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Isaac Regional Council

Extrinsic Material to the Local Government Infrastructure Plan

Revision 1.3

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Preface

This Local Government Infrastructure Plan (LGIP) has been developed to address infrastructure planning for the Isaac Regional Council under its forthcoming Isaac Region Planning Scheme, while also addressing the region's three existing planning schemes:

- Belyando Shire Planning Scheme, 2008
- Broadsound Shire Planning Scheme, 2005
- Nebo Shire Planning Scheme, 2008.

These planning schemes were all developed under the repealed *Integrated Planning Act 1997,* prior to the introduction of the Queensland Planning Provisions which provided uniform use and zoning definitions. The planning assumptions have been developed based on the assumptions prepared for the draft Isaac Region Planning Scheme and adapted for use under the existing schemes. This ensures the planning assumptions reflect development which has occurred since the current Planning Schemes were adopted.

The LGIP document provides more detail on the breakdown of planning assumptions between the planning schemes across the projection areas.

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1.0 Planning Assumptions

Underpinning the Planning Assumptions of the Local Government Infrastructure Plan (LGIP) is the Isaac Regional Council (IRC) Population and Demand Model. 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 Council area, from the base date of 2016 through to a realistic ultimate capacity determined for the draft Planning Scheme, being developed concurrently with the LGIP. The base assumptions and methodologies employed to develop these models and other key inputs into the Planning assumptions are detailed below.

1.1 *Population*

Isaac Regional Council have had an Economic and Population Review report prepared by Norling Consultants. This report provides four potential growth scenarios for the region, being:

Scenario 1 - Projections based upon the Queensland Government Statistician's Office (QGSO) medium series projections, adjusted to account for 2015 estimated resident population figures

Scenario 2 - Projections assume an increase in proportion of FIFO and DIDO and the corresponding consequence of using fewer resident workers, with population growth rates below 1%

Scenario 3 - Projections are based on the assumption that carbon capture storage technologies are unviable and thermal coal production ceases by 2031. The levels of non-resident workers are projected to decline beyond 2026

Scenario 4 - Projections assume that carbon capture storage technologies are viable ensuring the ongoing future operation of thermal coal production. The levels of non-resident workers remain unchanged

Council has chosen to undertake population and demand modelling based on scenario 2, projections under this scenario are provided for urban and rural projection areas within Isaac Regional Council through to 2036. The totals for 2041 and beyond have been extrapolated from the totals provided in the previous periods. These estimates are not incongruous with the Low Series Estimated Resident Populations published by the Queensland Government Statistician's Office (QGSO, 2015ed).

Council-wide non-resident worker projections are provided for scenario 2 within the economic and population review.

For the purposes of the LGIP and AICR, the ultimate scenario of the Isaac Planning Scheme (for resident population) is considered to occur in around 2129. **Table 1** below identifies the Population and Tourist Figures used as a basis for creating the Population Spatial Model.

***Table 1:* Resident and Non-resident Projections (2016 to Ultimate)**

	2016	2021	2026	2031	2036	Ultimate
Resident Population Projections	*24,623*	*25,764*	*26,682*	*27,431*	*28,175*	*43,685*
Non-resident Population Projections	9,730	14,650	15,150	16,100	17,500	31,847
Total Population Projections	***34,353***	***40,414***	***41,832***	***43,531***	***45,675***	***75,532***

Source: Economic and Population Review (Norling, 2016)

1.1.1 Current Population

Existing population has been allocated on a lot by lot basis to all residential landuses (obtained from Council's rates database) based on dwelling types and expected household sizes. For example, a property identified as containing a house is assigned a 2016 population of 2.75. This allocation has been aligned with the 2015 QGSO Projections and refined through comparison with the ABS 2011 Census Data. Projected average household sizes are shown in **Table 2**.

Following initial allocation of population, adjustments were made as necessary within urban and regional reporting areas to align with population totals provided in the Economic and Population review, resulting in existing household sizes which vary regionally.

Table 2: Average Household Size

Dwelling Type	2016	2021	2026	2031	2036	IRC Model 2041 to Ultimate
Separate House	2.75*	2.73	2.72	2.70	2.69	2.69
Semi, Detached, Flats	1.63*	1.63	1.62	1.61	1.60	1.60
Other	1.69*	1.68	1.68	1.67	1.65	1.65
All	***2.56****	***2.55***	***2.54***	***2.52***	***2.51***	***2.51***

Source: IRC (Isaac Regional) Model 2017 & ABS 2011 PEP
Note: Measured as persons/occupied dwelling
* - Household size varied regionally to reflect inputs from Economic and Population Review.

