Development manual planning scheme policy (PSP)
SC6.4.5 Road network infrastructure

Index

SC6.4.5.1 Townsville road hierarchy

(1) Introduction

(a) Overview

The Townsville road hierarchy is a planning tool to guide good practice transport planning and management, with the aim of balancing the needs of both the land use and the roadway system. A road hierarchy establishes each roadway function such that appropriate objectives for that roadway and design criteria, can be developed and implemented.

These objectives and design criteria are aimed at achieving an efficient road system whereby conflicts between the roadway and the adjacent land use are minimised, and the appropriate level of interaction between the roadway and land use is permitted. The road hierarchy also forms the basis of ongoing planning and system management aimed at reducing the conflict between existing incompatible functions.

The use of road hierarchy categories as part of the land use and transport network planning process enables optimisation of the relationships and key roles associated with accessibility, connectivity, amenity, and safety for all road/land users, including vehicles, bicycles, pedestrians, and public transport. The road hierarchy categories and sub-categories contained herein are pertinent and appropriate with the current transport environment in the Townsville area. As time passes, and the transport system and its relationship with land uses changes, these road hierarchy principles will require further development and refinement.

(b) Townsville Integrated Transport Plan – Strategic Directions (TITP)

Integrated land use and transport planning must be embedded and applied in a wide range of circumstances – from strategic planning to detailed design for one mode or across all modes. This road hierarchy section contains specific information for managing the interface between land use and roadway systems. This section has regard to the overarching planning framework of the Townsville Integrated Transport Plan – Strategic Directions document (TITP). The TITP was adopted by the Council in 2021, this document provides overarching guidance on transport planning in Townsville and covers matters not addressed by this road hierarchy section.

The TITP is a strategic directions document that forecasts Townsville's future through a vision statement supported by a series of objectives and key initiatives. The vision states "Townsville has a flexible and responsive world class transport system which meets the needs and aspirations of the community and industry and reflects the city's position as the capital of Northern Australia". The vision is supported by 19 objectives and delivered through 25 key initiatives.

(c) Road hierarchy objectives

The road hierarchy aims to meet the following objectives:

(i) to systematically classify roads into a framework around which Council and the state government can plan and implement various land use, infrastructure construction, maintenance, and management schemes and projects such as:

1. identifying the effects of development decisions in and on surrounding areas and roadways within the hierarchy; and

2. developing design that facilitates urban design principles such as accessibility, connectivity, efficiency, amenity, and safety;

(ii) to guide network planning and management for all modes (private, passenger and commercial/industrial transport) and users (motorised and non-motorised); and

(iii) to clarify policies and decisions in designing new networks and in managing existing road systems to provide a rational basis for management of the network under the current or future planning schemes, for example:

1. enabling investment and traffic management efforts to be concentrated on those links able to cope efficiently with transport needs;
2. enabling Council and the state government to adopt appropriate standards of construction on traffic routes; and
3. enabling the network to be optimised to accommodate access and non-transport functions.

(d) Definition of urban and rural

The application of the road hierarchy requires the terms urban and rural to be defined for the purpose of this policy.

Urban	Developed area which may comprise densely developed uses such as residential, commercial, industrial, education, recreation, or a mix of these. In general, this is characterised by evenly spaced street lighting, kerbed streets,frequent closely spaced driveways (preferably none on traffic carrying roads). This will also include land designated for future urban development.
Rural	Sparsely developed area which may comprise rural development, rural residential development, isolated pocket of urban development and environmental area. In general, this is characterised by unkerbed streets, both sealed and unsealed roads, infrequent driveways, and large tracts of undeveloped land. Street lighting may only be at intersections and points of safety concerns.

For the specific purpose of showing urban and rural traffic environments for the Townsville road hierarchy, a map has been provided in Clause SC6.4.5.7 - Map A.

If a rural development is located in the adjacent urban fringe area or adjoined/contained a part of continuous existing network connection, it may be required to be designed similar to the adjacent road network environment, e.g., urban road cross section.

(e) Terminology

Category	Those elements of the road hierarchy defined at level 2 of the road hierarchy.
DTMR	Department of Transport and Main Roads
Environmental Cell	Contains local streets with a slow speed and pedestrian priority environment, and generally bounded by major collector roads.
LITP	A Linear Integrated Transport Plan is a method of planning between the roadway and the surrounding environment in an integrated manner.
MUTCD	*Manual of Uniform Traffic Control Devices*
RPT	Regular public transport.
Specific Cell	A part of the urban fabric that is contained within a block bordered by trafficcarrying roads or other physical boundaries.
Specific Area	A part of the urban fabric that is generally bounded by arterial or sub

	arterial roads, or other physical boundaries. A specific area will contain one or more cells.
Sub - category	Those elements of the road hierarchy defined at level 3 of the road hierarchy.
VPD	Vehicles per day.

(f) Structure of the road hierarchy

Based on the desired outcomes, directions and principles contained in the TITP Strategic Directions, this section establishes a four-level road hierarchy that manages the interface between land use and roadway system and guides system planning and management in urban and rural areas. Figure SC6.4.5.1 shows the basic structure of the four-level road hierarchy, and the four levels are explored in more detail in Section SC6.4.5.1(3).

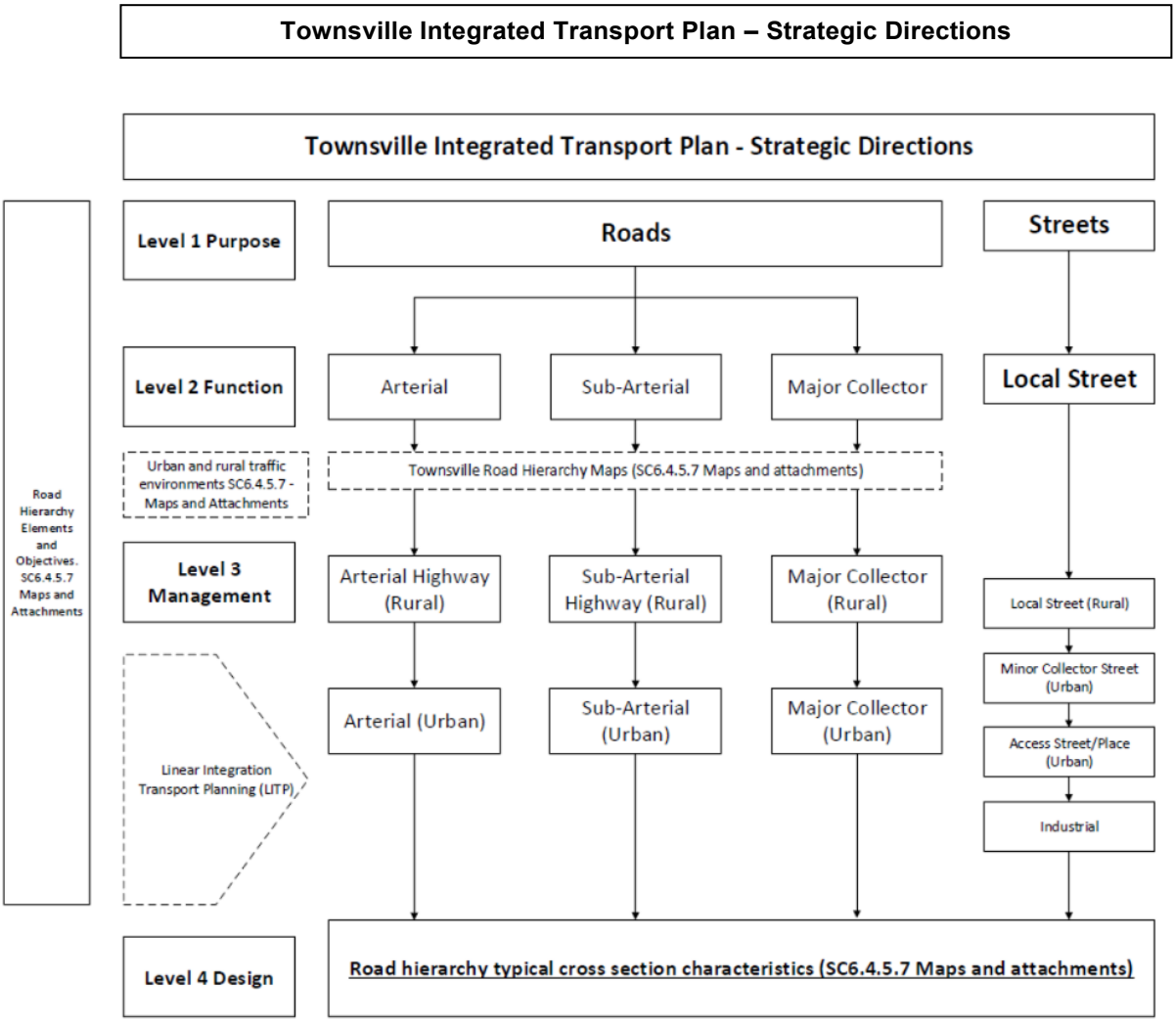


Figure SC6.4.5.1 - Structure of the Four-Level Road Hierarchy

(2) General principles

(a) Network linkage

Ideally, only roadway elements with the same place in the hierarchy, or one position higher or lower in level 2 of the hierarchy, should intersect.

For example:

(i) arterial roads should only intersect with sub arterial roads and other arterials;

(ii) sub arterial roads should only intersect with arterials, other sub arterials, or major collectors;

(iii) major collectors should only intersect with sub arterials, other major collectors, or local streets; and

(iv) local streets should only intersect with collectors or other local streets.

In certain situations, it may be acceptable for roadway categories separated by two positions within level 2 of the hierarchy to intersect. For instance, a local street may intersect with a sub arterial road, or a collector with an arterial, without significant adverse ramifications. In other cases, a permeable grid local network creates too many street/road intersections, and some of these have to be blocked off to limit points of access for vehicles by creating cul-de-sacs. Active transport pathway linkages into the local area for pedestrians and cyclists could be maintained, providing the desired pedestrian and cyclist access onto the arterial roads, without adverse impact on traffic flow, safety, and local amenity.

It may even be acceptable for roadway categories separated by three positions in level 2 of the hierarchy to intersect in certain cases. That is, a local street may intersect with an arterial road, provided it is not an uninterrupted flow facility, without significant adverse effects. This may be the case, for example, where a service road provides access directly to a two or four lane arterial road in an urban area, or two-lane highway in a rural area.

(b) Size of precincts free from unwanted traffic

The spacing of arterials or traffic routes has the effect of defining the size of development areas that are penetrated only by streets. The size of these "areas" has a direct influence on issues such as the local traffic environment, whether or not "difficult traffic routes" can be avoided, the feasibility of sustaining low vehicle speeds in the local area, the number and frequency of connections to surrounding arterials, and access to bus routes around and through the area. Traffic should be distributed appropriately amongst the local streets to ensure that amenity levels are not exceeded, and adequate connectivity is maintained.

(i) Urban areas

While the size and shape of a specific area is commonly constrained by fixed elements such as existing infrastructure, topography and property boundaries, the idealised form is of the order of 1 km × 1 km for an urban specific area. This size would typically encompass four environmental cells, each 0.5 km × 0.5 km. The boundaries of the specific areas will be partially defined by the existing major road system, which in turn has generally been developed to a large extent as a result of historical events rather than recent planning initiatives. Other features may also be used as boundaries.

The aim is to define specific areas which:

1. are relatively homogeneous in land use;

2. have only that traffic necessary for the functioning of the area, I.e., they are free of non-essential or through traffic; and

3. have a balance between the volume of essential traffic and the nature of the area. e.g., higher volumes may be more acceptable in industrial areas than in residential areas.

(ii) Rural areas

While the specific area concept is most relevant to an urban area, it also applies to rural areas, although in a slightly different context. Specific areas in rural areas should be linked by a system of through traffic carrying roads. The dimensions and form of a specific area will vary in rural areas due to the reduced development densities. As a result, specific area sizes in rural areas will be significantly larger than in urban areas.

(c) Abutting development and access

Restriction of access points to abutting land uses is one of the key parameters in the road hierarchy. Decisions on access points to new developments are linked to the strategic function of the road and the types of traffic and trips that it serves, as well as the type of environment intended to result.

Decisions on network types, especially at the local level, will have long term effects on the traffic character of an area, and inevitably the quality of service on the surrounding traffic routes. The road hierarchy provides a means of classifying and designing a roadway according to its purpose, function, and management. It is intended that this process be carried out within the constraints of the network, as it is imperative that corridor continuity be considered. Notwithstanding past decisions that have resulted in existing constraints, this may mean that corridor continuity may need to be targeted as a long-term goal.

In addition to corridor continuity, future development potential should also be addressed in the road hierarchy. The planning scheme earmarks a considerable quantity of land for future urban development, industrial, commercial, or residential. Classification of existing roadways in these areas should support future amendments to the hierarchy and the associated changes in performance criteria. For example, an existing road may currently serve a collector function, but as the area is subdivided into urban development in the future, the potential future function of the road may require allowances to be conformed at an earlier time so that the performance criteria of its future function can be met.

It is important to note that some non-residential land uses such as schools, parks and local shops have to be located within or near the specific areas they serve. These may be accessed by a sub arterial road, or, if this is not possible, it is desirable that they are accessed via a major collector road rather than the local street environment. The conflicting land use requirements in these circumstances mean that network considerations must be carefully examined in terms of connectivity, network efficiency and compatibility between private vehicle, public transport, nonmotorized, and freight networks. Integrated land use and hierarchical transport planning can overcome this shortcoming to a large extent.

(d) Relationships between networks

"Cells" may be sized and have access limited to manage entry of unwanted traffic. However, different networks will have different entry criteria. As mentioned in Clause SC6.4.5.1 (2) above, network linkage principles may vary between motorised vehicles modes such as public transport and active transport (pedestrian and bicycle). For example, passenger transport networks are often focused on middle order roads to balance point to point travel times, network reach, connectivity, and passenger safety. Similarly, freight networks will be based on specific freight criteria and result in different networks for freight. The overlay of modal networks is a key consideration in establishing the functional category for a specific link in the road network.

(3) Four level road hierarchy

A four level road hierarchy has been developed, based on the functional objectives of each category or sub-category within the hierarchy. Level 1 begins with a broad distinction between roads and streets, and the following three levels listed with an increasing degree of detail with respect to functional objectives. The levels are defined as follows:

Level 1 - Purpose relates to the primary objective of the element, whether to carry through traffic or provide direct property access.

Level 2 - Function relates to the relationship between the roadway and land use it serves (I.e., how the roadway serves the land use). This level of the hierarchy is common to traditional road hierarchy concepts.

Level 3 - Management relates to the implementation of policies to achieve the envisaged function based upon the attributes of the element and of the adjacent land uses.

Level 4 - Design relates to specification of the form of the element to achieve its functional objectives.

(a) Hierarchy level 1 – purpose

Level 1 of the hierarchy defines roadways as either:

(i) roads to carry through traffic; or

(ii) streets for access to property and collection of local traffic.

This classification applies to both rural and urban areas.

The definition of a roadway in one particular category serves to indicate a planning intent in relation to the functions that will be permitted on that roadway. Thus, measures are likely to be adopted on streets that relate to amenity and environmental capacity, for example, by removal of through traffic, or direction of local traffic to a particular collector road. At the other end of the scale, treatments on arterial roads will principally be related to increasing traffic carrying capacity. This would tend to be by removal of some incompatible lower order functions, such as limiting access to properties, disallowing any further new accesses, or reducing the number of intersecting roads.

Figure SC6.4.5.2 below illustrates the relationship between traffic mobility and land access in a functionally classified roadway system.

