# MAROOCHY SHIRE COUNCIL PLANNING SCHEME POLICY NO. 6

## Transport Traffic and Parking

### Contents

# 1 Introduction

## 1.1 Purpose

The Transport, Traffic and Parking Code guides development and the planning and construction of transport, traffic and parking facilities within Maroochy Shire. This policy is intended to provide applicants with more detailed guidance on the standards expected to meet the performance criteria nominated in this code.

If any doubt exists in respect to the interpretation of any part of this policy, the most appropriate interpretation will be that which is most consistent with the stated purpose of the code.

Where development involves traffic and transport related impacts that require any works, remedial treatments or upgrades to State Controlled Infrastructure, the relevant requirements of the particular State Government Agency must be applied in addition to the requirements of this policy. In circumstances where there is a conflict between this policy and a State Government Policy, the requirements of the State Government Policy must be applied.

## 1.2 Scope

This policy outlines the information requirements that are needed to support a development application that is likely to generate impacts on transport, traffic and parking infrastructure.

It also outlines key planning and design principles for achieving the intent of the Desired Environmental Outcomes (DEO's), the precinct intentions, and development codes in the Maroochy Plan that relate to Transport, Traffic and Parking infrastructure.

Volume 4 of the Planning Scheme contains a range of provisions that seek to achieve safe, convenient, efficient, attractive and legible transport, traffic and parking facilities. These provisions are primarily located in the Transport Traffic and Parking Code, the Code for Reconfiguring Lots, and the Code for Operational Works.

Volume 2 (Strategic Plan) and Volume 3 (Planning areas and Precincts) also contain specific provisions for impact assessable development in relation to Transport, Traffic, and Parking infrastructure.

## 1.3 Definitions

**Road Hierarchy Plan** – a plan of development that indicates the proposed hierarchy of roads and streets and how it proposes to integrated with the existing road and street network using the Maroochy Shire Road Hierarchy characteristics outlined in section 4 of this policy.

**Public Transport Network Plan** - a plan of development that indicates the proposed public transport network, including routes and the proposed location of stops or interchanges. The plan is used to demonstrate how the development intends to meet the Public Transport Network Planning Principles outlined in section 3 of this policy.

**Integrated Movement Network Plan** – a plan of development that indicates the proposed pedestrian and cyclist network, including proposed treatments. The plan is used to demonstrate how the development intends to meet the Pedestrian and Cyclist Network Planning Principles outlined in section 3 of this policy.

**DMR** – Department of Main Roads

**State Controlled Road** – is a road under the control of the Queensland Department of Main Roads

**MUTCD** – Queensland Manual of Uniform Traffic Control Devices developed by DMR.

**vpd** – vehicles per day

**vph** – vehicles per hour

**Van** – Courier or delivery van as defined in this policy in section 6.3

**SRV** – Small Rigid Vehicle or small truck defined in AS2890.2

**MRV** – Medium Rigid Vehicle or medium sized truck defined in AS2890.2

**LRV** – Large Rigid Vehicle or large sized truck defined in AS2890.2

**WCV** – Waste Collection Vehicle for Maroochy Shire as defined in this policy in section 6.3.

**Coach** – Bus or Coach as defined in Austroads Design Vehicles and Turning Path Templates

**AV** – Articulated Vehicle or 19m Semi-trailer as defined in AS2890.2

**Tandem Parking Spaces** – refers to a parking arrangement where a vehicle parks behind another vehicle that is parked with its nose or rear against a wall or other obstruction so that it cannot be moved without moving the second vehicle that is blocking it.

**85th percentile** – term used to specify a design scenario, eg it is often used when referring to design vehicles or design speeds. The 85$^{th}$ percentile car is the size of car that 85% of cars are smaller than, and 85$^{th}$ percentile speed is the speed that 85% of vehicles travel at or below.

**30th Highest Hour** – is used to specify a design period for transport infrastructure, particularly roads, intersections or carparks. It refers to the circumstances that occur during the 30$^{th}$ highest hour period in a year.

### 1.4 Expertise Required to Prepare Supporting information

A suitably qualified and experienced Traffic Engineer must undertake detailed Traffic Impact Assessment Reports. However, traffic impact assessment reports for developments that are considered to cause relatively minor traffic impacts may be undertaken by a Civil Engineer or Civil Designer who has a respected background and knowledge in the design and construction of road infrastructure and potential traffic impacts.

Qualified planners or engineers with a background of knowledge and experience in landuse and transport planning must undertake preparation of Road Hierarchy Plans, Public Transport Network Plans and Integrated Movement Network Plans.

### 1.5 References and Guidelines

- Austroads Guide to Traffic Engineering Practice - all Parts,
- Austroads Rural Road Design,
- Austroads Urban Road Design,
- Austroads Design Vehicles and Turning Path Templates,
- Amcord: *A national resource document for residential development (1995),*
- Queensland Streets: *Institute of Municipal Engineering Australia Queensland Division (1995),*
- AS2890 – Australian Standard for Parking Facilities, all parts,
- Queensland Department of Main Roads - Road Planning and Design Manual,
- Queensland Department of Main Roads – Traffic & Road Use Management (TRUM) Manual,
- Queensland Urban Design Manual (QUDM)
- Queensland Manual of Uniform Traffic Control Devices: *Queensland Department of Main Roads,*
- Liveable Neighbourhoods: *Western Australian Planning Commission (June 2000)*
- Austroads – Cities for Tomorrow:
- Brisbane City Council – Transport, Access, Parking and Servicing Planning Scheme Policy
- Brisbane City Council – Transport and Traffic Facilities Planning Scheme Policy.

Where discrepancies exist between the above references and guidelines, the following order of precedences apply unless specifically stated otherwise in this policy:

- The Queensland Department of Main Roads Road Planning and Design Manual takes primary precedence except for references to rural roads where Austroads Guide to Rural Road Design takes precedence.
- The Queensland Manual of Uniform Traffic Control Devices takes precedence over Austroads publications and Australian Standards.
- Austroads publications take precedence over the Australian Standards with respect to the design of the public road and street systems.
- Queensland Streets is used for the layout and geometric design of streets in residential (urban, rural, and multi-unit) and industrial lot reconfiguratons and development for Community Title uses. Other specific requirements detailed in this policy take precedence over Queensland Streets.

## 2 Information Requirements - Traffic Impact Assessment Reports

This section is relevant to the assessment of compliance with:

- Footnote 1 of the Transport, Traffic and Parking Code;
- Element 1 (Transport Network), and Element 2 (Road and Street Network)- of the Transport, Traffic and Parking Code;

### 2.1 General Requirements

All applications must be accompanied by appropriately scaled and dimensioned drawings, clearly showing all aspects of the proposal, specifically including the details of all interfaces with existing and proposed external roads (including relevant features and services, kerb lines, channelisation and line marking), and public transport, pedestrian and cyclist facilities.

As indicated in footnote 1 in the Traffic Transport and Parking Code, traffic impact assessment reports will be required for developments which are assessed as having a significant impact on the operation of the adjacent road network, or where the development proposed is not consistent with the acceptable measures in the Transport, Traffic and Parking Code. The traffic impact assessment report must deal with potential impacts and inconsistencies and identify ways in which the potential impacts and consequences of inconsistencies can be minimised.

For most developments, it will be sufficient that the proposed development is shown to comply with the requirements of this policy and other relevant codes and policies, without the submission of a traffic impact assessment report.

For developments that trigger a referral to DMR based on Guide 3 under the Integrated Planning Act, the applicant must follow the requirements of DMR, in particular the *'Guidelines for Assessment of Road Impacts of Development Proposals'*.

A traffic impact assessment report will be required for developments, which have a potentially significant

impact on the transport or traffic network, particularly those which potentially increase any of the following by 5 percent or more:

a) Peak period or daily total traffic movements through a signalised intersection;

b) Any peak period or daily turning traffic movement (not priority movements) at a priority controlled intersection;

c) Peak period or daily traffic movements on an approach to a roundabout;

d) Peak period or daily traffic movements on a traffic route.

This determination does not apply to intersections where all intersection approach streets are classified as Urban Neighbourhood Collectors Streets or lower in the Maroochy Shire Urban Road and Street Hierarchy.

Traffic impact assessment reports shall also be required for developments that are assessed by Council or its delegate as having the potential to significantly impact on the amenity of existing or planned residential communities, particularly relative to community expectations based on the Maroochy Plan 2000.

Where the subject development is part of an overall development planned for an area (by one or several applicants), whether staged development or independent development, and where the overall development would have significant impacts as defined above, a traffic impact assessment report will be required taking account of the impacts of the overall development and the contribution of the individual components to the total impacts at the various stages of the overall development.

A traffic impact assessment report must assess the impact of the proposed development based on current traffic operations, and based on a ten year planning horizon from the anticipated date of completion. Assessments of future traffic operations must separately assess the impact of the development:

- with the existing transport infrastructure,
- with planned transport infrastructure for which funding has been allocated, and
- with planned or proposed transport infrastructure for which funding has not been allocated.

The likely traffic to be generated from a proposal must be calculated as part of identifying the potential impacts on traffic operation. Council generally accepts the following references on land use trip generation for the purposes of calculating the likely traffic generation of a development:

- DMR Road Planning and Design Manual,
- RTA Guide to Traffic Generating Developments.

Council may also complete other more recent and locally derived traffic generation surveys of land uses from time to time and the results of these surveys should take precedence over the above references. Where a proposal includes a land use that is not covered by the above references, or by specific Council surveys, traffic generation surveys of other similar land use examples must be provided to justify the assumptions made when calculating traffic impacts.

The report must specifically identify ameliorative works that are necessary as a consequence of the proposed development, or the extent of any contribution that the proposed development must make to infrastructure upgradings planned or proposed by Council or relevant State Government Agencies.

There may be instances where other road users (current and future) may benefit from ameliorative works provided by a development proponent. However, it does not necessarily mean that other road users receiving benefits should contribute to the financing of the works, especially if they did not precipitate the timing of provision of those works.

Traffic impact assessments must take account of seasonal variations. In some cases, this will require analyses of traffic operations during off-peak periods, and during peak holiday periods. Generally, design traffic impacts will be assessed on the basis of traffic during the 80th highest hour in the year. New developments must be assumed to be 85th percentile developments in respect of traffic generation potential. Car parking demand estimates for design must be based on sufficient data to reliably estimate the 30th highest hourly demand in the year.

A traffic impact assessment report must address the impact of the proposed development relative to the purpose of the code and must address the compliance of the development with all requirements of the code and this policy, particularly any areas of inconsistency of the proposal with those requirements. Design or development options that ensure consistency with the purpose of the code will be required, even if this impacts on the scale or cost of feasible development.

A traffic impact assessment report must address on-site arrangements, particularly in respect of traffic, pedestrian and cyclist circulation, and the requirements for on-site parking, servicing and public transport facilities, and appropriate integration with existing or planned off-site transport infrastructure.

Traffic impacts are to be assessed based on evaluations of operations during the 80th highest hour in the year and must include safety considerations, degrees of saturation, queue lengths, delays, signal coordination, and the effects of interaction with adjacent intersections. Reports must be supported by statements of the data relied upon, assumptions made and the output of all relevant analyses.

The limits of operation for the different types of intersections are generally accepted as being:

- **signalised intersections** – the intersection degree of saturation (DOS), which represents the proportion of available green time capacity taken up for the critical movement(s), should generally be less than 0.90. This represents 90% of theoretical capacity and is considered a 'practical capacity' beyond which delays increase substantially for modest increases in volume;
- **roundabouts** – the DOS for any movement calculated using the procedures in Austroads Guide to Traffic Engineering Practice, Part 6 should not exceed 0.85; and
- **priority junctions** – the DOS for any movement calculated using the procedures in Austroads Guide to Traffic Engineering Practice, Part 5 should not exceed 0.80.

A 95% confidence limit should generally be used for assessing queue lengths (95th percentile queue length). A greater confidence limit may be appropriate where excessive queue length is likely to cause significant problems.

New traffic facilities must be designed to operate at Level of Service 'D' assessed as described in the Highway Capacity Manual.

Sight distance at intersections must comply with the requirements of the DMR Road Planning & Design Manual, Chapter 13.

All sketch plan or design proposals for site access or roadworks must be based on survey showing all relevant features and drawn to scale.

In masterplanned community developments or developments that propose greater than 100 lots or residential dwellings, development applications must be accompanied with the following plans to demonstrate how the Transport Network planning requirements are proposed to be met:

- **Road Hierarchy Plan** to indicate the proposed road hierarchy and how it proposes to meet the planning requirements detailed in section 3, and how it will integrate with the existing or planned road hierarchy indicated on the Maroochy Shire Road Hierarchy Map.
- **Public Transport Network Plan** to indicate how the planning requirements for public transport outlined in Section 2.1 are proposed to be achieved.
- **Integrated Movement Network Plan** to indicate how the proposed pedestrian and cyclist network achieves the planning requirements outlined in Section 2.2 and how it is intended to integrate with the proposed road hierarchy and public transport network plans.

## 3 Transport Networks

This section is relevant to the assessment of compliance with:

- Element 1 (Transport System) P1 Element 4, P1, Element 5, P1 and P2 Element 6 of the Transport, Traffic and Parking Code;
- Element 3 (Integrated Movement Networks), P1-P6 Element 4 (Pedestrian and Cyclist Facilities), and Element 5 of the Code for Reconfiguring Lots.

### 3.1 General

Transport networks in Maroochy Shire must be planned and provided with the following aims in mind:

- To create a system of transport networks that integrate with each other to encourage use of public transport, walking and cycling in preference to private car use by achieving higher levels of convenience and access for the non-car based transport modes.
- To create an interconnected system of streets that provide access to key local features and minimise travel distance on the network.
- To create a simple and legible hierarchy of roads and streets that meet the needs of locals and visitors to the area and has regard to the potential noise and amenity impacts associated with noise sensitive uses.
- To create a safe and convenient system of roads and streets that caters for the requirements of Public Transport, Pedestrians and Cyclists in addition to the motor vehicle.

### 3.2 Public Transport

Provision must be made on Arterial, Sub-Arterial Roads, and District Collector Streets and occasional Neighbourhood Collector Streets for bus routes to achieve highly accessible, convenient and efficient services. The following guidelines must be followed to ensure that convenient and efficient services can be achieved:

- Public transport routes must be planned concurrently with landuse to ideally achieve an integration of higher density residential uses and key activity centres with public transport nodes. (see Figure 3.1).
- Bus routes are planned and located within 300-400m walking distance to 90% of establishments within urban areas and within 200m of demand responsive routes (see Figure 3.2).
- Streets suitable for bus routes must be no more than 30% longer than those available on the road network for at least 85% of all routes.

Figure 3.1: Landuse and Public Transport Planning

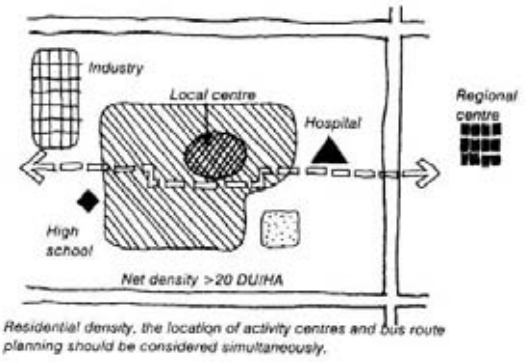
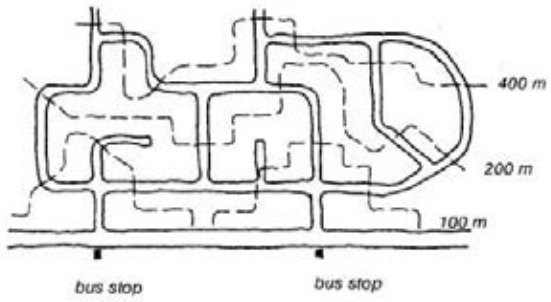



Figure 3.2: Areas served by regular bus routes (90% of houses within 400m of a route).




- Bus Gates', or bus only connections are provided between neighbourhood areas that deliberately don't connect to eliminate potential impacts of high traffic volumes using the street system to move between Arterial Roads. In these circumstances a bus only connection is required to achieve an efficient linear service rather than one that results in a circuitous route or one that doubles back on itself to service the area. (see Figure 3.4)
- Bus routes are planned and located through the centre of neighbourhood areas to maximise potential patronage and minimise walking distances to the route.
- Bus stops are located conveniently for the walkable catchment served at an average spacing of 300-400m to balance accessibility with running time (see Figure 3.2).
- The pedestrian network is designed to minimise walking distances to the nearest public transport route and bus stops are sited with regard to the pedestrian network.
- Bus stops are located at potential key destinations including schools, neighbourhood and town centres, stations, recreational areas, and industrial areas.
- Bus stops are located near traffic lights and median islands on busy roads to facilitate safe pedestrian movement.
- Traffic management devices on bus routes are designed to achieve comfortable movement by buses, ie speed humps, or chicanes and other slow points with 25km/h spot speeds must be avoided on bus routes. Roundabouts and bends with deflection angles greater than 60o are favoured methods of speed management on bus routes.
- Where bus routes need to be located on Neighbourhood Collector Streets to meet bus route planning targets, the Street must be provided using the 'Neighbourhood Collector Street (Bus Route)' cross section detailed in Section 3.6.2.
- Intersections along bus routes must be designed to achieve, as a minimum, the 12.5m wide swept turning path for a single bus unit as out lined in Austroads Design Vehicles and Turning Path Templates.
- Where bus routes link residential areas across any road which carries in excess of 6000vpd, the intersection is designed as a roundabout or with traffic signals to enable a left turn into the road from one area followed by a right turn from the road into the adjoining residential area.
- Retirement Villages should ideally be located within 100m of a proposed bus route.
- Where bus routes are proposed on new roads or on development sites, the separate requirements of the Queensland Department of Transport will also need to be accommodated.

## 3.3 Road and street Network planning

Maroochy Shire Council, in consultation with relevant State Government Agencies will plan sub-arterial and arterial road and transport facilities, including major pedestrian, cycle and public transport facilities. All development must be consistent with this planning.

The DMR and/or Council will prepare plans for road and transport system upgrades that will incorporate dedicated and/or constructed road widening or new road corridor requirements. Some or all of the planned works may be reasonable requirements of adjoining development. When these works would impact on development sites but the works are not reasonable requirements of that development, the development must not compromise the future corridor.

Where access is proposed to a State Controlled Road, or the subject development will have significant impact on a State Controlled Road, the separate requirements of the DMR will need to be accommodated.

The road and street system in Maroochy Shire must achieve a safe, convenient and efficient network of roads and streets that appropriately caters for both current and anticipated local and regional traffic movement and must have regard to potential impacts on noise sensitive land uses. The functional characteristics of the road and street hierarchy for Maroochy Shire are outlined in section 4 of this policy and illustrated in Figure 3.3.

All new developments, including residential, commercial, and industrial, must plan and provide a network of Roads and Streets using the following principles:

- In Urban Areas a network of Arterial and Sub-Arterial Roads spaced at 1 to 1.5km is generally required as a guide, with actual need dependant on landuse density and topography. The road system should be more convenient for long distance traffic than the local street network.

- Sub-arterial Roads and District Collector Streets form the spines of towns and neighbourhoods rather than the edges, which have little development. These roads are appropriate for mixed use, shopping and community activities and help to integrate landuses.

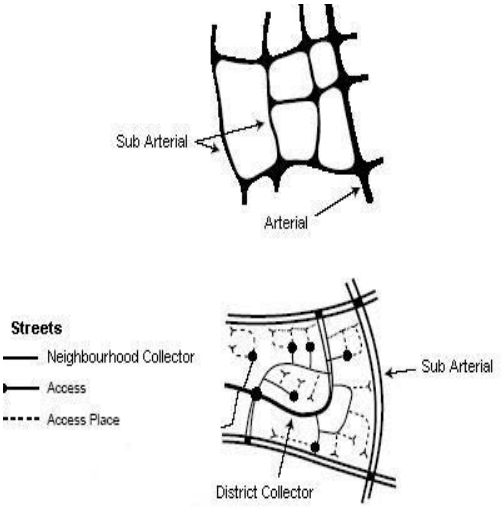
- Local Streets should be provided to support short trips for local traffic moving within and between neighbourhoods. They should also be designed to discourage traffic travelling long distances (i.e. beyond adjacent neighbourhoods) from passing through.

- The street system should be site responsive and highly interconnected, with good external connections. It should integrate developments into their surroundings, including with existing and future development on adjacent and other nearby sites. A highly connected system of streets is desirable to maximise choice of travel rather than the alternative of creating an unconnected system of cul-de-sacs that concentrate traffic movement to one point and potentially results in more circuitous and inefficient traffic movement on the street system. However interconnected street systems require careful design to ensure that they do not create potential for unintended through traffic using the street system as a shortcut.

- District Collector Streets must achieve convenient access to a group of neighbourhoods but must also be carefully planned to prevent shortcuts through residential neighbourhoods except for buses (see Figure 3.4).

- The street system must also be legible and logical. It must be designed to ensure that motorists don't lose their sense of direction and can find their way to and from the nearest District Collector Street or Sub-Arterial road with relative ease. This is generally achieved by limiting the number of turns that a driver needs to make to 3 or less between the furthest point in the neighbourhood and the nearest Road or District Collector Street (see Figure 3.5). The street layout should support a consistent approach to traffic priority at intersections. Higher order streets should not change direction at intersections with lower order streets, particularly at roundabouts.

**Figure 3.3: Local Arrangement for District Collectors to exclude through traffic (except buses)**

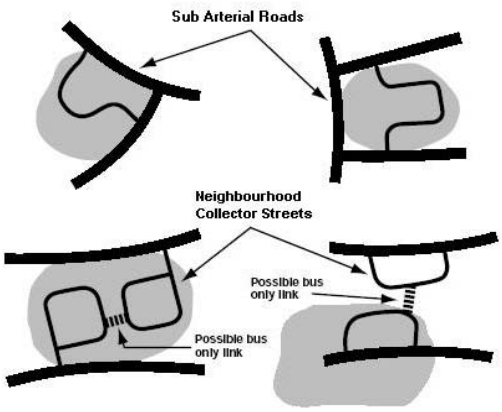



- The street system must facilitate walking, cycling and use of public transport for access to daily activities, and enable relatively direct local vehicle trips within and between neighbourhoods and to local activity nodes.

- The street system must be convenient to use, minimise driver impatience and reduce the propensity for drivers to travel at excessive speed by limiting the time that drivers spend travelling in a low speed restrictive environment. This is achieved by limiting travel distance from the furthest lot in the catchment to the nearest District Collector Street or Sub-Arterial Road to 700m in Urban areas and 2000m in Rural Residential Areas.

- The street system must provide a reasonable degree of connectivity and access convenience, and an alternative access route for emergency use. This is achieved by providing an alternative street access in residential areas for all 'precincts' having more than 100 lots. Street layouts should allow a minimum of two access routes for all industrial subdivisions.

**Figure 3.4: Illustrative layout of Roads and streets in Hierarchy**



## 3.4 Pedestrian and Cyclist Network Planning

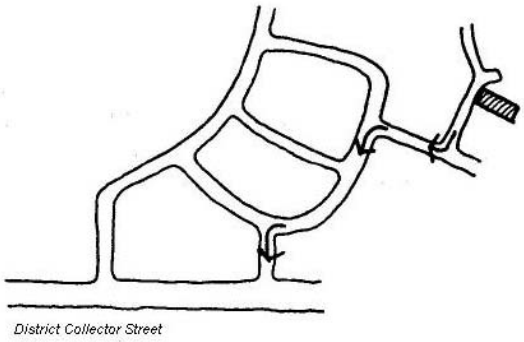
Pedestrian and Cyclist networks must be planned to provide safe and convenient connections to key loca attractions, particularly to transport nodes, schools and commercial centres. Provision of a well designed and planned pathway network will encourage people to walk and cycle rather than relying on the car for shorter distance trips. In terms of cycling, the provision of pathways is particularly important for children and other inexperienced cyclists. Direct paths must be provided to local activity centres and schools using lower-order streets and the open space system. Wherever possible the pedestrian and cycleway network must be designed to achieve shorter travel distances than those available via car, particularly for shorter distance trips (up to 1km).

