Chapter 6

Subdivision and Infrastructure Village and Rural Subdivision



6 Subdivision and Infrastructure – Village and Rural

This chapter is divided into two sections, as follows:

- 6.1 Village Subdivisions
- 6.2 Rural Residential Subdivisions

6.1 Village subdivision

6.1.1 Minimum Allotment Sizes

Lismore Local Environmental Plan 2000, (as amended) does not specify a minimum lot size in the 2(v) Village Zone.

The preferred lot sizes of this plan are:

- an average of 1,000 m² where reticulated/common effluent disposal is available and
- 2,000 m² where no reticulated sewerage system is available.

The Lismore Village Development Strategy proposes that in order to retain a small village character the ultimate population size of the existing villages should be kept below 1,000 persons.

Refer to specific Chapters in Part B of this DCP for more information.

6.1.3 Neighbourhood Planning

This plan encourages a concept of residential design which retains the character of the existing villages. To reinforce and create (where applicable) distinctive, identifiable and relatively self contained villages based on the following design principles:

- a maximum population threshold of 1,000 persons;
- residential densities and larger lot sizes to reinforce an open village character and atmosphere, providing peace and quiet and a sense of community;
- a rural outlook;
- increasing local self sufficiency;
- providing high levels of accessibility, including the use of public transport, and smooth travel speed and flow within the villages and to Lismore;
- lot orientation to minimise building energy use; and
- high levels of public safety.

6.1.4 Design Elements

Element:- Village Design

 To provide safe, convenient and attractive villages that meet the diverse and changing needs of the community by: Offering a wide choice in good quality housing and associated community facilities; Encouraging walking and cycling; Minimising energy consumption; and Promoting a sense of place by providing linkages with existing village focal points and the maintenance of a distinctive identity which recognises the structure of the existing village and preserves the natural environment. 			
PERFORMANCE CRITERIA	SUGGESTED SOLUTIONS		
The objectives may be achieved when the Phases in the Design Process (refer section 6) are followed and where:	There are no recommended		

	Suggested Solutions for this
1. The subdivision layout responds to site	Element, as each situation requires
characteristics, setting, landmarks and rural views	an individual approach.
through street and open space networks.	

2.	Village identity is reinforced by locating community facilities at focal points within convenient walking distance for residents.
3.	The street network provides a high level of internal accessibility and good external connections for local vehicle, pedestrian and cycle movements, with traffic management to restrain vehicle speed, deter through traffic and create safe conditions for all road users.
4.	The street layout and lot density minimise fuel use by reducing travel distances, providing for public transport effectiveness, and encouraging walking and cycling.
5.	The street and lot layout enables efficient provision of physical services.
6.	The street and lot orientation and lot dimensions facilitate the siting and design of energy efficient dwellings.
7.	The lot design and layout provides a variety of lot sizes and enables a variety of housing types and other compatible land uses.
8.	The lot design and layout provide for higher densities in areas adequately serviced and located in a manner which does not detract from the village character.
9.	The layout provides well distributed public open spaces that contribute to the character of the village and development, provide for a range of uses, are cost effective to maintain, and contribute to stormwater management and environmental care.
10.	The layout retains significant vegetation and habitat areas, particularly koala habitat.
11.	The layout is integrated with the existing village, complements existing attractive streetscapes and landscapes, and provides for shared use of public facilities.
12.	The layout enhances personal safety, and minimises potential for crime through surveillance by pedestrians and drivers of passing vehicles.
13.	The pedestrian network is safe, attractive and efficient, running largely along public spaces fronted by houses, and avoiding areas that generate major breaks in surveillance on routes used at night.

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Element:- Major Movement Networks OBJECTIVE

PERFORMANCE CRITERIA	SUGGESTED SOLUTIONS
The objective may be achieved where:	The following suggested solutions a ONE WAY of meeting the objective performance criteria:
1. The street network meets local needs and allows for the provision of public transport, for pedestrians and cyclists, and for expected vehicle traffic in a co-ordinated	The plan conforms to a Developmen Control Plan approved by Council w provides for public transport, pedest and cycleways.
manner. (<i>Table 9-1 & Figure 9-2</i>)	OR
	A Traffic Study submitted with the p provides for an integrated approach movement systems in a manner sat this Plan.
2. The arterial road network has the capability to accommodate public transport services and has capacity to safely and efficiently accommodate projected movements.	The arterial road servicing the villag Lismore is capable of meeting incre traffic.
3. The street network connects with external traffic routes in a manner which maximises movement efficiency on the traffic routes.	The street network conforms to a Development Control Plan for the and and/or Traffic Study with the proposed showing an existing and proposed r road network which satisfies project local travel and integrates with the a road network.
	The street network provides for pedestrians and cyclists in accordar with the requirements of this plan.

- 5. Village streets do not operate as through traffic routes for externally generated traffic (other than for pedestrians, cyclists & public transport).
- 6. Safe and efficient connections between transport corridors and village development are provided.
- 7. Safe and convenient links are provided for pedestrians and cyclists across transport corridors and to the existing village.
- 8. The spacing of intersections between street networks in the village and road networks in corridors protects the performance of the road corridors and preserves the quality of the street networks in the village.
- **9.** Access arrangements for housing along an arterial road do not impede the traffic performance of the road.

Minimum Standards and Techniques



Access streets Collector Streets Arterial/subarterial road



The street network conforms to a Development Control Plan for the area, showing an existing and proposed road network which satisfies projected district travel.

Through traffic with projected traffic volumes exceeding those specified in *Table 6-1* is not preferred in village streets.

Connections between residential streets and arterial roads are in accordance with the requirements of *Table 6-3.*

Intersections between the external roads and the internal road network are located so as to minimise restriction of movement on the roads, and to avoid traffic volumes in excess of 1,500 vpd on local collector streets.

Proposed housing development along a movement corridor does not have direct vehicle access to an arterial road unless there are no suitable alternatives, in which case provision must be made for vehicular access to and from the road to be in a forward direction.

Source: AMCORD

Table 6-1: Village Street Types

Street	Function
Village Laneway (including right of way) Privately owned right of way or access easement under Community Title.	is an access street to be held in private ownership. These streets provide a shared carriageway for use by pedestrians, cyclists and vehicular traffic. No provision for parking is made within the laneway. The laneway services less than 5 dwellings where the majority of those dwellings do not utilise the lane as the sole means of access. Where the laneway is the sole means of access the number of lots it services is to be less than 3.
Village Access Place (small cul-de-sac)	is a street in which the residential environment is dominant. These streets provide a shared carriageway for use by pedestrians, cyclists and vehicular traffic. Footpaths not required. There is only one entry and exit point. Generally, the number of dwellings does not exceed 5. Traffic volume, less than 50 veh/day.
Village Local Street	is a street in which the residential environment coexists with vehicular traffic pedestrians and cyclists. Footpaths required where the street connects to a Collector Street. Traffic volume, less than 500 veh/day.
Village Collector Street	is a street in which the residential environment coexists with vehicular traffic, pedestrians and cyclists. Pedestrian movements are facilitated by paths on the verge. Vehicular parking partly on the verge and carriageway. Footpaths provided on one side of the street only. The street caters for up to 50 dwellings and distributes traffic to higher volume streets. Traffic volume, less than 1,500 veh/day.
Village Sub-arterial Street	typically collects traffic from lower volume streets and may provide bus routes within residential neighbourhoods. Separate provision to be made for cyclists and pedestrians which provide district connections. On-street parking is provided in the carriageway. Traffic volume, more than 1,500 veh/day. Sub-arterial streets provide the highest order of road linkages between the village roads and arterial roads to Lismore.
Arterial Road	refer to Rural Roads Policy

Element:- Local Street Networks

OBJECTIVE
To create street networks in which the function of each street is clearly defined, providing acceptable
levels of access, safety and convenience for all users.

Street	Function
The objective may be achieved where:	The following suggested solutions are ONE WAY of meeting the objective and performance criteria:
 Function and structure 1. The street network has a clear structure and component streets conform to their function in the network. 	<i>Function and structure</i> Streets link with other streets that are no more than two levels higher or lower in the hierarchy.
2. The network has clear physical distinctions between each type of street. These distinctions are based on function, legibility, convenience, traffic volumes, vehicle speeds, public safety and amenity.	The street network reflects the characteristics specified in <i>Table 6-1, 6-2, 6-3, 6-4 and 6-5.</i>

3. The design features of each type of residential street encourage driver behaviour appropriate to the primary function of the street.

Safety, access and convenience

- 4. Intersections along residential streets are spaced to create safe and convenient vehicle movements.
- 5. The street network creates convenient movement for residents between their homes and higher order roads.

Mode choice

- 6. There is provision for efficient bus routes which are direct and safely accessible by foot from the majority of dwellings and activity centres.
- 7. The alignment and geometry of streets carrying bus routes provide for ease of movement of buses without retracing the route, complicated turning manoeuvres and without facilitating high traffic speeds.
- **8.** The street network facilitates walking and cycling within the village.

Village design and character

- **9.** The street network takes account of the topography and vegetation, respects any existing or potential site assets, and takes advantage of opportunities for views and breezes.
- **10.** The street network takes account of the streetscapes that may be created or that already exist.
- **11.** The street network is oriented, where practical, to promote efficient solar access for dwellings.
- **12.** The street network takes account of natural drainage and open space systems.

Environmental protection

- **13.** Traffic generated by a development is within the acceptable capacity of the roads.
- **14.** Streets do not operate as through traffic routes for externally generated traffic, while limiting the length of time local drivers need to spend in a low speed environment.

Safety, access and convenience Intersections are spaced as set out in *Table 6-2.*

The driving distance from any dwelling to the nearest collector (or higher-order) road is minimised.

Turning movements at intersections are to be minimised in order to travel from any home to the most convenient collector street or higher order road.

Mode choice

Public transport routes and stops are provided as set out in *Element - Public Transport*

Streets provide a safe, convenient and legible network for pedestrians and cyclists in accordance with *Element Pedestrian and Cyclist Facilities*.

Village design and character

The street network permits the establishment of streetscapes that incorporate the provisions of *Element Street Design and On-street Parking*.

The streets are aligned in east-west or north-south direction, wherever possible.

Environmental protection

15. The street network is designed to reduce traffic speeds and volumes to acceptable levels, with most dwellings fronting streets with low volumes.	Intersections within the street network are either roundabouts or other appropriate traffic management treatments to slow and control traffic.
 16. The impact of measures intended to restrain traffic speeds and/or volumes takes account of the needs of other street users and adjoining dwellings, by avoiding: stop start conditions; unacceptable traffic noise to adjoining dwellings; devices which reduce convenience or safety levels for cyclists and public transport. 17. Streets and lots are located so that dwellings are not subject to unacceptable levels of traffic noise. 	 Traffic speeds and volumes are restrained through measures such as: limiting street length; introducing bends; and introducing slow points Traffic noise in residential streets should not exceed 55 dB(A) L₁₀ at the facade of dwellings.
 Cost effectiveness 18. Streets and carriageway widths and street lengths optimise the cost effectiveness of the street network. 	Cost effectiveness Major collectors are less than 150 m. long, except where the topography or the location of major traffic routes makes a longer distance unavoidable.
19. The network provides for the cost effective provision of public utilities.	The network caters for the provision of public utility networks including water, sewerage (where required), electricity and telecommunications.

Minimum Standards and Techniques

Table 6-2:	Classification	of Village	Streets
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Street level/type and function	Design speed	Indicative	Stopping
	(km/hr.)	traffic vol.	sight dist.
		(vpd)	(metres)
Village Laneway or Right of Way	10	< 50	
Village Access Place	40	< 50	
Village Local Street	40	< 500	40
Village Collector Street	40	< 1,500	40
Village Sub-arterial Street	60	1,500+	70

Table 6-3: D	Desirable	Minimum	Intersection	Spacing
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		0
Street Type	Same side of	Opposite side of the street
	street	from centreline (metres)
	(metres)	
Village Access Place	40	See
Village Local Street	40	Austroads
Village Collector Street	40	Pt. 5.
Village Sub-arterial Street	100	



Figure 6-2: Minimise turning movements from the lot to collector streets

Element:-	Pedestrian	and C	yclist F	Facilities
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OBJECTIVE				
attraction within the development and village.				
PERFORMANCE CRITERIA	SUGGESTED SOLUTIONS			
The objective may be achieved where:	The following suggested solutions are ON WAY of meeting the objective and performance criteria:			
 <i>Planning</i> 1. The residential streets and paths provide a network of pedestrian and cyclist routes, with connections to adjoining streets, open spaces and activity centres. 2. A network of footpaths and cycle routes is provided that accounts for: the need to encourage walking and cycling; likely users (e.g. school children, parents with prams, the aged and people with disabilities, and recreational cyclists); opportunities to link open space networks and community facilities, including public transport, local activity centres and schools; topography; cyclist and pedestrian safety. 	Planning Where a Development Control Plan, Traff Study with a proposal or an approved Pedestrian and Cyclist Plan exists, pedestrian and cyclist paths are to be provided in accordance with that plan.			
 Location and design 3. The location of footpaths and cycleways in a street reservation is determined by: whether vehicle speeds and volumes are low and the use of the street pavement by cyclists does not affect the comfort and safety of pedestrians; whether pedestrians and cyclists are protected from parked vehicles and vehicles moving along the street and on driveways; whether postal delivery will be significantly inconvenienced; 	 Location and design Footpaths and cycleways are provided in accordance with Table 6-3 and 6-4. OR Footpaths are provided on one side of streets with traffic volumes greater than 150 vpd. No footpaths are required on streets with traffic volume <150 vpd as pedestrians cas share with vehicles in a low speed environment. 			

- the location of physical services;
- cross falls;
- landscaping;
- whether there is any development fronting that part of the street;
- cyclist and pedestrian safety;
- cost effective construction.

4. The alignment of paths allows safe and convenient use by pedestrians and cyclists and is varied to preserve trees and other significant features. A focus on vistas and landmarks add visual interest where they exist.

