Part 4. Local Government infrastructure plan

4.1. Preliminary

(1) This local government infrastructure plan (LGIP) has been prepared in accordance with the requirements of the *Sustainable Planning Act 2009*.

(2) The purpose of the local government infrastructure plan is to:

- (a) integrate infrastructure planning with the land use planning identified in the planning scheme;
- (b) provide transparency regarding a local government's intentions for the provision of trunk infrastructure;
- (c) enable a local government to estimate the cost of infrastructure provision to assist its long term financial planning;
- (d) ensure that trunk infrastructure is planned and provided in an efficient and orderly manner; and
- (e) provide a basis for the imposition of conditions about infrastructure on development approvals.

(3) The local government infrastructure plan:

- (a) states in Section 4.2 (planning assumptions) the assumptions about future growth and urban development including the assumptions of demand for each trunk infrastructure network;
- (b) identifies in Section 4.3 (priority infrastructure area) the prioritised area to accommodate urban growth up to 2031;
- (c) states in Section 4.4 (desired standards of service) for each trunk infrastructure network the desired standard of performance;
- (d) identifies in Sections 4.5 (plans for trunk infrastructure) the existing and future trunk infrastructure for the following networks:
  - (i) water supply;
  - (ii) sewerage;
  - (iii) stormwater;
  - (iv) transport;
  - (v) parks and land for community facilities;
- (e) provides a list of supporting documents that assist in the interpretation of the local government infrastructure plan in Section 4.6 (extrinsic material).

4.2. Planning Assumptions

(1) The planning assumptions state the assumptions about:

- (a) population and employment growth;
- (b) the type, scale, location and timing of development including the demand for each trunk infrastructure network.

(2) The planning assumptions together with the desired standards of service form a basis for the planning of the trunk infrastructure networks and the determination of the priority infrastructure area.

(3) The planning assumptions have been prepared for:

(a) the base date 2011 and the following projection years to accord with future Australian Bureau of Statistics census years:

(i) mid 2016;

(ii) mid 2021;

(iii) mid 2026;

(iv) mid 2031;

(b) the LGIP development types in column 2 that include the uses in column 3 of Table 4.2.1;

(c) the projection areas identified on Local Government Infrastructure Plan Map A, Map B and Map C located in Table SC3.3.1 – Priority Infrastructure Area Maps, in Schedule 3 of the planning scheme.

Table 4.2.1—Relationship between LGIP development categories, LGIP development types and uses

Column 1 LGIP development category	Column 2 LGIP development type	Column 3 Uses
Residential development	Single Dwelling	Dwelling house Dual occupancy Caretakers accommodation
	Multiple Dwelling	Multiple dwelling Hotel (accommodation component) Short-term accommodation Rooming accommodation Retirement facility Relocatable home park
	Other	Dwelling unit Tourist park Community residence Nature based tourism (accommodation component) Non-resident workforce accommodation Resort complex (accommodation component) Rural workers' accommodation
Non-residential development	Commercial	Bulk goods: • Agricultural supplies store • Bulk landscape supplies • Garden centre • Hardware and trade supplies • Outdoor sales • Showroom Office: • Office • Sales office
	Retail	Adult store

Column 1 LGIP development category	Column 2 LGIP development type	Column 3 Uses
		Bar Food and drink outlet Service industry Service station Shop Shopping centre
	Industrial	Low impact industry Medium impact industry Research and technology industry Warehouse Marine industry High impact industry Special industry Low impact rural industry • Animal husbandry • Cropping • Permanent plantation High impact rural industry • Aquaculture • Intensive animal industry • Intensive horticulture • Rural industry • Wholesale nursery • Winery
	Community	Places of Assembly: • Child care centre • Club • Community care centre • Community use • Educational establishment • Function facility • Funeral parlour • Place of worship Entertainment: • Hotel • Nightclub entertainment facility • Theatre Sport and recreation: • Indoor sport and recreation • Outdoor sport and recreation Essential Services: • Detention facility • Emergency services

Column 1 LGIP development category	Column 2 LGIP development type	Column 3 Uses
		• Health care services • Hospital • Residential care facility • Veterinary services
	Other	Specialised uses • Air services • Animal keeping • Brothel • Car wash • Crematorium • Extractive industry • Market • Major sport, recreation and entertainment facility • Motor sport facility • Outstation • Parking station • Port services • Renewable energy facility • Tourist attraction • Transport depot • Utility installation Minor Uses • Cemetery • Environment facility • Home based business • Landing • Major electricity infrastructure • Park • Roadside stall • Substation • Telecommunications facility • Temporary use

(4) Details of the methodology used to prepare the planning assumptions are stated in the extrinsic material (refer Section 4.6).

4.2.1 Population and Employment Growth

(1) A summary of the assumptions about population and employment growth for the planning scheme area is stated in Table 4.2.1.1—Population and employment assumptions summary.

Table 4.2.1.1—Population and employment assumptions summary

Column 1- Description	Column 2 Assumptions

Column 1- Description		Column 2 Assumptions					
		Base date 2011	2016	2021	2026	2031	Ultimate development
Population	No.	33,400	37,960	41,434	46,001	51,151	57,052
	% change		14%	9%	11%	11%	12%
Employment	No.	10,832	12,311	13,437	14,918	16,589	18,502
	% Change		14%	9%	11%	11%	12%

(2) Detailed assumptions about growth for each projection area and LGIP development type category are identified in the following tables in Schedule 3 Local government infrastructure plan mapping and supporting material:

(a) for population, Table SC3.1.1—Existing and projected population;

(b) for employment, Table SC3.1.5 —Existing and projected employees.

4.2.2 Development

(1) The developable area is identified on Local Government Infrastructure Plan Map A, Map B and Map C identified in Table SC3.3.1 in Schedule 3—Local government infrastructure plan mapping and supporting material.

