Burdekin Shire Council

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Burdekin Shire Council

Extrinsic Material to the Local Government Infrastructure Plan

Revision 1.0

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1.0 Planning Assumptions

Underpinning the Planning Assumptions of the Local Government Infrastructure Plan (LGIP) is the Burdekin Shire Council (BSC) 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 2023 through to a realistic ultimate capacity determined for the currently adopted Planning Scheme. The base assumptions and methodologies employed to develop these models and other key inputs into the Planning assumptions are detailed below.

1.1 *Population*

Burdekin Shire Council have chosen to adopt an adjusted version of the 2023 edition projections (high series) prepared by the Queensland Government Statisticians Office (QGSO). The adjusted high series has been determined by Council as the most appropriate projection to utilise given the uncertainties with growth in the region and the need to appropriately plan for infrastructure. This approach has been discussed with the Department of State Development, Infrastructure and Planning, with the following justifications presented:

- The current Estimated Resident Populations as at 2023 (being 17,020 persons) is higher than the forecasted populations at 2041 under the High Series projections.
- All three series in the QGSO 2023 projections have shown a decrease in population between 2021 and 2026, whilst the ERP's for 2021-2023 show a significant increase. If this average growth continued to 2026, this would exceed the 2041 Population projection.
- Only the High Series Population projections indicate an increase in populations over the reporting period, noting that they first project a decrease for the first two (2) reporting periods, before an overall increase in population is anticipated.

The Adjusted High Series projections has been determined on the following basis:

- 2023 populations have been based on the Estimated Resident Populations (ERP) as at 2023 produced by the QGSO;
- The annual change from the 2023 ERP to the 2046 QGSO High Series has been applied to produce a straight-line projection for all interim reporting periods (being a 0.11% annual increase).
- The 2046 ERPs are consistent with the QGSO High Series.
- This same annual increase will be applied for all future reporting periods beyond 2046 for the purpose of identifying an ultimate development year of the Planning Scheme Capacities.

Table 1: Resident Population Projections – Adjusted High Series vs QGSO High Series

Resident Population Projections	2021	2023 (base year)	2026	2031	2036	2041	2046
Adjusted High Series	***16,842***	***17,020***	***17,076***	***17,169***	***17,262***	***17,356***	***17,451***
change per annum		0.21%	0.11%	0.11%	0.11%	0.11%	0.11%
2023 QGSO High Series	**16,842**	**16,754**	**16,623**	**16,739**	**16,932**	**17,175**	**17,451**
change per annum		-0.26%	-0.16%	0.14%	0.23%	0.29%	0.32%

Council-wide non-resident population has been identified for tourists and non-resident workers across the region, and therefore an additional population of 981 persons has been added to the QGSO figures, based on an assessment of existing land use data (non-residential accommodation) and typical vacancy rates. The non-resident population has been projected to grow at a rate of 2.5% based on anticipated construction of future energy, agriculture and other new industries across the region.

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Table 2 below identifies the resident and non-resident population adopted as the 'top-down' projections in developing the Population Spatial Model.

Table 2: Resident and Non-resident Projections (2023 to Ultimate)

	2023	2026	2031	2036	2041	2046
Resident Population Projections	*17,020*	*17,076*	*17,169*	*17,262*	*17,356*	*17,451*
Non-resident Population Projections	*981*	*1,006*	*1,031*	*1,056*	*1,083*	*1,110*
Total Population Projections	***18,001***	***18,081***	***18,199***	***18,319***	***18,439***	***18,561***

Source:

- Population projections by LGA (QGSO, 2023 edition – Adjusted High Series)
- Tourist and Non-resident Workers (BSC, accommodation assessments, 2024).

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 identified household sizes. For example, a property identified as containing a house is assigned a 2023 population of 2.41. The determination of household size is based on 2021 Census data. An assessment of projected household sizes was made using QGSO dwelling projections, with the identified changes over the LGIP reporting periods being applied.

The population allocations have been reviewed and validated through a quantitative analysis against 2023 estimated resident population small area data.