5. Footpaths and cycleways are well lit and located where there is casual surveillance.

6. Footpaths or shared paths are designed and constructed of appropriate width, longitudinal gradient and sight distance to cater for the number of projected pedestrians and cyclists, and user types (e.g. the aged, the very young, people with prams and people with disabilities).

7. Design of streets accommodates pedestrian and cyclist use of street pavements in access places, and cyclist use of street pavements in access streets and collector streets.

8. Provision is made for the location of seats in appropriate places.

9. There is adequate provision for passing with paths widened at potential conflict points or junctions on high use facilities to allow for passing of pedestrians/cyclists.

Safe Crossings

10. Safe street crossings are provided for all street users with safe sight distances and adequate pavement markings, warning signs and safety rails (where appropriate for cyclists).

Construction

11. Pedestrian and cyclist paths are constructed to provide a stable surface for projected users, which are easily maintained.

Collector streets on which there is access to lots or where there is a planned pedestrian or cyclist path are provided with a separate path on one side clear of the carriageway pavement.

A pedestrian (only) footpath, where required, is 1.2 metres wide and has a maximum grade of 15%.

Footpaths are widened to 1.5 metres minimum in the vicinity of meeting points, schools, shops and other activity centres and along Trunk Collector streets.

Cycle paths and shared paths have widths in accordance with *Figure 6.5.*

Maximum longitudinal gradient of cycle paths to be no greater than that at any adjacent street pavement.

Paths are widened at potential conflict points or junctions in areas of high use, such as schools, corner stores etc.

Construction

Footpaths are to be constructed in accordance with Council's "General Specification for the Construction of Road and Drainage Works".

Cycleways may be constructed of an asphalt sealed pavement or equivalent standard concrete pavement.

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Segregated path dimensions



Source: AMCORD

Desirable minimum bicycle path

Figure 6-3: Protection for cyclists and pedestrians



Figure 6-4: Designing for cyclists at vehicle slow points

Element:- Public Transport

OBJECTIVE				
To increase opportunities for choice in mode of transport and provide cost effective and energy				
efficient public transport services that are accessible	and convenient to the village community.			
PERFORMANCE CRITERIA	SUGGESTED SOLUTIONS			
The objective may be achieved where:	The following suggested solutions are ONE WAY of meeting the objective and performance criteria:			
 Planning 1. Village densities provide for and encourage the economic provision of regular public transport services. 	Planning Where a Development Control Plan or other planning instrument exists, routes, neighbourhood and net residential densities conform with that plan.			
 2. A public transport route is provided that takes account of: projected travel demand; distribution of likely demand; scale and time of demand; characteristics of travellers; travel time; operating characteristics; cost of providing the service; and route location and design. 	The majority of lots are within 400 metres safe walking distance from an existing or potential bus route.			
 <i>Route location and design</i> 3. Convenient connections to adjoining areas provide for ease of movement of buses within the village and onto arterial roads. 	Route location and design			
4. Buses are able to safely gain access to the development without complicated turning manoeuvres.				
5. The alignment and geometry of the streets that form the bus route allow for the efficient, circular and unimpeded movement of buses without facilitating high traffic speeds.	Routes for regular bus services are designed in accordance with <i>Table 6-4 and 6-5.</i>			
Bus stop location and design6. Public transport stops provide for pedestrian safety, security, comfort and convenience.	Bus stop location and design Bus stops are, or are planned for, 400 metre spacings where the route serves residential development.			
	The siting of bus stops is related to the pedestrian path network.			
 7. Bus stops are designed to prevent vehicles from overtaking a stationary bus, or vehicle speeds are reduced to ensure safe pedestrian crossing. 8. Bus stops are located and designed to provide shelter, seats, adequate lighting and timetable information, are overlooked from nearby buildings, and are located to minimise adverse impact on the amenity of nearby dwellings. 	Bus shelters are provided at key locations.			

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Table 6-4: Minimum requirements for Bus Routes

STREET CARRIAGEWAY WIDTHS	
One-way: 6.5 metres	
Two-way: 9.0 metres or 7.5 metres where	bus bays are provided with a traffic calming and
management.	
TURNING CIRCLE	
R 12.5 metres + 1 m. gravel shoulder for si	ngle bus
ROUNDABOUTS	
Maximum desirable pavement crossfall:	3%
Maximum desirable longitudinal gradient:	6%
Absolute maximum gradient:	12%



Figure 6-5: Traffic control for buses

Element:- Public Open Space

OBJECTIVE				
To provide, where appropriate, public open space that meets user requirements for outdoor recreational and social activities and for landscaping that contributes to the identity and environmental health of the community.				
PERFORMANCE CRITERIA	SUGGESTED SOLUTIONS			
The objective may be achieved where:	The following suggested solutions are ONE WAY of meeting the objective and performance criteria:			
 The multi functional role of public open space, and its use as a community facility is recognised and promoted. 	Public open space is provided in accordance with an approved open space strategy or Development Control Plan.			
 Public open space provides: a range of recreation settings, corridors for community paths, and attractive village settings and focal points; adequate facilities to meet the needs of the community as reflected by indicators such as population density and demographic structure; accessibility to users in conjunction with existing facilities; opportunities for the incorporation of existing trees, rocks, streams and other sites of natural or cultural value, and linkage of habitats and wildlife corridors; opportunities to link public open spaces into a legible network; public safety and reasonable amenity of adjoining land users in the design of facilities and associated engineering works; for future maintenance requirements; a clear relationship between public open space and adjoining land uses, established by appropriate treatment including alignment fencing, landscaping, and issues of security and surveillance; avoidance of continual lengths of solid fencing along open space areas for security, surveillance, aesthetic and maintenance reasons. 	 Submission of a plan and documentation showing: the adjacent street reserves, carriageways, parking bays, footpaths, cycleways and street and park lighting; existing vegetation and proposed general character of tree planting and landscaping (including proposed species); existing rare or significant vegetation, natural habitats and features (e.g. creeks) which are retained, enhanced or otherwise affected; general arrangement of hard landscaping elements and major earth cuts, fills and mounding; indicative treatment of any drainage systems, along with general information on fencing, access points and furniture; proposed recreation facilities; and the age groups of intended user targets and the facilities to be provided to service the user group; the distances from the furtherest lot in the development. Parks include provision for lighting where appropriate in accordance with Australian Standard 1158.1 (1986). Parks should have a minimum area of 5,000m ² , except where there function is primarily to provide cyclist / pedestrian connection or habitat linkages.			



A variety of recreation settings should be provided.





It is important to provide sufficient space around water features and detention ponds to maximise the land area available for recreation use and to create a quality setting for major elements.

Figure 6-6: Designing for open space

In this residential estate, the primary function of the detention basin is recreation. A development of this quality should qualify as open space rather than 'drainage' reserve.

Physical Infrastructure

Element:- Street Design and On Street Parking

OBJECTIVE

To provide for streets that:

- fulfil their designated functions within the street network,
- accommodate public utility services,
- accommodate drainage systems, and
- create a safe and attractive environment.

PERFORMANCE CRITERIA	SUGGESTED SOLUTIONS
The objective may be achieved where:	The following suggested solutions are ONE WAY of meeting the objective and performance criteria:
 Function and width 1. The design features of each type of residential street convey its primary function. 2. The street reserve width is sufficient to cater for all street functions, including: safe and efficient movement of all users; provision for parked vehicles; provision of landscaping; location, construction and maintenance of 	 Function and width The following street components for each type of street are as specified in Table 6-5: street reserve widths; carriageway widths; verge widths; parking within street reserve; kerb type; pedestrian and cyclist facilities; number of desired lots the road is to
3. The verge width is sufficient to provide for special site conditions and future requirements.	The verge width is increased where necessary to allow space for larger scale landscaping, indented parking, future carriageway widening, retaining walls, cycle paths or overland flow paths.
Designing for safety 4. The design facilitates safe use by pedestrians, particularly people with disabilities, the aged and children, by:	Designing for safety
 providing a carriageway width which allows vehicles to proceed safely at the operating speed intended for that level of street; making allowances for restrictions caused by on street parking; providing a horizontal and vertical alignment which is not conducive to excessive speeds; promoting the safety of pedestrians at bus stops and other crossing points; promoting the safety of cyclists in streets and at crossing points. 	
5. Speed reduction techniques are used to achieve desired speeds, as part of a design for the whole street environment, and include the following principles:	Traffic speeds and volumes are restrained through one or more of the following measures:

- slow points including either horizontal or vertical deflection are designed to slow traffic to design speeds;
- slow points and carriageway narrowing are designed to take into account the needs of cyclists, by ensuring speed compatibility, adequate space for concurrent passage, or off street diversions;
- landscape design, on street parking and streetscape design are used to complement speed restriction measures;
- speed restriction techniques and devices are not used in isolation;
- the verge provides safe sight distances, taking into account expected vehicle speeds and pedestrian and cyclist movements.

6. Safe sight distances, based on vehicle travel speeds, exist at property access points, pedestrian and cyclist crossings and at junctions and intersections.

Driveway Access

7. The carriageway and verge width allows for unobstructed access to individual lots, even when a car is parked on the opposite side of the street.

Driveway egress movements do not create a safety hazard.

(i) Limiting street length

Where street 'leg' length is limited to control vehicle speed, the lengths between slow points are designed to restrict operating speeds.

(ii) Introducing bends

Where bends are introduced to control speeds to 20 km/h or less, the deflection angle in the change of the alignment of a street or pavement is at least the angle determined from *Table 6-7.*

(iii) Introducing slow points Where slow points are used to allow speeds greater than 20 km/h, the length of street between two bends or slow points complies with the distances specified in Table 6-6.

Speed reduction devices are part of a design for the total street environment.

Where speed restriction devices are used in isolation, they include:

- full horizontal displacement of the vehicle path;
- swept vehicle paths to have a 20 m. radius;
- constriction on exit rather than on entry (otherwise there is a risk that the device may be short cut);
- additional pavement treatment behind the kerb for a large vehicles;
- line marking and signposting

Driveway Access

Motorists can enter or reverse from a lot in a single movement.

Lot design enables driveways on major collector streets and streets which carry more than 1,500 vpd to be designed to promote forward movement of vehicles across the verge.

 Geometric Design 8. Bus routes have a carriageway width that: allows for the movement of buses; unimpeded by parked cars; safely accommodates cyclists; avoids cars overtaking parked buses. 9. The horizontal and vertical alignments satisfy safety criteria and reflect physical land characteristics and major drainage functions. 	Geometric Desig The geometry of routes provides s sight distance, gr buses (as determ design document carriageway width specified in <i>Table</i> Longitudinal grad gradients specifie Curve super elev 6%. For downgrades should be based maximum speed downgrades >10 ⁶
	crossfall on stree
10. Geometric design for intersections, roundabouts and slow points is consistent with the vehicle speed intended for each street.	Design complies Guidelines. Sufficient area is cul-de-sacs for w make a 3 point tu
11. Kerb radii at intersections and junctions are kept to a minimum, subject to:	Kerb radii do not
 satisfying required turning manoeuvres; keeping pedestrian crossing distances to a minimum; controlling the speed of vehicles. 12. Siting conditions on land abutting major and miner distribute periods around that all wabishes.	 between colle turns to be made movement: between colle the design he path radius l5 pavement. between acco design car (tu using the cor only.
can enter or leave the street in a forward direction.	On street parkin
 On street parking 13. Carparking is provided in accordance with projected needs which are determined by: the number and size of probable future dwellings; the carparking requirements of likely future residents; 	One on street par provided for ever are to be located parking bays con located within 60

streets identified as bus suitable turning, stopping rade and parking for nined from appropriate ts), and has maximum hs within the ranges e 6-4.

lients do not exceed the ed in Table 6-4.

ration does not exceed

of 5-10% street design on an increase of the of 5 km/h. For %, this maximum speed sed by 10 km/h.

et pavement is to be 3%.

with AUSTROADS

provided at the head of aste disposal vehicles to ırn.

exceed 8 m.

are accommodated using , to enable the following in a single forward

- ector and access streets, eavy rigid vehicle (turning 5 m.) using any part of the
- ess streets, the 99 % urning path radius 7.5m), rect side of the pavement

ıg

rking space is to be y two dwellings. These against the kerb or in structed within the verge, m. of each allotment.

Minimum Standards and techniques





Table 6-5:	Village Stree	t Characteristics	(refer	Tables 6-1	, 6-2 & 6	3-3)
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Element	Laneway Private or Community Title only	Access Place	Local Street	Collector Street	Sub- arterial Street	Access Place (if lots less than 2000m ²)	Local Street (if lots less than 2000m ²)
<u>Road</u> <u>Reserve</u> <u>Width (</u> m)	Variable	16	18	18	20	16	18
<u>Carriageway</u> <u>Width</u> (<u>Pavement</u> <u>Cement</u> <u>Stabilised)</u> metres	1 lot 3 m seal 2 lots 4m seal 2x0.5m gravel shoulders	5 m seal 2 x 1m gravel shoulders	6m seal 2 x 1m gravel shoulder 5.5m seal with designed traffic mgmt & parking	9m seal (incl. bus route) 2x1m gravel shoulder 7m seal, with designed traffic mgmt & parking	13m seal 2x1m gravel shoulder 11m seal with designed traffic mgmt & parking	6m seal 5.5m seal with designed traffic mgmt & parking	7m seal 5.5m seal with designed traffic mgmt & parking
<u>Max.</u> longitudinal gradients	20%	20%	20%	10%	10%	20%	20%
<u>No. travel</u> lanes	1	2	2+	2+	2+	2	2
<u>Parking in</u> <u>reserve</u>	None	Verge.	Verge + indent parking @ 1 / 1 lot if pavement < 7m.	Carriage- way	Carriage- way	Verge + indent parking @ 1 / 1 lot if pavement < 5.5m.	Verge + indent parking @ 1 / 1 lot if pavement < 5.5m.
<u>Kerb type</u> Note 1	Layback or grass swale	Layback or grass swale	Layback or grass swale	Layback	Upright	Layback	Layback
Footpath Built & concrete	Nil, road	Nil, road	Nil, road	1 x 1.2 m. in verge	1 x 1.5 m. in verge	Nil	Nil
<u>Cycleway</u>	Road	Road	Road	Road	Good visibility 1 x 3.5 m. on carriage- way	Road	Road
Verge width	variable	2 x 4	2 x 4.75	2 x 4.5	2 x 3.5	2x5	2x5.5
metres		(2 x 5)	(2 x 5)	(2 x 5)	(2 x 4.5)		
No. of lots to be serviced	< 3	5 and less	<50	50 - 150	> 150	5 and less	< 50

Note 1: Scouring of grass swales is likely to occur in grades exceeding 7%. Where gradients in excess of 12% occur, kerb and gutter must be provided on all roads.

