Local Government Infrastructure Plan (LGIP)

Assumptions Report

February 2018

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1. Background

1.1 Overview

The *Planning Act 2016* (Act) is the principal legislation for Queensland's planning and development system. It aims to create an efficient system that embraces community engagement and stimulates investment and jobs.

In conjunction with a number of other key planning instruments, the Act also establishes a framework to plan for and resolve local government infrastructure matters. This framework is commonly referred to as the Infrastructure Planning and Charges Framework. The infrastructure planning and charges framework under the Act is generally consistent with the framework that existed under the repealed *Sustainable Planning Act 2009 (SPA).*

Livingstone Shire Council commenced preparation of a Local Government Infrastructure Plan (LGIP) under the *Sustainable Planning Act*, the purpose of which is to:

- Identify the Councils **projections of growth** for the region (both in absolute terms as well as its distribution);
- Identify the **desired standards of service** that Council intends to provide for each infrastructure type;
- Outline Councils preferred (most cost effective) pattern for development over the next 10-15 years (as defined in the **Priority Infrastructure Area (PIA)**); and
- Clearly identify the **scope and timing of trunk infrastructure** necessary to serve development within the PIA.

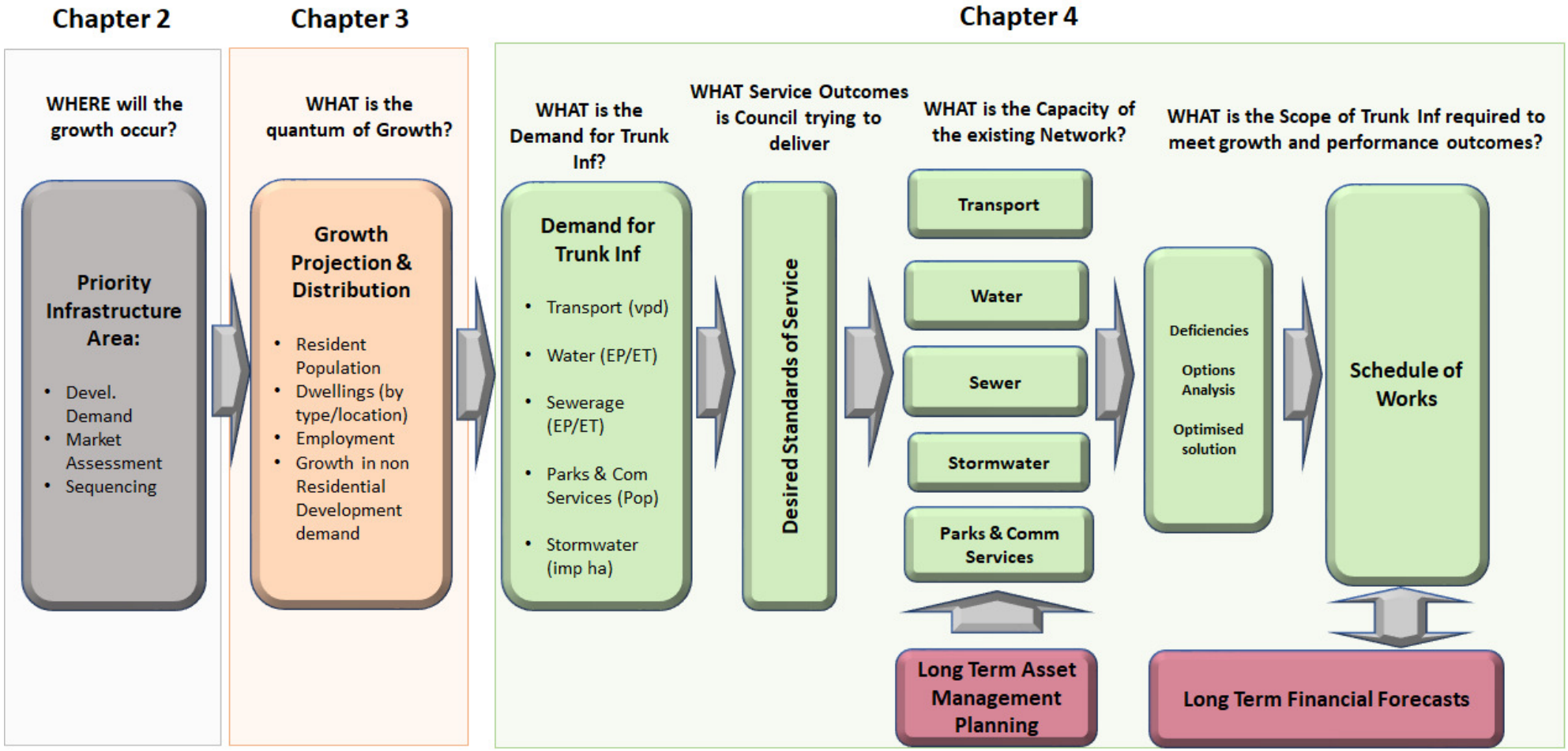
In developing its LGIP the Council needs to make a wide range of assumptions regarding the location, scope and timing of individual items within the trunk infrastructure network. Section 25 of the Ministers Guidelines[1] requires Council to provide a transparent explanation of these assumptions and the inter-relationships between each element of the LGIP.

The purpose of this brief report is to provide a succinct overview of the key planning assumptions that underpin the development of Livingstone Shire Councils LGIP

Conceptually, the report will step through the processes applied in determining the scope of the growth (quantum, timing and distribution), intended service outcomes, scope of trunk network to deliver those outcomes and augmentation required. This process is illustrated in Figure 1.1

[1] Department of Infrastructure Local Government and Planning (DILP), "Minister's Guidelines and Rules Under the Planning Act 2016", July 2017

Figure 1.1 – Process Overview



2. Establishment of the Priority Infrastructure Area

2.1 Overview

The **Priority Infrastructure Area** (PIA) is that part of the **Local Government Infrastructure Plan (LGIP)** which identifies the areas within the region that the Council will support for urban development. The PIA is typically intended to accommodate between ten (10) and fifteen (15) years anticipated urban growth. The benefit of the PIA is to enable improved coordination of development and focus Council's capital works program on supporting a development pattern which is efficient and represents the least cost to the community.

The PIA does not prevent development from occurring outside of the designated areas. However, those proposals which are inconsistent with the PIA (i.e. "out of sequence") may trigger the provisions of the *Planning Act (2016*) that allow Council's to impose additional development conditions regarding the cost, timing and scope of trunk infrastructure.

2.2 Context

The Councils growth strategy plays a key role in facilitating development of the region. The strategy has been developed with due consideration of the following;

The State context:

Both the former *Sustainable Planning Act 2009 (SPA)* and its successor the *Planning Act 2016 (Act)* define the framework within which Councils undertake their strategic planning. The *Planning Act 2016* is the principal legislation for Queensland's planning and development system. In conjunction with a number of other key planning instruments, the Act establishes a framework to plan for and resolve local government infrastructure matters. The infrastructure planning and charges framework under the Act is generally consistent with the framework that existed under the repealed SPA.

As part of development of the Livingstone Planning Scheme, patterns of growth at a strategic or region-wide level are decided through consensus between the State and local government. The Strategic Framework contained in Part 3 of the Livingstone Planning Scheme outlines the ultimate landuse preference which then filters down into a local level through zones and codes which regulate development type and location. The ultimate objective of the strategic framework is to ensure sustainable development of regional areas and to align land use with infrastructure planning to ensure economies of scale and responsible asset allocation

Under the current infrastructure framework enacted by the State government, Councils are limited to recovering a capped charge under a maximum infrastructure charges resolution. As such, Council decisions in identifying a Priority Infrastructure Area (PIA) needs to consider a pathway that facilitates development in a manner that represents the least cost to the community.

The Regional Context:

The **Central Queensland Regional Plan (CQRP)** was completed in 2013 and provides a broad framework with which to manage growth, change, land use and development across local government boundaries within the region. Regional planning matters are identified in collaboration with local governments, key industry groups and the wider community. Where a regional plan exists, the local government must consider it when preparing or making a major amendment to a Planning Scheme.