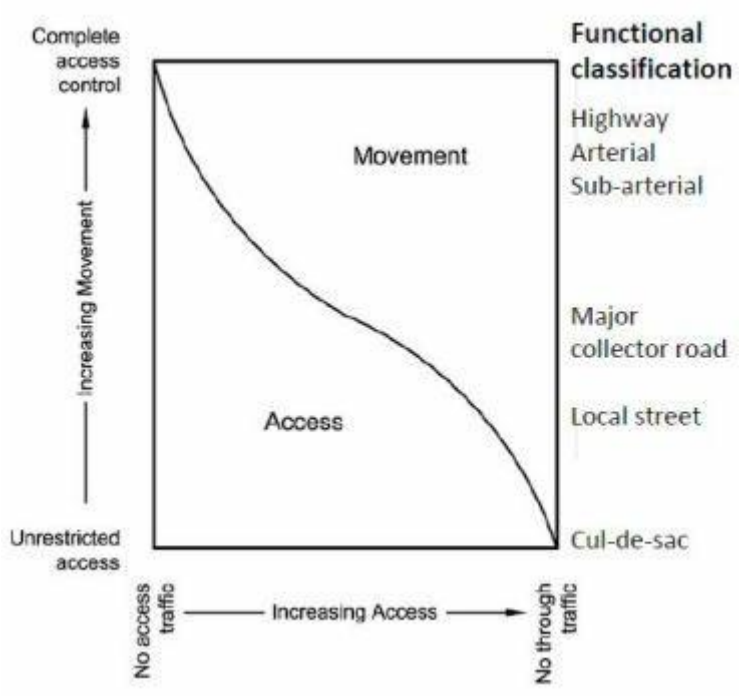


Figure SC6.4.5.2 - Relationship Between Traffic Mobility and Accessibility.

Source - Adapted from a figure in NCHRP Report 348, Access management Policies and Guidelines for Activity Centres, Transportation Research Board, Washington DC, 1993.

(b) Hierarchy level 2 – function

Within the two broad groups of roads and streets in the first level of the hierarchy, four functional roadway categories have been identified, reflecting the different ways in which they serve land use and carry traffic.

The functional classification indicates the relative importance of the traffic mobility function as opposed to the amenity/access functions, and how these conflicting aims are to be prioritised and managed.

Based on the current and future land use zoning in the Townsville City Plan, the Townsville Road Hierarchy map (see Clause SC6.4.5.7 Map B1 Townsville Road Hierarchy Map (Existing) and Clause SC6.4.5.7 Map B2 Townsville Road Hierarchy Map (Future)) has been developed for all level 2 categories. To enable easier application of the road hierarchy, the same overarching objectives and category names have been applied for both urban and rural areas. It should be noted that some links are identified as a conceptual location with respect to spacing, hierarchical connectivity and continuation of links between start and end points. Therefore, if significant development is planned to occur in a large or multiple parcels of undeveloped land in either an urban or rural area, then it may be necessary to reassess that area road hierarchy plan within a whole network.

The four functional categories in level 2 of the hierarchy are:

(i) Arterial roads are to carry long distance through traffic external to specific areas.

The primary objective of arterial roads is to provide major through routes for traffic. All longer distance traffic movements should be directed onto the arterial roads.

Arterial roads should form a principal connection between major regional centres and towns. It can also serve a line haul function for public transport.

Arterial roads may accommodate sections of the active transport network, but travel speed, volume and composition is such that cycle movements should desirably be kept separate from general traffic.

In general, arterial roads have high design standards for efficiency and no direct frontage access.

In rural areas it is recognised that many arterial roads have direct property access. On such roadways the main goal is to provide a highly efficient traffic flow (increased speed and increased capacity), balanced with safe access.

For all arterial roads it is desirable that, over time, no new accesses are permitted and that existing accesses be removed, or at least consolidated, or turns restricted.

(ii) Sub arterial roads are to carry through traffic between specific areas and arterial roads in a supporting role to the latter.

Sub arterial roads carry through traffic and should be more convenient than using the "streets" network; therefore, a high level of efficiency and safety should be provided.

In general, sub arterials serve to provide connections between arterial roads and may be used to provide such additional connections for through movements.

In urban areas, sub arterial roads typically provide connection between residential, commercial, or industrial areas and arterial roads. They will normally be the lowest order of road to be traversed by scheduled public transport in performing a line haul function.

Sub arterial roads may provide for active transport network infrastructure.

These roads can provide consolidated access to commercial and retail developments and as a result can also cater for pedestrian movements, especially in the vicinity of such developments. The provision of consolidated access allows for turning movements to be focussed at specific, controlled locations rather than at high frequency along the roadway, thus minimising interruptions to through traffic.

In rural areas, sub arterial roads provide connections between adjacent suburbs and/or between arterials. Access may also occur, and be necessary, but these will be more widely spaced due to the larger lots.

(iii) Major collector roads are to provide connectivity between the environmental cells and the traffic carrying road and to provide grouped property access.

The objective of major collector roads is to provide for the connection between the local area (local streets) and the traffic carrying roads. The form of linkage provided should predicate against the usage of major collector roads within a particular area by longer distance traffic unless the trip is relevant to the area. In residential areas particularly, amenity and safety should be the most important consideration, as these roads are also intended to provide direct access to grouped properties, commercial premises, schools, or community facilities.

Major collector roads will carry public transport operating in a sweeper role, and these are likely to be school bus routes. It is necessary to ensure that the connectivity to achieve an efficient bus route does not encourage penetration by through traffic. Typically, scheduled bus routes would begin a service on major collector roads, as a sweeper service, and then move to higher order links in the bus network to run as limited stop or express services.

As these roads serve as access to adjacent grouped properties, whether in residential or commercial/industrial areas, pedestrian movements need to be accommodated off the roadway. Traffic volumes should be balanced to accommodate local active transport cycle movements on the road, and road design should create a safe environment for these vulnerable road users.

(iv) Local streets are to provide direct property access and immediate local movements. The objective of local streets is to provide access to properties. In residential areas, these should be in a form to encourage a liveable and safe street environment where the motor vehicle is secondary to the active transport modes such as walking and cycling. Through traffic should be discouraged on these streets and a lower speed environment is desirable for safety. Given the low traffic volume and potentially lower speed environment, it is appropriate for active transport cyclists to share the road space. Similarly, specific facilities for pedestrians (such as pedestrian crossings) may not be required due to low traffic volumes and speeds.

(c) Hierarchy level 3 – management

To achieve the desired traffic levels and conditions, a combination of road use management actions will often be necessary to reduce traffic flows on some elements of the network and to increase traffic flows on other elements of the network. To minimise the use of lower order roads, such as local residential streets, it will be necessary to manage arterial roads in a way that makes their use more attractive than the lower order roads. Lower order roads must then be managed in a way that discourages traffic through environmental street design, such as street closures, street element length and design speed. If reactivity treatments are applied in existing areas, they must be undertaken on an area wide basis to ensure that problems are not simply shifted from one street to another.

In managing road hierarchy distinction needs to be drawn with respect to performance criteria between roadways in an urban or rural environment. Accordingly, the thresholds of the performance criteria differ between the urban and rural areas. The desirable performance criteria are subdivided into four groups and described below.

(i) Urban and rural characteristic (sub-categories)

To achieve effective management of the road system, the road hierarchy has been split into sub-categories of rural and urban. Each sub-category has objectives that are more specific than the category objectives for level 2. The management sub-categories are described broadly as follows (listed under each level 2 category):

1. Arterial road

    a) Arterial highway (rural) serves longer distance movements as well as regionally and nationally significant movements. (A motorway is a highway that provides for a very high standard of travel by restricting non-motorised traffic and using only grade separated intersections.).

    b) Arterial (urban) caters for longer distance movements, for example, connections between major centres, they may also serve adjacent retail/commercial land uses.

2. Sub arterial road

    a) Sub arterial (rural) connects traffic generated in rural areas to the arterial roads.

b) Sub arterial (urban) connects traffic generated in urban areas to the arterial roads and provides access to major developments and adjacent retail/commercial land uses.

3. Major collector road

a) Major collector (rural) are typically spine roads that connect local streets in a specific rural area to the sub-arterial or arterial rural road network.

b) Major collector (urban) typically carry more than 3,000 vpd in each direction and provide connections between local streets and the sub-arterial or arterial urban road network. These roads also provide direct access to large sites with restricted or controlled access (for example, schools, shops, and multi-unit residential developments).

4. Local street

a) Local street (rural) typically provide direct access to individual rural properties that do not have frontage to higher order rural roads.

b) Minor collector (urban) carry less than 3,000 vpd and provide connections between local access streets and the major collector or sub arterial or urban road network. These streets are often the entry street or main street in a residential subdivision / precinct. They provide direct access to individual properties and smaller local community sites with restricted or controlled access (for example, childcare facilities & local shops). Minor collector streets may also provide a route for public transport and school bus service and typically have pedestrian pathways on both sides of the street.

c) Access street / place (urban) are low traffic carrying streets typically providing access to individual properties. These streets provide for high permeability and connectivity of pedestrian and recreation use pathways that service the local area; as such the streets are generally short in length, i.e., less than 250 m and have a lower speed limit, i.e.,50 km/h or less.

d) Industrial streets are local streets or roads that provide access to properties within an industrial area. Industrial streets are generally designed for trucks, with wide traffic lanes and wide property accesses that can accommodate the turning radius of large vehicles (for example, semi-trailers, B-doubles and road trains). The pavements and surfacing treatments on these streets are also designed for heavy loads.

(ii) Functional characteristics

Functional characteristics have been set to ensure the network operates effectively, efficiently, and safely for its users. The functional aspects of a roadway element include:

1. dominant linkage

what type of areas should the roadway provide service to/from;

2. traffic carrying function

whilst volumes are not intended to define the category into which the roadway falls, this criterion provides some guidance as to the maximum volumes anticipated. These maximum volumes may not be met in non-urban areas due to the low density of development, residential, commercial, industrial access – what degree of access to each of the land use types is appropriate;

3. desirable traffic speed environment

   the desirable speed anticipated. This is not intended to define the maximum speed limit, which should be done in accordance with the MUTCD;

4. heavy vehicle movement

   whether the roadway is appropriate for heavy vehicles, other than for local access. Note that heavy vehicle volume will be important in defining road pavement and design form;

5. dangerous goods movement

   whether the roadway is appropriate for the passage of dangerous goods vehicles, other than for local access;

6. public transport facilities

   what role should the roadway serve for public transport (consistent with any public transport network planning);

7. active transport cycleway facilities

   what type of cycleway facilities should be provided in the roadway corridor (consistent with any cycleway network planning). Cycleway facilities would only be provided where sufficient demand is proven; and

8. active transport pathway facilities

   what type of pathways (not for crossing the roadway) should be provided along the roadway. These should only be provided to satisfy a proven demand.

   Editor's Note - The term pathway refers to footpaths that are typically located on the roadside nature strip and are described in legislation as footpaths within a road-related area.

(iii) Frictional characteristics

Frictional characteristics are set with the intent of improving the efficiency of traffic flow and thus reducing its environmental consequences in balance with access needs. Frictional characteristics relate to the way roadside activity affects traffic use and include:

1. access control

   constraints imposed on direct access to adjacent development sites;

2. parking provision

   what provision for parking within the road reserve is appropriate;

3. bus stopping provision

   what provision for bus stops within the road reserve should be made;

   Editor's Note - Indented bays also refer to bays which are clear of the through lanes as per Council standard.

4. pedestrian crossings

   what type of facilities should be provided to allow pedestrians and cyclists to cross the roadway, for example, signalised crossings, zebra crossings or pedestrian refuge islands;

   Editor's Note - Crossings must meet Council standards and MUTCD guidelines.

5. typical intersection spacing

   the typical distance between successive intersections along that roadway;

   Editor's Note - Generally, 300 m intersection spacing is not favourable for a corridor signal coordination plan.

6. preferred intersection treatments

   what form of intersection control is appropriate where the roadway intersects another of equal or higher classification; and

   Editor's Note – Clause SC6.4.5.7 Attachment A provides some guidance on the preferred intersection treatments.

7. number of traffic lanes

   what function of road hierarchy and ultimate traffic demand should be considered.

(iv) Impact characteristics

The impact characteristics of a road element is important in making the adjacent land use areas more liveable and to address issues associated with the social interaction between transport and land use.

Impact characteristics relate to the relationship between a roadway element and amenity for adjacent land use and include:

1. abutting land use types

   what type of land use would be appropriate or compatible with the roadway function; and

2. land use impact amelioration

   what type of measures are appropriate on this roadway to reduce the immediate social and environmental impacts of traffic. Such treatments include barriers (fences, walls), buffers (vegetation), setbacks (distance to property lines and/or building facades), streetscaping and environmental street design.

(d) Hierarchy level 4 – design

The fourth level of the road hierarchy framework relates to specific design criteria that are applicable to each sub-category in level 3. Level 4 aims to provide the tools with which to specify the form required of individual road hierarchy elements in order that they achieve their functional objectives. The roadway design should meet safety objectives as well as capacity and amenity objectives, where relevant. In conjunction with level 3 objectives, it should also dictate the type of facility and design form for active transport infrastructure (pedestrians & cyclists) and public transport.

For each roadway, there are design elements that combine to produce a cross section or form for the roadway. Clause SC6.4.5.7 Attachment A provides a set of desirable performance criteria for urban and rural areas, and Section SC6.4.3 Standard drawings also includes a set of road cross sections. The design elements identified are those applicable to the road cross section away from intersections (i.e., mid-block cross section). Intersection requirements will dictate other specifications. For example, widening at intersections and future planning are an important part of defining these overall requirements. These design element details and the cross sections have been prepared for new roadways. Council recognises that there will need to be variations to this to suit existing roadways (i.e., existing road forms and existing road reserve widths) in the process of network design.

It is important to note that the level 4 requirements represent preferable performance criteria. There will be other constraints (for example, topography role in the range of networks, existing land uses, road reserve, and physical elements), which mean that the requirements may be varied from time to time. Whilst this flexibility needs to exist, it is important to keep an appropriate balance between mandatory standards, desirable objectives, and constraints, to develop an appropriate road form for each individual situation whilst still maintaining some consistency in the overall road network. The objectives and performance criteria should be maintained wherever possible.

In any case, all design criteria should be considered in line with relevant documents and proper guidelines, for example, other parts of the SC6.4 Development manual planning scheme policy, DTMR Guidelines, Austroads, MUTCD, Australian Standards, the *Model Code for Neighbourhood Design* for the local street level.

Editor's Note - Posted speed limits are to be designated in accordance with the MUTCD Part 4 and are required to be approved by Council.

(i) Arterial road design standards

Administrative responsibility for roads is based on historical and political decisions as well as function within the hierarchy. Arterial roads comprise highways, typically administered by DTMR and urban arterials that may be the responsibility of either the state or local government.

1. Arterial roads (general criteria)

Arterials cater for external or intra-regional traffic and traffic between suburbs or major centres. These facilities should preferably have no direct access for all land uses. However, they often do have direct accesses due to past land use decisions, so longer-term access limitations and land use amalgamation should be pursued so that the traffic carrying role can be progressively enhanced.

The design standards are set to achieve a balance between safety and efficiency. In this case, spacing of intersections will often control the design speed and hence other design elements. There will be many existing situations where the road design is constrained by elements such as the road reserve, property access and road width. In such situations, an individual design form will need to be developed to suit the constraints, whilst still achieving the arterial road objectives.

