January 2019

South Burnett Regional Council

Extrinsic Material to the Local Government Infrastructure Plan

Revision (V1.3)

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1.0 Background

This report details the methodology, and all relevant background studies and reports utilised in the preparation of South Burnett Regional Council's Local Government Infrastructure Plan (LGIP).

2.0 Planning Assumptions

Underpinning the Planning Assumptions of the LGIP are the South Burnett Regional Council (SBRC) Population and Demand Models. These Geographic Information System (GIS) models have been developed using a "bottom up" approach, allowing for the spatial allocation of population and demands (residential & non-residential) across all land parcels within the Local Government Area (LGA), from the base date of 2016 through to an ultimate capacity determined by growth in development permitted under the Planning Scheme. The base assumptions and methodologies employed to develop these models and other key inputs into the planning assumptions are detailed in this section.

2.1 *Population Spatial Model*

The 2015 Queensland Government Statistician's Office (QGSO) population projections (Medium Series) were used as a basis for determining the ***percentage growth*** for population over the periods 2021 to 2036 across South Burnett Regional Council, however the 2016 population has been sourced from Australian Bureau of Statistics (ABS) Estimated Resident Population (ERP) data (shown in table 1). The 2016 ERP has been used in favour of currently published QGSO figures, as there is a considerable discrepancy between the two. Given that the base year of the LGIP aligns with recently published 2016 census data, the ABS data is presumed to be more accurate. The population totals for 2041 and beyond have been extrapolated from the totals provided in previous periods.

Tourism forecasts have been included in the projections based on the South Burnett Regional Council LGA Profile (2016) published by Tourism Research Australia. The total number of annual 'visitor nights' has been divided by 365 to determine an average daily non-resident population. These results have been trended over projection cohorts using expected population growth rate as a surrogate for determining projected tourists over time.

For the purposes of the LGIP, the ultimate scenario of the SBRC Planning Scheme is considered to occur in approximately 100 years, which represents an almost doubling of the current population across the LGA. Table 1 below identifies the population and tourist figures used as a basis for creating the Population Spatial Model.

***Table 1:* Resident Population and Tourist Projections (2016 to 2041)**

	2016	2021	2026	2031	2036	2041
2016 ERP + QGSO Projections	32,747	34,236	36,000	37,783	39,542	41,451
Tourism Projections	1,520	1,564	1,616	1,666	1,712	1,763
Total Population Projections	***34,267***	***35,800***	***37,616***	***39,448***	***41,254***	***43,215***
Annual Growth Rate (QGSO)	*NA*	*0.89%*	*1.01%*	*0.97%*	*0.91%*	

Sources:

1. 2016 Population: Australian Bureau of Statistics (ABS) – 2016 Estimated Resident Population (ERP)
2. Population Growth: Queensland Government Statistician's Office (QGSO) – 2015 Edition Population (medium series)
3. Tourism Projections: Tourism Research Australia – LGA Profiles 2016

Notes:

1. % tourist growth based on QGSO population growth rates
2. Projections for 2041 have been extrapolated from previous periods

2.1.1 Population Projections

Existing population has been allocated on a lot by lot basis to all residential landuses (obtained from Council's landuse database) based on dwelling types and expected household sizes. A summary of the average household sizes used are been provided in Table 2. This allocation has been aligned with the 2015 edition QGSO Projections and refined through comparison with the ABS 2016 Census Data.

Table 2: Average Household Size

Dwelling Type	2016	2021	2026	2031	SBRC Model 2036 to Ultimate
Separate House	2.44	2.40	2.37	2.34	2.31
Semi, Detached, Flats	1.47	1.45	1.43	1.41	1.40
Other	1.78	1.75	1.72	1.70	1.69
All	***2.35***	***2.32***	***2.29***	***2.26***	***2.24***

Source: South Burnett Regional Council Model 2018 & QGSO 2015 edition & ABS 2016 PEP Census profiles
Note: Measured as persons/occupied dwelling

2.1.2 Ultimate Development

The development potential (or ultimate development) of the South Burnett Regional Council Planning Scheme was determined through analysis of the planning scheme intents (constraints and densities), consideration of approved development applications, and understanding of the realistic development trends throughout South Burnett. The constraints considered as part of this assessment included:

- Agricultural areas;
- Biodiversity areas;
- Bushfire hazards;
- Historic subdivisions;
- Infrastructure corridors;
- Key resource areas;
- Flood hazards; and
- Existing easements.