The CQRP addresses land use issues at the regional level and takes precedence over all other planning instruments where inconsistency arises. Current land use trends, population data and growth rates may vary slightly with the directions or assumptions of the Regional Plan due to the availability of more accurate information. Nevertheless, the broad desirable outcomes expressed in the CQRP remains a valid summary of the consensus reached in determining a pattern of growth that:

- Is efficient and effective (for Council and the community);
- supports long-term viability and growth of the local economy; and
- provides for liveable communities.

The Local Context:

The **Livingstone Shire Councils Planning Scheme** gives effect to the strategic direction for development of the local government area. In doing so it prescribes a vision for the region that incorporates the Councils Corporate Plan as well as prescribed State interests.

2.2.1 Strategic Intent

The overall Strategic Intent of Livingstone Shire Council Planning Scheme is to "…. *provide opportunities to accommodate the forecast population and employment growth in a way which balances the importance of assuring the ability to grow with the need to protect places of value, deliver preferred lifestyle choices and to achieve a high-level of amenity and community wellbeing".*

2.2.2 Strategic Outcomes:

The Strategic Outcomes prescribed in the Planning Scheme has been developed by theme. The objectives of *those themes most relevant to the LGIP* re summarised as follows:

The strategic outcomes for the **Settlement Pattern Theme** are:

- Ensure that urban development occurs on land identified to accommodate the forecast population and employment growth over the next twenty-five (25) years. These identified areas provide sufficient land supply for projected requirements.
- Development makes efficient use of land and existing or planned infrastructure.
- Expansion of settlements for urban activities predominantly avoids known and potential natural hazard areas, or where natural hazard areas cannot be avoided, development is designed to mitigate and be resilient to potential adverse impacts.
- The settlement pattern provides for a diverse range of housing options to meet the changing needs of the population, and creates opportunities for living close to services and facilities.
- Accommodation activities in urban places are well connected to places of employment, sports and recreation facilities, and major community facilities by a developing and planned public transport network.
- An integrated open space and recreation network is accessible and caters for the needs of the community, particularly at locations in proximity to centres and urban infill and intensification places.

- Places providing for economic development such as industrial places, specific use places, rural places, known natural resources, and other important features such as major infrastructure and movement networks are protected from incompatible land uses.

- Opportunities for rural residential living continue on land identified as a rural residential place and in limited opportunities adjacent to the townships of Cawarral, Mt Chalmers, or The Caves where there is a community need.

- Small townships remain a focal point for their surrounding rural places and provide limited opportunities for growth in population, convenience businesses and community facilities.

- Rural places are predominantly used for purposes that contribute to primary production.

- Development does not limit or compromise agricultural land or uses involved in primary production.

- Development avoids causing significant adverse impacts on matters of environmental significance, or when this cannot be achieved, impacts are minimised or residual impacts offset.

The strategic outcomes for the **Transportation and movement theme** are:

- Connectivity between accommodation activities, centres, and places providing for employment, community activities and recreation, is enhanced by the provision of a safe and efficient transport and movement network.

- The transport and movement network support the settlement pattern and the economy of the planning scheme area by facilitating the efficient and safe movement of people, goods, resources and materials both within the planning scheme area and to and from other areas outside the planning scheme area.

- The transport and movement network (including the location and design of future links) is designed to minimise impacts on existing and future communities, natural environments and scenic amenity.

- Development does not compromise the safety, efficiency, effectiveness and operation of the transport and movement network.

- The transport and movement network encourage and supports active lifestyles by providing for integrated walking, cycling and public transport infrastructure to support a progressive reduction in car dependency.

The strategic outcomes for the **Infrastructure and services theme** are:

- Infrastructure and services are planned and delivered in a logical, timely and cost-effective manner which:
  (a) supports the identified settlement pattern,
  (b) is fit for purpose;
  (c) is sensitive to cultural and environmental values;
  (d) meets the long term needs of the community, industry and business; and
  (e) achieves the desired standards of service.

2.3 Priority Infrastructure Area (PIA) rationale

The *Priority Infrastructure Area (PIA)* is the area identified by Livingstone Shire Council within which it will prioritise the provision of trunk infrastructure for the next 10 to 15 years. The PIA supports the Planning Scheme through:

- Managing urban growth within defined boundaries in a sustainable manner;
- Enhancing liveability through access to adequate services, functional open space, and encouraging clever urban design to improve quality of life;
- Encouraging effective mobility (access and transport) through increased access to a range of modes of transport; and
- Encouraging development which delivers these outcomes within the broader constraints of infrastructure funding and sequencing.

The process of establishing a PIA within the **Local Government Infrastructure Plan** (LGIP) included the following staged series of steps;

- The original PIA was established by the Livingstone Shire Council in 2007/08 as part of development of its draft Priority Infrastructure Plan (PIP).
- Upon amalgamation, this work was absorbed into the development of the PIP for the expanded Rockhampton Regional Council;
- As party of this process, Rockhampton Regional Council commissioned GHD[2] to undertake a detailed assessment of population, employment and development in the Livingstone region. The population model developed as part of this commission provided estimates of population growth and employment calculated by land use type and allocated at a lot level. The resulting planning assumptions regarding lot yield, demand, and ultimate development potential were then reflected in the development of a Priority Infrastructure Area (PIA) for Livingstone Shire (2009).
- Livingstone Shire Council formally de-amalgamated from Rockhampton Regional Council in 2014. Council immediately set about developing a new Planning Scheme for the shire. As part of this assessment, the Livingstone Council undertook a detailed assessment of the Developable Area for the region (i.e. land which is not subject to development constraint). The Developable Area has been derived as the area of land that is not subject to a development constraint arising from:
    - Acid sulphate soils;
    - Airport environs;
    - Biodiversity;
    - Bushfire hazard;
    - Coastal hazard;
    - Extractive resources and minerals;
    - Flood hazard;

[2] Rockhampton Regional Council, "Livingstone Shire Priority Infrastructure Plan Planning Assumptions Report", GHD, December 2009

- Hazardous activities;
- Heritage;
- Regional infrastructure;
- Scenic amenity;
- Steep land; and
- Water resource catchment.

- The **Planning Assumption Model (PAM)** that underpinned the 2009 PIP/PIA assessment was updated by Livingstone Shire Council post amalgamation (2014 and 2015). The outcomes from the model were a key input in the refinement of Councils Infrastructure Planning

- The PAM uses the Council Planning Assumptions (specifically identifying developable areas and land use at the lot level) to provide guidance on the likely development potential for the region. This was a key input in determining the Priority Infrastructure Area.

- When defining the PIA boundary, regard was given to:

    - Areas which are currently available for urban development (as defined under the Planning Scheme);

    - The availability and capacity of all five (5) key trunk infrastructure types;

    - Infill and re-development potential of existing serviced areas; and

    - Existing development approval information.