Editor's note: Not all land within the identified Priority Infrastructure Area is suitable for development due to constraints. The identified Priority Infrastructure Area contains sufficient developable area to accommodate the assumed future urban growth. Further explanation of developable area is provided in the Livingstone Shire Council LGIP Assumptions Report which is identified as extrinsic material in 4.6.

(2) The planned density for future development is stated in Table SC3.1.3 in Schedule 3—Local government infrastructure plan mapping and supporting material.

(3) A summary of the assumptions about future residential and non-residential development for the planning scheme area is stated in Table 4.2.2.1—Residential dwellings and non-residential floor space assumptions summary.

Table 4.2.2.1—Residential dwellings and non-residential floor space assumptions summary

Column 1- Description		Column 2 Assumptions					
		Base date 2011	2016	2021	2026	2031	Ultimate
Residential Dwellings	No.	15,718	18,142	20,109	22,672	25,210	28,119
	% change		15%	11%	13%	11%	12%
Non-Residential floor space (m2 GFA)	No.	294,430	334,635	365,256	405,513	450,911	502,931
	% Change		14%	9%	11%	11%	12%

(4) Detailed assumptions about future development for each projection area and LGIP development type are identified in the following tables in Schedule 3 Local government infrastructure plan mapping and supporting material:

(a) for residential development, Table SC3.1.2;

(b) for non-residential development, Table SC3.1.4.

4.2.3 Infrastructure Demand

(1) The demand generation rate for a trunk infrastructure network is stated in Table SC3.1.6 in Schedule 3 Local government infrastructure plan mapping and supporting material.

(2) A summary of the projected infrastructure demand for each service catchment (i.e. Water supply network, sewerage network, stormwater network, transport network, parks and land for community facilities network) is stated in Table SC3.1.7 in Schedule 3.

4.3. Priority Infrastructure Area

(1) The Priority Infrastructure Area (PIA) identifies the area prioritised for the provision of trunk infrastructure to service the existing and assumed future urban development up to 2031.

(2) The Priority Infrastructure Area is identified on Local Government Infrastructure Plan Map A, Map B and Map C identified in Table SC3.3.1 in Schedule 3—Local government infrastructure plan mapping and supporting material.

4.4. Desired Standards of Service

(1) This section states the key standards of performance for a trunk infrastructure network.

(2) Details of the standard of service for a trunk infrastructure networks are identified in the extrinsic material.

4.4.1 Water Supply Network

(1) The desired standards of service for the water supply system are detailed in Tables 4.4.1.1 and 4.4.1.2.

(2) Livingstone Shire Council aims to provide reticulated potable water supply to the consumer to meet the demands imposed upon it by both the consumers and the fire-fighting requirements.

(3) It is acknowledged that in some cases, due to local circumstances, the desired standards of service may not be met. In these situations, water supply trunk infrastructure aims to meet the standards to the greatest degree practicable.

Table 4.4.1.1 - Water Supply Network Design Criteria

Design criteria	Measure
Average Day (AD) Demand	500 litres per equivalent person per day (L/EP/Day)
Maximum Day (MD) Demand	1.9 x average day (AD)
Maximum Hour (MH) Demand	1/12 x maximum day (MD)
One (1) equivalent tenement (ET)	2.7 equivalent persons (EP)
Minimum Service Pressure	• 22 metres head at the centroid of the residential lot during normal diurnal flow in the reticulation non-trunk network • for trunk network to be a minimum 1-meter head at all times
Desirable Upper Service Pressure	50 metres head at the centroid of the residential lot during normal diurnal flow in the reticulation non-trunk network
Maximum Service Pressure	• 80 meters head at the centroid of the residential lot in the reticulation non-trunk network • 90 meters for the trunk network
Fire Fighting Pressure	12 metres minimum in the reticulation non-trunk water supply network
Fire Flow for residential area in the reticulation non-trunk network	15 litres per second for a duration of two (2) hours at minimum pressure of 120 kilopascals (kPa)
Fire Flow for industrial/commercial area in the reticulation non-trunk network	30 litres per second for a duration of four (4) hours at minimum pressure of 120 kilopascals (kPa)
Pipeline design maximum velocity	two (2) metres per second (1.5m/sec desirable for optimum

Design criteria	Measure
	energy useage)
Reservoir Capacity	one (1) Maximum Day for the supply zone
Trunk Water Main sizing	• Average Day (AD) supply to Trunk Dams • Maximum Day (MD) supply to Reservoirs • Maximum Hour (MH) supply to reticulation

Table 4.4.1.2 – Water Supply Network Desired Standards of Service

Measure	Planning criteria (qualitative standards)	Design criteria (quantitative standards)
Reliability/ continuity of supply	The water supply system has been designed to provide water twenty-four (24) hours a day seven (7) days a week, but under certain circumstances, Livingstone Shire Council may need to interrupt or limit this service so that essential repair and maintenance work can be carried out.	• Livingstone Shire Planning Scheme • Section 3 and table 3.1 FRW Strategic Asset Management Plan 22/11/2012 • *Water Supply (Safety and Reliability) Act* • Compliance with the requirements of the System Leakage Management Plan for the Rockhampton Region • Capricorn Municipal Development Guidelines
Adequacy of supply	The objective of the water supply system is to provide to the consumer a reticulated potable water supply to meet the demands imposed upon it by both the consumer and firefighting requirements.	• Livingstone Shire Planning Scheme • Water Development Code and Planning Scheme Policy – Livingstone Shire Planning Scheme • Capricorn Municipal Development Guidelines • *Water Supply (Safety and Reliability) Act* • Compliance with the requirements of the System Leakage Management Plan for the Rockhampton Region
Quality of supply	Livingstone Shire Council will ensure that the water quality is generally in accordance with recognised standards that safeguards community health.	• Australian Drinking Water Quality Guidelines issued by the National Health and Medical Research Council • Section 3 table 3.2 FRW Strategic Asset Management Plan 22/11/2012
Environmental impacts	The environmental impacts of the water supply network are minimised in accordance with community expectations.	• Livingstone Shire Planning Scheme • Compliance with the requirements of the *Environmental Protection Act 1994* • *Water Supply (Safety and Reliability) Act*
Pressure and leakage management	The water supply network is monitored and managed to maintain the reliability and adequacy of supply and to minimise environmental impacts.	• Livingstone Shire Planning Scheme • Compliance with the requirements of the System Leakage Management Plan for the Rockhampton Region • *Water Supply (Safety and Reliability) Act*