1.1.2 Ultimate Population

The ultimate development potential of the Isaac Regional Council Planning Scheme was determined through analysis of the Planning Scheme Intents (constraints and zones / densities), consideration of approved development applications and understanding of the realistic development trends throughout the region. The constraints considered as part of this assessment included:

- Biodiversity and conservation;
- Bushfire hazards;
- Coastal hazards including storm tide and erosion prone areas;
- Key resource and mining areas;
- Flood hazards;
- Existing easements.

It is noted that the developable area as described within the LGIP statutory guidelines is represented by the planning scheme zonings as depicted on the PIA Mapping, having consideration of any absolute and/or partial constraints described above for each land parcel.

Planning Scheme density assumptions have been developed for each zone, with consideration given to the following:

- Residential density provisions within the planning scheme for each zone type, including assumptions about dwelling composition (**Table 3**)
- Household size calculations and projections, changing over time in accordance with Table 2;
- Discussions with Council Officers and understanding the realistic development trends throughout the LGA;
- Discussions with Council Officers regarding the arrangements and limitations in relation to non-resident worker accommodation; and

- Assumptions about land requirements for roads, parks and other services, depending on the planning scheme provisions for different zones (i.e. considerations/requirements in urban vs rural zones).

Table 3: Ultimate Residential Density Assumptions

Planning Scheme Zone	Precinct/Area	Excluded Land - Services, Roads, etc.	Lot Size (m²) – Attached*	Lot Size (m²) – Detached*	Planned Density - Gross (Dwellings/Ha)*
Centre		30%	*N/A - Unit size used to determine density*	*N/A - Unit size used to determine density*	*22.4*
Centre	Moranbah	30%			*33.6*
Emerging Community		*Varies depending on assumed underlying intent*			
Low density residential		30%	400 - 450**	900	8.2
Low density residential	Moranbah	30%	400 - 450**	800	9.5
Low-medium density residential		30%	250 - 450**	500	16.6
Rural		5%		50,000,000	0.0002
Rural	Class A/B Agricultural	5%		5,000,000	0.002
Rural residential		10%		40,000	0.2
Specialised Centre		*Applied on a site-by-site basis using existing and current non-resident accommodation approvals*			
Township		30%		1,000	7.0

** Lot Size represents a realistic ultimate average size, based on an assessment of planning scheme provisions, market trends and preferences, and matters affecting propensity to develop.*
*** Varies depending on dwelling type*

Residential populations were allocated across all residential Planning Areas, in accordance with the projections of the Economic and Population Review, while non-resident growth was only allocated to only those sites identified by Council in use as, or approved for, non-resident worker population. **Table 4** below provides a summary of the population found in each Planning District for the periods 2016 to Ultimate. Please note that these figures differ from those presented in the LGIP document as the document has consolidated the non-resident worker accommodation population into each projection area and excluded population outside the PIA.

This information has been used in the development of the spatial model.

Table 4: Population Projections 2016 to Ultimate

Norling Projection Areas	2016	2021	2026	2031	2036	Ultimate
Moranbah Total	10,303	10,951	11,435	11,761	12,077	21,164
Carmilla Total	411	425	446	469	492	534
St Lawrence Total	388	395	409	422	426	1,673
Ilbilbie Total	319	319	335	352	369	660
Clermont Rural	1,652	1,706	1,773	1,885	2,011	3,748
Clermont Town	2,458	2,565	2,681	2,793	2,902	3,685
Dysart	3,305	3,413	3,476	3,508	3,540	4,090
Middlemount	2,091	2,142	2,149	2,126	2,104	2,739
Nebo Town	469	515	536	556	576	976
Nebo Rural	1,768	1,807	1,896	1,993	2,092	2,468

Norling Projection Areas	2016	2021	2026	2031	2036	Ultimate
Glenden	1,459	1,526	1,546	1,566	1,586	1,948
Worker Accommodation	9,730	14,650	15,150	16,100	17,500	31,847
TOTAL	**34,353**	**40,414**	**41,832**	**43,531**	**45,675**	**75,532**

Source: IRC (Isaac Regional) Model 2017

1.1.3 Interim Population Allocation

Growth between 2016 (base year) and ultimate populations have been allocated to each 5-year cohort using a 'gravity model' approach, with populations within each projection area set to align with the Economic and Population Review. Within each projection area, consideration was given to factors affecting propensity to develop, including:

- The properties location with respect to the Priority Infrastructure Area (i.e. accommodates 10-15 years of growth); and
- Availability and proximity to infrastructure services.