The draft Priority Infrastructure Area (PIA) thus identified has the capacity to accommodate the expected urban growth over the next ten (10) to fifteen (15) years. **A copy of the draft PIA is provided in Figures 2.1 to 2.3.**

Figure 2.1 – Priority Infrastructure Area – Capricorn Coast

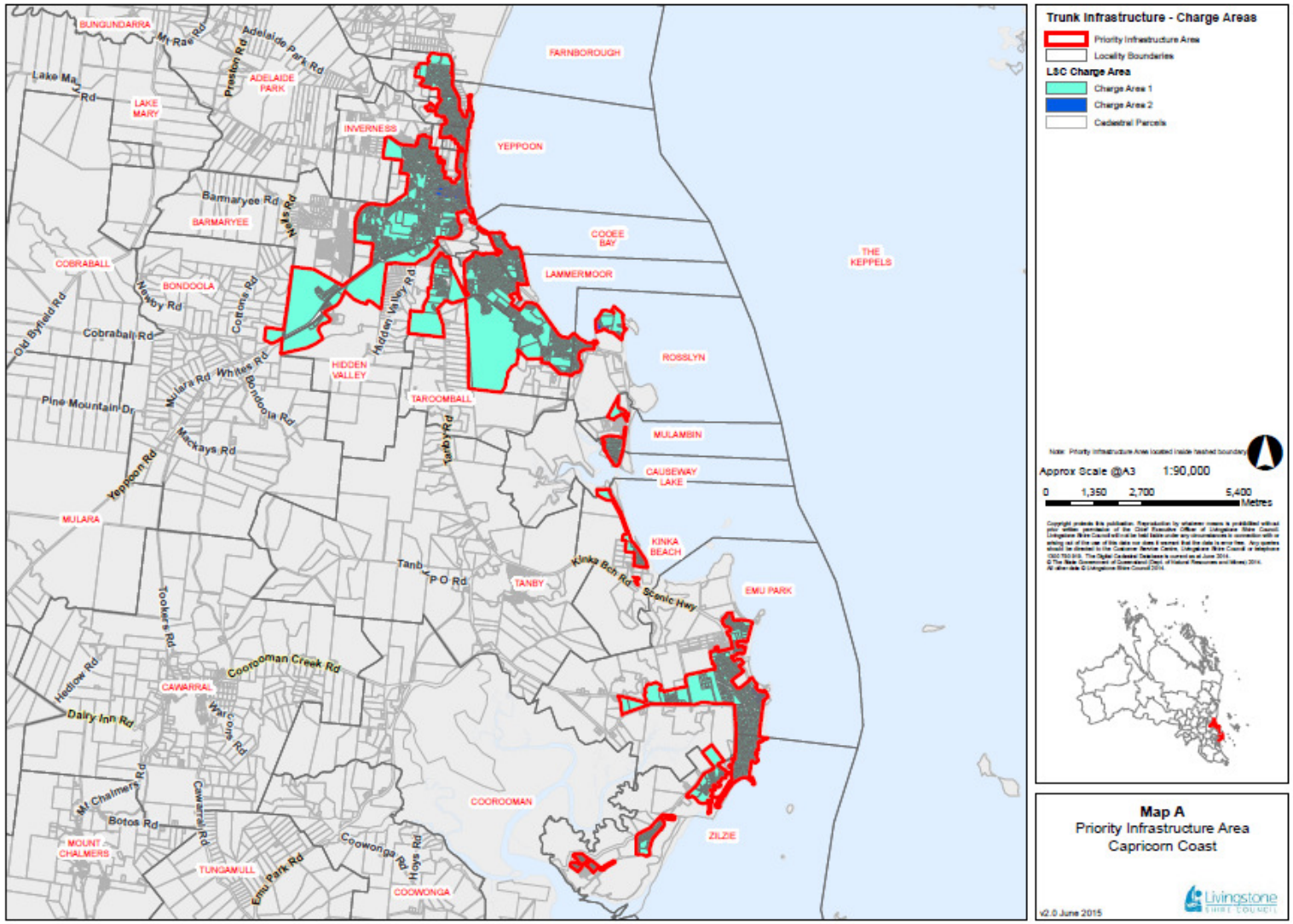


Figure 2.2 – Priority Infrastructure Area – Yeppoon

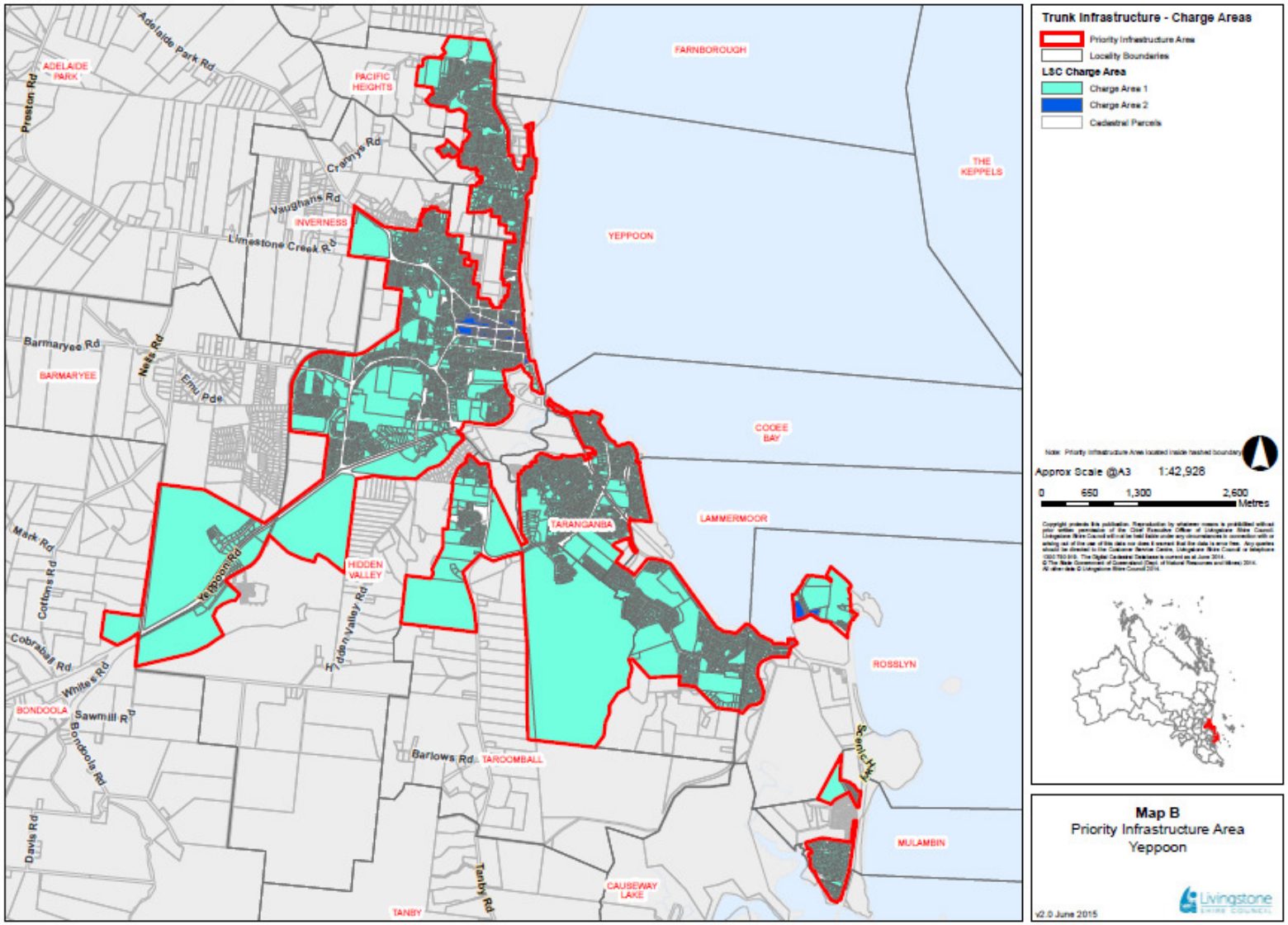
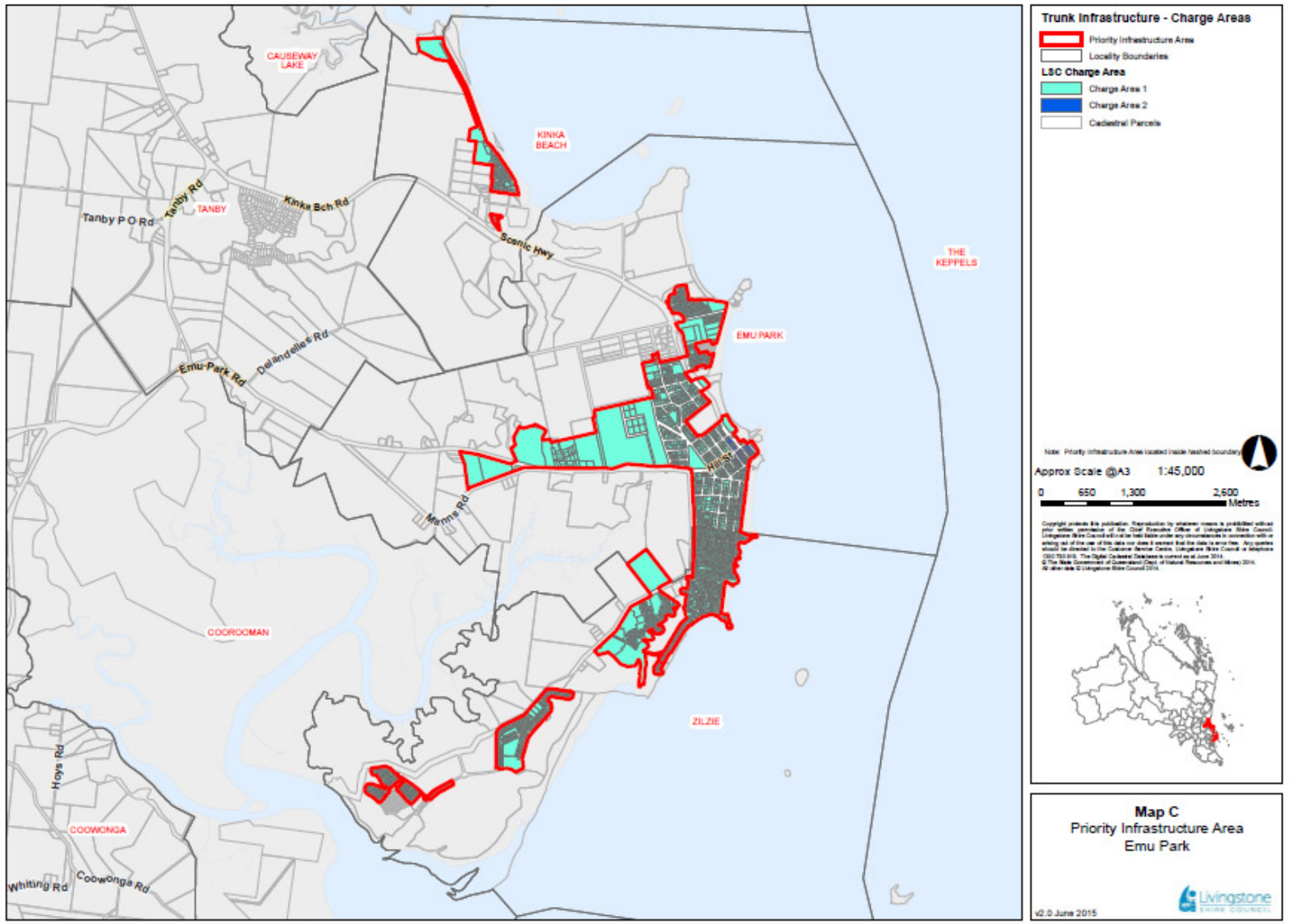


