilities is daytime based.</p>	<ul style="list-style-type: none"> AS1158 Lighting for Roads and Public Spaces
	<p>P3.2 Shelter for uses are provided over major internal pathways.</p>	<p>A permanent shade structure or awnings are the preferred option. On paths that are less important, appropriate shade trees could be considered.</p>	<ul style="list-style-type: none"> Sunsmart Australia Developing Quality Shade in Schools
	<p>P3.3 Signage is provided to clearly identify pathways, school entrances/exits, school buildings and amenities, as well as directional signage to connect external walking and cycling paths and public transport.</p>	<p>A map at school entrances should be provided. Signage at primary schools should be designed cognisant of the developing reading skills of students.</p>	<ul style="list-style-type: none"> TRUM Volume 1 Part 4 - Queensland Cycle Network Signage Guidelines
	<p>P3.4 Provision of appropriate end of trip facilities such as showers and lockers are provided for staff in accordance with Schedule 2. For high school students, ensure the school allows access to showers for students before school.</p>	<p>Generally showers are not necessary for primary school students. However, some older students might prefer access to showers, therefore it is recommended access to existing showers should be provided, e.g., in school gym.</p>	

Specific outcome	Probable solutions	Notes	Relevant infrastructure guidelines and standards
<p>S4 Safe and connected crossing facilities for cyclists and pedestrians are provided</p>	<p>P4.1 School crossing facilities provided in accordance with MUTCD Part 10 generally shown on Figures 4-6. Kerb build outs should be provided to reduce crossing distance for users, and to discourage illegal parking in no standing zones and reduce vehicle speeds.</p>	<p>At-grade crossings types selected should correspond to the warrants outlined in the relevant guidelines. Additional guidance is provided in Schedule 4.</p> <p>Kerb build outs should ideally continue the full length of the No Standing zone.</p>	<ul style="list-style-type: none"> • TRUM Volume 2 Part 3 - School Zone Guidelines • Austroads Guide to Traffic Management • Austroads Guide to Road Design • MUTCD Part 10 • TRUM Volume 1 Part 6 - Pedestrian Crossing Facility Guidelines
	<p>P4.2 School crossings are located:</p> <ul style="list-style-type: none"> • to meet the desire lines from the surrounding areas; • offset 20m of the school gate. 	<p>Pedestrian network analysis as part of new school design would be beneficial</p>	
	<p>P4.3 School crossings are located:</p> <ul style="list-style-type: none"> • in a location with appropriate sight distance (refer Austroads); • not conflicting with carpark operation and visibility; • be well lit in accordance with AS1158; • Ideally greater than 200m from another higher order traffic control device with a formal crossing facility on the same street e.g. traffic signals/roundabouts. 	<p>School crossings should be designed in locations that don't compromise the safety of users, and incorporate the requirements outlined within the relevant design guidelines.</p>	<ul style="list-style-type: none"> • Austroads Guide to Traffic Management • Austroads Guide to Road Design • TRUM Volume 2 Part 3 - School Zone Guidelines • MUTCD Part 10
	<p>P4.4 School crossings incorporate channelisation which could incorporate low vegetation and planting to encourage people to use the crossing and not cross in other locations. If space constraints, fencing could be considered.</p>	<p>These measures should not be necessary if comply with P4.2.</p>	

Table 2: Public transport

Specific outcome	Probable solutions	Notes	Relevant infrastructure guidelines and standards
<p><u>Outcome 2:</u> Provide safe infrastructure that promotes and support the use of public transport</p>			
<p>S1 Safe, convenient and prioritised public transport facilities are provided which adequately accommodates the proposed school population.</p>	<p>P1.1 Bus stops / bus bays are to be provided in accordance with the Transport Planning and Coordination Regulation and Figure 7 in this report.</p>	<p>Refer to Figure 7 in this report for typical bus stop/bay layouts</p>	<ul style="list-style-type: none"> • TRUM Volume 2 Part 3 - School Zone Guidelines • Transport Planning Co-ordination Act Regulation • Austroads Guide to Traffic Management Part 11: Parking (AGTM11-17) • TMR Road Planning and Design Manual • TransLink Public Transport Infrastructure Manual
	<p>P1.2 Bus stops and indented bus bays provision are designed to cater for the anticipated school student population and avoid queuing. The following factors are considered to determine bus bays needed:</p> <ul style="list-style-type: none"> • expected final demand; • location and accessibility to scheduled public transport; • existing and potential cycle/pedestrian catchment area; • potential students living outside of catchment area; • rural vs. urban schools; • school service versus general service; • age of students; 	<p>Figure 7 outlines design criteria for calculating the length of bus stops necessary for a variety of placement locations. Additional guidance is provided in Figure 7 of the TransLink Public Transport Infrastructure Manual.</p>	<ul style="list-style-type: none"> • TRUM Volume 2 Part 3 - School Zone Guidelines • TRUM Volume 2 Part 5 - Rural School Bus Routes and Bus Stops • TransLink Public Transport Infrastructure Manual

Specific outcome	Probable solutions	Notes	Relevant infrastructure guidelines and standards
<p>S1 Safe, convenient and prioritised public transport facilities are provided which adequately accommodates the proposed school population.</p>	<ul style="list-style-type: none"> • demographics; • consultation with TMR and local bus operators; • bus size; • public transport timetables. 		
	<p>P1.3 The location of bus stops are as follows:</p> <ul style="list-style-type: none"> • in an on-street configuration adjacent to the major road way and not requiring diversion through a car park or drop-off area; • roads and driveways in and around schools that are to be used by buses shall have a longitudinal gradient of no more than 8%; • located separately from the car parking area; • located closer to the school entrance/exit than the car parking area; • located to avoid congested routes such as those providing access to car parks and drop-off areas so they have a priority route through the transport system; • allows the bus to enter and exit in a forward direction; • located on the far side of an intersection, pedestrian crossing facility or vehicle entry/exit point. 	<p>If the location of the bus stops cannot be along the roadway, and a turnaround area for buses is required, it should remain separate from parking and drop-off areas. The turnaround needs to cater for the relevant design vehicle.</p> <p>If location of bus stops cannot avoid congested roads, then priority treatments for public transport need to be considered, including dedicated bus lanes or queue jumps at intersections.</p> <p>Some schools, particularly rural schools, may also require bus interchange facilities. If necessary, these should also be designed in accordance with Transport Planning Coordination Act.</p>	<ul style="list-style-type: none"> • TRUM Volume 2 Part 3 - School Zone Guidelines • TRUM Volume 2 Part 5 - Rural School Bus Routes and Bus Stops
	<p>P1.4 All bus stops and taxi zones are to be constructed in accordance with AS1428 - Design for Access and Mobility.</p>		<ul style="list-style-type: none"> • AS1428 - Design for Access and Mobility

Specific outcome	Probable solutions	Notes	Relevant infrastructure guidelines and standards
<p>S1 Safe, convenient and prioritised public transport facilities are provided which adequately accommodates the proposed school population.</p>	<p>P1.5 Bus stops and taxi zones are to incorporate Crime Prevention Through Environmental Design (CPTED) principles to minimise opportunities for crime/misbehaviour such as located to encourage casual surveillance, avoiding entrapment areas, placement and type of vegetation.</p>	<p>These areas are potentially key interfaces with the public where monitoring and supervision by school staff may have less impact and incorporating these principles will help reduce the incident potential.</p>	<ul style="list-style-type: none"> • Crime Prevention through Environmental Design - Guidelines for Queensland (Qld Government)
	<p>P1.6 Taxi zones incorporate the following:</p> <ul style="list-style-type: none"> • located within the vehicle drop-off/pick-up designated area and not within the bus drop-off area; • be located closer to the school buildings/entry point than the designated vehicle spaces; • be appropriately signed and line marked to avoid illegal use of these spaces; • at least one taxi space per school; • design of space should follow same fundamentals as disabled park space in AS2890.6. 	<p>Taxi zones should be designated appropriately to ensure appropriate use occurs.</p>	
	<p>P1.7 Day care/Outside School Hours Care buses are accommodated at school sites and incorporate the following:</p> <ul style="list-style-type: none"> • locate separate from other bus drop-off areas; • consider the number of day care/after school facilities in vicinity of school. 	<p>Day care/Outside School Hours Care buses generally remain parked longer than standard buses, thus separate parking is necessary.</p>	

Specific outcome	Probable solutions	Notes	Relevant infrastructure guidelines and standards
S2 Appropriate support facilities are provided to increase the comfort, convenience and amenity for those using public transport/buses	P2.1 Public transport waiting areas are designed to cater for the potential number of users and be separated from main active transport pathways.	Refer to Figure 7 in this report for typical bus waiting areas.	<ul style="list-style-type: none"> Transport Planning Coordination Act; TransLink Public Transport Infrastructure Manual.
	P2.2 Waiting areas are covered to shelter students from the weather.		<ul style="list-style-type: none"> Sun Smart Policy (Qld Government)
	P2.3 Seating and other facilities to increase amenity such as bins should be provided at the waiting area.		
	P2.4 Bus stops for the school should provide lighting in accordance with AS1158 - Public Lighting Code.		<ul style="list-style-type: none"> AS1158 – Public Lighting Code

Table 3: Private vehicles

Specific outcome	Probable solutions	Notes	Relevant infrastructure guidelines and standards
<p><u>Outcome 3:</u> Safe and appropriate infrastructure should be provided to cater for Private Vehicle access to the site.</p>			
<p>S1. Safe and adequate pick-up/drop-off zones and short term parking areas for private vehicles are provided.</p>	<p>P1.1 The location of the pick-up/drop-off zone is in accordance with the following:</p> <ul style="list-style-type: none"> • located away from and separate to pedestrian/cycle and bus stop areas; • is located consistent within the hierarchy of transport modes (i.e. below active transport and public transport modes); • is located on collector and access type streets; • considers principles of CPTED. 	<p>An integrated off-street facility that caters for both types of short term parking (pick-up/drop-off and short term parking) needs to be located appropriately to achieve the policy outcomes. Figure 2 indicates appropriate locations for these components.</p>	<ul style="list-style-type: none"> • TRUM Volume 2 Part 3 - School Zone Guidelines • Crime Prevention through Environmental Design (CPTED)-Guidelines for Queensland (Qld Government) • AS 2890.1 Off-Street Parking
	<p>P1.2 The design of the pick-up/drop-off zone accords with:</p> <ul style="list-style-type: none"> • allows all vehicles to enter and exit parking area in a forward direction operating in a one-way arrangement; • designed with pick-up/drop-off areas configured in a parallel arrangement with the left hand side doors presented to children getting in/out; • short term parking designed with an angle 60o nose in arrangement; • should be designed to AS2890.1 Class 3/3A standard and in accordance with Figure 8; 	<p>An integrated facility designed to accommodate both the pick-up/drop-off and short term parking is the preferred arrangement.</p> <p>For guidance on design, refer to Figure 8 depicting typical configuration as well as AS2890.1 and AS2890.6 for design standards.</p> <p>Operational assessment may be required on roadways with high volumes and car parks which cater for high vehicle volumes. Turn warrants at the carpark access intersections should also be investigated to ensure the safety of road users is maintained.</p>	<ul style="list-style-type: none"> • AS2890.1 – Off Street Carparking TMR Road Planning and Design Manual • Austroads Guide to Traffic Management Part 6: Intersections, Interchanges and Crossings (AGTM06/17) • Austroads Guide to Road Design Part 4: Intersections and Crossings • Austroads Guide to Traffic Management Part 11: Parking (AGTM11-17) • Relevant local government authority design guidelines may also apply.