Table 6-6: Village Street leg length and travel speed.

Street type	target travel speed	Max. leg length
	(km/hr)	between slow points
Village Access Place	30	75-100
Village Local Street	40	100-140
Village Collector Streets	40	120-150

Priority Junctions and Driveways



Visibility uninterrupted by fixed objects to be provided over entire shaded area. Hilly terrain may require junctions to be moved onto or well away from crests to satisfy sight distance Vertical Curves requirements.

Stopping distance Y is directly related to speed. Increased speed requires increased verge width to improve visibility of people or cars coming out of driveways or at intersections.



(c) Carriageway Edge



Planting with foliage in the height range of 0.6m to 2m should not restrict the available sight distance to less than Y on streets with frontage access. 1.15m represents the standard driver eye height.

Source: AMCORD





Figure 6-9: Measures to control vehicle speed

Table 6-7: Minimum deflection angles for traffic control devices (20 km/hr).

Bend type	Street pavement width	
	5.0 - 6.0 metres	7.0 - 7.5 metres
Single bend	70 ⁰	90 ⁰
Chicane (two reverse single bends)	45 ⁰ - 45 ⁰	60 ⁰ - 60 ⁰



Figure 6-10: Examples of verge and on street parking treatment

Element:- Street Construction

OBJECTIVE	
To construct streets that support the design intentions without unnecessary construction and whole of life cycle costs.	
PERFORMANCE CRITERIA	SUGGESTED SOLUTIONS
The objective may be achieved where:	The following suggested solutions are ONE WAY of meeting the objective and performance criteria:
 The pavement edging and landscaping support the specified functions and amenity of the street. 	Pavement and landscape materials are used, where appropriate, to distinguish different street functions.

 The pavement edge: controls vehicle movements by delineating the carriageway for all users; assists in controlling stormwater runoff; provides for people with disabilities, by allowing safe passage of wheelchairs and other mobility aids. 	Pavement edges at pedestrian crossings are constructed for wheelchair and pram access and to assist sight-impaired people in accordance with <i>AS1428 Pt I and Pt 4.</i>
3. Street pavement surfaces are well designed and durable enough to carry wheel loads of travelling and parked vehicles; ensure the safe passage of vehicles, pedestrians and cyclists; the discharge of rainfall, and the preservation of all- weather access; and allow for reasonable travel comfort.	Elexible pavement construction and kerb
4. Consistent with <i>Performance Criteria 3</i> , public street construction and whole of life cycle costs are kept low.	and gutter profiles are based on the requirements contained in Council's "General Specification for the Construction of Road and Drainage Works".

Element:- Utility Services

OBJECTIVE To ensure that residential areas are adequately serviced with sewerage (where applicable), water, fire fighting, electricity, street lighting and communication services in a timely, cost effective, co-ordinated and efficient manner that supports sustainable development practices.

PERFORMANCE CRITERIA	SUGGESTED SOLUTIONS
The objective may be achieved where:	The following suggested solutions are ONE WAY of meeting the objective and performance criteria:
 Design and provision of utility services, including sewerage, water, electricity, street lighting, and communication services, are cost effective over their life cycle and incorporate provisions to minimise adverse environmental impact in the short and long term. Compatible public utility services are located in common trenching in order to minimise the land required and the costs for underground services. Cables for cable television should be underground where electricity service is underground. Development occurs within locations where there is an adequate water supply for domestic and fire fighting purposes. Development is staged to ensure that each stage is fully serviced before a new area is released. 	 The design and provision of utility services conforms to Council's; "General Specification for the Construction of Road and Drainage Works", "Specification for the Construction of Sewers", and "Specification for the Construction of Water Reticulation". The requirements of other relevant supply authorities. Lot layout to be designed to ensure that effluent from each lot can gravitate into the sewer. This might require a building envelope and a minimum floor level.

6. Water supply and sewerage networks are accessible, easy to maintain, and cost effective based on life cycle costs.	
7. The selection of materials used for water supply and sewerage works is determined by suitability, durability, ease of maintenance and whole of life cost effectiveness, achieving beneficial environmental impacts/energy savings etc. from new materials and technologies.	
8. Adequate buffers are maintained between utilities and houses to protect residential amenity and health.	
9. Public lighting shall be designed to maximise energy efficiency.	 Public lighting is designed in accordance with: Australian Standard AS/NZS 1158 "Lighting for Roads and Public Spaces"; The NSW Public Lighting Code; and Any relevant street lighting service agreements between council and the service provider. The efficiency of public lighting lamps is no less than 60 lumens/watt. (Note that mercury vapour lamps do not meet this criterion)
	 Public lighting lamps are shielded so that no light is emitted above the horizontal thus minimising wasted light.

Minimum Standards and techniques



Figure 6-11: Utilities and typical joint trenching

Element:- Effluent Disposal

OBJECTIVE		
To ensure that residential areas are adequately serviced with on-site sewerage systems (where the area is not sewered) in a cost effective, co-ordinated and efficient manner that supports sustainable development practices.		
PERFORMANCE CRITERIA	SUGGESTED SOLUTIONS	
The objective may be achieved where: 1. No risk to public health occurs.	The following suggested solution is ONE WAY of meeting the objective and performance criteria:	
2. Land quality deterioration through chemical or biological contamination, or degradation of soil structure does not occur.	The design and provision of wastewater systems conforms to Council's current On-Site Sewage & Wastewater Management Strategy. OR	
3. There is no contamination of surface waters emanating from the site, including first-flush rainfall runoff, contaminated surface or subsurface flow or contaminated groundwater.	A decentralised wastewater management system (packaged treatment plant), including appropriate management and maintenance systems, is provided.	
4. Groundwater is not contaminated.		
5. Useful resources in domestic wastewater (e.g. nutrients, organic matter and water) are identified and utilised to the maximum.		
6. Unreasonable interference and nuisance to the public from odour, dust, insects and noise above background levels is to be avoided.		
 On-site wastewater management systems are preferably of a low technology design. 		

6.1.5 Stormwater Management

Element:- Stormwater Drainage

OBJECTIVES		
 To provide major and minor drainage systems which: Adequately protect people and the natural and built environments to an acceptable level of risk and in a cost effective manner, in terms of initial cost and maintenance, and Contribute positively to environmental enhancement of catchment areas. 		
PERFORMANCE CRITERIA	SUGGESTED SOLUTIONS	
The objectives may be achieved where:	The following suggested solutions are ONE WAY of meeting the objectives and performance criteria:	
<i>Major system</i> 1. The major stormwater drainage system has the capacity to safely convey stormwater flows resulting from the relevant design storm under normal operating conditions, taking partial minor system blockage into account.	<i>Major system</i> The design and construction of the major storm drainage systems are in accordance with the requirements of <i>Australian Rainfall and Runoff</i> (1987) and Council's "General Specification for the Construction of Road and Drainage Works".	

2. The major system has the capacity to convey safely, but possibly with flooding, stormwater flows resulting from events more extreme than the design storm without significant property damage.

3. Ground floor levels of all buildings are located above the design flood level to provide protection to property in accordance with the accepted level of risk.

4. Floodways are developed for storms greater than pipe capacity and which ensure that there is a low risk of property damage.

5. Community benefit is maximised through the retention of natural streams and vegetation wherever practicable and safe, the incorporation of sports grounds and other less flood sensitive land uses into the drainage corridor and the placement of detention basins where necessary to control stormwater.

6. The major system is designed to ensure that there are no flow paths which would increase risk to public safety and property.

Minor System

7. The minor storm drainage system has the capacity to control stormwater flows under normal operating conditions for the relevant design storm with minimal risk of blockage.

8. Drainage networks are well defined to ensure there are no hidden flow paths which could reduce their capacity to convey design flows.

9. The design of the minor system takes full account of existing downstream systems.

10. The minor system design allows for the safe passage of vehicles at reduced speed on streets which have been affected by runoff from the relevant design storm.

11. The minor system is accessible and easily maintained.

12. Where a portion of the minor system lies within a site, access is available for maintenance.

13. The selection of materials used for the construction of the minor system is based on their suitability, durability, maintainability and cost-effectiveness.

The major system design is undertaken on a Total Catchment Management basis.

The major system design outflow is matched to the capacity of any existing downstream system and where necessary detention basins etc. are provided to retard stormwater flows onto downstream properties.

Minor System

The design and construction of the minor storm drainage system are in accordance with the requirements of *Australian Rainfall and Runoff (1987)* and Council's "General Specification for the Construction of Road and Drainage Works".

The minor system design outflow is matched to the capacity of any existing downstream system.

The minor system allows for the safe passage of vehicles at reduced speeds on streets which have been affected by runoff from a 10% AEP storm event.

Site drainage

- 14. Subdivision design and layout provides for:
- on-site stormwater detention and retention and
- on-site infiltration.

DRAINAGE OUTLETS

15. All stormwater systems shall be designed to discharge appropriate water volume, velocity and quality to an acceptable legal point of discharge.

Site drainage

Where soil and site geological conditions permit, on-site retention in storage tanks, soak trenches or other arrangements are provided.

OR

Where site topography prevents the discharge of stormwater directly to the street gutter or a Council controlled piped system, inter-allotment drainage is provided to accept runoff from all existing or future impervious areas that are likely to be directly connected.

The design of drainage systems is undertaken by a suitably qualified person. The design and construction of the inter allotment drainage system are in accordance with the requirements of *Australian Rainfall and Runoff (1987)* and Council's "General Specification for the Construction of Road and Drainage Works".

Inter-allotment drainage should preferably not service more than 10 lots.





The type of detention basin chosen should be based on a range of functional requirements and site conditions.

Source: AMCORD



Preferred treatment

cent grassed od with trees



Figure 6-13: Pollutant traps and wetland filters

Source: NSW EPA

Element:- Water Quality Management

OBJECTIVE

- To provide water quality management systems which:
- ensure that disturbance to natural stream systems is minimised, and
- stormwater discharge to surface and underground receiving waters, both during construction and in developed catchments, does not degrade the quality of receiving waters.

SUGGESTED SOLUTIONS
The following suggested solutions are ONE WAY of meeting the objective and performance criteria:
An Erosion and Sediment Management Plan is prepared by properly qualified personnel using recognised and locally accepted design methodologies.
The Erosion and Sediment Management Plan is to comply with the Department of Land and Water Conservation's "Urban Erosion and Sediment Control Manual"
and Council's "General Specification for the Construction of Road and Drainage Works". and "Soil Erosion and Sediment Control Guidelines".
Water pollution control ponds or wetlands are developed (where appropriate) for final treatment before discharge to the wider environment. Should be sited to minimise impacts on the natural environment.

6.1.6 Streetscape and Lot Layout

Element:- Streetscape and Landscaping

OBJECTIVE	
To provide attractive streetscapes that:	
• Reinforce the functions of a street,	
 Enhance the amenity of buildings, and 	
Are sensitive to the built form, landscape and	environmental conditions of the village.
PERFORMANCE CRITERIA	SUGGESTED SOLUTIONS
The objective may be achieved where:	The following suggested solutions are ONE

 The objective may be achieved where: The street and landscape design achieves: 	WAY of meeting the objective and performance criteria:	
 the creation of attractive residential environments with clear character and identity; 	A Landscape Plan is submitted that demonstrates how the Performance Criteria are met, showing:	

- respect for local topography;
- habitat protection;
- respect for existing attractive streetscapes in established areas;
- appropriate streetscapes in areas where desired future urban character has been defined;
- provision for appropriate street tree planting taking into account the natural landscape, the image and role of the street, solar access requirements, soils, selection of appropriate species, and services;
- use of such features as views, vistas, existing vegetation and landmarks.
- 2. The design of the landscape in public streets:
- defines a theme for new streets, or complements existing streetscapes and integrates with new developments;
- is sensitive to site attributes;
- complements the functions of the street;
- reinforces desired traffic speed and behaviour:
- is of an appropriate scale relative to both the street reserve width existing or expected future building bulk;

- promotes safety and casual street surveillance;
- improves privacy and minimises unwanted overlooking;
- incorporates existing vegetation where possible and desirable;
- promotes the planting of native vegetation in environmentally sensitive areas;
- appropriately accounts for streetscapes and landscapes of heritage significance;
- assists in microclimate management;
- maximises landscaped areas where appropriate;
- integrates and forms linkages with parks, reserves and transport corridors;
- enhances opportunities for pedestrian comfort;
- achieves lines of sight for pedestrians, cyclists and vehicles;
- provides adequate lighting for pedestrian and vehicle safety;
- provides attractive and co-ordinated street furniture and facilities to meet user needs;
- satisfies maintenance and utility requirements and minimises the visual impact of above ground utilities.

- the street reserve and indicative locations of the carriageway, parking bays, footpaths, cycleway systems, speed control devices and, where practicable, driveways, bus stops, street lighting and substations;
- location of existing vegetation to be removed or conserved;
- location, species and general character of tree planting and hard and soft landscape treatment.

Landscape is in accordance with Council's *"Landscape Guidelines"*,

OR

any approved landscape strategy for the area.

Compliance with this requirement is achieved by submission of a plan meeting the performance criteria and showing:

- boundaries and areas of communal open space including sites for specific recreational uses;
- existing vegetation and proposed general character of landscape treatment;
- general arrangement of hard landscaping elements and major earthcuts, fills and mounding;
- indicative treatment of floodways and drainage lines, along with general information on fencing, access points, furniture, pavement style, and treatment of the verge including any associated parking or drainage requirements;
- landscape plantings in buffers is to be dense to minimise future maintenance.