Figure 2.3 – Priority Infrastructure Area – Emu Park



3. Growth Projections and Distribution

3.1 Overview:

The objective of this section of the report is to provide a succinct summary of how key planning assumptions have been developed and applied within the Local Government Infrastructure Plan. As outlined schematically in Figure 1, development of the growth projections (and their allocation across the region) is a key input into infrastructure planning and subsequent development of a schedule of trunk infrastructure works.

Livingstone Shire Councils Population Assumptions Model (PAM) provided a powerful tool with which to identify and allocate population and employment growth across the region. As outlined earlier, the PAM uses a land parcel based Geographic Information System (GIS) model to assess:

- Existing land uses and scale of existing development;
- Physical constraints on the land;
- Land-use and development provisions of the Livingstone Planning Scheme;
- Current development applications and approvals;
- Development trends;
- Development sequencing analysis;
- Average dwelling occupancy rate projections; and
- Average floor space conversion rates for non-residential floor space.

The outcomes from the PAM provide a robust mechanism for Council to forecast the impact of future demand and the corresponding need for supporting trunk infrastructure

3.2 Residential Population projections

The source of the original baseline (2011-2036) population data contained within the LGIP was the statistical analysis information (SA2 data) provided by the **Queensland Government Statisticians Office** (QGSO). This data provided estimates of total population together with a broad distribution of population across the region.

The QGSO data was checked against the population and dwelling forecast suggested by Council population modelling. In some instances, minor changes to the allocation of population projections across the region were made to align with the more site-specific PAM modelling.

This provided an initial estimate of the 2011 population figures, distribution of the population across the Region as well as an estimate of the employment profile and dwelling structure (i.e. percentage of the population living in single dwellings, multiple dwellings or other accommodation).

Table 3.1 –Population Projections

Livingstone R)	2011	2016	2021	2026	2031	2036
Population	33,400	37,960	41,434	46,001	51,151	57,052
Growth (5yr)		14%	9%	11%	11%	12%

These total growth figures were used as the "anchor points" for all projections. This provided a sound "top down" forecast of population growth across the region. Growth in the period 2026-2031 was determined through consideration of overall regional growth projections, available capacity and likely development potential.

A more granular allocation of forecast growth was determined using the the PAM which provided a robust "bottom up" assessment of current and projected demand (by area). At this point, the location of the PIA was reviewed to ensure that the population within and outside the PIA (as suggested by the PAM) was broadly consistent with QGSO estimates.

The statistical data also provided an initial estimate of **dwelling structure** (i.e. percentage of the population living in single dwellings; multiple dwellings or other accommodation). Initial estimates of dwelling numbers were derived using forecast dwelling densities suggested in the States PIP/ICS model for Livingstone (2011). This estimate was compared with Australian Bureau of Statistics (ABS) data contained in its **Basic Community Profile** (BCP) which suggested a higher 2011 density (although the BCP data also included Rockhampton figures).

For the purpose of the LGIP, the dwelling densities suggested in the States PIP/ICS model have been applied. As this rate is marginally less than the comparative rates, it tends to suggest a marginally higher dwelling projection over the medium to longer term. This suggests that the PIA may tend to be more accommodative than would be the case if the higher densities had been applied. Differences in dwelling structure from various data sources is summarised in table 3.2.

Table 3.2 – Assumptions Regarding Dwelling Structure

Data Source	Dwelling type	2011
States PIP/ICS Model	Single Dwelling	2.27
	Multiple Dwelling	1.4
ABS "Basic Community profile	Single Dwelling	2.6
	Multiple Dwelling	1.54
Council Population Modelling	Single Dwelling	2.7
	Multiple Dwelling	1.6

As part of the development of the dwelling and population projections, sequencing analysis was undertaken as part of the PAM process. This was initially undertaken in collaboration with RRC with assumptions reviewed again in 2015/16. The objective of the sequencing assessment was to estimate the timing of future development and to assist in the determination of the PIA. Sequencing analysis considered:

- Available development approval data;
- Proximity of land to existing trunk infrastructure;
- Development trends;
- Livingstone Planning Scheme zoning and codes;

- Available dwelling capacity to accommodate projected population growth; and
- The dwelling and associated land requirements to accommodate no more than fifteen (15) years of population growth.

3.3 Non-Residential Projections:

The existing amount of **Gross Floor Area** (GFA) within the former Livingstone Shire Local Government Area was based on land-use data supplied by Rockhampton Regional Council (RRC) and used to determine the location of retail, commercial, industrial and other non-residential land uses. The land-use data is classified according to the Department of Environment and Resource Management or DERM land valuation land-use codes, which are also used for rating purposes.

As part of the modelling, it was assumed that existing land uses with intensity higher than allowed under the Livingstone Planning Scheme or an existing inconsistent use would continue as an existing use. For other areas, the future use was based on zoning and associated codes (including approved structure plans) within the Livingstone Planning Scheme.