Specific outcome	Probable solutions	Notes	Relevant infrastructure guidelines and standards
<p>S1. Safe and adequate pick-up/drop-off zones and short term parking areas for private vehicles are provided.</p>	<ul style="list-style-type: none"> • operation of the facility does not impact on adjacent roadway traffic flow by accommodating queuing, and providing turn lanes on the major road where necessary for safety and to maintain efficiency; • provides adequate queue storage to cater for the size and turnover of the parking area to ensure queuing can be accommodated entirely within the carpark; • appropriate pathway networks to direct students to the school site are designed within the pick-up/drop-off /parking zone; • appropriate crossings facilities should be provided and located at the start and end of the facility; • does not incorporate dead end aisles requiring vehicles to turn around; • make provision for vehicles to pass parked vehicles, 		
	<p>P1.3 The number of pick-up/drop-off spaces are provided in accordance with Schedule 3. The supply is based on the following:</p> <ul style="list-style-type: none"> • number of students attending the school; • location of the school and its catchment; • modes of travel; • age of students; • public transport accessibility. 	<p>Appropriate parking needs to be provided giving consideration to the intent and goals of the policy to attract and facilitate the use of other modes as a preference to private vehicle use. Therefore parking rates have been identified in Schedule 3 to help achieve these goals</p>	

Specific outcome	Probable solutions	Notes	Relevant infrastructure guidelines and standards
<p>S2 Safe and adequate car parking for private vehicles with a longer term stay is provided</p>	<p>P2.1 Separate car park areas are provided, which will primarily serve staff and those with longer term stays.</p>	<p>Separate parking areas should be provided for specialised school users, such as Preparatory and Special Education facilities.</p>	<ul style="list-style-type: none"> AS2890.1: Off Street Parking
	<p>P2.2 The location of the car park area is in accordance with the following:</p> <ul style="list-style-type: none"> located away from the pedestrian/cycle, bus and pick-up/drop-off areas, and if adjacent potentially fenced to separate these area; should not be located on the same frontage as the major school access; is located consistent with its position within the hierarchy of transport modes, below active transport and public transport modes; is located on appropriate frontage road types; considers the CPTED principles within the carpark. 	<p>These parking facilities should generally be located to discourage use of this transport mode, with the exception of the specialised school user groups, which should be located proximate to these uses. Figure 2 illustrates this.</p>	

Specific outcome	Probable solutions	Notes	Relevant infrastructure guidelines and standards
<p>S2 Safe and adequate car parking for private vehicles with a longer term stay is provided</p>	<p>P2.3 The design of the car park is in accordance with:</p> <ul style="list-style-type: none"> • two-way access aisles designed to incorporate a 90o parking configuration; • should be designed to Class 1/1A Standard identified within AS2890.1; • parking configuration ideally designed without dead end aisles, or where provided, adequate turning provision should be made; • operation of the facility does not impact on adjacent roadway traffic flow by accommodating queuing, and providing turn lanes on the major road where necessary for safety and to maintain efficiency; • provides adequate queue storage to cater for the size and turnover of the parking area to ensure queuing can be accommodated entirely within the carpark; • appropriate pathway networks to direct users to the school site should be designed from the parking area. 	<p>For guidance on design, refer to Figure 9 depicting typical configuration as well as AS2890.1 for design standards.</p> <p>Operational assessment may be required on roadways with high traffic volumes and carparks which cater for high vehicle volumes. Turn warrants at the carpark access intersections should also be investigated to ensure the safety of road users is maintained.</p> <p>It is noted that 90° parking configuration is only appropriate in this longer stay staff parking and not in car parks where there is high turnover and potential conflicts with students.</p>	<ul style="list-style-type: none"> • AS2890.1 – Off Street Carparking Road Planning and Design Manual • Austroads Guide to Traffic Management Part 6: Intersections, Interchanges and Crossings (AGTM06-17) • Austroads Guide to Road Design Part 4: Intersections and Crossings • Austroads Guide to Traffic Management Part 11: Parking (AGTM011-17) • Relevant local government authority design guidelines may also apply.

Specific outcome	Probable solutions	Notes	Relevant infrastructure guidelines and standards
S2 Safe and adequate car parking for private vehicles with a longer term stay is provided	P2.4 Supply of car parking to be provided in accordance with Schedule 3.	Appropriate car parking supply should be provided which considers the goals and outcomes of the policy with these users given lowest priority.	
	P2.5 Bays for disabled drivers must be located in area which does not impinge on their safety or convenience. These are designed in accordance with AS2890.6.		<ul style="list-style-type: none"> AS2890.6: Disabled Parking
	P2.6 Two percent of the required car parking supply is to be provided for disabled parking		<ul style="list-style-type: none"> Building Code of Australia Austroads Guide to Traffic Management - All Parts Austroads Guide to Road Design - All Parts
	P2.7 Appropriate levels of parking supply are provided for motorbikes/scooters	Cater for all road users.	<ul style="list-style-type: none"> Local Government Standards
S3 Safe access points are provided for schools	P3.1 Avoid roundabouts as traffic control devices at accesses to school car parks and pick-up/drop-off areas where there are high levels of pedestrian and cyclist activity. School access intersections should generally be configured as t-intersections, or four-way intersections with alternative means of traffic control.	Roundabouts provide inferior pedestrian/cycle facilities and should particularly be avoided on pedestrian/cycle desire lines.	

Specific outcome	Probable solutions	Notes	Relevant infrastructure guidelines and standards
<p>S3 Safe access points are provided for schools</p>	<p>P3.2 The location of the access points address the following:</p> <ul style="list-style-type: none"> • avoids crossing major pedestrian and cycle access points and pathways; • avoid bus stop areas; • be located so any associated queuing does not impact on pedestrian, cycle or buses or nearby intersections and roads; • be located along the minor road frontages of the school; • should not be located on a minor residential access street e.g. cul-de-sac. 	<p>Access to private vehicle infrastructure should not be given priority over active transport modes.</p>	
	<p>P3.3 Design of roads surrounding the school are based on a maximum 40km/h design speed.</p>	<p>School siting should ideally occur on roads that are sympathetic to the school safety environment and opportunities may exist to influence the adjacent subdivision design. Where possible school frontage should be designed to facilitate low speeds contributing to a safe school environment. Collector and local streets (except cul-de-sacs) meet these requirements.</p>	<ul style="list-style-type: none"> • Queensland Streets • TMR Road Planning and Design Manual
	<p>P3.4 School access is gained from roads with appropriate level road hierarchy, and appropriate turn facilities should be provided where warranted. Collector and local streets (except cul-de-sacs) meet these requirements.</p>	<p>The road hierarchy and associated elements of school site selection should be considered.</p>	<ul style="list-style-type: none"> • Austroads Guide to Traffic Management Part 6: Intersections, Interchanges and Crossings (AGTM06-17) • Austroads Guide to Road Design Part 4: Intersections and Crossings • TMR Road Planning and Design Manual

Table 4: Site selection

Specific outcome	Probable solutions	Notes	Relevant infrastructure guidelines and standards
<p><u>Outcome 4:</u> The location of the potential school site appropriately considers safe access by all modes of transport</p>			
<p>S1 The location of the potential school site appropriately considers access by all modes of transport to enable safe and efficient movement as well as encouraging students to walk, cycle and catch public transport to school</p>	<p>P1.1 Schools are located adjacent to existing or planned active transport networks</p>	<p>To achieve the policy outcomes, school sites need to be sited to capitalise on the existing and planned active transport infrastructure</p>	<ul style="list-style-type: none"> • Shaping Up, TMR
	<p>P1.2 School sites are not land locked and ideally have through street access on at least 2 sides</p>	<p>These street frontages should exclude cul-de-sacs.</p>	<ul style="list-style-type: none"> • Queensland Streets
	<p>P1.3 Schools are selected with topography that promotes and enhances the use and ease of active transport and public transport</p>	<p>Selecting school sites with appropriate topographical characteristics can help encourage active transport use.</p>	
	<p>P1.4 School is located within or adjacent to the catchment it is to serve. It is not separated from its catchment by a major barrier such as a creek, major road, rail line etc</p>	<p>In urban areas, 70% of the school's catchment should be within 3.2km of state primary schools and 4.8km within state secondary schools to avoid need for subsidised school bus transport (measured by actual road network)</p>	
	<p>P1.5 School not to be located adjacent to, or with access from a major state controlled road, arterial or sub arterial road. It is also not located with frontage only along access streets or lower order streets. Collector and local streets (except cul-de-sacs) are the preferred location for school accesses.</p>	<p>Refer to Figure 2 for typical best practice locations. This will help promote safety by siting schools away from roads with a higher traffic speed and volume.</p>	

Specific outcome	Probable solutions	Notes	Relevant infrastructure guidelines and standards
<p>S1 The location of the potential school site appropriately considers access by all modes of transport to enable safe and efficient movement as well as encouraging students to walk, cycle and catch public transport to school</p>	<p>P1.6 The school's major access points are to be located along a collector street.</p>	<p>This also complements the bus routes through a neighbourhood, which typically remain on the collector street network.</p>	
	<p>P1.7 Schools are not located adjacent to land uses that are not complementary to the outcomes of this policy. Examples include industry, intense commercial development, and high traffic generating retail land uses such as shopping.</p>	<p>There is some merit in locating schools proximate to land uses that incorporate high order public transport interchanges either planned or existing. If this is the case, linkages to these components will need to be examined in detail to ensure safe and efficient active transport connections can be provided.</p>	
	<p>P1.8 School is located within 400m of a higher order public transport route and stop.</p>	<p>This may only be applicable in urban areas</p>	

Table 5: New Split Campuses

Specific outcome	Probable solutions	Notes	Relevant infrastructure guidelines and standards
<p><u>Outcome 5:</u> New Split Campus schools should be avoided. Where unavoidable, adequate infrastructure must be provided to minimise vehicular and pedestrian conflict</p>			
<p>S1 If new split campus schools cannot be avoided, adequate infrastructure must be provided to minimise vehicular and pedestrian conflict on higher order roads to ensure all users are able to cross such roads safely.</p>	<p>P1.1 Transport infrastructure is designed and sited so that the need for interaction between campuses is minimised.</p>	<p>Siting transport infrastructure appropriately improves safety by potentially minimising the crossing requirements at split campus schools</p>	<ul style="list-style-type: none"> • Principal Cycle Network Plans • Local government cycle plans

Specific outcome	Probable solutions	Notes	Relevant infrastructure guidelines and standards
<p>S1 If new split campus schools cannot be avoided, adequate infrastructure must be provided to minimise vehicular and pedestrian conflict on higher order roads to ensure all users are able to cross such roads safely.</p>	<p>P1.2 An appropriate crossing facility is provided between school campuses in accordance with the criteria in Schedule 4.</p>	<p>Schedule 4 has been developed to identify potentially appropriate crossing types based on the road type it crosses. Figures 4-6 illustrate appropriate crossing facilities in more detail.</p> <p>Grade separated outcomes provide maximum protection for users. Overpasses and underpasses are superior outcomes for grade separated crossings with overpasses being the first priority. Provision of this option needs to consider a range of factors such as traffic volumes, speeds, crash history, number of traffic lanes, surrounding uses, etc</p> <p>Overpass design should promote and encourage its use and be designed in accordance with the relevant standards.</p> <p>An overpass is the most desirable grade separated treatment for interaction of split campuses, but is recognised as not cost effective or achievable in all cases. Provision of this option needs to consider a range of factors such as traffic volumes, speeds, crash history, number of traffic lanes, surrounding uses, etc.</p>	

Specific outcome	Probable solutions	Notes	Relevant infrastructure guidelines and standards
<p>S1 If new split campus schools cannot be avoided, adequate infrastructure must be provided to minimise vehicular and pedestrian conflict on higher order roads to ensure all users are able to cross such roads safely.</p>	<p>P1.3 A crossing facility between the campuses is located in accordance with a desire line analysis, the location of other crossings, adjacent road furniture and infrastructure.</p>	<p>Undertaking a desire line analysis will ensure any crossing facilities required will be best sited to ensure maximum use of the facility occurs and help prevent crossings at undesirable locations.</p>	
	<p>P1.4 The overpass /underpass facility linking split campus schools:</p> <ul style="list-style-type: none"> • locate along the travel desire line; • are direct to avoid additional distances for users; • utilise the principles of Crime Prevention Through Environmental Design; • address AS1428 - Design for Access and Mobility; • use vegetation or fencing to discourage users from crossing at grade; • accord with MUTCD 10 and Austroads requirements. 		<ul style="list-style-type: none"> • MUTCD Part 9 and 10 • Austroads Guide to Traffic Management • Austroads Guide to Road Design • AS1428 - Design for Access and Mobility Crime Prevention through Environmental Design - Guidelines for Queensland (Qld Government)
	<p>P1.5 At grade crossings for new split campuses are only utilised on road types identified in schedule 4 and after assessment of student population and movements, vehicle and speed thresholds.</p>	<p>At grade crossings may represent an acceptable outcome on certain roadway types.</p>	