The policy is to pursue no direct access from individual properties to arterial roads. Examples of alternative treatments include:

a) side street entry to corner blocks; and/or

b) combining driveways; and/or

c) creating rear lane access; and/or

d) creating easements to service multiple properties.

To facilitate efficient traffic movement, a higher speed environment is desirable. Limits of 80 km/h for new arterial roads and 60 or 70 km/h for existing arterial roads and where physical constraints exist in urban areas, and up to 100 km/h in rural areas are recommended. Speeds more than the above stated speeds are generally not appropriate with intersections at grade and high traffic volumes.

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 regular public transport bus traffic under a line haul mode with priority treatment. Any bus stops should be separate from the through traffic lanes.

Pedestrians should be located separately from the carriageways, and pedestrian crossings provided at signalised points. Cycleway facilities can be provided in exclusive bike lanes or on the road shoulder on roads with a speed limit less than 80 km/h, provided Austroads guidelines are met. In locations where the speed limit is higher than 80 km/h, or where there is a cycle accident history or identified potential, consideration should be given to locating these facilities separate from the carriageway.

A number of traffic lanes have to be acquired, with a minimum of a four to six lane carriageway for ultimate traffic growth, and provision made for a proper width to cater for kerb and channel, medians, bus stops and bike lanes. For the interim, a two-lane undivided cross section may be appropriate for a low traffic volume environment whilst achieving affordability, sufficient overtaking opportunities, vehicle breakdown, stopping or turning vehicles and bicycles. However, divided carriageways are desirable to optimise safety and driver comfort.

The abutting land use should preferably be less noise sensitive, or alternatively should include building and site designs that minimise impacts from adjacent traffic flows.

In urban areas, intersections are generally configured at grade for this sub-category. Signalised or roundabout control is generally appropriate although high volumes may necessitate grade separation. Intersections should desirably be spaced a minimum of 500 m apart.

In rural areas, direct access can be tolerated due to low volumes and limited frequency. However, appropriate safety levels must be achieved, and the aim should be to remove such accesses over time. Intersections are generally configured at grade for this sub-category. Priority control is generally appropriate, and intersections should desirably be spaced a minimum of 1km apart due to the higher speed environments. However, a proper intersection type must be assessed and determined using traffic analysis.

2. Highways and motorways (specific criteria)

These roads serve regionally significant travel and longer distance travel. To provide for a high standard of travel, speed environments of 100 km/h or more are desirable, together with no frontage access. If frontage access does occur, then elimination of direct access from the abutting land use should be pursued.

These roads should also provide the primary freight routes, and dangerous goods routes, and carry coach traffic between centres and regular public transport bus traffic under a line haul mode. Any pathway and cycleway facilities in urban areas should be located separately from the carriageways and protected accordingly. Crossing provisions should be grade separated. Grade separated intersections are desirable for all facilities in this category, although this will essentially be driven by volume demand or safety issues rather than hierarchy.

The road reserve width will often be dictated by the need for adjacent service roads, buffer zones and ancillary uses in the road corridor (for example, cycleway facilities, bus lanes). Divided carriageways are desirable to optimise safety and driver comfort. However, a two-lane undivided cross section may be appropriate for low traffic volumes on a rural highway, provided there are sufficient overtaking opportunities. Whilst cycleway facilities, pathways and bus lanes may be provided in the overall corridor, these facilities should desirably be separated from the through roadway and therefore represent an additional carriageway within the overall corridor. In rural areas, it is recognised that the demand for these adjacent facilities will generally be low.

Abutting land use types should be non-sensitive to vehicular traffic and generally not have frontage or direct access to the roadway. Uses such as highway service centres with amenities may be deemed appropriate in some locations based upon a needs assessment. In such cases, these would be provided with high quality direct access. Design standards for highways will primarily be set according to a high design speed and to maximise road user safety. In particular, the provision of wider shoulders is important in high-speed locations.

In urban areas, grade separated intersections on urban roadways should desirably be spaced at least 2 km apart. Intersections at grade on existing highways should be desirably spaced no less than 1 km apart and are generally found to be between 1 km and 2 km apart.

In rural areas, if some land use provides for frontage access due to historic events, then any works undertaken to reduce this frontage access will enhance the traffic carrying capability of the highway in terms of both volume and speed. Whilst volumes may be low, the high traffic speeds mean that safety issues are important at access locations and reductions in the frequency of accesses will reduce the crash rate. Provision of pathway and cycleway facilities will generally be related to demand and the need for a link associated with network planning. Grade separated intersections should be spaced between 4 km and 8 km, with a maximum spacing of 12 km.

3. Arterial roads in urban areas (specific criteria)

This category is directed at existing situations in urban areas, including urban precincts where a group of commercial land uses exists, generally on both sides of an arterial road. In these situations, a decision needs to be made, dependent on the value of these uses, whether 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 short or long term, measures will need to be developed as part of a Linear Integrated Transport Plan (LITP) to address this mix.

These design standards are primarily aimed at safety and ensuring pedestrian mobility in conjunction with parking and vehicle access. Traffic volumes may be so high that amenity to roadside activities is limited. However, as these are arterial roads, traffic volumes should not be moderated except by bypassing where feasible.

Speeds on these facilities should be kept sufficiently low (60km/h to 70 km/h) to provide for safe pedestrian crossing at controlled points and to maintain environmental amenity for adjacent land uses while still allowing for efficient traffic movement. These roads should provide for pedestrian movement on both sides

with crossing at controlled points and with bicycle lanes on the road to avoid mixing with denser pedestrian traffic.

Limiting the frequency of property access is important for the traffic carrying capacity and for the amenity levels associated with significant pedestrian traffic in the 'main street precinct'. Streetscaping would assist in ameliorating visual and audible land use impacts.

A number of traffic lanes will have to be acquired to enable four lane or six lane carriageways (if a corridor is likely to take a key public transport route associated with the adjacent land use, e.g., potential exclusive PT lane) for ultimate traffic growth and provision made for proper width to cater for kerb and channel, medians, indented bus bays to reduce delay to through traffic and bike lanes. Opportunities should be sought to bypass freight movements. This category is generally inappropriate as a dangerous goods route.

Intersections are typically spaced 250 - 400 m apart, however due to past planning and land use decisions intersections and median breaks should be spaced a minimum of 150 m apart to avoid queue interaction.

(ii) Sub arterial road design standards

1. Sub arterial roads (general criteria)

These traffic carrying roads are the key supplement to the arterial road network. They should connect between arterials and specific areas and should be more convenient than using the local streets. Consequently, a higher level of efficiency and safety should be provided. Due to the traffic volumes, the abutting land uses should be non-sensitive.

To make these roads more desirable to drivers than local streets, a higher speed environment is desirable. Speed environments of between 60 km/h to 80 km/h in urban areas and up to 100 km/h in rural areas are recommended. The policy is to pursue no direct access to individual properties.

Examples of treatments include:

a) side street entry to corner blocks;

b) combining driveways;

c) creating rear lane access; and

d) creating easements to service multiple properties.

In the preferred design form, access should be restricted and should be managed through treatments such as amalgamated entry points or side streets as discussed above. This would be the treatment pursued as part of any new development. Access for major developments, multi-unit dwellings, schools, childcare centres, and/or commercial uses may be provided along these routes, provided it is controlled through channelisation or signals.

These roads may serve as secondary freight routes. Nominated routes may be appropriate for dangerous goods movement. They could accommodate public transport (bus) traffic under a sweeper mode. Any bus stops should be located separately from the through traffic lanes.

In most circumstances, specific provision for control of pedestrian movements should be provided and roadside parking will be discouraged. Usually, the prime concern will be the movement of traffic, so traffic management techniques could be

applied (such as access minimised by consolidation of development accesses or side road access to sites). Noise and visual amenity impacts on surrounding uses should be managed through site considerations and/or road treatments.

Cycleway facilities can be provided in exclusive bike lanes or on the road shoulder on roads with a speed limit less than 80 km/h, provided Austroads guidelines are met. In locations where the speed limit is higher than 80 km/h, where a high percentage of school cyclists are likely or where there is a cycle accident history or identified potential, consideration should be given to locating these facilities separate from the carriageway.

A number of traffic lanes have to be acquired, with a four-lane carriageway for ultimate traffic growth, and provision made for a proper width to cater for kerb and channel, medians, bus stops and bike lanes. For the interim, a two-lane undivided cross section may be appropriate for a low traffic volume environment whilst achieving affordability, sufficient overtaking opportunities, vehicle breakdown, stopping or turning vehicles and bicycles. However, divided carriageways are desirable to optimise safety and driver comfort.

To satisfy the competing demands of traffic carrying efficiency and property access/on street parking, it is important to separate parked cars and turning vehicles from the through traffic lanes. The verge widths need to include landscaping, pathways, and separation. This will be an important factor in subdivision planning when determining the lot layout and road reserve needs.

In urban areas, paved pathways are generally required on both sides depending on the demand of pathway usage to abutting land use and traffic facilities (e.g., bus stops) with pedestrian crossings at controlled points. Intersections at grade are appropriate for this management type. Signalised or roundabout control is generally appropriate although priority-controlled intersections may be acceptable; this will be determined by a traffic analysis study.

Intersections are typically spaced 250 - 400 m apart, however due to past planning and land use decisions, intersections and median breaks should be spaced a minimum of 150 m apart to avoid queue interaction.

In rural areas, although access is restricted in the preferred design form, individual lot accesses are acceptable, particularly if the access points are widely spaced and properties are well set back. Pathways are only required where the road serves an identified pedestrian linkage, with pedestrian crossings at controlled points. Roundabouts or priority control are generally appropriate, although this will be determined by a traffic analysis study.

2. Sub arterial in urban areas (specific criteria)

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

   If the traffic carrying and access functions need to, or should coexist, whether in the shorter or longer term, management measures will need to be developed as part of an LITP to address the coexistence of these two functions.

   In contrast to the arterial sub-category, the traffic environment on sub arterial roads 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 opportunities should be sought to bypass freight movements.

On roads where frequent access to adjacent land uses exists, and cannot be removed or consolidated, measures should seek to achieve safe access while retaining the convenience and efficiency of the route for through traffic.

Access for individual lots should be controlled using one or more of the following measures:

a) central median (no right turns);

b) turning lane separate from through traffic lane;

c) large lot frontage;

d) lot layout to avoid on street visitor parking (large lots); and

e) adjacent properties having adjacent driveways.

This category is generally appropriate as a bus route, and indented bays should be provided to reduce delay to through traffic. This category is generally inappropriate as a dangerous goods route.

Speeds should be kept low to improve amenity to pedestrians and abutting land uses and should typically be 60 km/h. Volumes in major shopping / commercial areas that have high pedestrian movement activity should be no greater than 15,000 vpd to maintain amenity to abutting land uses. These roads require a balance between accessibility and mobility, using environmental street design or streetscaping.

In special cases, a number of traffic lanes will have to be acquired to enable four lane carriageways for ultimate traffic growth (if a corridor is likely to take a key public transport route associated with the adjacent land use, e.g., potential exclusive Public Transport Lane), and provision made for a proper width to cater for kerb and channel, medians, bus stops and bicycle lanes. For the interim, a two-lane undivided cross section may be appropriate for a low traffic volume environment, whilst achieving affordability, sufficient overtaking opportunities, vehicle breakdown, stopping and turning vehicles and bicycles. However, divided carriageways are desirable to optimise safety and driver comfort.

This category should provide for pedestrian movement on both sides with crossings at controlled points, and with bicycle lanes on the road to avoid mixing with denser pedestrian traffic.

Intersections should be controlled by way of signalisation or roundabouts, although priority intersections may be appropriate. Spacing of intersections and median breaks is site specific based on past planning and land use decisions, although a minimum spacing of 150 m should be provided to avoid queue interaction.

(iii) Major collector road design standards

1. Major collector roads (general criteria)

Major collector roads provide a connection between the local streets and the traffic carrying roads and mark a shift in the environment between roads and streets. The design standards place a greater emphasis on travel time efficiency and strict guidelines for safety and environmental amenity apply to these roads.

Traffic flow levels commonly accepted range from 3,000 vpd up to 12,000 vpd. Access to multi-unit residential developments, schools or shopping centres may well be via major collectors. Individual residential lot access to these roads should be restricted, and generally a speed environment of 60 km/h to provide for safety and amenity while ensuring travel times are reasonable. Where there are long sections of on-street parking that generate frequent disruption to traffic flow, a 50 km/h speed limit may also be appropriate. Heavy vehicle and dangerous goods movement should be restricted in residential areas, except for service vehicle movement. Buses will generally operate in a sweeper role and indented bays may be required to maintain safety at some locations.

Pathways and bicycle lanes should be provided on both sides of the road. However, in rural areas, pathways are generally not required unless network planning deems it appropriate. Some controlled pedestrian crossing points may be required in urban areas, particularly where traffic volumes are higher. Kerbside parking could be provided for in urban areas.

Intersections and median breaks are typically spaced 150 m – 200 m apart, however due to past planning decisions a minimum 100 m spacing can be applied to major collector roads.

Intersection control would generally be either by roundabout or priority control. These roads should have two or four lane carriageways, depending on the degree of frictional and impact characteristics criteria that apply.

Environmental street design may be required in urban areas to moderate speeds and minimise through traffic penetration. Streetscaping would also assist in ameliorating visual and noise impacts to abutting land uses.

(iv) Local streets design standards

1. Local streets (general criteria)

Streets have as their function to facilitate public interaction and movement through a place or neighbourhood. Local Streets must allow for the safe and efficient movement of all users, provision for parked vehicles, the provision of public utilities, access to allotments and streetscaping.

The management of these streets is less restrictive due to low traffic volumes, property access and parking. Volumes should be limited to below 3,000 vpd in any one direction and the speed environment of 40 - 50 km/h in urban areas to ensure amenity for abutting land uses, it is noted that the default posted speeds will be at 50 km/hr as per the road rules, and to a maximum 60 km/h in rural areas to ensure reasonable travel times.

Heavy vehicles and dangerous goods movement should be restricted in residential areas, except for service vehicles and public transport. Kerbside bus stops are generally appropriate, although indented bays may be required to maintain safety at some locations.

No specific pedestrian crossing provision is required. No special cycleway facilities are needed unless specifically required as part of an active transport network route, cyclists should be able to share the road space due to the low traffic volumes and speeds.

No specific parking provision is required on these streets.

Intersection spacing is a minimum of 50 m in urban areas and 100 m in rural areas. Some intersections may be controlled by roundabouts; otherwise, priority control should be sufficient. These streets should have a two-lane cross section, or one lane where necessary, with reasonable travel efficiency.

Environmental street design may be required in urban areas to moderate speeds and minimise through traffic penetration. Streetscaping would also assist in ameliorating visual impacts on abutting land uses.

If significant development occurs in the future in rural areas, then it may be appropriate to reclassify these streets as 'major collector' if the catchment size or density increases significantly. Accordingly, allocations should be made in the network planning.

In urban areas, the primary design objective is to maximise safety and amenity for adjacent properties and adjacent activities/users (I.e., pedestrians, cyclists, car parking, children playing). The most important design standard in this regard is the maximum design speed. Travel time efficiency will be compromised over safety and amenity aspects by appropriate subdivision design. Such design includes consideration of the maximum volume (by catchment size), the design speed (by street length) and the travel time efficiency (by connectivity of streets). It is this category of roadway whereby design standards are well defined because of the clear principles set out in such documents as The Model Code for Neighbourhood Design.