1.2 *Infrastructure Demand*

IRC's spatial demand models express residential and non-residential demand in varying demand units. These are:

- Water Supply network - Equivalent persons (EP)
- Sewerage network - Equivalent persons (EP)
- Transport network - Trips per day (Trips)
- Parks and land for community facilities network - Persons

These units of measure have been selected as they are commonly used and easily understood by a reader of the LGIP.

1.2.1 Residential Demand

The Residential Demands have been calculated for each network in the following manner:

- Water Supply network
  - Population at each cohort = residential EP
- Sewerage network
  - Population at each cohort = residential EP
- Transport network
  - Population at each cohort divided by applicable detached household size (Table 2) to determine equivalent detached dwellings
  - Demand generation of 10 trips per equivalent detached dwelling
- Parks and land for community facilities network
  - Population at each cohort

1.2.2 Non-Residential Demand

Non-Residential Demands for the Water Supply, Sewer and Transport networks have been calculated by applying equivalent dwelling rates per hectare respectively to the developable areas available for non-residential development, derived from the population modelling process. The number of Equivalent dwellings was converted to the relevant demand units using:

- For the water supply and sewer networks - equivalent dwellings multiplied by the detached household size at each cohort (in accordance with Table 2)
- For the transport network - equivalent dwellings multiplied by the trip rate per detached dwelling identified in section 1.2.1 (10 trips per equivalent detached dwelling)

The process for determining the existing demand utilised the landuse information developed through the population modelling process and applied the generation rates presented in **Table 5** to the area of the parcel with existing demand.

***Table 5:* Non-Residential Demands by Zone - Water Supply, Sewerage & Transport (Roads) – Expressed as EDUs per Hectare**

PLANNING SCHEME ZONE	PLANNING SCHEME PRECINCT	WATER & SEWER EDUs / HA	TRANS-PORT EDUs / HA
Centre		25	50
Community Facilities		5	5
Emerging Community		0	0
Environmental Management & Conservation		0	0
Industry		15	7.5
Low Density Residential		0	0
Low-Medium Density Residential		0	0
Recreation and Open Space		0	0
Rural		0	0
Rural Residential		0	0
Special Purpose		0	0
Specialised Centre		5	5
Tourism Area (Minor)		0	0
Township		0	0

To ensure the existing non-residential demand was not overestimated (i.e. the area of the parcel does not necessarily reflect the demand that the existing land use generates), the demand model takes into account the realistic existing demands based on the size of the parcel and whether or not the existing landuse is consistent with the underlying land use intent (e.g. where an industrial use is occurring on a Rural zoned land parcel, and is unlikely to be placing demand over the entire site).

Ultimate future demands are based on demand generation rates per hectare for all land in each non-residential zone presented in **Table 5**.

The future demand calculated through the above process has been trended over the 2016 to Ultimate time period cohorts based on the rate of population growth rate found in each appropriately defined “Trending District” – in other words, 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 **Table 6**.

***Table 6:* Trending District applied to Each Zone / Locality**

CP ZONE	LOCALITY	TRENDING DISTRICT
Centre	Clermont	Clermont
Centre	Dysart	Dysart
Centre	Glenden	Glenden
Centre	Middlemount	Middlemount
Centre	Moranbah	Moranbah
Centre	Nebo	Nebo
Community Facilities	Clermont	Clermont
Community Facilities	Dysart	Dysart
Community Facilities	Glenden	Glenden
Community Facilities	Middlemount	Middlemount
Community Facilities	Moranbah	Moranbah
Community Facilities	Nebo	Nebo
Community Facilities	All other areas	Entire LGA
Industry	Clermont	Clermont
Industry	Dysart	Dysart
Industry	Moranbah	Moranbah
Industry	All other areas	Entire LGA
Specialised Centre	All areas	Entire LGA

1.3 *Employment*

The Isaac Regional Council Employment Model has been developed to provide important inputs into the LGIP, most notably the existing and future employees and future floor space requirements. The methodology for the employment modelling is detailed below.

1.3.1 Current Employment

Australian Bureau of Statistics (ABS) Census data was used to determine an existing employment profile within the Council area by employment sector for the following regions:

- Isaac Regional Council; and
- Regions aligning with the Population Study and LGIP Projection Areas

The employment profile is based on:

- Total population;
- Total current workforce;
- Total potential workforce (residents aged 15 and older);
- Residents who both live and work locally;
- 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 7** below.