Element:- Lot Layout

OBJECTIVES

To provide a range and mix of lot sizes to suit a variety of dwellings and household types, with areas and dimensions to meet user requirements.

To provide lots that are oriented where practicable to enable the application of energy conservation principles.

To encourage a lot layout which will provides and reinforces existing areas and facilities providing community focus and interaction.

PERFORMANCE CRITERIA	SUGGESTED SOLUTIONS
The objectives may be achieved where:	The following suggested solutions are ONE WAY of meeting the objectives and performance criteria:
<list-item><list-item><list-item><list-item></list-item></list-item></list-item></list-item>	 Size Lots are capable of containing a building envelope of 18 x 10 or 15 x 12 metres. Lots sizes between 1,000 and 2,000 m² are preferred. An absolute minimum lot size of 800 m², with an average of 1,000 m² where reticulated / common effluent disposal is available and 2,000 m² where no reticulated sewerage system is available. Lots with an area less than 2,000m² are square or rectangular in shape. Lots with an area less than 2,000m² are located on land with a slope of less than 10%. Smaller lots to be located near the village centre. Lots on slopes should be larger to reduce the need for building earthworks, compensate for loss of useful open space, potential difficulties with house construction and provision of access and where applicable, wastewater treatment and disposal. Generally at least 1,000 m² where slopes are over 15 %. All lots should have an area capable of accommodating a building envelope on slopes less than 20%.

<i>User requirements</i> 5. Lot frontages are orientated to streets and open spaces so that personal and property security, deterrence of crime and vandalism, and surveillance of footpaths and open spaces are facilitated.	
Orientation and energy 6. Lots are orientated to facilitate the siting of dwellings to take advantage of microclimatic benefits, and have dimensions to allow adequate on-site solar access, taking into account likely dwelling size and the relationship of each lot to the street.	 Orientation and energy Lot design allows for houses to be built with north facing windows which receive maximum winter sun. Lot design ensures that each lot: will not be overshadowed by neighbouring houses to the north. can have a sufficiently long north facade to receive winter sun. Streets are aligned in a north-south or east west direction, where practical.

Minimum Standards and techniques

- 1. Access to steep lots should have a gradient of no greater than 29%, with a maximum change in grade of less than 13%.
- 2. Cut and fill is to be limited to 1.2 metres below or above natural ground level.



Figure 6-14: Lot orientation and solar access

Element:- Environmental Protection

OBJECTIVE	
To ensure that the development of residential land recognises and protects areas and items of environmental significance.	
PERFORMANCE CRITERIA	SUGGESTED SOLUTIONS
The objective may be achieved where:	The following suggested solutions are ONE WAY of meeting the objective and performance criteria:
<i>Natural environment</i> 1. The design identifies and maintains the value of rare, endangered or uncommon flora, fauna and ecosystems.	Land suitable for urban bushland is dedicated to Council.
 Natural landscape 2. The design maintains and improves significant visual landscape elements such as ridgelines, water systems and prominent natural features. 	
<i>Cultural heritage</i> 3. The design conserves and enhances buildings, archaeological and other sites of recognised heritage significance.	

Minimum Standards and Techniques

- 1. The design complies with the requirements of State Government and Lismore City Council for the protection of native vegetation.
- 2. The design complies with the requirements of State Government and Lismore City Council for the protection of environmental and cultural heritage.
Element:- Subdivision of Buildings

OBJECTIVES

To allow separate titles to be created for parts of a development.

To provide for the effective and efficient management of common or shared facilities.

PERFORMANCE CRITERIA	SUGGESTED SOLUTIONS
The objectives may be achieved where:	The following suggested solutions are ONE WAY of meeting the objectives and performance criteria:
 The range and extent of body corporate activities are limited to those legally permitted. The street and lot layout clearly defines the public communal and private areas of a 	 Such measures may include: creating separate sites for each dwelling with their own public street frontage; limiting communal land to driveways only; designing dwellings to minimise the need for corporate building management; ensuring that cost effective management is practicable where communal open space or shared facilities are provided.
development, including the function, ownership and management of open spaces and communal areas.	

Minimum Standards and Techniques

- 1. The building/s were erected in accordance with a Development Consent issued after 27/2/92 by Lismore City Council under the Lismore Local Environmental Plan, 1992, otherwise development approval is required.
- 2. The building/s have been completed in accordance with relevant legislation.
- 3. Separate utility service meters / junctions are provided to each dwelling and if necessary any common area.
- 4. All private open space areas are to be allocated to a dwelling unit.

Element:- Village Commercial and Industrial Subdivision

OBJECTIVE	
To enable the development and use of village land f	or commercial and retail purposes.
PERFORMANCE CRITERIA	SUGGESTED SOLUTIONS
The objective may be achieved where:	The following suggested solutions are ONE WAY of meeting the objective and performance criteria:
 The lot has a shape and area that adequately provides for the proposed use. 	 The shape and size of lots provides for: siting and construction of any buildings and works; the parking of vehicles; provision of loading and servicing facilities; landscaping; the provision of utility services (water effluent disposal, electricity etc.). OR The subdivision plan is accompanied by a development plan showing how the above matters can be achieved.

Notes:

- 1. Chapter 6 (Nimbin Village) of Part B of this DCP designates areas for industrial subdivision and development.
- 2. In other villages an amendment to the applicable Chapter may be required, otherwise subdivision and development of land in the village may occur for light industrial purposes only.

6.2 Rural Residential Subdivision

The Department of Planning's, 'Guidelines for Rural Settlement on the North Coast of NSW', introduces a catchment approach to rural settlement in the North Coast region of NSW and the implementation of planning principles to ensure a comprehensive planned approach.

Those planning principles involve:

- 1. Defining the framework for a planning catchment based on physical, social and service features and networks;
- 2. Consideration of patterns of settlement by defining a rural settlement hierarchy to identify preferred areas for rural residential settlement;
- 3. Identifying the following key planning and design elements; environmental protection, social/people needs, compatible land use and character, servicing and self-reliance and community resource management to be considered in development design;
- 4. Providing opportunities for participation in location, design, development and management of settlements.

Best practice notes provide information and guidelines as a means of achieving the objectives of the catchment approach and satisfy major issues which typically arise in relation to rural residential development.

Consideration of the following, at a site level and co-ordinated at a local and district level is suggested for:

- 1. Resource management of the environment, land, utilities and infrastructure and community facilities; and
- 2. Development of a theme that fits the proposal into the preferred settlement pattern to establish the aims and functions, linking the development suitability with land capability, and compatibility with surrounding land use and local character. Several models are shown as examples.

The Guidelines are implemented through:

- 1. The North Coast Regional Environment Plan requiring that any local environment plan permitting rural residential development be based on a local government strategy, approved by State Government; and
- 2. The North Coast Urban Planning Strategy outlines matters to be addressed by Council wishing to enable rural residential development.
- 3. The Lismore Rural Housing Strategy 2002.

Council rural settlement strategies have to be approved by the Dept. of Planning prior to introduction and commencement of planning mechanisms to enable the form of subdivision. Lismore City Council has a Rural Settlement Strategy (Lismore Rural Housing Strategy) which has been endorsed by the Dept. of Planning.

All rural residential development should satisfactorily address relevant requirements of the guidelines, the Rural Housing Strategy, applicable Locality Development Strategies and Precinct Plans. This is to be demonstrated in the Development Context and Site Analysis Plan (Property Development Plan) with the proposal.

6.2.1 Minimum Allotment Sizes

Lismore Local Environmental Plan, 2000 (as amended) specifies the following minimum lot size in the rural residential zones:

Zone

1(c) - Rural Residential Zone

Minimum lot size

2,000 m², with an average of all lots to be created not less than $5,000m^2$



6.2.2 Locality Planning

Element:- Design in Local Context

OBJECTIVE

To locate rural settlements in a manner that reinforces existing rural settlement patterns and meets the diverse and changing needs of the community by:

- providing for the needs of existing and future people;
- protecting the environment;
- ensuring compatible land use and character;
- efficient provision of services and self reliance; and
- community resource management.

PERFORMANCE CRITERIA	SUGGESTED SOLUTIONS
The objective may be achieved when the Phases in the Design Process (refer section 6) are followed and where:	The following suggested solutions are ONE WAY of meeting the objective and performance criteria:
1. The proposal is located either in an area preferred for rural residential settlement, as identified in the Councils Rural Settlement Strategy. (<i>Refer to Figure 6-14 and Table 6-8</i>)	The proposed development is located in an area and meets the requirements of the Lismore Rural Housing Strategy.
2. The subdivision layout responds to topography, site characteristics, setting, landmarks and views, through road networks and protection of the environment.	
3. Local identity is reinforced by locating community facilities at focal points for residents.	
4. The road network provides a high level of accessibility and good external connections for local vehicle, pedestrian and cycle movements, with traffic management to restrain vehicle speed, deter through traffic and create safe conditions for all road users.	
5. The road and lot layout enables efficient provision of physical services.	
 The road and lot orientation and lot dimensions facilitate the siting and design of energy efficient dwellings. 	
7. The lot design and layout provide a variety of lot sizes and enable a variety of housing types and other compatible land uses.	
8. The layout provides well distributed rural open spaces that contribute to the character of the development, provide for a range of uses, are cost effective to maintain, and contribute to stormwater management and environmental care.	
9. The layout retains significant vegetation and habitat areas, particularly koala habitat.	
10. The layout is integrated with the surrounding rural environment, complements existing attractive rural landscapes, and provides for shared use of public facilities.	
11. The layout enhances personal safety, and minimises potential for crime through surveillance by pedestrians and drivers of passing vehicles.	
12. The layout and management of rural residential development provides for:	

 Environmental and land management through: protection and management of natural habitat and vegetation; reafforestation and tree planting; protection of water courses and water quality; control of weeds and feral animals; agricultural use of the land; buffer areas between potentially conflicting land uses; protection from bushfire; minimises soil erosion; avoids development on flood prone and hazardous i.e. unstable land; avoids contaminated areas e.g. cattle tick dip sites. 	
 Effective utility and infrastructure services including: road and road easement maintenance; potable water collection and reticulation systems; sewage treatment and effluent disposal; firefighting equipment and training; boundary fencing. 	
 Provision or up-grade of community facilities including where required: open space areas and passive recreation; active recreation; community centres, fire brigade sheds etc. 	

Minimum Standards and Techniques Table 6-8: Rural and Closer Rural Settlement Hierarchy / Classification

Form of settlement	Approximate size people [households]	Description and function
Large village	400 - 1,000 [130 - 330]	A settlement providing a focus and services for smaller villages and hamlets. It may include a central school, post office, police station, churches, hotel, local or district sports facilities, a reticulated water service, small business centre and bus service to Lismore.
Small village	100 - 400 [30 - 130]	A settlement providing local focus and services. It may include a convenience store and other localised services (garage/mechanic), church and community hall, bus services
Hamlet	30 - 100 [10 - 30]	May comprise either rural residential development or an existing small settlement. It can be a group of small holdings or organised development or subdivision. It may be based on rural community level of services e.g. school, school bus, hall. Development is clustered to achieve community or common facilities and services (roads, waste disposal).
Dispersed dwellings on individual lots	single dwelling	Associated with either agricultural use (farming or grazing), retreat/hobby bush blocks or previously created isolated concessional lots. Self contained, school bus links with villages and/or Lismore.

Examples: Large village: Nimbin Small village: Wyrallah

Hamlet: Rosebank



Figure 6-14: Rural Settlement Hierarchy

Element:- Major Movement Networks

OBJECTIVE		
To provide movement networks for vehicles, public transport, pedestrians and cyclists that are integrated, cost effective, environmentally acceptable, and minimise the impact of traffic on the rural road network.		
SUGGESTED SOLUTIONS		
The following suggested solutions are ONE WAY of meeting the objective and performance criteria:		
A road network is, or can be provided, in accordance with a Council approved Rural Roads Strategy or Development Control Plan, which provides for private and public transport.		
OR		
A Traffic Study submitted with the proposal which provides for an integrated approach to movement systems in a manner satisfying this Plan.		
The rural roads servicing the proposal to Lismore and/or nearby large villages are capable of meeting increased traffic.		
The road network conforms to Council's Rural Roads Strategy, Development Control Plan for the area and/or Traffic Study submitted with the proposal showing an existing and proposed major road network, which satisfies projected local travel and integrates with the arterial road network.		
The road network provides for pedestrians and cyclists in accordance with the requirements of this plan.		
Through traffic with projected traffic volumes exceeding those specified in <i>Table 6-9</i> is not preferred on rural residential roads.		

Minimum Standards and Techniques

- 1. Subdivision creating lots with direct vehicular access onto either the Bruxner Highway or Bangalow Road is prohibited.
- 2. Subdivision creating lots with direct vehicular access onto regional roads is not preferred, except by way of shared access.

Table 6-9: Rural Settlement Road Types

Street	Function
Rural Residential Laneway (including right of way)	is an minor access road to be held in private ownership. These roads provide a shared carriageway for use by pedestrians, cyclists and vehicular traffic. Where the laneway is the sole means of access the number of lots it services is to be less than 5.
Rural Settlement Local Road	is a road in which the rural residential environment coexists with vehicular traffic pedestrians and cyclists. Footpaths not required, parking partly on the verge and carriageway. Generally, the number of dwellings does not exceed 10. Traffic volume, less than 100 veh/day.
Rural Settlement Collector Road	is a street in which the rural residential environment coexists with vehicular traffic pedestrians and cyclists. Vehicular parking partly on the verge and carriageway. Footpaths not required. The street caters for up to 20 dwellings and distributes traffic to higher volume streets. Traffic volume, less than 300 veh/day.
Rural Settlement Sub-arterial Road	typically collects traffic from lower volume roads and may provide bus routes. Intermittent on-street parking is provided in the carriageway. Traffic volume, more than 300 veh/day. Sub-arterial roads provide the highest order of road linkages between the proposal roads and the Arterial rural road network to Lismore and/or the nearest large village.
Rural Settlement Arterial Road	refer to Rural Roads Policy

d Nat ...