Table 3: Average Household Size

Dwelling Type	2023	2026	2031	2036	2041	2046	Ultimate Development
Separate House	2.41	2.32	2.28	2.25	2.22	2.16	2.16
Semi, Detached, Flats	1.57	1.52	1.49	1.47	1.45	1.41	1.41
Other	1.58	1.52	1.50	1.47	1.45	1.42	1.42
All	***2.32***	***2.24***	***2.20***	***2.16***	***2.13***	***2.08***	***2.08***

Source: BSC (Burdekin Shire) Model 2017 & ABS 2016 PEP
Note: Measured as persons/occupied dwelling

1.1.2 Ultimate Population

The ultimate development potential of the Burdekin Shire 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 the region. Constraints relating to environmental/conservation are considered to be reflected in the planning scheme zoning. Additional constraints considered as part of this assessment included:

- Agricultural Land;
- Bushfire;
- Coastal Management;
- Environmental Significance;
- Extractive Resource;
- Flood hazards;
- Heritage;
- Infrastructure (electricity);
- Watercourses; and
- Existing easements.

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Constrained areas have been excluded from the developable area of land parcels in areas with substantial capacity for development, having regard to the intended development type (i.e. residential vs non-residential).

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

- Residential density provisions within the planning scheme for each zone type, including assumptions about dwelling composition (**Table 4**);
- Household size calculations;
- Discussions with Council Officers and understanding the realistic development trends throughout the LGA; 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 4: Ultimate Residential Density Assumptions

Planning Scheme Zone	Precinct/Area	Excluded Land - Services, Roads, etc.	Lot Size (m^2) – Attached*	Lot Size (m^2) – Detached*	% Attached / Detached	Planned Density - Gross (Dwellings/Ha)
Low Density Residential		25%	200-450**	800	15% / 85%	11.51
Low-medium Density Residential		25%	200-450**	900	70% / 30%	16.04
Emerging Community		25%	200-450**	650	15% / 85%	13.35
Centre		0%	200		20%^ / 0%	2.25
Township	Sewered	25%		1,000	0% / 100%	7.50
Township	Unsewered	25%		2,000	0% / 100%	3.75
Rural Residential	Mount Kelly	10%		8,000	0% / 100%	1.13
Rural Residential	Horseshoe Lagoon	10%		250,000	0% / 100%	0.04
Rural Residential	Elsewhere	10%		2,500	0% / 100%	3.60
Rural	Groper Creek, Jarvisfield, Jerona and Wunjunga Village Precincts	2%		100,000	0% / 100%	0.10
Rural	In the priority agricultural area or agricultural land class A and B on overlay map OM2	2%		300,000	0% / 100%	0.03
Rural	Elsewhere	2%		1,000,000	0% / 100%	0.01

** 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*
^ Only 20% of Centre residential anticipated to be realistically achieved

Residential populations were allocated across all residential Planning Areas with future capacity identified, in accordance with the medium series QGSO projections. **Table 5** below provides a summary of the population found in each projection area for the periods 2023 to Ultimate.

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***Table 5:* Population Projections 2023 to Ultimate**

Projection Areas	2023	2026	2031	2036	2041	2046	Ultimate Development
Ayr	8,912	9,128	9,284	9,423	9,429	9,428	13,679
Brandon	824	819	820	822	816	803	1,206
Home Hill	3,072	3,024	3,010	3,002	2,976	2,925	3,944
All other Localities (Outside PIA)	5,193	5,110	5,086	5,072	5,218	5,404	15,397
TOTAL	**18,001**	**18,081**	**18,199**	**18,319**	**18,439**	**18,561**	**34,226**

Source: BRC (Burdekin Shire) Model 2024

1.1.3 Interim Population Allocation

Growth between 2023 (base year) and ultimate populations have been allocated to reporting period / cohort using a 'gravity model' approach, with populations within each projection area set to align with the adjusted high series QGSO projections. 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.