For identified existing retail, commercial, industrial and other non-residential land uses, building footprint data was captured using aerial photography to establish the base area of GFA. The base area of GFA was multiplied by the captured levels of GFA to establish an estimate of the existing GFA in square metres (m2).

Existing GFA was converted to **employment** using floor space conversion rates contained within Table 3.3.

Table 3.3 Floor Space Conversion Rates for existing Gross Floor Area

Existing land use	Floor space conversion rate
Commercial Office	25m^2 GFA per employee
Commercial retail	35m^2 GFA per employee
Mixed Use (Mixed commercial or residential and commercial)	30m^2 GFA per employee
Commercial Other	40m^2 GFA per employee
Special/ Community Use	80m^2 GFA per employee
Industrial or Commercial retail showroom	100m^2 GFA per employee

These floor space conversion rates were determined through a literature review of existing studies, published Priority Infrastructure Plans and the PIP Regulated Infrastructure Charges planning assumptions calculator.

The projected (and ultimate) Gross Floor Area was determined through a Capacity Analysis. For land identified as having capacity for further retail, commercial, industrial and other non-residential development, ultimate GFA capacity was calculated based on site cover, GFA ratios and developable land area assumptions in combination with maximum approved GFA in comprehensive development zones, development approval data and consultation with Council.

When estimating employment forecast, it was assumed that a significant proportion of the existing and future population of the Planning Scheme area would find employment in Rockhampton City. It is intended that future development approvals or planning scheme amendments increasing the regions capacity to provide employment will subsequently increase the level of employment self-sufficiency.

4. Trunk Infrastructure

4.1 General

Having established the projected growth in population, employment and non-residential GFA, the next step in the process was to determine the scope, timing and cost of trunk infrastructure necessary to accommodate the expected growth. In doing so, Council has clearly defined:

- How the projected growth would manifest in terms of **demand for trunk infrastructure;**
- The **standard of service** required of the trunk infrastructure (i.e. what are the outcomes implied or embedded in Councils planning and corporate strategies that the trunk infrastructure needs to deliver);
- The extent to which the **existing trunk infrastructure networks** can accommodate the anticipated growth and deliver the nominated service outcomes;
- The scope of **additional trunk infrastructure** necessary to augment the existing networks to accommodate the development sequence outlined in the PIA; and
- The **cost and approximate timing** of the proposed works.

The purpose of this section is to provide a summary of the key assumptions underpinning the development of the **schedule of trunk infrastructure works** necessary to accommodate projected growth. For simplicity, the link between infrastructure demand, service standards, technical assessment of capacity and development of a schedule of works is outlined separately for each trunk infrastructure network.

It important to note that Councils infrastructure planning is often undertaken on a longer timeframe than that required for land use planning purposes. As a result, the schedule of works tables contained within the LGIP typically only cover those trunk items relevant for development over the prescribed 10-15-year timeframe. Where trunk infrastructure has been identified over a longer period, these items may feature in Council Schedule of Works model but are not included in the LGIP. This approach illustrates Councils longer term infrastructure planning and provides a basis for determining infrastructure needs in the case where development proceeds differently to that envisaged in the PIA.

In addition, Councils longer term infrastructure planning typically considers all items of infrastructure necessary to provide the targeted standard of service to the community. This may include some non-trunk elements. For example, where the service standards for parks includes items that do not meet the prescribed definition of “trunk” (e.g. public art, spectator seating etc), these items may be included in Councils Schedule of Works modelling (which considers the broader scope of infrastructure) but are excluded from the Schedule of Works tables contained within the LGIP. The Schedule of Work model reflects the fact that Council may still be planning for provision of such items however, where such non-trunk items are provided, the legislation requires that they are funded by revenue sources other than infrastructure charges.

4.2 Apportionment

The Schedule of Works model identifies all five (5) trunk infrastructure classes as either an *open* or *closed* network. In the case of open networks (e.g. transport and parks/community services), individual items of trunk infrastructure are available (and hence allocated) across the entire Shire. In the case of closed network (e.g. water, sewerage and stormater), individual

items of trunk infrastructure are allocated to the localities/catchments/zones which are serviced by those infrastructure items.

All development within Councils Priority Infrastructure Area (PIA) are required to make a contribution to all five networks. Under the Planning Scheme, development outside the PIA (which may include a number of zones such as rural, village, township, comprehensive development, local business, park residential/rural residential) may not be required to connect to reticulated services for the closed networks.

All land (within and outside the PIA) has been identified by locality in one of thirty (30) catchments (LGIP Table SC 3.1.7) as follows;

- Catchments 1-22 (**Capricorn Coast Urban**) are generally localities within the PIA and are each subject to apportionment of each trunk infrastructure network as indicated on the Plans for Trunk Infrastructure (PFTIS) and the Schedule of Works model;
- Catchment 23 includes five (5) localities which share a boundary with Rockhampton local government. These areas are not included within the PIA and have limited trunk infrastructure;
- Catchment 24 includes seven (7) localities which are typically non-urban areas with some existing trunk assets;
- Catchment 25 includes five (5) localities that are immediately adjacent to the south west of the Capricorn Coast urban catchments (catchments 1-22 as per above);
- Catchment 26 is located in the south-east of the Shire, and are predominantly rural lands which are not included in the PIA;
- Catchment 27 includes three (3) geographically separated localities which are serviced by water but are not included in the PIA;
- Catchment 28 includes rural areas of the north and west of the Shire and are not included in the PIA;
- Catchment 29 encompasses the Keppel's which, along with other islands that are tourist and recreational areas, have access to facilities at Roslyn Bay, Emu Park and Coorooman Creek. There is no existing or future trunk assets on the islands
- Catchment 30 is the Coral Sea.

Urban areas identified within Councils PIA are all included as one (1) charge area. Within these localities Council has maintained a consistent charge and has NOT resolved to actively divide charges. Areas outside the PIA are included in a separate charge area within which the required infrastructure charge is dependent on the scope of (closed) trunk networks accessed plus an equivalent apportionment of the cost of open networks (roads and parks/community facilities). Inconsistent development (including that outside of the PIA) may also be subject to additional conditioning as allowed for under the Planning Act.

4.3 Transport Infrastructure

4.3.1 Planned Infrastructure Demand

The planned transport infrastructure demand for the region has been developed from in-house analysis which is broadly based on an assumed rate of daily traffic generation of 10 trips per residential dwelling. This estimate of trip generation is consistent with other comparable Regional Councils as evident in the Capricorn Municipal Design Guidelines (refer Table D1.06.02). Trip generation (LGIP Table 3.1.6) has been aligned with current and projected measures of "equivalent tenements" across the Shires thirty (30) cost catchments (LGIP Table SC 3.1.7).

Allocation of trips across the network is undertaken using local knowledge and understanding of relative trip attraction associated with alternative land uses. This assessment has been used to identify constraints on the existing transport network for which trunk infrastructure solutions have been developed. These have been summarised in the Infrastructure Strategic Planning Report.

Livingstone Shire has engaged progressively with the DTMR throughout the process. This has included discussion on the scope of trunk infrastructure contained in the Adopted Infrastructure Charges Resolutions and specific advice to Council that DTMR has no objection to the structure and content of the draft LGIP.

4.3.2 Desired Standard of Service

The size, scope and performance of trunk infrastructure networks depends on the service standards that such infrastructure is intended to provide. A service standard that is set too low will not deliver the outcomes that Council requires. A service standard that is too high can act as a potential constraint for new development.

Recognising that demand is only part of the equation relevant to the determination of scope of trunk infrastructure, Council has established a desired standard of service for the trunk transport network which reflects basic requirements and commonly used design parameters. Councils standard for design of the road network is to meet a minimum Level of Service D as prescribed in the Department of Main Roads and Planning's Design Manual. this level of service is to be achieved at the Planning Horizon Peak Hour pattern for each site.

The primary performance criteria relevant in assessing the efficiency of the local transport network (both now and into the future) is the degree of saturation of the network. The Councils preferred outcome is to achieve a maximum degree of saturation of between 0.8 and 0.9 as outlined in Table 4.1.