Depending on the nature of the constraint, these have been applied as a mixture of absolute (i.e. no development possible within constraint area), or partial (i.e. constraint results in reduced development yields) constraints to development potential. Where developable land was substantial in size (i.e. not a simple 1 into 2, or 1 into 3 subdivision) allowance for services (roads/open space) has been considered on the following basis:

- Urban development – 30% of net site area;
- Rural residential development – 5-10% of net site area (Varied depending on planning scheme precinct); and
- Rural development – 2% of net site area.

The varying nature of the relevant constraints requires any potential development to be assessed on a site-by-site basis, and therefore the planning scheme zoning in the PIA mapping is considered to appropriately represent the developable area for the purposes of the LGIP.

2.1.3 Interim Population Allocation

On determination of the realistic ultimate development capacity of South Burnett, the expected growth for each five year period from 2021 and beyond was allocated across the potential growth areas. The growth available for each 5 year cohort has been based on the growth identified within the 2015 QGSO Projection in addition to Tourist Populations (as discussed in Section 2.1 above) with consideration given to displaced populations arising from the reducing

household sizes. This total growth has been allocated using a 'gravity model' approach, with consideration of factors relating to propensity to develop, such as:

- The properties location with respect to the Priority Infrastructure Area (i.e. accommodates 10-15 years of growth);
- Availability and proximity to infrastructure services;
- The likely staging of development for particular areas based on direction from the SBRC planning department; and
- Existence of Planning Approvals.

Table 3 below provides a summary of the population found in each Reporting District for the periods 2016 to Ultimate. This information has been used in the development of the spatial model.

***Table 3:* Population Projections 2016 to Ultimate**

Reporting District	2016	2021	2026	2031	2036	2041	Ultimate
Kingaroy	9,203	10,083	10,916	11,752	12,395	12,704	15,202
Nanango	2,841	2,979	3,128	3,284	3,413	3,495	4,254
Murgon	2,390	2,532	2,674	2,819	2,966	3,048	3,729
Blackbutt	792	865	940	1,017	1,092	1,132	1,462
Wondai	1,901	1,998	2,085	2,173	2,277	2,368	3,098
Proston	343	359	378	385	396	402	453
Other Areas	16,797	16,985	17,494	18,018	18,716	20,066	34,620
Total	***34,267***	***35,800***	***37,616***	***39,448***	***41,254***	***43,215***	***62,817***

Source: South Burnett Regional Council Model 2018

2.2 *Demand Spatial Model*

In accordance with the Ministers Guidelines and Rules, Council's spatial demand models expresses residential and non-residential demand as either Equivalent Persons (EPs), Impervious Hectares (Imp ha), or Trips, depending on the infrastructure network.

The Water, Sewer and Parks Demand Models express residential and non-residential demand as EPs or People. An EP or Person represents the level of demand generated by a single person. The Transport Demand Model expresses residential and non-residential demand as Trips. The number of Trips is generated using the number of Equivalent Dwelling Units (EDUs), calculated by applying the relevant separate household size for each period (as identified in Table 2). The Stormwater Demand Model expresses residential and non-residential demand as impervious fractions or hectares.

2.2.1 Existing Demand

2.2.1.1 Residential

With regard to the existing residential demand, the 2016 population determined through the Population Modelling exercise described in the section 2 above was converted at a 1:1 ratio to EPs.

In determining trip generation rates for the transport network, the 2016 detached household size was applied to the population to determine EDUs, 10 Trips per EDU were then applied.

2.2.1.2 Non-Residential

The EPs for existing non-residential demand have been determined using usage data prepared by Council.