Specific outcome	Probable solutions	Notes	Relevant infrastructure guidelines and standards
<p>S1 If new split campus schools cannot be avoided, adequate infrastructure must be provided to minimise vehicular and pedestrian conflict on higher order roads to ensure all users are able to cross such roads safely.</p>	<p>P1.6 The design of at grade crossings accord with MUTCD Part 10 (see Figures 4-6). Kerb build outs are provided to reduce crossing distance for users, to discourage illegal parking in no stopping zones and reduce vehicle speeds.</p>	<p>The design of at grade crossing should consider the performance criteria and principles outlined as part of Outcome 1: Active Transport.</p>	
	<p>P1.7 At grade School Crossings are to be located:</p> <ul style="list-style-type: none"> • to meet the desire lines; • offset within 10-20m of the school gate; • in a location with appropriate sight distance (refer Austroads Guide to Traffic Management All Parts and Guide to Road Design All Parts); • be well lit in accordance with AS1158; • not be located before the car park entrances/exits; • provide appropriate treatment to ensure pedestrians utilise the crossing facility and do not cross in uncontrolled locations. 	<p>Refer to Outcome 1 for specifics of acceptable design standards.</p> <p>if necessary provide low vegetation (less than 300mm) and planting to encourage people to use the crossing and not cross in other locations. If space constraints, fencing could be considered. This should not be necessary if crossing provided in correct location.</p>	
	<p>P1.8 Enhanced or variable School Zone Speed Limit signage is implemented on roads that separate the campus and/or incorporate a crossing facility. This signage is designed and provided in accordance with the MUTCD and SESG.</p>	<p>Promotion of a lower speed environment highlighting the school environment and the potential for more vulnerable road users promotes safety, and is particularly important for at-grade crossing facilities.</p>	<ul style="list-style-type: none"> • MUTCD part 9 and 10 • TRUM Volume 2 Part 3 - School Zone Guidelines

Specific outcome	Probable solutions	Notes	Relevant infrastructure guidelines and standards
<p>S1 If new split campus schools cannot be avoided, adequate infrastructure must be provided to minimise vehicular and pedestrian conflict on higher order roads to ensure all users are able to cross such roads safely.</p>	<p>P1.9 Road safety audits are undertaken at the planning, design, construction and operational phases of the development.</p>	<p>Road safety audits are a key tool in identifying safety deficiencies inherent throughout all phases of planning, design, construction and operation.</p>	<ul style="list-style-type: none"> • Austroads Guide to Road Safety



3. Recommendations: Infrastructure & Infrastructure Layouts

This section provides support to the planning guidance in Section 2.0, providing further details in regards to specific infrastructure requirements for schools. The schedules and infrastructure layouts developed are referred to under each outcome in Section 2.0 as follows:

Outcome 1: Active Transport - Provide Infrastructure that Promotes and Supports Active Transport

Schedule 1 – Minimum pathway widths

This schedule offers guidance for the minimum width of major and minor footpaths, shared pedestrian/cycle paths and separated two-way pedestrian/cycle paths at small, medium and large size urban and rural schools. External path widths shall be applied 400m from school boundaries.

Schedule 2 – Bicycle parking and end-of-trip facilities

This schedule offers guidance for short and long term bicycle parking requirements for primary and secondary/combined schools, with a user focus for students, staff and visitors. Schedule 2 also offers guidance for end-of-trip facilities such as lockers, showers, toilets and wash basins.

Outcome 2: Public Transport - Provide safe infrastructure that promotes and support the use of public transport

Outcome 3: Private Vehicles - Safe and appropriate infrastructure should be provided to cater for Private Vehicle access to the site

Schedule 3 – Car parking supply rates

This schedule provides guidance for parking requirements for private vehicle users, namely short term and set down users, longer term staff and visitor parking, and parking for specialised school users such as preparatory and special education units.

Outcome 4: Site Selection - the location of the potential school site appropriately considers safe access by all modes of transport

Figure 2: Example School Layout

Outcome 5: Split Campus schools

Schedule 4 – Split campus crossing facilities

This schedule offers guidance in determining appropriate crossing facilities to consider for split-campus schools (if they are unavoidable at the planning stage).

3.1 Recommendations for infrastructure

The following schedules provide design and best practice guidelines specific to the desired transport outcomes.

Outcome 1: Active Transport

Schedule 1: Minimum pathway widths

This schedule has been developed by identifying acceptable levels of service for active transport and selecting pathway widths based on the user type and expected maximum usage to achieve these service levels. The recommendations are broadly based on the methodology outlined within the Transit Cooperative Research Panel (TRCP) *Transit Capacity and Quality of Service Manual (TCQOS)* as well as considering Austroads *Guide to Road Design – Part 6A*. Examples of these pathway configurations in a typical school environment are outlined on Figure 1 and represent expected maximum school enrolment (i.e. all planning should be based on the maximum potential enrolment of the school and not the enrolment at time of construction).

The key assumptions that have been made in developing this schedule include:

- Provision of high quality best practice active transport facilities will encourage more users and priority should be given to this infrastructure. Facilities should be designed at a minimum in accordance with relevant standards and where possible exceed these standards due to the high demand at school environments, The planning guidance in Section 2.0 should dictate the planning of these networks;

- The number of students at a school will result in more demand for use of the pathways and hence the minimum widths recommended increase according to the size of the school. Capacity and level of service analysis of paths was undertaken using the methodology in the TCQOS using the potential school enrolment categories to provide a broad indication of differences in demand and hence dictated the recommendations across the school size categories;
- The minimum recommended width for a footpath in Schedule 1 is based on 1.8m which is the desirable width recommended in Austroads Guide to Traffic Management and Guide to Road Design to acknowledge that there is a greater density of potential users around a school;
- Recommended internal footpath widths are generally greater than the external footpath width as this will be where the largest concentration of users will occur i.e. 100% of the school users will utilise these internal footpaths;
- For shared pedestrian and cycle paths the internal and external path widths are similar to cater for the potential mix of users on these paths and also to take into consideration less experienced cyclists using these paths;
- The provision of separated two way paths are less likely to occur due to space limitations and are also less desirable due to the potential for misuse. The potential for misuse of these separated paths (i.e. pedestrians using a designated cycle path) in school environments are assumed to be higher. It is noted that, if such facilities are provided, extra consideration should be undertaken into their design and placement to reduce this misuse.

Schedule 1: Minimum pathway widths

School Type	Footpath (m)				Shared pedestrian - cycle path (m)				Separated two-way pedestrian - cycle path (m) ⁷			
	Major ¹		Minor ²		Major ¹		Minor ²		Major ¹		Minor ²	
	Internal	External ³	Internal	External ³	Internal	External ³	Internal	External ³	Internal	External ³	Internal	External ³
Urban schools												
Small ⁴	2.5	2.0	2.0	1.8	3.0	3.0	2.5	2.5	3.5	3.5	3.0	3.0
Medium ⁵	3.5	3.0	3.0	2.5	4.0	4.0	3.5	3.5	4.5	4.5	4.0	4.0
Large ⁶	4.5	4.0	4.0	3.5	5.0	5.0	4.5	4.5	5.5	5.5	5.0	5.0
Rural schools												
Small ⁴	2.0	1.8	1.8	1.8	2.5	2.5	2.5	2.5	3.0	3.0	3.0	3.0
Medium ⁵	3.0	2.5	2.5	2.0	3.5	3.5	3.0	3.0	4.0	4.0	3.5	3.5
Large ⁶	4.0	3.5	3.5	3.0	4.5	4.5	4.0	4.0	5.0	5.0	4.5	4.5

Notes:

1. Major path: Serves as direct access between major movements (e.g. drop-off zones to school entrance, etc.).
2. Minor path: Serves as access from adjacent neighbourhoods and less travelled routes.
3. Minimum pathway widths for external footpaths should ideally extend at least 400m from the school boundary.
4. Less than 500 students.
5. 501 to 1,000 students
6. Greater than 1,000 students
7. Not common, but can be justified if large number of pedestrians and cyclists desire to use the path.

Outcome 1: Active transport

Schedule 2: Bicycle parking and end-of-trip facilities

The schedule has been developed following a review of the practices and example case studies examined during the formulation of this guidance document. It has also been developed cognisant of the policy targets to increase mode share for cyclists and focuses on promoting active transport at the top of the hierarchy of school transport modes.

The key assumptions that have guided the development of Schedule 2 include:

- Provision of high quality best practice active transport facilities will encourage more users and priority should be given to this infrastructure. Facilities should be designed at a minimum in accordance with relevant standards and where possible exceed these standards due to the high demand at school environments. The planning guidance in Section 2.0 should dictate the planning and location of these facilities;
- Recommended rates for provision of end of trip facilities for schools was developed based on a literature review and particularly considered the Green Building Council of Australia's Green Star rating recommended rates.



Schedule 2: Bicycle parking and end-of-trip facilities¹

User	Parking			End of Trip Facilities ²			
	Long Term	Short Term	Class ³	Lockers	Showers	Toilet	Wash Basin
Primary school							
Students	1 per 3 students in year 4 or higher	--	1 or 2	--	--	--	--
Staff	1 per 10 staff	--	1 or 2	2 per bicycle space ²	1 per 10 bicycle spaces	1 per 2 showers w/ minimum of 1 per male/female	1 per shower
Visitors	--	1 per 25% of student parking	3	--	--	--	--
Secondary / combined school							
Students	1 per 3 students	--	1 or 2	--	Gymnasium and locker room use recommended	Gymnasium and locker room use recommended	Gymnasium and locker room use recommended
Staff	1 per 10 staff	--	1 or 2	2 per bicycle space ²	1 per 10 bicycle spaces	1 per 2 showers w/ minimum of 1 per male/female	1 per shower
Visitors	--	1 per 10% of student parking	3	--	--	--	--

1. This information has been primarily sourced from TMR's early work on Active Transport.

2. Accommodates all Active Transport (e.g. cycling, scooters, walking, running, etc.)

3. Refer to AS2890.3 for further details on Class categories:

Class 1: High security level with fully enclosed individual lockers and used by bike and ride commuters at railway and bus stations.

Class 2: Medium security level with locked compounds and communal access used by regular employees, students, regular commuters. Class 3: Facilities to which the bicycle frame and wheels can be locked

Outcome 3: Private vehicles

Schedule 3: Car parking supply rates

The car parking supply rates have been developed by undertaking a review of available literature and rates identified within local government authority planning schemes and other school transport documentation such as guidance from overseas and within sustainable building design guidelines. Parking supply rates vary considerably depending on the source and location of the data and separate rates of supply should apply to each user type.

These identified and modified rates consider the intent of the planning guidance outcomes and the position of private vehicle users in the transport mode hierarchy that the outcomes identifies, as well as general knowledge and expertise. General car parking design guidance for each user category is also provided. Note that school parking surveys demand analysis have not been undertaken during development of these rates. The key assumptions associated with the development of the recommended rates in Schedule 3 are:

- Generally the majority of Queensland local government planning schemes researched require between 1 space per 10 students to 1 space per 12 students. An example of the highest ratio (lowest provision) found was in the former Noosa Council area where 1 space per 30 students is required for short term parking at schools. A rate of 1 space per 15 students has been recommended here which is slightly less than the currently accepted provision for car parking to ensure active transport receives higher priority yet still maintains a balance to reducing the impact of overflow parking onto surrounding streets;
- 0.7 spaces per staff member recommended in the schedule which also takes into account the aim to encourage active and public transport use at schools, whilst balancing impacts on the surrounds. Many local government planning schemes researched were found to have between 1 space per staff member with some requiring 1 space per 2 staff members;
- Provision of long term student car parking is not considered appropriate as it could encourage students driving to school, which is undesirable. In addition, current changes to starting school ages will result in a limited number of students being eligible to drive before they complete school and hence a reduction in the demand for this type of parking over time;
- It was assumed there would be a greater demand for preparatory/special education car parking due to the age and special needs of these students, hence more likely requiring to be picked up/dropped off at school;
- Carpark design and location should be guided by the planning guidance provided in Section 2.0;
- The rates of provision recommended may differ from local government planning scheme rates, however these rates have been recommended to encourage outcomes where priority is given to active transport users and hence a balanced approach is recommended to ensuring active and public transport use is promoted and encouraged, whilst reducing the impact of overflow parking on the surrounding area;
- Schedule 3 recommends supply rates for car parking, however it is acknowledged that each school will be different and consideration will need to be given to other elements when finalising car parking for each individual school. These elements include the location of the school and its catchment, urban vs. rural environments, potential access to other modes of travel at the proposed school, as well as age and demographics of the potential users in the catchment surrounding the school;
- Recommended supply has been differentiated between the parking user category;
- General car parking design has also been recommended for each user category.

