



Local Government Infrastructure Plan (LGIP)

Planning Assumptions Report

**December 2017
(Version A.1)**



Table of Contents

1. BACKGROUND.....	3
1.1 OVERVIEW	3
1.2 STRUCTURE OF THIS DOCUMENT	4
2. ESTABLISHMENT OF THE PRIORITY INFRASTRUCTURE AREA (PIA).....	4
2.1 THE PRIORITY INFRASTRUCTURE AREA	4
2.2 CONTEXT.....	5
2.3 PRIORITY INFRASTRUCTURE AREA (PIA) RATIONALE.....	6
3. POPULATION AND EMPLOYMENT PROJECTIONS.....	18
3.1 OVERVIEW:	18
3.2 POPULATION PROJECTIONS	18
4. TRUNK INFRASTRUCTURE	19
4.1 GENERAL.....	19
4.2 TRANSPORT INFRASTRUCTURE	20
4.2.1 <i>Planned Infrastructure Demand</i>	20
4.2.2 <i>Desired Standard of Service</i>	20
4.2.3 <i>Schedule of Works</i>	21
4.3 TRUNK WATER SUPPLY	22
4.3.1 <i>Planned Infrastructure Demand</i>	22
4.3.2 <i>Desired Standard of Service</i>	22
4.3.3 <i>Schedule of Works</i>	23
4.4 TRUNK SEWERAGE NETWORK	23
4.4.1 <i>Planned Infrastructure Demand</i>	23
4.4.2 <i>Desired Standard of Service</i>	23
4.4.3 <i>Schedule of Works</i>	24
4.5 PARKS AND LAND FOR COMMUNITY PURPOSES.....	24
4.5.1 <i>Planned Infrastructure Demand</i>	24
4.5.2 <i>Desired Standard of Service</i>	24
4.5.3 <i>Schedule of Works</i>	25
4.6 STORMWATER.....	25
4.6.1 <i>Planned Infrastructure Demand</i>	25
4.6.2 <i>Desired Standard of Service</i>	25
4.6.3 <i>Schedule of Works</i>	26
4.7 SCHEDULE OF WORKS (SOW) GENERAL ASSUMPTIONS	26
4.7.1 <i>Financial Assumptions</i>	26
4.7.2 <i>Revenue projections:</i>	26
4.7.3 <i>Alignment of SOW with LTFF</i>	27
4.7.4 <i>Alignment of SOW with Asset management plans</i>	27
ATTACHMENT A – DEVELOPABLE AREA MAPPING	29



1. Background

1.1 Overview

Mackay Regional Council resolved to commence the **Local Government Infrastructure Plan** (LGIP) in April 2017. As the preparation of the LGIP formally commenced under the *Sustainable Planning Act 2009* (SPA), prior to the commencement of the *Planning Act 2016* (PA), the LGIP has been prepared in accordance with the requirements of the SPA and the relevant instruments in force at that time. The requirements of the PA and its relevant instruments have also been considered.

In accordance with the SPA, the purpose of the LGIP is summarised as follows:

- 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 Guidelines¹ requires Council to provide a transparent explanation of these assumptions and the inter-relationships between each element of the LGIP.

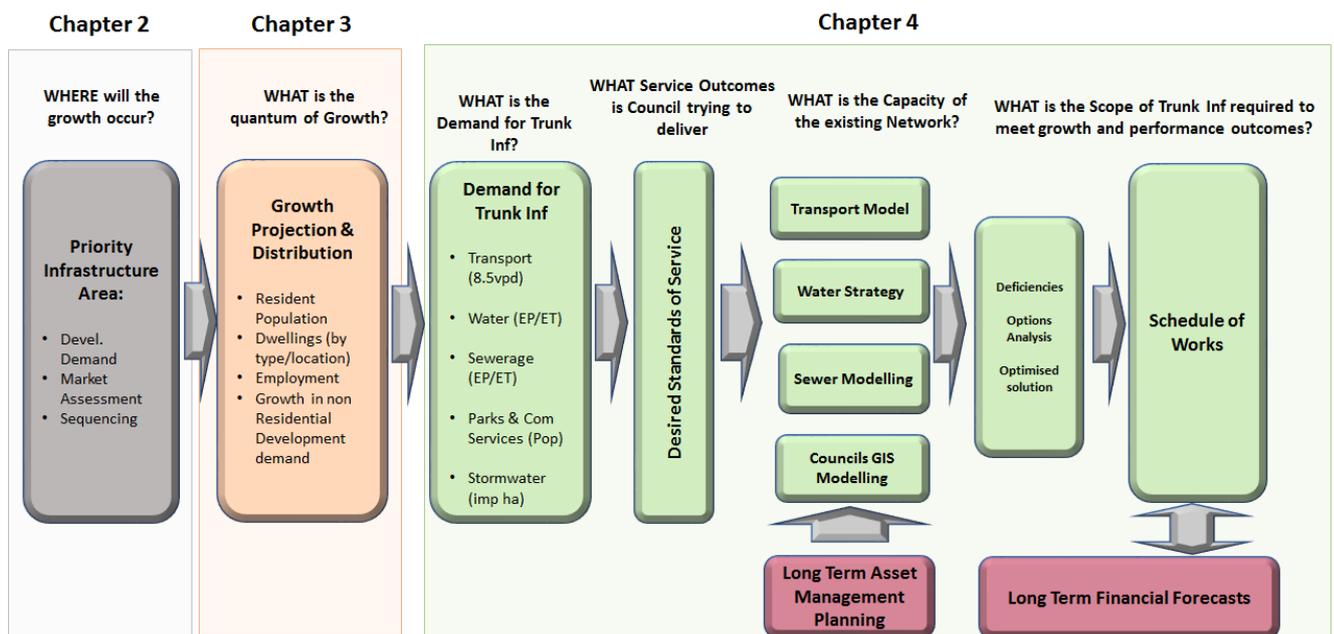
The purpose of this brief report is to provide a succinct overview of the key planning assumptions that underpin the development of Mackay Regional Councils LGIP

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



Figure 1 – Process Overview



1.2 Structure of this document

This document has been developed to succinctly outline the processes that have been applied in the development of Mackay Regional Councils Local Government Infrastructure Plan (LGIP). This includes the following

- Chapter 2 provides a summary of the process followed in establishing the **Priority Infrastructure Area (PIA)**;
- Chapter 3 outlines the process for development of population, dwelling, employment and Non-residential **growth projections**; and Chapter 4 provides a detailed summary of the planning for trunk infrastructure necessary to serve the projected growth. This includes an overview of the Schedule of Works (SOW) that accompany the LGIP.