2.2.2 Future Demand

2.2.2.1 Residential

The projected residential demand has also been determined through the Population Modelling exercise described in the section 2. The Population determined for each period has been converted to an EP's at a 1:1 ratio.

For trip generation rates, the relevant detached household size (refer to Table 2) was applied to the population at each cohort to determine Equivalent Dwelling Units (EDU's), 10 trips per EDU were then applied.

2.2.2.2 Non-Residential

Non-residential demand has been determined using the developable hectare calculations determined through the Population Modelling Process, applying these against the EDUs per Hectare for each landuse / Planning Area (refer to Table 4). These have been converted to standard demand units in the MGR using the following:

- Water Supply & Wastewater networks
  - 1 EDU = relevant separate household size for each period (refer to Table 2).
- Transport network
  - 1 EDU = 10 trips
- Stormwater network
  - No conversion required
- Parks network
  - No non-residential demands

The realistic demands created by these uses have been determined based on the size of the parcel and nature of the use. The base assumption used in determining the future non-residential demand is that non-residential areas reach 90% of their development potential. This is with the exception of the Open Space/Sport & Rec zones, whereby a factor of 50% has been applied for sites less than or equal to 1 hectare, and a factor of 15% has been applied for sites greater than 1 hectare.

The future demand calculated through the above process has been trended over the 2021 to Ultimate time period cohorts based on the rate of population growth rate found in each appropriately defined "Trending District" – in other words, this assumes that the growth in non-residential demand is proportional to the rate of growth of residential demand. The Trending Districts applied to each Zone/Locality are presented in Appendix A.

Table 4: Non-Residential Demands by Zone - Water Supply, Sewerage & Transport (Roads) – Expressed as EDUs per Hectare

SBRC ZONE	SBRC PRECINCT	WATER & SEWER EDUs / HA	STORM WATER IMP FR.	TRANS-PORT EDUs / HA
Community Facilities		5	0.5	5
Community Facilities	CF1 – Education	5	0.5	5
Community Facilities	CF2 – Hospitals	10	0.6	10
Community Facilities	CF3 – Community Infrastructure	5	0.5	5
Community Facilities	CF4 – Transport Facilities	2.5	0.5	5
Community Facilities	CF5 – Public Utilities	5	0.5	5

SBRC ZONE	SBRC PRECINCT	WATER & SEWER EDUs / HA	STORM WATER IMP FR.	TRANS-PORT EDUs / HA
Community Facilities	CF6 – Government	5	0.5	5
Environmental Management And Conservation		0	0.0	0
Extractive Industry		7.5	0.2	7.5
Low Impact Industry		15	0.9	7.5
Local Centre		15	0.9	30
Medium Impact Industry		15	0.9	7.5
Principal Centre		20	1.0	40
Principal Centre	PC1 – Retail Core	20	1.0	40
Recreation and Open Space		0	0.0	0
Specialised Centre		15	1.0	15
Special Industry		15	0.9	7.5
Emerging Community		N/A	0.5	N/A
Emerging Community	Kingaroy	N/A	0.6	N/A
Low Density Residential		N/A	0.4	N/A
Low Density Residential	Kingaroy	N/A	0.5	N/A
Low Density Residential	LD1 – Bunya Mountains	N/A	0.2	N/A
Medium Density Residential		N/A	0.7	N/A
Rural		N/A	0.0	N/A
Rural Residential		N/A	0.1	N/A
Rural Residential	RR1 – 4,000	N/A	0.2	N/A
Township		N/A	0.4	N/A

2.3 *Employment Model*

The South Burnett Regional Council Employment Model has been developed to provide important inputs into the LGIP. The methodology for the employment modelling process is detailed below.

2.3.1 Current Employment

Australian Bureau of Statistics (ABS) Census data from 2016 was used to determine an existing employment profile within the South Burnett LGA by employment sector for the following regions:

- Kingaroy;
- Nanango;
- Murgon;
- Blackbutt;
- Wondai;
- Proston; and
- The remainder of the local government area.