Many commuters and other longer-distance and experienced cyclists prefer cycling on roads, rather than on pathways. Therefore all roads and streets, with the exception of highways and motorways, must be designed to cater for on-road cyclists regardless of whether an adjacent shared pathway is present or is required to be provided.

A comprehensive pathway network, in addition to adequate provision for cyclists on roads and streets, will ensure that an integrated pedestrian and cyclist system is developed for all types of users. To plan and provide safe, convenient and attractive pedestrian and cycle networks, the following guidelines must be used:

- All networks must be designed to provide for safe and convenient movement of pedestrians and cyclists for recreation and commuting purposes including provision for the aged, young children, people with prams, and people with disabilities.

**Figure 3.5: Maximum of three turning movements from houses to nearest District Collector street/ Arterial Road.**




Linkages must be provided to open space networks and community facilities including public transport stations/ stops, local activity centres and schools.

- Attention must be given to providing pedestrian and cycle paths with casual surveillance. Routes along back ways that are hidden from view must be avoided. Paths must also be well lit in accordance with AS1158.3.1.

- The path network must be designed and provided according to the *Austroads Guide to Traffic Engineering Practice Part 13 'Pedestrians', and Part 14 'Bicycles'*. This includes path clearances and gradients.

- Facilities for cyclists on roads and streets must be designed and provided according to the *Austroads Guide to Traffic Engineering Practice Part 14 'Bicycles'* and the MUTCD.

- Pedestrian and cyclist infrastructure is located on the Urban road and street system in accordance with Table 4.4.1 and the acceptable solutions outlined in Section 4.5.1 and 4.5.2 unless a specific alternative is required in accordance with the Priority Infrastructure Plan.

- Generally pedestrian or cycle paths are not required on Access Streets or Access Places as these streets are designed to create a low speed shared street environment. However they are required if a key pedestrian or cyclist route needs to traverse an access street to achieve a convenient and efficient connection as part of broader network planning requirements.

- Footpaths may be omitted from one side of the street only where:
  - There is no development fronting that part or side of the street and the path is not required as part of broader network planning requirements to achieve direct connections to public transport or activity nodes.
  - Topography or vegetation precludes provision, or
  - Vehicle speeds are very low, and the future traffic volume will be less than 1000vpd

- Where it is expected that commuter cyclists are likely to use an Arterial or Sub-arterial road to access key employment centres, either segregated off-road paths or exclusive on road cycle lanes must be provided in addition to footpaths to separate the large speed differential that exists between pedestrians and higher speed commuter cyclists.

- Controlled crossing points such as refuges, slow points, thresholds or traffic signals, must be provided as appropriate where pedestrian and cyclist routes are proposed to cross roads or streets with traffic volumes higher than 3000vpd or traffic speeds greater than 50km/h, or at logical sites within the pedestrian and cycle network. The selection of facilities to be used in the control and protection of pedestrians crossing roads and streets must be in accordance with the MUTCD and the DMR Traffic and Road Use Management (TRUM) Manual.

Changes in paving colour or texture must not be introduced at locations where there is a pedestrian desire line to cross a road or street. This creates a safety hazard as some pedestrians may incorrectly perceive the change in paving as assigning priority to pedestrians over vehicles.

- The general minimum path widths are 1.5m for pedestrian footpaths and 2.5m for shared use paths. An absolute minimum shared path width of 2m will only be considered where significant constraints exist limiting the construction of a wider path and there is very low use at all times on all days. In commercial areas, the verges are fully paved.
- Paths must be widened at potential conflict points or junctions or in areas of high use (such as major commuting and recreational paths) based on the recommended widths outlined in *Austroads Guide to Traffic Engineering Practice Part 13 'Pedestrians' and Part 14 'Bicycles'*. The width of the gap in raised traffic islands at pedestrian crossing locations should generally be at least 3m.
- Kerb ramps must be provided at all kerbs including facilities for people with vision impairments as outlined in *Austroads Guide to Traffic Engineering Practice Part 13 'Pedestrians' and Part 14 'Bicycles',* and AS 1428. Where a kerb ramp is provided as part of a development, the corresponding kerb **ramp/s** on the opposite side of the **road/s** should also be provided.
- In circumstances where on road cycle lanes are needed and a slow point is required to achieve speed management targets on streets, the slow point must be provided to allow safe continuation of the cycle lane through the slow point.

## 4 Road Hierarchy

This section is relevant to the assessment of compliance with:

- Element 2 (Road and Street Network) - of the Transport, Traffic and Parking Code;
- P4, P6, and P7 in Element 3 (Integrated Movement Networks), P1 in Element 4 (Pedestrian and Cyclist Facilities) and P2 and P4 in Element 5 (Public Transport) of the Code for Reconfiguring Lots; and
- P1, P2, P5 and P6 in Element 2 (Movement Networks) of the Code for Operational Works.

### 4.1 General

The Maroochy Shire road hierarchy is shown on Map 1 attached to this Policy. This Map indicates the road and street hierarchy and known future intentions at the time the map was prepared. This hierarchy is likely to change in time due to the influences of further development and decisions that are made by Council to address immediate impacts and longer term planning requirements. Therefore, notwithstanding the road hierarchy on Map 1, it is essential that development applications review and consider the current and likely future hierarchy of the surrounding road network, and the impacts of the proposed development on this road hierarchy, based on the hierarchy principles and characteristics outlined further in this Policy.

Within this Policy and the Transport Traffic and Parking Code, the road hierarchy is broken into the two broad categories of *streets* and *roads*, which are defined in Sections 4.2, and 4.3 below.

Road hierarchy planning is intended to provide a safe, efficient and convenient road system providing for the movement of people and goods while minimising the adverse impacts of traffic flow, particularly on residential amenity and pedestrian safety.

It is intended that the classification system – a hierarchy of road types – should be used when describing and classifying roads by function for planning purposes. Classifying roads in this way recognises that not all roads are the same. At one extreme, the long-distance driver expects to be able to drive quickly without encountering potential conflicts with pedestrians, intersections and turning vehicles. At the other extreme, residential access streets are designed to give priority to the social and recreational needs of the people living there, rather than through-traffic.

Classifying roads thereby enables the identification of the required characteristics of the road and the traffic it carries, so that appropriate planning and design standards (such as width, geometry, degree of access permitted, junction priority, etc.) can be chosen.

Maroochy's Road and Street Hierarchy is structured in a tiered system to define the primary purpose of each element, its relationship between the road system and the land uses it serves, how it is proposed to be managed and its design requirements. The tiers relate to Function, Role, Management and Design of each roadway type and are defined as follows:

- **Function** – describes the primary purpose of the roadway type, whether to carry through traffic or to provide property access;
- **Role** – describes the relationship between the roadway type and the landuse it serves. This tier of the hierarchy is common to traditional road hierarchy concepts
- **Management** - relates to the policies that need to be introduced to achieve the desired role of each roadway type, such as defining how roadway types should connect in the network and the access management techniques that apply.
- **Design** – outlines the detailed design characteristics that need to be followed to achieve the Function, Role and Management objectives of each element.

Table 4.1.1 summarises traffic and access principles for Maroochy's road hierarchy elements and their objectives

**Table 4.1.1 - Maroochy Road Hierarchy Elements and their Objectives.**

<table>
<tr><th colspan="10">TIER 1: FUNCTION</th></tr>
<tr><th colspan="5">Roads</th><th colspan="5">Streets</th></tr>
<tr><td colspan="5">• To carry through traffic</td><td colspan="5">• To provide local property access<br>• To collect local traffic</td></tr>
<tr><th colspan="10">TIER 2: ROLE</th></tr>
<tr><th colspan="3">Arterial Roads</th><th colspan="4">Sub Arterial Roads</th><th colspan="2">Collector Streets</th><th>Local Streets</th></tr>
<tr><td colspan="3">• through traffic movements between settled areas<br>• longer distance traffic movements within settled areas<br>• line haul public transport task<br>• primary freight and dangerous goods routes<br>• regional / district cycle movements</td><td colspan="4">• connections between local areas and arterial roads<br>• connections for through traffic between arterial roads<br>• access to public transport<br>• through movement of public transport<br>• regional / district / local cycle movements<br>• pedestrian movements<br>• access to developments</td><td colspan="2">• carry traffic having a trip end within a local neighbourhood or district area<br>• direct access to properties<br>• access to public transport<br>• pedestrian movements<br>• district / local cycle movements</td><td>• direct access to properties<br>• pedestrian movements<br>• local cycle movements</td></tr>
<tr><th colspan="10">TIER 3: MANAGEMENT</th></tr>
<tr><th>Highway/ Motorway</th><th>Arterial Roads</th><th>Arterial Main Street</th><th>Distributor Road</th><th>Controlled Distributor</th><th>Sub Arterial Main Street</th><th>District Collector</th><th>Neighbourhood Collector</th><th>Access Street</th><th>Access Place</th></tr>
<tr><td colspan="10">The aim of management policies for these categories will be to facilitate:</td></tr>
<tr><td>• Longer distance traffic movements<br>• Regionally and nationally significant movements<br>• Restricted access</td><td>• Longer distance traffic movements through the region<br>• Main connection between suburbs and employment/ shopping centres</td><td>• Longer distance traffic movements through the region<br>• Access to commercial properties through town or village centres</td><td>• Connection of local areas to arterial roads<br>• Access to major developments<br>• Generally restricted access</td><td>• Connection of local areas to arterial roads<br>• access to properties (certain existing cases)<br>• control of some aspects of traffic operations to ameliorate impacts</td><td>• connection of local areas to arterial roads<br>• access to commercial properties<br>• preservation of aspects of local amenity in balance with traffic operations</td><td>• connection of residential streets with traffic carrying roads<br>• access to grouped properties<br>(new urban only)</td><td>• connection of residential streets with traffic carrying roads<br>• access to individual adjacent properties</td><td>• access to individual adjacent properties<br>• access to local area</td><td>• access to individual adjacent properties</td></tr>
<tr><th colspan="10">TIER 4: DESIGN</th></tr>
<tr><td colspan="10">Refer to Section 4.4 for the Design Characteristics for the various elements of Maroochy's Functional Road Hierarchy</td></tr>
</table>

## 4.2 Streets

The primary function of streets is to provide access to individual properties or developments and collect local traffic. They comprise the bulk of the overall road and street network. Streets should provide access to more major roads, but should not provide for any through traffic movement between major roads.

The street network includes the hierarchy categories of access places, access streets, neighbourhood collector streets and district collector streets. Streets can serve residential, rural, commercial, industrial and rural residential uses. Specific additional and alternative requirements for commercial, industrial and rural residential streets are contained in Sections 4.6, 4.7 and 4.8.

### 4.2.1 Local Access streets and Access Places

The objective of local access streets and access places is to provide direct access to properties. In residential areas, these must be in a form to encourage a liveable and safe street environment where the motor vehicle is secondary to the pedestrian and cyclist. Through traffic must be discouraged on these streets.

The catchment for Urban Residential Access Streets must be limited to less than the equivalent of 75 detached dwelling lots and therefore traffic volumes must not exceed 750vpd. In urban areas speed environments of 40km/h or less must be achieved to ensure amenity is compatible with abutting residences. To achieve a traffic speed environment less than 40km/h, speed management techniques must be introduced to reduce street leg lengths to 120m or less, provided that end conditions reduce traffic speed to 25km/h or less. On Access Streets in Rural Residential areas, higher speeds of 40km/h to 50km/h are more appropriate.

Access Places are generally short dead-end streets that serve up to 15 lots. The speed environment in these streets is 30km/h or less.

These streets are not appropriate for bus services in urban areas; however school bus services may need to operate on Access Streets in rural areas.

In urban residential areas street widths have traditionally been narrow in the past to achieve increased levels of residential density. These streets have narrow two lane cross-sections. One of the lanes is used for parking and the other is used for traffic movement, or alternatively if there are no vehicles parked on the street both lanes are used for traffic movement. Specific provision for parking (such as marked parking lanes or indented parking bays) was not usually made except in turning areas or where higher density uses exist and kerb space cannot meet anticipated on-street parking requirements.

However, the liveability of these narrow streets has been criticised in recent times with a desire expressed to widen these streets and create more on-street parking areas. Therefore the creation of indented parking bays on one side of the street at a time (alternating from one side to the other) in addition to two travelling lanes is encouraged in these areas. Alternatively, a 7.5m wide carriageway could be considered. Careful design is required to ensure that speed management objectives are still achieved.. A wider reserve is also needed to accommodate the desired cross-section with indented parking spaces.

In commercial and industrial areas higher traffic volumes can be tolerated on access streets. In these areas fewer lots are served, however the nature of industrial and particularly commercial uses in town and village centres have higher trip generating potential per lot compared to urban residential uses. Significantly higher heavy vehicle proportions and tolerances for environmental factors such as noise are generally accepted on Access Streets in Industrial areas.

### 4.2.2 Neighbourhood Collector streets

The objective of Neighbourhood Collector Streets is to provide for circulation of traffic having a trip end within a local neighbourhood area. These streets are generally located within a specific local area and do not provide for through traffic which does not have a trip end within the area.

These streets provide a connection between Access Streets and traffic carrying roads. In Urban Residential Areas amenity and safety are the most important consideration, as these streets are also intended to provide direct access to properties. Through traffic must be discouraged on these streets and heavy vehicle movement must be limited to occasional local delivery or service trips only.

The catchment area for Urban Neighbourhood Collector Streets must be limited to less than the equivalent of 300 detached dwelling lots and therefore traffic volumes must not exceed 3,000vpd. In Urban Areas speed environments of 50km/h or less are required to ensure compatible amenity with abutting residences is achieved. Speed management techniques must be introduced to reduce street leg lengths to 140m or less, provided that end conditions reduce traffic speed to 25km/h or less, to achieve speeds lower than the nominated maximum 50km/h traffic speed environment. On Neighbourhood Collector streets in Rural Residential areas, higher speeds of 60km/h are more appropriate.

Urban Neighbourhood Collector streets are two-lane, two-way streets that generally consist of a three lane carriageway width to allow for on

street parking. Either kerbside lane can be used for parking. When a kerbside lane is unoccupied by parked vehicles it is able to be used for traffic movement. If If vehicles park adjacent to each other in kerbside lanes, through traffic movement is restricted to one lane, which is considered appropriate in the resulting low speed low volume traffic environment. No specific provision needs to be made for parking such as marked parking lanes or indented parking bays unless the street forms part of a planned bus route.

These streets are suitable for occasional use by buses, such as infrequent school bus services. However, if a regular bus service needs to be allowed for to meet Public Transport Network Planning requirements, an alternative cross-section must be introduced such as the 'Neighbourhood Collector (Bus Route)' cross section outlined in Section 4.5.2.3. This cross section must provide on street parking lanes for cars and bus stops separate from the traffic lanes.

Speed management devices such as speed humps or chicanes that create 25km/h or less spot speeds should not be installed on Bus Routes. Speed management principles for Urban Neighbourhood Collector Streets with bus routes must be achieved by using roundabouts at intersections, or tight bends with angles greater than 60° to limit street leg lengths less than 140m. Curve widening should be provided on tight bends, along with median islands to control vehicle paths. Kerb buildouts should also be provided at regular intervals along Neighbourhood Collector (Bus Route) Streets to narrow the effective width of the street and enhance landscaping opportunities.

Intersections on neighbourhood collector streets must be either priority T, or roundabout controlled and must be spaced at intervals greater than 60m to minimise the potential for conflicting turning movements at intersections and to achieve appropriate reaction times for traffic entering from side streets.

Pedestrian movements need to be catered for off the roadway by constructing a footpath on one side; however traffic volumes should be sufficiently low to enable shared local cycle movements on street.

'Collector streets perform similar roles in Commercial Town and Village centre areas and Industrial areas. Generally higher traffic volumes can be tolerated on streets in these areas (refer Sections 4.6 and 4.7), and fewer lots are served due to the higher trip generating potential of commercial and industrial uses. Significantly higher heavy vehicle proportions and tolerances for environmental factors such as noise would be acceptable on such streets in industrial areas.

### 4.2.3 District Collector streets

Where required, these streets provide a connection between a district, or group of neighbourhoods, and traffic carrying roads. Due to the size of some development catchments it may be difficult to restrict traffic volumes on neighbourhood collector streets to acceptable environmental amenity levels for frontage residential lots. Traffic flow levels commonly achieved at the major point of access to urban residential neighbourhood areas are 3,000 veh/day but may be up to 7,000 veh/day. This category caters for a group of urban residential neighbourhood areas where traffic volumes of 3,000 veh/day are likely to be exceeded.

These streets are generally needed as a major point of access to urban residential areas with catchments greater than 300 lots and up to 700 lots. They have a maximum speed environment of 60km/h to ensure a reasonable balance of safety, amenity and travel time is achieved. In rural areas speeds of up to 80km/h may be acceptable. Heavy vehicle movement must be restricted to access only in residential areas.

It is desirable that these streets maintain frontage access to minimise potential safety and security concerns by creating casual surveillance. However, due to the higher speed environment and traffic volumes experienced, a range of frontage management techniques must be implemented where frontage access is permitted to address potential traffic noise, amenity and safety impacts. These techniques include building setbacks, fence construction, street alignment and cross section elements, provision for bicycles and on-street parking lanes, sight distances to and from individual driveways and reducing the need for reversing from driveways. Frontage management techniques for District Collector Streets are outlined further in Section 4.4.3.

Bus routes are generally required on district collector streets to achieve public transport planning requirements. Where parking lanes are not provided, indented set-down bays are required at regular intervals to provide for designated bus stops or to enable buses to stop at regular intervals as required.

Footpaths and cycle lanes must be provided on both sides of the street in urban areas, but are not generally required in rural areas.

Intersections must be spaced at no less than 80m to 100m in urban areas to minimise the potential for conflicting turning movements at intersections and to achieve appropriate reaction times for traffic entering from side streets. These streets also have two lane cross-sections.

Speed Management must be achieved by introducing tight bends with angles greater than 60° or roundabouts at intersections to limit street leg lengths to 180m, provided that end conditions of 25km/h or less are achieved. Curve widening should be provided on tight bends, along with median islands to control vehicle paths.

Street planning and construction is undertaken in accordance with Table 4.5.1 of this Policy.

## 4.3 Roads

The primary function of roads is to carry traffic, and to provide direct access to major developments in specific circumstances, particularly where the adverse amenity impacts of those developments gaining access via local roads would be unacceptable.

The major road network includes main streets, sub-arterial roads, arterial roads and motorways. Many major roads that provide inter-regional access are generally State Controlled Roads.

Main streets, sub-arterial roads and arterial roads are generally used by public transport bus services.

Ideally, there would always be a clear distinction in the road hierarchy between streets and major roads. However, road networks are constantly in a state of transition in respect of:

- Network developments, particularly new connections or substantial upgradings, and
- Changes in traffic flow patterns or volumes resulting from land or road network development.

Consequently, at different interim stages of network and urban development, streets may carry traffic volumes that are undesirably high, or at an undesirably high speed, for a street of that type and/or geometry. Further, because more appropriate alternative routes have not yet been developed, traffic routes with the alignment, cross section or frontage access characteristics of local streets may, for a number of years, function as sub-arterial or arterial traffic routes.

However, new development proposals should not create or exacerbate such circumstances.

Throughout this policy, all roads other than streets shall be treated as roads.

### 4.3.1 Sub Arterial Main street

This road category is directed at existing situations where a group of commercial land uses exists, generally on both sides of a stretch of sub-arterial road. A decision needs to be made dependent on the value of these uses, whether on these stretches of road the traffic carrying and access functions should coexist, or whether a bypass or parallel route upgrade is warranted.

On these sub-arterials the traffic environment may be restricted to improve the amenity for pedestrians and users of the adjacent developments. Measures may be taken to reduce some traffic use of the road, for example during peak periods, and there may be opportunities to bypass freight movements.

This category is generally appropriate as a bus route, and indented parking bays must be provided where required to reduce delays to through traffic caused by parking manoeuvres. This category is generally inappropriate as a dangerous goods route.

Speeds on these road stretches must be managed to improve amenity for pedestrians and abutting land uses, and should be no greater than 50km/h. Volumes should desirably be no greater than 15,000vpd so that vehicles can manoeuvre to and from on-street parking bays without creating unreasonable delays for through traffic. These roads generally have a two lane cross-section which may be divided or undivided. A central median is desirable to reduce potential delays and conflicts that are caused by vehicles that wait in the middle of the road to turn right into abutting property accesses. A central median treatment should be accompanied by upgrades of nearby intersections (eg. roundabouts or u-turn facilities at traffic signals) to cater for increased U-turns created as a result of eliminating right turn movements into abutting properties.

Pedestrian movement must be catered for on both sides with crossing at controlled points, and with bicycle lanes on road (or wide kerbside lanes or shared bicycle / parking lanes) where possible to avoid mixing with denser pedestrian traffic. Intersections must be controlled by traffic signals or roundabouts, although priority T intersections may also be appropriate. Intersections may be closely spaced along these roads as a result of past planning and land use decisions, however it is desirable that a minimum spacing of 150m be achieved to avoid queue interactions between intersections. The characteristics of Sub Arterial Main Streets are summarised in Table 4.5.1.

### 4.3.2 Controlled Distributor Roads

These roads are Sub-Arterial Roads and connect between local residential, commercial, or industrial areas and arterial roads. These roads carry through traffic and must be more convenient than using streets. Therefore a high level of efficiency and safety must be achieved. Generally, sub-arterial roads do not serve the longer distance regional movements and terminate at arterial roads rather than provide continuity across arterials.

These roads generally exist in urban areas where past planning decisions have resulted in abutting land uses that are not compatible with the nature of through traffic movement that occurs on sub-arterial roads.

By definition these are roads where an aspect, such as speed, volume, or access is controlled. Controls may be:

- Limiting speed where direct residential frontage exists;
- Limiting volumes to avoid road widening or excessive pressure on abutting uses
- Limiting heavy vehicle usage to protect the amenity of abutting uses;
- Limiting speed and/or usage of particular vehicle types where alignment constraints exist, particularly in rural areas.
- Limiting access points and reducing intensification of traffic on existing access points.

Ideally these roads should not have direct property access to minimise potential delays and conflicts to improve the safety and efficiency of through traffic movement. On roads where access to adjacent land uses exists, measures must seek to achieve safe access operation while retaining the convenience and efficiency of the route for through traffic. This may include the creation of a lower speed environment, but it must not be so low that it will increase the use of lower order streets elsewhere. Other measures include the protection of adjacent parking by indented bays, bicycle paths, and landscaping. Longer term aims must seek to reduce the quantity of accesses when further land use development opportunities arise. Dedicated bicycle lanes are the preferred treatment for on-road cycling, however wide kerbside lanes or shared bicycle / parking lanes, may need to be considered in existing constrained locations.

If side street access or other reasonable alternatives are not available, access for major developments, schools, and commercial uses may be considered along these routes provided access is consolidated and controlled through channelisation or traffic signals. Examples of frontage access treatments are outlined in Section 4.5.4 - frontage access techniques for Sub-arterial and Arterial Roads.

