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.

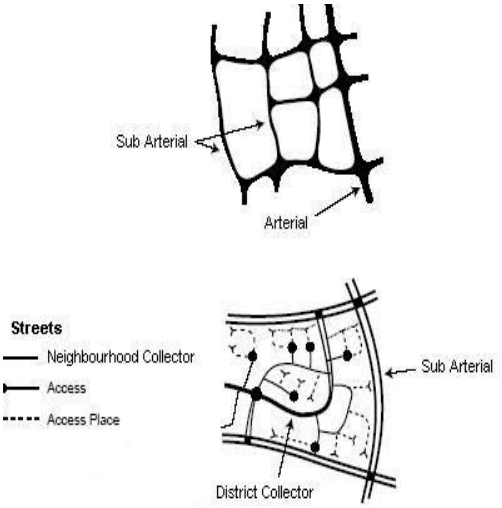
- Local Streets should be provided to support short trips for local traffic moving within and between neighbourhoods. They should also be designed to discourage traffic travelling long distances (i.e. beyond adjacent neighbourhoods) from passing through.

- 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)

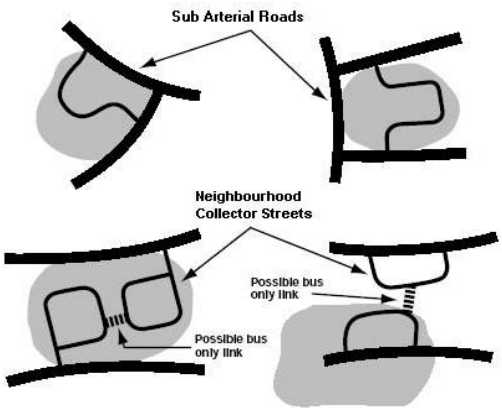


- The street system must facilitate walking, cycling and use of public transport for access to daily activities, and enable relatively direct local vehicle trips within and between neighbourhoods and to local activity nodes.

- 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

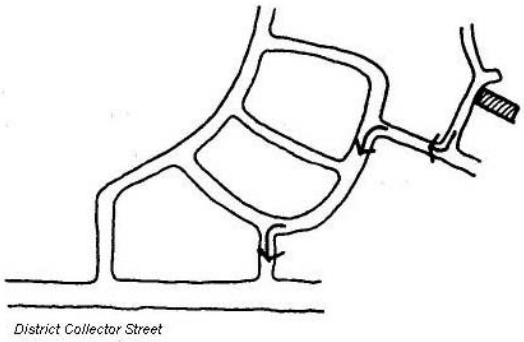
Pedestrian and Cyclist networks must be planned to provide safe and convenient connections to key loca attractions, particularly to transport nodes, schools and commercial centres. Provision of a well designed and planned pathway network will encourage people to walk and cycle rather than relying on 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.

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 99th 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