Given the size of the Council area, and the limited nature of the population growth anticipated, infill development in the form of small subdivision (e.g. 1 into 2 lots) is considered unlikely to occur to any substantial extent over the next 20 years. Therefore, the allocation of additional population through the LGIP projections has been prioritised and assigned primarily to:

- Take-up of existing residential sites which are currently vacant; and
- Development of larger 'greenfield' residential sites, being parcels greater than 5,000m² in size

1.2 *Infrastructure Demand*

BSC'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)
- Stormwater - Impervious area (Imp. ha)
- 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
- Stormwater network
  - Impervious area applied on a lot-by-lot basis, using Council land use data and typical impervious fractions from the Queensland Urban Drainage Manual (QUDM)
- Transport network

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- Population at each cohort divided by applicable detached household size (Table 3) to determine equivalent detached dwellings with demand generation calculated at 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 demand for the Water Supply, Sewer and Transport networks has been calculated by applying demand generation rates per hectare respectively to the developable areas available for non-residential development, derived through spatial modelling process. The number of Equivalent dwellings was converted to the relevant demand units using:

Demand associated with existing non-residential development utilised the landuse information acquired through the population modelling process and has been assessed against the demand generation rates presented in **Table 6** applied to the developable area of the parcel with existing demand. The various non-residential landuses have been aligned with comparable zones.

Non-residential demand for the stormwater network has been applied on a lot-by-lot basis, using Council land use data (for existing), planning scheme zoning (for future), and typical impervious fractions from the Queensland Urban Drainage Manual QUDM.

Table 6: Non-Residential Demands by Zone - Water Supply, Sewerage, Transport (Roads) & Stormwater

Planning Scheme Zone	Precinct/Area	Water & Sewer EPs / Ha	Transport Trips / Ha	Stormwater Impervious Fraction
Centre*		42.18	300	0.9
Community Facilities		12.05	50	0.3
Industry	Urban Localities	28.92	60	0.9
Industry	Existing Mills	*25,000m² GFA per site - EPs based on 14.46 per 10,000m of GFA (equivalent to 0.5 plot ratio)*	*25,000m² GFA per site - Trips based on 30 per 10,000m of GFA (equivalent to 0.5 plot ratio)*	*25,000m² GFA per site - Imp Fraction based on 1.8 x GFA (equivalent to 0.5 plot ratio)*
Recreation and Open Space		0	0	0
Environmental Management and Conservation		0	0	0

** Centre Zone generates both a residential and non-residential demand*

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. For example, 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 6**.

The future demand calculated through the above process has been trended over the 2023 to Ultimate time period cohorts based on the rate of population growth rate found in each appropriately defined “Trending District”. Such an approach assumes that 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 7**.

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***Table 7:* Trending District applied to Each Zone / Locality**

PLANNING SCHEME ZONE	LOCALITY	TRENDING DISTRICT
All non-residential zones	Ayr / Brandon	Ayr / Brandon
All non-residential zones	Home Hill	Home Hill
All non-residential zones	All others	Entire LGA

1.3 *Employment*

The Burdekin Shire 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

The 2021 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:

- Burdekin Shire Council; and
- Regions aligning with the LGIP Projection Areas, aggregated using UCL (Urban Centre Localities) regions as these provided the best alignment to the 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 8** below.

***Table 8:* 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)

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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 BSC 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 9** and have been identified based on industry knowledge and confirmed by BSC 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 9: **Floor space assumptions by LGIP Employment Sector**

LGIP Employment Sector	Floorspace (m^2/employee)
Retail	25
Commercial	20
Industry	110
Community Services	25
Other (incl. Home based business)	20

1.4 *Priority Infrastructure Area Capacity*

BSC'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 population growth of approximately 6,000 people are realistically able to be ultimately accommodated within the PIA. This is in contrast to approximately 430 people required to be accommodated within the PIA by 2038 (the "PIA Period").

Most notably, due to the sharp declines in household size anticipated in the short term by the QGSO, the total dwelling requirements during the PIA period are higher than the anticipated growth in population. In other words, although there is low population growth forecasted, there is a need for new housing to accommodate the forecasted downward trend in household. Based on the household size projections, there is a need for an additional approximately 770 dwellings across the local government area during the PIA Period, with approximately 630 of these anticipated to occur within the PIA.