Schedule 3: Car parking

User category (duration / type)	Parking supply to be provided ²	AS2890.1 User class for design purposes ³
Pick-up / drop-off (2 minutes) ¹	20% of short term supply ¹	Class 3/3A
Short-term (15 minutes)	1 per 15 students	Class 3/3A
Long-term (staff / visitor)	0.7 per staff member	Class 1/1A for staff and Class 2 for visitor only parking areas.
Preparatory / special education	1 per 8-10 students	Class 2

1. 20% of parent parking supply used for pick-up/drop-off parking has been developed as a function of the available space assuming a typical configuration for short term parking as shown in Figure 8. A pick-up/drop-off area length which can cater for approximately 20% of the short term parking supply generally caters for a capacity assuming 50% of all school trips are made by pick-up/drop-off. The requirements for queuing have been calculated with queuing theory based on these rates of supply and associated arrival and service rates assuming average durations of stay identified above.
2. Consideration should be given to modification of these base rates when considering specific characteristics of individual schools such as:
 - Location of school and its catchment;
 - Modes of travel available to students and staff;
 - Age and demographics of students and catchment;
 - Public transport accessibility;
 - Surrounding walking and cycling network.
3. Car parking spaces for vehicle occupants with disabilities are to be provided at a rate of 1 space per 100 parking spaces (total of pick-up/drop off, parent, staff, visitor, etc.), with a minimum of one space being provided. Such parking spaces shall be provided so as to minimise journey difficulty from the parking space to the origin/destination within the school.
4. Table 1.1 in AS2890.1 defines the user class in more detail. Generally Class 1 refers to all day employee and residential parking, Class 2 refers to medium to long term parking and Class 3 refers to short term.

Outcome 5: New split campus schools

Schedule 4: New split campus crossing facilities

This schedule provides guidance for selecting appropriate crossing facilities when considering the interaction between components of split campus schools. The table presents an extended version of the schedule identified within Austroads Guide to Traffic Management Part 6. It should be noted that this table should not be considered as a definitive treatment schedule, as the safety issues relating to split campus schools and interaction across the road network are complex and require detailed analysis and consideration. Further investigation into the applicability of each of the crossing facilities identified below for each individual school site needs to be undertaken. Guidance on this is identified in the planning guidance provided in Section 2.0 Table 5.

The key assumptions undertaken in developing Schedule 4 were:

- Split campus schools should be avoided where possible, particularly when planning new schools, and that this Schedule only applies to situations where such a situation cannot be avoided;
- If these situations cannot be avoided, the highest level of separation of vehicle-pedestrian conflicts should be sought, which will vary depending on the road hierarchy of the potential road to be crossed by the students. Overpasses/underpasses are particularly recommended when the campus may be split by a major road with four lanes or more and high traffic speeds and volumes (considering ultimate development demands) due to their superiority in removing all potential conflicts between vehicles and students;
- Schedule 4 provides an aid to decision making on appropriate facilities for split campus schools. Detailed investigation, including a road safety audit and cost-benefit, should occur before deciding on the crossing treatment for a split campus school.

Schedule 4: Split campus crossing facilities

Road hierarchy classification ¹	Overpass with proper pathway extension and connection	Underpass with proper pathway extension and connection	Children's crossing	Pedestrian actuated signal crossing	Pedestrian (zebra) crossing
Primary arterial	A	A	C	B	C
Secondary / sub-arterial	B	B	B	A	B
Collector / local road crossing	B	B	A	A	B
Local street	C	C	A	B	B

Note that this table has been sourced from Austroads Guide to Traffic Management Part 6 but adapted to consider split campus schools specifically.

A - Most likely to be the appropriate treatment

B - May be an appropriate treatment

C - Inappropriate treatment

1. Refer to local agency road hierarchy plan for specific criteria and/or to the former Queensland Transport's QTIPS 4.

3.2 Infrastructure layouts

The following technical drawings also provide support to the planning guidance provided in Section 2.0.

Outcome 1: Active transport

Figure 1: Active transport hierarchy – Example overlaid over an example of a greenfield site school layout

Figure 1 illustrates a proposed network of pathways surrounding an example school to encourage active transport. The school base has been developed utilising elements from a newly developed school site and adapting these to illustrate best practice. The aim of the figure is to:

- Illustrate the location of active transport infrastructure in a typical best practice school environment to provide further guidance for the implementation of Schedule 1;
- Demonstrates active transport connections to surrounding catchment with pathways via a number of access points at all school boundaries;
- Shows a network of internal pathways providing direct connections from other transport facilities such as bus stops and car parks to school facilities;
- Shared path connections to bicycle parking facilities;
- Illustrates how the different active transport facility types are provided in a typical school environment.

Figure 1 overleaf was developed based on a review of literature, discussions, and transport knowledge to create a best practice example. It is an example school site layout where all pathway types from Schedule 1 are used for demonstration purposes. Although unlikely that all of these pathways will be used simultaneously at one school site, it indicates typical locations where they would be considered.



Figure 1: Active transport hierarchy – example overlaid over an example of a greenfield site school layout

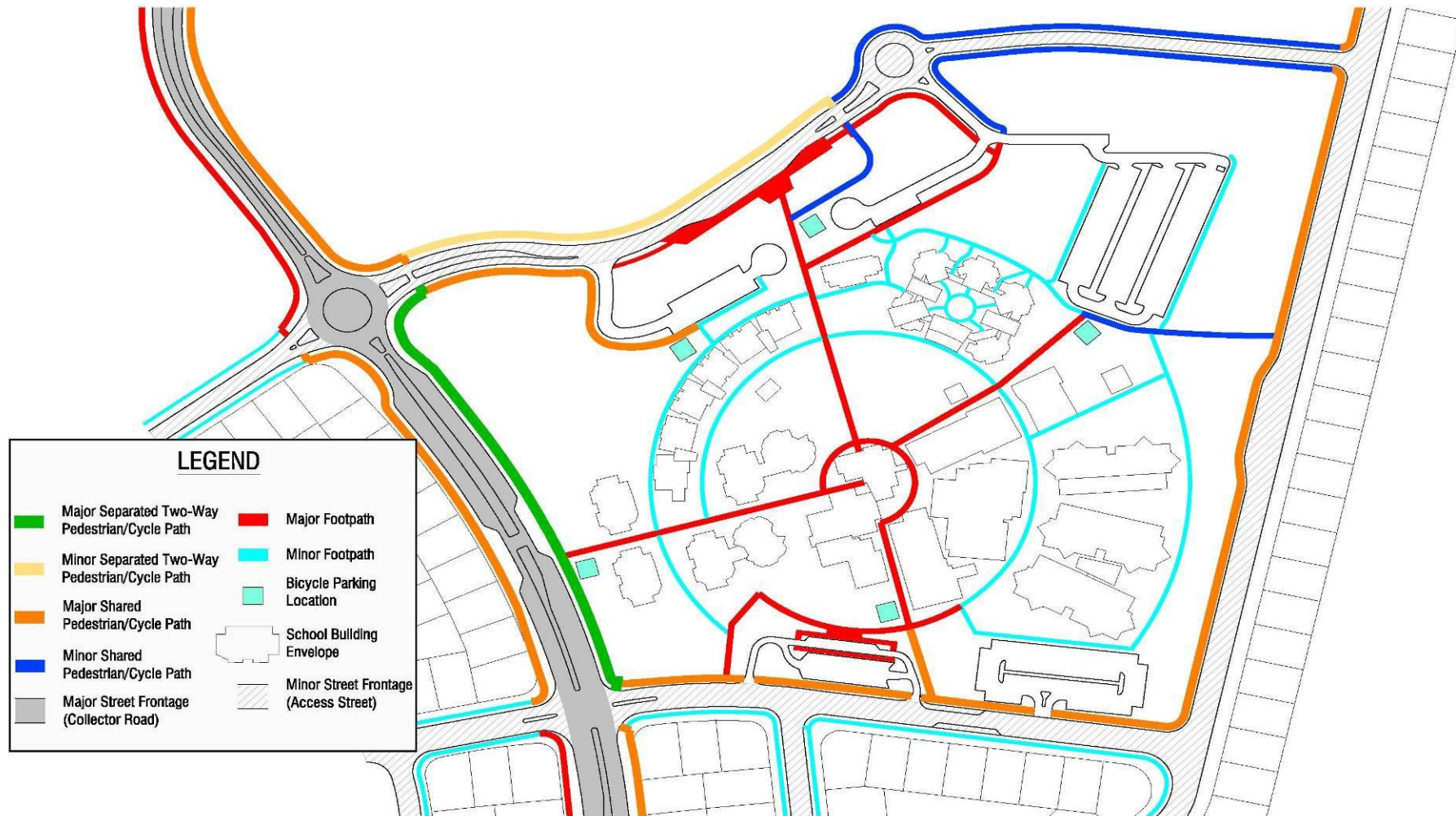


Figure 2: Example separation of modes of transport overlaid on an example school layout

Figure 2 overleaf was developed primarily from literature reviews, case studies and discussions. The diagram provides an example of a good school site layout complementing transport infrastructure.

The aim of the figure is to illustrate:

- separation of transport infrastructure to reduce conflicts and congestion in a school environment;
- priority placement of active transport facilities such as bicycle parking;
- the location of bus zones separate to the pick-up/drop-off car parking areas to avoid buses having to travel along congested roads;
- convenient location of prep parking close to the prep class rooms;
- convenient location of special education parking close to the special education class rooms;
- pick-up/drop-off car parking area located with separate entry points and a pedestrian crossing up stream to avoid queuing across the pedestrian crossing;
- entry to car parks off minor streets;
- pedestrian crossings located adjacent to key school entrances;
- location of long term car parking furthest away from school facilities.

Figure 2 also represents other desirable features discussed in the planning guidance outcomes in Section 2.0 such as separation of uses, location of paths to provide surveillance, multiple frontages and access points.

The following diagram demonstrates a potential process and logic for developing a school site layout.