Measure	Planning criteria (qualitative standards)	Design criteria (quantitative standards)
Infrastructure design/ planning standards	Design of the water supply network will comply with established guidelines, codes and standards.	• Capricorn Municipal Development Guidelines – Design Specifications and Standard Drawings • Water Reticulation Code of Australia WSA 03-1999 • Department of Natural Resources and Mines Planning Guidelines for Water Supply and Sewerage March 2005

4.4.2 Sewerage Network

(1) The desired standards of service for the sewerage system are detailed in Tables 4.4.2.1, 4.4.2.2 and 4.4.2.3.

(2) Livingstone Shire Council aims to provide reticulated sewerage to the consumer to meet the demands imposed upon it by the consumers and the Environmental Protection Agency.

(3) The objective of the sewerage system is to transport sewage from domestic, commercial and industrial properties using gravity flow pipes and where this is uneconomical, by pumping to the treatment plant.

(4) It is acknowledged that in some cases, due to local circumstances, the desired standards of service may not be met. In these situations, sewerage trunk infrastructure aims to meet the standards to the greatest degree practicable.

Table 4.4.2.1 – Sewerage Network Design Criteria

Design criteria	Measure
One (1) equivalent person (EP)	200 litres per equivalent person per day (L/EP/day)
One (1) equivalent tenement (ET)	2.7 equivalent person (EP)
Average Dry Weather Flow (ADWF)	540 litres per equivalent tenement per day (L/ET/day)
Peak Dry Weather Flow (PDWF)	2.5 x Average Dry Weather Flow (ADWF)
Wet Weather Flow (WWF)	Five (5) x Average Dry Weather Flow (ADWF)
Sewage pump station emergency storage	Four (4) hours minimum
Total sewage pump station capacity	Wet Weather Flow or Five (5) x Average Dry Weather Flow (ADWF) minimum
Gravity Main Flow Capacity	75% of full depth at Wet Weather Flow (WWF) capacity
Gravity Main Minimum velocity at Peak Dry Weather Flow (PDWF)	0.7 m/sec at Peak Dry Weather Flow (PDWF) capacity
Gravity Main Maximum velocity at wet weather flow (WWF)	2 m/sec at Wet Weather Flow (WWF) capacity
Rising main minimum scouring velocity	0.7 m/sec at Peak Dry Weather Flow (PDWF) capacity
Rising main maximum velocity	• 1.5m/sec for new trunk sewer rising mains at Wet Weather Flow (WWF) capacity • 2 m/sec for augmentation of existing trunk sewer rising mains at Wet Weather Flow (WWF) capacity
Planning Horizon	• Ultimate for reticulation (non-trunk) network • 20 years for trunk gravity mains, trunk sewage pump stations, trunk sewer rising mains, trunk effluent pressure mains

Design criteria	Measure
Odour Protection	• Required for new trunk sewage pump stations where initial loadings cause long detention times • Not required for augmented sewage pump stations
Air Release and Air Scour	• Air Venting in all gravity sewer mains at locations of excessive turbulence – particularly where a steep (super-critical flow) meets a flat section (sub-critical flow), and discharge chambers • Air scours on rising mains where air lock is a risk

Table 4.4.2.2 – Treated water quality

Criteria	Measure
Biological Oxygen Demand (BOD)	Less than 20 milligrams per litre
Dissolved Oxygen (DO)	Greater than 6 milligrams per litre
Suspended Solids (SS)	Less than 30 milligrams per litre
pH	6.5 – 7.5
Free chlorine residual	Less than 0.7 milligrams per litre

Table 4.4.2.3 – Sewerage Network Desired Standards of Service

Measure	Planning criteria (qualitative standards)	Design criteria (quantitative standards)
Reliability	Livingstone Shire Council is to provide prompt, courteous and effective sewerage services to its customers. Staff make every effort to ensure the sewerage system operates adequately and with minimal disruption.	• Livingstone Shire Planning Scheme • Section 3.2 and tables 3.3 to 3.5 Fitzroy River Water Strategic Asset Management Plan 22/11/2012
Quality of treatment	Livingstone Shire Council uses every effort to continue to operate the sewerage system efficiently and effectively, ensuring the highest value for effluent is received for all sewerage treatment plants. The quality of treatment ensures the health of the community, the safe and appropriate level of treatment and proper disposal of treated effluent.	• Compliance with the requirements of the *Environmental Protection Act 1994* • Tables 2.15 to 2.18 Fitzroy River Water Strategic Asset Management Plan 22/11/2012
Environmental impacts	Livingstone Shire Council uses every effort to continue to operate the sewerage system efficiently and effectively and minimise sewage overflows and interruptions. The environmental	• Livingstone Shire Planning Scheme • Compliance with the requirements of the *Environmental Protection Act 1994*

Measure	Planning criteria (qualitative standards)	Design criteria (quantitative standards)
	impacts of the sewerage network are minimised in accordance with community expectations.	
Effluent reuse	Livingstone Shire Council reuses effluent wherever possible.	• Compliance with the requirements of the *Environmental Protection Act 1994* • Queensland Water Recycling Guidelines – December 2005
Infrastructure design/ planning standards	Design of the sewerage network will comply with the established guidelines, codes and standards.	• Capricorn Municipal Development Guidelines – Design Specifications and Standard Drawings • Sewerage Reticulation Code of Australia WSA 03-1999 • Department of Natural Resources and Mines Planning Guidelines for Water Supply and Sewerage March 2005 • *Water Supply (Safety and Reliability) Act*

4.4.3 Stormwater Network

(1) The function of Council's stormwater drainage systems is to collect and convey stormwater through respective catchment areas via connected flowpaths with minimal nuisance, danger or damage, at a cost that is acceptable to the community.