To create local road networks in which the function of e acceptable levels of access, safety and convenience for	each road is clearly defined, providing or all users.
PERFORMANCE CRITERIA	SUGGESTED SOLUTIONS
The objective may be achieved where:	The following suggested solutions are ONE WAY of meeting the objective a performance criteria:
<i>Function and structure</i> 1. The road network has a clear structure and component roads conform to their function in the network.	<i>Function and structure</i> Roads link with other roads that are n more than two levels higher or lower i the hierarchy
 The network has clear physical distinctions between each type of road. These distinctions are based on function, legibility, convenience, traffic volumes, vehicle speeds, public safety and amenity. The design features of each type of rural residential road encourage driver behaviour appropriate to the primary function of the road. 	The road network reflects the characteristics specified in <i>Table 6-9, 10, 6-11 and 6-12.</i>
 Safety, access and convenience Intersections along rural residential roads are spaced to create safe and convenient vehicle movements. 	Safety, access and convenience

5. The road network creates convenient movement for residents between their homes and higher order roads.

6. Street lighting is provided at road intersections.

Mode choice

7. There is provision for efficient bus routes which are direct and safely accessible by foot from most dwellings and activity centres.

8. The alignment and geometry of roads carrying bus routes provide for ease of movement of buses without complicated turning manoeuvres and without facilitating high traffic speeds.

9. The road network facilitates walking and cycling.

Rural residential design and character

10. The road network takes account of the topography and vegetation, respects any existing or potential site assets, and takes advantage of opportunities for views and breezes.

11. The road network takes account of the rural landscape that may be created or that already exist.

12. The road network is oriented, where practical, to promote efficient solar access for dwellings.

13. The road network takes account of natural drainage and environmentally sensitive systems.

Environmental protection

14. Traffic generated by a development is within the acceptable capacity of the roads.

15. Roads do not operate as through traffic routes for externally generated traffic, while limiting the length of time local drivers need to spend in a low speed environment.

16. The road network is designed to reduce traffic speeds and volumes to acceptable levels, with most dwellings fronting roads with low volumes.

The driving distance from any dwelling to the nearest Collector (or higher-order) road is minimised.

Turning movements at intersections are to be minimised in order to travel from any home to the most convenient Collector or higher order road.

Mode choice

Public transport routes and stops are provided as set out in *Element – Public Transport.*

Roads provide a safe, convenient and legible network for pedestrians and cyclists in accordance with *Element – Pedestrian, Cyclist and Non-vehicular facilities.*

Rural residential design and character

The road network permits the establishment of landscapes that incorporate the provisions of *Element – Rural Landscape and Landscaping.*

The roads are aligned in east-west or north-south direction, wherever possible.

Environmental protection

Intersections within the road network have appropriate traffic management treatments to slow and control traffic.

 17. The impact of measures intended to restrain traffic speeds and/or volumes takes account of the needs of other street users and adjoining dwellings, by avoiding: stop start conditions; unacceptable traffic noise to adjoining dwellings. 	 Traffic speeds and volumes are restrained through measures such as: limiting street length; introducing bends; introducing slow points
18. Roads and lots are located so that dwellings are not subject to unacceptable levels of traffic noise.	Traffic noise in roads should not exceed 55 dB(A) L_{10} at the facade of dwellings.
 Cost effectiveness 19. Roads and carriageway widths and road lengths optimise the cost effectiveness of the road network, without compromising road standards. 20. The network provides for the community cost effective provision of public utilities. 	Cost effectiveness The length of Sub-arterial Roads is minimised, except where the topography or the location of major traffic routes makes a longer distance unavoidable. The network caters for the provision of public utility networks including water, electricity and telecommunications.

OBJECTIVE

Minimum Standards and Techniques Table 6-10: Classification of Closer Rural Settlement Roads

Road level/type and function	Design speed (km/hr.)	Indicative traffic vol. (vpd)	Stopping sight dist. (metres)
Laneway or Right of Way	10	<50	
Local Road	40	<100	40
Collector Road	40	<300	40
Sub-arterial Road	60	300+	70

Element:- Pedestrian, Cyclist and Non-vehicular facilities

To encourage walking, cycling and horse riding and the like, by providing sufficient area in the road reserve within the development.		
PERFORMANCE CRITERIA	SUGGESTED SOLUTIONS	
 The objective may be achieved when the Phases in the Design Process (refer section 5) are followed and where: 1. The road network provides sufficient area for pedestrian, cyclist and pony trails (separate from pedestrians), with possible connections to adjoining roads, open spaces. 	There are no recommended Suggested Solutions for this Element, as each situation requires an individual approach.	

Element:- Public Transport

OBJECTIVE			
To increase opportunities for choice in mode of transport and provide for cost effective and energy			
efficient public transport services that are accessible and convenient to the resident community.			
PERFORMANCE CRITERIA	SUGGESTED SOLUTIONS		
The objective may be achieved where:	The following suggested solutions are ONE WAY of meeting the objective and performance criteria:		
 <i>Planning</i> 1. A public transport route is provided that takes account of: projected travel demand; distribution of likely demand; scale and time of demand; characteristics of travellers; travel time; operating characteristics; cost of providing the service; and route location and design. 	Planning Where a Council approved strategy, Development Control Plan or other planning instrument exists, routes conform with that plan.		
 <i>Route location and design</i> 2. Convenient connections to adjoining areas provide for ease of movement of buses within the rural residential area and onto arterial roads. 3. Buses are able to safely gain access to the development without complicated turning manoeuvres. 	Route location and design		
4. The alignment and geometry of the roads that form the bus route allow for the efficient and unimpeded movement of buses without facilitating high traffic speeds.	Routes for regular bus services are designed in accordance with <i>Table 6-11 and 6-12.</i>		
 Bus stop location and design 5. Public transport stops provide for pedestrian safety, security, comfort and convenience. 6. Bus stops are designed allow safe passing of stationary buses, or vehicle speeds are reduced to ensure safe pedestrian crossing. 	Bus stop location and design		

Minimum Standards and Techniques

us Routes
bus bays are provided with a traffic calming and
ngle bus
3%
6%
12%

6.2.3 Physical Infrastructure

Element:- Road Design

OBJECTIVE

To provide for roads that:

- fulfil their designated functions within the road network; ٠
- •
- •
- accommodate public utility services; accommodate drainage systems; and create a safe and attractive environment. •

PERFORMANCE CRITERIA	SUGGESTED SOLUTIONS
The objective may be achieved where:	The following suggested solutions are ONE WAY of meeting the objective and performance criteria:
 Function and width 1. The design features of each type of rural residential road convey its primary function. 2. The road reserve width is sufficient to cater for all street functions, including: safe and efficient movement of all users; retention of existing trees; contributing to a rural residential character by providing increased widths between boundaries and/or dwelling sites; provision of landscaping; location, construction and maintenance of public utilities. 3. The verge width is sufficient to provide for special site conditions and future requirements. 	 Function and width The following road components for each type of roads are as specified in Table 6-12: street reserve widths; carriageway widths; verge widths; parking within street reserve; kerb type; pedestrian cyclist facilities; number of desired lots the road is to service.
 Designing for safety 4. The design facilitates safe use by vehicles and non-vehicles users by: providing a carriageway width which allows vehicles to proceed safely at the operating speed intended for that level of street; providing a horizontal and vertical alignment which is not conducive to excessive speeds; promoting the safety of pedestrians at bus stops and other crossing points; promoting the safety of cyclists in streets and at crossing points. 5. Speed reduction techniques are used to achieve desired speeds, as part of a design for the whole road environment, and include the following principles: 	The verge width is increased where necessary to allow space for larger scale landscaping, protection of trees, future carriageway widening, retaining walls, pedestrian, cycle or horse paths or overland stormwater flow paths. Designing for safety Traffic speeds and volumes are restrained through one or more of the following measures:

- slow points including either horizontal or vertical deflection are designed to slow traffic to design speeds;
- landscape and streetscape design are used to complement speed restriction measures;
- speed restriction techniques and devices are not used in isolation;
- the verge provides safe sight distances, taking into account expected vehicle speeds.

6. Safe sight distances, based on vehicle travel speeds, exist at property access points and at junctions and intersections.

Driveway Access

7. The carriageway and verge width allows for unobstructed access to individual lots, even when a car is parked on the opposite side of the road.

Driveway egress movements do not create a safety hazard.

Geometric Design

8. Bus routes have a carriageway width that:

- allows for the movement of buses;
- is unimpeded by parked cars;
- avoids cars overtaking parked buses.

9. The horizontal and vertical alignments satisfy safety criteria and reflect physical land characteristics and major drainage functions.

(i) Limiting street length Where road 'leg' length is limited to control vehicle speed, the lengths between slow points are designed to restrict operating speeds.

(ii) Introducing bends Bends are introduced to control speeds to 40 km/h in rural access places

(iii) Introducing slow points Slow points are used to restrict speeds to 30 km/h, the length of road between two bends or slow points is minimised.

Where speed restriction devices are used in isolation, they include:

- full horizontal displacement of the vehicle path;
- swept vehicle paths to have a 20 m. radius;
- construction on exit rather than on entry (otherwise there is a risk that the device may be short cut);
- additional pavement treatment behind the kerb for large vehicle;
- line marking and signposting

Driveway Access

Motorists can enter or reverse from a lot in a single movement.

Lot design enables driveways on major collector roads and roads which carry more than 300 vpd to be designed to promote forward movement of vehicles across the verge.

Geometric Design

The geometry of roads identified as bus routes provides suitable turning, stopping sight distance, grade and parking for buses (as determined from appropriate design documents), and has maximum carriageway widths within the ranges specified in *Table 6-12*.

	Longitudinal gradients do not exceed the gradients specified in <i>Table 6-12.</i>
	Curve super elevation does not exceed 6%.
	For downgrades of 5-10% the street design should be based on an increase of the maximum speed of 5 km/h. For downgrades >10%, this maximum speed should be increased by 10 km/h.
	Crossfall on street pavement is to be 3%.
10. Geometric design for intersections, roundabouts and slow points is consistent with the vehicle speed intended for each street.	Design complies with AUSTROADS Guidelines.
11. Siting conditions on land abutting major and minor distributor roads ensure that all vehicles can enter or leave the street in a forward direction.	Sufficient area is provided at the head of cul-de-sacs for waste disposal vehicles to make a 3 point turn.

Minimum Standards and Techniques





A 7-7.5 m carriageway is wide enough for two vehicles to pass each other while passing a parked car. It is wide enough for a moving car to pass between two parked cars, but is clearly not wide enough for two moving vehicles to pass at once. One must give way.



Figure 6-15: Carriageway widths

Table 6-12: Rural Settlement Road Characteristics

(refer Tables	6-9	and	6-11)	
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Element	Private Laneway Community Title development only	Local Road	Collector Road	Sub-arterial Road
Road Reserve Width	Variable	20	20	20
metres				
Carriageway Width (Sealed) metres	1 lot - 3m >1 lot - 4m	6	6	7 with designed traffic mgmt
Cement Stabilised Gravel Road Formation Width metres	1 lot - 4m >1 lot - 5m	8	8	9
Max. longitudinal gradients	25%	20%	20%	10%
No. travel lanes	1	2	2	2+
Parking in reserve	None	None	Verge	Verge
Kerb type	(See note 1)	(See note 2)	(See note 2)	(See note 2)
Footpath Built & concrete	Grass in verge	Grass in verge	Grass in verge	Grass in verge
Cycleway	Road	Road	Road	Road
<u>Verge width</u> metres	variable	Variable, min. 3.5 m.		Variable, min. 3.5 m.
No. of lots to be serviced	< 5	< 10	10 - 20	> 30

Notes:

 Road pavement: Scouring is likely to occur on typical gravel rural roads exceeding 7%. Slopes in excess of 12 % must be sealed and table drains lined.

- 2. Scouring of table drains is likely to occur in grades exceeding 7%. Where slopes in excess of 12% exist, kerb and gutter must be provided on all roads.
- 3. Type of pavement will be influenced by factors such as topography, potential for further subdivision, length of roads, existing and predicted traffic numbers.

Element:- Road Construction

OBJECTIVE			
To construct roads that support the design intentions without unnecessary construction and whole of life cycle costs			
PERFORMANCE CRITERIA	SUGGESTED SOLUTIONS		
The objective may be achieved where:	The following suggested solutions are ONE WAY of meeting the objective and performance criteria:		
 The pavement edging and landscaping support the specified functions and amenity of the road. 	Pavement and landscape materials are used, where appropriate, to distinguish different road functions.		
 2. The pavement edge: controls vehicle movements by delineating the carriageway for all users; assists in controlling stormwater runoff e.g. concrete kerbs on steep slopes. 3. Road pavement surfaces are well designed and durable enough to carry: wheel loads of travelling and parked vehicles; ensure the safe passage of vehicles; the discharge of rainfall; the preservation of all-weather access; and allow for reasonable travel comfort. 4. Consistent with <i>Performance Criteria</i> 3 public. 	Constructed drainage is to be provided where the gradient of roads exceeds 10 % or soil conditions require.		
4. Consistent with Performance Onterla 3, public street construction and whole of life cycle costs are kept low.	Pavement construction and kerb and gutter profiles are based on the requirements contained in Council's "General Specification for the Construction of Road and Drainage Works".		