Intersections should desirably be spaced at 300m to achieve efficient traffic movement, however in many instances a minimum spacing of 150m may be required. 150m is a minimum spacing to achieve efficient traffic movement and to minimise queue interactions between adjoining intersections.

Traffic speeds of 60km/h to 70km/h should be achieved on these roads to achieve efficient traffic movement.

On street parking may be required in some locations as required by existing abutting land uses, however on-street parking should be restricted on these roads to improve the efficiency of through traffic movement.

### 4.3.3 Distributor Roads

Distributor Roads are Sub-Arterial Roads that connect traffic through and around suburbs. They provide a major connection between local residential, commercial, or industrial areas and arterial roads. These roads carry through traffic and must be more convenient than using streets, and therefore a high level of efficiency and safety must be achieved. Generally, sub-arterial roads do not serve the longer distance regional movements and terminate at arterial roads rather than provide continuity across arterials.

These roads are generally needed in new large master planned community areas where a need for a sub-arterial road connection is identified based on broader road network planning principles.

Traffic volumes must not be affected by amenity as abutting land uses must be non-sensitive to traffic noise. In rural areas dwellings must be set well back from the road.

Access must be restricted, and can be managed through, for example, side streets, or rear access lanes or easements. These treatments must be pursued as part of any new development. Access for major developments may be provided along these routes provided that they are controlled through auxiliary lanes and channelisation, roundabouts, or traffic signals where appropriate. In rural areas, individual lot access may be acceptable due to the larger lot sizes and potential greater access spacing. However, auxiliary lanes or wider road shoulders will need to be constructed in accordance with the DMR Road Planning & Design Manual to achieve safer operating conditions near accesses in rural areas.

A higher speed environment is desirable on these roads to achieve a more attractive route than the street system. Speed environments of 70km/h are required in Urban Areas. Higher speeds of 80km/h and 100km/h are more appropriate in rural areas.

These roads may serve as secondary freight routes. Selected routes may be appropriate for dangerous goods movement. They could accommodate coach traffic between centres in rural areas and passenger transport sweeper routes in urban areas. Bus Stops must be located separately from through traffic lanes.

In urban areas, footpaths are required on both sides with pedestrian crossings at controlled points. On road bicycle lanes are incorporated into the road shoulders in both urban and rural areas.

The appropriate intersection types are at grade intersections such as traffic signals, roundabouts and occasional channelised priority T intersections with auxiliary lanes. In rural areas, roundabout or priority control intersections with auxiliary lanes are generally appropriate. Major intersections must be spaced at 300m in Urban or Rural Areas. In Urban areas channelised priority intersections may be acceptable at a minimum 150m spacing.

### 4.3.4 Arterial Roads

The primary objective of Arterial Roads is to provide major through routes for traffic. All longer distance traffic movement to, from and within settled areas should be directed onto the arterial roads. Arterial roads also serve a line haul function for urban public transport. These corridors should provide for regional and longer-distance cycle movements.

Urban arterials cater for the major movement of town and city traffic and rural arterials cater for traffic travelling between centres.

Generally, arterial roads have high design standards and no direct frontage access. However, there are often instances of existing arterials catering for longer distance traffic, but due to past land use decisions, multiple access points occur, often including residential property accesses. Any works undertaken should be directed towards enhancing the traffic carrying capability and safety, and/or ameliorating traffic impact on adjacent amenity. Longer term access limitations and landuse amalgamation would be pursued so that the traffic carrying role would be progressively enhanced. For urban arterial roads, the policy is to pursue no direct access.

Examples of treatments for minimising direct access to properties fronting Arterial Roads are outlined in Section 4.5.4 - frontage access techniques for Sub-arterial and Arterial Roads.

To facilitate efficient traffic movement, a higher speed environment is desirable. Limits of between 70 and 80km/h in urban areas are recommended, as speeds in excess of this are generally not appropriate with intersections at grade and high traffic volumes. A higher speed environment between 80 and 100km/h can often be achieved in rural areas, which reduces time for the longer distances travelled.

These roads may provide the primary freight routes and often provide secondary freight routes. Selected routes may be appropriate for dangerous goods movement. They accommodate inter urban and inter centre coach traffic and Regional Passenger Transit bus traffic under line haul mode. Any bus stops should be separate from the through traffic lanes.

Pedestrian and shared pathway facilities must be located separately from the carriageways. Additional protection must be provided on high speed facilities. On-road cycling is catered for on wide shoulders. Pedestrian crossings must be provided at signalised intersections, and otherwise at controlled points. Grade separation may be appropriate in some instances.

Intersections are generally configured at grade for this management type. Signalised (preferred) or roundabout control is generally appropriate in urban areas, although high volumes may necessitate grade separation. In rural areas, roundabout or priority control is generally appropriate, although high volumes may necessitate grade separation or in certain instances signalisation. Intersections should be spaced a minimum of 500m in urban areas, and at least 1km in rural areas due to higher speed environments.

Cross section for this management category is generally volume driven, however divided carriageways are desirable to optimise safety and driver comfort. A two lane undivided cross section may be appropriate for a lower volume facility, provided there are sufficient passing opportunities particularly in rural areas.

Abutting land use should preferably be less noise sensitive or urban areas alternatively should include building and site designs that minimise impacts from adjacent traffic flows. In rural areas land uses should be set well back, preferably greater than 30m.

### 4.3.5 Arterial Main Street

This category is directed at existing situations in urban areas, including town and village centres,where a group of residential and/or commercial land uses exists, generally on both sides of an arterial road. A decision needs to be made, dependent on the value of these issues, whether on these stretches of roadway the traffic carrying and access functions should coexist, or whether a bypass or parallel route upgrade is warranted. If it is decided that these functions should coexist, whether in the shorter or longer term, management measures will need to be developed as part of a local traffic management plan to address this mix.

It must be recognised that traffic volumes may be so high that amenity to roadside activities is limited. However, as these roads are arterials, actions must not seek to moderate traffic volumes other than by bypassing. Speeds on these facilities must be kept sufficiently low to provide for safe pedestrian crossing at controlled points and to maintain environmental amenity for adjacent land uses, but still allow for efficient traffic movement. Streetscaping would assist in ameliorating visual and acoustic land use impacts.

This category is generally appropriate as a bus route, in which case indented bus bays must be provided where appropriate to reduce delay to through traffic. Opportunities must be sought to bypass freight movements. This category is generally inappropriate as a dangerous goods route.

These roads must provide for pedestrian movement on both sides with crossing at controlled points, and with bicycle lanes on road to avoid mixing with denser pedestrian traffic. Intersections may be closely spaced along these facilities due to past planning and land use decisions, although spacing to avoid queue interaction must be a minimum of 150m.

## 4.4 Highways/Motorways

These roads serve regionally and nationally significant movements and longer distance movements between suburbs or settled areas. To provide for a high standard of travel, speed environments of 100km/h or more are desirable. Frontage access is not appropriate. If it does exist on highways due to historic events, then any works undertaken must enhance the traffic carrying capability of the highway in terms of both volume and speed. Reduction of direct access from abutting land use must be pursued as opportunities for redevelopment arise.

These roads provide the primary freight routes and dangerous goods routes (except through populated areas) and carry coach traffic between centres and regular public transport (RPT) bus traffic under line haul mode. Pedestrian and cycle facilities must be located separately from the carriageways and protected accordingly. Crossing provision must be grade separated.

Grade separated intersections are desirable for all facilities in this management category. Those located on urban facilities must be spaced greater that 2km apart, and on rural facilities between 4 and 8km, with a maximum spacing of 12km. Intersections at grade on existing highways must be spaced no less than 1km and are generally found to be between 1km and 2km in urban environs.

Cross section for this management category is generally volume driven, although divided carriageways are desirable to optimise safety and driver comfort. A two lane undivided cross-section may be appropriate for a lower volume rural highway, provided there are sufficient passing opportunities.

Abutting land use types must be non-sensitive to vehicular traffic and generally must not have frontage or direct access to the roadway. Uses associated with traffic such as highway service centres with amenities may be determined to be appropriate in some rural locations based upon needs assessment. In such cases these would be provided with high quality direct access.

## 4.5 Summary of Urban Road and street Hierarchy Characteristics

The design and functional characteristics of the different classes of Urban Roads and Urban Residential Streets in the road hierarchy are as set out in Table 4.5.1. These characteristics may be varied for certain commercial/ industrial roads and rural and rural residential roads, as set out in Sections 4.6, 4.7, 4.8 and 4.9. Notwithstanding these characteristics and the acceptable solutions in Sections 4.5.1 and 4.5.2, where works are required to be undertaken on or to extend an existing road or street, the reserve and pavement widths utilised should match those of the existing road or street where they are greater than the acceptable solutions.

**Table 4.5.1 Urban Roads and Urban Residential Streets**

| CRITERION | Roads | | | | |
|---|---|---|---|---|---|
| | Arterial Road | | | Sub Arterial Road | |
| | Highway/Motorway | Arterial Road | Main Street | Distributor | Controlled Distributor |
| **FUNCTIONAL CHARACTERISTICS** | | | | | |
| Dominant Linkage | Regional | Urban City or Town | Urban City or Town | Suburban or District | Suburban or District |
| Traffic Carrying Function | Longer distance traffic travelling through the region | Major Access route through large Cites and Towns | Major Access route through large Cities and Towns with direct access to adjacent commercial uses | Main Suburban Access Route through new Communities | Main Suburban Access Route through existing areas |
| Traffic Volume | No limit | 15000 to 65000 vpd | 15000 to 35000 vpd | 3000 to 35000 vpd | 3000 to 20000 vpd |
| Frontage Access | Nil | Restricted, major developments only. Apply frontage access techniques to existing accesses (see Section 4.5.4) | Restricted, access to commercial uses only. Apply frontage access techniques to existing accesses (see Section 4.5.4) | Restricted, only major developments | Restricted, no new access. Apply frontage access techniques to existing accesses (see Section 4.5.4) |
| Speed Environment | 100 km/hr | 70 to 80 km/hr | 50 or 60 km/hr | 60 or 70 km/hr | 50 or 60 km/hr |
| Intersects with: | Arterials, sub-arterials | Highways, arterials, sub-arterials, collectors | Arterials, sub-arterials, collectors | Highways, arterials, sub-arterials, collectors | Highways, arterials, sub-arterials, collectors |
| Truck Route? | Yes | Yes | Inappropriate except for access | Yes | Yes |
| Dangerous Goods Route? | Yes | Yes | Inappropriate except for access | Selected routes only | Selected routes only |
| Public Transport | Routes, not stops | Routes and stops | Routes and stops | Routes and stops | Routes and stops |
| Cycle Facilities | Regional, off-road only | Off-road and on-road | Off-road and on-road | Off-road and on-road | Off-road and on-road |
| Pedestrian Facilities | Grade separated, separate from road | Shared paths both sides | Footpaths both sides | Shared paths both sides | Shared paths both sides |
| **FRICTIONAL CHARACTERISTICS** | | | | | |
| Intersection treatments | Grade separated | Signal, Roundabout, Priority T | Signal, Roundabout, Priority T | Signal, Roundabout, Priority T | Signal, Roundabout, Priority T |
| Pedestrian Crossings | Grade separated | Grade separated, signalised or refuge | Signalised or refuge | Signalised or refuge | Signalised or refuge |
| Minimum Intersection spacing | > 2km | > 500m | > 150m | 300m | 150m |
| Reserve Width | 40 – 100m | 30 – 65m | 37-45m | 25-35m | 20 – 30m |
| Number of Moving Lanes | Two-way, 2 to 6 lane | Two-way, 2 to 6 lane | Two-way, 2 or 4 lane | Two-way, 2 or 4 lane | Two-way, 2 or 4 lane |
| Parking Lanes | Breakdown only | Breakdown only | Parking lane or indented parking both sides | Breakdown only | Parking lane with restrictions or indented parking both sides |
| Typical Longitudinal Drainage | Swale drain | Kerb & channel | Kerb & channel | Kerb & channel | Kerb & channel |
| Verge Width (min) | N/A | 5m | 4.5m | 5m | 4m |
| Carriageway cross-section | Volume driven, specific advice must be sought | Volume driven, specific advice must be sought | See Section 4.5.1 for Acceptable solutions | See Section 4.5.1 for Acceptable solutions | See Section 4.5.1 for Acceptable solutions |
| Desirable Maximum Grade | Specific consideration | 5% | 5% | 8% | 8% |
| Absolute Maximum Grade | Specific consideration | 6% | 7% | 10% | 10% |

Table 4.5.1 Urban Roads and Urban Residential Streets

| CRITERION | Roads | Streets | | | |
|---|---|---|---|---|---|
| | Sub Arterial Roads | Collector Streets | | Local Streets | |
| | Main Street | District Collector | Neighbourhood Collector | Access Street | Access Place |
| **FUNCTIONAL CHARACTERISTICS** | | | | | |
| Dominant Linkage | Town or Village Centre | District Cell | Neighbourhood cell | Individual sites | Individual sites |
| Traffic Carrying Function | Main suburban access route through towns or villages with direct access to adjacent commercial uses | District access and frontage access with special management characteristics | Neighbourhood access and frontage access up to 300 lots | Frontage access up to 75 lots | Frontage access up to 15 lots |
| Traffic Volume | 3000 to 15000 vpd | 3000 to 7000 vpd | 1000 to 3000 vpd | 0 to 1000 vpd | 0 to 150 vpd |
| Frontage Access | Restricted, commercial access only. Apply frontage access techniques to existing accesses (see Section 4.5.4) | In accordance with frontage access techniques (see Section 4.5.3) | Yes | Yes | Yes |
| Speed Environment | 40 or 50 km/hr | 60 km/hr | 50 km/hr | 30 or 40 km/hr | <30 km/hr |
| Intersects with: | Arterials, sub-arterials, collectors, access streets | Arterials, sub-arterials, collectors, access streets | Sub-arterials, collectors, access streets | Access streets, access places | Access streets |
| Truck Route? | Inappropriate except for access | Inappropriate except for access | No | No | No |
| Dangerous Goods Route? | Inappropriate except for access | No | No | No | No |
| Public Transport | Routes and stops | Routes and stops | Routes and stops | Nil | Nil |
| Cycle Facilities | Off-road and on-road | Off-road and on-road | On-road (shared) | On-road (shared) | On-road (shared) |
| Pedestrian Facilities | Footpaths both sides | Shared path one side, footpath one side | Footpaths both sides if bus route, one side otherwise | Nil, unless part of a specific network route | Nil, unless part of a specific network route |
| **FRICTIONAL CHARACTERISTICS** | | | | | |
| Intersection treatments | Signal, roundabout, priority T | Roundabout, Priority T, Signal | Roundabout, Priority T | Priority T | Priority T |
| Pedestrian Crossings | Signalised or refuge | Signalised or refuge | Refuge | No specific provision | No specific provision |
| Desirable Intersection spacing | 150m | 80-100m | 40-60m | 40m | 15m |
| Reserve Width | 20-30m | 20-25m | 16-20m (20m required for bus routes) | 16-16.5m | 14-14.5m |
| Number of Moving Lanes | Two-way, 2 lane | 2 | 1 or 2 (2 required on bus routes) | 1 or 2 | 1 or 2 |
| Parking Lanes | Parking lane both sides | Parking lane both sides | 2 or 1 (parking lane both sides on bus routes) | Parking unmarked or indented on one side | Parking unmarked or indented on one side |
| Typical Longitudinal Drainage | Kerb & channel | Kerb & channel | Kerb & channel | Kerb & channel | Kerb & channel |
| Verge Width (min) | 4m | 5m | 4.25-4.5m | 4.25m | 4.25m |
| Carriageway cross-section | See Section 4.5.1 for Acceptable solutions | See Section 4.5.2 for Acceptable solutions | See Section 4.5.2 for Acceptable solutions | See Section 4.5.2 for Acceptable solutions | 5.5-6m |
| Desirable Maximum Grade | 8% | 8% | 12% | 12% | 12% |
| Absolute Maximum Grade | 10% | 12% | 16% (12% required on bus routes) | 16% | 16% |

**Notes to Table 4.5.1**

a) There will be existing routes that do not have all of the characteristics expected for their role in the hierarchy, which is primarily dependent on function of the route in the network, rather than its design or construction characteristics. However, newly proposed roads will be expected to have all the listed characteristics.

b) Specific reference should be made to the acceptable solutions in Sections 4.5.1 and 4.5.2 for specific cross-section requirements.

c) It is desirable to retain the frontage of residential access to district collector routes. The provision of parking lanes and other measures to maintain appropriate safety and amenity standards, such as those outlined in Section 4.5.3 will be required.

d) In the planning of streets where high density residential development is likely, particular attention will be necessary to the provision of on-street parking, usually requiring wider pavements and reservations. Assuming that the off-street parking requirements described in Schedule 2 to the Transport, Traffic and Parking Code are achieved, on-street parking must be provided at a minimum rate of 2 spaces per 3 detached houses, plus one space per three 3 or 4 bedroom attached dwelling units, plus one space per four 1 or 2 bedroom attached dwelling units.

e) Frontage access, which is described as restricted, will be carefully controlled to minimise the number, location and external impact of access points, particularly if site access is also available to other roads. This may necessitate shared site access driveways, or the construction of controlled site access intersections. Site access will only be permitted where it can be demonstrated that the access proposed will not have an unreasonable impact on the safety and operation of the traffic, transport, pedestrian and cyclist networks. Acceptable solutions are outlined in Section 4.5.

f) Where access is described as restricted, median widths will depend on signage or traffic control requirements, and the need for the incorporation of turn lanes.

g) To achieve the speed environments described in Table 4.5.1 for urban residential streets, speed management techniques, possibly including speed control devices, will be necessary, in a fully integrated design.

h) Verges are measured from the kerb invert (outside edge of shoulder in the case of swale drains) to the reserve boundary, excluding cut / embankment batter slopes. Verge widths will depend on the needs for off-road cyclist facilities, pedestrian paths and service corridors.

i) Reserve widths will need to be increased accordingly where cut / embankment batter slopes are required to achieve the road formation.

j) Footpaths wider than 1.5 metres and shared paths wider than 2.5 metres will be required where high pedestrian and/or cyclist volumes are expected. Verge and reserve widths are to be increased accordingly. In commercial and high activity areas, verges should be fully paved. This is to ensure consistency with Section 7.

k) Footpaths should be located to form part of a logical and convenient pedestrian network. Footpaths should be provided on both sides of Neighbourhood Collector Streets and on one or both sides of Access Streets on sections where pedestrian demand is likely due to the layout of the street and pedestrian network and/or the location of activity nodes and facilities (eg. adjacent to or near a school, bus stop, neighbourhood centre, or at a roundabout).

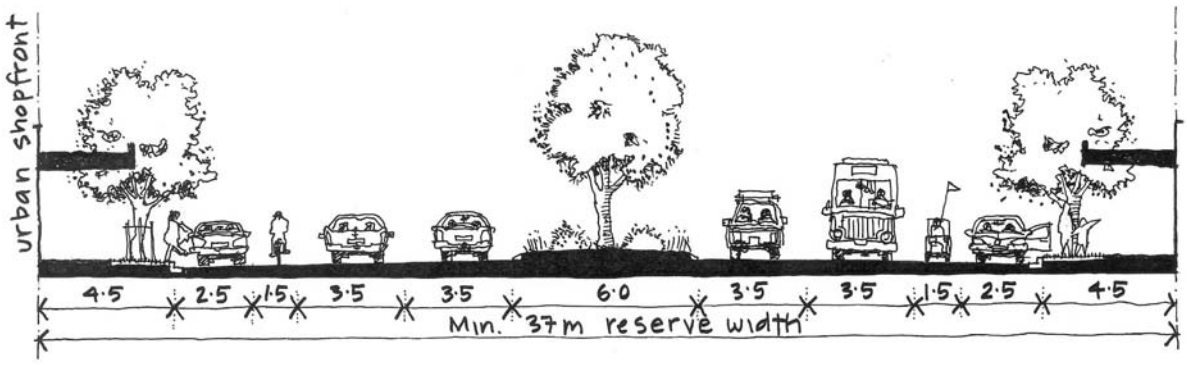
l) Under constrained circumstances and where limited heavy vehicle use is expected, grades greater than 16% but no greater than 20% may be accepted on Access Streets and Places for one short length of 50m over the entire street length.

m) Grades approaching intersections must not exceed 3% over the extent of the required stopping sight distance.

### 4.5.1 Acceptable solutions for Urban Road Cross-sections

The following cross sections are acceptable solutions for the various types of Urban Road classifications outlined in the Urban Road and Residential Street Hierarchy Table 4.5.1.

#### 4.5.1.1 Arterial Main Street




**Notes:**

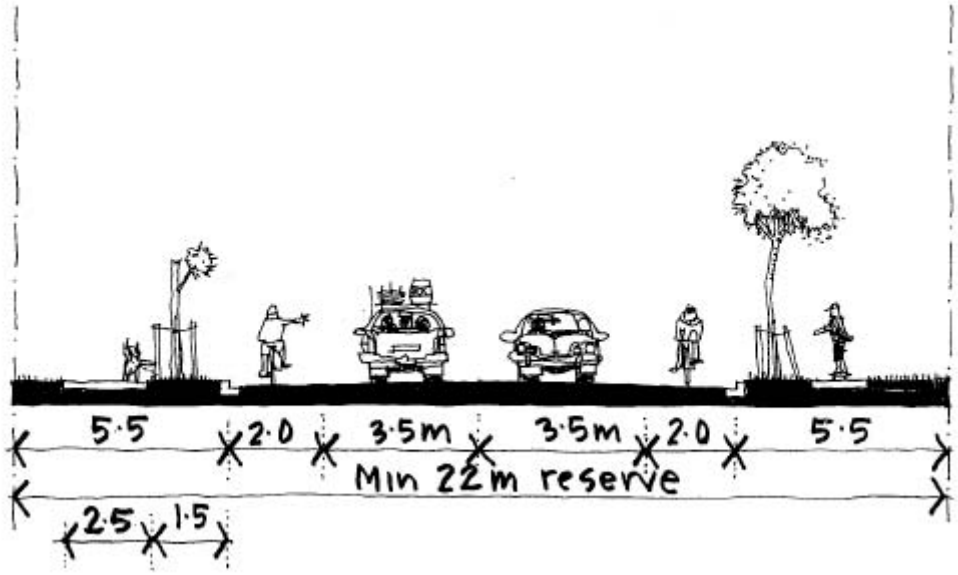
1. This cross section generally applies where 4-lane divided Arterial Roads pass through commercial precincts in Town and Village Centres. Many established Arterial Main Streets may differ from this illustrated example.
2. Cycle lanes may not be achievable on some existing reserves through existing developed areas. All efforts must be made to achieve an alternative on-road treatment such as advisory treatments or wide kerbside lanes (where there is no on-street parking), in accordance with Austroads Guide to Traffic Engineering Practice Part 14. Where a suitable on-road treatment cannot be achieved, an alternative convenient route must be provided. Off-road facilities within the same corridor are not desirable in main streets to avoid mixing with denser pedestrian traffic that generally exists in these areas.
3. Car park connections between rear car parks must be achieved to assist in minimising on-street parking activity and to assist in minimising the quantity of direct access points.
4. On street parking bays may be indented. Parking bays must be individually marked in accordance with AS2890.5 and the Queensland MUTCD. Parallel parking bays must be marked in a 'paired' format to enable vehicles to arrive in parking bays in a forward motion. This arrangement is needed to reduce delays caused by reverse parking manoeuvres. 'Paired' parking format means that parking bays are provided in groups of 2 with a 1 .5m gap between each pair of bays. The minimum length of each parking bay is 6.5m.
5. Parking is generally parallel but may also be angle where space in the reserve is available to achieve angle parking on-street in accordance with AS2890.5
6. The design vehicle for Arterial Main Streets in an AUSTROADS Semi-trailer.
7. Verges have footpaths paved for the full width in accordance with applicable Urban Design Guidelines.
8. A 6m wide median is necessary for landscaping, pedestrian refuge, and to accommodate right turn lanes at intersections.