The employment profile for each region is based on:

- Total population;
- Total current workforce;
- Total potential workforce (residents aged 15 and older);
- Residents who both live and work locally; and
- Industry of employment by occupation:
    - For the purposes of the LGIP employment modelling, ABS industry of occupation has been re-categorised into 'employment sectors' in order to align with categories in the LGIP tables. Assumptions made to assign ABS employment industry into LGIP Employment Sector are detailed in Table 5 below.

Table 5: Employment Category and Sector Assumptions

ABS Employment Industry Category	LGIP Employment Sector	ABS Employment Industry Category	LGIP Employment Sector
Agriculture, forestry & fishing	Other	Rental, hiring & real estate services	Commercial
Mining	Other	Professional, scientific & technical services	Commercial
Manufacturing	Industry	Administrative & support services	Commercial
Electricity, gas, water & waste services	Industry	Public administration & safety	Commercial
Construction	Other	Education & training	Community Purposes
Wholesale trade	Industry	Health care & social assistance	Commercial
Retail trade	Retail	Arts & recreation services	Commercial
Accommodation & food services	Commercial	Other services	Other
Transport, postal & warehousing	Industry	Inadequately described/Not stated	Other
Information media & telecommunications	Commercial	Rental, hiring & real estate services	Commercial
Financial & insurance services	Commercial		

2.3.2 Future Employment

The employment projections assume that the employment rate is maintained, considering labour retention and job containment, throughout all projection periods. The ratio of work force to population is used to determine employment projections for each cohort within the employment sectors and regions, as identified above. Population projection figures are used from the completed SBRC Population Spatial Model. The outputs of the employment model, as used in the LGIP employment assumption tables, include:

- Total current jobs identified within each LGIP projection area for each employment sector;
- Additional job requirements for local growth (i.e. growth within LGA) for each projection period, mathematically distributed amongst employment sectors within LGIP projection areas.

2.3.3 Floor Space Requirements

Floor space requirements are calculated based on assumptions about floor space per employee requirements for each employment sector. The assumed floor space requirements are detailed in Table 6, and have been identified based on industry knowledge, which has been discussed and confirmed with Council officers. As with the employment figures, floor space outputs used in the LGIP assumption tables include:

- Total existing floor space requirements within each LGIP projection area for each employment sector; and
- Additional floor space requirements for local growth (i.e. growth within LGA) for each cohort, mathematically distributed amongst employment sectors within LGIP projection areas.

Table 6: Floor space assumptions by Employment Sector

Employment Sector	Floor Space (m^2/employee)
Retail	30
Commercial	30
Industry	150
Community Purposes	25
Other	20

2.4 *Priority Infrastructure Area*

2.4.1 Capacity

The availability of a spatial parcel-based population model facilitated a rigorous analysis of the appropriateness of the Priority Infrastructure Area (PIA). After consideration was given to factors

affecting propensity to develop, the total population capacity inside the PIA boundary was determined to be approximately 28,500 persons, or 12,750 dwellings.

The population growth shown in Table 7 identifies the projected population growth between base year (2016) and 2031. While it is noted that this results in a remaining capacity of approximately 7,000 people (2,800 dwellings) inside the PIA at 2031, this is considered to be appropriate when the following is taken into account:

- The majority of excess capacity (6,000 people) is attributed to infill capacity in urban areas that are already developed;
- Such areas cannot be excluded from the PIA, but development through infill is anticipated to be slow, particularly over the short/medium term; and
- Given the low growth projections foreseen for the LGA, any capacities are going to take considerable time to be taken up.

Table 7: PIA Population Growth Projections

Area	Projected population growth (cumulative)					
	2016	2021	2026	2031 (PIA Period)	2036	Ultimate
Inside PIA	17,555	18,914	20,237	21,562	22,690	28,484
Outside PIA	16,713	16,886	17,379	17,886	18,564	34,333
Total LGA	34,267	35,800	37,616	39,448	41,254	62,817

2.4.2 Justification of PIA Extent

A number of parcels zoned as rural have been included inside of the boundary. The rural parcels which remain inside the PIA have been included to comply with checklist item 29, as they are "existing urban development serviced by all relevant trunk infrastructure networks", and Council would no longer comply with this checklist item if they were removed. Removing these parcels would be inconsistent with the definitions in the MGR and the Planning Act 2016.