Element:- Utility Services

OBJECTIVE To ensure that rural residential areas are adequately serviced with sewerage (where applicable), water, fire fighting, electricity, street lighting and communication services in a timely, cost effective, co-ordinated and efficient manner that supports sustainable development practices. **PERFORMANCE CRITERIA** SUGGESTED SOLUTIONS The objective may be achieved where: The following suggested solutions are **ONE WAY** of meeting the objective and performance criteria: 1. Design and provision of utility services, The design and provision of utility including sewerage, water, electricity, street services conforms to Council's; lighting, and communication services, are cost "General Specification for the effective over their life cycle and incorporate provisions to minimise adverse environmental Construction of Road and Drainage impact in the short and long term. Works", "Specification for the Construction of Sewers", and

 Compatible public utility services are located in common trenching in order to minimise the costs for underground services. Cables for cable television should be underground where electricity service is underground. Development is staged to ensure that each stage is fully serviced before a new area is released. Water supply and sewerage networks are accessible, easy to maintain, and cost effective based on life cycle costs. 	 "Specification for the Construction of Water Reticulation". The treatment and disposal of waste water is undertaken in a manner which satisfies Council, Dept of Environment and Conservation and NSW Health. The requirements of other relevant supply authorities. Lot layout to be designed to ensure that effluent from each lot can gravitate into the sewer. This might require a building envelope and a minimum floor level.
 Rural residential development is to be water self sufficient, without drawing water from existing permanent watercourses. The selection of materials used for water supply and sewerage works is determined by suitability, durability, ease of maintenance and whole of life cost effectiveness, achieving beneficial environmental impacts/energy savings etc. from new materials and technologies. Adequate buffers are maintained between utilities and houses to protect residential amenity and health. 	 Water supply may comprise either: service from Rous Water, or Lismore City Council; dam, spring or licensed groundwater supply; provision of a minimum 45,000 litres potable supply at the time at construction of a dwelling and access to another stored supply, or 90,000 litres if a dam, spring or licensed groundwater supply is not available.
9. Public lighting shall be designed to maximise energy efficiency.	 Public lighting is designed in accordance with: Australian Standard AS/NZS 1158 "Lighting for Roads and Public Spaces"; The NSW Public Lighting Code; and Any relevant street lighting service agreements between council and the service provider. The efficiency of public lighting lamps is no less than 60 lumens/watt. (Note that mercury vapour lamps do not meet this criterion) Public lighting lamps are shielded so that no light is emitted above the horizontal thus minimising wasted light.

Element:- Effluent Disposal

OBJECTIVE
To ensure that rural residential areas are adequately serviced with on-site waste water disposal systems (where the area is not sewered) in a cost effective, co-ordinated and efficient manner that supports sustainable development practices.

PERFORMANCE CRITERIA	SUGGESTED SOLUTIONS
The objective may be achieved where:	The following suggested solution is ONE WAY of meeting the objective and performance criteria:
 No risk to public health occurs. Land quality deterioration through chemical or biological contamination, or degradation of soil structure does not occur. There is no contamination of surface waters emanating from the site, including first-flush rainfall runoff, contaminated surface or sub-surface flow or contaminated groundwater. Groundwater is not contaminated. Useful resources in domestic wastewater (e.g. nutrients, organic matter and water) are identified and utilised to the maximum, within the thresholds of other performance criteria. Unreasonable interference and nuisance to the public from odour, dust, insects and noise above background levels is to be avoided. On-site wastewater management systems are preferably of a low technology design. 	The design and provision of wastewater systems conforms to Council's current On-Site Sewage & Wastewater Management Strategy. OR A decentralised wastewater management system (packaged treatment plant), including appropriate management and maintenance systems, is provided.

6.2.4 Stormwater Management

Element:- Stormwater Drainage

0		
OBJECTIVE		
 To provide major and minor d Adequately protect people and in a cost effective ma Contribute positively to er 	rainage systems which: e and the natural and bui inner, in terms of initial co nvironmental enhanceme	It environments to an acceptable level of risk ost and maintenance, and ent of catchment areas.
PERFORMANCE CRITERIA		SUGGESTED SOLUTIONS
The objective may be achieve	→d where:	The following suggested solutions are ONE WAY of meeting the objective and performance criteria:
Major system		

1. The major stormwater drainage system has the capacity to safely convey stormwater flows resulting from the relevant design storm under normal operating conditions, taking partial minor system blockage into account.

Major system

The design and construction of the major storm drainage system are in accordance with the requirements of *Australian Rainfall and Runoff (1987)* and Council's "General Specification for the Construction of Road and Drainage Works". **2.** Overland flow paths are developed which ensure that there is a low risk of property damage.

3. Community benefit is maximised through the retention of natural streams and vegetation wherever practicable and safe, the incorporation of environmentally sensitive areas and other less flood sensitive land uses into the drainage corridor and the placement of detention basins where necessary to control stormwater.

4. The major system is designed to ensure that there are no flow paths which would increase risk to public safety and property.

Minor System

5. The minor storm drainage system has the capacity to control stormwater flows under normal operating conditions for the relevant design storm with minimal risk of blockage.

6. Drainage networks are well defined to ensure there are no hidden flow paths which could reduce their capacity to convey design flows.

7. The design of the minor system takes full account of existing downstream systems.

8. The minor system design allows for the safe passage of vehicles at reduced speed on roads which have been affected by runoff from the relevant design storm.

9. The minor system is accessible and easily maintained.

10. Where a portion of the minor system lies within a site, access is available for maintenance.

11. The selection of materials used for the construction of the minor system is based on their suitability, durability, maintainability and cost-effectiveness.

Site drainage

12. Subdivision design and layout provides for:

- on-site stormwater detention and retention;
- on-site infiltration.

Drainage Outlets

13. All stormwater systems shall be designed to discharge appropriate water volume, velocity and quality to an acceptable legal point of discharge.

The major system design is undertaken on a Total Catchment Management basis.

The major system design outflow is matched to the capacity of any existing downstream system and where necessary detention basins etc. are provided to retard stormwater flows onto downstream properties.

Minor System

The design and construction of the minor storm drainage system are in accordance with the requirements of *Australian Rainfall and Runoff (1987)* and Council's "General Specification for the Construction of Road and Drainage Works".

The minor system design outflow is matched to the capacity of any existing downstream system.

The minor system allows for the safe passage of vehicles at reduced speeds on streets which have been affected by runoff from a 20% AEP storm event.

Site drainage

Where soil and site geological conditions permit, on-site retention in storage tanks, soak trenches or other arrangements are provided.

The design of drainage systems is undertaken by a qualified person. The design and construction of the inter allotment drainage system are in accordance with the requirements of *Australian Rainfall and Runoff (1987)* and Council's "General Specification for the Construction of Road and Drainage Works".

Minimum Standards and Techniques





The type of detention basin chosen should be based on a range of functional requirements and site conditions.

Source: AMCORD



Drop structures, energy dissipaters and other flow control structures should be made of natural materials.

Figure 6-16: Stormwater drainage





Sedimentation basins enable the collection of sediment from eroded or disturbed areas before it reaches waterways. They are generally replaced by more permanent wetlands upon completion of major construction.

Source: AMCORD





The adverse impact of large gross pollutant traps (GPT's) on the amenity of an area can be overcome with good design to integrate the facility with its surroundings.

Figure 6-17: Gross Pollutant traps

Element:- Water Quality Management

OBJECTIVE

- To provide water quality management systems which:
- ٠
- ensure that disturbance to natural stream systems is minimised, and stormwater discharge to surface and underground receiving waters, both during construction and in developed catchments, does not degrade the quality receiving waters. •

PERFORMANCE CRITERIA	SUGGESTED SOLUTIONS
The objective may be achieved where:	The following suggested solutions are ONE WAY of meeting the objective and performance criteria:
1. Adequate provision is made for measures during construction to ensure that the land form is stabilised and erosion is controlled.	An Erosion and Sediment Management Plan is prepared by properly qualified personnel using recognised and locally accepted design methodologies.
2. The system design optimises the interception, retention and removal of water-borne pollutants through the use of appropriate measures prior to discharge to receiving waters.	The Erosion and Sediment Management Plan is to comply with the Department of Land and Water Conservation's <i>"Urban</i> <i>Erosion and Sediment Control Manual"</i> .
3. The system design minimises the environmental impact of runoff on the surface receiving water quality and on other aspects of the natural environment by employing techniques which are appropriate and effective in reducing runoff and pollution travel.	Water pollution control ponds or wetlands are developed (where appropriate) for final treatment before discharge to the wider environment and should be sited to minimise impacts on the natural environment.
4. Point sources of pollution in the catchment should be identified and their impact minimised until their impact can be eliminated.	

Element:- Flooding

OB.	IFCTIVE	

Ensure the most appropriate development for flood prone land in rural areas.

PERFORMANCE CRITERIA	SUGGESTED SOLUTIONS
The objective may be achieved where:	The following suggested solutions are ONE WAY of meeting the objective and performance criteria:
 Rural residential subdivision is not permitted on land with the following flood characteristics: floodways; deep backwaters; 	Subdivision and development of rural residential land is to be in accordance with Chapter 8 - Flood Prone Lands OR
 land subject to isolation; or on land not suited to the proposed use. 	A Flood Study prepared by Council's and/or other Council approved hydraulic consultants substantiates the proposed use of the land.
	Where applicable, dwelling floor levels shall be 500 mm. above the 1 in 100 year flood event preferably on a mound minimum 3 m. wider, in all directions, than the dwelling, with batters of 1 in 4 or flatter.
2. Major cross road drainage structures designed for an acceptable level of safety, convenience and cost.	No filling is permitted in floodways, other than to return landform to its original state.



Lismore Development Control Plan - Part A

6.2.5 Lot Layout

Element:- Rural Landscape and Landscaping

OBJECTIVE

To provide attractive landscapes that:

- Reinforce the functions of the road,
- Enhance the amenity of buildings, and
- Are sensitive to the built form, rural landscape, native vegetation and environmental conditions of the site and locality.

PERFORMANCE CRITERIA	SUGGESTED SOLUTIONS
The objective may be achieved where:	The following suggested solutions are ONE WAY of meeting the objective and performance criteria:
 The road and landscape design achieves: the creation of attractive rural residential environments with clear character and identity; respect for existing attractive landscapes in the area; protection of environmentally sensitive such as habitat areas, steep slopes and watercourses; provision for appropriate roadside tree plantings taking into account the natural landscape, the image and role of the development, solar access requirements, soils, selection of appropriate species, and services; use of such features as views, vistas, existing vegetation and landmarks. The design of the landscape in public roads: 	 A Landscape Plan is submitted that demonstrates how the Performance Criteria are met, showing: the road reserve and indicative locations of the carriageway; location of existing vegetation to be removed or conserved; location, species and general character of tree planting and hard and soft landscape treatment; an indicative location of buildings.
 defines a theme for new roads, or complements the existing rural landscape character; is sensitive to site attributes; complements the functions of the road; reinforces desired traffic speed and behaviour; is of an appropriate scale relative to both the street reserve width; existing or expected future building bulk; promotes safety and casual street surveillance; 	 Compliance with this requirement is achieved by submission of a plan meeting the performance criteria and showing: boundaries and areas of communal open space including sites for specific agricultural, recreational and other uses; existing vegetation and proposed general character of landscape treatment; general arrangement of hard landscaping elements and major earthcuts, fills and mounding;

 improves privacy and minimises unwanted overlooking; incorporates existing vegetation where possible and desirable; promotes the planting of native vegetation in environmentally sensitive areas; appropriately accounts for rural landscapes of heritage significance assists in microclimate management; maximises landscaped areas where appropriate; integrates and forms linkages with environmental areas, reserves and transport corridors; achieves lines of sight for pedestrians, cyclists and vehicles; provides adequate lighting for pedestrian and vehicle safety; satisfies maintenance and utility requirements and minimises their visual impact of above ground utilities; provides additional buffer areas, where appropriate. 	 indicative treatment of floodways and drainage lines, along with general information on fencing, access points, and treatment of the verge including any drainage requirements; landscape plantings in buffers is to be dense to minimise future maintenance. bonds may be required to ensure maintenance of landscaping.
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Element:- Lot Layout

OBJECTIVES To provide a range and mix of lot sizes to suit a variety of dwellings and household types, with areas and dimensions to meet user and servicing requirements.

To provide lots that are oriented where practicable to enable the application of energy conservation principles.

To encourage a lot layout which will reinforce existing areas and facilities providing community focus and interaction.

PERFORMANCE CRITERIA	SUGGESTED SOLUTIONS
The objectives may be achieved where:	The following suggested solutions are ONE WAY of meeting the objectives and performance criteria:
 Size 1. Lots have the appropriate area and dimensions for the siting and construction of a dwelling and ancillary buildings, the provision of private outdoor space, rural views, convenient vehicle access and parking. 2. Lot size and dimensions take into account the slope of the land and the desirability of minimising earthworks, retaining walls etc. associated with dwelling construction. 3. Lot sizes and dimensions enable dwellings to be sited to: protect natural or cultural features; acknowledge site constraints including soil 	Size Lots sizes not less than 10,000 m ² are preferred, unless the subdivision is connected to a common effluent system or Council is satisfied that the lots adequately provide for wastewater treatment and disposal. Lots on slopes should be larger to reduce the need for building earthworks, compensate for loss of useful open space, potential difficulties with house construction and provision of access and services e.g. wastewater treatment. Maximum cut and/or fill shall be no more than 1.2 metres above or below natural ground level
 erosion and bushfire risk; retain special features such as trees and views. 4. A future Building Envelope and access road/driveway is to be identified in each lot. 	Shape of lots should be regular with boundaries related to physical features of the land such as ridges slopes and watercourses.
Siting of building envelopes is to minimise the impact of the future dwellings on the rural landscape.	Lots are capable of containing a building envelope of minimum dimensions 32 x 16 or 25 x 20 metres, with a minimum area of 500 m ² . The building envelope is not to be located on ridgelines, steep slopes, or poorly drained land.
<i>User requirements</i> 5. Lot frontages are orientated to roads so that personal and property security, deterrence of	The slope of building envelopes is to be less than 20% (1 in 5).
crime and vandalism are facilitated.	

Orientation and energy

6. Lots are orientated to facilitate the siting of dwellings to take advantage of microclimatic benefits, and have dimensions to allow adequate on-site solar access, taking into account likely dwelling size and the relationship of each lot to the road.

Orientation and energy

Lot design allows for houses to be built with north facing windows which receive maximum winter sun.

Streets are aligned in a north-south or east west direction, where practical.

Element:- Bushfire

OBJECTIVE
To reduce the level of fire risk associated with building in bushfire-prone areas by adopting suitable passive and active protection measures relating to siting, layout, design and construction techniques, and landscaping.