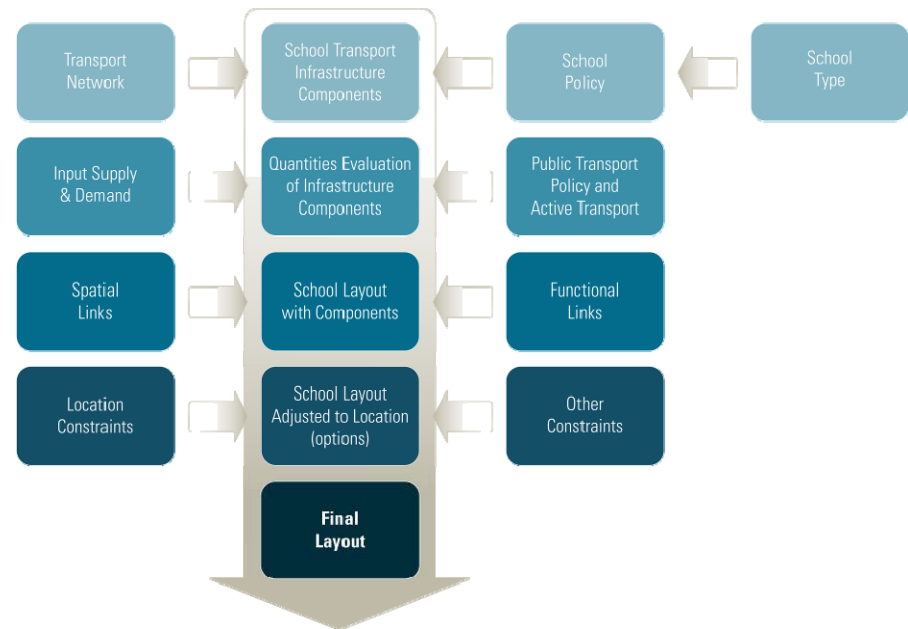
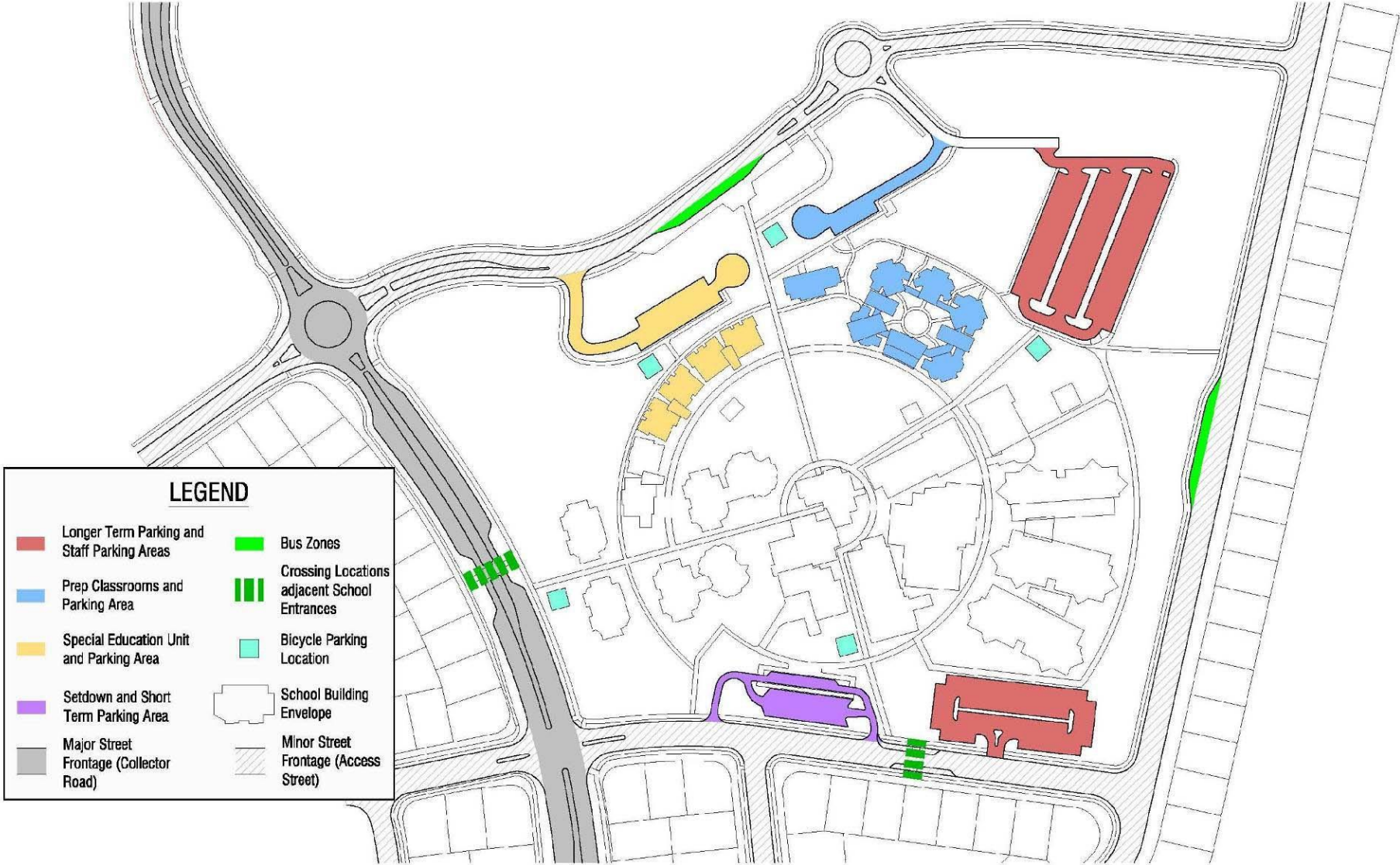


Figure 2: Example separation of modes of transport overlaid on an example school layout



Outcome 1: Active transport

Figure 3 overleaf is primarily sourced from AS2890.3 and the Bicycle Parking Handbook (Bicycle Victoria), which should both be referred to when designing bicycle parking at schools. The figure provides examples of typical bicycle cages and demonstrates a logical layout and design for bicycle racks within the cage. The planning guidance details in Section 2.0 should also be referred to when planning and locating such parking at schools. Considerations in the design of bicycle cages include:

- When storing bicycles in multiple rows ensure the area is enough to accommodate each bicycle and provide room to manoeuvre;
- Floor or pavement surfaces should have a maximum slope of 5% and should be of a hard surface;
- Bicycle parking facilities shall be designed to ensure that motor vehicles do not encroach into bicycle parking area;
- Bicycle parking should be located in public view, close to school buildings and ideally be sheltered and fenced;
- Design should comply with AS2890.3 Bicycle Parking Facilities at a minimum.

Figures 4 to 6 are directly sourced from TMR's MUTCD (Part 10) with a minor amendment to provide kerb build outs/extensions at the crossing facility. The provision of kerb build outs at schools is considered beneficial to reduce crossing distance for students and primarily to discourage illegal parking in these areas which significantly reduces safety and sight distance. The planning and locating of crossing facilities for school children should also refer to the planning guidelines discussed in Section 2.0. Schedule 4 (New split campus schools) is cross-referenced to the solutions in Figures 4 to 6.

Figure 3: A. Bicycle parking and cage details (refer AS2890.3 for further requirements)



Bicycle cage examples

Notes:

1. Stainless steel, powder coated or galvanised finish
2. Each rail parks two bicycles
3. Accommodates all types and sizes of bicycles
4. Supports the entire bicycle in an upright position so it won't slip or fall over
5. Easy to use with any bicycle lock
6. Roofs or shelter to protect bicycles could also be considered for both protection from the elements and to discourage theft
7. Dimensions and designs reflect best practice examples but do not demonstrate requirements. Additional parking operations can be found in Bicycle Victoria's "The Bicycle Parking Handbook" and AS2890.3 Bicycle Parking Facilities

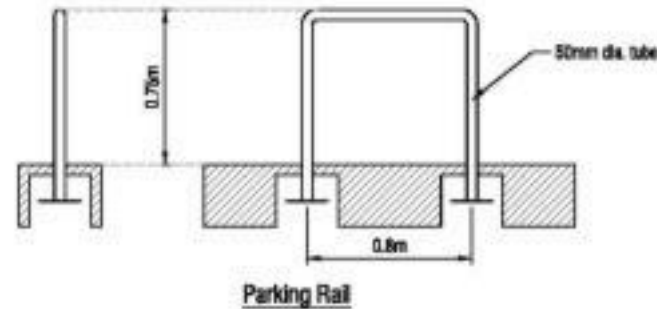
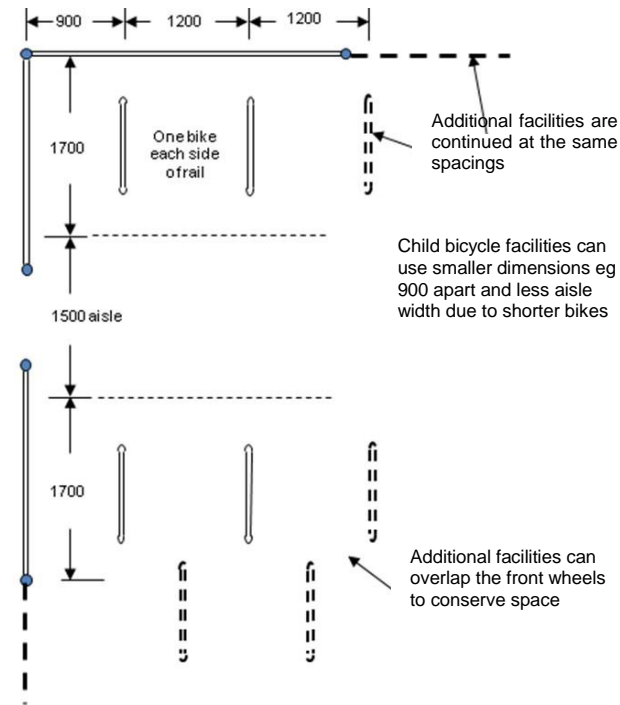
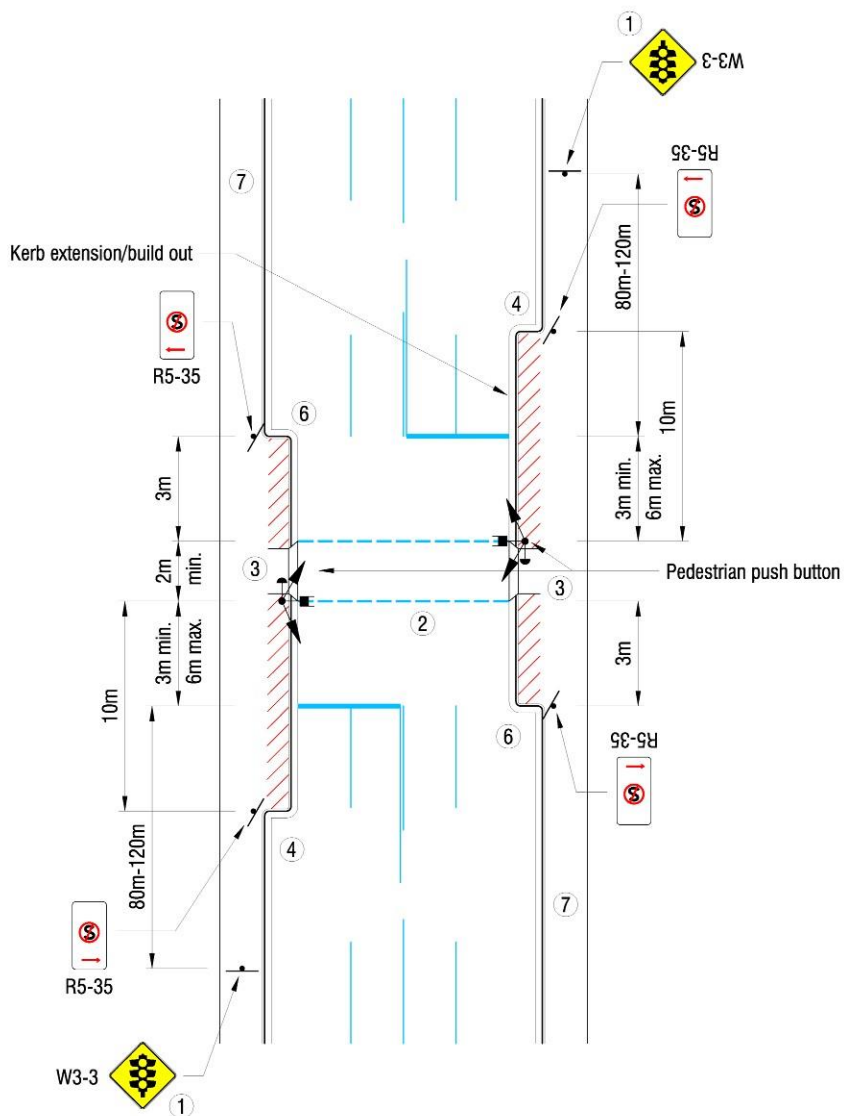


Figure 4: Pedestrian actuated traffic signals (Source: adapted from AS1742.10 Figure 5)

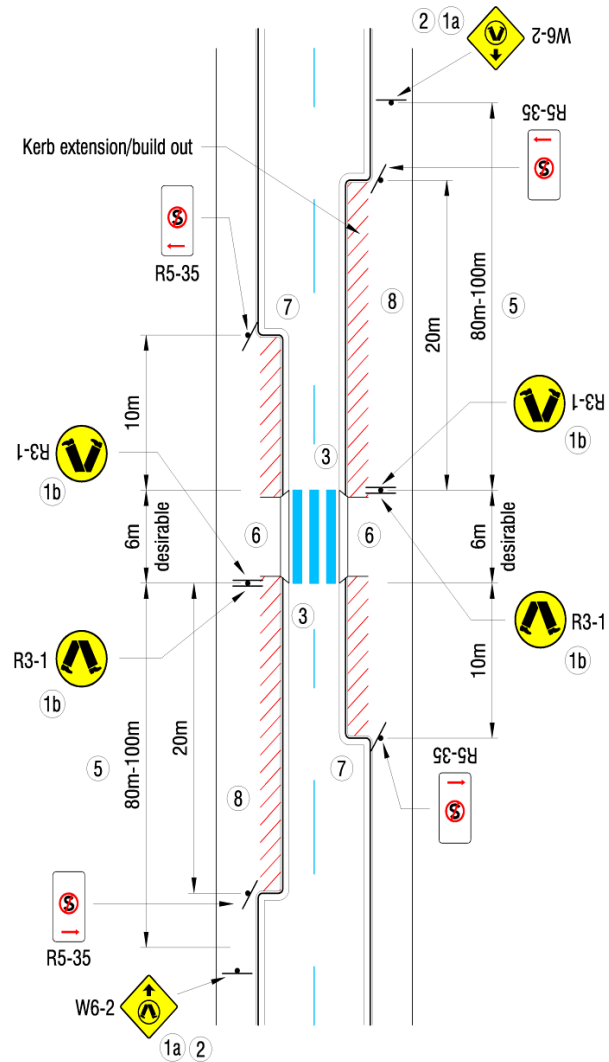


Notes:

The figure has been adapted from Figure 5 in AS1742.10 and this document shall be referred to before finalising any pedestrian crossing designs. The road must be a signed school zone and if the crossing is to connect a split campus, the school zone must be an all-day (7am – 4pm) flashing school zone.