Table 7: **Employment Industry Assumptions**

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

The following key inputs into Employment Modelling have been produced for each modelled region, using the available ABS data:

- Labour retention rate (Residents working locally ÷ total work force); and
- Job containment rate (Residents working locally ÷ local jobs available)

These attributes are identified in order to assess the employment increase as a result of growth occurring within the LGA.

1.3.2 Future Employment

The employment model assumes that labour retention, job containment, and unemployment levels are maintained throughout all projection periods.

The ratio of work force to population is used to determine employment projections in each LGIP projection area for each cohort, in each employment sector. This is applied to the population projections derived from the IRC population model. The outputs of the employment model used to inform the LGIP include:

- Total current jobs within each LGIP projection area for each employment sector; and
- Additional job requirements for growth within the LGA for each projection period, distributed amongst employment sectors in accordance with the current trends

1.3.3 Floor Space Requirements

Floor space requirements are calculated based on assumptions about floor space per employee for each employment sector. The assumed floor space requirements are detailed in **Table 8**, and have been identified based on industry knowledge and confirmed by IRC officers as both reasonable and appropriate for use in the LGIP. 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 growth within the LGA for each cohort, distributed mathematically amongst employment sectors within LGIP projection areas.

Table 8: **Floor space assumptions by LGIP Employment Sector**

LGIP Employment Sector	Floorspace (m^2/employee)
Retail	30
Commercial	30
Industry	150
Community Services	25
Other (incl. Home based business)	20

1.4 *Priority Infrastructure Area Capacity*

IRC's growth allocation model considers a range of factors for the distribution and take-up of available capacities across the Planning Scheme, in particular the propensity for areas to develop over time. Based on the assumptions, the modelling indicates that a population of approximately 28,650 people are realistically able to be accommodated within the PIA up until 2031 (the "PIA Period").

The extent of urban population growth allocated within the PIA boundary (approx. 4,000) demonstrates a total remaining capacity for approximately 2,800 dwellings identified at the end of the PIA period. In assessing the PIA capacity, it is important to note the following:

- The population residing in urban areas throughout the region is heavily dispersed, with varying growth profiles and outstanding capacities remaining for each township at the end of the PIA Period;
- Given current economic conditions, ongoing uncertainty regarding future growth (as outlined in the Norling Economic and Population Review), and the region's propensity for boom-and-bust development, the economic conditions driving development could potentially change within the lifetime of this LGIP, which may require additional land for urban development purposes; and,
- Additionally, the available PIA capacity is a result of a significant amount of infill development, and therefore this capacity may not be realised within 10-15 years. These areas cannot be removed from the PIA on the basis that they are existing urban development.

On this basis, the remaining capacity at the end of the 15 year PIA period is considered appropriate.

2.0 Cost Assumptions

The LGIP has used a variety of costing methodologies where available to inform the development of costs to be used within the Schedule of Works (SoW) model, using the information deemed most accurate and appropriate, which was available at the time the LGIP was being prepared. For asset costing purposes within the SoW model, all unit rates for all assets and networks have been indexed to the base year of the model, 2016 using relevant Producer Price Indices (PPI) data from the ABS unless otherwise noted. The transport network uses the Road and Bridge Construction (RBC) PPI index for Queensland, while all other networks use the Non-residential Building and Construction (NRBC) PPI index for Queensland.

2.1 *Baseline Valuation*

Existing asset valuations within the SoW model provide an additional level of detail when compared to the standard SoW models 'baseline valuation'. The 'Base Estimate' within the IRC SoW model provides the equivalent valuation figure, however this has been built using a raw unit rate cost in addition to project owners costs (on-costs).

On costs are considered to be an essential element of the 'current replacement cost' identified within Statutory Guideline 03/14, relating to design/redesign, environmental considerations, traffic management and project management among other things, all necessary components of the cost to replace an asset. The Evans and Peck report referenced within the SoW model user manual identifies that many Councils already include on costs within their unit rates. Isaac Regional Council has chosen to separate these costs in order to provide additional transparency and ease of understanding within their LGIP documentation.

2.2 *Water Supply & Sewerage Network*

2.2.1 Water Supply / Sewer Asset Costs

Water Supply and Sewerage network asset costs are derived from a variety of sources provided by Council for the purposes of developing costs to be utilised in the LGIP. Existing and future passive assets (i.e. pipework) were costed based on unit rates prepared by Council. Existing active assets (i.e. Treatment Plants, Reservoirs, Bores and Pump Stations) were costed from asset registers maintained by Council.