Table 4.1 - Maximum Degree of Saturation for Local Road Intersections

Road Network Item	Maximum Degree of Saturation
Traffic Signals	0.9
Roundabout	0.85
Priority Controlled	0.8
Traffic Signals (State Controlled)	0.9

The Council recognises the importance of cycleways and footpaths in facilitating local transportation and has prescribed an outcome for these infrastructure types which provides a safe, attractive and convenient network that links residential areas to major activity nodes and public transport interchanges. The relevant performance criteria for pedestrians and cycle

paths is outlined in the Capricorn Municipal Development Guidelines. The overall objective of Councils cycleway and footpath network is to encourage walking and cycling as acceptable and convenient travel alternatives.

4.3.3 Schedule of Works

Scope: (what's required to meet future demand)

Councils assessment of the regions transport capabilities has identified a range of initiatives that are designed to ensure that traffic movements remain efficient across the region.

The scope of trunk transport initiatives proposed by Council to accommodate growth has been summarised in the Schedule of Works. Projects forecast within the 10-15year LGIP horizon have been included in the Councils Long Term Financial Forecasts (LTFF).

The scope and scale of existing trunk infrastructure assets contained within the Schedule of Works model have been drawn from Councils Trunk Transport hierarchy and associated asset register.

Costing and Timing; (what it costs and when it will be delivered)

The establishment cost for proposed trunk transport assets has been determined using Councils internal valuation processes. This approach ensures that all projects are valued in a consistent manner. The unit rates applied in the valuation are representative of current costs incurred by Council in the construction of transport infrastructure and have been reviewed by external parties.

The timing of works was broadly linked to development expectations in the areas immediately relevant to the improvements. However, given uncertainties arising from the likely timing of development and limited traffic data, the dates provided should be interpreted broadly (i.e. likely to fall in a 3-5-year window) rather than being an absolute date.

Allocation of Cost and Terminal Value

The Schedule of Works Model includes provision for the cost of each initiative to be allocated across thirty (30) cost catchment(s). Costs are generally allocated only to those catchment that receive a service benefit from the infrastructure. Allocation of costs in this way can assist Council in better understanding the cost structure of its infrastructure network and the scope of cost recovery relevant to individual development.

In the case of transport infrastructure, as these networks are "open" (i.e. accessible from across the Shire), most transport items have been allocated across a wide spectrum of catchments.

In the case where trunk infrastructure is provided late in the 15-year planning horizon and where such infrastructure may have a significant residual capacity, Council has applied a terminal value. The terminal value recognises the extent to which the cost of the trunk infrastructure should be allocated to future users. For example, let's assume that a road has the capacity to carry 10,000 vehicles per day (vpd). In a given catchmenet, the existing network will reach capacity in 14 years' time, triggering the need for an augmentation which will provide an increase in capacity of 5,000 vpd. Within the schedule of works, the cost of this augmentation may be allocated to current and projected users within the 15-year planning horizon. However, the real benefit (and longer-term need for) the asset will occur after the 15-year mark. In such a circumstance, its prudent to apply a terminal value which recognises the fact that a significant proportion of the value of the trunk asset should be allocated to demand outside the 15-year

horizon. If we assume in this example that 10% of the value of the asset relates to existing and growth in the 15-year period and 90% of the value of the asset should be allocated to future users (outside the 15-year timeframe) then the residual value should deduct 90% of the value of the asset from the schedule). Its important to note that a residual value may not always apply. In the example above, if the augmentation was triggered by demand within the 15-year horizon only (i.e. this catchment reaches full development in year 15) then no terminal value applies.

In the case of trunk transportation infrastructure, a total of ten (10) items have been identified for which a terminal value has been applied.

4.4 Trunk Water Supply

4.4.1 Planned Infrastructure Demand

The demand for Trunk Water Services across the region has been developed from in house analysis and is summarised in Councils Infrastructure Strategic Planning report of April 2016. The performance of the network has been assessed using the Water Supply Network Analysis Software EPANET and assumes a demand 1620 L/ET/day (CMDG, Table D11.06.01). This level of demand is broadly consistent with other Regional Councils.

Demand generation for different land use types is related to Equivalent Tenements (ETs) using the factors contained in LGIP Table 3.1.6. In the case of water, the relevant conversion factor for commercial and retail land use is 0.004ET/dwelling and for all industrial uses the factor is 0.0014. The resultant demand on the network is then applied within the hydraulic model using the current and projected measures of “equivalent tenements” across the Shires thirty (30) cost catchments as defined in LGIP Table SC 3.1.7.

The outcomes from the Infrastructure Strategic Planning report provided Council with an initial scope of proposed water services upgrades. These works were subject to further review and refinement (including determination of estimated timing and cost) before being incorporated in Councils Long Term Capital program. Only those items of TRUNK water services infrastructure which were identified in this process have been incorporated into the Schedule of Works model.

4.4.2 Desired Standard of Service

The Desired Standards of Service contained within the Local Government Infrastructure Plan (LGIP) includes a combination of qualitative (outcome based) and quantitative (technical) requirements. The specific technical requirements underpinning the service standards are those prescribed in the Capricorn Municipal Development Guidelines (CMDG). This document provides specific design criteria consistent with the States Planning Guidelines for Water Supply and Sewerage.

It should be noted that the CMDG establishes the requirements for non-trunk infrastructure and explicitly defers the application of the standard to TRUNK infrastructure back to the Council. For the purpose of the LGIP, the CMDG requirements will apply to all water supply assets up to and including 300mm diameter. For assets above this threshold (as well as any significant reservoirs or pump stations), developers should refer to Council for advice.

The primary performance criteria relevant in the planning and design of trunk water services infrastructure are provided in Table 4.4 of the LGIP and are reproduced below:

Table 4.4 - Water Supply Network Design Criteria

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

4.4.3 Schedule of Works

Scope: (what's required to meet future demand)

Councils assessment of the hydraulic capacity of the regions potable water supply network identified a range of challenges (primarily triggered by future demand). The Strategic Infrastructure Planning report for water supply proposed initiatives that are designed to address the issues identified. This initial work has been supplemented by ongoing assessment of the network capability in key areas, specifically those for which demand is forecast to increase creating a need for augmentation.

The overall network upgrade strategy prescribed in the Schedule of Works is intended to support growth across the region and maintain the targeted standards of service. Those projects that have been identified as being necessary over the next 10-15 years have been incorporated into Councils Long Term Financial Forecasts (LTFF).

The scope and scale of existing trunk infrastructure assets contained within the Schedule of Works model have been drawn from Councils GIS and the associated fixed asset register.

Costing and Timing; (what It costs and when it will be delivered)

The establishment cost of proposed water service assets has been determined using Councils internal valuation processes. This approach ensures that all projects are valued in a consistent manner. The unit rates applied in the valuation are representative of current costs incurred by

Council in the construction of transport infrastructure and have been reviewed by external parties.

The timing of works was broadly linked to development expectations in the areas immediately relevant to the improvements. However, given uncertainties arising from the likely timing of development and limited traffic data, the dates provided should be interpreted broadly (i.e. likely to fall in a 3-5-year window) rather than being an absolute date.

Allocation of Cost and Terminal Value

The Schedule of Works Model includes provision for the cost of each initiative to be allocated across thirty (30) cost catchment(s). Costs are generally allocated only to those catchments that receive a service benefit from the infrastructure. Allocation of costs in this way can assist Council in better understanding the cost structure of its infrastructure network and the scope of cost recovery relevant to individual development.

In the case of water services, the cost of proposed infrastructure items has been broadly allocated to the catchments that they serve. This creates the necessary link (nexus) between the cost of providing trunk infrastructure and the demand for water services.

In the case where trunk infrastructure is provided late in the 15-year planning horizon and where such infrastructure may have a significant residual capacity, Council has applied a terminal value which recognises the extent to which the cost of the trunk infrastructure should be allocated to future users. This approach ensures that costs that relate to longer term demand (i.e. growth outside the 15-year LGIP horizon) are not unfairly allocated to development in the medium term (i.e. the 15-year LGIP timeframe).