1. Sign W3-3 to be used only when required, see MUTCD Clause 10,2,1 (sign W6-2 not to be used)
2. Normal crosswalk width 3.5m
3. Pram/bicycle ramps should be installed
4. Where parking of vehicles close to the crossing may cause difficulties (i.e., reduced sight distance, activation of traffic detectors), this distance may be increased
5. For pedestrian-actuated traffic signals (mid-block) at schools, a school warning sign (W6-4) should be erected in advance of the SIGNALS AHEAD sign
6. Kerb build outs should be constructed at a minimum length shown, but can be extended if necessary
7. Pathway width should be constructed based on Schedule 1 – Pathway widths

Figure 5: Pedestrian crossing (zebra) (Source: adapted from AS1742.10 Figure 1)

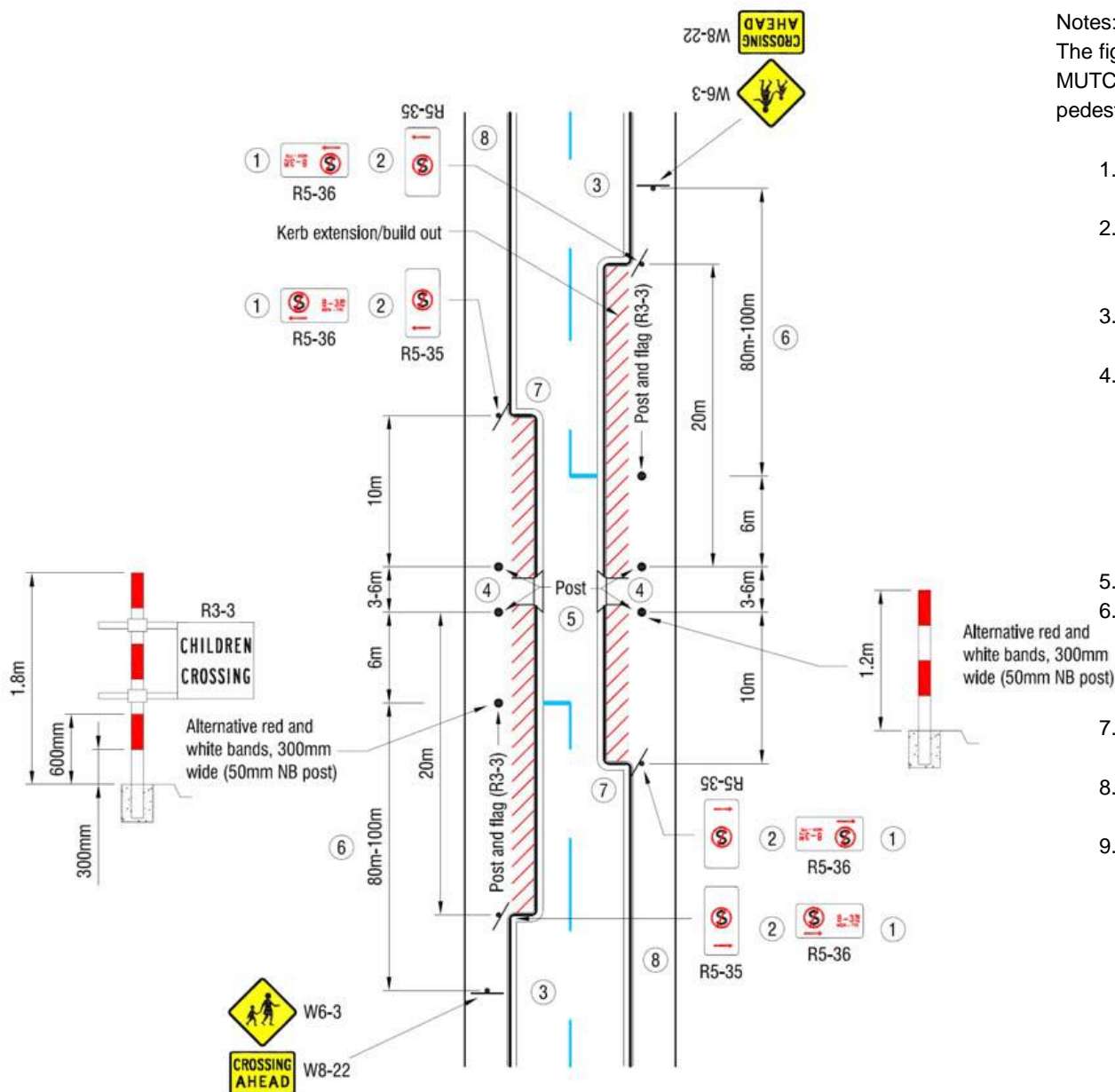


Notes:

The figure has been adapted from Figure 1 in AS1742.10 and this document shall be referred to before finalising any pedestrian crossing designs

1. Pedestrian crossings (zebra) at schools (refer to SESG)
2. The Pedestrian Crossing Ahead sign (W6-2) is always used in advance of pedestrian crossings. The sign may be supplemented with advance pavement messages (see MUTCD Clause 11.5).
3. Where there is significant night time use, street lighting should be provided (see MUTCD Clause 14).
4. The Pedestrian Crossing Ahead sign (W6-2) should be located 80m-100m in advance of the crossing. This distance may be reduced to 30m minimum in low speed environments.
5. Pram/bicycle ramps should be installed.
6. Kerb build outs should be constructed at a minimum length as shown, but can be extended if desired.
7. Pathway width should be constructed based on Schedule 1 – Pathway widths.

Figure 6: Children’s crossing (Source: adapted from AS1742.10 Figure 3)



Notes:

The figure has been adapted from Figure 3 in Part 10 of the MUTCD and this document shall be referred to before finalising any pedestrian crossing designs

1. Times of operation may be specified by use of sign R5-36 (see MUTCD Clause 10.1.9) if required.
2. Where stationary vehicles near a crossing seriously limit visibility between drivers and pedestrians, an increase in these distances may be required.
3. Advance signs may be supplemented with advance pavement messages (see MUTCD Clause 11.5).
4. A line (approximately 100mm wide) may be painted on the footpath 0.5m behind the face of the kerb (to indicate the position where pedestrians should wait until directed to cross the roadway). Where used, this line extends the width of the sealed apron connecting the footpath and kerb or a distance of 3 to 6m, i.e., between the crossing posts (without flags).
5. Pram/bicycle ramps should be installed.
6. The Children (W6-3) /Crossing Ahead (W8-22) sign assembly should be located 80-100m in advance of the crossing. This distance may be reduced to 30m minimum in low speed environments.
7. Kerb build outs should be constructed at a minimum length as shown, but can be extended if necessary.
8. Pathway width should be constructed based on Schedule 1 – Pathway widths.
9. School gate should be offset 20m from children crossing.

Outcome 2: Public transport - Provide safe infrastructure that promotes and support the use of public transport

Figure 7: Indented and kerbside bus set-down

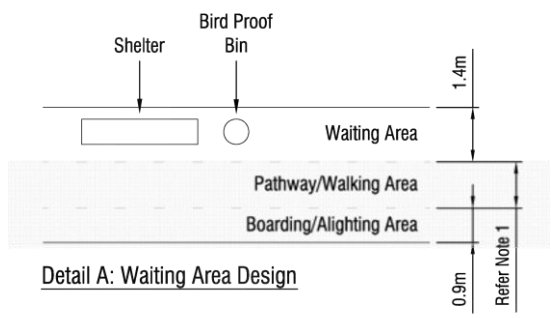
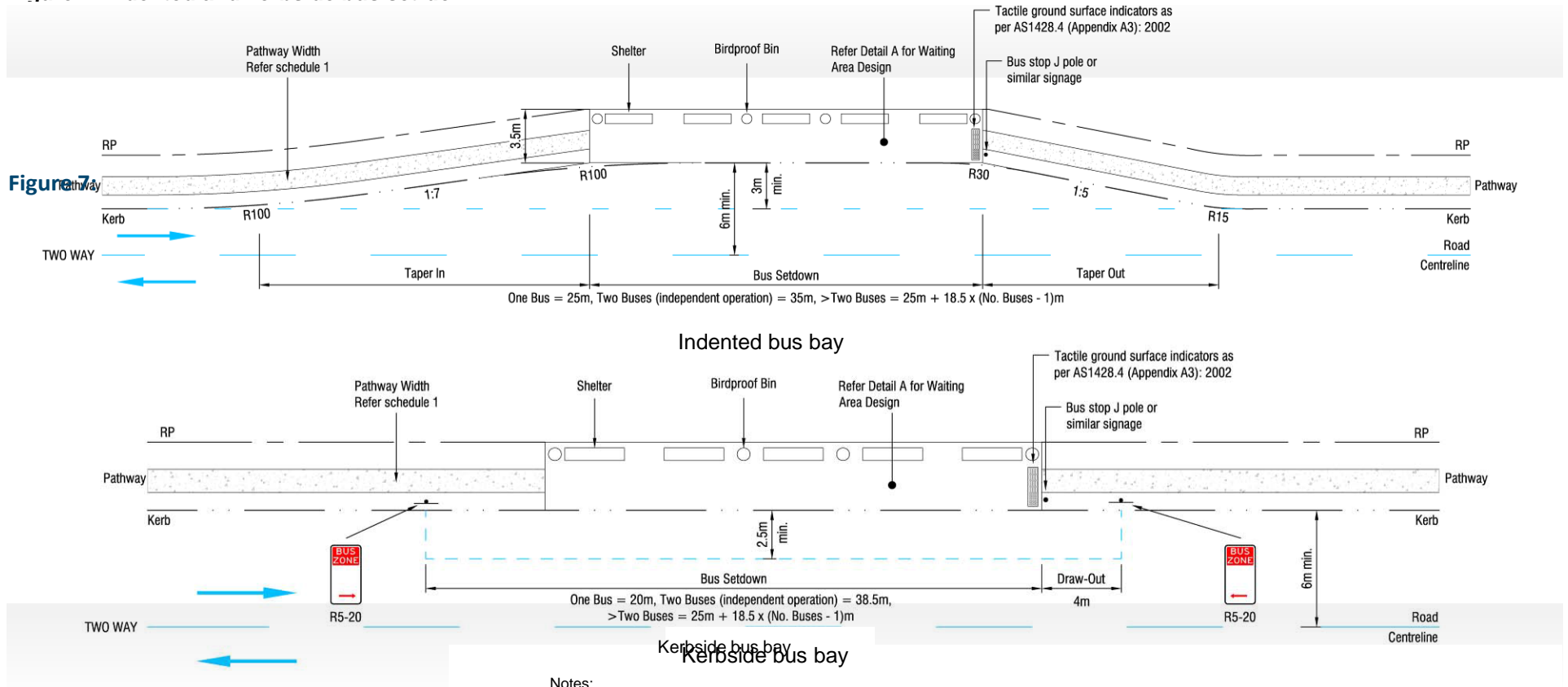
Figure 7 has been developed on reviews of guidelines including the Transport Planning and Coordination Regulation, TransLink, Austroads, SESG and NSW guidelines. It illustrates a typical design of an indented and kerbside bus stop suitable for a school environment.

The purpose of the figure is to illustrate space requirements for bay width and length, waiting areas and support facilities.