(2) It is acknowledged that in some cases, due to local circumstances, the desired standards of service may not be met. In these situations, stormwater trunk infrastructure aims to meet the standards to the greatest degree practicable.

(3) The Defined Flood Event (DFE) and Defined Flood Level (DFL) are defined in the Planning Scheme and Policies.

(4) Table 4.4.3.1 outlines the planning and design criteria for the stormwater network within the Livingstone Shire Council area. Some significant design parameters are as follows:

(a) Major and Minor System Criteria are required.

(b) Q100 (AEP 1% or ARI 100) for all Major Systems, Q5 for residential and Q10 for industrial Minor Systems.

(c) Building level freeboard not less than 300 millimetres above DFE level.

(d) Natural flowpaths will be connected and protected.

Table 4.4.3.1 – Stormwater Network Desired Standards of Service

Measure	Planning criteria (qualitative standards)	Design criteria (quantitative standards)
Connectivity	Ensure trunk drainage flowpaths are connected to ensure lawful access for development	• Water Act defined Watercourses are assumed to be protected under State authority, but is desirable in urban areas to have drainage Easement for the natural bed and banks • Water Act defined Watercourses are to have Q100 flood drainage easements • Water Act defined Drainage Features are to have Q100 drainage easements

Measure	Planning criteria (qualitative standards)	Design criteria (quantitative standards)
		for the natural flowpath • Water Act defined Overland Flow does not require drainage easements over the natural flowpaths • Combined use for parks and sporting facilities according to the risks
Quantity	Collect and convey stormwater in natural and engineered channels, a piped, drainage network and system of overland flow paths to a lawful point of discharge, in a safe manner that minimises the inundation of habitable rooms and protects life.	• Local government standards in planning scheme, planning scheme policies and Capricorn Municipal Development Guidelines • Queensland Urban Drainage Manual
Quality	The water quality of urban catchments and waterways is managed to protect and enhance environmental values and pose no health risk to the community.	• Local water quality guidelines prepared in accordance with the National Water Quality Management Strategy • Queensland Water Quality Guidelines 2009 — Environmental Protection Agency (EPA) • National Water Quality Guidelines — National Water Quality Management Strategy
Environmental impacts	Where appropriate, adopt water-sensitive urban design principles and on-site water quality management to achieve Environmental Protection Agency water quality objectives.	• Local government standards/codes in the planning scheme, planning scheme policies and Capricorn Municipal Development Guidelines • Environmental Protection [Water] Policy 1997
Infrastructure design/ planning standards	Design of the stormwater network will comply with established codes and standards.	• Local government standards in the planning scheme, planning scheme policies and Capricorn Municipal Development Guidelines • Queensland Urban Drainage Manual • Natural Channel Design Guidelines

4.4.4 Transport Network

(1) The transport network contains three integrated systems being roads, public transport, and the pedestrian and cycle network. The desired standards are below.

(a) Roads:

(i) The desired standards of service for trunk roads are largely dependent on the road hierarchy classification, lanes, traffic loading, traffic pattern, and level of service (LOS) (shown in Tables 4.4.4.2 and 4.4.4.3);

(ii) The desired standards of service apply to all trunk infrastructure roads within the Livingstone Shire Council area in accordance with Table 4.4.4.1.

(b) Public transport:

(i) Bus facilities are to include bus stopping treatments and shelters in accordance with Table 4.4.4.1.

(c) Pedestrian and cycle network:

(i) Desired standards of service for cycleways and pedestrian pathways concern geometric design considerations required for the construction of trunk infrastructure as defined by on-road and off-road facilities identified in the Capricorn Municipal Development Guidelines, and summarised in Table 4.4.4.1 below.

(2) It is acknowledged that in some cases, due to local circumstances, the desired standards of service may not be met. In these situations, transport trunk infrastructure aims to meet the standards to the greatest degree practicable.

Table 4.4.4.1 – Transport Network Desired Standards of Service

Measure	Planning criteria (qualitative standards)	Design criteria (quantitative standards)
Road network design/ planning standards	The road network provides a functional urban and rural hierarchy that supports settlement patterns, commercial and economic activities and freight movement. Design of the road system aims to meet minimum Level of Service (LOS) D at the Planning Horizon Peak Hour Pattern for the particular site.	• Local government road design and development manual/standards/codes in the planning scheme, planning scheme policies and Capricorn Municipal Development Guidelines • The Queensland Department of Transport and Main Roads Road Planning and Design Manual • Australian Standards • AUSTROADS guides • Maximum acceptable degree of saturation for intersections identified in Table 4.4.4.3 or minimum levels of service (LOS) D in Table 4.4.4.2 • Level of service (LOS) – Table 4.4.4.2
Public Transport design/ planning standards	Ensure development accommodates the access to and integration of public transport services. Provide bus stops including bus bays, shelters, seating and bus information systems in accordance with Council's adopted standards identified in the planning scheme.	• Local government road design and development manual/standards/codes in the planning scheme, planning scheme policies and Capricorn Municipal Development Guidelines • Design accords with the performance criteria set by Department of Transport and Main Roads • Queensland Government TRANSLINK Public transport infrastructure manual • AUSTROADS guides for road-based public transport and high-occupancy vehicles
Cycleway and pathway design/ planning standards	Cycleways and pathways provide a safe and convenient network that encourages walking and cycling as acceptable travel alternatives. Design of the network will comply with Council's adopted standards identified in the planning scheme.	• Local government road design and development manual/standards/codes in the planning scheme, planning scheme policies and Capricorn Municipal Development Guidelines • Australian Standards • AUSTROADS Guides • Complete Streets