In rural areas, the primary design objective is to minimise the cost of roadway provision whilst still maintaining acceptable performance levels (because of the very low volume use). Travel time efficiency will be compromised over safety and amenity aspects. There may be an issue with dust nuisance, which may be one of the factors considered when determining whether the road should be sealed or not. The low traffic volumes anticipated on some rural streets require the need for a single lane cross section alternative, as well as the two-lane form. There may also be a demand for the provision of horse trails within the road verge, and in this case a widened verge may be required to cater for these.

Generally, the maximum traffic volume on unsealed rural roads is 100 vpd.

2. Local streets in commercial and industrial areas (specific criteria)

   Generally, higher traffic volumes can be tolerated in local streets in commercial (including CBD) and industrial areas than can be accepted in residential areas. Fewer lots would be served in commercial and industrial areas by these streets than low density residential areas, due to the high trip generation of the land uses. Significantly higher heavy vehicle proportions and tolerances for environmental factors such as noise would be acceptable on such streets in industrial areas.

(4) Linear Integrated Transport Plans (LITP)

There may be cases where a roadway does not readily fit into any category within the road hierarchy due to incompatibility with the performance criteria. Under these cases, it is recommended that an LITP be developed specifically for the roadway under consideration. For example, with a key public transport corridor such as Ross River Road and Charters Towers Road there is a need to satisfy both the traffic carrying roadway objectives, as well as the access and amenity to adjacent properties objectives. Each LITP will need to assess the roadway under consideration on an individual basis and will therefore have to satisfy individually tailored criteria. Figure SC6.4.5.3 below describes a general methodology for developing an LITP.

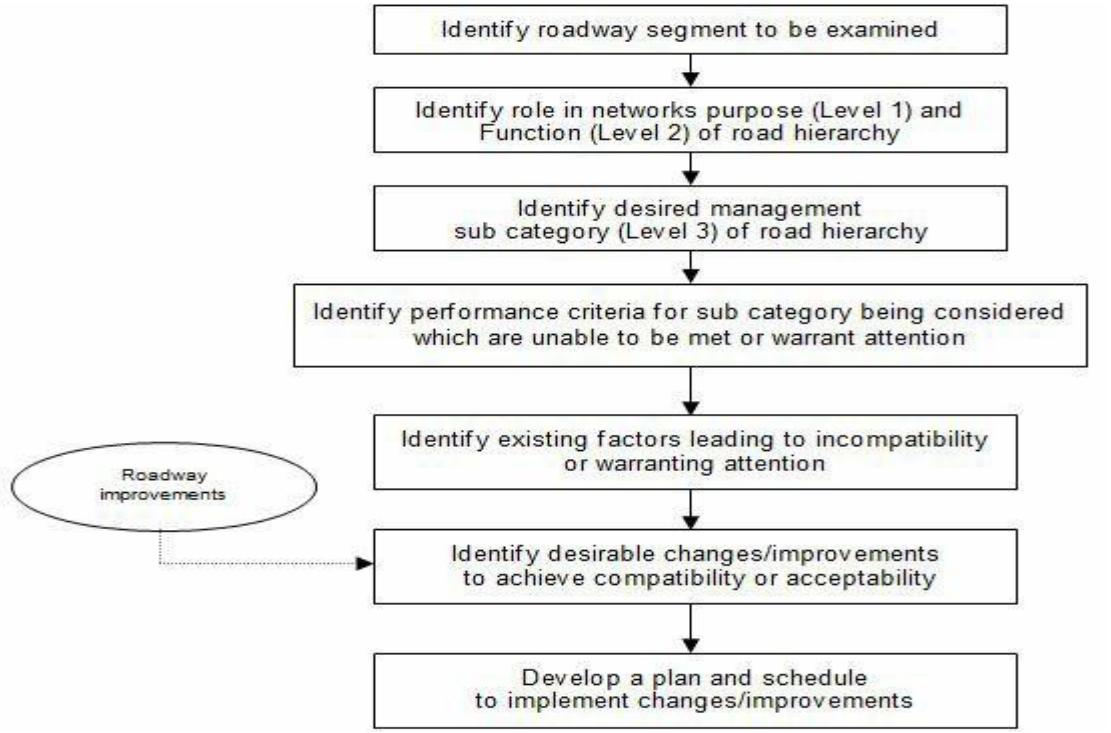


Figure SC6.4.5.3 - Linear Integrated Transport Planning (LITP) Process.

SC6.4.5.2 Traffic impact assessments

(1) Introduction

(a) Overview

A traffic impact assessment (TIA) is a process of compiling and analysing information on the impacts that a specific development proposal is likely to have on the operation of roads and transport networks. The assessment will not only consider general impacts relating to traffic management (road efficiency and safety) but will also consider specific impacts on land use, environment, and all road users, including on road public transport, pedestrians, cyclists, and heavy vehicles.

Developers should refer to the *Guide to Traffic Management* produced by Austroads as a primary reference, and in particular, *Part 12: Integrated Transport Assessments for Developments*. The TIA section has been produced to supplement Part 12 by establishing criteria for low, moderate, and high traffic impact developments, and to supply additional information pertinent to particular land uses, climate, and traffic characteristics in Townsville. If a discrepancy exists between this document and the *Guide to Traffic Management*, this section will prevail.

To add clarity and further guidance developers should also refer to the Townsville City Council TIA Guidelines this document provides in-depth guidance on the requirements of Traffic Impact Assessments and has been prepared to assist Council staff and development applicants to identify the traffic information which is typically needed to support a development application.

Editor's Note - DTMR have published a TIA guideline which applies to State Controlled Roads only, and it does not align with the TCC City Plan and Council's Desired Standards of Service (DSS) and Measures of Effectiveness (MoE) for transport infrastructure. The DTMR TIA guideline is not applicable to Local Government roads.

(b) TIA scope and purpose

(i) TIA purpose

Council requires a TIA in order to:

1. assess the adequacy of the existing or future transportation system to accommodate additional traffic generated by a proposed development, redevelopment, or land use change; and
2. to assist in determining what improvements may be required to transport infrastructure (e.g., roadways, pathways, public transport, and traffic facilities, parking, etc.) to maintain a satisfactory level of service for the Townsville community.
3. within the context of the matters outlined above, the aim of this section is to ensure that:
    a) traffic impact assessment of developments is undertaken in a uniform manner leading to consistent treatment of similar developments;
    b) the level of impact assessment is appropriate for the level of potential impacts;
    c) a road or a road network continues to operate at an agreed level of service following the opening of a development;
    d) both "soft" solutions (e.g., road use management such as alternative routes) and "hard" solutions (e.g., changes to infrastructure) are considered when mitigating impacts;
    e) the needs of all road users are considered and appropriate facilities (e.g., bicycle lanes, footpaths, bus lanes, intersection widening or upgraded intersection controls) are provided in a timely manner;
    f) a development is considered within its proposed environment and not in isolation from nearby features such as intersections, footpaths and other driveways;
    g) cumulative impacts on transport networks of other developments in an area or region are considered; and
    h) road safety and environmental impacts (both natural and built) are considered.

(ii) TIA scope

A TIA may be required where a development affects the function, safety, and efficiency of the transport network. The requirements for a TIA are outlined in this policy section.

The scope of a TIA will depend on the location, type and size of the development and the ability of the road network to handle traffic generated by the development. Therefore, some developments will require an extensive and detailed TIA, while others will require only a brief TIA.

(c) How to use the TIA Guidelines document

The following steps will guide the applicant in determining the level of TIA required with regard to land use and traffic environment perspectives.

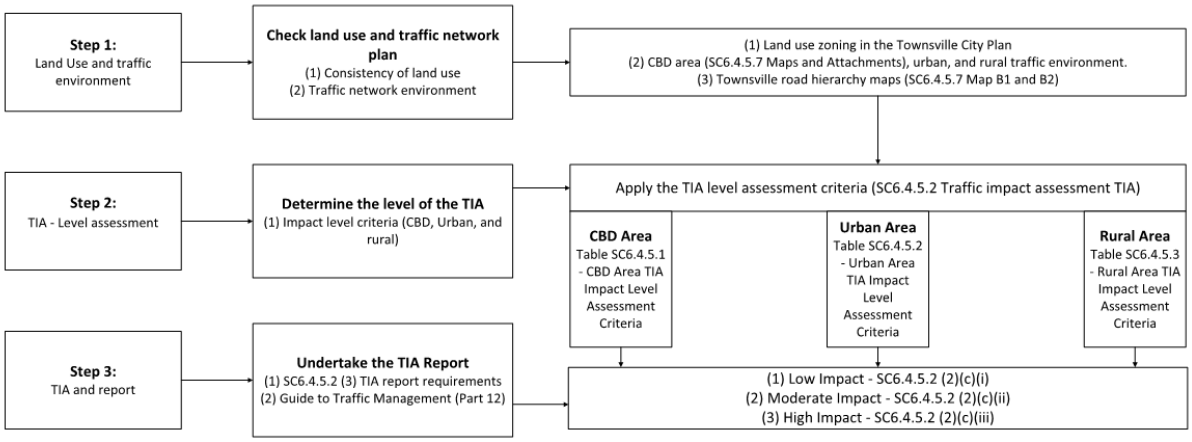


Figure SC6.4.5.4 How to use clause SC6.4.5.2 Traffic Impact Assessment Guidelines

(d) Terminology

AADT	Annual Average Daily Traffic
CBD	Central Business District, click here to see Townsville's CBD Information Sheet
DTMR	Queensland Department of Transport and Main Roads
DoS	Degree of saturation
Inconsistent Development	Development that is not consistent with the planning scheme, or development that is inconsistent as described in Section 650 in the *Planning Act 2016*.
Level of Service (LOS)	A qualitative measure using a sequence of letters from A through F to describe the quality of operational conditions within an intersection, transit, or a roadway link. Refer to the Highway Capacity Manual for details.
LGIP	Local Government Infrastructure Plan
PCE	Passenger Car Equivalent
PCU	Passenger car unit
PT	Public transport
TAIM	Townsville Aimsun Integrated Model
TIA	Traffic impact assessment
Traffic Facility	Roads, streets, bikeways, highways, their networks, terminals, traffic signs, public transport/car park and abutting lands related to all modes of transportation, I.e., people, vehicles, goods.
TDM	Travel Demand Management - the application of strategies and policies to reduce travel demand (specifically that of single occupancy private vehicle), or to redistribute this demand in space or time.
Trip	A single or one direction person or vehicle movement

Trip Generation	The total number of trips measured in trip ends (i.e., trip production or trip attraction) entering and exiting the site for the defined period, e.g., day or hour
VPD	Vehicles per day

(e) Reference and source documents

Reference and source documents that must be read in conjunction with this section are as follow:

(i) Queensland Government Legislation:

Planning Act 2016

(ii) *Transport Infrastructure Act 1994*Townsville City Council:

TIA Guidelines (refer current version)

Transport and Pathway Demand Rates (refer current version)

(iii) Australian Standards:

AS2890.1 *Parking facilities - Part 1: Off street carparking,*
AS2890.2 *Parking facilities - Part 2: Off street commercial vehicle facilities,*
AS2890.*3* *Parking facilities - Part 3: Bicycle parking facilities,*
AS2890.*5* *Parking facilities - Part 5: On street parking, and;*
AS2890.*6* *Parking facilities - Part 6: Off street parking for people with disabilities).*

(iv) Austroads:

Cycling Aspects of Austroads Guides (refer current version)
Guide to Road Safety (in particular, Part 6) (refer current version)
Guide to Traffic Management (in particular, Part 12) (refer current version)

(v) Department of Transport and Main Roads Queensland:

Manual of Uniform Traffic Control Devices (MUTCD)Road Planning and Design Manual (RPDM)

(vi) Other:

Transportation Research Board, *Highway Capacity Manual (HCM*), (refer current version)

Roads and Maritime Services NSW (RMS), Guide to Traffic Generating Developments (refer current version)

(2) Determining the level of the TIA

(a) Traffic impacts

The scope, intent and degree of traffic impact will vary. This will depend on the land use of the proposed development, direct access locations and current land use zoning.
For example:

(i) development based on the current land use zoning and character of the locality;

(ii) location of the development: CBD, urban, rural area;

(iii) the existing and future planned transport network;

(iv) direct access to the external road hierarchy system;

(v) staging, size and type of the development;

(vi) the traffic environment at the time of the proposal;

(vii) existing approved (but not delivered) development within the area;

(viii) Council's current LGIP for roads and pathways;

(ix) current development applications within the area; and

(x) any strategic planning determining future land uses such as the Townsville State Development Area.

(b) Land use environment

Due to the different desirable service standards in the CBD/Urban and Non-urban areas, Council has different impact assessment thresholds depending on whether the development is in the CBD, urban or rural traffic environments. These areas are defined as follows:

(i) The CBD - (refer to Clause SC6.4.5.7 - Map A); or

(ii) Urban area – with the exception of the CBD, refer to the map in Clause SC6.4.5.7 - Map A; or

(iii) Rural area – areas not in the urban area, or CBD, refer to the map in Clause SC6.4.5.7 - Map A.

These TIA land use traffic environment definitions relate to the character of the land for the purpose of assessing the traffic impacts on the site and the adjacent network.

(c) Three levels of TIA

For each of the development locations identified above, and in conjunction with the defined Townsville road hierarchy system, Clause SC6.4.5.1 Townsville road hierarchy, there are three different levels of traffic impact assessment. The anticipated level of impact will require different methodologies of traffic forecasting and analysis, as described below.

(i) Low impact – low TIA report

The development is likely to have a very minor impact as the land use is consistent with the Townsville City Plan, but a review is still required to ensure potential traffic issues are assessed in terms of traffic safety and amenity issues. A low-level TIA report will generally involve assessment of the proposed property access of the development and comprise of a statement of impact, and a corresponding statement of proposed mitigation measures to ensure the access is safe.

(ii) Moderate impact – moderate TIA report

The development is likely to have a moderate traffic impact on the surrounding existing and future land uses, traffic network and operations. A moderate level TIA Report will be performed using traffic forecasting processes or computerised methods (e.g., Sidra) to estimate and analyse traffic flows on the surrounding road network at predefined time horizons.

(iii) High impact – high TIA report

The development is likely to have a high impact on the surrounding existing and future land uses, traffic network and operations. A high level TIA report will require a comprehensive assessment approach using appropriate traffic modelling software (e.g., Sidra, Aimsun or Emme), which allows the model outputs to be directly comparable against Council's traffic model outputs at predefined time horizons, e.g., 2021, 2026, 2031, 2036 & 2041.

(d) Applying the TIA impact level assessment criteria

Use Tables SC6.4.5.1, SC6.4.5.2 and SC6.4.5.3 whichever is relevant to the location of the development, I.e., CBD, Urban, or Non-urban area, and assess the development against the TIA impact level assessment criteria whilst also considering the following:

(i) the applicant must consider the actual or potential traffic impacts of all land/development under their common ownership or control (for example, by a joint venture agreement), at one location.

Editor's Note - The phrase "at one location" means all adjacent land of the applicant, the property lines of which are contiguous or nearly contiguous at any point, or separated by other land of the applicant, or a public or private street, road, highway, or utility right-of-way or other public or private right-of-way.

Editor's Note - "All land/development" includes existing development and planned/potential development.