Notably, parcels in Blackbutt have been included as they are generally 1,000m² sites, and meet the following criteria in accordance with the MGR Requirements and Planning Act 2016 definitions:

- Serviced by all LGIP networks; and
- Currently used and approved for use for residential purposes.

These sites are entirely consistent with the surrounding, developed, low-density residential urban fabric, and therefore are appropriate to include within the PIA.

A number of rural zoned lots in south Nanango remain inside the PIA. These have not been removed as they are:

- Completely surrounded by urban development;
- Have access to services from all LGIP networks; and
- Are generally used and approved for use for industrial purposes.

Council believes it is appropriate for these sites to remain within the PIA.

Low density residential zoned parcels in several regions have been excluded from the PIA. For clarity, the MGR does not require the inclusion of all land zoned as LDR, and the approach taken is entirely consistent with the processes and definitions outlined in the MGR and Planning Act 2016 for the following reasons:

- Excluded parcels are not currently serviced by all LGIP networks, or planned to be serviced within the current network planning horizon (20 years);

- They are not currently used or approved for a residential purpose (or other urban purpose), and growth has not been identified/prioritised in these areas within the next 10-15 years; and/or
- There is sufficient capacity within the identified PIA boundary to meet the 10-15 year capacity requirement of the Planning Act 2016, as demonstrated in section 2.4.1 above.

3.0 Cost Assumptions

LGIP unit rates for determining asset costs have utilised the information deemed most accurate and appropriate, which was available at the time the document was drafted. For asset costing purposes within the SoW model, all asset costs have been indexed to the base year of the model, 2016, using the indices identified below:

- Works
  - Transport network – Producer Price Index 3101: Road and bridge construction Queensland (A2333727L)
  - All other networks – Producer Price Index 3020: Non-residential building and construction Queensland (A2333721X)
- Land
  - All networks – Consumer Price Index: All Groups, Brisbane (A2325816R)

3.1 *Baseline Valuation and Establishment Costs*

Current replacement cost for all existing assets are based on Council's asset register data where possible, and otherwise have been determined through various cost guides and historical unit rates. The unit rate spreadsheet in Appendix B, outlines the unit rates that have been used in the specific instances where asset register data was not available. Cost modifiers have been applied where relevant, including:

- Asset depth (for gravity mains); and
- Physical dimensions of asset

The establishment costs for future assets were determined either directly from cost estimates in current planning documents (project cost), first principles assessments based on the outcome of network planning processes (project cost), or using unit rates and cost modifiers in accordance with the existing asset valuation methodology. The unit rate spreadsheet in Appendix B outlines the unit rates that have been used in the specific instances where asset register data was not available.

We note that as the unit rate valuation methodology has been used 'by exception' (i.e. only where asset register data or project cost information was not available), the unit rates identified in Appendix B are only identified for the specific assets that were valued using this method within the LGIP.

Project owners' costs have been applied to existing and future infrastructure costs as identified in Table 8, which are below the maximums set out within the Ministers' Guidelines and Rules.

Table 8: Application of On-costs to Existing and Future Works

Network	On-costs applied
Water Supply	21%
Sewerage	21%
Stormwater	21%
Transport	21%
Parks and Land for Community Facilities	21%

Contingencies have been applied to all networks as identified in Table 9, which are below the maximums set out within the Ministers' Guidelines and Rules.

Table 9: Application of Contingencies to Future Works

Delivery Timeframe	Contingency Applied – Parks Network	Contingency Applied – All Other Networks
1 – 5 years	30%	7.5%
6 – 10 years		10%
10 – 20 years		15%
21 years and beyond		20%

4.0 Network Planning

LGIP network planning has been undertaken by Council engineers and planners in conjunction with a number of relevant planning studies and technical reports. Additional detail is provided for each network below.