Table 4.4.4.2 - Level of service (LOS) for trunk roads, intersections, pedestrian and cycle networks *

Level of Service	Short Description	Loading
A	Free flow	< 33 %
B	Reasonably free flow	< 50 %
C	Stable flow	< 65 %
D	Approaching unstable flow	< 80 %
E	Unstable flow	100 %
F	Forced or breakdown flow	

* Refer to Department of Main Road Planning and Design Manual

Table 4.4.4.3 – Maximum Degree of Saturation for Road Intersections

Road Network Item	Maximum degree of saturation
Traffic Signals	0.9
Roundabout	0.85
Priority controlled	0.8
Traffic signals (State-controlled)	0.9

4.4.5 Public Parks and Land for Community Facilities Network

(1) The desired standards of service for the public parks and land for community facilities trunk infrastructure are shown in Tables 4.4.5.1 to 4.4.5.6 – desired standards of service – public parks and land for community facilities, and they should be read in conjunction with Councils adopted technical standards – Capricorn Municipal Development Guidelines and the Economic Development Queensland Guidelines 11 and 12.

(2) It is acknowledged that in some cases, due to local circumstances, the desired standards of service may not be met. In these situations, public parks and land for community facilities trunk infrastructure aims to meet the standards to the greatest degree practicable.

Table 4.4.5.1 – Public Parks and Land for Community Facilities Network Desired Standards of Service

Measure	Planning criteria (qualitative standards)	Design criteria (quantitative standards)
Functional network	A network of parks and community land is established to provide for the full range of recreational and sporting activities and pursuits.	• Parks and community land are provided at a local, district and local government area wide level • Parks and community land address the needs of both recreation and sport
Accessibility	Public parks and land for community facilities will be located to ensure adequate pedestrian, cycle and vehicle access. Co-locate land for multi-purpose community facilities with parks and recreation land and commercial/retail centres.	• 2,000 square metres of land for community facilities is to be provided when such land is co-located with a district and regional park • Accessibility standards are identified in Table 4.4.5.3
• Land quality/ suitability	Public parks and land for community facilities will be	The rate of land provision is identified in Table 4.4.5.2. The minimum size, shape of

Measure	Planning criteria (qualitative standards)	Design criteria (quantitative standards)
• Area/ 1,000 persons • Minimum size • Shape of land • Minimum desired flood immunity • Maximum desired grade • Road frontage and visibility	provided to a standard that supports a diverse range of recreational, sporting, community and health–promoting activities to meet community expectations. This includes ensuring land is of an appropriate size, configuration and slope, and has an acceptable level of flood immunity.	land, minimum desired flood immunity, maximum desired grade and road frontage and visibility for land is identified in Table 4.4.5.4.
Facilities/ embellishments	Public parks and land for community facilities contain a range of embellishments to complement the type and purpose of the park.	Indicative embellishments for each type of park, land for community facilities and sports grounds are identified in Table 4.4.5.5 and Table 4.4.5.6.
Infrastructure design/ performance standards	Maximise opportunities to collocate recreational parks and land for community facilities in proximity to other community infrastructure, transport hubs and valued environmental and cultural assets.	• Local government standards in the planning scheme and planning scheme policies • Australian Standards

Table 4.4.5.2 – Rate of Land Provision

Infrastructure type	Rate of provision (Hectare per 1000 people)	
	District	Local government-wide
Recreation park	0.8	0.5
Sports Ground	2.5	2.5
Land for Community Facilities	Rate of provision to be determined by minimum land sizes and at least one (1) district facility per the following planning sectors: • Yeppoon • Emu Park	Rate of provision to be determined by minimum land sizes and at least one (1) regional facility per the following planning sectors: • Yeppoon

Table 4.4.5.3 – Accessibility Standard

Infrastructure type	Accessibility standard (km)	
	District	Local government-wide
Recreation park	2.5 kilometres in urban areas and within 500 metres of a public transport pick up/drop off point.	Local government area and within 500 metres of a public transport pick up/drop off point.
Sports ground	2.5 kilometres in urban areas and within 500 metres of a public transport	Local government area and within 500 metres of a public transport pick up/drop

Infrastructure type	Accessibility standard (km)	
	District	Local government-wide
	pick up/drop off point.	off point.
Land for community facilities	Within 800 metres of a public transport pick up/drop off point.	Within 500 metres of a public transport pick up/drop off point.

Table 4.4.5.4 – Public Parks and Land for Community Facilities Characteristics

Characteristic	Recreation Parks and Land for Community Facilities		Sports Grounds	
	District	Regional	District	Regional
Minimum size of open space (hectares)	Two (2) hectares of usable space for parkland.	Six (6) hectares of usable space for parkland.	A minimum of three (3) hectares, sufficient to boast two (2) fields per one (1) oval collocating and room for ancillary facilities (club house, toilets, car parking).	A minimum of four (4) hectares, sufficient to boast three (3) fields per two (2) ovals collocating and room for ancillary facilities (club house, toilets, car parking).
	One (1) hectare of usable space for land for community facilities.	1.5 hectares of usable space for land for community facilities.		
Shape of land	The preferred shape for a park/land for community facilities is square to rectangular with the sides no greater than 2:1.		To maximise the area available for playing fields, a square or rectangular shape is considered most efficient.	
Minimum desired flood immunity for parks	At least twenty-five (25) per cent of total area above Q50 with main activity area/s above Q100.	At least fifty (50) per cent of total area above Q50 with main activity area/s above Q100 and free of hazards.	Free of hazards. Ninety per cent of land above Q20. Fields/courts above Q50. Built facilities above Q100.	
Maximum desired grade	Recreation parks — average grade of 1:14 for eighty (80) per cent of the area of the park to facilitate wheelchair access to parks. Variable topography is satisfactory for the remaining area No area of the park will have a grade greater than 1:6 Community facilities — a maximum grade of no more than six (6) per cent for the	Recreation parks — average grade of 1:20 for main use areas, 1:50 for kick about area, and variable topography for remainder No area of the park will have a grade greater than 1:6 Community facilities — a maximum grade of no more than six (6) per cent for the	Laser levelling to a maximum gradient of playing surface 1:100.	