(ii) an applicant must not avoid the intent of this policy section, and that of Townsville City Plan, by submitting partial or segmented applications or approval requests for development plans, subdivisions, etc. If the properties will form an integrated or complementary development, Council expects the applicant to submit one consolidated TIA report based on the integrated level of impact;

(iii) if the criteria that apply are spread across two or more impact columns, the highest level of impact will apply. For example, if the development is low for all criteria, except for one criterion that is in the high column, a high level TIA will be required;

(iv) Council may require additional information as part of the traffic impact assessment at the Information and Referral stage of an application for a Development Permit, which will be decided on a case-by-case basis;

(v) if the proposed development land is zoned for rural purposes but the development proposed is an urban land use that will either be surrounded by a rural traffic environment or adjoin an urban area, Table SC6.4.5.2 Urban TIA impact level assessment criteria must be used, rather than Table SC6.4.5.3 Rural area TIA impact level assessment criteria;

(vi) Council may request a more thorough analysis if negative impacts on traffic facilities have been identified, or if particular factors of the development cause concern to the safety, efficiency and operation of the transport network; and

(vii) if the proposed development has roads that are not identified in the Road Hierarchy Map (e.g., in the development of new subdivision plans), a new link(s) road hierarchy in the subjected development area may be proposed by the developer, with Council's agreement.

Editor's Note - If any of the above conditions apply, or more details are required, Council encourages a pre lodgement meeting to be arranged prior to commencing the TIA.

Table SC6.4.5.1 - CBD Area TIA Impact Level Assessment Criteria

Criteria	Impact		
	Low	**Moderate**	**High**
Trip generation	New or additional trip generation in a peak hour of <10 trips directly accessinga street[1].	New or additional trip generation in a peak hour of 10 to 100 trips directly accessing a street. New or additional trip generation in a peak hour <100 trips directly accessing a major collector, sub arterial, arterial, or highway[1].	New or additional trip generation in a peak hour of more than 100 trips.
Commercial vehicles	3 or less new or additional commercial vehicles per day.	More than 3 and up to 100 new or additional commercial vehicles per day.	More than 100 new or additional commercial vehicles per day.
Car parking	An increase or decrease of9 or less on-site car park spaces. Loss of 2 or less line marked on-street carparks and no loss of loading zones.	An increase or decrease of 10 or more on-site car park spaces. Loss of 3 or more line marked on-street carparks, or any loading zones.	
Public transport	No impact on any bus zone or taxi operations.	Relocation of any bus zone or taxi rank. Impacts on the bus interchange or bus routes.	
Transport system	No change to existing transport network operation.	Change to permitted vehicle movements at a T-intersection.	Change of permitted vehicle movements at a crossroads or multiple intersections.

Editor's Note - 1. Refer to Map B1 Townsville Road Hierarchy Map (existing) and Map B2 Townsville Road Hierarchy Map (future).

Table SC6.4.5.2 - Urban Area TIA Impact Level Assessment Criteria

Criteria	Impact		
	Low	**Moderate**	**High**
Trip generation	New or additional trip generation in a peak hour of less than 20 trips directly accessing a street[1].	New or additional trip generation in a peak hour of 20 to 300 trips directly accessing a street. New or additional trip generation to a major collector, sub arterial, arterial, or highway[1].	New or additional trip generation in a peak hour of more than 300 trips directly accessing a road system.
Commercial vehicles	5 or less new or additional commercial vehicles per day in a residential area. Less than 10 new or additional commercial vehicles per day in a non-residential area.	More than 5 and up to 300 new or additional commercial vehicles per day in a residential area. More than 10 and up to 300 new or additional commercial vehicles per day in a non-residential area.	More than 300 new or additional commercial vehicles per day.
Car parking	Increase or decrease of 9 or less on-site car park spaces. Loss of 2 or less line marked on- street carparks or loading zones.	Increase or decrease of 10 or more on-site car park spaces. Loss of between 3 or more line-marked on street carparks or loading zones.	
Public transport	Relocation of any bus zone or taxi rank.	Impacts on the bus interchange or bus routes.	
Transport system	No change to existing transport network operation.	Changes to the connectivity between local streets and collector roads.	Changes to the connectivity between arterial and sub arterial roads.

Editor's Note - 1. Refer to Map B1 Townsville Road Hierarchy Map (existing) and Map B2 Townsville Road Hierarchy Map (future).

Table SC6.4.5.3 - Rural Area TIA Impact Level Assessment Criteria

Criteria	Impact		
	Low	**Moderate**	**High**
Trip generation	New or additional trip generation in a peak hour of less than 30 trips directly accessing a street[1].	New or additional trip generation in a peak hour of 30 to 300 trips directly accessing a street. New or additional trip generation of less than 300 trips directly accessing a sub arterial, arterial, or highway1.	New or additional trip generation in a peak hour of more than 300 trips.
Commercial vehicles	Less than 30 new or additional commercial vehicles per day.	More than 30 and up to 300 new or additional commercial vehicles per day.	More than 300 new or additional commercial vehicles per day.
Public transport	Relocation of any bus zoneor taxi rank.	Impacts on the bus interchange or bus routes.	
Transport system	No change to existing transport network operation.	Changes to the connectivity between local streets and collector roads.	Changes to the connectivity between arterial and sub-arterial roads.

Editor's Note - 1. Refer to Map B1 Townsville Road Hierarchy Map (existing) and Map B2 Townsville Road Hierarchy Map (future).

(e) Collaborative traffic impact assessments

If the anticipated traffic impact is determined to be of moderate or high impact on the existing or future transportation system due to its location, development type, or land use characteristics, the traffic impact assessment may require a more strategic and holistic assessment to be prepared collaboratively with Council and any other relevant stakeholders.

(f) Associated reports

(i) Road safety audit

If the TIA report indicates that significant safety issues may occur, the developer must engage an accredited road safety auditor to undertake an independent Road Safety Audit, in line with the *Guide to Road Safety* Part 6, Austroads. It is not acceptable for the consultant who prepared the TIA report or who undertook any design to mitigate the effects of the development to also undertake the road safety audit.

(ii) Noise

A road noise assessment may be required if there is a forecasted volume that will increase traffic over 3,000 vpd (link traffic) in the subjected TIA study scope, or if noise sensitive receptors are identified. Refer to Section SC6.4.19 Noise and vibration assessment guidelines for more information.

(3) TIA report requirements

The TIA will be used to help evaluate whether the development is appropriate for the site and what type of transportation improvements may be required. The TIA Report should address any traffic issues outlined in this document and the *Guide to Traffic Management Part 12: Integrated Transport Assessments for Developments.*

Additional guidance on TIA Report requirements is provided in the TIA Guideline which provides information about the steps involved in preparing a TIA report to support a development application. The guideline may also be used to help identify measures to mitigate any impacts the development proposal may have on the operation of the road.

The TIA report must identify the type and amount of additional traffic expected to be generated by the proposed development on the adjacent transport network and include recommendations on any site specific and external upgrading or network management works required to cater for short term and long-term traffic and transportation planning.

It is important that early contact be made with the Planning and Development Division of Council during the TIA process. This should commence at the outset and continue as required during the preparation of the TIA. For example, if Council's concerns about access to the Council's Road network are identified early, this may be able to be addressed through minor amendments to the on-site layout of the development. For larger developments, it may be appropriate to consult with Council regarding consideration of the project's scope, methodology and other possible planning consideration during the development of the initial project concept.

(a) General requirements

The TIA Report must demonstrate that the proposed development is consistent with the traffic and transportation aims of the planning scheme for that area. The intent of the TIA is to evaluate worst case traffic scenarios. For example, if several different uses are proposed, the land use with the greatest overall traffic impact must be assumed in the study, unless the applicant specifies the uses for the site.

(i) TIA consultant qualification

A low impact TIA report may generally be prepared by the developer. However, if existing traffic facilities need to be changed, then recommendations for mitigation must be made by a Registered Professional Engineer of Queensland (RPEQ) qualified person at a minimum. The moderate or high impact TIA is to be prepared by an impartial professional traffic/transportation consultant who is appropriately experienced and holds current RPEQ qualification. The document must be certified by the appropriately qualified and experienced RPEQ.

(ii) Report documentation

The TIA Report must fully document the approach, methodology, and assumptions of the analysis. It must clearly explain the reasons for any adjustments to the trip generation rates and assumptions used for trip distribution and assignment. Figures (drawings and maps) are to be used to help illustrate these assumptions. The report must summarise the results of the Level of Service (LOS) calculations in tabular or map form and include figures showing the traffic volumes for the project alone and for each scenario. The report must also include any mitigation measures, appropriately tested by the model. All worksheet and analysis input and output data must be included as appendices to the report, if applicable.

(iii) Impact on other stakeholders

If there are other jurisdictions or stakeholders impacted within the area of influence, for example, DTMR, Queensland Rail (QR), or Bus/taxi companies, the consultant should arrange a scoping meeting with all relevant agencies to discuss the issues. This will provide improved coordination and reduce the potential for later revisions to the TIA.

(iv) Updating an existing TIA

An existing TIA requires updating when the amount or character of traffic is significantly different from an earlier study; for example, changes to the land use, road hierarchy or road networks. Any traffic study may also need to be revised if the study is older than 2 years and Council determines that the existing conditions have changed enough to invalidate the study results or if the initial study assumes an incorrect build out period. A TIA may require updating sooner in rapidly developing areas and not as often in slower developing areas. In these cases, consultation with Council is recommended.

(v) Possible additional requirements
At times, Council may extend the study to additional street segments and/or intersections on the public street system. Council will make this determination based on the scale, location, and/or nature of the proposed development and the condition or state of development of the street network in the vicinity of the site.

(b) Low TIA report

1. Justification for low impact assessment;
2. A brief description of the development in terms of site location, direct site access(es), land use, size and expected year of completion;
3. Analysis/Findings, e.g., impact on existing traffic facilities, heavy vehicles turning path and other safety issues;
4. Recommendation and mitigation; and
5. Appendices if applicable.

(c) Moderate and high TIA reports

Executive Summary

- a brief description of the development (site location, internal layout, all site access(es), land use/size andyear of completion) ;
- a brief overview of trip generation and analysis result (LOS), Degree of Saturation (DoS) and Average Delay;
- parking demand; and
- mitigation plan and conclusion/recommendation.

Editor's Note - Desirably, the executive summary should be no longer than five pages, complete in itself, and not dependent on supplementary data included by reference.

1. Introduction and Summary

1.1 Justification for moderate or high impact assessment

1.2 Study objectives and scope

- Time horizon - the analysis shall consider the following time periods:
  - (a) Year of commencement of the development. (Commencement Year)
  - (b) Year of completion of ultimate buildout of the development. (Completion Year)
  - (c) All TAIM future traffic projection periods between the Commencement Year and the Completion Year. The TAIM future projection periods are 2026, 2031, 2036 and 2041.
  - (d) Period 10 years after the Completion Year
- TIA Area – where:
  - (a) the amount of additional traffic likely to be generated is more than 5% of existing volumes on links and at intersections during a peak hour; or
  - (b) the likely increase in the proportion of heavy vehicle traffic is more than 5% during a peak hour associated with the development.

2. Proposed Development

2.1 Land use and intensity;

2.2 Site plan/layout;

2.3 Phasing and timing; and

2.4 Specific information of the proposed development (operation hours, number of employees, type ofservice vehicles, etc.).

3. Existing Conditions

3.1 Study area land use:

- existing land use/zoning; and
- anticipated future development (background); land use/traffic network.

3.2 Existing traffic analysis:

- roadway system;
- traffic volumes and analysis;
- active mode facilities (public transport stops/route, pathway, bicycle lane, trip end facilities);
- parking (car park type, operation, existing/potential car park demand);
- traffic accident data (traffic safety); and
- other.

4. Traffic Forecasting and Analysis

4.1 Method of projection.

4.2 Background traffic (each horizon year):

- traffic model calibration or validation if applicable; and
- forecasting and analysis.

4.3 Site traffic (each horizon year):

- trip generation;
- trip distribution;
- modal split;
- trip assignment; and
- analysis.

4.4 Summary of analysis (with/without development scenario).

5. Improvement Analysis

5.1 Improvements to accommodate background traffic.

5.2 Additional improvements to accommodate all site traffic.

5.3 Alternative improvement.

5.4 Need for any improvements (e.g., TDM).

5.5 Status of improvements already funded, programmed, or planned.

5.6 Independent road safety audit, if required.

5.7 Summary.

6. Parking

6.1 Method of projections.

6.2 Parking demand forecasting and analysis (including all service vehicles and bikes).

6.3 Site circulation and parking layout (including all service vehicles).

7. Public Transport and Pathway

7.1 Possible/desirable PT system.

7.2 Internal/external pathway network system (type, location).

8. Recommendation

8.1 Site access/circulation plan.

8.2 Roadway improvement:

- On-site;
- Off-site; and
- phasing, if appropriate.

8.3 PT, bicycle, and pathway system.

8.4 Other.
9. Conclusion
10. Special Analysis/Issues (if applicable, refer to Clause SC6.4.5(4) below.
11. RPEQ Certification
Appendices

(4) Essential technical guidance

(a) Existing condition

(i) Traffic count data

Traffic trends and counts data may be available from DTMR and Council. Traffic data must reflectexisting normal conditions and should not be used if more than two years old at the time of the TIA submission or if significant changes have occurred at or near the count location or as otherwise requested by Council. The traffic consultant or the applicant is responsible for providing traffic counts that are not available through DTMR or Council. If requested Council will provide TAIM future year traffic flow projections for year 2026, 2031, 2036 and 2041. These projections are updated annually and take account of the most recent approved LGIP.

Editor's Note - TAIM data is available in TownsvilleMAPS

(ii) Traffic accident and safety

Accident data is available from the State traffic accident reporting system and can be obtained through data analysis at the Queensland Department of Transport and Main Roads. Accident data requests should be made as early as possible to enable the information to be provided in a timely manner.

(b) Traffic forecasting and analysis

(i) Townsville Aimsun Integrated Model (TAIM)

The TAIM is a city-wide mesoscopic model and is Council's primary planning tool for the analysis of proposed improvement options, upgrades, and interventions on the road network to support growth identified in the Local Government Infrastructure Plan (LGIP).

The TAIM is calibrated annually against traffic signal information provided by DTMR and provides detailed traffic flow information across the entire city for the calibration year and future year projections in 2026, 2031, 2036 and 2041.

Upon request, or following a pre lodgement meeting agreement, TAIM and future demographic data are available to use under license among Council/DTMR and the applicant. Also, depending on the process of Council/DTMR traffic model development, meso/micro simulation models for other areas will be available, including various Aimsum subnetwork microsimulation models which have been integrated within the TAIM. Council encourages the use of the output of these models, as they have been developed for the LGIP and reflect the planned future network structure.

All traffic modelling input and output data produced by the applicant should be calibrated and validated at the time of the assessment prior to using the data and details of this process are required to be included in the report. It should be acknowledged that TAIM, especially, is intended for use with high level or complex traffic network modelling and is

not designed for small size or individual lots of development and other traffic modelling software such as Sidra may be more appropriate considering the scale of the proposed development. It is important to apply the correct level of traffic modelling work/methodology to forecast the traffic demand associated with the development.

Council retains intellectual proper

ty ownership rights to the latest data for Council purposes. Applicant must ensure that any consultants engaged to undertake this work are aware of this stipulation.

Any updated or developed input/output traffic modelling data as part of the TIA study, must be submitted. If the applicant intends to develop new traffic modelling as part of the TIA report, Council encourages the use of the same platform of traffic modelling, I.e., Sidra Intersection and Aimsun. If the applicant uses an alternative equivalent traffic model, this must be agreed to by Council prior to the TIA commencing. The agreement will cover issues such as network structure, demographic data, and methodology.

(ii) Trip generation rates

The trip generation rates for the residential component of dwellings are 8 VPD per dwelling in nonurban areas and 10 VPD per dwelling in CBD/Urban areas unless actual survey data is available. In the same manner, all considered trip generation rate data must be provided in the TIA Report as source or reference data. Consideration must also be given for other ancillary uses proposed on the land.