Key assumptions utilised to develop this figure include:

- The length of the bus stop recommended is based on a review of literature for best practice approach. The lengths allow independent functionality;
- The number of buses required to be provided for at these locations will depend on the potential demands – refer to Section 2.0 for planning guidance on this issue;
- Calculations of level of service and capacity at bus stop waiting areas using the Transit Capacity and Quality of Service Manual was undertaken to develop recommendations;
- Recommendations on support facilities such as shelters, bird proof bins, benches etc. were based on the TransLink Public Infrastructure Manual which forms a best practice approach to these public transport facilities, combined with general knowledge and expertise

Figure 7: Indented and kerbside bus set-down



Notes:

Kerbside Bus Bay Refer Schedule 1 for widths of pathway within the Waiting Area

1. Dimensions of the waiting and Boarding/Alighting Area have been based on achieving minimum acceptable levels of service identified in the Transit Co-operative Research Program Transit Capacity and Quality of Service Manual, and the minimum acceptable dimensions for these components
 2. Shelters and bird proof bins should be provided generally consistent with the recommendations of the TransLink Public Transport Infrastructure Manual
- Indented Bus Stop*
1. Bus stop gradient at boarding point to be 1:40 and all other areas to achieve a gradient of 1:20 to comply with disability standards. However, it is recognised that some areas will have site constraints
 2. Clear hardstand access of 1.2m minimum required between and around all bus stop infrastructure to meet disability standards (1.5m desirable)
 3. Bus stop lengths and tapers assume independent operation in all cases and are based on formulas identified through literature review
 4. Shelter and shading should be provided consistent with the intent of the TransLink Public Transport Infrastructure Manual and QLD Sunsmart Policy

Outcome 3: Private vehicles - Safe and appropriate infrastructure should be provided to cater for private vehicle access to the site

Figure 8: Typical design configuration for set-down and short-term parking

Figure 8 illustrates a typical design of a pick-up /drop-off area combined with a short term parking area for parents. The design has been based on the SESG and existing example which was identified as a best practice approach to this type of facility. Desirable elements of this design include:

- restricts vehicle movement in a one-way direction.
- A 10km/h speed limit could also be adapted for this access road;
- The pick-up/drop-off area includes provision for passing and is also located on the left hand side to allow unloading of children directly onto the footpath and not passing traffic;
- footpath provision on all sides of the facility to encourage connectivity and safety;
- location of the pedestrian crossings at either end of the pick- up/drop-off zone to ensure appropriate sight distance is achieved. Raised pedestrian crossings could be considered at these locations to further improve safety;
- requirements for queue storage was based on utilising the queuing theory from Austroads and testing a variety of arrival flow rates and duration of stay scenarios to identify the average queue requirements;
- provision of angled parking in the short term parking only to achieve an efficient layout and enable pedestrians in the car park to quickly access safe pathways to their destinations without having to walk past

reversing vehicles;

- Section 2.0 on planning guidance should also be referred to when planning and designing such facilities as should Schedule 3 for the supply requirements
- AS2890.1 should be referred to when designing car parks in the school environment and provides further details about layouts, widths of car parks, etc. For example, short term parking (i.e. parent parking during the school peak periods) with high turnover should be designed to Class 3/3A Standards.

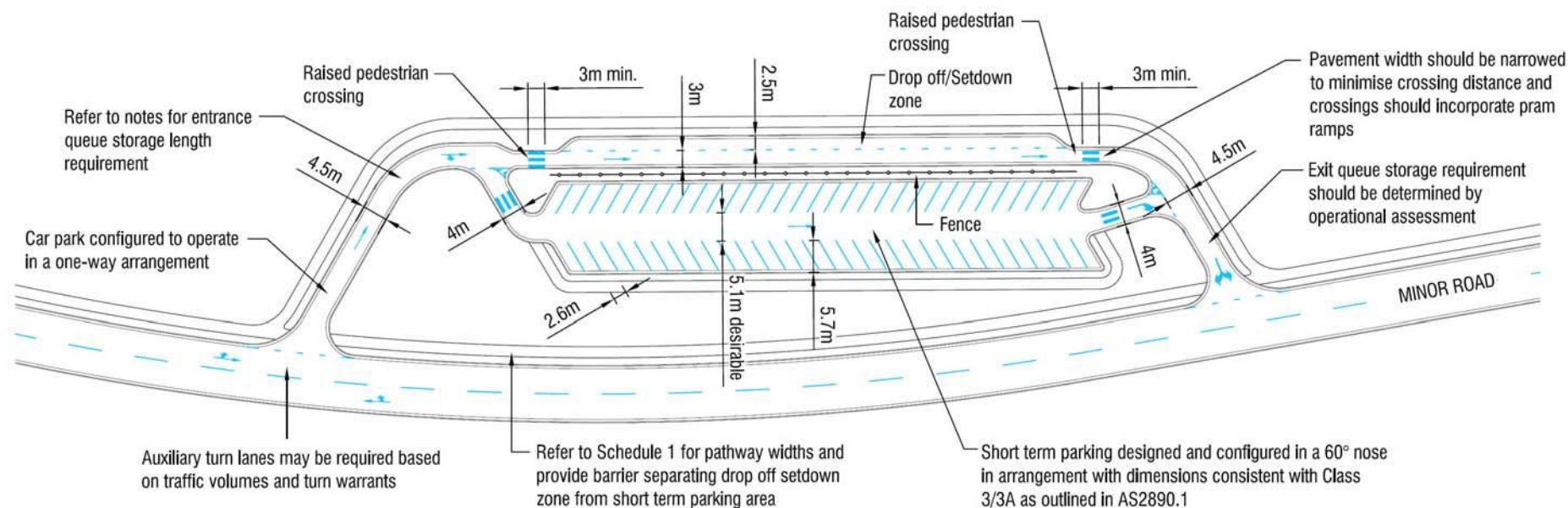
Figure 9: Typical Design Configuration for Longer Term Parking

Figure 9 illustrates a typical design for a longer term staff or visitor parking area. The design is based on a typical example in an existing school considered to be best practice. It is also based on AS2890.1 standards for off street car parking. The recommended queuing storage at the entry to the carpark has been developed based on Gold Coast City Council, Brisbane City Council and AS2890.1 tabulations for the queuing storage required in developments. Furthermore, these assumptions were validated by assuming mode splits for parking, drop- off, bus, walking and cycling consistent with the intent of the policy to generate sample arrival profiles by private vehicle to ensure that the assumptions were of the correct order.

AS2890.1 recommends, long term parking, i.e., staff parking, should be designed to Class 1/1A Standards.

In addition to the Australian Standards, Section 2.0 planning guidance and Schedule 3 on supply requirements should also be referred to when planning, designing and locating car parks in school environments.

Figure 8: Typical design configuration for set-down and short-term parking



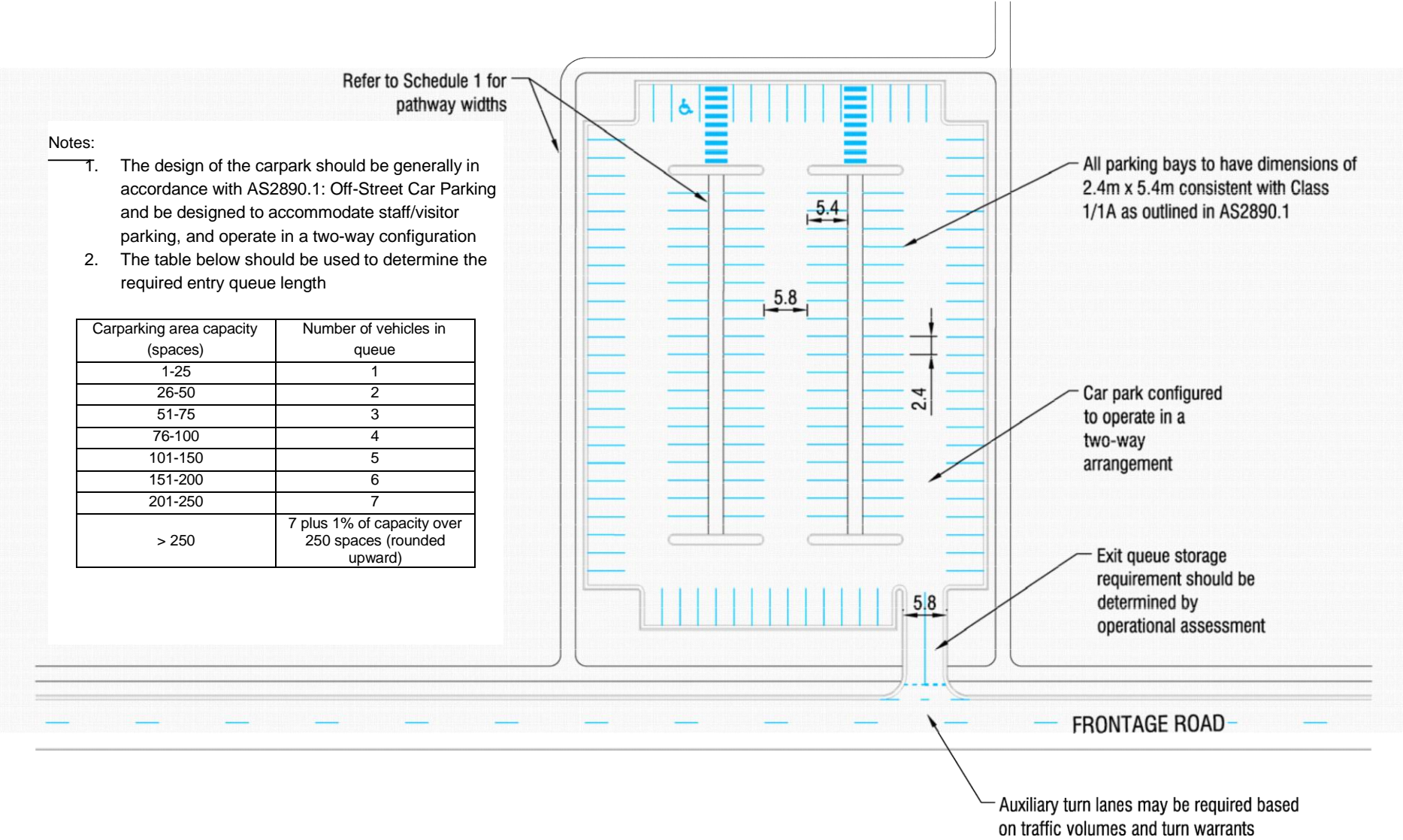
Capacity		Required Queue (vehicles)
Car park (cars)	Drop-Off (cars)*	
25	5	6
50	10	8
75	15	10
100	20	10
125	25	9
150	30	8
175	35	7
200	40	5

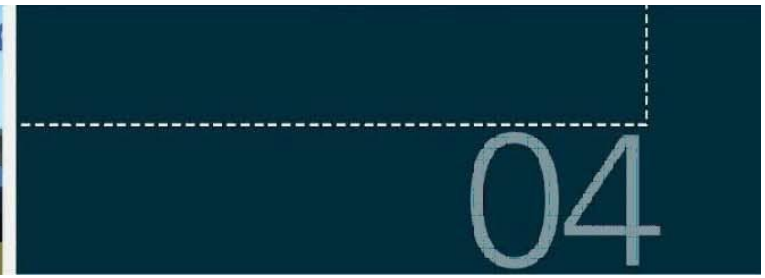
* 20% of short-term car park capacity

Notes:

1. The design of the carpark should be generally in accordance with AS2890.1: Off-Street Car Parking and be designed to integrate the setdown and short term parking areas, and operate in a one-way configuration
2. In the design configuration shown, the capacity of the drop-off zone generally equates to 20% of the short term parking capacity
3. The queue requirements have been generated from queue theory calculations based on car parking capacity, expected service rates and arrival flows
4. The adjacent table should be used to determine the required entry queue length

Figure 9: Typical design configuration for longer-term parking





4. Issues Application Matrix

The application matrix identifies key characteristics relating to each of the outcomes discussed in the planning guidance in Section 2.0 and presents strategies and examples of resolution strategies.

Active transport - Path width

Key Elements

- comply with Australian Standards for footpaths;
- ensure there is ample width to cater for the intended users;
- if paths are to be shared by pedestrians and cyclists, ensure appropriate width is provided for both modes in both directions;
- path width dependent upon school location, path hierarchy and proposed school size (enrolment);
- obstacles should not be located along the path such that they affect the width of paths;
- reference Schedule 1 for appropriate widths to use per location.



This example provides an external footpath of approximately 4m in width near the main school entrance.

This design reflects infrastructure needed to accommodate the highest levels of pedestrian traffic and also adequately separates users from other modes of transport.

A fence is also constructed to separate pedestrians from the bus drop-off area; however, an alternative and effective design would also be low lying vegetation.



This example provides a wide footpath leading from the car park drop-off to the main entrance to school, where the highest pedestrian volumes are to be expected.

This design should be designed in accordance with Schedule 1 as a Major Pathway in an urban setting.

Active transport - Path connectivity

Key Elements

- internal and external connectivity to existing and proposed cycle and walking networks within neighbourhoods;
- consistency in width, grade and material between internal and external paths;
- likely involves multiple pathways from a number of school boundaries and consequently additional pedestrian/cycle only entrances at these locations;
- should meet the direct desire line of users.