Characteristic	Recreation Parks and Land for Community Facilities		Sports Grounds	
	District	Regional	District	Regional
	entirety of the site or ten (10) per cent for the footprint of the community facility.	entirety of the site or ten (10) per cent for the footprint of the community facility.		
Road frontage and visibility	Twenty-five (25) per cent of park perimeter to have direct road frontage, preferably on a collector road.	Fifty (50) per cent of park perimeter to have direct road frontage, preferably on a collector road.	Twenty-five (25) per cent of the ground perimeter to have direct road frontage.	

Table 4.4.5.5 – Indicative Embellishments for the Hierarchy of Recreation Parks and Land for Community Facilities

Embellishment	Recreation parks	
	District	Local government-wide
Internal roads	None.	As required to service car parking and access requirements.
Car parking	Forty (40) sealed car parks.	Minimum of 120 sealed car parks.
Fencing/bollards, lock rail	Fencing/bollards along road frontages and including a lock rail.	Fencing/bollards along road frontages and including a lock rail.
Lighting	Lighting to all roadways, parking, picnic nodes and primary pedestrian paths.	Lighting to all roadways, parking, picnic nodes and primary pedestrian paths.
Toilets/public amenities	One (1) toilet (location to be determined in consultation with Council).	Two (2) toilets (location to be determined in consultation with Council).
Pedestrian pathway access network	2.2 metre wide concrete shared pedestrian and cycle path through and around park connecting to adjacent pathways.	Entrance and access paths. Concrete shared pedestrian and cycle path (minimum 2.2 metre wide generally and minimum 3.5 metre wide in key, high use areas) connecting to adjacent pathways.
Bench seating	Minimum of four (4), located for supervision of any play area (if not otherwise serviced by sheltered tables), and/or along recreation corridors/pedestrian pathways to provide rest stops.	As determined in consultation with Council. Located for: • supervision of any play area (if not otherwise serviced by sheltered tables); and • along recreation corridors/pedestrian pathways to provide rest stops; and/or • enjoyment of views/amenity.
Shade structures or trees (over playgrounds)	Yes.	Yes.
Shelters/gazebo with tables and seating and bins	Minimum of six (6) shaded tables, seating and bins.	Minimum of fifteen (15) shaded tables, seating and bins (further provision to be determined in consultation with Council).

Embellishment	Recreation parks	
	District	Local government-wide
Tap/bubbler	Three (3) drinking fountain/bubbler and taps.	Ten (10) drinking fountain/bubbler and taps.
Barbeques	Three (3) barbeques.	Ten (10) barbeques (to be determined in consultation with Council – provision may consist of multiple double barbecues located to service picnic nodes for individuals, families and large groups).
Rubbish bins	As required to service activity areas, picnic nodes, key access/egress areas and pathway systems.	As required to service activity areas, picnic nodes, key access/egress areas and pathway systems.
Landscaping and turfing	Shade trees, landscaping and turfing to enhance amenity (determined in consultation with Council).	Shade trees, landscaping and turfing to enhance amenity (determined in consultation with Council).
Signage	Park identification and way finding signage, located at key entrances. Optional — interpretive signage (for nature appreciation areas) or trail signage (for example distance markers on recreation corridors).	Park identification and way finding signage, located at key entrances. Optional — interpretive signage and/or trail signage (for example distance markers on recreation corridors). Signage theme reflecting key features of the park.
Recreation activity areas	Mix of ten (10) recreation activity areas, clustered in two or more nodes (for example mix of toddlers, children, youth, picnic and barbecue area, dog off-leash, skate park, meeting area, older adults, pathway systems).	Mix of fifteen (15) recreation activity areas dispersed across well-defined nodes of activity focus (for example a mix of toddlers, children, youth, older adults, major picnic and barbecue area, dog off-leash, skate park, meeting areas, trail network, event area, nature appreciation area).
Irrigation	In identified high use areas.	In identified high use areas.
Bike racks	Three (3) bike racks for a minimum of fifteen (15) bikes.	Bike racks for a minimum of thirty (30) bikes.
Bus pull-through	No.	Yes (location to be determined in consultation with Council).
Bus parking	No.	Yes (location to be determined in consultation with Council).

Table 4.4.5.6 – Indicative Embellishments for the Hierarchy of Sport Parks

Park element	Embellishment details	
	District	Local government-wide
Courts/fields	As a minimum, two (2) rectangular fields and capacity for additional facilities/courts (as determined in consultation with Council). Sports grounds and facilities meet accepted standards including dimensions, playing surface and subsurface drainage.	As a minimum, three (3) rectangular fields and capacity for additional facilities/courts (as determined in consultation with Council). Sports grounds and facilities meet accepted standards including dimensions, playing surface and subsurface drainage.