In the case of trunk water infrastructure, a total of twenty one (21) items have been identified for which a terminal value has been applied.

4.5 Trunk Sewerage Network

4.5.1 Planned Infrastructure Demand

The demand for Trunk Sewerage Services across the region has been developed from in house analysis and is summarised in Councils Infrastructure Strategic Planning Report of April 2016. The performance of the network has been assessed using the Sewerage Reticulation Analysis software SWIMM5 and assumes an average day demand of 540 L/ET/day (CMDG, Table D12.06.01). This flow is broadly consistent with other Regional Councils.

Demand generation for different land use types is related to Equivalent Tenements (ETs) using the factors contained in LGIP Table 3.1.6. In the case of sewerage infrastructure, the relevant conversion factors for non-residential land uses are as follows:

- Commercial – 0.004ET/dwelling
- Retail - 0.007ET/dwelling
- Industrial (light, medium and heavy) - 0.00217ET/dwelling

The resultant demand on the network is then applied to the sewer network model using the current and projected measures of “equivalent tenements” across the Shires thirty (30) cost catchments as defined in LGIP Table SC 3.1.7.

The outcomes from the Infrastructure Strategic Planning Report provided Council with an initial scope of proposed upgrades to the sewerage network and treatment capacity. These works were subject to further review and refinement (including determination of estimated timing and cost) before being incorporated in Councils Long Term Capital Program. Those items of TRUNK sewerage infrastructure which were identified in this process have been incorporated into the Schedule of Works model.

4.5.2 Desired Standard of Service

The Desired Standards of Service contained within the Local Government Infrastructure Plan (LGIP) includes a combination of qualitative (outcome based) and quantitative (technical) requirements. The specific technical requirements underpinning the service standards are those prescribed in the Capricorn Municipal Development Guidelines (CMDG). This document provides specific design criteria consistent with the States Planning Guidelines for Water Supply and Sewerage.

It should be noted that the CMDG establishes the requirements for non-trunk infrastructure and explicitly defers the application of the standard to TRUNK infrastructure to the Council. For the purpose of the LGIP, the CMDG requirements will apply to all sewerage transport assets up to and including 300mm diameter and pump stations up to 200L/s. For assets above this threshold, more specific advice will be provided by Council.

The primary performance criteria relevant in the planning and design of trunk sewerage transportation infrastructure are provided in Table 4.6 of the LGIP and are reproduced below:

LGIP Table 4.6 – Sewerage Network Design Criteria

Design criteria	Measure
One (1) equivalent person (EP)	200 litres per equivalent person per day (L/EP/day)
One (1) equivalent tenement (ET)	2.7 equivalent person (EP)
Average Dry Weather Flow (ADWF)	540 litres per equivalent tenement per day (L/ET/day)
Peak Dry Weather Flow (PDWF)	2.5 x Average Dry Weather Flow (ADWF)
Wet Weather Flow (WWF)	Five (5) x Average Dry Weather Flow (ADWF)
Sewage pump station emergency storage	Four (4) hours minimum
Total sewage pump station capacity	Wet Weather Flow or Five (5) x Average Dry Weather Flow (ADWF) minimum
Gravity Main Flow Capacity	75% of full depth at Wet Weather Flow (WWF) capacity.
Gravity Main Minimum velocity at Peak Dry Weather Flow (PDWF)	0.7 m/sec at Peak Dry Weather Flow (PDWF) capacity.
Gravity Main Maximum velocity at wet weather flow (WWF)	2 m/sec at Wet Weather Flow (WWF) capacity.
Rising main minimum scouring velocity	0.7 m/sec at Peak Dry Weather Flow (PDWF) capacity.
Rising main maximum velocity	• 1.5m/sec for new trunk sewer rising mains at Wet Weather Flow (WWF) capacity; • 2 m/sec for augmentation of existing trunk sewer rising mains at Wet Weather Flow (WWF) capacity.
Planning Horizon	• Ultimate for reticulation (non-trunk) network • 20 yrs. for trunk gravity mains, trunk sewage pump stations, trunk sewer rising mains, trunk effluent pressure mains.
Odour Protection	• Required for new trunk sewage pump stations where initial loadings cause long detention times; • Not required for augmented sewage pump stations

Air Release and Air Scour	• Air Venting in all gravity sewer mains at locations of excessive turbulence – particularly where a steep (super-critical flow) meets a flat section (sub-critical flow), and discharge chambers; • Air scours on rising mains where air lock is a risk.

4.5.3 Schedule of Works

Scope: (what's required to meet future demand)

Councils assessment of the hydraulic capacity of the regions sewer collection and transportation network identified a range of challenges (primarily triggered by future demand). The Strategic Infrastructure Planning Report proposed initiatives that are designed to address the issues identified. This initial work has been supplemented by ongoing assessment of the network capability in key areas, specifically those for which demand is forecast to increase creating a need for augmentation.

The overall network upgrade strategy prescribed in the Schedule of Works is intended to support growth across the region and maintain the targeted standards of service. Those projects that have been identified as being necessary over the next 10-15 years have been incorporated into Councils Long Term Financial Forecasts (LTFF).

The scope and scale of existing trunk infrastructure assets contained within the Schedule of Works model have been drawn from Councils GIS and the associated fixed asset register.

Costing and Timing; (what It costs and when it will be delivered)

The establishment cost for proposed trunk sewerage assets has been determined using Councils internal valuation processes. This approach ensures that all projects are valued in a consistent manner. The unit rates applied in the valuation are representative of current costs incurred by Council in the construction of transport infrastructure and have been reviewed by external parties.

The timing of works was broadly linked to development expectations in the areas immediately relevant to the improvements. However, given uncertainties arising from the likely timing of development and limited traffic data, the dates provided should be interpreted broadly (i.e. likely to fall in a 3-5-year window) rather than being an absolute date.

Allocation of Cost and Terminal Value

The Schedule of Works Model includes provision for the cost of each initiative to be allocated across thirty (30) cost catchment(s). Costs are generally allocated only to those catchments that receive a service benefit from the infrastructure. Allocation of costs in this way can assist Council in better understanding the cost structure of its infrastructure network and the scope of cost recovery relevant to individual development.

In the case of sewerage services, the cost of proposed infrastructure items has been broadly allocated to the catchments that they serve. This creates the necessary link (nexus) between the cost of providing trunk infrastructure and the demand for sewerage collection, transport and treatment services.

In the case where trunk infrastructure is provided late in the 15-year planning horizon and where such infrastructure may have a significant residual capacity, Council has applied a terminal value which recognises the extent to which the cost of the trunk infrastructure should be allocated to future users. This approach ensures that costs that relate to longer term demand

(i.e. growth outside the 15-year LGIP horizon) are not unfairly allocated to development in the medium term (i.e. the 15-year LGIP timeframe).

In the case of trunk sewerage infrastructure, a total of nine (9) items have been identified for which a terminal value has been applied.

4.6 Parks and Land for Community Purposes

4.6.1 Planned Infrastructure Demand

The key source of information regarding the scope, cost and timing of parks and land for community infrastructure is the recently completed Infrastructure Strategic Planning report. (2016). This document builds on earlier work undertake by Council in 2002 and reflects relevant State guidance as contained in the DILGP Consultation report on Multiple Use Open Space (2015)

Demand generation for parks has been linked to population growth across the region.

4.6.2 Desired Standard of Service

The Desired Standards of Service contained within the Local Government Infrastructure Plan (LGIP) includes a combination of qualitative (outcome based) and quantitative (technical) requirements.

The primary performance criteria relevant in the provision of park and land for community services are outlined in the following LGIP tables:

- Table 4.1.4 – Rate of land provision
- Table 4.15 – Accessibility Standard;
- Table 4.16 – Public Park and Land for Community Facilities – Characteristics; and
- Table 4.17 and 4.18 – Indicative Embellishments

Its relevant to note that the service standards prescribed for parks includes both “trunk “and “non-trunk” items. This has been done to preserve consistency in the standards across different documents (specifically the LGIP and associated technical standards). This approach ensures there is no discrepancy in communicating the Councils ultimate service standards for these asserts.