#### 4.5.1.2 Distributor Road (4 lane, No direct Access)


**Notes:**

1. Distributor Roads are generally provided as new roads in large Master-planned Community Areas where a need is identified from broader road network planning principles.
2. This typical divided cross-section is required where traffic volumes up to 35,000vpd are anticipated.
3. Direct property access and kerbside parking are restricted on the Distributor Road cross-section. Access to major development sites may be acceptable provided that the access is controlled through channelisation and turn lanes, with traffic signals where necessary, and the nominated intersection spacing is achieved.
4. Potential noise impacts are likely to arise in the vicinity of noise sensitive uses along these roads. For assessment of noise impacts and requirements for noise attenuation refer to *Planning Scheme Policy No. 7 - Acoustic Environment Assessment*.
5. On road cycle lanes are incorporated into the road shoulder and must be continued through intersections.
6. This road may be constructed in stages. One carriageway may be constructed to enable operation as a two lane two-way road as the first stage. This will require the overall carriageway width of the first carriageway to be increased to a minimum of 9.6 metres to allow 2 x 3.3 metre traffic lanes and 2 x 1.5 metre shoulders / on road cycle lanes in the interim. The second carriageway or duplication may occur at a later date when traffic conditions are likely to require the construction of the second carriageway.
7. The design vehicle for a Distributor Road is an AUSTROADS Semi-trailer.
8. Semi-mountable kerb is required in speed environments > 60km/h.

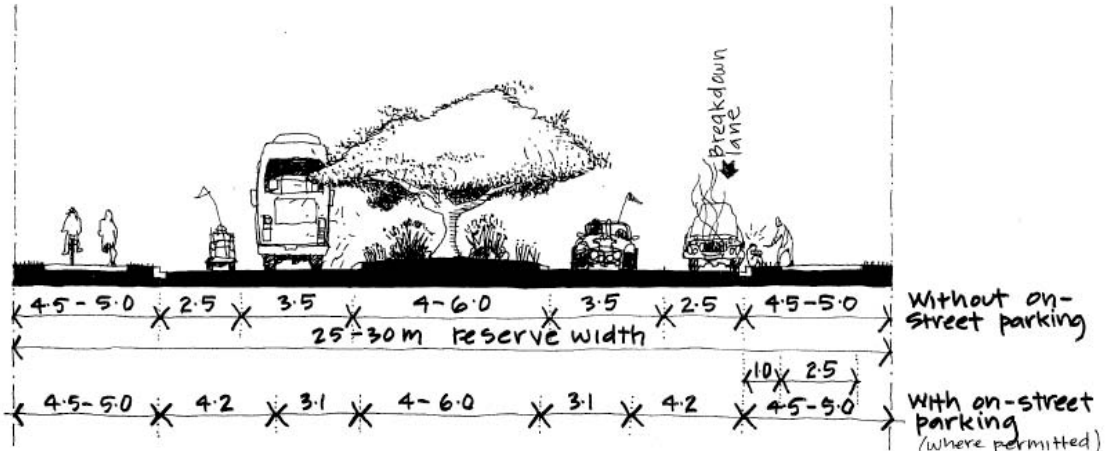
#### 4.5.1.3 Distributor Road (2 lane, no direct access)



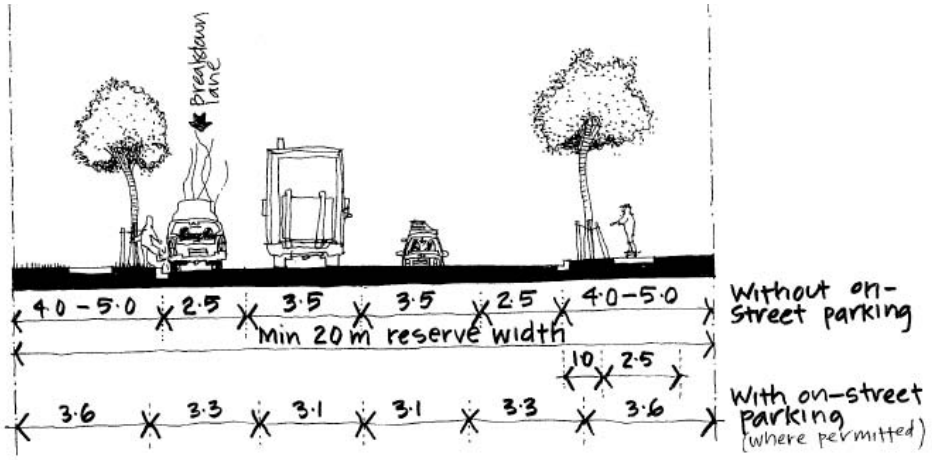

**Notes:**

1. Distributor Roads are generally provided as new roads in large Masterplanned Community Areas where a need is identified from broader road network planning principles.
2. This 2 lane cross section is appropriate for traffic volumes up to 15,000vpd.
3. Direct property access and kerbside parking are restricted on this Distributor Road cross-section. Access to major development sites may be acceptable provided that the access is controlled through channelisation and turn lanes, roundabout, or traffic signals and the nominated intersection spacing is achieved.
4. Potential noise impacts are likely to arise in the vicinity of noise sensitive uses along these roads. For assessment of noise impacts and requirements for noise attenuation refer to *Planning Scheme Policy No. 7 - Acoustic Environment Assessment*
5. The design vehicle for a Distributor Road is an AUSTROADS Semi-trailer.
6. On road cycle lanes are incorporated into the road shoulders and must be continued through intersections.
7. Widening is required at intersections to achieve additional turning lanes and channelisation is needed to manage expected traffic demands. This will require increased reserve widths. Intersection geometric requirements must be determined in accordance with the DMR Road Planning & Design Manual.
8. Semi-mountable kerb is required in speed environments > 60km/h.

**4.5.1.4 Controlled Distributor Road (*Preferred*)**




**4.5.1.5 Alternative Controlled Distributor Road *(Constrained Reserves in Existing Developed Areas)***

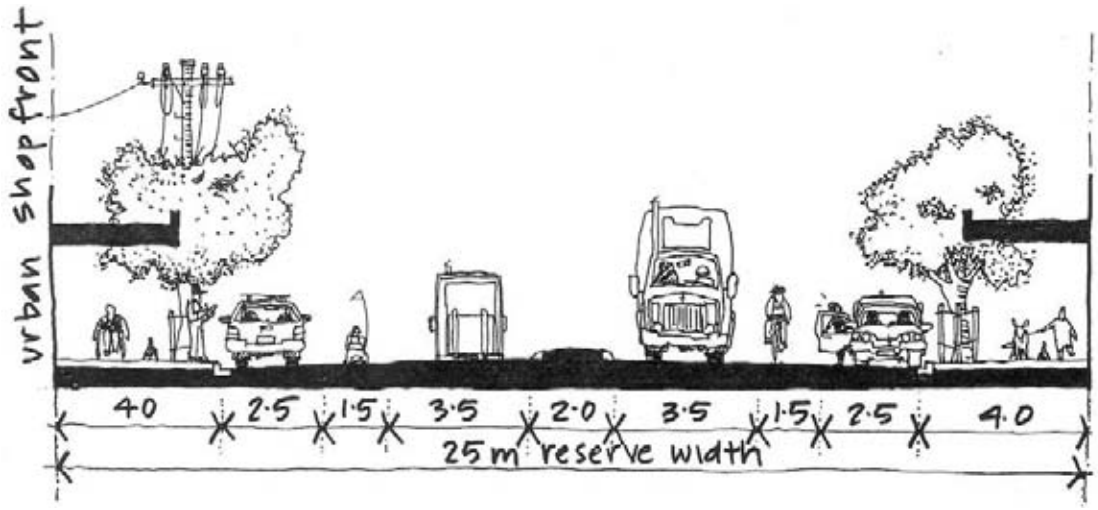



**Notes:**

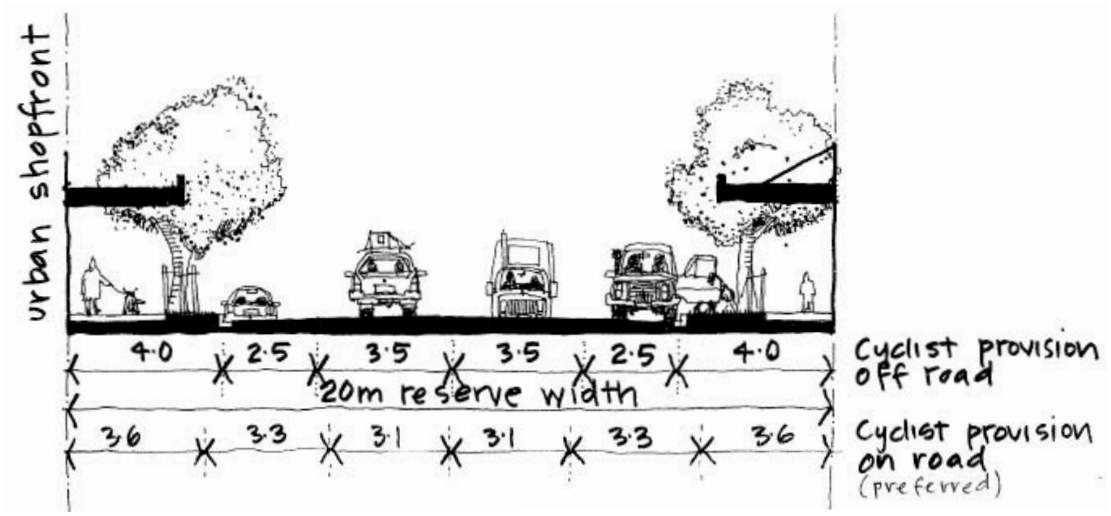
1. Controlled Distributor Roads are generally existing roads through Urban Areas that have a Sub-Arterial Road Function, and direct access points exist for historical reasons.
2. Frontage access techniques in accordance with Section 4.5.4 must be achieved for new development that fronts Controlled Distributor Roads.
3. The Alternative Controlled Distributor Road (4.5.1.5) cross-section represents the absolute minimum widths for the various cross-sectional elements and should only be used in existing constrained reserves where the presence of existing continuous development prevents a wider reserve from being obtained. All efforts must be made to achieve a reserve width and cross-sectional element widths as close to the preferred Controlled Distributor Road (4.5.1.4) as possible
4. Potential noise impacts are likely to arise in the vicinity of noise sensitive uses along these roads. For assessment of noise impacts and requirements for noise attenuation refer to Planning Scheme Policy No. 7 - Acoustic Environment Assessment.
5. Controlled Distributor Roads often have existing parallel kerb side parking where demanded by adjacent uses. This parking should not be maintained adjacent to new developments and should be restricted or used for breakdown purposes to improve the safety and efficiency of traffic movement.

6. Cycle lanes may not be achievable on some existing carriageways through developed areas, particularly where on-street parking is retained for historical reasons. All efforts must be made to achieve an alternative on-road treatment such as advisory treatments (where there is on-street parking) or wide kerbside lanes (where there is no on-street parking), in accordance with Austroads Guide to Traffic Engineering Practice Part 14. Where a suitable on-road treatment cannot be achieved, off-road shared paths (2.5m widths) must be provided on both sides of the road.
7. The design vehicle for Controlled Distributor Roads is an AUSTROADS Semi-Trailer.
8. The desirable minimum verge width is 5.0m, however a 22m wide reserve is needed to achieve this. Where a 22m wide reserve cannot be achieved in existing developed areas, the absolute minimum verge width is 3.5m.
9. Widening is required at intersections to achieve additional turning lanes and channelisation is needed to manage expected traffic demands. This will require increased reserve widths. Intersection geometric requirements must be determined in accordance with the DMR Road Planning & Design Manual.
10. Semi-mountable kerb is required in speed environments > 60km/h.

**4.5.1.6 Sub-Arterial Main Street (Preferred)**




**4.5.1.7 Alternative Sub-Arterial Main Street (Constrained Reserves in Existing Developed Areas)**




**Notes:**

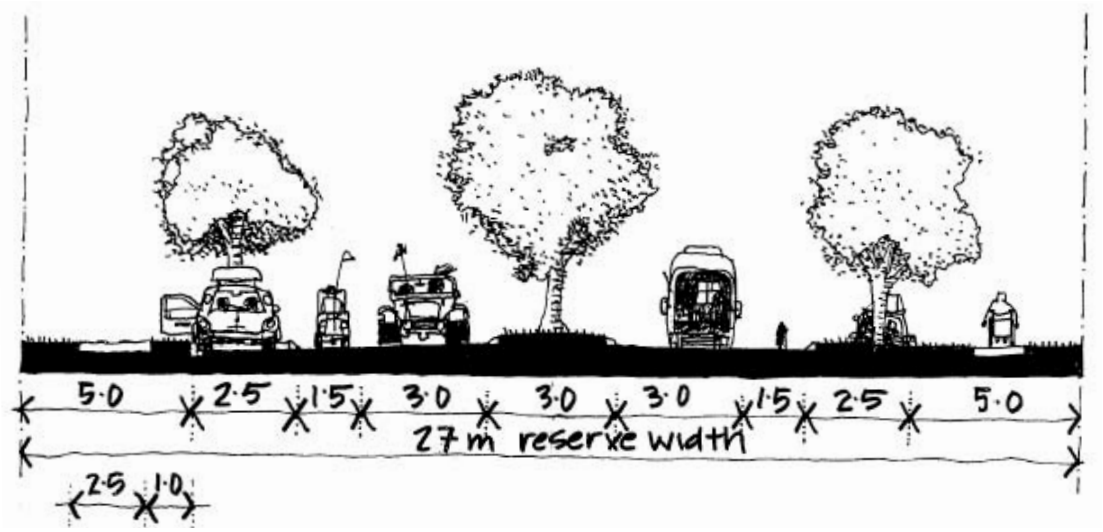
1. These cross-sections generally exist where sub-arterial roads pass through town and village centre precincts. These are typical examples only. Many established main streets may differ from these illustrations. Each of the desirable reserve and cross-sectional element widths of the preferred Sub-Arterial Main Street cross-section 4.5.1.6 should be achieved wherever possible.
2. Where cycle lanes cannot be achieved on established main streets, all efforts must be made to achieve an alternative on-road treatment such as advisory treatments (such as shown on the Alternative Sub-Arterial Main Street above) or wide kerbside lanes (where there is no on-street parking), in accordance with Austroads Guide to Traffic Engineering Practice Part 14. Where a suitable on-road treatment cannot be achieved, an alternative convenient route must be provided. Off-road facilities within the same corridor are not desirable in main streets to avoid mixing with denser pedestrian traffic that generally exists in these areas.
3. Car park connections between rear carparks must be achieved to assist in minimising on street parking activity and to minimise the quantity of direct access points.

4. On street parking lanes may be indented. Parking bays must be individually marked in accordance with AS2890.5 and the MUTCD. Bays must also be marked in a 'paired' format to minimise on street reverse parking manoeuvres by enabling vehicles to arrive in parking bays in a forward movement. 'Paired parking' format means that parking bays are provided in groups of two with a 1.5m gap between each pair of bays. The minimum length of each parking bay is 6.5m.
5. Right turns must be minimised or restricted by a double line or desirably by a 2.0m wide median if space permits. However, right turns must only be restricted if an alternative u-turn can be performed safely at a nearby roundabout or traffic signals.
6. Parking is generally parallel but may also be angle where space in the reserve is available to achieve angle parking on street in accordance with AS2890.5.
7. The design vehicle for sub-arterial main streets is an AUSTROADS semi-trailer.
8. Verges have footpaths paved for the full width in accordance with applicable Urban Design guidelines.

### 4.5.2 Acceptable solutions for Urban Residential street Cross-sections

The following cross sections provide acceptable solutions for the various types of Urban Road classifications outlined in the Urban Road and Residential Street Hierarchy Table 4.5.1.

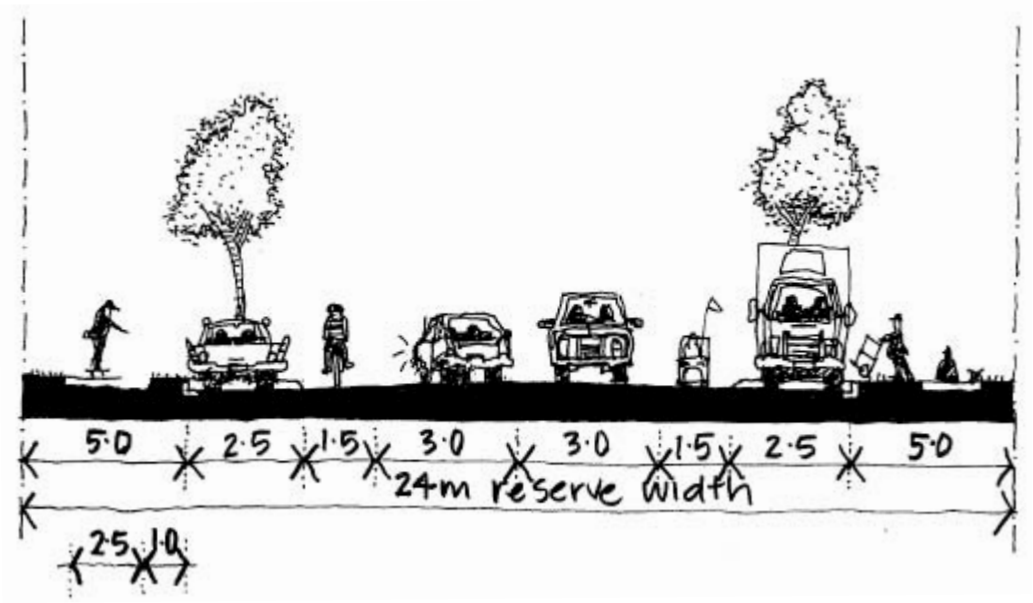
#### 4.5.2.1 District Collector (*Divided*) – Up to 7000 vpd




**Notes:**

1. This cross-section applies where traffic volumes up to 7000 vpd are anticipated.
2. Access management techniques in accordance with Section 4.5.3 must also be applied to this cross-section.
3. Speed control devices must not be used on District collector streets. Target maximum design speeds must be achieved by tight curves (min inside radius 10m) or roundabouts at intersections (with minimum outer radius of 15m).
4. The kerb must be built out into the parking lanes to create landscaped kerb buildouts at regular intervals of approximately 80m. Driveways must be constructed as part of the development roadworks for lots with a kerb buildout on their frontage.
5. Where parking lanes are not provided, indented bus stops must be constructed at convenient locations, usually at 120m – 200m intervals.
6. Sufficient sight distance to approaching traffic must be achieved for on-street parking and potential driveway locations near bends.
7. Edge lines, buildouts and landscaping visually reduce road width.
8. Where the speed limit on District Collector Streets is greater than 60km/h, the minimum bike lane width must be 2 metres.
9. Design vehicle for typical District Collectors is AUSTROADS large rigid truck/bus.

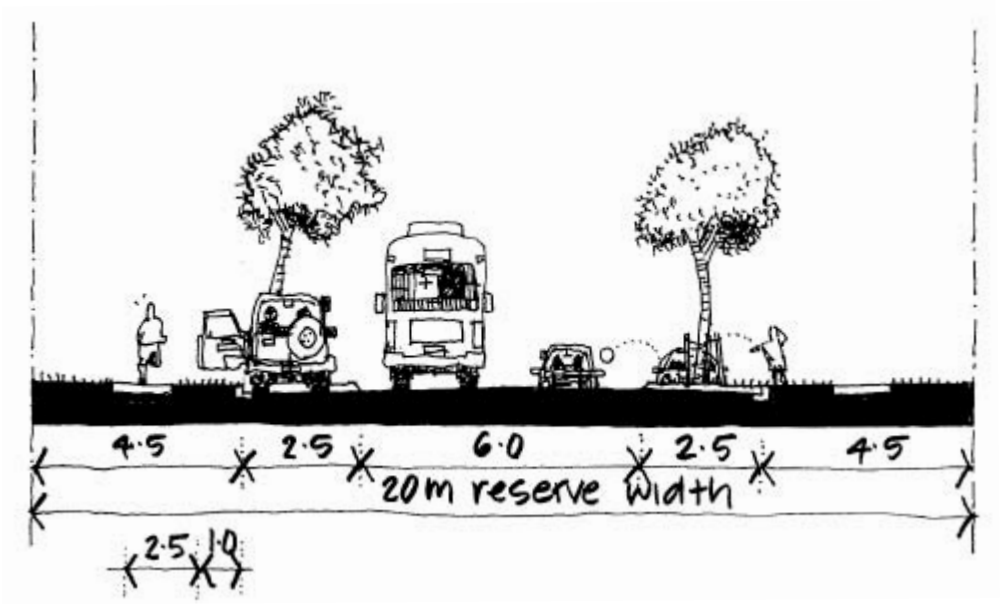
#### 4.5.2.2 District Collector – Up to 5000 vpd




**Notes:**

1. This cross-section applies where traffic volumes up to 5,000 vpd are anticipated.
2. Access management techniques in accordance with Section 4.5.3 must be applied to this cross-section also.
3. Speed control devices must not be used on District Collector Streets. Target maximum design speeds must be achieved by using tight curves (min inside radius 10m) or roundabouts at intersections (with min outer radius of 15m).
4. The overall carriageway is typically 11 metres wide. The kerb must be built out into the parking lanes to create landscaped kerb buildouts at regular intervals of no more than approximately 140m. Driveways must be constructed as part of the development roadworks for lots with a kerb buildout on their frontage. Kerb buildout locations must not prevent a through vehicle from passing to the outside of a vehicle waiting to turn right into a driveway.
5. Where parking lanes are not provided, indented bus stops must be constructed at convenient locations, usually at 120m – 200m intervals.
6. Sufficient sight distance to approaching traffic must be achieved for on-street parking and potential driveway locations near bends.
7. Edge lines, buildouts and landscaping visually reduce road width.
8. Where the speed limit on District Collector Streets is greater than 60km/h, the minimum bike lane width should be 2 metres.
9. Design Vehicle for *typical* District Collectors is AUSTROADS Large Rigid Truck/Bus.