2. Establishment of the Priority Infrastructure Area (PIA)

2.1 The Priority Infrastructure Area

The **Priority Infrastructure Area (PIA)** is that part of the **Planning Scheme** which identifies the areas within the region that the Council will support for 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 program on supporting a development pattern which is efficient and represents least cost to the community.

The PIA does not prevent development from occurring outside of the PIA but those proposals which are outside of the PIA (i.e. “out of sequence”) may be subject to additional conditioning provisions of the Act for additional/extra costs.

The proposed **Priority Infrastructure Area** for Mackay Regional Council is illustrated on Figures 2.1- 2.10.



2.2 Context

The State context:

Until the proposed LGIP is adopted as part of the MRPS, the existing PIA for MRC is identified in the *State Regulatory Provision (adopted charges)* maps, available at <http://dilgp.qld.gov.au/resources/map/pia/sprp/mackay-regional-council-pia.pdf>.

With respect to the proposed PIA, SPA defines the framework within which Councils undertake their planning. As part of development of the **Mackay Region Planning Scheme 2017 (MRPS)**, patterns of growth at a strategic level are decided through consensus between the State and local government as well as through consultation with non-government stakeholders at the regional level.

The ultimate objective of this framework is to ensure sustainable development of regional areas. Under the current infrastructure framework, Councils are limited to recovering a capped charge under an infrastructure charges resolution. As such, Council decisions in identifying a priority infrastructure area needs to consider a pathway that facilitates development in a manner that is affordable and represents the least cost to the community.

The Regional Context:

The **Mackay, Isaac and Whitsunday Regional Plan (2012)** documented the consensus reached in determining a pattern of preferred land use for the region as well as a number of development areas adjacent to the Mackay Urban Area which could accommodate long term growth objectives. These included Ooralea, Richmond and Paget. The future development potential of these areas is reflected in the MRPS, where appropriate, as either investigation areas or zoned as emerging community zone.

The Local Context:

The MRPS gives effect to the strategic direction of development in the local government area. In doing so it prescribes a vision for the region that incorporates the Council's Corporate Plan. The existing MRPS includes a Priority Infrastructure Plan (PIP) that has no statutory effect in accordance with the transitional provisions of SPA and now PA. As part of the published PIP, there is also a PIA identified that also has no statutory effect (as the statutory PIA is identified in the State Regulatory Provision (adopted charges) maps).

Key principles

The policy direction for the MRPS is outlined in its Strategic Framework and can be summarised as follows:

- A settlement pattern which focuses on **urban consolidation** and supports regional growth towards a population of 180,000 by focusing growth in the key urban areas of Mackay, Walkerston, Sarina, Marian, and Mirani, whilst enabling continuation of a rural lifestyle within the rural landscape in designated nodes.
- The settlement pattern supports growth that aligns with existing and planned **economically efficient infrastructure**, creates an integrated and compact urban form that provides accessible and walkable communities, facilitates active modes of transport, advances the primacy of productive agricultural land and areas of environmental significance and reduces urban sprawl through infill development within the key urban areas.



- Maintaining the **natural environment** through maintaining core habitat areas, riparian corridors and best practice catchment management practices;
- **Strengthening communities** through maintaining the distinctive qualities of the region, encouraging housing diversity and affordability and providing options for physical activity, recreation and community connection;
- **Managing natural resources** and agricultural production to meet current and future needs. Applying best practice catchment management principles and total water cycle management across the region to protect water resources, ensure sustainable water use and water quality.
- Development of improved **access and mobility** in the Region through an integrated, efficient and safe transport system with a range of transport modes to meet the mobility needs of residents and the economy; and
- Providing **infrastructure and services** in an economically sustainable manner which supports orderly growth and development

The MRPS envisages that the Mackay urban area, as defined by the PIA, will continue to accommodate the majority of the region's population (through a mix of identified greenfield areas, particularly in the Northern Beaches, and infill development), employment and business activity, supported by areas of Sarina, Walkerton, Marian and Mirani within the PIA. The concept of urban consolidation is supported by the development of Local Area Plans that apply to Marian and the City Centre.

The MRPS also recognises that industrial areas serve different purposes in the Mackay region – high impact industry supporting the resources and energy sector in the Bowen, Central Galilee and Upper Surat Basins, and low-medium impact industry that supports the region's local needs. The MRPS provides for Paget as the key location for high impact industry and associated industrial uses. It also incorporates a number of industry investigation areas, intended to protect potential future industrial sites which are of strategic importance to the region's economic development, but the development of these are subject to feasible and holistic infrastructure provision based on full cost recovery of trunk infrastructure. These investigation areas are not yet required, and require further investigation especially with regard to infrastructure, and therefore are identified as Investigation areas only.

2.3 Priority Infrastructure Area (PIA) rationale

The proposed PIA seeks to consolidate urban expansion through:

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

Development of the LGIP included a staged series of steps that led to the creation of the proposed PIA. These steps could be summarised as follows:



- An initial version of the PIA was developed as part of the proposed MRPS version 0.8. This version reflected the statutory PIA as identified in the State Regulatory Provision (adopted charges) maps.
- Changes were made to the PIA as part of the proposed MRPS version 0.9.
- The proposed MRPS version 0.10 included the same PIA as version 0.9, however the following note was included:

Until the Local Government Infrastructure Plan is adopted as part of an amendment to the Mackay Region Planning Scheme – please refer to Council’s Adopted Infrastructure Charges Resolution maps available on the MRC website

- The final MRPS (version 1.0) adopted by Council and now amended to version 1.1 retains the PIP, its PIA and the note as discussed above.
- Through the development of the LGIP, the Council has refined the proposed PIA by reviewing those areas which met the following criteria:
 - Areas which are currently available for urban development, not including rural or rural-residential zoned land, except for instances where there are existing zoning errors that will be corrected as part of future amendments to the MRPS;
 - Areas serviced or planned to be serviced by all (or most) of the five (5) key trunk infrastructure types; and
 - Areas that are currently known to be likely development sites.