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The extent of urban population growth allocated within the PIA boundary demonstrates a total remaining capacity for approximately 5,600 people (or 3,000 dwellings) identified at the end of the PIA period (2038). Despite the remaining capacity at this time, the PIA boundary is considered appropriate on the following basis:

- Infill development and existing vacant residential parcels do not provide sufficient capacity to service anticipated population growth over the 15 year PIA period, and are not expected to develop to any substantial extent within this time;
- Only one physically distinct area of undeveloped 'greenfield' residential land has been included within the PIA boundary at Ayr.
    - This area is bounded on all sides by serviced properties, and allows for a logical and efficient expansion of all infrastructure networks;
    - Given each individual sites proximity to existing trunk infrastructure networks and their co-location, portions of any site within this area have potential to be developed within the PIA period, and therefore exclusion of some of these parcels at the expense of the others is not considered to be appropriate.
- Risk to Council through adoption of the proposed PIA is considered to be low:
    - It is unlikely that development of any of the included sites would incur additional cost impacts to Council;
    - Any trunk works required to service these sites will be relatively small in size, and it is unlikely that the value of any works will exceed the applicable infrastructure charges. Therefore, the provisions relating to automatic refunds are not likely to pose a risk.

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 costs have been indexed to the base year of the model (2023) 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 BSC 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 the Ministers Guidelines and Rules, 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. Burdekin Shire Council has chosen to separate these costs in order to provide additional transparency and ease of understanding within their LGIP documentation.

2.2 *Consideration of other Revenue Sources for Future Works*

Council's Future Schedule of Works has considered other revenue sources available to fund each proposed trunk infrastructure item. Where the proposed trunk works relates to an upgrade to existing trunk infrastructure, these will attract a portion of renewal funding relating to those components of being replaced. This ensures that only those costs attributed to improving the asset to meet the desired standards of service are contained in the LGIP.

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In addition to renewal funding, where Council has secured external grants or subsidies for a proposed trunk infrastructure item, these have been removed from the Establishment Cost.

The schedule of Works model has included both of these cost considerations in the calculation of the establishment cost for each future trunk infrastructure item.

2.3 *Water Supply & Sewerage Network*

2.3.1 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. The cost for existing assets was sourced from asset registers maintained by Council. Future trunk projects were valued based on project costs approved within Council's Capital Works Program.

2.3.2 Cost Modifiers

In addition to the unit rates identified above, the cost modifiers listed in **Table 11** have also been applied as necessary to assets across the water supply and sewerage networks.

Table 11: **Water and Sewerage network asset cost adjustments**

Modifier	Valuation Component	Applies To	Adjustment Factor
On-Cost Allowance	Works	All existing & future assets	10%
Contingency	Works	All future assets	15%

2.4 *Stormwater*

2.4.1 Stormwater Asset Costs

Stormwater 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. The cost for existing assets was sourced from asset registers maintained by Council. Future trunk projects were valued based on project costs approved within Council's Capital Works Program.

2.4.2 Cost Modifiers

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

Table 12: **Stormwater network asset cost adjustments**

Modifier	Valuation Component	Applies To	Adjustment Factor
On-Cost Allowance	Works	All existing & future assets	10%
Contingency	Works	All future assets	15%

2.5 *Transport Network*

2.5.1 Transport Asset Costs

Transport 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. The cost for existing assets was sourced from asset registers maintained by Council. Future trunk projects were valued based on project costs approved within Council's Capital Works Program.

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2.5.2 Cost Modifiers

In addition to the unit rates identified above, the cost modifiers in **Table 13** have also been applied as necessary, to assets across the transport network.

Table 13: **Transport network asset cost adjustments**

Modifier	Valuation Component	Applies To	Adjustment Factor
On-Cost Allowance	Works	All existing & other future assets	10%
Contingency	Works	All other future assets	15%

2.6 *Parks and Land for Community Facilities Network*

2.6.1 Parks Asset Costs

Existing park work establishment costs have been established using nominal costs for typical park embellishments, being $200,000 for a local park and $600,000 for a regional park. Future trunk projects were valued based on project costs approved within Council's Capital Works Program.

Land unit rates have been calculated based on the land classification with consideration also given to flood affected land. These represent an 'englobo' rate, following an assessment of available land valuations within the Council area. Land values per m² of site area are shown in **Table 14**.

Table 14: **Parks land valuation**

Location	Land valuation ($/m²)
Urban Land	$33/m²
Township/Rural Residential	$4/m²
Rural Land	$3/m²
Flood Affected Land	$3/m²

2.6.2 Cost Modifiers

In addition to the unit rates identified above, the cost modifiers in **Table 15** have also been applied as necessary to assets across the transport network.