In the absence of specified trip generation rates within Council documentation including the Transport and Pathway Demand Rates (refer current version), the DTMR's *Guide to Traffic Impact Assessment*, December 2018 and *Road Planning and Design Manual* must be used.

(c) Traffic analysis performance criteria

The results of the traffic analysis must be compared using the Measure of Effectiveness (MOE), as set out inTable SC6.4.5.4 below.

Table SC6.4.5.4 - MOE Based on the Traffic Characteristics and Type

Facility	Type	Measure of effectiveness (MOE)
Intersections	Un-signalized or prioritised control	Average delay (seconds per vehicle) Delay to critical movements (seconds) Degree of Saturation (DOS) Queue length for critical movements (metres or vehicles)
	Traffic signals	Average delay (seconds per vehicle) Delay to critical movements (seconds) Degree of Saturation (DOS) Queue length for critical movements (metres or vehicles)
	Roundabouts	Average delay (seconds per vehicle) Delay to critical movements (seconds) Degree of Saturation (DOS) Queue length for critical movements (metres or vehicles)
Interrupted flow, e.g., Urban/CBD network		Average travel speed (km/h) Volume/Capacity ratio
Uninterrupted flow, e.g., Non-urban/highway network		Density (PCU/km/lane) Volume/Capacity ratio

Two lane uninterrupted flow, e.g., Non-urban/highway network	Average travel speed (km/h) Volume/Capacity ratio
Pedestrian	Space (m^2/person) in queuing area Speed (person/min/m) in walkway
Transit	Headway (minutes or veh/hr) Passenger loading (m^2/person) Reliability (%)

Source: *Transportation Research Board, Highway Capacity Manual,* 2010.

The type and level of analysis and evaluation will include documentation of LOS for intersections. A saturation flow rate and all parameters for analysis should be considered in accordance with the SIDRA Intersection user guide and default parameters unless field measurements at the study area would indicate a more appropriate value. In this case, all source or reference data must be provided in the TIA Report.

(d) Conversion of vehicle numbers to passenger car equivalents (PCE)

Table SC6.4.5.5 shows the conversion of vehicles (as classified by Austroads) to comparative number of passenger car equivalent (PCE) for the determination of trip generation, intersection capacity and LOS analysis.

Table SC6.4.5.5 - Calculating Passenger Car Equivalent (PCE)

Austroads (*Guide to Traffic Management Part 12)* Vehicles Classifications	**Passenger Car Equivalent (PCE)**
Classes 1 to 2 i.e., short vehicles	1 PCU
Classes 3 to 5 i.e., light to medium trucks	2 PCU
Classes 6 to 9 i.e., heavy trucks	3 PCU
Classes 10 to 12 i.e., B-doubles, Triple Road Train	5 PCU

(e) Desirable service standards for links

According to the given MOE in Table SC6.4.5.4, the threshold for acceptable operation is the upper limit of LOS D' for CBD/urban roads and upper limit of LOS 'C' for rural roads. Refer to the table SC6.4.5.6 below:

Table SC6.4.5.6 - Maximum Volume to Capacity Ratios for the Road Network

Infrastructure item	**Maximum volume to capacity ratio by land use**	
	Residential (Urban)	**Non-residential (Rural)**
Arterial	0.9 (Upper limit LoS D)	0.7 (Upper Limit LoS C)
Sub arterial	0.9 (Upper limit LoS D)	0.7 (Upper Limit LoS C)
Major collector	0.9 (Upper limit LoS D)	0.7 (Upper Limit LoS C)
Arterial (state-controlled)	0.95 (Mid LoS E)	0.95 (Mid LoS E)

(f) Desirable service standards for intersection/access operationi

Any intersection analysis should demonstrate that the delays would be less than that shown in Table SC6.4.5.7 up to the ten-year horizon after completion of the development. If they are not, improvements to the intersection layout and/or changes to the proper method of control must be assessed.

Table SC6.4.5.7 - Desirable Service Standard for Intersection/Access Operation

Road network item	Maximum degree of saturation	
Traffic signals	0.9 (55 second average delay)	
Roundabout	0.85 (35 seconds average delay)	
Priority controlled	0.8 (35 seconds average delay)	
Traffic signals (state-controlled)	0.9 (55 seconds average delay)	

(g) Parking

Adequate parking must be provided to meet site generated demands and be consistent with the most current version of the references. If the consultant conducts a survey, or uses other source data, the car parking demand must be compared against Clauses SC6.4.5.4 Car parking and SC6.4.5.3 Public transport facilities guidelines, with the greater car parking demand being applied. In considering car parking for a specific type of development, the consultant must use data from at least two different sources, or use the data compiled from both a survey and one source data, with the greater level of car parking demand being applied. All surveys or source data must be from a similar land use to the proposed development.

Specific dimensions, parking angles, and parking ratio requirements are addressed in the planning scheme and planning scheme policies (Clauses SC6.4.5.4 Car parking and SC6.4.5.3 Public transport facilities guidelines), and Austroads *Cycling Aspects of Austroads Guides.*

Editor's Note - From time to time, Council may introduce incentive programmes that impact on parking requirements. Information on any incentive programmes is available from Council.

(h) Special analysis/issues

Council may request specific traffic analyses relevant to the proposed development. These include details about access management, a TDM plan, cut through traffic and residential quality of life analysis, truck estimates, Intelligent Transport System (ITS) strategies, pedestrian/bicycle safety, signage and access, safe routes to school, emergency routes, etc.

(i) Mitigation plans and conclusions

All mitigation plans identified as necessary to serve the proposed development should be listed in the TIA report, along with the timing of implementation.

During construction, private approaches should be located, and configured in such a manner as to avoid disruption to the public street system. If changes to traffic controls are proposed, warrants should be reviewed and documented in the report. Reference should also be made to Section SC6.4.6 Road works and traffic control, relating to the control of traffic.

The TIA report must provide a preliminary overall master plan map, and recommendations, and include the status (funded, programmed, or unfunded) of any existing traffic upgrading plans.

(j) TIA report appendices

The following appendices should be included in the TIA Report submitted to Council:

(i) raw traffic count data-average daily and peak hour turning movement traffic count data collected and/or obtained from other sources;

(ii) printouts of analysis results input/output; e.g., SIDRA;

(iii) all traffic network modelling work as an electronic copy - e.g., network attribute data, demographic data, and other relevant files (macro, excel etc);

(iv) photographs of the site;

(v) additional tables or figures not included in the TIA report;

(vi) description of methodologies and assumptions used in analysis;

(vii) worksheets used in analysis - I.e., signal warrant, LOS, queuing, capacity etc;

(viii) notes on the outcomes of any meetings in regard to the development; and

(ix) variations to the standard report (template) – RPEQ certification of any non-conformances with requirements.

SC6.4.5.3 Public transport facilities

(1) Introduction

(a) Purpose

This section provides advice, guidance, and standards with respect to public transport facilities to support an integrated safe, efficient, and sustainable transport network.

(b) Scope

This section includes the consideration ofpublic transport infrastructure integration with the road network and for the provision of facilities both on-road and off-road;

(c) Relationship of codes

(i) Where a development application is assessable against Part 9.3.5 Transport impact access and parking code, the application of this section will assist the applicant to address the performance outcomes and acceptable solutions of that code as it contains advice, guidelines, and standards.

(ii) This section can also be used as guidance and advice for other assessment criteria and codes including Part 9.3.4 Reconfiguring a lot code, Part 9.3.6 Works code and Part 9.3.3 Landscape code.

(d) Reference and source documents:

The reference and source documents that must be read in conjunction with this section are as follow:

(i) Townsville City Plan planning scheme policy sections:

Section SC6.4.3 Standard drawings

Section SC6.4.4 Active transport infrastructure

Section SC6.4.6 Road works and traffic control

Section SC6.4.12 Landscaping and open space

Section SC6.4.14 Public utilities and building over/near services

Section SC6.4.17 Structures

Section SC6.4.20 Footpath treatment and outdoor dining design,

Section SC6.10 Parking rates

(ii) Australian Standards:

AS 2890 *Parking Facilities Set*

AS1428 *Design for Access and Mobility Set*

(iii) Austroads Guides:

Austroads Design Vehicles & Turning Path Templates

Guideto Road Design – set

Guide to Traffic Management – set

(iv) Department of Transport and Main Roads Queensland:

Manual of Uniform Traffic Control Devices (MUTCD)

Road Planning and Design Manual (RPDM)

Transport Planning and Coordination Regulation 2005

Planning for Safe Transport Infrastructure at Schools, (refer current version)

Public Transport Infrastructure Manual (PTIM) *TransLink Division*

(v) Other:

Australian Government	*Disability Standards for Accessible Public Transport (Refer current version)*(DSAPT)
Australian Government	*Disability (Access to Premises - Buildings) Standards 2010 Premises Standards*

Disability Discrimination Act 1992 (DDA)

Australian Building Codes Board	*National Construction Code (NCC)*
Queensland Government	*Crime Prevention through Environmental Design: Guidelines for Queensland* (CPTED)

(2) Public transport

(a) Public transport provision

(i) The need for public transport provision should be assessed for any new residential reconfiguration of a lot development or major development. As part of this needs assessment consideration must be given to upgrading the existing road network, PT service, and facilities in accordance with the current and future demands.

(ii) The developer is required to consult with Translink on existing PT services and any proposals to change the locations of existing or proposed bus stops.

(iii) The developer is to provide Council with a comprehensive assessment of the current and projected public transport demands and to advise of any new facility or change to existing PT facility required by the proposed development. This assessment is to be in the form of a detailed transport infrastructure assessment (TIA) and will include the particulars of any proposed upgrade to the existing transport services, routes and systems that adjoin the proposed project development. Taxi services are also considered a form of public transport and are to be considered in the model assessment

of the site (if applicable). Taxi services should be integrated with other transport node facilities wherever it is possible to do so.

(b) Major development

(i) Major developments include schools, hospitals, event venues, shopping or employment centres, and high-density residential developments, aged care facilities, medical centres, and retirement villages.

(ii) These developments typically have high levels of public transport demand. Design of major developments should include consideration to the provision and integration of public transport services on or near the development site. Facilities should be designed to be convenient and encourage public transport, walking or cycling.

(iii) Major developments which will generate high demands for public transport services may require a modal interchange which includes provision for taxis. A setback from the main road/route should be provided to ensure the site is serviced safely and directly for these facilities. Developments should present an active frontage to the transport interchange facility with wide footpaths and no conflicting vehicular accesses to ensure pedestrian and user safety is a priority.

(3) Public transport information and guidelines (planning and design)

(a) For new residential reconfiguration of a lot development or major development the developer is to prepare a draft public transport master plan for the proposed development. The public transport master plan will identify (as a minimum):

(i) proposed residential development lot sizes and densities;

(ii) any proposed commercial development, including approx. GFA;

(iii) any proposed education facility or other significant bus passenger service attractor (e.g., retirement village, hospital etc.);

(iv) location, type, and hierarchy of open spaces areas;

(v) the proposed road hierarchy for the development, and how it connects to the existing road network;

(vi) the location of the proposed active transport network facilities (pathways and cycleways) throughout the development, and how they connect to the existing, and future, road network;

(vii) the route of all existing passenger bus routes within 1 km of the proposed development and through the development; and

(viii) the public transport master plan must be submitted for the approval of Council.

(b) As part of the information required in obtaining a development approval, the developer must provide evidence of feedback from consultation with all the following stakeholders on the feasibility of potential passenger bus service route/major bus corridor through the new development:

(i) Department of Transport and Main Roads (TransLink Division);

(ii) Department of Transport and Main Roads (Northern Region);

(iii) local contract bus operator (Sunbus Townsville) and if necessary, school bus operator/s;

(iv) local taxi operators (13 cabs Australia, Checker Cabs); and

(v) Council's Infrastructure Services Division.

(c) The outcome from the engagement with the stakeholders will be:

(i) advice if the development is ever likely to be serviced by a passenger bus service or school bus service;

(ii) agreement of the most likely route(s) through, or servicing, the proposed development;

(iii) the need and likely location of bus stops necessary to service the development;

(iv) general agreement on the location and route of pathways servicing any future bus service along the agreed bus routes;

(v) advice on the need for any bus stop to be constructed as part of any proposed commercial centre, and the likely required standard of the facility; and

(vi) the need for the developer to provide any other additional facilities to ensure the operation of an efficient and effective public transport services, including taxis. This may include required intersection treatment, bus stop locations, the possibility of joint use bus stops and the like.

(d) Public transport facility design guidance is discussed in detail in the Public Transport Infrastructure Manual (PTIM), specific Townsville City Council requirements are:

(i) Bus routes are preferred along the shortest route, or up to 120% of the shortest length, between destinations.

(ii) Preferred bus routes are generally located along arterial, sub arterial and major collector roads. Passenger bus services will not service an estate with only one entry/exit; as existing passengers are taken on a tourist trip through the estate without getting closer to their destination.

(iii) The main criteria in determining the location of a bus route is that no more than 10% of residents should have to walk more than 400m to catch a bus within the urban area. Council may request a public transport route plan as part of the development to demonstrate this requirement. Bus services operate to a published timetable, so routes with minimal delays at intersections are preferred; routes with multiple traffic signals can cause delays to timetable service.

(iv) To minimise resident objection to the placement of bus stops in front of houses, any public open space (e.g., drainage or recreational reserve) should be considered to accommodate a bus stop. This is particularly pertinent if the public open space contains a pathway. Other options include high density residential or commercial developments where off-street / on-site parking is a component of the development. It is most desirable to establish the location of future bus stops during the design process to ensure that future development proposals recognise the implications of this infrastructure and its location. A layout plan showing the proposed locations must be submitted for the approval of Council.

(v) New bus stops will be one of four standards:

1. minimum boarding point bus stop sign with timetable displays (TDC), platform with tactile ground surface indicators (TGSI); or
2. regular stop bus stop sign, with TDC, platform with (TGSI) and seat (inbound definite, outbound optional); or
3. intermediate stop bus stop sign, with TDC, platform with TGSI and shelter with seat (inbound definite, outbound optional) – site specific; or
4. premium stop generally limited to high route volume locations and stops at

shopping centres. As per intermediate stop, with greater care to the infrastructure finish standards and capacity requirements.

(vi) New regular and intermediate bus stops are to be designed and constructed in accordance with Council's standard drawings (Section SC6.4.3 Standard drawings) and meeting disability compliance standards (DSAPT and Premises Standards) or set out under the *Disability Discrimination Act 1992*.

(vii) Bus stops should be located where there is no conflict with the location of (drainage pits/surrounds, poles, items of street furniture), street trees or driveways to properties. Drainage pits must be located away from the bus platform (concrete slab) to avoid creating a safety hazard. They are generally located in residential areas at side boundaries of adjoining properties to avoid resident concerns about loss of amenity and view, by having a stop directly in front of their property. Bus stops are generally preferred to include a location near an intersection to pick up passenger from the side streets; however, it should not impact on intersection functionality or operation. Bus stops are preferred on the departure side of intersections and major driveways.

(viii) Bus stop facilities within private property must comply with the DSAPT and associated guidelines, the Premises Standards or under the DDA. The developer must provide documentation to demonstrate consultation with the Department of Transport and Main Roads and the impacted bus operators about future passenger bus routes servicing the facility during the design phase. A layout plan showing the proposed location with details must be submitted for the approval of Council.

(ix) Pathways servicing bus stops must form an integral part of an active transport pathway network servicing the entire estate, and not just be a short connection to the corner of the nearest street.

(x) The in-bound and out-bound bus stops along the same route should be in proximity to each other on opposite sides of the street, although the bus stops do not have to be directly opposite each other (especially at intersections).