Park element	Embellishment details	
	District	Local government-wide
Goal posts/line marking	According to accepted standards.	According to accepted standards.
Irrigation	Main field as a minimum (to be determined in consultation with Council).	Two (2) main fields as a minimum (to be determined in consultation with Council).
Field/court lighting	Lighting for night sports.	Lighting for night sports.
Spectator seating	100 seats and earth mounds (determined in consultation with Council).	150 seats and earth mounds (determined in consultation with Council).
Tap/bubbler	Four (4) drink bubblers and taps located near activity areas and canteen/clubhouse area.	Eight (8) drink bubblers and taps located near activity areas and canteen/clubhouse area.
Sports clubhouse	Minimum of one (1) (exact provision to be determined in consultation with Council) including a toilet/change room, canteen, storage and administrative/office space.	Minimum of two (2) (exact provision to be determined in consultation with Council) including a toilet/change room, canteen, storage and administrative/office space.
Landscaping and turfing	Trees/shade provision for spectators, landscaping of boundaries to buffer noise/light spill to any surrounding properties.	Trees/shade provision for spectators, landscaping of boundaries to buffer noise/light spill to any surrounding properties.
Feature paving/ concrete stencilling	Located at key entry areas or high use zones (to be determined in consultation with Council).	Located at key entry areas or high use zones (to be determined in consultation with Council).
Internal roads	Yes.	Yes.
Bus pull-through	Yes.	Yes.
Bus parking	Yes.	Yes.
Car parking	Minimum of sixty (60) sealed spaces for a two (2) field complex or twelve (12) per court.	Minimum of 100 sealed spaces for a three (3) field complex or twelve (12) per court.
Bike racks	Bike racks for a minimum of thirty (30) bikes.	Bike racks for a minimum of fifty (50) bikes.
Fencing/ bollards, lock rail	Fencing/bollards along road frontages and including a lock rail.	Fencing/bollards along road frontages and including a lock rail.
Security Lighting	Security lighting to all roadways, parking, picnic nodes and primary pedestrian paths.	Security lighting to all roadways, parking, picnic nodes and primary pedestrian paths.
Pedestrian pathway access network	Entrance and access paths, walking/cycling network. Minimum 2.2 metre wide concrete shared pedestrian and cycle path.	Entrance and access paths, walking/cycling network. Minimum 2.2 metre wide concrete shared pedestrian and cycle path.
Public artwork	To be determined in consultation with Council.	To be determined in consultation with Council.
Signage	Park identification and way finding signage, located at key entrances.	Park identification and way finding signage, located at key entrances.
Recreation activity areas (for example	Mix of three (3) recreation activity areas (for example play spaces, fitness	Mix of five (5) recreation activity areas (for example play spaces,

Park element	Embellishment details	
	District	Local government-wide
play spaces, fitness circuits, hit up walls)	circuits, half courts, free to use courts).	fitness circuits, half courts, free to use courts).

4.5. Plans for Trunk Infrastructure

(1) The plans for trunk infrastructure (PFTI) identify the trunk infrastructure networks intended to service the existing and assumed future urban development at the desired standard of service up to 2031.

4.5.1 Plans for Trunk Infrastructure maps

(1) The existing and future trunk infrastructure networks are shown on the following maps. The maps are located in Schedule 3 - Local government infrastructure plan mapping and supporting material.

Table 4.5.1.1 – Locality Map References for Livingstone Shire Council Plans for Trunk Infrastructure

Locality	Map Series Reference	Locality	Map Series Reference	Locality	Map Series Reference
Adelaide Park	1	Greenlake	23	Pacific Heights	45
Bangalee	2	Hidden Valley	24	Rockyview	46
Barlows Hill	3	Inverness	25	Rosslyn	47
Barmaryee	4	Ironpot	26	Rossmoya	48
Barmoya	5	Jardine	27	Sandringham	49
Bondoola	6	Joskeleigh	28	Shoalwater	50
Bungundarra	7	Keppel Sands	29	Stanage	51
Byfield	8	Kinka Beach	30	Stockyard	52
Canal Creek	9	Kunwarara	31	Tanby	53
Canoona	10	Lake Mary	32	Taranganba	54
Causeway Lake	11	Lammermoor	33	Taroomball	55
Cawarral	12	Marlborough	34	The Caves	56
Cobraball	13	Maryvale	35	The Keppels	57
Cooee Bay	14	Meikleville Hill	36	Thompson Point	58
Coorooman	15	Milman	37	Tungamull	59
Coowonga	16	Mount Chalmers	38	Wattlebank	60
Coral Sea	17	Mount Gardiner	39	Weerriba	61
Emu Park	18	Mulambin	40	Woodbury	62
Etna Creek	19	Mulara	41	Yaamba	63
Farnborough	20	Nankin	42	Yeppoon	64
Glendale	21	Nerimbera	43	Zilzie	65
Glenlee	22	Ogmore	44		

Table 4.5.1.2 – Locality Plans for Trunk Infrastructure Networks

Network	Maps
Water supply	1-1, 2-1, 3-1, 4-1, 5-1, 6-1, 7-1, 8-1, 9-1, 10-1, 11-1, 12-1, 13-1, 14-1, 15-1, 16-1, 17-1, 18-1, 19-1, 20-1, 21-1, 22-1, 23-1, 24-1, 25-1, 26-1, 27-1, 28-1, 29-1, 30-1, 31-1, 32-1, 33-1, 34-1, 35-1, 36-1, 37-1, 38-1, 39-1, 40-1, 41-1, 42-1, 43-1, 44-1, 45-1, 46-1, 47-1, 48-1, 49-1, 50-1, 51-1, 52-1, 53-1, 54-1, 55-1, 56-1, 57-1, 58-1, 59-1, 60-1,61-1, 62-1, 63-1, 64-1, 65-1
Sewerage	1-2, 2-2, 3-2, 4-2, 5-2, 6-2, 7-2, 8-2, 9-2, 10-2, 11-2, 12-2, 13-2, 14-2, 15-2, 16-2, 17-2, 18-2, 19-2, 20-2, 21-2, 22-2, 23-2, 24-2, 25-2, 26-2, 27-2, 28-2, 29-2, 30-2,