PERFORMANCE CRITERIA	SUGGESTED SOLUTIONS	
The objective may be achieved where:	The following suggested solutions are ON WAY of meeting the objective and performance criteria:	E
1. Each dwelling site is provided with a safe and secure water supply for fire fighting and protection.	Buildings comply with the <i>Building Code o</i> <i>Australia</i> for construction in bushfire prone areas, and with Council requirements.	ıf ?
2. Subdivision is prevented in high-risk bushfire areas.		
3. Subdivision is designed to provide for a fuel- reduced buffer area and the creation of building sites that minimise risk of fire.	Subdivision and building envelopes meet relevant requirements described in <i>"Planning for Bushfire Protection"</i> .	
4. The road layout, design and construction takes account of the needs of emergency vehicles and possible evacuation.		



Element:- Buffers to Avoid Land Use Conflicts

OBJECTIVE

To minimise land use conflicts between agricultural and industrial land uses and potentially incompatible land uses through the establishment and maintenance of appropriate buffers.

PERFORMANCE CRITERIA	SUGGESTED SOLUTIONS
The objective may be achieved where:	The following suggested solutions are ONE
	WAY of meeting the objective and performance criteria:
 Buffer areas are provided between agricultural, industrial, extractive and infrastructure services and rural residential land 	Subdivision of industrial land is to be in accordance with Chapter 14 - Buffer Areas.
uses.	Buffer areas are to be landscaped in accordance with an approved landscape
2. Landscape plans are to include the proposed treatment, ownership and maintenance of buffer	plan and prior to release of linen plans.
areas.	Lodging of a bond may be required to
	ensure maintenance of landscaping.

Element:- Prime Agricultural Land

OBJECTIVE	
To retain and enhance prime agricultural lands.	
PERFORMANCE CRITERIA	SUGGESTED SOLUTIONS
The objective may be achieved where:	The following suggested solutions are ONE WAY of meeting the objective and performance criteria:
1. Reducing the potential for rural land use conflicts.	An agricultural land capability and suitability assessment is undertaken by a suitably qualified person
 Ensuring the subdivision design is compatible with the agricultural capability of the land. Ensuring land to be potentially used for intensive agricultural uses has: 	Lands having an Agricultural Land Classification of 1, 2, 3 or Specialist classes are not to be developed for rural residential purposes.
 minimal detrimental impacts on water quality of receiving waters; minimal adverse impacts on the amenity of the surrounding area by reason of noise, odour and visual issues; embraced the concept of total catchment management. 	A pattern of subdivision is proposed which clusters residential lots, retaining land suitable for agricultural uses.
 Encourage agricultural use of high class agricultural land. 	

Element:- Village and Urban Expansion

OBJECTIVE

To retain lands identified as having a potential for future urban, village and other uses.

PERFORMANCE CRITERIA	SUGGESTED SOLUTIONS
The objective may be achieved where:	There are no recommended Suggested Solutions for this Element, as each situation requires an individual approach.
1. The proposed subdivision conforms to the appropriate Development Strategy for the locality.	

6.3 Rural and Rural Special Use Subdivision

6.3.1 Minimum Allotment Sizes

General Rural Subdivision Provisions.

Lismore Local Environmental Plan, 2000 (as amended) specifies the following minimum lot sizes in rural zones for the purposes of agriculture, forestry or a dwelling:

Zone	Minimum lot size
1(a) - General Rural Zone	40 ha.
1(b) - Agricultural Zone	20 ha.
1(d) - Investigation Zone	40 ha.
1(r) - Riverlands Zone	40 ha.

Subdivision for Intensive Horticulture and Agriculture.

The plan permits, subject to the provision of a satisfactory plan of management, financial feasibility report and the support of DPI, subdivision of land in the 1(b) Zone to create a lot not less than 13 ha.

6.3.2 **Design Elements**

Element:- Design in Context

OBJECTIVE

To encourage rural and rural special purpose lots located in a manner that reinforces existing rural settlement patterns and the needs of the use by:

- providing for the needs of the proposed use; •
- protecting the environment; •
- •
- encouraging compatible land use and character; efficient provision of services, self reliance and resource management. •

PERFORMANCE CRITERIA	SUGGESTED SOLUTIONS
The objective may be achieved when the Phases in the Design Process (refer Chapter 5) are followed and where:	There are no recommended Suggested Solutions for this Element, as each situation requires an individual approach.
1. The subdivision layout responds to site characteristics, setting and protection of the environment.	
2. The road network provides a high level of accessibility and good external connections for local vehicle, movements to create safe conditions for all road users.	
3. The layout retains significant vegetation and habitat areas, particularly koala habitat.	
4. The layout is integrated with the surrounding rural environment and complements existing attractive rural landscapes.	
5. The layout provides for:	
 Environmental and land management through: protection and management of natural habitat and vegetation; reafforestation and tree planting; protection of water courses and water quality; control of weeds and feral animals; agricultural or approved use of the land; buffer areas between potentially conflicting land uses; protection from bushfire; minimises soil erosion; avoiding development on flood prone and hazardous i.e. unstable land; avoids contaminated areas e.g. cattle tick dip sites. 	
 Effective utility and infrastructure services including: road and road easement maintenance; potable water collection; sewage treatment and effluent disposal; firefighting equipment and training; boundary fencing. 	

 Provision or up-grade of community facilities including where required: active recreation; community centres, fire brigade sheds, SES etc. 	
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Table 6-13 Rural and Closer Rural Settlement Hierarchy / Classification

Form of settlement	Approximate size people [households]	Description and function
Large village	400 - 1,000 [130 - 330]	A settlement providing a focus and services for smaller villages and hamlets. It may include a central school, post office, police station, churches, hotel, local or district sports facilities, a reticulated water service, small business centre and bus service to Lismore.
Small village	100 - 400 [30 - 130]	A settlement providing local focus and services. It may include a convenience store and other localised services (garage/mechanic), church and community hall
Hamlet	30 - 100 [10 - 30]	May comprise either rural residential development or an existing small settlement. It can be a group of small holdings or organised development or subdivision. It may be based on rural community level of services e.g. school, hall. Development is clustered to achieve community or common facilities and services (roads, waste disposal).
Dispersed dwellings	single dwelling	Associated with either agricultural use (farming or grazing), retreat/hobby bush blocks or previously created isolated concessional lots. Self-contained, school bus links with villages and/or Lismore.

Element:- Major Movement Networks

OBJECTIVE To provide movement networks for vehicles and public transport that are integrated, cost effective, environmentally acceptable, and minimise the impact of traffic on the rural road network.

PERFORMANCE CRITERIA	SUGGESTED SOLUTIONS
The objective may be achieved where:	The following suggested solutions are ONE WAY of meeting the objective and performance criteria:
1. The road network meets local existing and future needs generated by the proposal and allows for the provision of public transport in a co-ordinated manner.	A road network exists, or can be provided in accordance with an approved Rural Roads Strategy.
2. The rural road network has the capability to accommodate public transport services and has capacity to safely and efficiently accommodate projected traffic movements.	The rural roads servicing the proposal to Lismore are capable of meeting increased traffic.
3. The road network connects with external traffic routes in a manner which maximises movement efficiency on the traffic routes.	

Table 6-14: Rural Road Types

Street	Function
Privately owned e.g. right of way	Is a minor access road to be held in private ownership. These roads provide a minimum shared single carriageway for use by vehicular traffic. Where the laneway is the sole means of access the number of lots it services is to be less than 3.
Rural Laneway	Is a minor gravel access road. These roads provide a shared carriageway for use by vehicular traffic. Where the laneway is the sole means of access the number of lots it services is to be less than 3.
Rural Access Place (cul-de-sac)	These roads provide a shared carriageway for use by vehicular and other traffic. The preferred road construction and pavement type is bitumen seal, however this issue will be assessed in the context of the existing network. Generally, the number of lots the road services does not exceed 10. Traffic volume, less than 100 veh/day.
Rural Local Road	These roads provide a shared carriageway for use by vehicular and other traffic. The preferred road construction and pavement type is bitumen seal, however this issue will be assessed in the context of the existing network. The road caters for up to 30 lots and distributes traffic to higher volume roads. Traffic volume, approximately 300 veh/day with some local through traffic.
Rural Collector Road	These roads provide a carriageway for use by vehicular traffic. The preferred road construction and pavement type is bitumen seal. The road caters for up to 30+ lots and distributes traffic to higher volume roads. Traffic volume, 300 + veh/day with through traffic.
Rural Sub-arterial Road	These roads provide a sealed carriageway for use by vehicular traffic. Typically collects traffic from lower volume roads and may provide bus routes. Road construction and pavement type is bitumen seal.
Rural Arterial Road	refer to Rural Roads Policy

Rural Arterial Roads

All major rural roads to Lismore have been classified as Rural Arterial Roads and are listed below:

- Bruxner Highway (SH 16), which becomes Ballina Road (SH16) east of Lismore
- Kyogle Road (MR 544)
- Route along Nimbin Road and Blue Knob (MR 142)
- Dunoon Road (MR 306)
- Bangalow Road (MR 65)
- Eltham Road (Mr 146)
- Rous Road (MR 555)
- Wyrallah Road (MR 147)

Rural Sub-Arterial

The following rural roads have been classified as Sub-Arterial Roads:

- Caniaba Road (Caniaba)
- Rock Valley Road, between Kyogle Road (MR 544) and Quilty Road at Thorne Bridge
- Route along Boggumbil Road and Jiggi Road (east of Boggumbil Road to Nimbin Road)
- Rosehill Road, between Rock Valley Road and Nimbin Road
- Stony Chute Road (MR 141A)
- Route along Koonorigan Road and The Channon Road
- Route along Duncan Road, Lockton Road (between Duncan Road and Corndale Road) to Bangalow Road (MR 65)
- Route along Hunters Hill Road, Corndale Road (between Hunters Hill Road and James Gibson Road) and James Gibson Road

- Richmond Hill Road (Richmond Hill)
- Route along Cowlong Road and Pearson Road
- Alphadale Road (Tregeagle)
- Tregeagle Road
- Robson Road
- Route along Gundurimba Road (south of Trevans Road) and River Bank Road
- Coraki Road (MR 148)
- Swan Bay Road (MR 149)
- Wyrallah Ferry Road (Wyrallah)

Rural Collector Roads

The following roads have been classified as Collector Roads:

- Route along Rock Valley Road (north of Thorne Bridge) and Cawongla Road (south of Lindsay Road)
- Route along Jiggi Road (north of Boggumbil Road), MountainTop Road, and Whitney Road
- Route along Pinchin Road, Keerrong Bridge Road, and Keerrong Road (south, to Nimbin Road)
- Route along Tuntable Creek Road and Tuntable Falls Road (to Blue Knob Road)
- Whian Whian Road, between Dunoon Road and Leeson Road
- Route along Woodlawn Road and Numulgi Road
- Cusack Road
- Corndale Road
- Dorroughby Road
- Rosebank Road
- Route along Boatharbour Road and McKenzie Road
- Tucki Tucki Road, between Robson Road and Marom Creek Road
- Route along Dungarubba Road and Stibbard Lane
- Tuckean Island Road, between Dungarubba Road and Hoare Lane
- Broadwater Road
- Bagotville Road
- Tuckurimba Road
- Tatham Road
- Rogerson Road, between Aukram Road and Coraki (MR 148)
- Flood Reserve Road
- Frame Road

Rural Local Roads

All other rural streets not previously listed have been classified as Local Roads.

Source: Lismore Citywide Road Study, PPK Environment and Infrastructure Pty Ltd - August 1998

Element:- Local Road Networks

OBJECTIVE

To create local road networks in which the function of each road is clearly defined, providing acceptable levels of access, safety and convenience for all users.

PERFORMANCE CRITERIA	SUGGESTED SOLUTIONS
The objective may be achieved where:	The following suggested solutions are ONE WAY of meeting the objective and performance criteria:
 The road network has a clear structure and component roads conform to their function in the network. 	
2. The network has clear physical distinctions between each type of road. These distinctions are based on function, legibility, convenience, traffic volumes, vehicle speeds, public safety and amenity.	The driving distance from any lot to the nearest collector (or higher-order Main or Regional) road is minimised. The road network reflects the characterist
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3. The design features of each type of rural road encourage driver behaviour appropriate to the primary function of the road.	specified in Tables 6-13, 6-14 and 6-15.
4. There is provision for efficient bus routes.	
5. The alignment and geometry of roads carrying bus routes provide for ease of movement of buses, bus pull over areas and safe and convenient shelter.	
6. The road network facilitates walking, horse riding and cycling.	
 New roads take account of the topography and vegetation and respects any existing or potential site assets. 	
8. The road network takes account of natural drainage and environmentally sensitive systems.	
9. Traffic generated by a development is within the acceptable capacity of the roads.	
10. Access roads do not operate as through traffic routes for externally generated traffic.	
11. Roads and carriageway widths and road lengths optimise the cost effectiveness of the road network.	
12. The network provides for the cost effective provision of required public utilities.	