(xi) All new bus stops being constructed must comply with the requirements of the DSAPT and associated guidelines (including any bus stop relocations), the Premises Standards or under the DDA. It must also have a clear continuous accessible path of travel; that is be serviced by a smooth, level, and impervious surface with a 1.5 m minimum width. One aspect of compliance is that the preferred crossfall on the bus stop platform slab is 2%, and absolute maximum of 2.5%. School bus stops (mostly in a rural environment) do not need to comply with this requirement at this time.

(xii) A standard bus stop is 3 m wide by 12 m long, (see minimum width. One aspect of compliance is that the preferred crossfall on the bus stop platform slab is 2%, and absolute maximum of 2.5%. School bus stops (mostly in a rural environment) do not need to comply with this requirement at this time.) plus entry/exit tapers on roads with a posted speed limit of 60 km/h or less. A bus bay (with associated parking restrictions) is approximately 42 m long (allowing for a 15 m in taper and 15 m egress taper). These dimensions can vary and may severely impact on the required street width (especially where no indents are to be provided), driveway access to properties and the availability of visitor/customer parking.

(xiii) Consideration must be also given as to how elderly and young passengers (especially school children) will safely cross the street to access the bus service. This may require the installation of a nearby refuge crossing or traffic signals, or similar measures.

(xiv) Bus routes should avoid having vertical or horizontal deflection traffic calming measures along the route. Any vertical deflection devices that are to be used by a bus service intended to operate in high pedestrian environment must be flattop road humps. Council may support a bus route where speed cushions are installed.

(xv) Any roundabout along a bus route must be able to accommodate a turning bus without mounting the kerb and channel or encroaching onto any landscaping on the centre island, including during a right-hand turn. Consideration must be also given as to how elderly and young passengers (especially school children) will safely cross the street to access the bus service. This may require the installation of a nearby refuge crossing or traffic signals.

(4) Consultation guidelines

The following sets out the requirements for authority consultation for public transport, taxis, buses, and school buses.

(a) Taxi service operations

Contact the Department of Transport and Main Roads Northern Region and the local taxi operators about taxi service operations.

(b) Taxi rank infrastructure

(i) Contact Townsville City Council about existing and proposed taxi rank infrastructure in the area.

(ii) Any existing or new infrastructure undergoing substantial refurbishment or alteration must comply with the Disability Standards for *Accessible Public Transport 2002* and associated guidelines, the Premises Standards or under the *Disability Discrimination Act 1992* (DDA), and be in accordance with Section SC6.4.3 Standard drawings at the time of the re furnishment or alteration. It must have clear continuous accessible path of travel; that is, be serviced by a smooth, level, and impervious surface.

(c) Bus routes

(i) Contact the Department of Transport and Main Roads Northern Region and the local bus operator (service contract holder) about current and future passenger bus routes.

(ii) The developer will need to be aware of, and make provision for, future bus routes as determined through the consultation process with DTMR, Council and the local bus operators.

(d) Bus stop infrastructure

(i) Contact Townsville City Council in the first instance about existing and proposed bus stop infrastructure on the road reserve, then contact the Department of Transport and Main Roads about interchange type infrastructure.

(ii) Any existing or new infrastructure undergoing substantial refurbishment or alteration must comply with the DSAPT and guidelines, the Premises Standards or under the DDA, and be in accordance with Section SC6.4.3 Standard drawings at the time of the refurbishment or alteration.

(iii) Townsville City Council has prepared standard drawings for bus stop infrastructure. Also, new or relocated bus stops must have the specified branding (J Pole/ Blade signing), an identifying name approved by Council's Technical Services Unit and be in accordance with Section SC6.4.3 Standard drawings and the bus stop position identified by easting and northing.

(e) School bus services

Contact the Department of Transport and Main Roads Northern Region and the local bus operator about currentand future school bus route operations.

(f) School bus infrastructure

Contact Townsville City Council about existing and proposed school bus stop infrastructure on the roadreserve.

(g) Intercity buses (long distance)

Contact Townsville City Council about existing and proposed intercity bus stop infrastructure on the road reserve, but also contact the Department of Transport and Main Roads TransLink Division about bus stop infrastructure and bus stop operations.

SC6.4.5.4 Car parking

(1) Introduction

(a) Purpose

This section provides advice, guidance, and standards with respect to car parking facilities to support an integrated safe, efficient, and sustainable transport network.

(b) Scope

This section includes the consideration of:

(i) parking facilities integration with the road network including consideration of parking both on-site (outside of the road reserve) and on-road; and

(ii) servicing provision of appropriate loading/unloading facilities and manoeuvring areas both on-road and on-site and provision for emergency and service vehicle access.

(c) Relationship of codes

(i) Where a development application is assessable against Part 9.3.5 Transport impact, access and parking code, the application of this section will assist the applicant to address the performance outcomes and acceptable solutions of that code as it contains advice, guidelines, and standards.

(ii) This section can also be used as guidance and advice for other assessment criteria and codes including Part 9.3.4 Reconfiguring a lot code, Part 9.3.6 Works code and Part 9.3.3 Landscape code.

(d) Reference and source documents

Reference and source documents that must be read in conjunction with this section are as follow:

(i) Townsville City Plan planning scheme policy sections:

Section SC6.4.3 Standard drawings

Section SC6.4.4 Active transport infrastructure

Section SC6.4.6 Roadworks and traffic control

Section SC6.4.12 Landscaping and open space

Section SC6.4.14 Public utilities and building over/near services

Section SC6.4.17 Structures

Section SC6.4.20 Footpath treatment and outdoor dining design,

Section SC6.10 Parking rates planning scheme policy

(ii) Australian Standards:

AS2890 *Parking Facilities* - Set

AS1428 *Design for Access and Mobility* - Set

(iii) Austroads Guides:

Austroads Design Vehicles and Turning Path Templates

Guide to Road Design – Set

Guide to Traffic Management – Set

(iv) Department of Transport and Main Roads Queensland:

Manual of Uniform Traffic Control Devices (MUTCD)

Road Planning and Design Manual (RPDM)

Transport Planning and Coordination Regulation 2005

Planning for Safe Transport Infrastructure at Schools, (Refer to current version)

Public Transport Infrastructure Manual (PTIM) - TransLink Division

(v) Other:

Australian Government	*Disability Standards for Accessible Public Transport 2002* (DSAPT)
Australian Government	*Disability (Access to Premises - Buildings) Standards Premises Standards (Refer to current version)*

Disability Discrimination Act 1992 (DDA)

Australian Building Codes Board	*National Construction Code (NCC)*
Queensland Government	*Crime Prevention through Environmental Design: Guidelines for Queensland* (CPTED)

(2) Parking

(a) Parking on-site

(i) On-site parking must be provided to meet the demands of the development, including open space areas and meet the minimum rates set out in Section SC6.10 Parking rates planning scheme policy (Table SC6.10.2.1 Parking rates). Section SC6.4.12 Landscaping and open space policy provides further direction on the provision of parking to service open space areas.

(ii) Any associated change to existing on street parking controls or loading bays must also be appropriately addressed by the development. A parking layout plan must be submitted for the approval of Council which accounts for the loss of any existing on street parking bays to accommodate loading zones, bus stops, taxi ranks or driveways required for the orderly operation of the proposed development.

(iii) The design of the car park, its accesses and associated aisles are to be in accordance with AS/NZS 2890.

(iv) Accesses must be designed in accordance with Section SC6.4.5, Clause SC6.4.5.5 Driveways below and Section SC6.4.3 Standard drawings.

(v) Where car parks are accessed through security barriers, doors or lifts, sufficient queuing space must be provided on site to accommodate all expected traffic during peak demand periods.

(vi) Access ways adjacent to car park entries should have sufficient internal queuing space to prevent vehicles queuing into the street whilst waiting for a vehicle to manoeuvre into or out of a parking bay.

(vii) Turning paths for cars and service vehicles must be provided in accordance with the Austroads' Design Vehicles and Turning Path Template Guide. Council may require the preparation of plans that demonstrate adequate turning paths in accordance with Austroads.

(viii) Pavements must be sealed, line marked and constructed to a design appropriate for the anticipated vehicular loading.

(ix) Parking for schools must comply with Planning for Safe Transport Infrastructure at Schools.

(x) Car parks must provide adequate manoeuvring and parking areas for the type of vehicles and functions served. They must be clearly signed and marked, accessible, safe and contribute aesthetically to the internal user and the streetscape character. Landscaping associated with parking facilities must be in accordance with Part 9.3.3 Landscape code and with Section SC6.4.12 Landscaping and open space.

(xi) All car parking spaces for people with a disability must be designed in accordance with AS 2890.6. Car parking spaces for people with a disability are to be largely located as close as possible to the point of entry into the proposed development. Provision for off-site parking may also be required. In this circumstance, the ability to safely provide this within the road reserve must also be demonstrated.

(xii) Pedestrian access and movements within the car park should be separate from vehicular access and should be appropriately marked and signed and accessible by all abilities.

(xiii) Carwash bays must be clearly marked and signed, even though this may also be utilised as a visitor space. Run off from the car washing bay must not discharge into the stormwater drainage system. Stormwater quality treatment for the car park run-off must be considered as part of the treatment for the whole site.

(xiv) Bicycle storage racks must be provided on-site in accordance with AS 2890.3.

(xv) Provision of lighting in off street carparks is to comply with AS1158.

(b) Parking on-street

(i) The design of on-street parking is to be in accordance with AS/NZS2890.5.

(ii) If a new driveway is to be constructed in a street where parallel parking exists and it is necessary to remove parking bays and install a driveway, the remaining parallel parking bays must be remarked such that at least 3 m is left clear from the edge of the driveway on the approach side of the driveway and at least 2 m is left clear on the other side of the driveway. Remarking of the remaining on street bays and any relocation/alteration to parking control signs must be undertaken as part of this works. A parking layout plan must be submitted for the approval of Council.

(iii) Where a loading zone, bus stop or a taxi zone is required as a result of a development, the infrastructure, line marking, and signage must be provided by the developer. The design must be submitted to Council for approval prior to works commencing on site.

Editor's Note - A loss of parking may occur due to access requirements by Queensland Fire and Rescue at hydrant boosters.

(3) Servicing

(a) The development must make adequate onsite provision for the access, loading, unloading, and manoeuvring of service vehicles sufficient to cater for the demand generated by the development and the service vehicles utilised. The design must ensure the safety of other vehicles, pedestrians and cyclists and that other users are not inconvenienced. The design must also consider any adverse effect on the amenity of the development and its surroundings including the effects of visual amenity, operating hours, the generation of noise, odour and dust, and proximity to sensitive uses. The design of this layout must conform to AS 2890.2.

(b) The development must make adequate internal provision within the site to allow all vehicles servicing the development to enter and exit the site in a forward direction only. In demonstration of this requirement, Council may request a turning path plan to show how the intended vehicle types that are expected to use the development can enter and exit the site in a forward gear.

(c) Entry of B-double or other multi-combination vehicles servicing a proposed development will be considered by Council on a case-by-case basis. In making this assessment, Council will:

(i) assess the status of the roadway fronting the development;

(ii) consider the zoning of the adjoining properties;

(iii) design particulars of the vehicle entry and exit layout – with particular attention to the footway/verge crossing details;

(iv) the internal manoeuvring capacity of the development site; and

(v) safety implications to the public and other road users.

Editor's Note - Road manager consent is required for travel on the road network. Applications are coordinated by the National Heavy Vehicle Regulator.

(d) Provision for waste collection must be in accordance with Section SC6.4.22 Waste management.

SC6.4.5.5 Driveways

(1) Introduction

This section details standards and provides advice and guidelines to assist in the design and construction of driveways (domestic, industrial, commercial, and rural property access), location, and other aspects in relation to theirimpact on pedestrians, cyclists, other vehicles, stormwater, and neighbours.

Editor's Note - the technical details depicted and described in Section SC6.4.3 Standard drawings must be adhered to.

(a) Reference and source documents
Reference and source documents that must be read in conjunction with this section are as follow:

(i) SC6.4 Development manual planning scheme policy sections:

SC6.4.3 Standard drawings:

SD-006 *Typical Road Cross Sections – B - Double Turning Path and Access Plan Example Drawing*

SD-020 *Concrete kerbing*

SD-025 *Kerb Ramp*

SD-030 *Driveway access urban residential properties*

SD-031 *Driveway access industrial properties*

SD-032 *Driveway crossovers urban residential properties*

SD-090 *Driveway Access Rural Properties Type 1 - Access With Invert Slab H<300mm*

SD-091 *Driveway Access Rural Properties Type 2 - Conc. Access With Culvert Cast Insitu With GrateH≥300mm*

SD-092 *Driveway Access Rural Properties Type 3 - Gravel Access With Culvert Cast Insitu WithGrate H≥300mm*

SD-093 *Driveway Access Rural Properties Type 4 - Conc. Access With Culvert Inverted Pre-cast BoxCulvert H≥325mm*

SD-094 *Driveway Access Rural Properties Type 5 - Gravel Access With Culvert Inverted Pre-cast Box Culvert H≥325mm*

SD-095 *Driveway Access Rural Properties Type 6 – Access With Culvert Cast Insitu H≥450mm*

SD-096 *Driveway Access Rural Properties Type 7 - Conc. Access With Culvert 535mm<H<685mm*

SD-097 *Driveway Access Rural Properties Type 8 - Gravel Access With Culvert 535mm<H<685mm*

(ii) Townsville City Council:

Local Law No. 1 *(Administration) 2011*

Local Law No. 4 *(Local Government Controlled Areas, Facilities and Roads) 2011*

Subordinate Local Law No. 1.1 *(Alteration or Improvement to Local Government Controlled Areas and Roads) 2011*

Subordinate Local Law No. 1.15 *(Carrying Out Works on a Road or Interfering with a Road or itsOperation) 2011*

(iii) Australian Standards:
AS2890.1 *Parking facilities - Part 1: Off street carparking*
Queensland Development Code:

NMP1.1 Driveways

(iv) Austroads:

Guide to Road Design: Part 3 – Geometric Design
Guide to Road Design: Part 4 - Intersections and Crossing - General

(b) Terminology

Driveway	Unless stated otherwise, the term driveway in this section refers to the access between the road and the property boundary; I.e., on Council-controlled land. This section does not provide advice on the vehicular movement area within the private property.

Editor's Note - Types of driveways include:

New driveways	Must comply with the requirements of Council's standard drawings. Works are at the property owner's cost and to the satisfaction of Council.
Non-conforming driveways	Existing driveways which do not meet Council requirements that must be reassessed in the event of a redevelopment of the site. Works are at the property owner's cost and to the satisfaction of Council.
Redundant driveways	Existing driveways that are no longer in use and must be removed. Works are at the property owner's cost and to the satisfaction of Council.
Unapproved driveways	Driveways that have not been approved by Council. Council may require these driveways to be removed or modified. Such works are at the property owner's cost and to the satisfaction of Council.
Modified driveways	Modifications to existing driveways must comply with the requirements of Council's standard drawings. Works are at the property owner's cost and to the satisfaction of Council.
Temporary driveways	Temporary property access during construction. Works are at the property owner's cost and to the satisfaction of Council.
Crossover	The part of a driveway that is located crossing the kerb and channel.
Local Road	A road under the control of a local government.
Property owner	Entity, applicant, developer, or owner/s who is responsible for the driveway at the time.
Queuing area	The area of a circulation roadway between the property boundary and the vehicle control point, available for the queuing of vehicles.
Regulated parking	Parking controlled by traffic signs and/or line marking.
Rural area	An area where the urban criteria are not met as specified in the Townsville City Plan.
Road corridor permit	A permit issued by the Department of Transport and Main Roads authorising works on a State Controlled Road.
Road works permit	A permit issued by Council authorising works within the road reserve on a Local Road; the area of land under the Council's control, dedicated, notified, or declared to be a road for public use.
Sight stopping distance	Means the distance to enable a normally alert driver, travelling at the design speed on wet pavement, to perceive, react and brake to a stop before reaching a hazard on the road ahead. Refer to the Austroads *Guide to Road Design Part 3 – Geometric Design*.
State controlled road	Means a road under the control of the Department of Transport and Main Roads, including national highways.
Urban area	An area where the urban criteria are met in accordance with Clause SC6.4.5.1.