4.1 *Water Supply Network*

Network planning for the water supply network has been guided by discussions between SBRC planners and engineers, based on knowledge of the local network and servicing requirements. Water supply infrastructure requirements within urban areas have been determined based on Councils own network modelling using the WaterGEMS software program. The model has been developed over a number of years, with updates, and differing planning scenarios being carried out by Councils Infrastructure Department. The outcome of the modelling has guided the water infrastructure requirements over the planning horizon, to supply water in line with Councils Customer Service Standards, with key input parameters and design criteria summarised below.

Table 10: Water Supply Network Modelling Parameters

Parameter	Criteria	
Average Day Demand per EP (excluding non-revenue water)	230L/EP/d	
Estimated Non-Revenue Water (NRW)	30L/EP/d	
Peaking Factors MDMM/AD PD/AD PH/PD PH/AD	Residential 1.5 2 2 4	Commercial/Industrial 1.5 2 1.4 2.8
Pressure (normal operating conditions)	Urban - 22m at property boundary Rural Residential – 15m at property boundary except where otherwise required	
Maximum service pressure	55m	
Emergency fire operating conditions (Minimum Residual Mains Pressures)	12m min in the main at the flowing hydrant 6m elsewhere in the mains that have customer connections Positive pressure throughout	
Fire fighting (Rural residential)	7.5L/s for 2 hours where applicable	
Fire fighting (Urban)	Residential - 15L/s for 2 hours Non-residential – 30L/s for 2 hours	
Fire fighting (Background Demand)	Residential – Highest of 2/3 PH or AD Non-residential – PH demand between 10am and 4pm	
Reservoir storage – operational capacity	Ground level: 3 x (PD – MDMM) + greater of 4hrs MDMM and Firefighting Storage, subject to a minimum reservoir size of 150kL Elevated: 6 x (PH – 1/12 MDMM) + 150kL fire storage; or In supply zones where 8 x PH is less than or equal to MDMM, (2xPH)+150kL fire storage	
Reservoir Pump Servicing Requirements Ground level – Duty pump Elevated – Duty Pump	 MDMM over 20 hours Capacity (L/s) = Peak Hour (L/s)	

Standby pump	Match largest single pump unit capacity
Pipeline Capacity Requirements	Transport MDMM in 20 hours Reticulation mains – Maintain pressure for Peak Hour and fire flow performance
Pipe Friction Losses Hazen Williams Friction Factors	<=150, C=100 >150-300, C=110
Maximum Allowable Headloss (PH) (m/km)	5m/km for DN<=150 3m/km for DN>=200
Maximum Allowable velocity	2.5m/s

Water supply infrastructure, including treatment facilities, servicing camping areas at Boondooma Dam have been excluded from the LGIP, with no service catchment identified. This infrastructure has been determined to be non-trunk on the following basis:

- Active assets are small, and have been specifically installed to service a few localised users;
- The infrastructure does not create a 'network' that can be utilised by other users; and
- Supply mains are all too small to be considered trunk (100mm or less).

Network planning has been undertaken generally for a 20 year planning horizon, that is considered to provide service to the identified LGIP Service Catchment. This exceeds the 10-15 year minimum specified within Ministers Guidelines and Rules, at a level of service that aligns with the LGIP DSS.

4.2 *Sewerage Network*

Network planning for the sewerage network has been guided by discussions between SBRC planners and engineers, based on knowledge of the local network and servicing requirements. Sewerage infrastructure requirements within urban areas have been determined based on Councils own network modelling using the SewerGEMS software program. The model has been developed over a number of years, with updates, and differing planning scenarios being carried out by Councils Infrastructure department. The outcome of the modelling has guided the wastewater infrastructure requirements over the planning horizon, to supply water in line with Councils Customer Service Standards, with key input parameters and design criteria summarised below.