Future Water Supply and Sewerage network projects listed in **Table 9** below have been project costs, based on information provided by IRC.

Table 9: **Water Supply and Sewerage networks assets utilising Project Cost assumptions**

Network	Asset ID	Asset Description	Project Base Cost
Water	WTPF_01	Clermont – Water Treatment Plant Upgrade – Generator	$142,500
Water	WTPF_02	Nebo – New WTP	$3,861,164
Water	WTPF_03	Moranbah – Water Treatment Plant Upgrade – Generator	$441,600
Water	RESF_01	Nebo – Reservoir at WTP site	$1,256,814
Water	PSF_01	Nebo – Pump Station	Included in RESF_01 costing
Water	BRF_01	Nebo – Bore 6	$500,000
Water	BRF_02	Nebo – Bore 7	$500,000
Sewerage	WWTPF_01	Clermont - Wastewater Treatment Plant Upgrade – Generator	$62,800
Sewerage	PSF_01	Dysart – Sewerage Pump Station	$550,000

2.2.2 Cost Modifiers

In addition to the unit rates identified above, the cost modifiers listed in **Table 10** have also been applied as necessary to assets across the water supply and sewerage networks.

Table 10: **Water and Sewerage network asset cost adjustments**

Modifier	Valuation Component	Applies To	Adjustment Factor
On-Cost Allowance	Works	All existing & future assets	13%
Contingency	Works	All future assets	11.8%

2.3 *Transport Network*

2.3.1 Transport Asset Costs

Transport network unit rates were provided by Council for the purposes of developing costs to be utilised in the LGIP.

One future Transport network project listed in **Table 11** below was costed on the basis of existing project costs, prepared by UDP in 2013. Given changed economic conditions and based on advice from Council, these costs were not escalated as the bridge structure could likely be delivered utilising the same costing today.

Table 11: **Transport network assets utilising Project Cost assumptions**

Asset ID	Asset Description	Project Base Cost
STF_01	Moranbah Access Road Bridge over Grosvenor Creek	$16,304,899

2.3.2 Cost Modifiers

In addition to the unit rates identified above, the cost modifiers in **Table 12** have also been applied as necessary, to assets across the transport network.

Table 12: **Asset Cost Adjustments**

Modifier	Valuation Component	Applies To	Adjustment Factor
On-Cost Allowance	Works	STF_01	12%
On-Cost Allowance	Works	All existing & other future assets	13%
Contingency	Works	STF_01	15%
Contingency	Works	All other future assets	11%

2.4 *Parks and Land for Community Facilities Network*

2.4.1 Parks Asset Costs

Where no project costs are available, existing park embellishment costs have been established using costs for individual embellishment items. An audit of the current embellishments within existing parks was completed by IRC Officers. This complete embellishment list applies the individual item costs to determine a total embellishment value per park.

Future park embellishment costs have been applied using the same method, using standard embellishments comparable to the standards identified in the Desired Standards of Service and the standards of recent trunk park contributions.

Unit rates have been calculated based on a park's location inside or outside a PIA, representing a higher value for land within existing or planned urban areas. Land values per m² of site area are shown in **Table 13**.

Table 13: **Parks land valuation**

Location	Land valuation ($/m²)
Moranbah PIA	$40/m²
All other township PIAs	$25/m²
Outside PIA	$10/m²

2.4.2 Cost Modifiers

In addition to the unit rates identified above, the cost modifiers in **Table 14** have also been applied as necessary to assets across the transport network.

Table 14: **Asset Cost Adjustments**

Modifier	Valuation Component	Applies To	Adjustment Factor
On-Cost Allowance	Works	All existing & future assets	20%
Contingency	Works	All future assets	25%

3.0 Network Planning

Network planning has been undertaken over a 20 planning horizon from the base date of the LGIP (2016). It is important to note that this does not align with the ultimate development of the Planning Scheme, which based on LGIP modelling and forecasts produced by the QGSO, is currently anticipated to be achieved at or around 2129, however this may occur sooner for individual townships or if economic circumstances change.

Network planning has been prepared on a basis of various studies. Due to time and resource limitations it was not possible to undertake new modelling for all trunk networks, however existing modelling was utilised for the networks and townships where available.