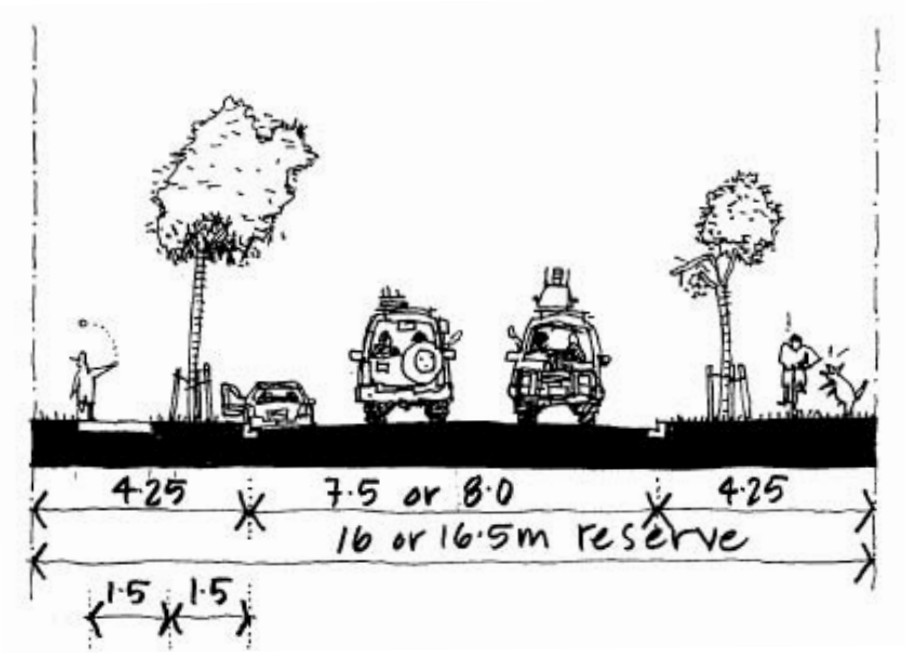
#### 4.5.2.3 Neighbourhood Collector Street (Bus Route)




**Notes:**

1. A minimum 1.8m wide concrete footpath is required on both sides of Neighbourhood Collector Streets with Bus Routes.
2. Where a shared off-road path needs to be accommodated within the reserve of a Neighbourhood Collector Street to meet wider cycle network planning needs, the verge must be widened to a minimum 5.0m and the reserve width must be widened to a minimum 20.5m.
3. Speed control devices must not be used on bus routes. Target design speeds must be achieved by using tight curves (min inside radius 10m) or roundabouts at intersections (with a minimum outer radius 15m).
4. The overall carriageway is typically 11 metres wide. The kerb must be built out into the parking lanes to create landscaped kerb buildouts at regular intervals of no more than approximately 120m. Driveways must be constructed as part of the development roadworks for lots with a kerb buildout on their frontage.
5. Sufficient sight distance to approaching traffic must be achieved for on-street parking and potential driveway locations near bends.
6. Edge lines, build-outs and landscaping visually reduce road width.
7. Design vehicle for typical bus routes is AUSTROADS Large Rigid Truck/Bus.

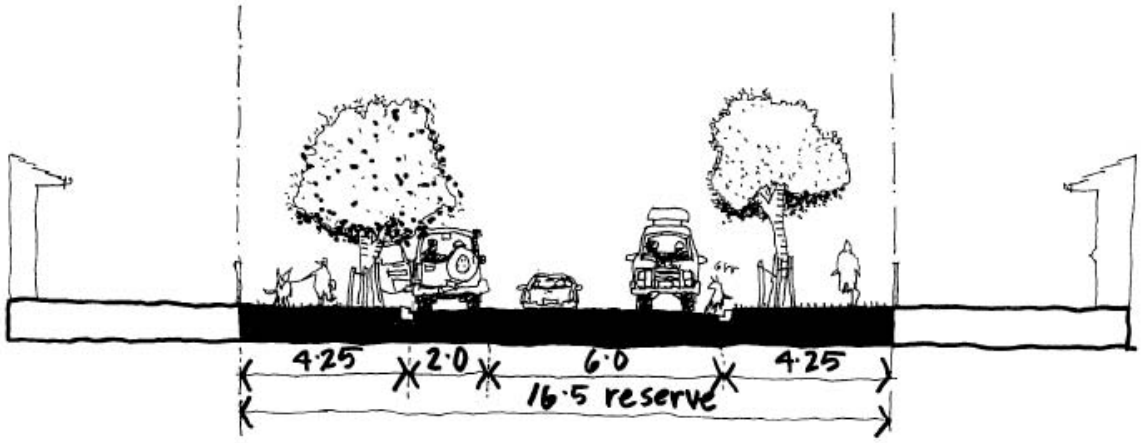
**4.5.2.4 Neighbourhood Collector Street (Non-Bus Route)**




**Notes:**

1. A 16.5m wide reserve is required if an 8.0m wide carriageway is used.
2. 8.0m wide carriageways must be used where a maximum design speed of 50 km/hr is achieved.
3. 7.5m wide carriageways must be used where a maximum design speed of 40 km/hr is achieved.
4. Where the speed limit on Neighbourhood Collector Streets is greater than 50km/h (e.g. some existing streets), a cross-section similar to the District Collector Street should be used.
5. A minimum 1.8m wide concrete footpath must be constructed on both sides of all Neighbourhood Collector Streets. Its alignment must be offset from the carriageway by more than 1.5m. Side of street to be constructed is optional, however it should be located where it is most convenient for use.
6. Where a shared off-road path needs to be accommodated within the reserve of a Neighbourhood Collector Street to meet wider cycle network planning needs, the verge must be widened to 5.0m and the reserve width must be widened to 17.5m

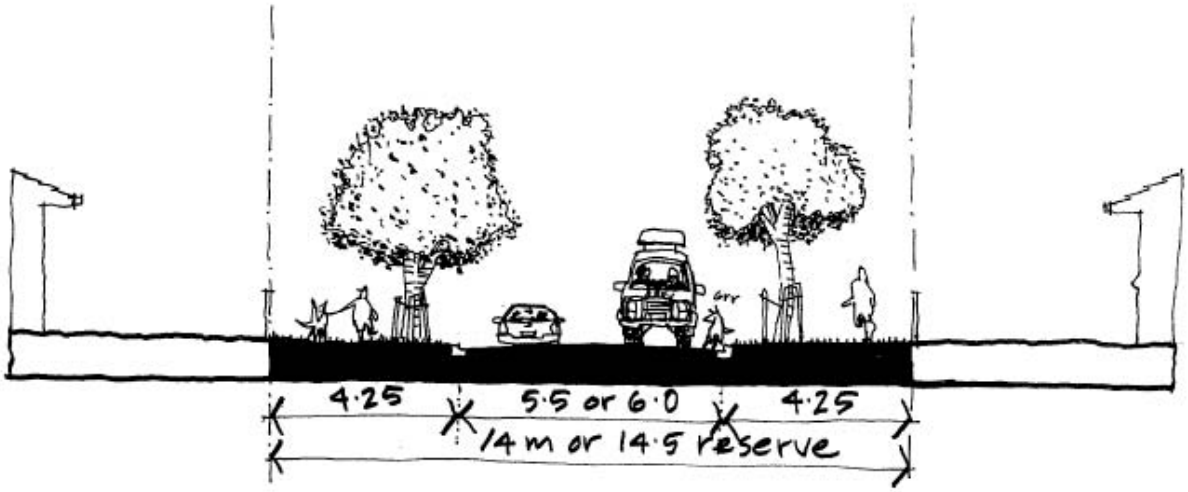
**4.5.2.5 Access Streets**




**Notes:**

1. 6.0m wide carriageways must be used where a maximum design speed of 40 km/hr is achieved.
2. Where the speed limit on Access Streets is greater than 50km/h (e.g. some existing streets), a cross-section similar to the District Collector Street should be used
3. A minimum 1.8m wide concrete footpath must be constructed on one side of all Access Streets. Its alignment must be offset from the carriageway by more than 1.5m.
4. On-street parking in Access Streets is desirably indented on one side only with indents alternating from one side to another along the street. An exception to this requirement will exist where indented parking areas are needed on both sides to meet on street parking requirements where small lots or lots with narrow frontages (less than 17m) exist. On street parking spaces are provided at a minimum rate of 2 spaces per 3 detached dwellings.
5. The road reserve will need to be widened to 16.5m where indented parking spaces are provided.

**4.5.2.6 Access Places and alternative Access Street solution**



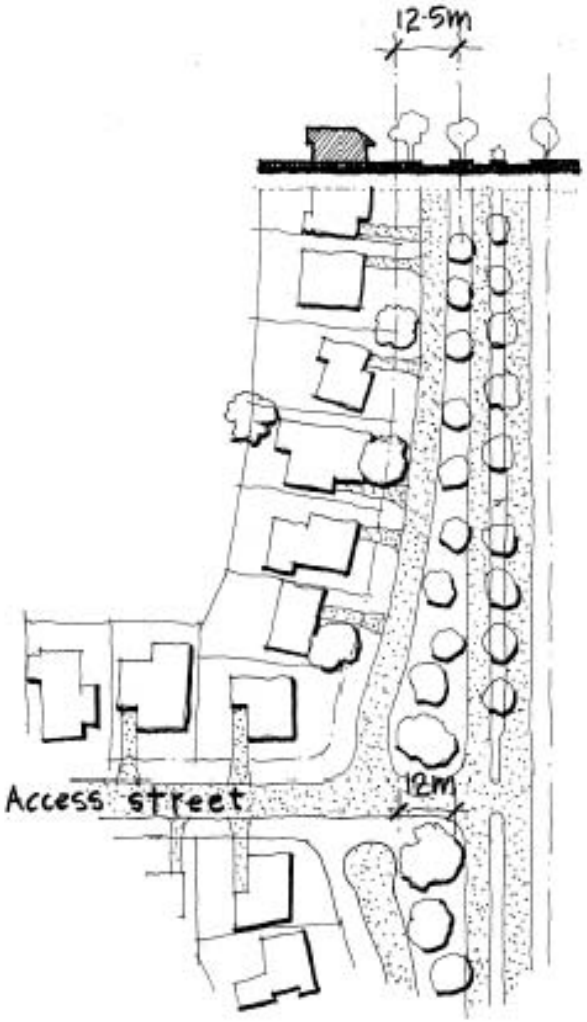

**Notes:**

1. 14.5m wide Reserve is required if 6.0m wide carriageway is used.
2. 6.0m wide carriageways must be used where a maximum design speed of 40 km/hr is achieved.
3. 5.5m wide carriageways must be used where a maximum design speed of 30 km/hr is achieved.
4. Access Places have lower traffic volumes and a lower maximum design speed of 30 km/hr. Therefore a reserve width of 14m and carriageway width of 5.5m applies to Access Places.
5. On-street parking in Access Places must be achieved at minimum rate of 2 spaces per 3 detached dwellings. Indented parking areas may be needed to meet these demands where lots with narrow frontages exist.
6. The road reserve will need to be widened to 16.5m where indented parking spaces are needed.

### 4.5.3 Access Management Techniques for District Collector streets

The following access management techniques are examples of acceptable solutions to manage the potential impacts of traffic noise, and safety and residential amenity associated with residential uses having direct access onto District Collector Streets. At least one or more relevant treatments must be introduced where development proposes to have frontage to a District Collector Street.

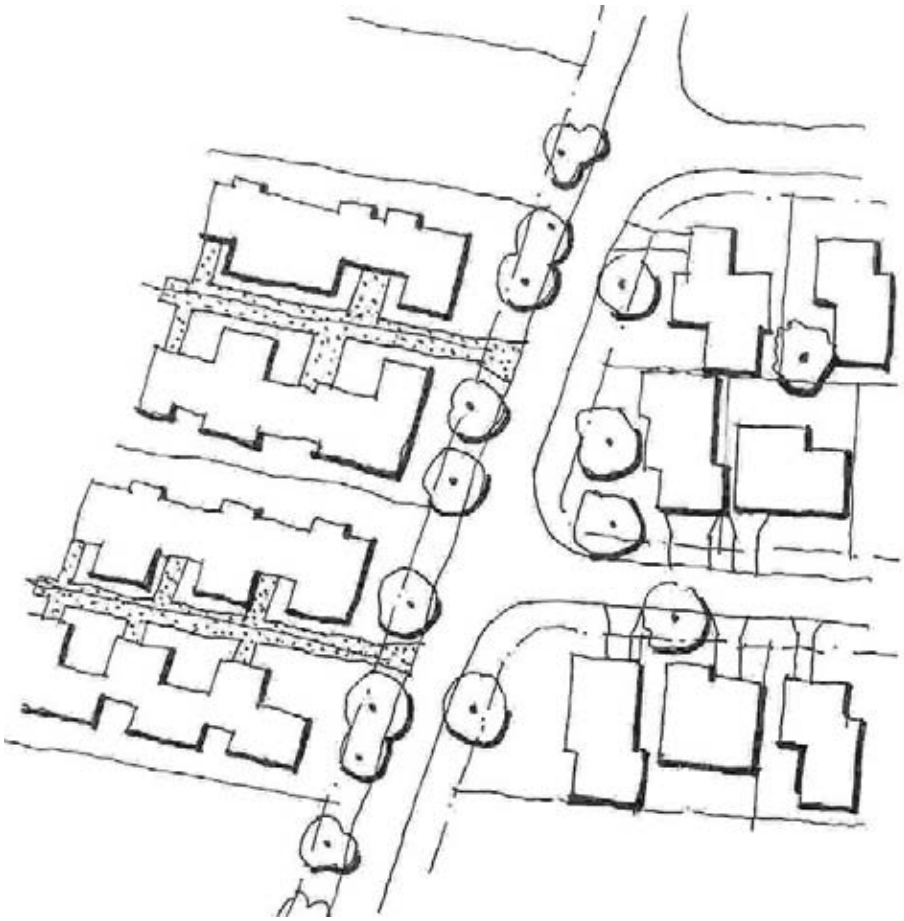
#### 4.5.3.1 Service Road (5,000 - 7,000vpd)




**Notes:**

1. This option is used where traffic volumes are expected to be between 5,000vpd and 7,000vpd on District Collector Streets, and where proximity of non-residential uses may result in increased frictional effects of slower moving traffic, such as near a local shopping centre or community activity centre.
2. Road reserve widths must be widened an additional 12.5m on each side of a typical District Collector Street cross-section where Service Roads are proposed.
3. Service Roads must have a 4.5m wide verge width with a 6.0m wide carriageway.

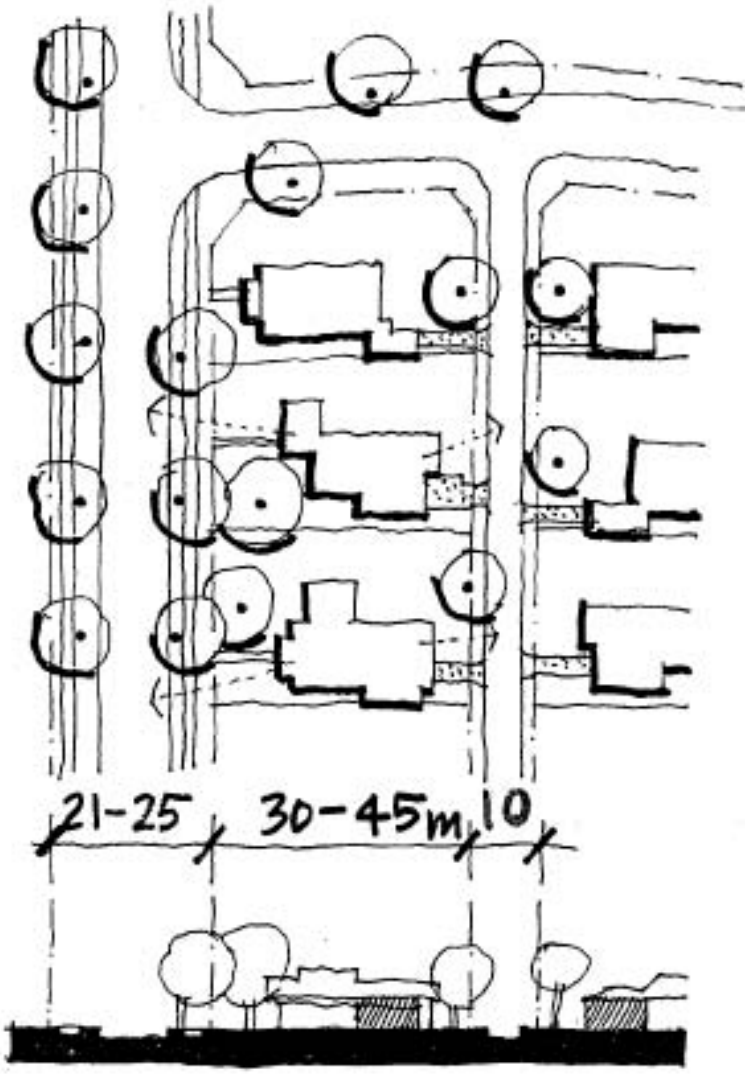
**4.5.3.2 Shared Driveways (3,000 – 5,000vpd)**



**Notes:**

1. This option must be implemented where group housing or multi-unit residential developments are proposed on District Collector Streets that are anticipated to carry between 3,000 and 5,000vpd.
2. It is intended to improve safety by reducing the number of potential conflicts on the road system to one point. It also reduces interference with through traffic movement by providing for vehicle parking and manoeuvring away from the road.
3. This technique must be incorporated into structure plans or applications for reconfiguring a lot to ensure that driveways are located safely and at appropriate spacings to minimise potential conflicts near intersections or other proposed or existing driveways, and to minimise conflict with through traffic movement.
4. Driveways must be located in accordance with an approved plan. Agreements are required between adjacent landowners (for reciprocal rights of access) at the planning approval or building approval stages as appropriate.
5. Shared driveways shall be considered as intersections for the purposes of determining driveway and intersection spacing along a District Collectors

**4.5.3.3 Rear Lane Access (3,000 – 7,000vpd)**




**Notes:**

1. This option is implemented on District Collector streets carrying between 3,000vpd and 7,000vpd to minimise the impacts of access and parking along the street frontage.
2. Houses address the District Collector street with pedestrian access from the main street frontage and vehicle access and parking activity occurring via the rear lane system.
3. Rear lanes are achieved by construction of a 5.5m wide carriageway in a 10m wide reservation.
4. Increased setbacks greater than 10m along the District Collector Street must also be introduced to reduce noise nuisance and improve safety and amenity.

#### 4.5.3.4 On-site Turnaround (3,000 – 5,000vpd)

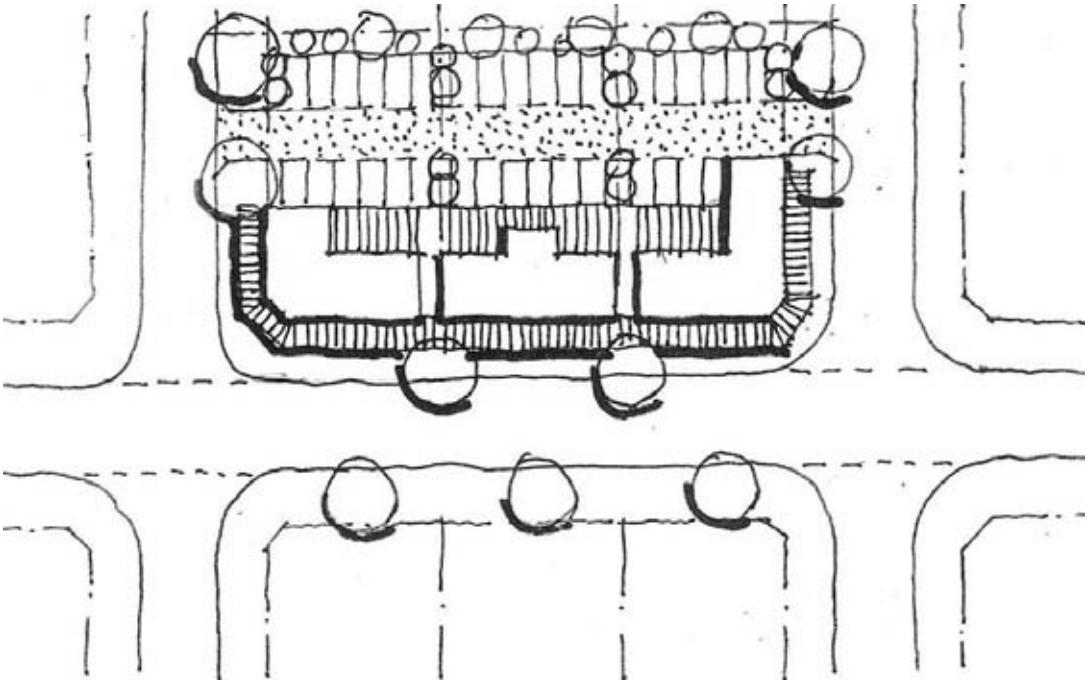
This technique requires the construction of a turnaround facility on site to ensure that vehicles can exit the site in a forward gear.

This technique must be incorporated into Structure Plans or applications for reconfiguring a lot to ensure that turnaround facilities are provided upon planning approval or building approval as appropriate.

### 4.5.4 Access Management Techniques for Arterial and sub Arterial Roads

As described in Section 4.3, direct property access to Arterial and Sub-arterial Roads is not preferred. The following Access Management Techniques are examples of acceptable solutions to manage the potential impacts of traffic noise, and safety and to reduce the number of direct access points from properties that have existing direct access to Arterial and Sub-arterial Roads, in particular Main Streets and Controlled Distributor Roads.

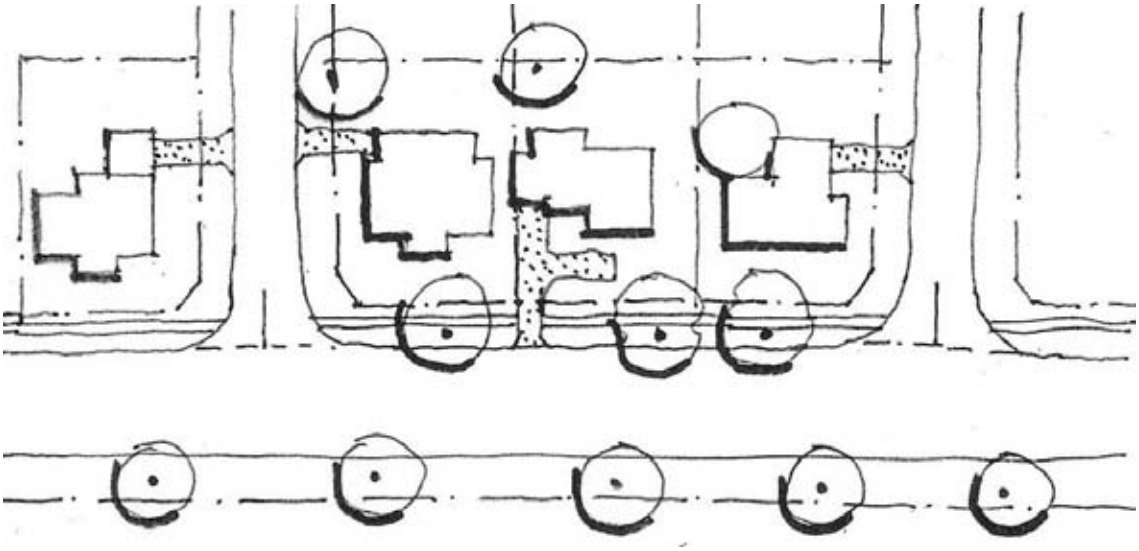
#### 4.5.4.1 Access Easements Through Rear Carparks



**Notes:**

1. This technique must be introduced where opportunity exists to achieve access to a side street through a neighbouring corner lot.
2. An agreement needs to be reached with neighbouring land-owners (for reciprocal rights of access) at the planning approval or building stages.
3. This technique reduces the number of direct access points to Controlled Distributor Roads by facilitating alternative access to the side street system.