Table 11: Wastewater Network Modelling Parameters

Parameter	Criteria
Average Dry Weather Flow (ADWF)	210 L/EP/d
Peak Dry Weather Flow (PDWF)	C2 x ADWF, where C2 = 4.7 x $(EP)^{-0.105}$
Peak Wet Weather Flow (PWWF)	5 x ADWF Vacuum/Low Pressure Sewer - 4 x ADWF
Pump Station Servicing Requirements Operating Storage (m^3)	Ops Storage = 0.9 x Q / N Q = pump rate (L/s) of duty pump or Total pump capacity if multiple duty pumps Number of starts per hour: N = 12 for motors <100kw N = 8 for motors 100-200kw N = 5 for motors >200kw
Minimum Wet Well diameter	As shown in the Sewer Pump Station Code (as amended)
Emergency storage	4hrs at ADWF
Pump Operation Mode	Duty/Assist
Single Pump Capacity	Min pump capacity for Pump Stations(duty & assist) = C1 x ADWF Where C1 = 15 x $(EP)^{-0.1587}$ Value of C1 to be within the range 3.5-5
Total Pump Station Capacity	PWWF
Size of Pump Station Lot and buffer	As shown in the Sewer Pump Station Code (as amended)
Rising Main Preferred Velocity	1.0-1.5m/s

Rising Main Minimum Velocity	0.75m/s
Rising Main Maximum Velocity	3.0m/s
Roughness	As shown in the Sewer Pump Station Code (as amended)
Odour Management Requirements	Determined on a site specific basis as outlined in the Sewer Pump Station Code (as amended)
Gravity Sewer Requirements (Conventional) Roughness Equation Pipe Friction Coefficient	 Manning's All Smart Sewers – n = 0.0128
Minimum Pipe Grades	100 – Connection 1:60 for single connection 150 – Connection/main, 1:100 for first 10 allotments 150 – Connection/main, 1:180 after first 10 allotments 225 – 1:300 300 – 1:400 375 – 1:550 450 – 1:700 525 – 1:750 600 – 1:900 675 – 1:1050 750 – 1:1200
Maximum Depth of Flow	75% d (at PWWF)
Gravity Main Minimum Velocity	0.7m/s at PDWF
Gravity Main Maximum Velocity	3.0m/s
Average Dry Weather Flow for Treatment Plants	As per network flows

Network planning has been undertaken generally for a 20 year planning horizon, that is considered provide service to the identified LGIP Service Catchment. This exceeds the 10-15 year minimum specified within Ministers Guidelines and Rules, at a level of service that aligns with the LGIP DSS.

4.3 *Stormwater Network*

Network planning for the stormwater network has been guided by discussions between SBRC planners and engineers, based on knowledge of the local network and servicing requirements.

Network planning has been undertaken to a 20 year planning horizon, that is considered provide service to the identified LGIP Service Catchment. This exceeds the 10-15 year minimum specified within Ministers Guidelines and Rules, at a level of service that aligns with the LGIP DSS.

4.4 *Transport Network*

Network planning for the transport network has been guided by discussions between SBRC planners and engineers, based on knowledge of the local network and servicing requirements.

Network planning has been undertaken to a 20 year planning horizon, that is considered provide service to the identified LGIP Service Catchment. This exceeds the 10-15 year minimum specified within Ministers Guidelines and Rules, and results in a suitable road network, to support existing and future needs at a level of service consistent with the LGIP DSS.

4.5 *Parks and Land for Community Facilities Network*

Network planning for the water supply network has been guided by discussions between SBRC planners, engineers, and external consultants, based on knowledge of the local network and assessment of servicing requirements set out in the DSS.
Network planning has been undertaken to a 20 year planning horizon, that is considered provide service to the identified LGIP Service Catchment. This exceeds the 10-15 year minimum specified within Ministers Guidelines and Rules, at a level of service that aligns with the LGIP DSS.

5.0 Financial Modelling

5.1 *Schedule of Works Model*

The Schedule of Works (SoW) model used in the preparation of the South Burnett Regional Council LGIP has been prepared in accordance with the requirements of the Ministers Guidelines and Rules (Schedule 7), and contains the same functionality as the template prepared by the Department of State Development, Manufacturing, Infrastructure and Planning. An assessment against these requirements has also been undertaken after the completion of the draft LGIP, with no compliance issues identified.