The network planning horizon has been selected on the basis that it provides a rational alignment between the infrastructure planning and landuse outcomes envisaged under the IRC Planning Scheme. The considerations given to the planning of each network within the LGIP are as follows.

3.1 *Network Planning in General*

An assessment of the future growth characteristics and trends over each network's planning horizon has been performed by Council engineers and planners together with a review into existing network servicing capacity / adequacy through application of the Desired Standards of Service (DSS) identified within the LGIP. The population and demand models completed as a part of the LGIP project have been considered against Council's previously completed network planning in order to reassess its appropriateness and assist in determining where planning 'gaps' may exist that need to be addressed.

3.2 *Water Supply Network*

Water supply network planning has been undertaken to a 20 year planning horizon at a level of service that aligns with the DSS in the LGIP.

Future trunk infrastructure has been primarily guided by discussions between IRC planners and engineers, in conjunction with the recommendations identified in water network planning undertaken as part of the development of IRC's Belyando Estate scheme from 2011 to 2014.

3.3 *Sewerage Network*

Sewerage network planning has been undertaken to a 20 year planning horizon at a level of service that aligns with the DSS in the LGIP.

Future trunk infrastructure has been primarily guided by discussions between IRC planners and engineers, in conjunction with the recommendations identified in water network planning undertaken as part of the development of IRC's Belyando Estate scheme from 2011 to 2014.

3.4 *Transport Network*

The transport network planning was performed collaboratively through discussions between IRC planners and engineers in order to determine a suitable IRC road network for the LGIP that will support the existing and future needs of the region and that will meet the community outcomes envisaged by the DSS prepared and agreed to by IRC.

Transport network planning has been undertaken to a 20 year planning horizon at a level of service that aligns with the required DSS.

3.5 *Parks and Land for Community Facilities Network*

The Parks and Land for Community Facilities network planning was performed collaboratively through discussions between IRC planners and engineers in order to determine a suitable IRC parks and land for community facilities network for the LGIP, taking into account both land and embellishments. This will support the existing and future needs of the region and that will meet the community outcomes envisaged by the DSS prepared and agreed to by IRC up to the 20 year network planning horizon.

4.0 Financial Modelling Assumptions

Financial modelling inputs for the IRC LGIP SoW model are outlined in **Table 15** below, including brief comments and justifications around the appropriateness of the inputs used.

Table 15: **Financial Modelling Assumptions within the IRC LGIP SoW model.**

Financial Modelling Assumptions		Inputs	Comments/Justification
Model Setup	Base Year of Model	2016	To align with the Infrastructure Planning and Demand Modelling that has been prepared for the LGIP project
	Infrastructure Planning Horizon	20	20 years for all infrastructure networks. This represents the extent to which each network has been planned and alignment of infrastructure and landuse outcomes is reached.
	Demand Unit (Unit of Measure)	EP/Trips/ Persons	EP – Water Supply / Sewerage networks Trips - Transport network Persons - Parks and Land for Community Facilities network
Financial Inputs	**Discount Rates**		
	Post-tax Nominal WACC to be applied to Expenses (WACC)	6.00%	Comprised of: • 2.5% - Typical 10-year bond rate over the past 3 years; and • 3.5% - Margin
	Real Post-tax Nominal WACC to be applied to Revenues (RWACC)	3.99%	The WACC Adjusted for inflation using the Fisher Equation.
	Escalations		
	Works Escalation Rate (for discounting purposes)	1.04% 2.05%	The current annual 10-yearly moving average of the applicable QLD PPI indices (RBC - Transport, NRBC - All other networks), calculated using the same methodology as the State's 3-year PPI averages.
	Land Escalation Rate (for discounting purposes)	1.93%	The current annual 10-yearly moving average of the Brisbane CPI index, calculated using the same methodology as the State's 3-year PPI averages.
	Modelled Charge Inflation Rate	1.93%	The current annual 10-yearly moving average of the Brisbane CPI index, calculated using the same methodology as the State's 3-year PPI averages.

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.

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

The Net Present Value (NPV) of future infrastructure expenditure is determined using the *Nominal WACC* (6.00%) and *Escalation Rates* (1.04% & 2.05%), to take into account the escalation of the capital spend in the years forward of the base year. These rates are aligned with assumptions used in Council's Long Term Financial Forecast (LTFF).

The NPV of future demand is a proxy, used to represent future revenue from infrastructure charges. This is determined using a *Real WACC* (3.99%), 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. The final cost schedules are presented in the LGIP SoW Model.