The above example provides a connecting path to the school from an adjacent neighbourhood. Such pathways must often be planned for in advance of school and adjacent use development. Such paths should consider both pedestrian and cyclist users. Proper signage and way finding is essential for connecting pathways.



Provision of a separated two-way cycle and pedestrian path adjacent to the school boundary and connecting to the internal network is shown in this example.

Separated paths such as this often connect to external commuter routes and should be considered during planning stages of school development.

Active transport - Path priority

Key Elements

- pathways should have priority over private vehicles and public transport;
- pathways should avoid crossing entrances to car parks and areas where private vehicles pick-up and drop-off students;
- where crossings of vehicle paths is unavoidable, the pathway should have priority over the vehicles and be designed to increase awareness and visibility of the users;
- will improve safety because less modal conflicts will occur;
- promotes active transport, particularly if seen as a safer and friendlier environment.



This example provides a zebra crossing and signs at the beginning of a car park and not mid-block. The placement of the crossing increases awareness of entry to a pedestrian zone.



The above photo illustrates a properly signed zebra crossing located at the end of a private vehicle zone (mid-block is not recommended). Path priority also offers adequate pathways once the user has crossed the street and is walking along the footpath.

Active transport – School crossings

Key Elements

- kerb build outs should be provided at either side of crossing to reduce crossing distance for users, to discourage illegal parking in no stopping zones and to reduce vehicle speeds;
- refuge islands are considered inappropriate for school crossings due to the large size of crossing groups and the need to cross in two stages making it difficult for a school crossing supervisor to manage;
- school crossing treatments should be based on road hierarchy, available supervision, expected traffic and potential safety risks;
- school crossing facilities are to be provided in accordance with MUTCD Part 10 and Schedule 4, Split Campus Crossings.



The above photo illustrates a school crossing with kerb build outs. Kerb build outs reduce street crossing distances, thus improving safety for students.

School crossings should also include crossing supervisors; however, the School Crossing Supervisor Scheme has limited funding and applications must meet established criteria largely based on risk.



This example shows a pedestrian actuated signalised crossing. Pedestrian signals provide a safe means of street crossing, particularly with the assistance of crossing supervision during peak school hours. Pedestrian signals are typically used on arterial roads with high vehicle and pedestrian volumes and must be warranted by MUTCD guidelines.

Active transport – Bicycle parking

Key Elements

- to be located near the main school entrance and in a location that allows surveillance across the day to prevent theft;
- secure bicycle parking to prevent theft should be provided;
- minimum infrastructure includes bicycle racks (see Figure 3) which allow the user to lock their bike securely and a direct path from connecting pathways;
- desirable level of service for parking is a secure bicycle cage (see Figure 3);
- consider Crime Prevention Through Environmental Design (CPTED) principles in bicycle parking location;
- bicycle parking requirements are identified in Schedule 2 – Bicycle Parking and End of Trip Facilities.



This example illustrates a safe and secure bicycle cage adjacent to school facilities. Although a good example of a secure parking facility, the racks could be placed more efficiently to allow more parking.

Consult Figure 3 for a more effective cage and parking layout. In addition, a roof for shelter and to prevent theft could also be provided.

Bicycle parking supply recommended per school can be found in Schedule 2 – Bicycle Parking and End of Trip Facilities.



The above photo shows a secure and locked cage that is also behind a secure and locked fence.

Public transport – Bus stops

Key Elements

- should be located in an on-street configuration without any type of diversion through a car park and designed to allow buses to enter and exit in a forward direction;
- priority over private vehicle drop-off area (located closer to school entrance) and located away from congested vehicle routes (i.e. private vehicle drop-off and car park areas);
- designed to cater for the anticipated school student population;
- located on the far side of an intersection, pedestrian crossing facility or vehicle access point.



This example shows a bus bay located along an adjacent road and allows the bus to enter/exit in a forward direction.

The tapered in and out approach is the best alternative for bus stops along a minor street. It provides easy access into and out of the site with minimal blind spots and ease of maneuverability.



The above example also shows a bus bay located along an adjacent road. Notice the separation between traffic, on-site car parking, signage and wide footpath leading to the school entrance.

However, the sawtooth bus bay design is not considered ideal because pulling out into the street is more difficult and bus drivers are likely to visually experience a temporary blind spot.

Public transport

Key Elements – Set-down waiting area

- appropriate support facilities should be provided in suitable locations to address the comfort, convenience and amenity for the students;
- the waiting area should incorporate bird proof bin, tactile surface indicators and signage;
- the set-down waiting area should consist of: waiting area, walking area and boarding/alighting area (refer to Figure 7 in Infrastructure Guidelines);
- consider Crime Prevention Through Environmental Design (CPTED) principles in bus set-down areas;
- waiting areas should be designed to cater for the anticipated total school student population using the area;
- signage must be provided that clearly defines bus/taxi lanes at entry and exit points and on the road surface in accordance with the MUTCD.

Key Elements - Connectivity to infrastructure and separation from other modes

- adequate separation is required between infrastructure provided to accommodate the use of private vehicles and infrastructure provided for other modes of transport;
- bus bays should be designed with on-street bus bays rather than off-street facilities;
- bus lanes must provide through access for buses and taxis to enter and exit without impacting on buses that must continue to queue or wait.

Queues of private vehicles at the entrance point should not impact on the through road traffic in particular public transport lanes and routes.



This example illustrates the provision of a large storage area, a number of seats, bins and protection from weather.

It is important to note that demand for public transport, ridership, location and specific school characteristics affect the required bus storage and waiting area for schools.

Covered shelters should be provided with adequate seating to give protection from weather.

Private vehicle – Pick-up and drop-off zone

Key Elements

- pick-up and drop-off area (2 minute parking) should be integrated, but separated from the 15 min parking area with channelisation;
- the pick-up and drop-off zones should be separate from other transport modes to avoid conflicts;
- avoid on-street loading zones, where possible;
- avoid two-way loading zones;
- avoid conflicts with other modes;
- pick-up/drop-off and short term parking design and requirements can be found in Schedule 3 – Car parking



This example provides 11 spaces in the drop-off/pick-up area.

This zone incorporates a 6m pavement allowing passing of parked vehicles.

This drop-off/pick-up area has kerb extension narrowing to 3.5m at the crossing area.

This drop-off/pick-up area is designed in a one way arrangement.



This example has a separate pick-up/drop-off area from the 15-minute car parking area.

The pick-up/drop-off area has a signed and marked pedestrian crossing with kerb extension.

The pick-up/drop-off area is one-way parallel to the carpark direction.

The drop-off/pick-up area provides wide footpath for pedestrians.

Private vehicle – Car parking

Key Elements

- separate short term and long term users;
- avoid two-way aisles in short term parking areas;
- car parking recommended for school can be found in Schedule 3– Car Parking



This example illustrates separate short and long term parking areas.

The short term parking is designed with angled 60 degree parking (Class 3/3A Standard).

The provision of disabled car parking is adequate.



The long term parking is designed with a 90 degree two-way aisle (Class 1/1A Standard).

The long term parking is well signed and gated.

The long term parking is adjacent the administration building and the class rooms for staff.

Private vehicle – Site access

Key Elements

- avoid school access points along arterial roads and higher level roads;
- provide appropriate turning facilities where warranted;
- avoid combining access and entrance into one driveway to reduce conflicts and achieve one-way circulation;
- avoid school access points adjacent to major intersections;
- avoid roundabouts as access treatments to the school



The above example illustrates a school with minor road frontage access.

One-way access reduces the conflicts with other modes.

The site access has good visibility.

This school has a separate entrance and exit driveway.

The school access forms a T-intersection.



The above photo illustrates a school with a left-out only egress and a downstream roundabout for those turning right.

The site egress has good visibility and connects to a minor road.

The school egress forms a T-intersection.

Site location – General considerations

Key Elements

- school development sites should be located adjacent to existing or planned active transport networks and public transport networks;
- school sites should not be constructed on land locked sites, and should provide frontage to at least two streets;
- school development sites should desirably be selected on flat terrain and with topography that promotes and enhances the use and ease of use of active transport and public transport;
- school development sites should be designed so that active transport pathways are not diverted or obstructed by natural or man-made barriers



The above example illustrates a school fronting existing bus route and on-road cycleway.



Map source – © 2010 MapData Sciences Pty Ltd, PSMA

The above example illustrates a school fronting a major bus route in a rural area and minor bus route along the minor road adjacent the school main access, with short walking distance.

Site location – General considerations

Key Elements

- the site should be located and connected to infrastructure that can service all possible transport modes for schools;
- ideally site location will be based on access from a minor road to promote a safe environment to the students;
- school should be located within or adjacent to the catchment it is to serve. It should not be separated from its catchment by a major barrier such as a creek, major road, rail line etc;
- access to the transport infrastructure components should also be gained from appropriate road types and planning should be undertaken to ensure desire lines for active transport networks are sympathetic to the road environment;
- school development sites should be located adjacent to land uses that do not compromise safety of school uses and help promote active transport;
- school development sites should not have front of school access to a freeway, highway, arterial, sub-arterial, busway, toll road, or cul-de-sacs road type.



The above example shows a staff access with left-in/left-out configuration and its main access from a minor street. This is a good example of diverting the main school traffic into an appropriate access street.

Access to public transport or along a bus route is also desirable.



Map source – © 2010 MapData Sciences Pty Ltd, PSMA

This example illustrates a school which fronts minor streets and is well connected to external footpaths and cycleways. Each of the entrances front minor streets which are connected to the adjacent residential catchment. The school location uses existing infrastructure to connect to the external road network.

New split-campus schools – Crossings

Key Elements

- if unavoidable, split campus schools should provide infrastructure that minimises interaction between motor vehicles and pedestrians/cyclists, particularly when crossing the dividing street;
- avoid crossings of arterial roads. If this cannot be avoided, an overpass or underpass would be the ideal solution (designed in accordance with Austroads, MUTCD and TMR consultation);
- the design of at grade crossings should be considered only on appropriate road types and needs to be designed in accordance with MUTCD Part 10 (also see Figures 4, 5 and 6);
- at grade school crossings should be designed and located to meet the desire lines within 20m of the school access gate, in a location with appropriate sight distance, supervised during school peak hours if possible and provided with low vegetation to discourage crossing at improper locations;
- consult Schedule 4 – Split Campus Crossing Facilities to help determine appropriate crossing facilities for each split-campus scenario



This example shows an overpass on a busy four-lane arterial constructed for access to a school.

This overpass provides a ramp and lift for disabled users and is within the school site and cannot be used by the general public.



The underpass at this school provides an alternative to a very busy arterial roadway above.

The tunnel remains locked while not in use. It should be wider to accommodate pedestrians, wheelchairs and cyclists. It does however provide a ramp for disabled users.

New split-campus schools – Overpass

Key Elements

- remove infrastructure that may reduce the use of an overpass first taking into consideration the needs of other users;
- ensure appropriate pathway connections provided to overpass;
- provide high standard overpass which includes wide walkway width, cover from rain and sun, natural lighting, and features to prevent anti-social or dangerous behaviour (i.e. overhanging or throwing objects on passing vehicles).



This example incorporates a wide width to accommodate high student capacity, cover from rain and sun and is naturally lit. It also incorporates measures to prevent pedestrians overhanging, or objects being thrown or dropped on passing vehicles.



This overpass will serve the students exclusively while the public will use pedestrian actuated signals to cross the road. The overpass is located adjacent to an indented bus stop within short walking distance with connection to a pathway.

Split-campus schools – Safety

Key Elements

- split campuses with grade separated crossing facilities should be designed to consider the principles of CPTED;
- pedestrian actuated traffic signals on collector roads and sub-arterial roads to provide safe travel between the campuses;
- enhanced (flashing) school zone signage in accordance with the guidelines in TRUM Volume 2 Part 3 - School Zone Guidelines;
- road safety audit should be undertaken as a key element of any split campus school development process. This should occur at all audit stages to ensure the focus on safety is paramount.

Road safety audits are a key tool to identify safety deficiencies inherent throughout all phases of planning, design, construction and operation.

Promotion of a lower speed environment highlighting the school environment and the potential for more vulnerable road users promotes safety, and is particularly important for at-grade crossing facilities.

Grade separated outcomes provide maximum protection for users.

5. References

In preparing this technical guidance document, reference has been made to the following background material:

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