(2) Responsibility

(a) The driveway is the responsibility of the property owner to construct and maintain. A road works permit isrequired for all works within the road reserve under Council control.

(b) Costs

The property owner is responsible for the cost to:

(i) prepare and obtain the appropriate permit(s);

(ii) design and construct the driveway and associated works; and

(iii) maintain the driveway.

(3) Location

The location and layout of a driveway must consider the type of frontage road, land use of the property, and the type and volume of vehicles likely to use the access. It must be located to avoid being a hazard to any pedestrian and cyclist, through movement of traffic, and to minimise damage to the verge and vegetation/ landscaping. A separate, clearly distinguishable access for pedestrians and cyclists is to be provided.

The property owner must ensure that there are no impacts on stormwater, upstream or downstream, due to the driveway (refer to Section SC6.4.9 Stormwater quantity) being constructed.

Rural driveway location and layout must also consider the through traffic volume, turning volume, vehicle type, speed environment, road layout, land use and general topography. It may be necessary to widen the shoulder or provide a turning lane to enhance safety for turning vehicle and through traffic.

(a) For all driveways, the location of the driveway should be:

(i) as far as practical from intersections to minimise points of conflict and confusion, and to improve safety.Driveways should not be situated within the functional area of at grade intersections;

(ii) to a road of a lower hierarchy where reasonable access can be provided. Notwithstanding this preference, access arrangements for each development must be considered on a case-by-case basis.

(iii) at least 6 m from the tangent point, or where no tangent point exists, at least 12 m from the intersection of two street property boundaries; and

(iv) positioned to achieve adequate sight distance for all traffic movements associated with property accesses. Desirably, a driver has at least stopping-sight distance available to react to a potential conflict and come to a stop.

Editor's Note - Refer to *AS2890.1 Parking facilities - Part 1: Off street carparking,.*

(b) All driveways should avoid being located:

(i) opposite the terminating road of a T junction on non-residential streets;

(ii) within the signalised area (defined by extension of the signal stop lines to the road boundaries), within 25 m of a signalised intersection, and not adjacent to auxiliary lanes, depending on the property frontage width. Access may be permitted if it can be demonstrated to Council that the location of the driveway will be safe;

(iii) within a roundabout area, nor desirably within 25 m of the roundabout entrances or exits. Access may be permitted if it can be demonstrated to Council that the location of the driveway will be safe;

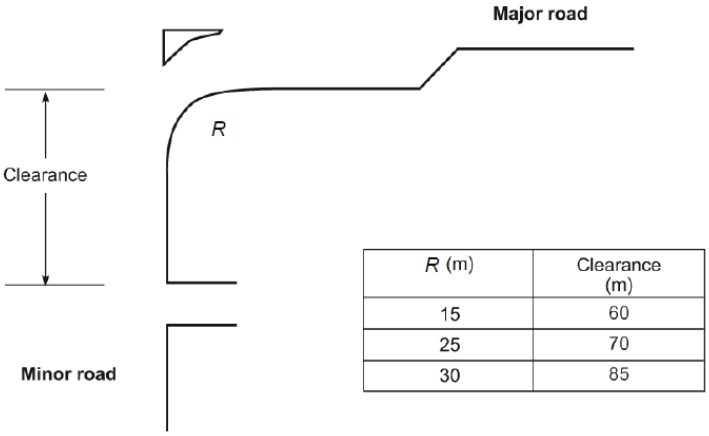
(iv) opposite or within 6 m of a median opening in a major road; and

(v) within the bus stop boarding area and on the downstream side of the bus stop.

Editor's Note - On-site parking bays must be located clear of queuing areas. This allows vehicles to drive completely onto the property without having to stop for other vehicles to complete on-site parking manoeuvres.

(c) Driveways in the vicinity of intersections on major roads, (Arterial & Sub arterial) should be located in accordance with following Austroads guideline:

(i) *Guide to Road Design Part 4: Intersections and Crossings – General,* Figure E 5: Corner clearance – channelised intersection below.



R (m)	Clearance (m)
15	60
25	70
30	85

Source: Transportation Research Board (2003).

(ii) Alternatively in accordance with Austroads *Guide to Traffic Management Part 12: Traffic Impacts of Development*, 3.3.2 Driveways or Intersections into the Development; right turns after major intersections should only be considered where a separate right-turn lane with adequate deceleration and storage length can be provided, otherwise rear end crashes may become common. On typical undivided urban roads, the safety implications of allowing right turns from a through lane into a development within 100 m of a major intersection should be carefully considered.

(d) Driveways must be constructed at a right angle to the kerb line/road centreline unless demonstrated that it is not safe to have the driveway at a right angle.

(e) Driver visibility at the property line to pedestrians, cyclists and other vehicles must be clear of obstruction (e.g., fencing, and landscaping), and should account for changes in grades or curves in road alignment. The location of the driveway will be assessed against the safety provisions detailed in the Department of Transport and Main Roads Guideline - *Treatment options to improve safety of pedestrians, bicycle riders and other path users at driveways, February 2021.*

Editor's Note - If sight distance is not adequate then a mirror, or other approved device, will be required to be installed at the property owner's cost.

(4) Amenity

(a) The driveway should not adversely affect, impede, or cause a nuisance to neighbouring properties.

(b) The driveway crossover of one property should not encroach onto the frontage of any adjacent property, except where it is required to achieve the desired outcome and has received approval from Council.

(c) The driveway should minimise the vehicle headlight impact on the adjacent neighbourhood.

(5) Materials

The driveway must be constructed in accordance with Section SC6.4.3 Standard drawings.

(6) Clearances

The driveway must be constructed in accordance with Section SC6.4.3 Standard drawings..

(7) Gradient

The driveway must be constructed in accordance with Section SC6.4.3 Standard drawings.

Editor's Note - This may not be practicable in some particularly hilly residential locations. Driveways with higher gradients can be constructed by using the expertise of a professionally qualified engineer and with the approval of Council.

(8) Number of driveways

(a) The number of driveways will be one per lot.

(b) Two may be permitted where:

(i) there will be more than ten metres or less than two metres between the new driveway and any otherdriveways; and/or

(i) the property has two street frontages; and

(ii) an analysis of on street parking demonstrates that on street parking will continue to be adequate even if a second driveway is constructed.

Where parking bays are marked on the street including service bays and bus stops and alteration to these bays is required to accommodate the second driveway, there is to be no loss of use. Displaced bays can be included in the off-street parking component of a commercial development, where considered appropriate. The applicant is responsible for the alterations to the line marking and signage.

(9) Stormwater

(a) The property owner must ensure that there are no impacts upstream or downstream as a result of the driveway works.

(b) In rural areas in particular, the driveway must not block or significantly impede stormwater flow along the road table drain.

(c) Where a box culvert is installed under the access, the minimum clearance below the level at the property boundary or the edge of the bitumen roadway (whichever is the lower) to the top of the access is provided in accordance with Section SC6.4.3.Standard drawings. This clearance must be achieved to allow water flowing in the drain to surcharge over the access before entering onto the roadway or the adjacent property.

SC6.4.5.6 Road and street names

(1) Introduction

(a) Objectives

The objectives of this section are to:

(i) provide a consistent procedure and setting of standards for road and street naming within the Townsville City Council Local Government Area to contribute towards a legible road and street network;

(ii) ensure urban and rural addressing are simple as possible, unique, and clearly identifiable;

(iii) identify the information Council may request for a development application or as a condition of approval; and

(iv) provide guidance or advice about satisfying an assessment criteria.

(b) Terminology

Estate	An estate is a group of homes and other buildings built together as a single development (e.g., housing development).

Roadway	Is considered to be any public or private land- based thoroughfare or course navigable by vehicle or foot that can be used for assigning addresses or allowing access between points or to a feature. Examples of roadways include alleyways, roads, streets, highways, laneways, fire tracks, bicycle paths, and walking tracks.
Roads	Are generally through routes for the movement of vehicular traffic. (Refer Clause SC6.4.5.1 Road hierarchy).
Streets	Are generally for providing property access, pedestrian, and cycle movement with more localised vehicular traffic. (Refer Clause SC6.4.5.1 Road hierarchy).

(c) Reference and source documents:

Reference and source documents that must be read in conjunction with this section are as follow:

(i) SC6.4 Development manual planning scheme policy sections:

Section SC6.4.3 Standard drawings

SD-065 Street Name Sign and Installation Details

Section SC6.4.17 Structures,

Section SC6.4.18 Concrete works

(ii) Australian Standards:

AS/NZS 4819 *Rural and urban addressing*

(2) Information requirements

(a) For Council to consider a name for a new road or street, the following information is required, in support of the request:

Editor's Note - An application for road/street name approval must be submitted to and approved by Council prior to the submission of any operational works application.

Editor's Note - Fees are to be paid in accordance with the Planning and Development Schedule of Fees and Charges for formal applications for road and street naming approval. Planning and Development Schedule of Fees and Charges – Schedule 1 can be found on Council's website.

(i) for new developments not associated with an estate, three proposed names for each proposed road/street;

(ii) for a new estate, a list of proposed names to be used within the estate; and

(iii) the origin of each name should be clearly stated on the submitted proposal for consideration. Requests for roads/streets to be named after significant individuals are to be accompanied by a summarised autobiography of each individual to be recognised. For groups of names with similar origins, a bulk explanation is acceptable if the theme generated is from the same source.

Editor's Note - For roads/streets that are existing gazetted roads, whether constructed or not, names must be submitted to Council for approval.

Editor's Note - The approved road/street names as well as the road/street type must be shown on the engineering drawingssubmitted for subsequent operational works approval.

(3) Criteria for naming of roads and streets

The following criteria will be used in assessing requests for road and street naming:

(a) Australian Standard (AS/NZS 4819 – *Rural and urban addressing*):

This section adopts the parts of AS/NZS 4819 identified below, for use in the naming of roads and streets:

(i) Section 1 – Scope and General;

(ii) Section 4 – Road definition and naming; and

(iii) Appendix A – Road types – Australia

Where this section is silent on a matter, Sections 1, 4 and Appendix A of AS/NZS 4819 shall apply and,further, they will prevail to the extent of any inconsistency with this section.

(b) Name duplication

Name duplication (both existing names and approved names) within the Townsville City Council Local Government Area will not be approved. This requirement is to ensure consistency and to avoid confusion andmisunderstanding in the delivery of goods or services or in the dispatch of emergency vehicles.

(c) Sources

(i) The preferred sources for road and street names include:

1. indigenous names of significance to the area, subject to prior approval of the relevant local Aboriginal or Torres Strait Islander Land Council via Council's Aboriginal and Torres Strait Islander Advisory Committee;

Editor's Note - The relevant local Aboriginal or Torres Strait Islander Land Council should be consulted via Council's Aboriginal and Torres Strait Islander Advisory Committee when choosing Aboriginal or Torres Strait Islander names unless Council already has an agreed list of appropriate names.

2. flora and fauna, generally using the common name and excluding lengthy or complex scientific names;

3. names of founding mothers and fathers, prominent citizens, or identities, excluding living persons;

4. war casualty lists;

5. local heritage values; and

6. existing road/street naming themes in the suburb or area.

(ii) Names should be appropriate to the physical, historical, or cultural character of the area concerned.

(iii) The origin of each name should be clearly stated on the submitted proposal for consideration. Requests for roads/streets to be named after significant individuals are to be accompanied by a summarised autobiography of each individual to be recognised. For groups of names with similar origins, a bulk explanation is acceptable if the theme generated is from the same source.

(iv) A variation to these sources will be considered on the individual merits of the proposal.

Editor's Note - All proposed names will be considered on their individual merit.

(d) Communication

(i) Names should be reasonably short, easy to read, spell and pronounce in order to assist service providers, emergency services and the travelling public. Proposed names should not be similar in spelling or sound to existing names.

(ii) Names must not be offensive or discriminatory.

(iii) Unduly long names and names composed of two or more words should be avoided:

1. a given name should only be included with a family name where it is essential to identify an individual or where it is necessary to avoid ambiguity, e.g., Angus Smith Drive, John Melton Black Drive, Sir Leslie Thiess Drive etc. The use of given names should generally be avoided; and

2. whilst street and cul-de-sac names should have only one word it is recognised that some roads require a two-word name because of their geographic relationship e.g., Old Common Road, Ross River Road etc.

(e) Spelling

(i) Where it is intended that a road/street have the same name as a place or feature with an approved geographical name, then particular care should be taken to ensure that the correct spelling is adopted.

(ii) Where names have been changed or corrupted by long established local usage, it is not usually advisable to attempt to restore the original form; that spelling which is sanctioned by general usage should be adopted.

(iii) Generally, road/street names proposed or approved should not contain abbreviations. For example, the "Creek" in "Wallaby Creek Road" must not be abbreviated. There is, however, one exception: "ST" should always be used in place of Saint.

(f) Form

(i) "The" must not be used in place of a name followed by a road type for example, "The Boulevard".Prepositions in road names should not be used, for example, "Hampton on Boulevard".

(ii) No directional indicators are to be used, for example, "Gold Road West" and "Gold Road East".

(iii) Prefixes such as "Upper", "New", "North" or "South" must not be used unless the name has been specifically derived from a name that includes these.

(iv) The apostrophe mark must be omitted in the possessive case, e.g., ‘Smith’s Road’ should be "Smiths Road".

(v) Hyphens are not to be used. Full stops are not to be used.

(vi) No symbols, diacritical marks or special characters are to be used. The exception is macrons for Maori names.

(vii) Numerals are not to be used. Any numbers in a name must be written in full. Only standard A to Z alphabet characters may be used.

(g) Road types

(i) Particular attention should be paid to the use of street, road, court, crescent, drive etc., to ensure that the road type is representative of the road being described. Road/Street types are to be in accordance with AS 4819 Appendix A and read in conjunction with section 4.3 of AS 4819.

(ii) The road/street type/s is required to be submitted to Council as part of the application for consideration of road/street names. The road/street type/s is to be submitted for checking by Council on plans associated with operational works approval. The road/street type must be appropriate for the road layout.

(h) Holding of approved names

Approved names remain valid for the following periods:

(i) 5 years for developments not associated with estates; and

(ii) for estates, the applicant is to advise Council at the time of the request for approval of names, the proposed, estimated time period for the completion of the estate. Approved names will be held for this time period.

(4) Street name signs

The street name signage must be in accordance with Section SC6.4.3 Standard drawing SD-065 Street Name Sign and Installation Details and installed and constructed in accordance with Section SC6.4.18 Concrete works and Section SC6.4.17 Structures, Clause SC6.4.17 (11) Signs and supporting structures

SC6.4.5.7 Maps and attachments

Map A - Urban and Rural Traffic Environments Map	Click here
Map B1 - Townsville Road Hierarchy Map (Existing)	Click here
Map B2 - Townsville Road Hierarchy Map (Future)	Click here
Attachment A - Road Hierarchy Typical Cross Section Characteristics	Click here