5.2 *Revenue Assumptions*

Revenue assumptions within the LGIP are based on the current infrastructure charge rates under Councils Adopted Infrastructure Charges Resolution.

5.3 *Schedule of Works Inputs*

The SoW model's financial modelling assumptions are listed in Table 12, including relevant comments/justification behind the selection and appropriateness of these assumptions.

Table 12: Financial Modelling Assumptions

Assumptions	Type	Inputs	Comments/Justification
Model Setup	Base Year of Model	2016	Chosen to align with available data at the beginning of the LGIP project
	Infrastructure Planning Horizon (Term)	20 years	Aligned to reflect the extent of current network planning
	Demand Unit (Unit of Measure)	EP (Water Supply & Sewer) Trips (Transport) Imp ha (Stormwater) Persons (Parks)	In accordance with the Ministers Guidelines and rules
Financial Inputs	**Discount Rate**		
	Post-tax Nominal WACC (to be applied to Expenses)	6.12% (All networks)	WACC rate is based on a 10 year bond rate of 2.62% at the time of preparation, and a margin of 3.5% in accordance with LG Bulletin 06/01.
	Escalations		
	Works Escalation Rate	0.85% 1.94%	The current 10-yearly average of the NRBC PPI index (WS, Sew, SW, PPCL), and the RBC PPI index (Transport). These indices have been selected as Council considers they are the most suited to the type of construction required for each network.
	Land Escalation Rate	2.12%	The current 10-yearly average of the Brisbane CPI index.
	Charges Escalation Rate	2.12%	The current 10-yearly average of the Brisbane CPI index.

The LGIP SOW model has adopted a "User Pays" approach for the apportionment of infrastructure costs between the users. In addition, this calculation method also employs a discounted cashflow methodology to appropriately model the time value of money over the modelling horizon and to understand the true cost of infrastructure delivery and funding. The SoW model therefore applies the following formula in order to determine a cost per demand unit for each network.

$$x = \frac{\text{Existing Infrastructure Value (\$)} \ + \ \text{NPV (Nominal) of Future Infrastructure Expenditure (\$)}}{\text{Current Demand (D)} \ + \ \text{NPV (Real) of Future Demand (D)}}$$

The Net Present Value (NPV) of future infrastructure expenditure is determined using the Nominal WACC and Escalation Rates, to take into account the escalation of the capital spend in the years forward of the base year. The NPV of future demand is a proxy, used to represent future revenue from infrastructure charges. This is determined using a 'Real WACC', which is adjusted to account for inflationary effects.

The use of these equations determines an escalating price path which is driven by the inflation rate. In this way, the contribution rate grows over time in line with other cost growth in works, land, sales and wages, etc. The final Cost Schedules are presented in the LGIP SoW Model.

Appendix A – Population Modelling Trending Districts

Appendix A – Trending Districts Applied to Non-Residential Demand

Planning Scheme Zone	Locality	Trending District
Community Facilities	All Localities	Entire LGA
Emerging Communities	Blackbutt	Blackbutt
Emerging Communities	Kingaroy	Kingaroy
Emerging Communities	Murgon	Murgon
Emerging Communities	Nanango	Nanango
Emerging Communities	Wondai	Wondai
Extractive Industry	All Localities	Entire LGA
Local Centre	Blackbutt	Blackbutt
Local Centre	Murgon	Murgon
Local Centre	Nanango	Nanango
Local Centre	Wondai	Wondai
Local Centre	All other Localities	Entire LGA
Low Impact Industry	Blackbutt	Blackbutt
Low Impact Industry	Murgon	Murgon
Low Impact Industry	Wondai	Wondai
Low Impact Industry	All other Localities	Entire LGA
Medium Impact Industry	Murgon	Murgon
Medium Impact Industry	Wondai	Wondai
Medium Impact Industry	All other Localities	Entire LGA
Principal Centre	All Localities	Entire LGA
Special Industry	All Localities	Entire LGA
Specialised Centre	All Localities	Entire LGA

Appendix B – Unit Rates Spreadsheet