Table 15: **Asset Cost Adjustments**

Modifier	Valuation Component	Applies To	Adjustment Factor
On-Cost Allowance	Works	All existing & future assets	10%
Contingency	Works	All future assets	15%

3.0 Network Planning

Network planning has been undertaken over a 15-year planning horizon from the base date of the LGIP (2023). 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 in over 100 years, taking care to note that Burdekin has experienced negative growth relatively recently.

Given the limited growth anticipated over the LGIP planning horizon, and the available capacity in the existing network, network planning has been prepared at a master planning level,

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indicative of anticipated infrastructure requirements, to be refined if and when the projected growth occurs.

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 BSC 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 15-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 BSC planners and engineers, in consideration of the growth identified in the population and demand modelling outputs. The future LGIP Projects are consistent with Council's current Capital Works Program.

3.3 *Sewerage Network*

Sewerage network planning has been undertaken to a 15-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 BSC planners and engineers, in consideration of the growth identified in the population and demand modelling outputs. The future LGIP Projects are consistent with Council's current Capital Works Program.

3.4 *Stormwater Network*

Stormwater network planning has been undertaken to a 15-year planning horizon at a level of service that aligns with the required DSS in the LGIP.

The stormwater network planning was performed collaboratively through discussions between BSC planners and engineers in order to determine a suitable BSC drainage 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 BSC. The future LGIP Projects are consistent with Council's current Capital Works Program.

3.5 *Transport Network*

Transport network planning has been undertaken to a 15-year planning horizon at a level of service that aligns with the required DSS in the LGIP.

The transport network planning was performed collaboratively through discussions between BSC planners and engineers in order to determine a suitable BSC 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 BSC. The future LGIP Projects are consistent with Council's current Capital Works Program.

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3.6 *Parks and Land for Community Facilities Network*

The Parks and Land for Community Facilities network planning was performed collaboratively through discussions between BSC planners and engineers in order to determine a suitable BSC 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 BSC up to the 15-year network planning horizon.

The future LGIP Projects are consistent with Council's current Capital Works Program.

4.0 Financial Modelling Assumptions

Financial modelling inputs for the BSC 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 BSC LGIP SoW model.**

Financial Modelling Assumptions		Inputs	Comments/Justification
Model Setup	Base Year of Model	2023	To align with the Infrastructure Planning and Demand Modelling that has been prepared for the LGIP project
	Infrastructure Planning Horizon	15	15 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/imp ha/Persons	EP - Water Supply / Sewerage networks Imp ha - Stormwater network 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)	6.02%	Comprised of: • 2.52% - Average of the 10-year bond rate over the past 10 years – as at the base year of the LGIP; and • 3.5% - Margin
	Real Post-tax Nominal WACC to be applied to Revenues (RWACC)	3.21%	The WACC Adjusted for inflation using the Fisher Equation.
	Escalations		
	Works Escalation Rate (for discounting purposes)	PPI(NRBC) 3.28% PPI(RBC) 2.57%	The annual 10-yearly moving average of the applicable QLD PPI indices (RBC - Transport, NRBC - All other networks), as at the base year of the LGIP.
	Land Escalation Rate (for discounting purposes)	2.72%	The annual 10-yearly moving average of the Brisbane CPI index, as at the base year of the LGIP.
	Modelled Charge Inflation Rate	2.72%	The annual 10-yearly moving average of the Brisbane CPI index, as at the base year of the LGIP.

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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.

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

The Net Present Value (NPV) of future infrastructure expenditure is determined using the *Nominal WACC* (6.02%) and *Escalation Rates* (3.28% & 2.57%), to take into account the

escalation of the capital spend in the years forward of the base year. These rates are closely 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 (*3.21%), 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.

4.1 *Projected Revenue for Financial Sustainability Assessment*

Approximately 30% of future growth has been projected to involve the take-up of developed, urban land which is currently vacant. For this reason, the projected revenues have been discounted by 30%, accounting for the fact that these sites have already paid infrastructure charges, and are unlikely to be contributing to Council's future revenue streams (i.e. Future dwellings on these sites will receive credit for 1 dwelling from the original reconfiguration).

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