The proposed PIA has also been developed based on consideration of the following:

- Research undertaken by the Queensland Government Statistician’s Office (QGSO) including the current and projected population for the region;
- Utilisation and refinement of the QGSO population projections as modelled as part of Mackay’s Growth Allocation Model (MGAM) and reported in the PIE Solutions Planning Assumption Report of May 2017 and subsequent revision in September 2017; and
- The Mackay Regional Council Residential Land Development Activity Profiles.

The proposed PIA identifies those areas where Council will invest its limited capital to support development. **A copy of the proposed PIA is provided in Figures 2.1 to 2.10.**

The proposed PIA will be subject to independent review (as part of the LGIP assessment process) to ensure that the area contained within the PIA has the capacity to accommodate the expected urban growth over the next ten (10) to fifteen (15) years.

Council officers have also developed Developable Area Maps (refer attachment A) as part of the LGIP preparation process. The developable area maps identify land that is suitable for development which consider the zoning and the development constraints. These maps relate to **Table SC 3.1.3 – Planned density and demand generation rate for a trunk infrastructure network** in the LGIP.



Figure 2.1 – Priority Infrastructure Area – Master

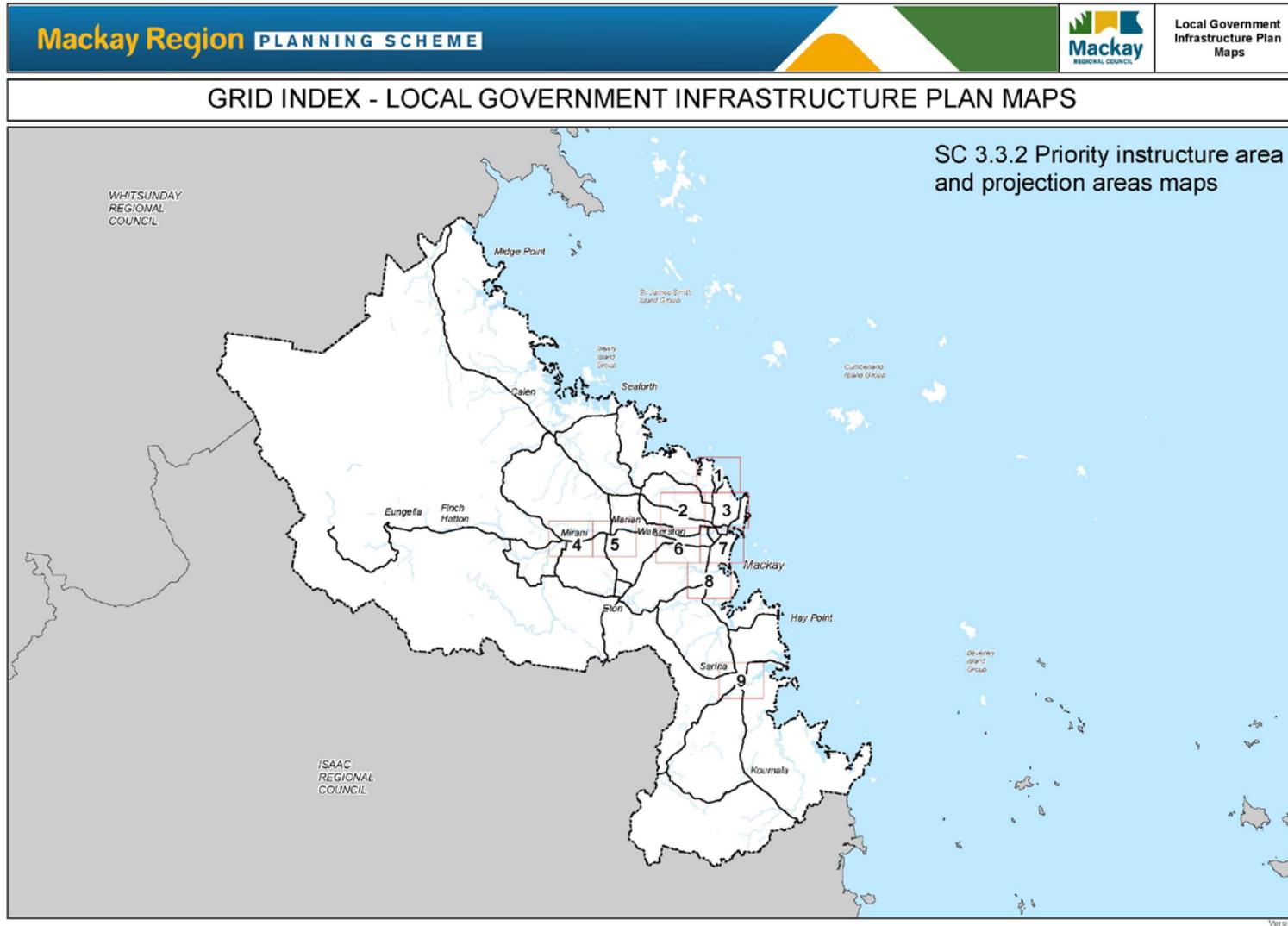




Figure 2.2 – Priority Infrastructure Area – Map 1 of 9