	31-2, 32-2, 33-2, 34-2, 35-2, 36-2, 37-2, 38-2, 39-2, 40-2, 41-2, 42-2, 43-2, 44-2, 45-2, 46-2, 47-2, 48-2, 49-2, 50-2, 51-2, 52-2, 53-2, 54-2, 55-2, 56-2, 57-2, 58-2, 59-2, 60-2, 61-2, 62-2, 63-2, 64-2, 65-2
Transport	1-3, 2-3, 3-3, 4-3, 5-3, 6-3, 7-3, 8-3, 9-3, 10-3, 11-3, 12-3, 13-3, 14-3, 15-3, 16-3, 17-3, 18-3, 19-3, 20-3, 21-3, 22-3, 23-3, 24-3, 25-3, 26-3, 27-3, 28-3, 29-3, 30-3, 31-3, 32-3, 33-3, 34-3, 35-3, 36-3, 37-3, 38-3, 39-3, 40-3, 41-3, 42-3, 43-3, 44-3, 45-3, 46-3, 47-3, 48-3, 49-3, 50-3, 51-3, 52-3, 53-3, 54-3, 55-3, 56-3, 57-3, 58-3, 59-3, 60-3, 61-3, 62-3, 63-3, 64-3, 65-3
Stormwater	1-4, 2-4, 3-4, 4-4, 5-4, 6-4, 7-4, 8-4, 9-4, 10-4, 11-4, 12-4, 13-4, 14-4, 15-4, 16-4, 17-4, 18-4, 19-4, 20-4, 21-4, 22-4, 23-4, 24-4, 25-4, 26-4, 27-4, 28-4, 29-4, 30-4, 31-4, 32-4, 33-4, 34-4, 35-4, 36-4, 37-4, 38-4, 39-4, 40-4, 41-4, 42-4, 43-4, 44-4, 45-4, 46-4, 47-4, 48-4, 49-4, 50-4, 51-4, 52-4, 53-4, 54-4, 55-4, 56-4, 57-4, 58-4, 59-4, 60-4, 61-4, 62-4, 63-4, 64-4, 65-4
Public parks and land for community facilities	1-5, 2-5, 3-5, 4-5, 5-5, 6-5, 7-5, 8-5, 9-5, 10-5, 11-5, 12-5, 13-5, 14-5, 15-5, 16-5, 17-5, 18-5, 19-5, 20-5, 21-5, 22-5, 23-5, 24-5, 25-5, 26-5, 27-5, 28-5, 29-5, 30-5, 31-5, 32-5, 33-5, 34-5, 35-5, 36-5, 37-5, 38-5, 39-5, 40-5, 41-5, 42-5, 43-5, 44-5, 45-5, 46-5, 47-5, 48-5, 49-5, 50-5, 51-5, 52-5, 53-5, 54-5, 55-5, 56-5, 57-5, 58-5, 59-5, 60-5, 61-5, 62-5, 63-5, 64-5, 65-5

(2) The State infrastructure forming part of the transport trunk infrastructure network has been identified using information provided by the relevant State infrastructure supplier[1].

4.5.2 Schedules of Works Spreadsheet (SOWS)

(1) Details of the existing and future trunk infrastructure networks are identified in the electronic Excel schedule of works model which can be viewed at Councils website (https://www.livingstone.qld.gov.au/).

(2) The future trunk infrastructure is identified in the following tables in Schedule 3—Local government infrastructure plan mapping and supporting material:

(a) for the water supply network, Table SC3.2.1;

(b) for the sewerage network, Table SC3.2.2;

(c) for the stormwater network, Table SC3.2.3;

(d) for the transport network, Table SC3.2.4;

(e) for the parks and land for community facilities network, Table SC3.2.5.

4.6. Extrinsic Material

(1) The below table identifies the documents that assist in the interpretation of the local government infrastructure plan and are extrinsic material under the Statutory Instruments Act 1992.

Table 4.6.1 – Extrinsic Material

Trunk Infrastructure Network	Title of Document
Growth Projections, Planning assumptions and PIA (for all networks)	• ABS Catalogue 2004.0 and 2001.0-2012 Community Profile Services • Livingstone Shire Council Draft Planning Scheme • Rockhampton Regional Council Industrial Land Use Study, GHD, December 2010 • Rockhampton Centres Study, Urban Economics and Buckley Van, Nov 2010

(1)

[1] LGIP has been discussed previously with DTMR (note minutes of meeting of 9 March 2016 and email correspondence of July 14 and 16 2016), as part of the discussion of Councils Adopted Infrastructure Charges Resolution (AICR). Advice to Council is that DTMR have no objection to the structure/content of the LGIP

	• Queensland Regional Profiles - Livingstone Shire Local Government Area (LGA), Queensland Governments Statisticians Office, 26 October 2015 • Livingstone Shore Council Corporate Plan (2014-2019)
Water Supply	• FRW Strategic Asset Management Plan (22/11/2012) • Infrastructure Strategic Planning Report, April 2016 • Capricorn Municipal Development Guidelines (CMDG) • Australian Drinking Water Quality Guidelines, National Health and Medical Research Council
Sewerage	• FRW Strategic Asset Management Plan (22/11/2012) • Infrastructure Strategic Planning Report, April 2016 • Capricorn Municipal Development Guidelines (CMDG)
Stormwater	• Infrastructure Strategic Planning Report, April 2016 • Capricorn Municipal Development Guidelines (CMDG) • Queensland Urban Drainage Manual (QUDM) • PDA Guideline No. 15 for Protection from flood and storm tide inundation, EDQ, May 2015
Transport	• Infrastructure Strategic Planning Report, April 2016 • Capricorn Municipal Development Guidelines (CMDG) • Austroads Guidelines
Public Parks and Land for community facilities	• Infrastructure Strategic Planning Report, April 2016 • PDA Guideline No.12 for Park Planning and Design • Multiple Use Public Open Space, Consultation Report, DILGP, Sept 2015 • PDA Guideline No. 11 for Community Facilities, EDQ, May 2015 • Livingstone Shire Open Space and Recreation Plan, Amarna 2002
Other	• Department of Infrastructure and Planning, PIP Calculator Version 11 (2011) • Statutory guideline 03/14 - Local government infrastructure plans • Statutory guideline 04/14 Making and amending local planning instruments • LGIP Service Catchments Map 1 Shire • LGIP Service Catchments Map 2 • LGIP SOW Model • Livingstone Shire Council Local Government Infrastructure Plan Checklist