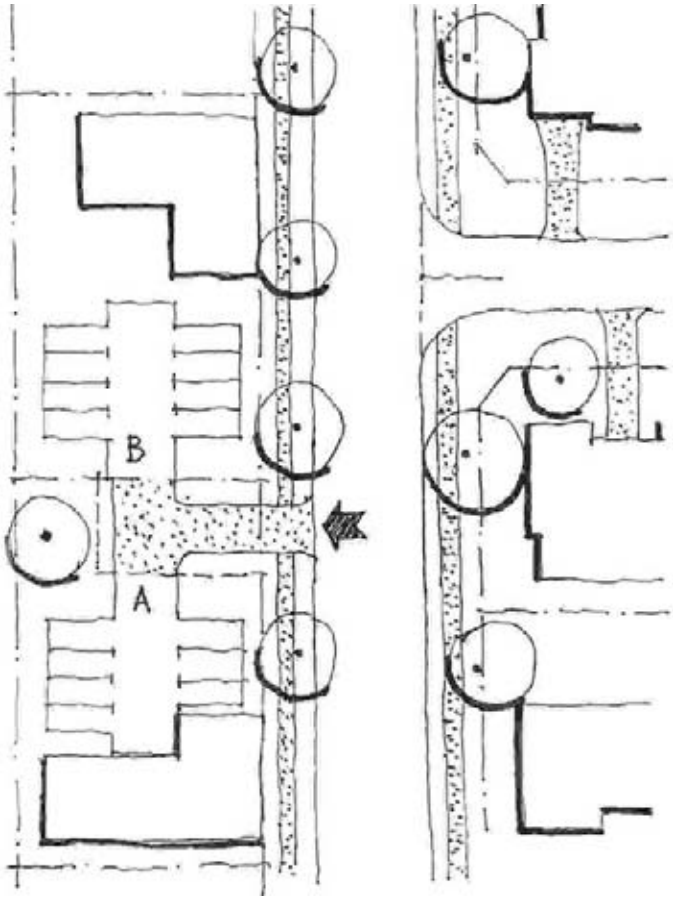
**4.5.4.2 Side Road Access and on site Manoeuvring**



**Notes:**

1. Corner lots on Controlled Distributor Roads must achieve access via a lower order side road.
2. Smaller lots with direct frontage and no achievable alternative frontage access technique must provide on site manoeuvring areas to ensure that vehicles access and depart the site in a forward motion.
3. This technique reduces the number of access points on Controlled Distributor Roads to reduce side friction and improve the safety and efficiency of through traffic movement.
4. In most instances, particularly where traffic volumes exceed or are likely to exceed 15,000vpd, right turn movements must be restricted by designing driveways to cater for left turn in and out movements only.

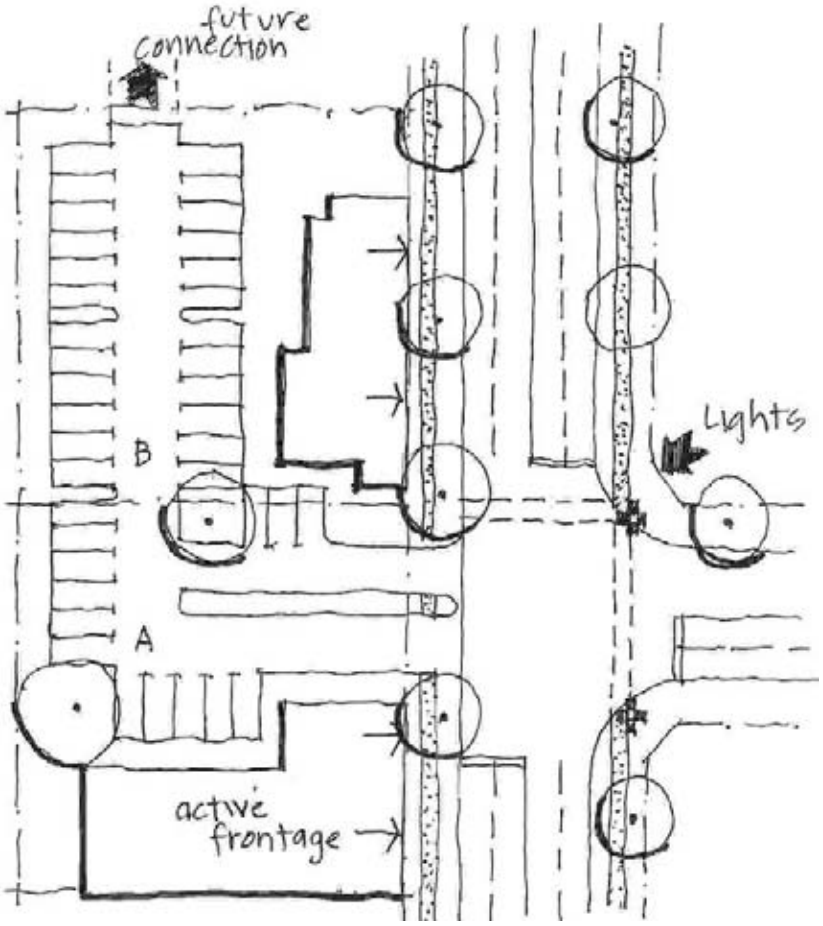
#### 4.5.4.3 Shared Driveways




**Notes:**

1. This technique reduces the number of direct access points by combining or sharing a single point of access where no other alternative Frontage Access Techniques can be achieved.
2. This technique aims to reduce the number of direct access points and improve the safety and efficiency of access and through traffic movement on the Controlled Distributor Road.
3. In this example an access easement has been created on property A in favour of property B to achieve reciprocal rights of access for the adjoining landowners.
4. In most instances, particularly where traffic volumes exceed or are likely to exceed 15,000 vpd, right turns at the shared access must be restricted by designing driveways that restrict turning movements to left turn in and out only.

### 4.5.4.4 Consolidation of Access at a Controlled Intersection




**Notes:**

1. This technique aims to reduce the number of direct access points by consolidating access at one controlled intersection location.
2. To improve the safety and efficiency of through traffic movement, this technique reduces side friction by reducing the number of access points.
3. Fully controlled safe access is achieved to the road system with no restricted turning movements. Developments with traffic signal controlled or roundabout access to the frontage road are to dedicate land as public road to accommodate all intersection infrastructure, including traffic signal loops.
4. Property A would establish the first direct point of access to the controlled intersection. This property must establish reciprocal rights of access for potential adjoining property owners. Property B would achieve access to the controlled intersection via Property A through established reciprocal rights of access. This property must also establish rights of access for other potential neighbouring landowners to achieve access to the controlled intersection.

## 4.6 Commercial Streets

The design and functional characteristics of commercial streets must have characteristics as set out in Table 4.6.1. These streets are generally planned and provided for in city, town and village centre areas where the predominant abutting land use is commercial.

**Table 4.6.1 Commercial Streets**

| CHARACTERISTICS | Commercial Streets | | |
|---|---|---|---|
| | Collector streets | | Local streets |
| | Boulevard street | Collector Street | Access Street |
| Max. Traffic Volume | 12,000vpd | 8,000vpd | 5,000vpd |
| Frontage Access | Yes | Yes | Yes |
| Speed Environment | 50km/h | 50km/h | 40km/h |
| Cycle Facilities | On-road cycle lanes (2x 1.5m wide) | On-road cycle lanes (2x 1.5m wide) | On-road (shared) |
| Pedestrian Crossings | Signals or Refuge | Signals or Refuge | No specific provision |
| Intersections | Priority T, Roundabout or Signals | Priority T, Roundabout or Signals | Priority T, Roundabout or Signals |
| Reservation width | 30m | 22m | 19m |
| No. of moving lanes | 2 | 2 | 2 |
| Pavement Width | Two 7m pavements | 13.6m | 11m |
| Median | 4m | Nil | Nil |
| Minimum Verge Width | 6m | 4.7m | 4m |
| Parking | Parallel both sides (2x 2.5m wide lanes) | Parallel both sides (2x 2.3m wide lanes) | Parallel both sides (2x2.3m wide lanes) |

**Notes to Table 4.6.1**

1. Fully paved verges will be required to the frontage of all developed properties in accordance with relevant Urban Design Guidelines.
2. Traffic catchment areas will be limited so that traffic volumes do not exceed the volumes described in Table 4.6.1.
3. Kerbside parking areas must be defined by line marking and regulatory parking signs in accordance with AS2890.5 and the Queensland Manual of Uniform Traffic Control Devices. Parking must be restricted near intersections and major driveways to ensure that sight distances, and service vehicle turning areas are not compromised.
4. Collector streets expected to carry more than 8000vpd must have a median, with appropriate U-turn facilities or other route choice options.
5. Greater attention must be given to designing commercial streets to cater for higher pedestrian intensity such as wider areas for pedestrian movement and crossing facilities are likely to be necessary, and this may necessitate a lower speed environment. Roundabouts may not be appropriate in some areas with high pedestrian movements.
6. In some cases, intersection designs for commercial streets may not need to accommodate articulated vehicles.
7. Local Streets may have angle parking provided in accordance with the Australian Standard for on-street parking (AS2890.5). Where angle parking is provided the nominated pavement width and street reserve width must be widened to accommodate the design requirements outlined in AS2890.5.
8. Where a high demand for cyclists is expected on local streets, shared on road parking/cycle lanes may be required which will require additional widening of the pavement width and reserve width.
9. The desirable maximum grade for all commercial streets is 6% to achieve suitable access for pedestrians and cyclists and to meet the maximum grade requirements for car park areas
10. Reserve and pavement widths will need to be increased to accommodate intersection requirements

## 4.7 Industrial Streets

Industrial collector and access streets shall have characteristics as set out in Table 4.7.1.

**Table 4.7.1 Industrial Streets**

| CHARACTERISTICS | Industrial Streets | |
|---|---|---|
| | Collector street | Access street |
| Traffic Catchment | 30 ha | 8 ha |
| Max. Traffic Volume | 12,000vpd | 5,000vpd |
| Frontage Access | Yes | Yes |
| Speed Environment | 60 km/h | 60 km/h |
| Cycle Facilities | On-road (shared) | On-road (shared) |
| Intersections | Priority T, roundabout, or traffic signals | Priority T, roundabout |
| Min. Intersection spacing | 100m | 60m |
| Reservation width | 22m | 20m |
| No. of moving lanes | 2 x 3.5m wide | 2 x 3.5m wide |
| Pavement Width | 14m | 12m |
| Median | Nil | Nil |
| Min Verge Width | 4.0m | 4.0m |
| Parking | Parallel kerbside –2 x 3.5m wide lanes delineated by a white edgeline | Parallel kerbside – 2x 2.5m wide lanes, no delineation required. |
| Pedestrian Facilities | Footpaths both sides | Not required |
| Grades<br>Desirable Maximum<br>Absolute Maximum<br>Minimum | <br>6%<br>8%<br>0.3% | <br>6%<br>10%<br>0.3% |

**Notes to Table 4.7.1**

1. Concrete footpaths (1.5m wide) must be provided to the frontage of all developed properties that have frontage to Industrial Collector Streets.
2. Traffic catchment areas must be limited so that traffic volumes do not exceed the volumes described in Table 4.6.1, based on design generation rates of 200, 400 and 800 vehicles per day per hectare of site for low, medium, and high intensity development. Bulk warehouses with few employees will be at the low end of the scale and light industry / service industry areas with more employees will be at the upper end of the scale. Generally, smaller lots have higher generation rates per hectare.
3. A typical industrial development with a site area of 8 Hectares is likely to generate 5000vpd. Developments that achieve a traffic catchment area that is greater than 8 Ha (or 5000vpd) must plan for the street system to include a Collector Street to service the area.
4. Kerbside parking areas must be defined by line marking and parking regulation signs as necessary around intersections and major driveways to ensure that heavy vehicle turning areas are not compromised.
5. Industrial collector roads expected to carry more than 8000 vpd must have a median, with appropriate U-turn facilities or other route choice options.

## 4.8 Rural Roads and streets

Rural roads and streets must be designed and constructed with the characteristics described in Table 4.8.1.

Table 4.8.1

| CRITERION | Rural Roads | | | |
|---|---|---|---|---|
| | Arterial Roads | | Sub Arterial Roads | |
| | Highway Motorway | Rural Arterial | Distributor | Controlled Distributor |
| **FUNCTIONAL CHARACTERISTICS** | | | | |
| Dominant linkage | Regional | Intra regional | Rural Suburbs or Districts | Rural suburbs or Districts |
| Traffic carrying function | Longer distance traffic travelling through the region | Major Access route between cities and towns | Major access route between towns and villages | Major access route between towns and villages |
| Traffic Volume | Volumes not restricted | Volumes not restricted | Volumes not restricted | <8,000vpd |
| Frontage Access | Nil | Restricted direct access | Restricted direct access | May be individual |
| Minimum Operating Speed Standard | High (>100km/h) | High (>100km/h) | Intermediate (80km/h – 100km/h) | Intermediate (80km/h – 100km/h) |
| Truck Route? | Primary freight routes | Primary/secondary freight routes | Secondary routes | Secondary routes |
| Dangerous goods route? | Primary routes | Selected routes only | Selected routes only | Selected routes only |
| Public transport facilities | Line haul, priority treatments | Line haul, priority treatments | Bus route | Bus route |
| Cycle facilities | Regional, off carriageway | Regional, cycle lanes on road shoulder and/ or off carriageway | Regional/local, cycle lanes on sealed road shoulder | Regional/local, cycle lanes on sealed road shoulder |
| Pedestrian movement facilities | No specific provision | No specific provision | No specific provision | No specific provision |
| **FRICTIONAL CHARACTERISTICS** | | | | |
| Intersection treatments | Grade separated/ priority | Roundabout/ priority | Roundabout/ priority | Roundabout/ priority |
| Typ. Intersection spacing | 4-8km (maximum 12km) | >1000m | >300m | >300m |
| Reserve Width (not including embankments) | 40-100m | 40-60m | 35-45m | 35m |
| Preferred access control | No access | No access | Combined sites only | Selective access control |
| Parking provision | No parking on roadway | No parking on roadway | No parking on roadway | No specific provision |
| Bus stopping provision | None on road | Indented bays where appropriate | Indented bays where appropriate | Indented bays where appropriate |
| Cross section | Volume driven, could be divided | Volume driven, could be divided | 11m sealed<br>11m formation<br>could be divided | 10.5m sealed<br>10.5m formation |
| Traffic Lane width | Volume driven, could be divided | Volume driven, could be divided | 2 x 3.5m | 2 x 3.5m |
| Shoulder width (full seal each side) | Volume driven | Volume driven | 2 x 1.5m | 2 x 1.25m |
| Verge Width (sealed) | Volume driven | Volume driven | 2 x 0.5m | 2 x 0.5m |
| Absolute Maximum Grades | 5% | 6% | 7% | 8% |

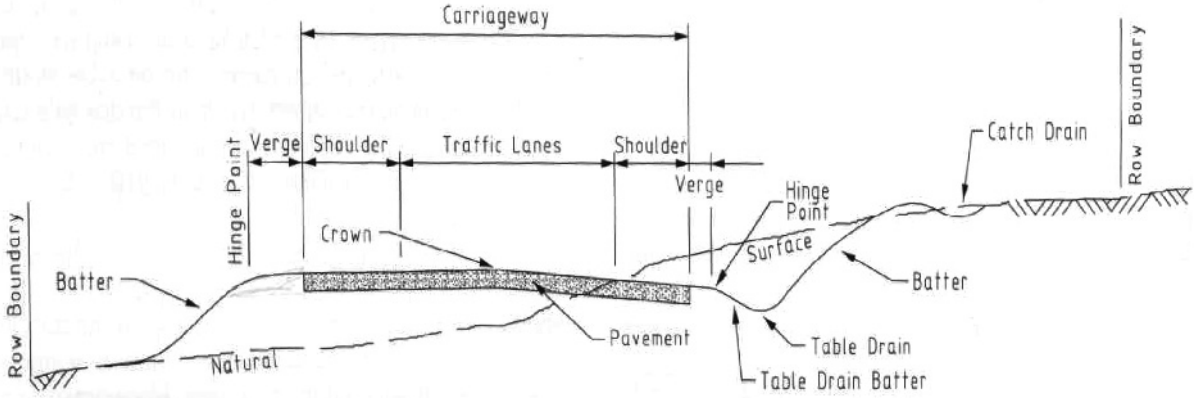
Table 4.8.1

| CRITERION | Rural Streets | | | |
|---|---|---|---|---|
| | Collector Streets | | Local Streets | |
| | District Collector | Neighbourhood Collector | Access Street | Access Place |
| **FUNCTIONAL CHARACTERISTICS** | | | | |
| Dominant linkage | Rural Districts or groups of Neighbourhoods | Rural Neighbourhoods | Individual Sites | Individual Sites |
| Traffic carrying function | Major access to rural districts with direct access to rural properties | Access and circulation within rural neighbourhoods with direct access to properties | Direct access to rural properties, up to 50 lots | Direct access to rural properties, up to 12 lots |
| Traffic Volume | 1,000 – 5,000 vpd | 500 - 1,000 vpd | 150 - 500 vpd | 0 - 150 vpd |
| Frontage Access | May be individual | Individual | Individual | Individual |
| Minimum Operating Speed Standard | Intermediate (80km/h – 100km/h) | Intermediate (80km/h – 100km/h) | Low (50km/h – 70km/h) | Low (50km/h – 70km/h) |
| Truck Route? | Access only | Access only | Access only | Access only |
| Dangerous goods route? | Inappropriate except for access | Inappropriate except for access | Inappropriate except for access | Inappropriate except for access |
| Public transport facilities | School Bus route | School Bus route | N/A | N/A |
| Cycle facilities | On-road – sealed shoulders | On-road – sealed shoulders | On-road – sealed shoulders | On-road (shared) |
| Pedestrian movement facilities | No specific provision | No specific provision | No specific provision | No specific provision |
| **FRICTIONAL CHARACTERISTICS** | | | | |
| Intersection treatments | Roundabout/ priority | Priority | Priority | Priority |
| Typ. Intersection spacing | >100m | >100m | >100m | Nil |
| Reserve Width (not including embankments) | 30m | 25m | 20m | 20m |
| Preferred access control | Individual sites | Individual sites | Individual sites | Individual sites |
| Parking provision | No specific provision | No specific provision | No specific provision | No specific provision |
| Bus stopping provision | Off carriageway | Off carriageway | Nil | Nil |
| Cross section | 10 m sealed<br>10 m formation | 9.5 m sealed<br>9.5 m formation | 8.7 m sealed<br>8.7 m formation | 6.5 m sealed<br>6.5 m formation |
| Traffic Lane width | 2 x 3.5m | 2 x 3.5m | 2 x 3.1 | 1 x 3.5m |
| Shoulder width (full seal each side) | 2 x 1.0m | 2 x 0.75m | 2 x 0.75 | 2 x 1.0m |
| Verge Width (sealed) | 2 x 0.5m | 2 x 0.5m | 2 x 0.5m | 2 x 0.5m |
| Absolute Maximum Grades | 9% | 10% | 16% | 16% |

**Notes to Table 4.8.1**

1. Urban residential subdivisions must not gain access via rural residential local roads.
2. Rural arterial roads and highways must be designed in accordance with the relevant requirements of Austroads Guide to Rural Road Design and the DMR Road Planning and Design Manual.
3. Refer to Section 1.3, Austroads Rural Road Design Guide for further discussion on the concept of operating speed standards.
4. For definition of cross-section elements such as Traffic Lane Width, Shoulder, and Verge widths refer to Fig 4.8.1.
5. MSC requires full width shoulder and verge seal to reduce maintenance costs and to improve moisture conditions under pavements, especially under the outer wheel path.
6. Short lengths of wider shoulder seals or lay-bys are to be provided at suitable locations to provide for discretionary stops
7. Wider shoulders must be provided to accommodate cyclists where a need is identified in the Maroochy Bikeways Strategy.
8. Wider verge widths are required to provide space for installation of road safety barriers, and to achieve horizontal sight distance requirements, or to balance cut and fill.
9. Under constrained circumstances and where limited heavy vehicle use is expected, grades greater than 16% but no greater than 20% may be accepted on Access Streets and Places for one short length of 100m over the entire street length.
10. Grades approaching intersections must not exceed 3% over the extent of the required stopping sight distance.
11. Length of steep grades must be limited using the design requirements of Austroads Guide to Rural Road design.

**Figure 4.8.1 Typical Cross Sections**




Two Lane Two Way Rural Roads

## 4.9 Rural Residential Streets

Rural residential streets shall be designed and constructed with the characteristics described in Table 4.9.1.

**Table 4.9.1**

| CRITERION | Rural Roads | | | |
|---|---|---|---|---|
| | Arterial Roads | | Sub Arterial Roads | |
| | Highway/Motorway | Rural Arterial | Distributor | Controlled Distributor |
| **FUNCTIONAL CHARACTERISTICS** | | | | |
| Dominant linkage | Refer to Rural Areas Table for details of the Arterial / Sub-Arterial Network | | | |
| Traffic carrying function | | | | |
| Residential access function | | | | |
| Traffic speed environment | | | | |
| Heavy traffic movement | | | | |
| Dangerous goods movement | | | | |
| Public transport facilities | | | | |
| Cycle facilities | | | | |
| Pedestrian facilities | | | | |
| **FRICTIONAL CHARACTERISTICS** | | | | |
| Intersection treatments | Refer to Rural Areas Table for details of the Arterial / Sub-Arterial Network | | | |
| Typ. Intersection spacing | | | | |
| Reserve width (not including embankments) | | | | |
| Parking provision | | | | |
| Bus stopping provision | | | | |
| Max travel distance to the road system | | | | |
| Verge width | | | | |
| Sealed pavement width | | | | |
| Absolute Maximum Grades | | | | |

Table 4.9.1

| CRITERION | Rural Residential Streets | | | |
|---|---|---|---|---|
| | Collector Streets | | Local Streets | |
| | District Collector | Neighbourhood Collector | Access Street | Acceess Place |
| **FUNCTIONAL CHARACTERISTICS** | | | | |
| Dominant linkage | District cell | Neighbourhood cell | Sites | Sites |
| Traffic carrying function | 3000 - 5000 vpd | 800 - 3,000 vpd | 0 - 800 vpd | 0 - 300 vpd |
| Residential access function | In accordance with frontage access techniques (see Section 4.5.3) | Individual | Individual | Individual |
| Traffic speed environment | Terrain dependant, =< 100 km/ h | 60 km/h (speed control by alignment) | 45 km/h with speed control devices | 45 km/h with speed control devices |
| Heavy traffic movement | Access only | Access only | Access only | Access only |
| Dangerous goods movement | Inappropriate except for access | Inappropriate except for access | Inappropriate except for access | Inappropriate except for access |
| Public transport facilities | Bus route | School Bus route | N/A | N/A |
| Cycle facilities | On-road – sealed shoulders | On-road - shared | On-road - shared | On-road shared |
| Pedestrian facilities | No specific provision | No specific provision | No specific provision | No specific provision |
| **FRICTIONAL CHARACTERISTICS** | | | | |
| Intersection treatments | Roundabout/ priority | Priority | Priority | Priority |
| Typ. Intersection spacing | >100m | >100m | >100m | Nil |
| Reserve width (not including embankments) | 30m | 25m | 20m | 20m |
| Parking provision | No specific provision | No specific provision | No specific provision | No specific provision |
| Bus stopping provision | Off carriageway | Off carriageway | N/A | N/A |
| Max travel distance to the road system | N/A | 800m (2000m in total) | 1200m | 1200m |
| Verge width | 10m | 8m | 5.0m min. (7.0m typical) | 5.0m min. (7.0m typical) |
| Sealed pavement width | 10 m sealed<br>10 m formation | 8.0 m sealed<br>Driveover kerb | 6.0 m sealed<br>Driveover kerb | 6.0 m sealed<br>Driveover kerb |
| Absolute Maximum Grades | 9% | 16% | 16% | 16% |

**Notes to Table 4.9.1**

1. Urban residential subdivisions must not gain access via rural residential local roads.
2. The major traffic design issue in rural residential subdivisions is the control of vehicle speed which is made more difficult (if not impossible) if travel distances on local roads are excessive. Even with travel distances constrained in accordance with the requirements of Table 4.9.1, horizontal and vertical alignments and intersection design will need to be closely coordinated to avoid areas of excessive speed. The horizontal geometric design and intersection designs of rural residential streets must be integrated to achieve the speed environments described without the use of specific speed control devices.
3. Higher order rural roads must be designed in accordance with the requirements for major roads described in the rural road and streets hierarchy Table 4.8.1.
4. Where rural district collector streets or Sub-arterial roads pass through rural residential areas, and frontage access is permitted, kerb and channel must be placed on an alignment abutting the nominated 10m width.
5. Where the building envelope in Rural Residential areas is proposed within 15m of a road or street, additional widening is required to accommodate on-street parking at the desirable rate of one space per each lot.
6. Under constrained circumstances and where limited heavy vehicle use is expected, grades greater than 16% but no greater than 20% may be accepted on Access Streets and Places for one short length of 100m over the entire street length.
7. Grades approaching intersections must not exceed 3% over the extent of the required stopping sight distance.