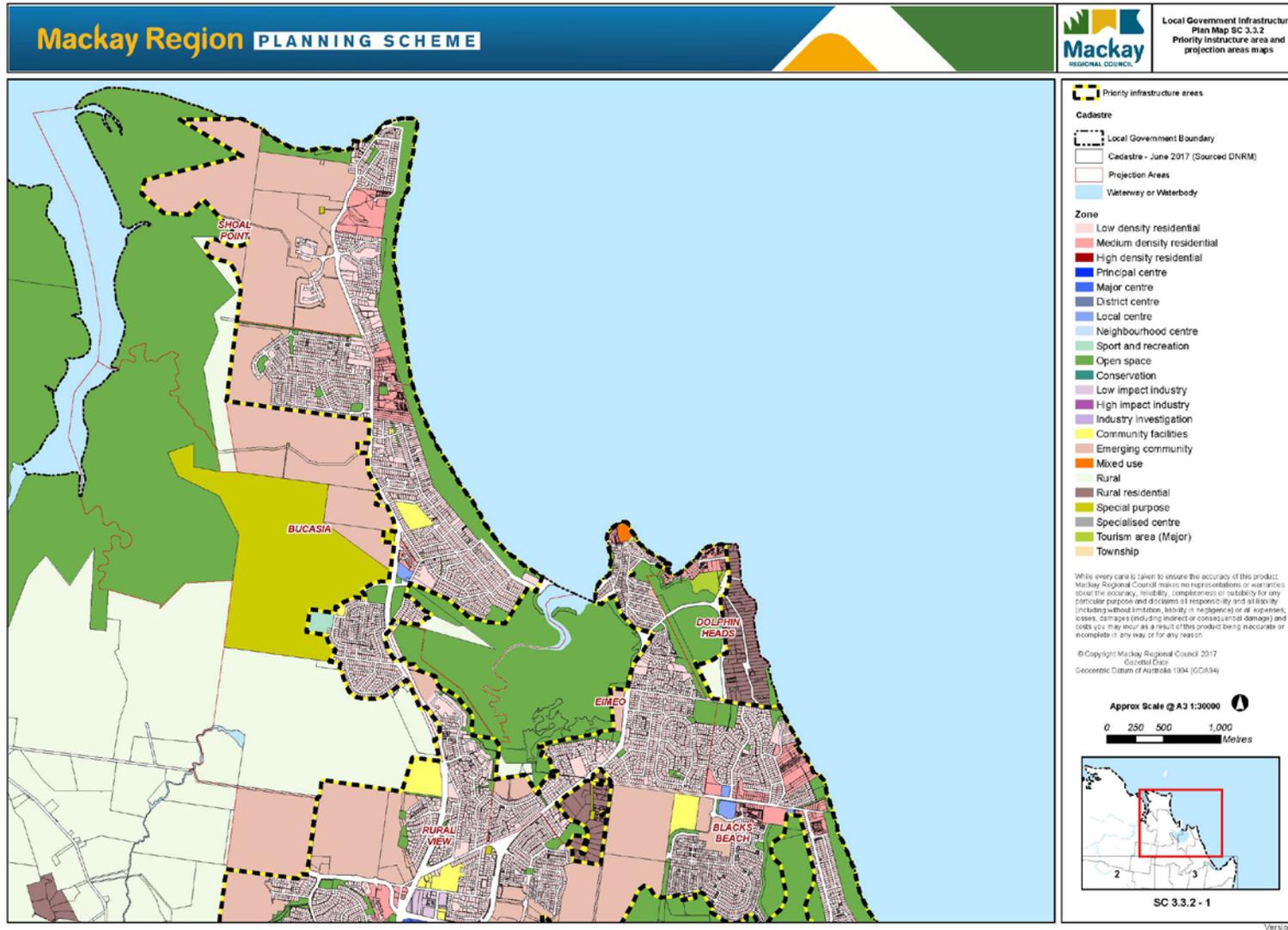




Figure 2.3 – Priority Infrastructure Area – Map 2 of 9

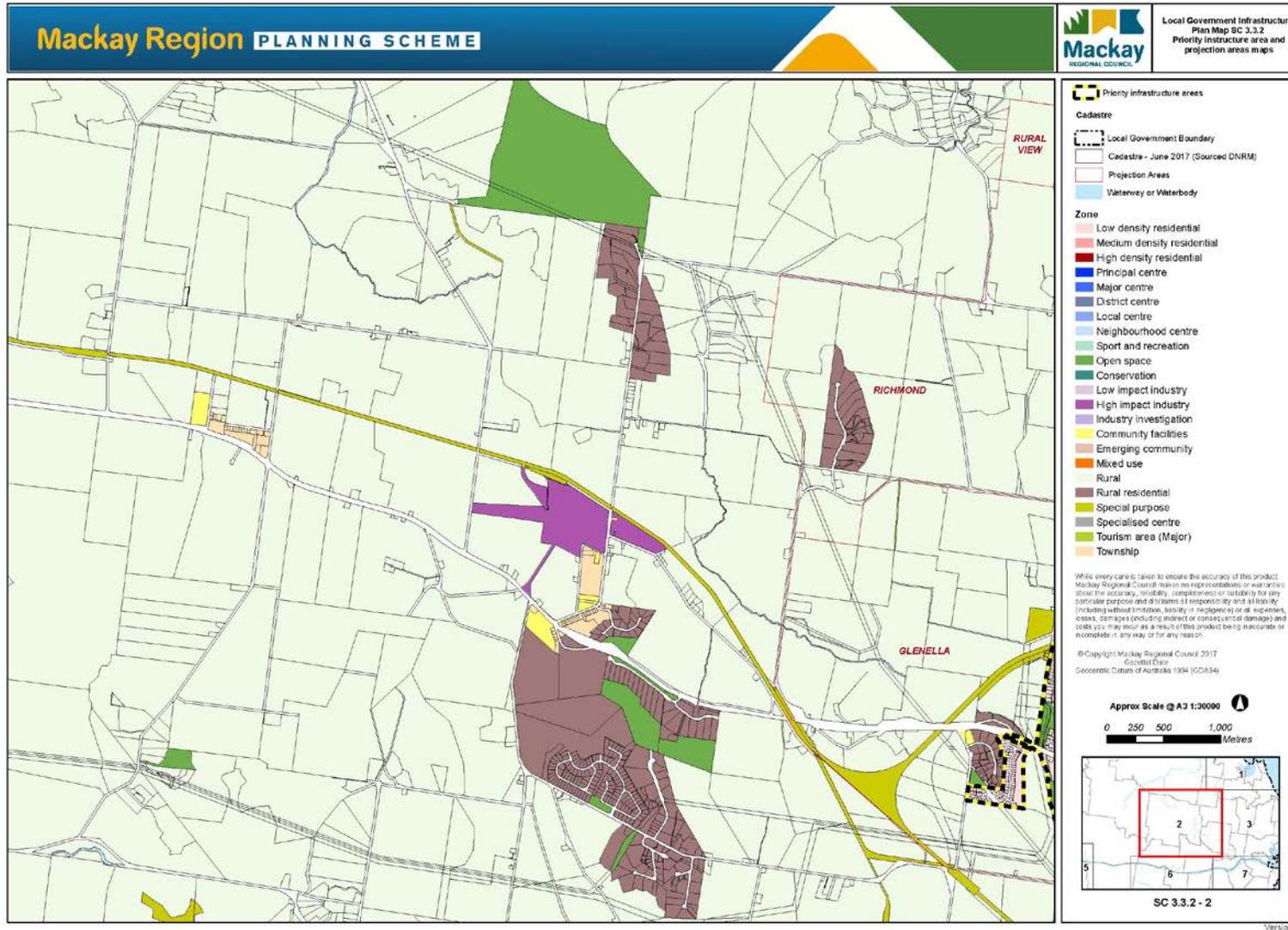




Figure 2.4 – Priority Infrastructure Area – Map 3 of 9

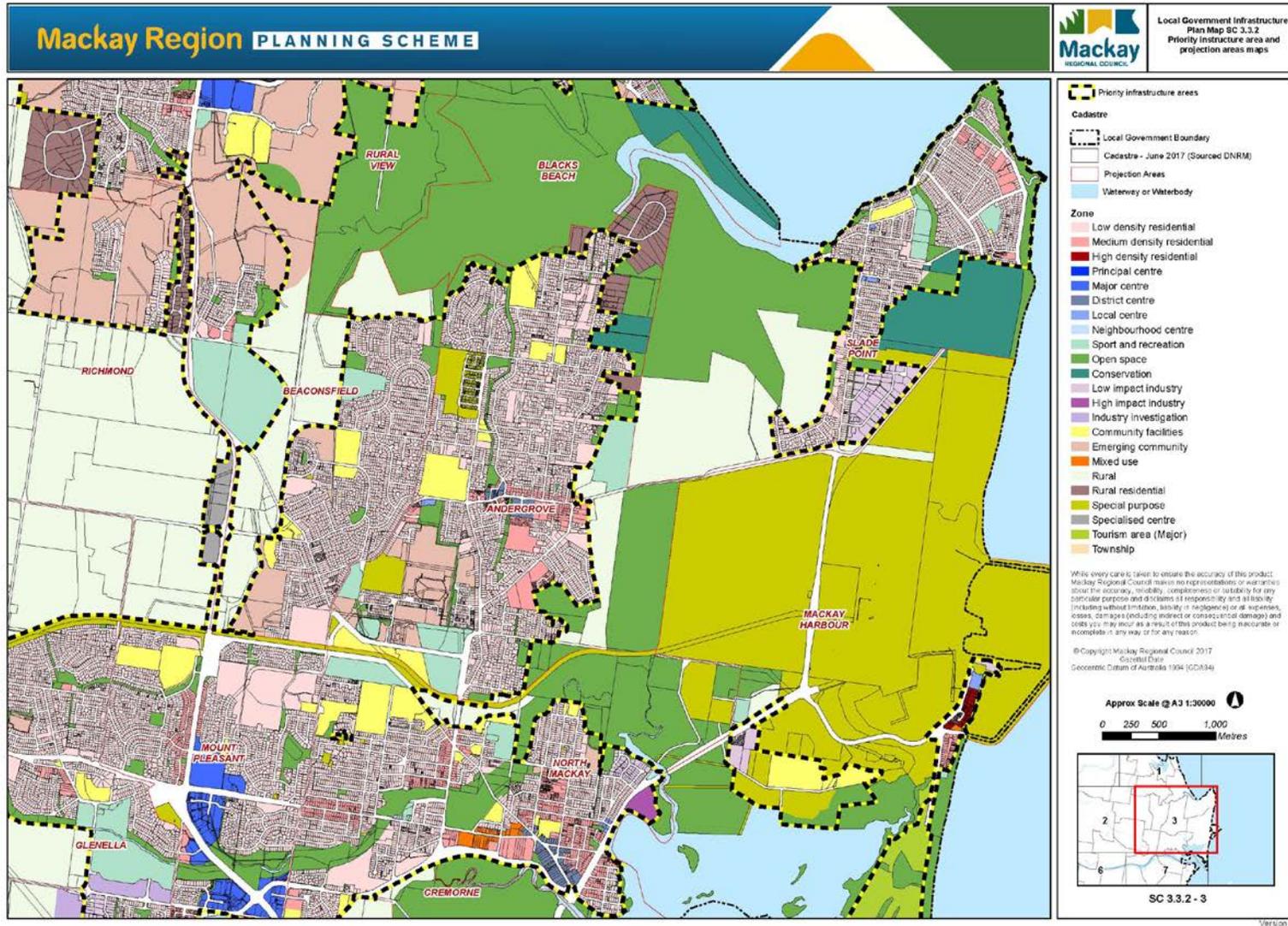




Figure 2.5 – Priority Infrastructure Area – Map 4 of 9

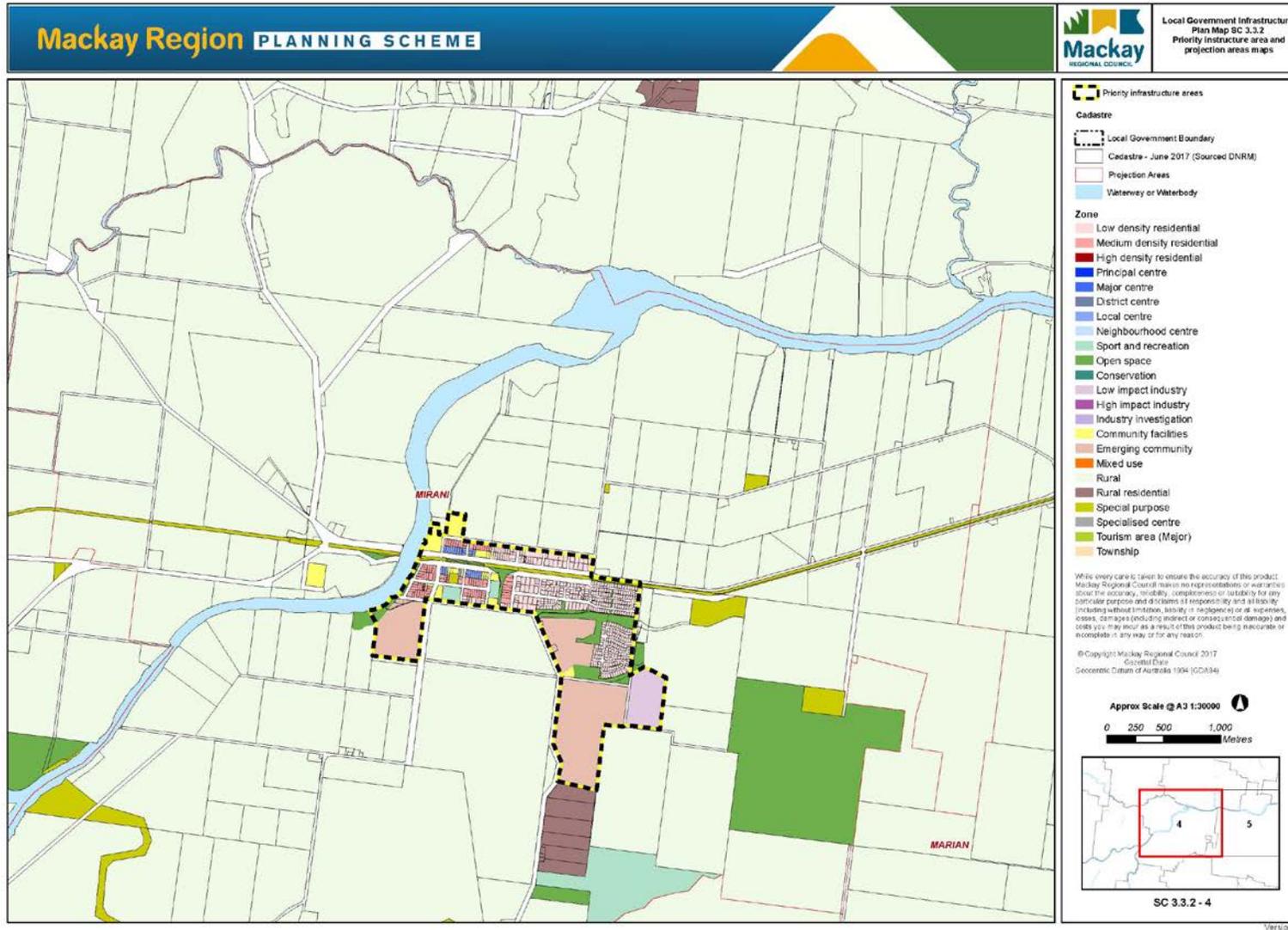