Those items that are contained in the Councils technical specification but which are NOT trunk infrastructure have been excluded from the LGIP Schedule of Works tables. This includes items such as:

- Provision of Courts/fields;
- Goal Posts/Line marking
- Spectator Seating;
- Sports clubhouse;
- Feature paving/concrete stencilling; and
- Public Artwork

These items are not included in the definition of trunk park and land for community infrastructure as prescribed in the Ministers Guidelines and Rules (MGR). Such non-trunk items are not included in the Schedule of Works tables. While the desired standards of service illustrate Council intention for these assets, Council will fund the cost of the non-trunk elements through other mechanisms (i.e. not infrastructure charges)

4.6.3 Schedule of Works

Scope: (what's required to meet future demand)

Councils assessment of the provision (and need) for public parkland has identified potential deficiencies in key catchments (specifically Yeppoon, Barmaryee, Cooee Bay and Emu Park). The Schedule of Works identifies the need for assets to address this shortfall over time

The overall network upgrade strategy prescribed in the Schedule of Works is intended to support growth and improve liveability in the region. Those projects that have been identified as being necessary over the next 10-15 years have been incorporated into Councils Long Term Financial Forecasts (LTFF).

The scope and scale of existing trunk infrastructure assets contained within the Schedule of Works model have been drawn from Councils GIS and the associated fixed asset register. In the case where parkland is owned by the crown, the land has been allocated no value.

Costing and Timing; (what It costs and when it will be delivered)

The establishment cost for trunk element of parks and land for community infrastructure has been determined using Councils internal valuation processes. This approach ensures that all projects are valued in a consistent manner. The unit rates applied in the valuation are representative of current costs used by Council.

The timing of trunk aspect of parks and land for community infrastructure has been linked to development expectations in the areas immediately relevant to the improvements. However, given uncertainties arising from the likely timing of development and limited traffic data, the dates provided should be interpreted broadly (i.e. likely to fall in a 3-5-year window) rather than being an absolute date.

Allocation of Cost and Terminal Value

The Schedule of Works Model includes provision for the cost of each initiative to be allocated across thirty (30) cost catchment(s). Costs are generally allocated only to those catchments that receive a service benefit from the infrastructure. Allocation of costs in this way can assist Council in better understanding the cost structure of its infrastructure network and the scope of cost recovery relevant to individual development.

In the case of park assets that serve a broader function (metro and district), the cost of these items has been allocated broadly across the region. In the case of local/district assets, costs have been allocated more specifically to those catchments served by the trunk asset. This approach ensures there is a link (nexus) between the cost of providing trunk infrastructure and the demand for such service outcomes.

In the case where trunk infrastructure is provided late in the 15-year planning horizon and where such infrastructure may have a significant residual capacity, Council has applied a terminal value which recognises the extent to which the cost of the trunk infrastructure should be allocated to future users. This approach ensures that costs that relate to longer term demand

(i.e. growth outside the 15-year LGIP horizon) are not unfairly allocated to development in the medium term (i.e. the 15-year LGIP timeframe).

In the case of trunk parks infrastructure and land for community facilities, a total of six (6) district and regional items have been identified for which a terminal value has been applied

4.7 Stormwater

4.7.1 Planned Infrastructure Demand

As part of the development of the Infrastructure Strategic Planning report, Council has undertaken an internal review and assessment of the stormater needs across the region. This process has included identification of the impervious area (current and projected) for each of the key growth centres.

4.7.2 Desired Standard of Service

The Desired Standards of Service contained within the Local Government Infrastructure Plan (LGIP) includes a combination of qualitative (outcome based) and quantitative (technical) requirements. The performance criteria relevant in the provision of stormwater infrastructure has been established with reference to contemporary benchmarking including the Queensland Urban Drainage Manual (QUDM)

The service standards set for stormwater are intended to convey flows for both major and minor flood events in a manner that protects life, limits nuisance an inundation of habitable areas and facilitates appropriate flood immunity for the regions critical infrastructure.

4.7.3 Schedule of Works

Scope: (what's required to meet future demand)

The scope of trunk stormwater infrastructure has been developed by Council progressively with the objective of providing an adequate service to meet the growing needs of the region. The scope and scale of existing assets contained within the Schedule of Works is based on information contained within Councils GIS and the associated Fixed Asset Register. In the case where stormwater assets are located on land which is owned by the crown, the land has been allocated no value

Costing and Timing; (what It costs and when it will be delivered)

The assessment of the establishment cost for proposed trunk stormwater assets has been determined using Councils internal assessment processes. The unit rates applied in the valuation are representative of market costs for the provision of stormwater. As capital projects progress to the design phase, a more detailed estimate of cost is undertaken and the capital program updated accordingly.

The timing of trunk aspect of trunk stormwater infrastructure has been linked to development expectations in the areas immediately relevant to the improvements. However, given uncertainties arising from the likely timing of development and limited traffic data, the dates provided should be interpreted broadly (i.e. likely to fall in a 3-5-year window) rather than being an absolute date.

Allocation of Cost and Terminal Value

The Schedule of Works Model includes provision for the cost of each initiative to be allocated across thirty (30) cost catchment(s). Costs are generally allocated only to those catchments that

receive a service benefit from the infrastructure. Allocation of costs in this way can assist Council in better understanding the cost structure of its infrastructure network and the scope of cost recovery relevant to individual development.

In the case where trunk infrastructure is provided late in the 15-year planning horizon and where such infrastructure may have a significant residual capacity, Council has applied a terminal value which recognises the extent to which the cost of the trunk infrastructure should be allocated to future users. This approach ensures that costs that relate to longer term demand (i.e. growth outside the 15-year LGIP horizon) are not unfairly allocated to development in the medium term (i.e. the 15-year LGIP timeframe).

In the case of trunk stormwater infrastructure, a total of twenty one (21) items have been identified for which a terminal value has been applied

4.8 Schedule of Works (SOW) General Assumptions

4.8.1 Financial Assumptions

The general financial assumptions relevant to the calculations undertaken in the Schedule of Works (SOW) modelling are underpinned by the following assumptions:

- **Weighted Average Cost of Capital** has been estimated at 6.1% per annum (which reflects the baseline margin of 3.5% on the ten (10) year bond rate of 2.6% as broadly outlined in **Local Government Bulletin 06/01** as referenced in the States Guideline 3/14 appendix C);
- **Escalation of Infrastructure** was assumed at 2.0% which is broadly consistent with the ten (10) year average **Roads and Bridges Index (ABS 6427, Table 15, Index 3101)** as at 2016;
- **Escalation of land** has been taken as 2% in line with local long run averages; and
- The Infrastructure **Charges inflator** has also been stated at 2% to align with PPI increases;
- The **term of the calculations** undertaken in the Schedule of Works is twenty-five (25) years

4.8.2 Revenue projections:

Revenue projections have been calculated in the States Schedule of Works model assuming application of adopted charges as outlined in the Councils **Adopted Infrastructure Charges Resolution (Jan 2018)**. Councils adopted charge for Reconfiguring a Lot within the Priority Infrastructure ranges from $14,000 to $25,00 per lot.

The adopted charge for development uses within the Priority Infrastructure Area range from $10,000 (for a 1-bedroom multiple dwelling) to $ $25,000 per suite (with 3 or more bedrooms).

4.8.3 Alignment of SOW with LTFF

The current Schedule of Works (SOW) has been progressively developed to ensure that it aligns with the Councils Long Term Financial Forecasts. The initial Schedule of Works (SOW) has been checked against Council Long Term Financial Forecasts. Anomalies identified between the LGIP and LTFF are being reviewed and will be addressed. The new SOW will be aligned with the new financial years LTFF (1 July 2018) when the LGIP is implemented.