## 4.10 Intersections

Intersections are generally designed in accordance with the requirements of the DMR Road Planning and Design Manual and the Austroads Guide to Traffic Engineering Practice.

Intersection treatments are generally selected as a result of traffic analysis along with safety and operational considerations, undertaken in a traffic impact assessment report as detailed in Section 2 of this policy.

Typically accepted intersection treatments for various types of Urban Roads and Streets are outlined in Table 4.5.1.

No specific turn treatments are required at priority controlled T-intersections where the speed limit is 50km/h or less on Neighbourhood Collector Streets in urban residential areas or on Local Streets in both urban and rural residential areas. The minimum right-turn treatment on District Collector Streets and higher-order roads should be a separate right-turn lane. In all other cases, the minimum left and right turn treatments for intersection safety purposes should be determined in accordance with the warrants detailed in the DMR Road Planning and Design Manual, Where a basic left-turn treatment (BAL) is used on urban roads and streets and no parking lane is provided, a widened area should be provided on the major road prior to the intersection to assist the left-turn movement. The minimum width of the widened area plus the adjacent through lane is 6m.

Separate right turn lanes should be provided on all approaches to signalised intersections, regardless of traffic volumes or hierarchy. The layout, lane configuration and phasing of signalised intersections should consider the most efficient intersection operation for pedestrians and traffic movements during all periods of the day, rather than simply attempting to achieve a degree of saturation during the design traffic peak hour at or below the maximum permissible.

Sight distance on all approaches to roundabouts should be in accordance with the DMR Road Planning and Design Manual. The minimum outside diameter of roundabouts on urban residential streets should generally not be less than 26m where the speed limit is 50km/h or less, and not less than 30m where the speed limit is 60km/h or where the roundabout is on a bus route. The roundabout diameter may need to be increased to allow for situations where the angle between any adjacent roundabout leg is considerably more or less than 90 degrees, there are medians on some or all of the carriageways, or where larger design turning vehicles need to be accommodated.

Kerbed splitter islands should be provided on all roundabout approaches. On urban Local Streets, the general minimum area of kerbed splitter islands is $5m^2$. On urban Neighbourhood Collector Streets and higher-order roads, splitter islands should be of sufficient size to incorporate a pedestrian refuge at least 1 car length

(6m) back from the roundabout holding line. The splitter island should be at least 2m wide at the position of the refuge. The general minimum lane width adjacent to splitter and median islands on urban Neighbourhood Collector and Local Streets is 4.2m.

Roadside hazards must not be placed within the clear zone associated with all roundabouts and their approaches, particularly on the roundabout central island. Roadside hazards include retaining walls, rocks and boulders, trees and shrubs with a maximum ultimate trunk diameter greater than 80mm, and other non-frangible items. The height and profile of the kerb on the roundabout central island should be in accordance with Maroochy Shire Council standard requirements for semi-mountable and mountable kerb.

Provision for U-turns must be made at intersections on streets that include a centre median in the cross section.

Where permitted, site access for larger commercial, residential, retail or mixed use developments onto Urban District Collector Streets or Sub Arterial Roads should address the requirements of intersection design.

## 4.11 Speed Control

Speed Control must be introduced to Urban Residential Streets and Rural Residential Streets to achieve the maximum target speeds listed in Table 4.5.1 and listed in the notes for the urban residential street cross sections in section 4.5.2. Speed control is required on these streets to achieve a low speed environment that is safe for pedestrians and cyclists and is compatible with the amenity of the residential area.

It is preferable that speed control devices are avoided wherever possible and that the maximum target design speeds are achieved by tight bends (greater than 60°) and by roundabouts at intersections.

Speed Control devices are not accepted on Bus Routes unless they are designed to enable safe and comfortable movement by buses, ie without mounting kerbs or causing buses to swerve.

The guidelines in Queensland Streets for control of traffic speed must be followed when planning and designing street alignments and speed control devices on new residential streets.

In circumstances where speed control devices can't be avoided in order to achieve the maximum target speeds specified in Table 4.5.1 the type of devices specified in Queensland Streets must be used.

Speed control is generally achieved by reducing the length of straight sections of street to:

- 75m or less where the target speed is 30km/h,
- 120m or less where the target speed is 40km/h,
- 140m or less where the target speed is 50km/h

These target lengths are based on the assumption that design speeds of 20km/h or less are achieved on bends, or roundabouts, or at speed control devices.

## 4.12 On Street Parking

In the planning of streets where high density residential development is likely, particular attention will be necessary to the provision of on-street parking, usually requiring wider pavements and reservations.

Assuming that the off-street parking requirements described in Schedule 2 to the Transport, Traffic and Parking Code are achieved, on-street parking must be provided at a minimum rate of 2 spaces per 3 detached houses plus one space per three 3 or 4 bedroom attached dwelling units, plus one space per four 1 or 2 bedroom attached dwelling units. The opportunity for on street parking should be integral to the design of reserves and in the location of driveways.

At least 75% of the on street spaces required must be located within 25m, and 100% of the spaces required must be located within 40m of the closest lot boundary.

Cul-de-sac and small lot (less than 15m frontage) locations require, in addition, indented bays or other special provision for parking. Additional on-street parking space is also required near parks and other community facilities.

## 4.13 Flood Immunity

Road Drainage Design

Roads located in flood-prone areas should be designed in accordance with the Queensland Urban Design Manual (QUDM), Average Recurrence Intervals. For the purpose of clarification: the term Major Roads, Arterial, Subarterial Roads and District Collector Streets in Maroochy Plan's Road Hierarchy Map and Minor roads are all other streets.

## 5 Site Access

This section is relevant to the assessment of compliance with P1-P6 (in Element 3 – Site Access Requirements) of the Transport, Traffic and Parking Code.

### 5.1 General

Site access driveways will generally be configured as concrete industrial crossings, but may in special circumstances be configured as roadway approaches to traffic signal, roundabout or priority controlled intersections.

Generally, only one site access driveway will provide access to a development. Additional driveways shall only be approved for major developments where it can be demonstrated that the purpose of the code is best met with additional driveways.

Generally, site access driveways will be to the more minor road where a development site has frontage to two or more roads, except where the generated traffic would impact adversely in respect of amenity or safety.

Site access driveways will generally be required to satisfactorily accommodate light vehicles and service vehicles. In some major developments, separate driveways for heavy vehicles may be appropriate where it can be demonstrated that this leads to safer traffic operations or reduced impact on the external road network.

### 5.2 Driveway Location

Site access driveways and their splays at the kerb line should not extend beyond the frontage of the site (normal to the frontage) unless a joint access driveway is proposed.

In addition to the other driveway location requirements of this Policy, site access driveways for minor developments shall be located consistent with the requirements of Table 5.2.1.

Table 5.2.1

| Type of Frontage Road | Adjacent Feature | Minimum Separation of Proposed Minor Driveway from Adjacent Feature (TP to TP along kerb) |
|---|---|---|
| Street | Minor intersection | 10 metres |
| | Major intersection | 20 metres |
| | Other driveway | 3 metres between extent of splays |
| | Controlled intersection | Clear of 95th percentile queue areas and turn lanes |
| Road | Minor intersection | 20 metres |
| | Major intersection | 30 metres |
| | Median break | 15 metres (or twice one-way carriageway width, whichever is greater) |
| | Other driveway | 15 metres |
| | Controlled intersection | Clear of 95th percentile queue areas turn lanes approach tapers |

**Notes to Table 5.2.1**

1. TP is tangent point of curve at intersection or other driveway closest to proposed minor driveway.
2. For the purposes of this Table, a District Collector Street and Industrial Collector Street are classified as Roads.
3. 'Other driveway' relates to driveways on same side only on Streets. On Roads, 'Other driveway' relates to driveways on both sides of undivided carriageways.
4. Where permitted, the minimum separation between driveways for detached dwellings on Roads may be reduced to 3 metres.
5. A major intersection is defined as an intersection controlled by traffic signals or a roundabout, or where a median break is provided on the major road at a priority-controlled intersection of a minor road and a major road.

## 5.3 Road Planning Considerations

Intersection spacing on major roads must be in accordance with Section 4 of this policy and the requirements of Austroads Guide to Traffic Engineering Practice Part 5, Section 5.

Where right turn ingress is permitted from Arterial and Sub-arterial roads at major developments, a separate right turn lane will normally be required. Turn lanes must be designed in accordance with the DMR Road Planning & Design Manual. The minimum dimensions of a left turn or right turn lane in constrained circumstances should be a 20 metre taper plus a 30 metre parallel storage lane.

Constructed road widening and dedication of land may be necessary as a result of median construction or widening, or the provision of right or left turn lanes associated with the proposed driveway, or to ameliorate traffic volume increases associated with the proposed development pursuant to a traffic impact assessment as described in Section 2 of this Policy.

Even where construction of a median break or a right turn lane is required as a condition of development, Council always retains the right to close a median break at any time in the future to improve safety or network traffic operations.

## 5.4 Sight Distance Requirements

Sight distances at driveways must comply with the requirements of the DMR Road Planning & Design Manual. Reduced sight distances will only be considered where there is no practical alternative, and where specific traffic design or control measures have been taken to minimise hazards.

Sight distance requirements may require the tapered set-back of buildings or landscaping from the property boundary.

Further, the opening in a building constructed on the front alignment should be set back at least 2.0 metres from each side of the driveway to allow drivers to have minimum visibility of pedestrians on the footpath.

Service vehicles, particularly large trucks require substantially longer gaps in traffic to complete turning, crossing and merging manoeuvres. Where truck volumes are significant, sight distance requirements should be increased to take account of site-specific circumstances.

## 5.5 Driveway Type selection

Driveways should be constructed generally as shown in Figure 5.5.1, with the driveway type and width defined by Table 5.5.1. For Type 'C' driveways, the first width nominated is the width of the entry driveway, followed by the width of the exit driveway.

**Figure 5.5.1**

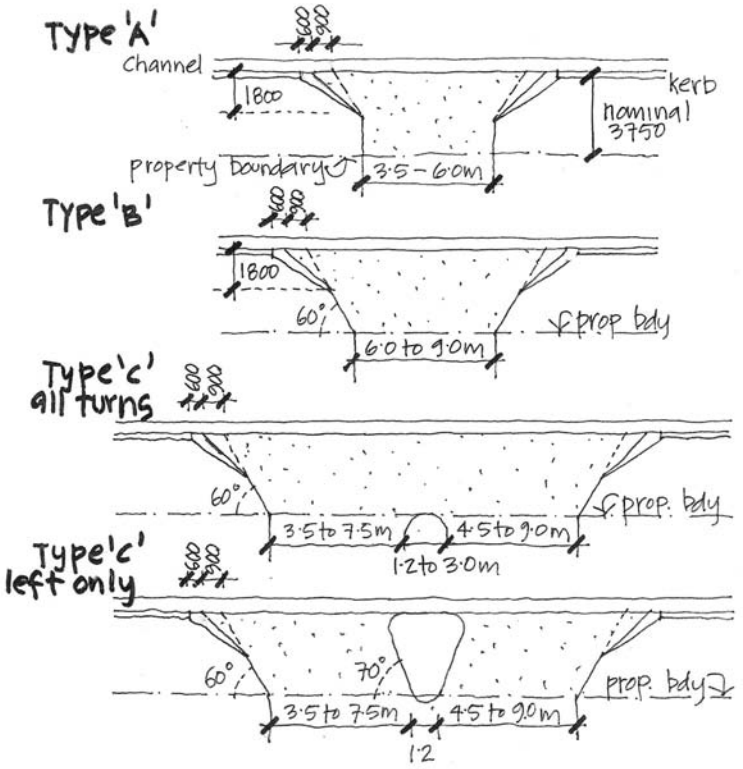



**Table 5.5.1**

| Type of Frontage Road | Driveway Traffic Volume | Driveway Type for Vehicle: | | | | | |
|---|---|---|---|---|---|---|---|
| | | Van/Car only | SRV | MRV | LRV | WCV | AV |
| Street | <25 vph | A6.0 | B6.0 | B7.0 | B7.5 | B7.5 | B9.0 |
| | >25 vph | B6.0 | B7.0 | B7.5 | B9.0 | B9.0 | B9.0 |
| Road | <25 vph | B7.0 | B7.5 | C6.0/4.5 | C7.5/6.0 | C7.5/6.0 | C9.0/7.5 |
| | >25 vph | C4.5/3.5 | C5.5/4.0 | C6.0/4.5 | C7.5/6.0 | C7.5/6.0 | C9.0/7.5 |

**Note to Table 5.5.1:**

1. Traffic volumes described are during design peak period.
2. For the purposes of this Table, a District Collector is classified as a Road.
3. Where traffic volumes are low (typically less than 25 vehicles per hour two-way), it may be appropriate for the driveway width and type adopted to be based on the premise that the largest service vehicles expected to visit the driveway infrequently will use the full width of the driveway.

## 5.6 Provisions for Queues

### 5.6.1 Queues at Driveways

Queue lengths are to be measured along the driveway from the property boundary to the first parking space or internal intersection. Queues may be permitted adjacent to low turnover parking spaces in some circumstances. Each queued vehicle will be assumed to occupy a space 6.0 metres long.

The length of a design queue is dependent on a number of factors, including:

- The form of control at the driveway intersection,
- The nature of the external road and the traffic volumes carried,
- The size of the car park and the turnover rate,
- The design of the internal traffic and parking system.

When queue lengths can reasonably be calculated using conventional intersection analysis techniques, the design queue shall be the peak design period 95th percentile queue. In the absence of appropriate queue length calculations, the minimum queue provision on entry and exit shall be as set out in Table 5.6.1. Greater queue provisions may be required in some cases.

**Table 5.6.1**

| Nominal Car Park Capacity | Design Queue Length |
|---|---|
| 5-20 | 1 |
| 21-50 | 2 |
| 51-100 | 3 |
| 101-150 | 4 |
| 151-200 | 5 |
| 201-250 | 6 |
| 251-300 | 7 |
| Over 300 | 2.25 percent of nominal capacity (rounded upwards) |

The minimum queue provision for any driveway shall be one vehicle at entry and one vehicle at exit.

If a site has more than one driveway, the queue provisions should be calculated on the basis of the proportion of the site served by each driveway.

### 5.6.2 Gated and Controlled Driveways

The above requirements are based on uncontrolled entry and exit with no gates. At sites with security gates, the design queue is to be accommodated between the property boundary and the gate, and with provision for a light vehicle to turn on the site if declined entry.

At controlled car parks, provision is to be made at all ticket spitters, card readers and pay booths for design queues calculated on the basis of estimated peak entry and exit rates and control facility capacity. At entrances and exits, separate queue provisions will be necessary both inside and outside the control facility.

### 5.6.3 Internal Queue Provisions

Separate internal queue provisions are necessary at drive-through facilities, particularly fast-food (10 vehicles) and bottle shops (12 vehicles). The queue requirements at other drive-through facilities shall be calculated on the basis of peak period 95th percentile queues.

Queuing lanes shall be not less than 3.0 metres wide (when straight) with separate provision for pedestrian service where necessary, and geometry must facilitate easy ingress and egress. Where queue areas are curved, the queue lanes shall be widened based on the turning paths of 99$^{th}$ percentile cars.

Drive-through facilities for fast food outlets must include provision for short term parking of one or two vehicles diverted from the queue while their orders are being prepared.

## 5.7 Traffic Control signage

Direction, regulatory, warning and information signs are to be erected on-site to control traffic movements and to warn of potential hazards. Signage also includes pavement markings.

All traffic/parking control signs and pavement markings are to conform to the requirements of the Manual of Uniform Traffic Control Devices (Qld). All signs and line markings are to be self illuminated or reflectorised in accordance with current Queensland and Australian standards.

Direction signage at the site frontage and within the site is to be provided in respect of:

• The location of site access driveways and car parking areas, particularly rear parking areas,
• Where visitor or public parking is not visible from the frontage road or access driveway

## 6 Provision For Public Transport

This section is relevant to the assessment of compliance with:

- P1 – P3 in Element 7 (Public Transport Facilities) of the Transport, Traffic and Parking Code; and
- P2 in Element 5 (Public Transport) of the Code for Reconfiguring Lots.

### 6.1 On-Site Public Transport Facilities

In large developments, particularly high traffic generating uses such as major retail and commercial developments or sporting venues, provision for public transport interchange facilities will be necessary, particularly for bus, and rail public transport facilities. Normally, the separate approval of Queensland Transport will be required for the design of such facilities.

Separate provision will be necessary for taxis.

On major development sites, bus and taxi facilities should be located as close as is practical to pedestrian entry points, with clearly defined and high standard pedestrian connections.

## 7 Pedestrian Facilities

This section is relevant to the assessment of compliance with:

- P1 and P2 in Element 5 (Pedestrian Facilities) of the Transport, Traffic and Parking Code;
- P1 in Element 4 (Pedestrian and Cyclist Facilities) of the Code for Reconfiguring Lots; and
- P4 in Element 2 (Movement Networks) in the Code for Operational Works.

### 7.1 Public Pedestrian Facilities

Provision for pedestrians is primarily to be on footpaths within road reservations as covered in Section 3.4 of this policy. This section covers walkways through development sites, subdivisions and open space areas which provide linkages to public transport facilities, schools or important activity nodes. Pedestrian facilities are generally provided in accordance with *Austroads Guide to Traffic Engineering Practice, Part 13 Pedestrians.*

Pedestrian walkways through development sites and estates are to be in reservations having a minimum width of 7.0 metres, with a minimum footpath width of 1.5 metres (in low use scenarios) if only used by pedestrians, or 2.5 metres if also used by cyclists. Wider paths will be required if pedestrian or cyclist volumes are high. In these circumstances wider paths must be provided in accordance with the recommended widths outlined in *Austroads Guide to Traffic Engineering Practice, Part 13 Pedestrians, and Part 14 Bicycles.* Shared pedestrian/ bicycle paths must be designed with care in respect of sight distances and the high speed differential that exists between pedestrians and cyclists.

Walkways are to be as wide and short as possible to enhance their attractiveness, convenience and security. To achieve high levels of safety and security, casual surveillance must be introduced by ensuring that all walkways are clearly visible from roads and/or residences.

### 7.2 On-Site Pedestrian Facilities

Within development sites, the primary design requirements of pedestrian facilities are:

- Safety, particularly in respect of sight distances at vehicular conflict points, and the avoidance of heavy vehicle routes and reversing areas;
- Security, taking account of lighting and the visibility of the pathway from areas of activity;
- Convenience, particularly in respect of pedestrian paths being close to natural desire lines;
- Design standards in respect of widths, grades and surface treatments. Changes in paving colour or texture should not be introduced on a roadway at locations where there is a pedestrian desire line to cross the roadway. This creates a safety hazard as some pedestrians may incorrectly perceive the change in paving as assigning priority to pedestrians over vehicles.

## 8 Cyclist Facilities

This section is relevant to the assessment of compliance with:

• Element 6 (Cyclist Facilities) of the Transport, Traffic and Parking Code;

• P1 in Element 4 (Pedestrian and Cyclist Facilities) of the Code for Reconfiguring Lots; and

• P4 in Element 2 (Movement Networks) in the Code for Operational Works.

### 8.1 On-Site Cyclist Facilities

Requirements for public and on site cyclist facilities are set out in the Priority Infrastructure Plan.

On site parking requirements for bicycles are detailed in Schedule 1 to the Transport, Traffic and Parking Code. The design and provision of on site bicycle parking facilities must be undertaken in accordance with *Austroads Guide to Traffic Engineering Practice, Part 14 Bicycles.*

### 8.2 Public Cyclist Facilities

Off road shared use paths in low use scenarios must be a minimum of 2.5m wide. Wider paths are required in

moderate to high use scenarios. In these circumstances the recommended widths outlined in the *Austroads Guide to Traffic Engineering Practice, Part 14 Bicycles* must be applied. Where there is anticipated to be a high volume of commuter cyclists it is desirable that on-road cycle lanes be provided. However in some circumstances routes need to take off road routes and these routes must be provided as either a segregated or separate exclusive bicycle paths to remove the potential conflict that exists between higher speed commuter cyclists and pedestrians. These facilities must also be provided using the recommended widths outlined in the *Austroads Guide to Traffic Engineering Practice, Part 14 Bicycles*.

## 9 On-site Car Parking

### 9.1 Car Parking Design and Layout

This section is relevant to the assessment of compliance with P1 and P2 in Element 4 (Car Parking) of the Transport, Traffic and Parking Code.

#### 9.1.1 General

Visitor and public parking spaces shall be located, designed and/or signed so that it is obvious to unfamiliar users that such spaces are available on-site, and it is obvious how they will be accessed. Except where streetscape and landscaping requirements necessitate alternative design solutions, it is desirable that visitor or public parking spaces are visible from the street to encourage utilization of off-street parking rather than on-street parking for this purpose.

Outdoor storage must not occur within parking spaces.

Parking areas and car park access systems must comply with the requirements of AS2890.1 – Off Street Parking except as provided for in this Policy.

Larger car parking areas must be designed on the basis of a hierarchy of internal roadways ranging from those providing only for vehicular circulation to those providing only for access to parking spaces. That is, circulation roadways, circulation aisles (which have shared function) and parking aisles. Queue areas associated with internal or site access intersections must be entirely on circulation roadways.

#### 9.1.2 Basic Design Requirements

All development proposals should meet the following requirements:

1. Restrict vehicle speeds at pedestrian conflict points,
2. Ensure that pedestrians of all ages have clear visibility of approaching vehicles, with sight distances based on the design (85th percentile) vehicle speeds expected. In particular, pedestrians should always have visibility of vehicles for a minimum of 2.5 seconds of travel at the design speed. This will require splayed corners to buildings and careful treatment of landscaping, signage and parking spaces in areas of potential conflict;
3. Ensure that no reversing of service vehicles larger than SRV's occurs in areas where pedestrian traffic is expected,
4. Ensure that the site access and circulation arrangements and the on-site activities do not significantly impact on external traffic operations on the roadway or the footpath. In particular, ensure that car park space search patterns are simple and logical with no need to return to the public road in moving between separate car parking areas,
5. Provide adequate on-site lighting, particularly at pedestrian, site access and intersection areas.

#### 9.1.3 Design Requirements for New Development

Where a development proposal involves the provision of new car parking facilities (rather than the re-use of existing facilities), the following requirements must also be met:

1. Design for a progressive reduction in the speed environment between the external road and the parking space,
2. Avoid dead-end aisles, particularly in larger car parks, and design for simple and efficient search patterns,
3. Avoid usage of one-way roadways or aisles, particularly if contra-indicated usage is reasonably expected,
4. Eliminate cross intersections, and ensure that priorities are clearly defined if they are unavoidable,
5. Ensure that aisles intersect circulation roads and circulation aisles as close as practicable to 90 degrees,
6. Provide a clearly defined pedestrian network to and from and within the site which:
   - Closely follows pedestrian desire lines,
   - Clearly establishes priority at vehicular / pedestrian conflict points,
   - Provides line marking and signage at vehicular / pedestrian conflict points in accordance with the requirements of the Queensland Manual of Uniform Traffic Control Devices (MUTCD),

- Ensures that pedestrians move along aisles rather than across them,
- Minimises the number and severity of vehicular / pedestrian conflicts,
- Minimises vehicle speeds and congestion levels at pedestrian conflict points,
- Provides for appropriate queues of pedestrians and vehicles at the conflict points.