Minimum Standards and Techniques

Table 6-15: Classification of Rural Roads

Road level/type and function	Design speed (km/hr.)	Indicative traffic vol. (vpd)	Stopping sight dist. (metres)
Laneway or Right of Way	10	<20	
Rural Access Place	40	<100	
Rural Local Road	40	< 300	40
Rural Collector Road	80	300 +	40
Rural Sub-arterial Road	80		70
Rural Arterial	100		

6.3.3. Physical Infrastructure

Element:- Road Design

OBJECTIVE			
To provide for roads that:			
 fulfil their designated functions within the road network; 			
 accommodate public utility services; 			
 accommodate drainage systems; and create a safe environment 	accommodate drainage systems; and		
PERFORMANCE CRITERIA	SUGGESTED SOLUTIONS		
The objective may be achieved where:	The following suggested solutions are ONE WAY of meeting the objective and performance criteria, otherwise each situation requires its own approach:		
<i>Function and width</i> 1. The design features of each type of rural road convey its primary function.	<i>Function and width</i> The following road components for each type of roads are as specified in <i>Table 6-16.</i>		
 2. The road reserve width is sufficient to cater for all road functions, including: safe and efficient movement of all users: 	 road reserve widths; carriageway widths; verge widths; number of desired lots the road is to 		
 retention of existing trees; contributing to a rural character by providing increased widths between boundaries and/or dwelling sites; provision of landscaping, where relevant to uses other than agriculture or forestry; location, construction and maintenance of public utilities; 	service.		
 the potential for higher order rural and other subdivision and development use. 3. The verge width is sufficient to provide for provide for superior states and future requirements. 	The verge width is increased where		
special site conditions and future requirements.	landscaping and environmental repair, protection of trees, future carriageway widening, retaining walls, pedestrian, cycle or horse paths or overland stormwater flow		
Designing for safety4. The design facilitates safe use by vehicles by:	paths.		
 providing a carriageway width which allows vehicles to proceed safely at the operating speed intended for that level of road; 			
 providing a horizontal and vertical alignment which is not conducive to excessive speeds. 			
Driveway Access 5. The carriageway and verge width allows for unobstructed access to individual lots.	Driveway Access Motorists can enter and exit from a lot in a single forward movement, without obstruction to the road network.		
Driveway egress movements do not create a safety hazard.			
Geometric Design 6. Bus routes have a carriageway width that allows for the movement of buses; and avoids cars overtaking parked buses.	Geometric Design		

7. The horizontal and vertical alignments satisfy safety criteria and reflect physical land characteristics and major drainage functions.	Longitudinal gradients do not exceed the gradients specified in <i>Table 6-15.</i> Curve super elevation does not exceed 6%.
	Crossfall on road pavement is to be minimum 3% for paved and 4% for unpaved surfaces.
8. Siting conditions on land abutting major and minor collector roads ensure that all vehicles can enter or leave the street in a forward direction.	Design complies with AUSTROADS Guidelines.

Minimum Standards and Techniques

Table 6-16: Rural Road Characteristics (refer Tables 6-13 and 6-14)

Element	Private Right of Way	Rural Laneway	Rural Access Place	Rural Local Road	Rural Collector Road	Rural Sub- arterial Road
Road Reserve Width	10 min.	20	20	20	20	20
Carriageway Width (sealed) metres (refer notes)	1 lot 3m >1 lot 4m	5 m. gravel or sealed	5 m. gravel or sealed	6 m. sealed	6 m. sealed	7 m. sealed
Cement Stabilised Gravel Formation Width metres	1 lot 4m >1 lot 5m	7	7	8	8	9
Max. longitudinal gradients	25%	20%	20%	20%	10%	10%
No. travel lanes	1 with passing bays	2	2	2	2	2+
No. of lots to be serviced Refer notes	< 3	< 5	< 10	< 30	30+	Varies

Notes:

1. Road pavement:

Slopes in excess of 12 % must be sealed and drains concrete lined. Type influenced by factors such as topography, potential for further subdivision, length of roads, existing and predicted traffic numbers.

2. Number of lots serviced:

The number of lots serviced may also be expressed as equivalent tenements, in order to provide guidance on estimating traffic generation rates. Refer to the Rural Roads Contributions Plan.

3. New roads:

The above table applies primarily to new rural roads. Applicants should consult early with Council's Infrastructure Services to obtain direction in respect of any existing road up-grading that may be required to service a proposed rural or rural residential subdivision.





Element:- Road Construction

OBJECTIVE	
To construct roads that support the design intention	as without unnecessary construction and whole of
PERFORMANCE CRITERIA	SUGGESTED SOLUTIONS
The objective may be achieved where:	The following suggested solutions are ONE WAY of meeting the objective and performance criteria:
 The pavement, edging and vegetation support the specified functions and amenity of the road. The pavement edge: 	Pavement construction and kerb and gutter profiles, where required, are based on the requirements contained in Council's
 controls vehicle movements by delineating the carriageway for all users; assists in controlling stormwater runoff. 	of Road and Drainage Works".
3. Road pavement surfaces are well designed and durable enough to carry wheel loads of travelling vehicles; ensure the safe passage of vehicles; the discharge of rainfall; the preservation of all-weather access; and allow for reasonable travel comfort.	
4. Consistent with <i>Performance Criteria 3,</i> public street construction and whole of life cycle costs, including maintenance, are kept low.	

Element:- Utility Services

OBJECTIVE

To ensure that rural areas are adequately serviced with sewerage (where required), water, fire fighting, electricity and communication services in a timely, cost effective, co-ordinated and efficient manner that supports sustainable development practices.

PERFORMANCE CRITERIA	SUGGESTED SOLUTIONS
The objective may be achieved where:	The following suggested solutions are ONE WAY of meeting the objective and performance criteria:
 Design and provision of utility services, including sewerage (where appropriate), water, electricity and communication services, are cost effective over their life cycle and incorporate provisions to minimise adverse environmental impact in the short and long term. Rural dwellings are to be water self sufficient, without drawing water from existing permanent watercourses. Adequate buffers are maintained between utilities and houses to protect residential amenity and health. 	 The design and provision of utility services conforms to Council's: "General Specification for the Construction of Road and Drainage Works", "Specification for the Construction of Water Reticulation". The treatment and disposal of waste water is undertaken in a manner which satisfies Council. The requirements of other relevant supply authorities are met.

6.3.4 Flooding

Element:- Flooding

OBJECTIVE		
Ensure the most appropriate development for flood prone land in rural areas.		
PERFORMANCE CRITERIA	SUGGESTED SOLUTIONS	
The objective may be achieved where:	The following suggested solutions are ONE WAY of meeting the objective and performance criteria:	
 Subdivision and development of rural land is to be in accordance with Chapter 9 - Flood Prone Lands. 	Where applicable, dwelling floor levels shall be 500 mm. above the 1 in 100 year flood event. Either on a mound minimum 3 m. wider, in all directions, than the dwelling with batters of 1 in 4 (or flatter) or elevated on foundation designed to withstand afflux	
 Major cross road drainage structures are designed for an acceptable level of safety, convenience and cost. 	loadings.	

6.3.5 Lot Layout

Element:- Rural Landscape

OBJECTIVE To provide attractive landscapes that are sensitive to the built form, rural landscape, native vegetation and environmental conditions of the site and locality.

PERFORMANCE CRITERIA	SUGGESTED SOLUTIONS
The objective may be achieved where:	There are no recommended Suggested Solutions for this Element, as each situation requires an individual approach.
1. The road and landscape design achieves:	
 the creation of attractive rural environments with clear character and identity; respect for existing attractive landscapes in the area; provision for appropriate roadside tree plantings taking into account the natural landscape, soils, selection of appropriate species, and services; use of such features as views, vistas, existing vegetation and landmarks; the use of land for the purposes of environmental repair, provision of wildlife and habitat corridors and rural open space. 	

Element:- Lot Layout

OBJECTIVE		
To provide a range and mix of lot sizes to suit agriculture and uses permitted in the respective zone, with areas and dimensions to meet user and servicing requirements.		
PERFORMANCE CRITERIA	SUGGESTED SOLUTIONS	
The objective may be achieved where:	The following suggested solutions are ONE WAY of meeting the objective and performance criteria:	
1. Lots have an appropriate area and dimensions for the siting and construction of a dwelling and ancillary and farm outbuildings, buildings or works associated with a permitted use.	Shape of lots should be regular with boundaries related to physical features of the land such as land classes, ridges slopes and watercourses.	
2. Lot size and dimensions take into account overall farm design and viability by recognising issues such as:	Long narrow lots are to be avoided as this makes it difficult to provide separation distances and buffers.	
 the slope of the land; natural boundaries; existing fencing and paddock structure; the balance of agricultural land classes to allow flexibility in farm management; regard to the potential future use of the land. 3. Lot sizes and dimensions enable dwellings to be sited to: protect natural or cultural features; acknowledge site constraints including soil erosion and bushfire risk; retain special features such as trees and views. 	All lots are to have adequate access to a public road.	
4. The site meets requirements for septic effluent disposal area, slope, etc.	A future Building Envelope, showing proposed means of access and effluent disposal areas is to be identified in each lot. Siting of building envelopes is to minimise the impact of the future dwelling on the rural landscape and rural (or other approved) usage of the land. Building envelopes are to maximise the opportunities for solar orientation.	

Element:- Bushfire

OBJECTIVE			
To reduce the level of fire risk associated with building in bushfire-prone areas by adopting suitable passive and active protection measures relating to siting, layout, design and construction techniques, and landscaping.			
PERFORMANCE CRITERIA	SUGGESTED SOLUTIONS		
The objective may be achieved where:	The following suggested solutions are ONE WAY of meeting the objective and performance criteria:		
 Each dwelling site is provided with a safe and secure water supply for fire fighting and protection. The subdivision is designed to provide for a fuel-reduced buffer area and the creation of building sites that minimise risk of fire. 	Buildings comply with the <i>Building Code of</i> <i>Australia</i> for construction in bushfire prove areas, and with Council requirements. Subdivision and building envelopes meet relevant requirements described in <i>"Planning for Bushfire Protection"</i> .		
3. The road layout, design and construction takes account of the needs of emergency vehicles and possible evacuation.	No through roads, and cul-de-sac are not preferred unless alternative escape access is provided.		

Figure 6-19: Bushfire Protection



Source: NSW Bushfire Service

Element:- Buffers to Avoid Land Use Conflicts

OBJECTIVE		
To minimise land use conflicts between agricultural and industrial land uses and potentially incompatible land uses through the establishment of appropriate buffers.		
PERFORMANCE CRITERIA	SUGGESTED SOLUTIONS	
The objective may be achieved where:	The following suggested solutions are ONE WAY of meeting the objective and performance criteria:	
 Buffer areas are provided between agricultural, industrial, extractive and infrastructure services and rural dwellings. 	Subdivision of industrial land is to be in accordance with Chapter 11 - Buffer Areas.	

2. Landscape plans are to include the proposed treatment, ownership and maintenance of buffer areas.

Buffer areas are to be landscaped in accordance with an approved landscape plan and prior to release of linen plans.

Lodging of a bond may be required to ensure maintenance of landscaping.



Possible development considerations to help minimise land use conflict

Element:- Prime Agricultural Land

OBJECTIVE

To retain and enhance prime agricultural lands.

PERFORMANCE CRITERIA	SUGGESTED SOLUTIONS
The objective may be achieved where:	The following suggested solutions are ONE WAY of meeting the objective and performance criteria:
 Reducing the potential for rural land use conflicts. Ensuring the subdivision design is compatible with the agricultural capability of the land. Ensuring land to be potentially used for intensive agricultural uses has: 	An agricultural land capability and suitability assessment is undertaken by a suitably qualified person. Lands having a Agricultural Land Classification of 1, 2, 3 or Specialist classes are not to be developed for purposes, other than agriculture.
 minimal detrimental impacts on water quality of receiving waters; minimal adverse impacts on the amenity of the surrounding area by reason of noise, odour and visual issues; embraced the concept of total catchment management. Encourage agricultural use of high class agricultural land. 	 A pattern of subdivision is proposed which: retains land suitable for agricultural uses; maintains paddocks in workable sizes; maintains access to stock water and yards; retains flood refuges and shelter belts; retains and protects environmentally sensitive lands.

Element:- Village and Urban Expansion

OBJECTIVE	
To retain lands identified as having a potential for future urban, village and other uses.	
PERFORMANCE CRITERIA	SUGGESTED SOLUTIONS
The objective may be achieved where:	There are no recommended Suggested Solutions for this Element, as each situation requires an individual approach.
1. The proposed subdivision conforms to the appropriate Development Strategy for the locality.	

REFERENCES

1. References

Lismore City Council:

Lismore Strategic Plan

Lismore Urban Strategy

Lismore Village Development Strategy

Lismore Rural Housing Strategy

Lismore Local Environmental Plan 2000, (as amended)

Section 94 Contributions Plan

Landscape Guidelines

Planning for Bushfire Protection (RFS).

General Specification for the Construction of Road and Drainage Works.

General Specification for the Construction of Sewers.

General Specification for the Construction of Water Reticulation.

On-site Sewage and Wastewater Management Strategy.

Koala Management Study for Goonellabah and East Lismore, Nov. 1995. Phillips S. & Callaghan J.

NSW Dept of Planning:

Guidelines for Rural Settlement on the North Coast of NSW, 1995.

North Coast Urban Planning Strategy.

Dept of Planning and Dept. of Transport, Planning for Bus Services - Technical Bulletin 19, 1989, Dept of Planning, Sydney.

North Coast Regional Environmental Plan (as amended).

NSW Roads and Traffic Authority:

Guidelines for Traffic Generating Developments 1993, NSW Roads and Traffic Authority, Sydney.

Road Design Guide 1989, NSW Roads and Traffic Authority, Sydney.

National Office of Local Government, Dept. of Environment, Sport and Territories, AMCORD (Australian Model Code for Residential Development): A National Resource Document for Residential Development and Practice Notes, 1995, AGPS, Canberra.

AUSTROADS 1988, Guide to Traffic Engineering Practice Series; Part 1 - Traffic Flow,

- Part 2 Roadway Capacity
- Part 5 Intersections at Grade
- Part 6 Roundabouts
- Part 8 Traffic Control Devices
- Part 9 Arterial Road Management
- Part 10 Roadway Lighting
- Part 11 Local Area Traffic Management
- Part 12 Parking
- Part 13 Pedestrians
- Part 14 Bicycles
- AUSTROADS, Sydney.

Aust. Local Government Assoc., Institute of Municipal Engineering, Australia and Statewide Roads 1997, AUS-SPEC Development Specification Series, Sydney.

The Institute of Municipal Engineering, Australia, Queensland Division, QUEENSLAND STREETS: Design Guidelines for Subdivisional Streetworks - 1995, The Institute of Municipal Engineering, Australia, Queensland Division, Brisbane.

Dept of Conservation and Land Management 1992, Urban Erosion and Sediment Control, ed. J.S. Hunt, Dept of Conservation and Land Management, Sydney.

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