7. Avoid long straight sections of aisles or roadways that encourage high operating speeds and shortcutting when the car park is only partially used,
8. Restrict the length of parking aisles to 100 metres, unless additional measures are adopted to satisfactorily restrict vehicle speeds,
9. Within larger developments, provide for relatively uncongested public transport and service vehicle movements through the site, without using parking aisles,
10. Provide adequate queue space for drive-through facilities which do not interfere with primary circulation routes. Occasional queuing in parking aisles, may be acceptable.
11. Provide turning lanes at intersections to avoid excessive congestion and queue formation,
12. Ensure that appropriate design provision has been made for storage areas, fire escapes, loading areas, refuse collection areas, etc,
13. Minimise the use of speed humps, particularly in entry / exit queue or intersection areas, or across pedestrian paths. If used, speed humps must be positioned so that vehicles are only likely to cross them at right angles.
14. Shade structures are provided or, if shade structures are not proposed, open car parks should have one shade tree expected to reach maturity within ten years for each six parking spaces, with at least one third of the trees in larger unsealed areas rather than the approximately 1 square metre plots which can be accommodated at the common corners of four parking spaces.

### 9.1.4 Reserved Parking spaces

Only staff or resident parking spaces may be located within secured or gated areas. All visitor and public parking spaces must remain accessible at all times that any approved activity occurs on the site. Further, in mixed use developments where relaxations have been granted in respect to the number of parking spaces provided on the basis of the non-coincidence of individual development component peak parking demands, all of the spaces on the site must remain accessible at all times.

In mixed use developments where it is proposed that staff or resident parking area are proposed to be secured or gated separately from the remainder of the site, an assessment report from a Traffic Engineer must be submitted. This report must demonstrate the adequacy of secured staff or resident parking areas and public parking areas to ensure that sufficient space is available for the public parking and secured parking user demands.

### 9.1.5 Circulation Roadways

Circulation roadways are the major circulation aisles in car parks that connect site access intersections to other circulation roads, circulation aisles, or parking aisles. Due to the higher traffic volumes on Circulation Roadways they must not provide direct access to parking spaces. They can provide connections between separate car parks.

Minimum widths of straight circulation roadways are to be in accordance with Table 9.1.5.1.

**Table 9.1.5.1**

| Type of Circulation Road | Width of Circulation Roadway |
|---|---|
| One-way, one-lane | 3.5 m<br>5.0 m if more than 20m long |
| One-way, two-lane | 6.0 m |
| Two-way, one-lane | 5.0 m (only less than 25 vph) |
| Two-way, two-lane | 6.2 m (up to 100 vph)<br>6.5 m (101 to 300 vph)<br>7.5 m (over 300 vph) |

**Notes to Table 9.1.5.1**

1. Roadways are to be widened based on turning templates if curved.
2. Circulation roadways or circulation aisles are 6.5 metres wide (minimum) at intersections with parking aisles, based on a 2.0 metre radius on the aisle end island, or a greater width if a lessor or no island is provided.
3. Two-way usage of 5.0 metre wide circulation roadways (or ramps) is permitted in small, low turnover car parks where a delayed vehicle will not interfere with site entry or exit, and where sight distances are adequate for safe operation.

All dimensions are from nominal kerb face to kerb face. Kerbs shall be 100 to 150mm high, with not less than 300mm setback from the kerb face to a solid obstruction such as a wall or column. This setback may be reduced to 150mm if all likely vehicle paths are straight and parallel to the kerb face over the relevant section of circulation roadway.

If parking control or payment facilities are proposed, roadway widths are to be increased by a minimum of 1.2 metres to allow for a median to accommodate such facilities.

The dimensions described in Table 9.1.5.1 relate to usage of a circulation roadway to provide access to car parking spaces. Greater widths may be necessary to accommodate service vehicles or buses.

A curved two-way circulation roadway (or ramp) must have a minimum internal radius of 4.0 metres at the kerb face and a minimum external radius at the kerb face of 11.5 metres.

### 9.1.6 Circulation Aisles

Circulation aisles can provide access to parking spaces, parking aisles and circulation roadways. At any intersection with a parking aisle, another circulation aisle or a circulation roadway, the minimum width of a circulation aisle shall be 6.5 metres, based on a 2.0 metre radius on the aisle end traffic island, or a greater width if a lesser or no aisle end traffic island is provided.

### 9.1.7 Parking Aisles

Parking aisles provide access to parking spaces.

Desirably, all parking aisles should provide for two-way traffic and have a minimum width of 6.2 metres, providing access to right angle parking spaces. Angle parking will only be accepted in unusual circumstances, and one-way parking aisles are only acceptable in conjunction with angle parking arrangements.

The minimum width of parking aisles providing access to designated high turnover (less than 1 hour average duration) parking spaces (5.4m by 2.7m) is 7.0 metres.

Dead-end aisles should desirably be avoided wherever possible. Where dead-end aisles can't be avoided, they must service areas that have no more than 12 spaces (6 on each side of the aisle). In these circumstances the aisle must extend 1.0 metres past the last parking space to allow vehicle egress from spaces at the end of the aisle. In any other circumstances where a longer dead-end aisle is unavoidable a turnaround area must be provided at the end of the aisle in the form of a rounded cul-de-sac head or a three point turn area.

### 9.1.8 Gradients

Minimum gradients of parking areas are defined by surface drainage requirements.

Maximum gradients, taking account of vehicle performance, user comfort, car door opening, and the control of prams, wheelchairs and shopping trolleys, are as set out in Table 9.1.8.1.

**Table 9.1.8.1**

| Location – Design situation | Maximum Gradient |
|---|---|
| Parking areas for people with disabilities | 2.5 percent |
| Parking spaces, parking aisles and circulation aisles in:<br>• Public parking areas (prams & trolleys likely)<br>• Tenant parking areas in residential buildings<br>• Employee (long term) parking areas | 6.7 percent<br>8.3 percent<br>10 percent |
| Straight circulation roadway | 16.7 percent |
| Curved circulation roadway (or ramp) | 16.7 percent at inside kerb face |
| Circulation road, ramp or driveway within 6.0 metres of property boundary, control point or ped. crossing | 5 percent |
| Uphill queue area | 8.3 percent |
| Super-elevation of camber on curved roadway | 5 percent |

**Notes to Table 9.1.8.1**

1. The component of the total gradient across a parking space as defined in Table 9.1.8.1 is not to exceed 8.3 percent (to ensure that doors are controllable).
2. At changes of grade, a transition at one half the grade change is required of length in metres one fifth of the percentage change of grade.

### 9.1.9 Height Clearances

The minimum clear height in a car park generally is to be 2.3 metres, with all principal circulation routes and at least 80 percent of parking spaces having this clear height.

The minimum clear height above any parking space is to be 2.1 metres, subject to appropriate signage in respect of the low clearance.

Clear heights must be measured clear of all appurtenances, including sprinklers, lights, services drains and signs. Additional vertical height clearances will be necessary at sag vertical curves at the ends of ramps to allow for the centre of the vehicle to be higher than over the wheels.

Disabled parking spaces must have a clear height of 2.5 metres from the open end of the parking space to 2.1 metres from the closed end of the space. That is, for a space 5.4 metres by 3.2 metres, the additional height shall be available over an area 3.2 metres wide and 3.3 metres long.

In service vehicle areas the clear high must be a minimum of 4.5m. Where Waste collection activities are proposed in off-street service vehicle areas, additional height clearances are needed to allow for a front loading waste collection vehicle to lift an industrial bin above the vehicle.

### 9.1.10 Dimensions of Parking Spaces

The dimensions of Parking Spaces must be in accordance with the Australian Standard for Off-street parking AS2890.1.

User class 1A detailed in AS2890.1 is not accepted in carparks designed for commercial or mixed use, retail or community uses where regular public use is expected. This category is only accepted in circumstances where its users intend to park long term in residential, domestic and employee parking situations. Under these circumstances, class 1A spaces must be located in low use areas of car parks that are separated from main entrances, the main circulation aisles, and other high activity areas.

### 9.1.11 Tandem Parking Spaces

Tandem parking spaces must not be provided in public or customer parking areas. Tandem parking is not desirable but may be considered for:

- Residential developments where both spaces are allocated to one unit,
- Visitors to residential developments where the visitor space is associated only with and behind a resident parking space for the individual unit that they are visiting,
- Reserved parking spaces where both spaces are allocated to a single tenant.

Tandem parking may be permitted in some valet parking operations, but only if adequate additional temporary holding spaces are provided in the forecourt sufficient to accommodate likely peak demands for vehicles dropped-off and/or awaiting collection.

### 9.1.12 Small Car Spaces

Small car spaces must not be provided in visitor or public parking areas.

In fully reserved or tenant parking areas, up to 5 percent of the required number of spaces may be small car spaces having dimensions of 5.0 metres by 2.4 metres, provided such spaces are appropriately signed as being for small cars only.

### 9.1.13 Fully Enclosed Spaces (garages)

Where straight entry to a garage is possible (straight for a minimum of 5.0 metres outside the garage), the minimum dimensions shall be 6.0 metres by 3.0 metres, with a minimum opening width of 2.4 metres.

Where entry to the garage is via a turn from a driveway or aisle, the minimum opening width shall be increased to 3.0 metres. If the garage is set back from the aisle, some relaxation of the 3.0 metre opening may be possible based on the turning path of an 85th percentile car.

### 9.1.14 Disabled User Parking Spaces

Provision of parking and access is made for disabled users in accordance with the requirements of Australian Standards AS1428 and AS2890.1, particularly in respect of parking space width and location, manoeuvring areas, for wheelchairs, gradients, location of stairs, ramps and doorways, and signage.

Parking Spaces for disabled users shall be provided at a rate of one space per 100 parking spaces provided, with a minimum of one space.

### 9.1.15 Motorcycle Parking Spaces

Motorcycle spaces may replace required car parking spaces at a rate of up to 2 percent of total public or visitor parking provision, provided the spaces are so located as to be more attractive for motorcyclists to use than alternative parking spaces.

Motorcycle spaces are 3.5 metres by 1.3 metres.

### 9.1.16 Design Cars

The design vehicles used in car park design are generally outlined in the Australian Standard for Off-street parking AS2890.1. However the requirements for small cars compared to medium and large cars are outlined in Table 9.1.16.1.

Table 9.1.16.1

| Dimensions | Small Car (50th percentile) | Medium Car (85th percentile) | Large Car (99th percentile) |
|---|---|---|---|
| **Length** | 4500 | 4750 | 5350 |
| **Wheel Base** | 2600 | 2820 | 3070 |
| **Width** | 1650 | 1860 | 1900 |
| **Height (from vans)** | 1900 | 2100 | 2300 |
| **Front Overhang** | 900 | 900 | 1000 |
| **Rear Overhang** | 1000 | 1030 | 1280 |
| **Min.turn radius:** | | | |
| • Inside body | 2750 | 3500 | 3750 |
| • Outside front wheel | 5000 | 6000 | 6300 |
| • Outside front corner | 5600 | 6600 | 6900 |

Generally, the small car dimensions and templates are used only for designated small car spaces, the medium car is used for the design of individual parking spaces, and the large car is used for the design of access and circulation systems, ramps etc.

The templates shown make no allowance for working clearances, generally required to be approximately 300mm.

## 9.2 Required on-Site Parking Provision

This section relates to A2. 1 in Element 4 – Car Parking of the Transport, Traffic and Parking Code.

### 9.2.1 Design Parking Demands

These requirements are intended to satisfy the design peak parking demand for a particular land use without use of on-street parking.

The design peak parking demand is defined as the parking demand estimated for the 30th highest hour of the year. During the busiest hours in the year, excess demand will be satisfied by on-site queuing or overflow to on-street spaces. Parking demand studies intended to demonstrate compliance with this requirement will be based on adequate seasonal variability data.

### 9.2.2 Number of Parking Spaces Required

The parking space requirements for different land uses are set out in Schedule 2 in the Code for Transport, Traffic and Parking.

A parking space is defined for the purposes of parking provision as the space needed to satisfactorily accommodate a medium (85th percentile) car, together with the means to satisfactorily access that space.

Where the rate for parking provision is not defined, Council will determine the appropriate provision rate,, taking account of information supplied by the applicant, and from other reference sources.

### 9.2.3 Basis for Consideration of Alternative Parking Rates.

Where an applicant proposes a lesser number of car parking spaces that set out in Schedule 2 in the Code for Transport, traffic and Parking, it will be necessary to satisfactorily demonstrate that a proposed use will generate a design peak parking demand lower that that specified, and that Performance Criterion 1 in Element 7 – Car Parking of the Transport, Traffic and Parking Code will still be met.

A lower amount of parking will not be approved on the basis of the characteristics of a particular tenant unless it can be demonstrated that the site can not be used by other tenants without the need for a code or impact assessable development application.

## 10 Service Requirements

This section is relevant to the assessment of compliance with P1 in Element 3 (Service Vehicle Requirements) of the Transport, Traffic and Parking Code.

### 10.1 Access Design Vehicle

**Selection**

The largest vehicles expected to visit the site more than 20 times per year shall be considered to be regular users of site service facilities, and these vehicles must be accommodated. Lower standards will be accepted for vehicles expected to visit the site only occasionally (less than twenty times per year).

Where regular visits are expected by one service vehicle type, and occasional visits by another service vehicle type, the facility must be designed for both circumstances. For example, if a development site is expected to be regularly visited by an MRV, a vehicle of that size must be able to visit the site without any inconvenience to other users of the site, whereas some inconvenience would be tolerated when an articulated vehicle visited the site only occasionally.

The design service vehicle requirements for individual land use types are set out in Schedule 2 of the Transport Traffic and Parking Code, including requirements for occasional access, regular road access, and regular street access. These requirements relate only to the driveways and site circulation systems. The requirements for on-site service vehicle loading or parking spaces are separately listed in Schedule 3 of the Transport Traffic and Parking Code.

### 10.2 Loading Bay & Service Area Requirements

The minimum number of service vehicle spaces to be provided on-site is set out in Schedule 3 to the Transport Traffic and Parking Code. The design of loading bays must satisfy the requirements of AS2890.2 Off Street Parking for Commercial vehicles. Service vehicle manoeuvres should occur clear of queue areas and where safety could be compromised. They should not occur in aisles providing access to public or visitor spaces.

### 10.3 Design Vehicles

The design of internal roadways, circulation areas and service vehicle manoeuvre areas are to provide for the operational requirements of service vehicles of different types as described in Table 10.3.1. Standard turning path templates for Van and WCV design service vehicles are included in Figure 6.3.1. The standard turning path template for a Coach is included in Austroads Design Vehicles and Turning Path Templates. Standard turning path templates for other types of design vehicles are based on AS2 890.2 – Off-street parking for Commercial Vehicle Facilities.

If other vehicle types are expected to use the site, vehicle-specific turning templates, computer generated templates or templates derived from field trials may be used.

The design requirements for these various Service Vehicles are outlined in Table 10.3.1

Table 10.3.1 service Vehicles

| | Van | SRV | MRV | LRV | WCV | Coach | AV |
|---|---|---|---|---|---|---|---|
| **Vehicle dimensions** | 5.4 x 2.0 | 6.4 x 2.3 | 8.3 x 2.5 | 10.7 x 2.5 | 10.2 x 2.5 | 12.5 x 2.5 | 19.0 x 2.5 |
| **Service bay dimensions** | 5.4 x3.0 | 7.0 x3.5 | 9.0 x3.5 | 11.0 x 3.5 | 10.5 x 2.5 | 13.0 x 3.5 | 19.5 x 4.5 |
| **Clear height required** | 2.3 | 3.5 | 4.0 | 4.5 | 4.5 | 4.5 | 4.5 |
| **Loading dock height** | | 0.7- 0.9 | 0.9 - 1.1 | 1.1 - 1.4 | | | 1.1 - 1.4 |
| **Max. grad. Manoeuvre Areas** | 12 % | 12 % | 8 % | 8 % | 5 % | 5 % | 4 % |
| **Min. access road width** | | | | | | | |
| • **One-way** | 3.5 | 3.5 | 4.0 | 4.5 | 4.5 | 4.5 | 5.0 |
| • **Two-way** | 6.2 | 6.2 | 6.5 | 6.5 | 6.5 | 6.5 | 7.0 |
| **Max. grad. access route** | 16.7 % | 16.7 % | 12 % | 10 % | 10 % | 10 % | 10 % |
| **Max grad. Queue area** | 10 % | 10 % | 8 % | 8 % | 5 % | 5 % | 4 % |

**Notes to Table 10.3.1**

1. At changes in grade, the height required is to be maintained throughout.
2. Service bay dimension for WCV does not include bin or compactor area.
3. Operating clear heights for WCV - front load 6.1m, side load 6.7m, rear (roll-off) 7.1m.
4. Loading dock heights indicative only, where docks provided.
5. On curved roadways, maximum gradient measured at inside kerb face.
6. 5.0m Height Clearance is required where access to the top of a tall vehicle, eg pantechnicon, or load is required.

## 10.4 Location and Design of Service Areas

Service areas are to be located close to service entrances (or other building entrances) to ensure that they are able to be conveniently utilised and to discourage the use of parking areas or aisles for loading and unloading.

Service areas are to be separated from public or visitor parking areas and defined pedestrian paths.

Service vehicle access and loading areas must comply with the requirements of AS2890.2.

In all but the smallest developments, service vehicles should be confined to circulation roadways separate from parking aisles. The service area should include all of the space necessary for vehicle manoeuvres in and out of service vehicle parking spaces, including when other adjacent service vehicle spaces are occupied, turning manoeuvres being defined by the templates in Figure 10.4.1, with a maximum of one reversing manoeuvre to enter or leave the space.

When vehicles are required to reverse into a dock, the vehicle should be moving in an anti-clockwise direction so that the driver can see the dock. This is critically necessary for AV's, and desirable for other vehicles although wider bays may compensate for rigid vehicles forced to reverse clockwise.

## 10.5 Waste Collection

Access for waste collection vehicles to refuse bins or compactors is to be maintained at all times. Where it can be demonstrated that waste collection will occur at specific hours, it may be possible to allow waste collection vehicles to manoeuvre through other service vehicle spaces.

Some waste collection contracts may specify vehicle sizes and heights less than those for a standard WCV. In these circumstances, a full copy of the contract must be provided.

Where disposal of industrial or commercial liquid waste by discharge to road tankers is proposed, the road tanker must be able to stand fully on the site and comply with other access design requirements.

## 10.6 Fuel Deliveries

Provision for fuel deliveries for any purpose must comply with AS1940 and Council's Local Laws. Fuel will be assumed to be delivered in an LRV sized vehicle, with appropriate access design. Depending on the frequency of deliveries, and deliveries occurring out of hours, the vehicle may stand in a suitable circulation road, aisle or forecourt area.

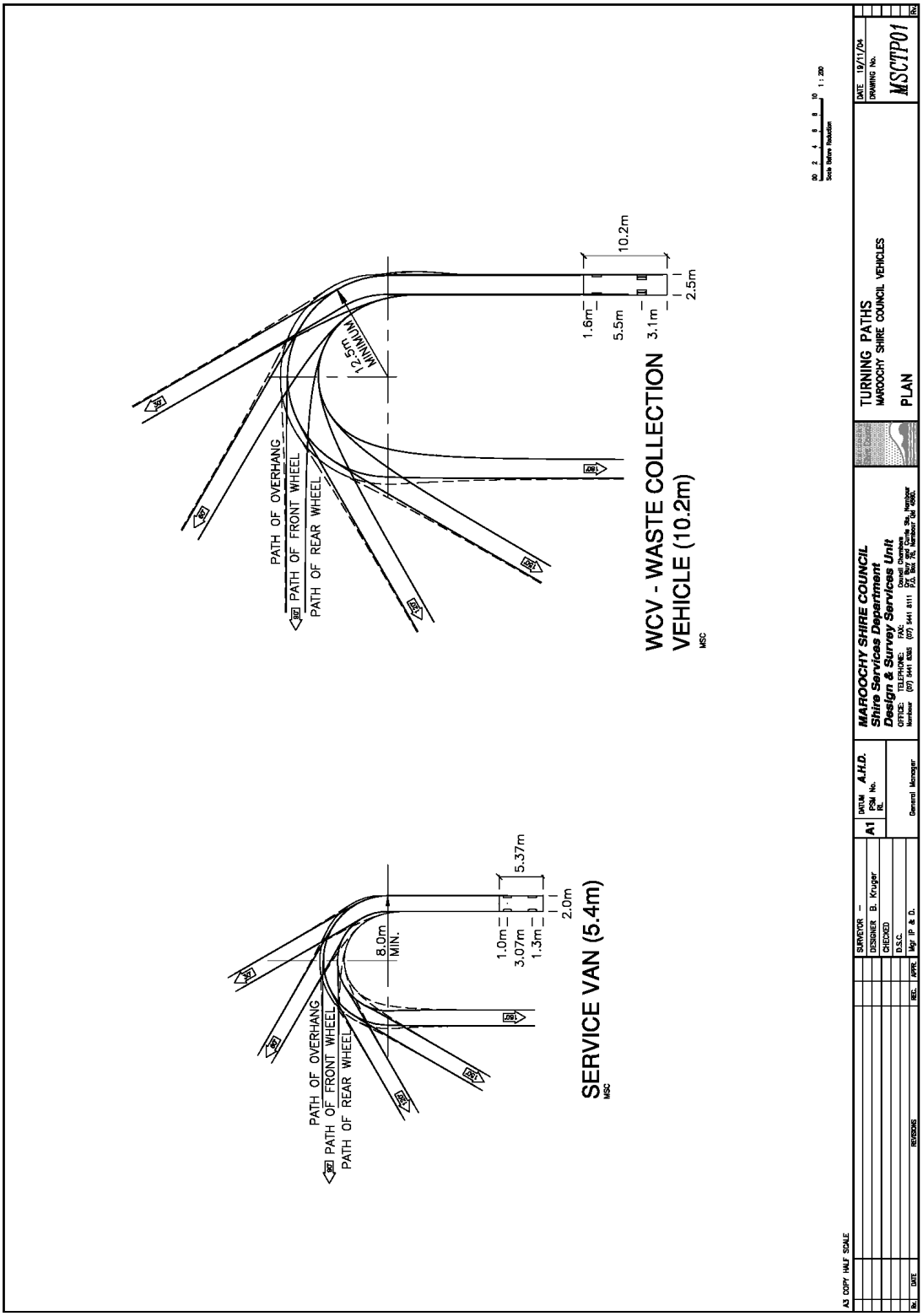

WCV - WASTE COLLECTION VEHICLE (10.2m)
MSC
PATH OF OVERHANG
PATH OF FRONT WHEEL
PATH OF REAR WHEEL
MINIMUM 2.5m
1.6m
5.5m
3.1m
10.2m
2.5m
SERVICE VAN (5.4m)
MSC
PATH OF OVERHANG
PATH OF FRONT WHEEL
PATH OF REAR WHEEL
8.0m MIN.
1.0m
3.07m
1.3m
5.37m
2.0m
TURNING PATHS
MAROOCHY SHIRE COUNCIL VEHICLES
PLAN
MAROOCHY SHIRE COUNCIL
Shire Services Department
Design & Survey Services Unit
A.H.D.
A1
SURVEYOR –
DESIGNER B. Kruger
CHECKED
D.S.C.
Mgr IP & D.
General Manager
DATE 19/11/04
DRAWING No.
MSCTP01

Figure 10.4.1