Figure 2.6 – Priority Infrastructure Area – Map 5 of 9

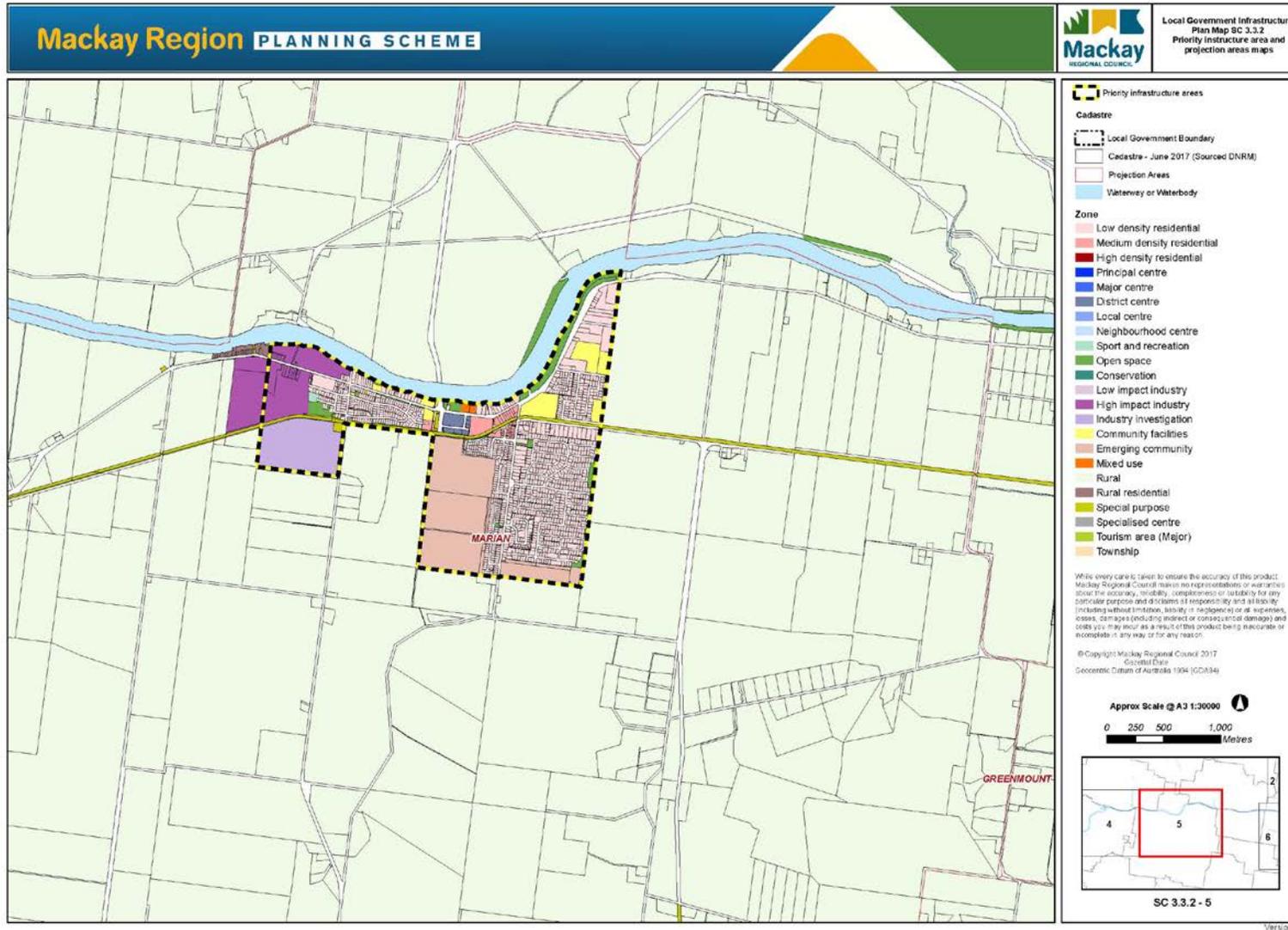




Figure 2.7 – Priority Infrastructure Area – Map 6 of 9

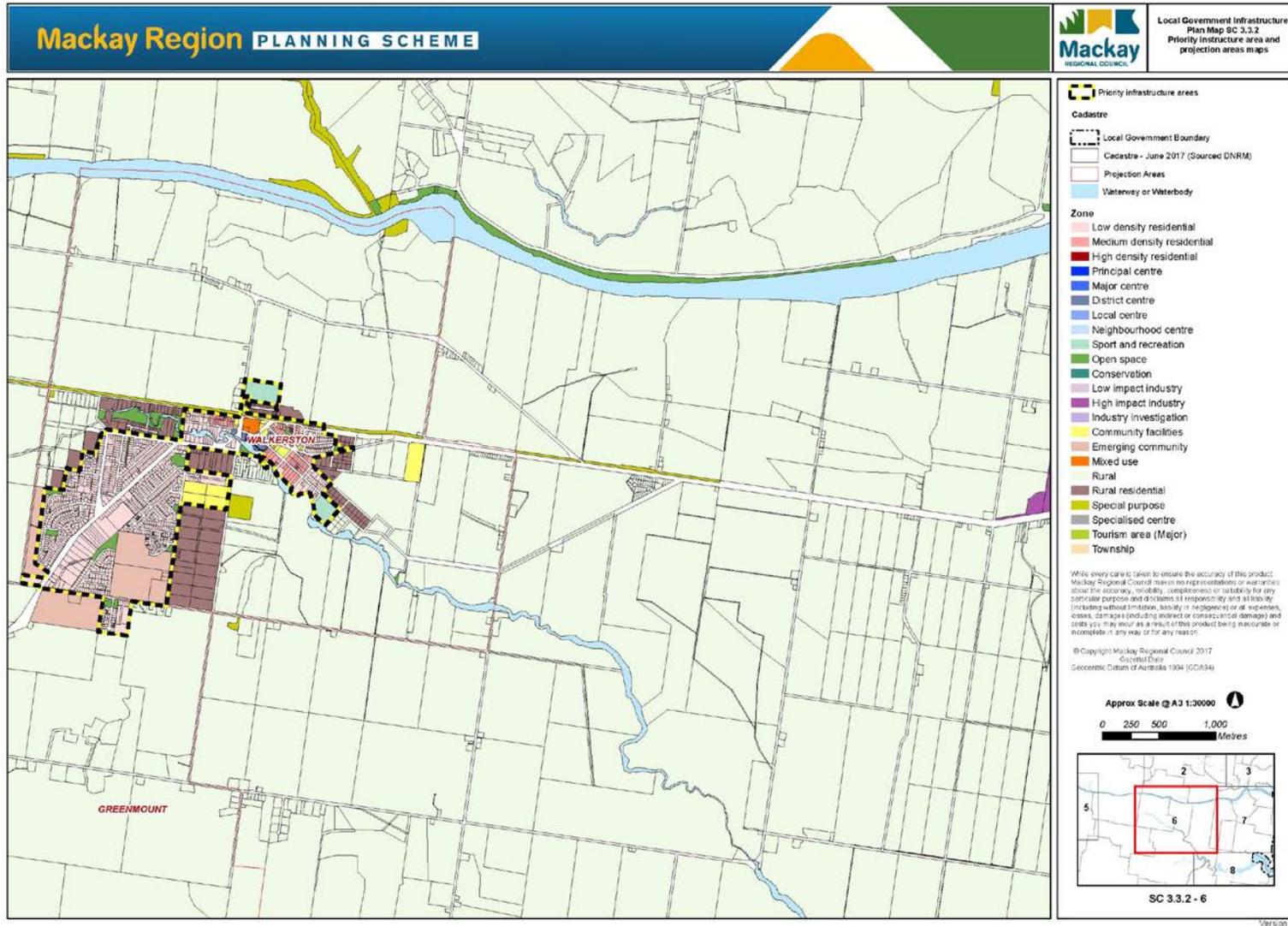




Figure 2.8 – Priority Infrastructure Area – Map 7 of 9

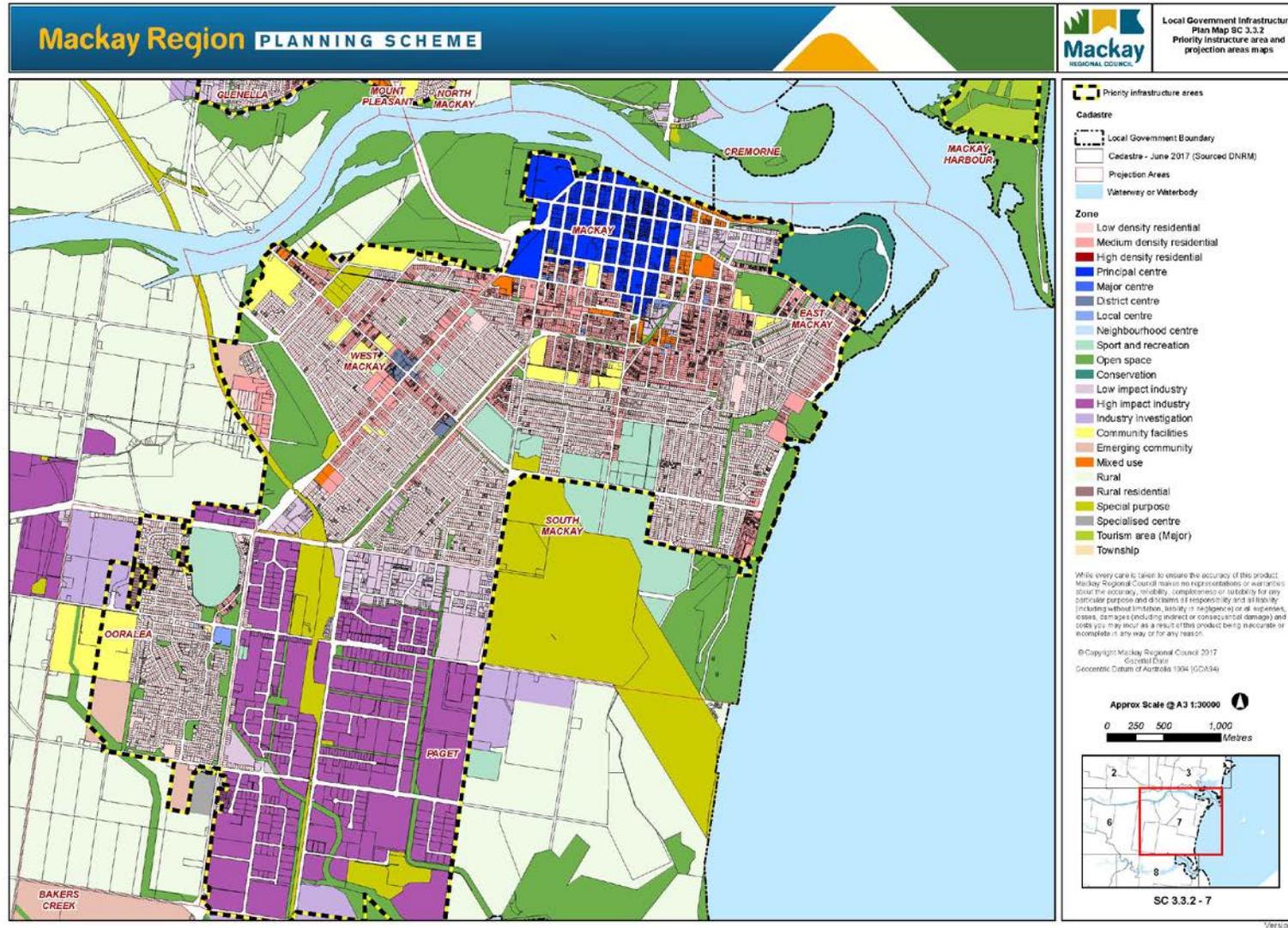




Figure 2.9 – Priority Infrastructure Area – Map 8 of 9

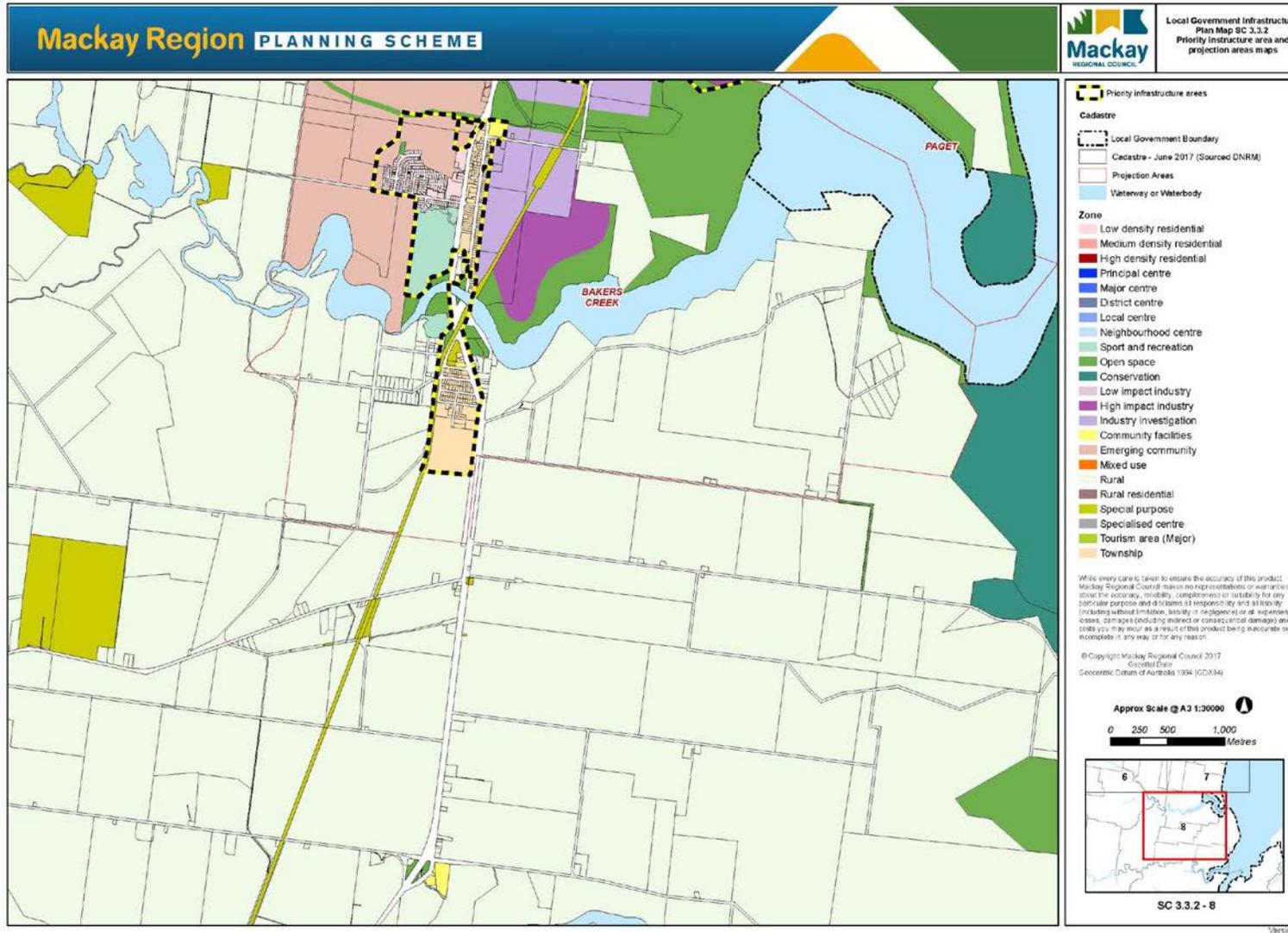
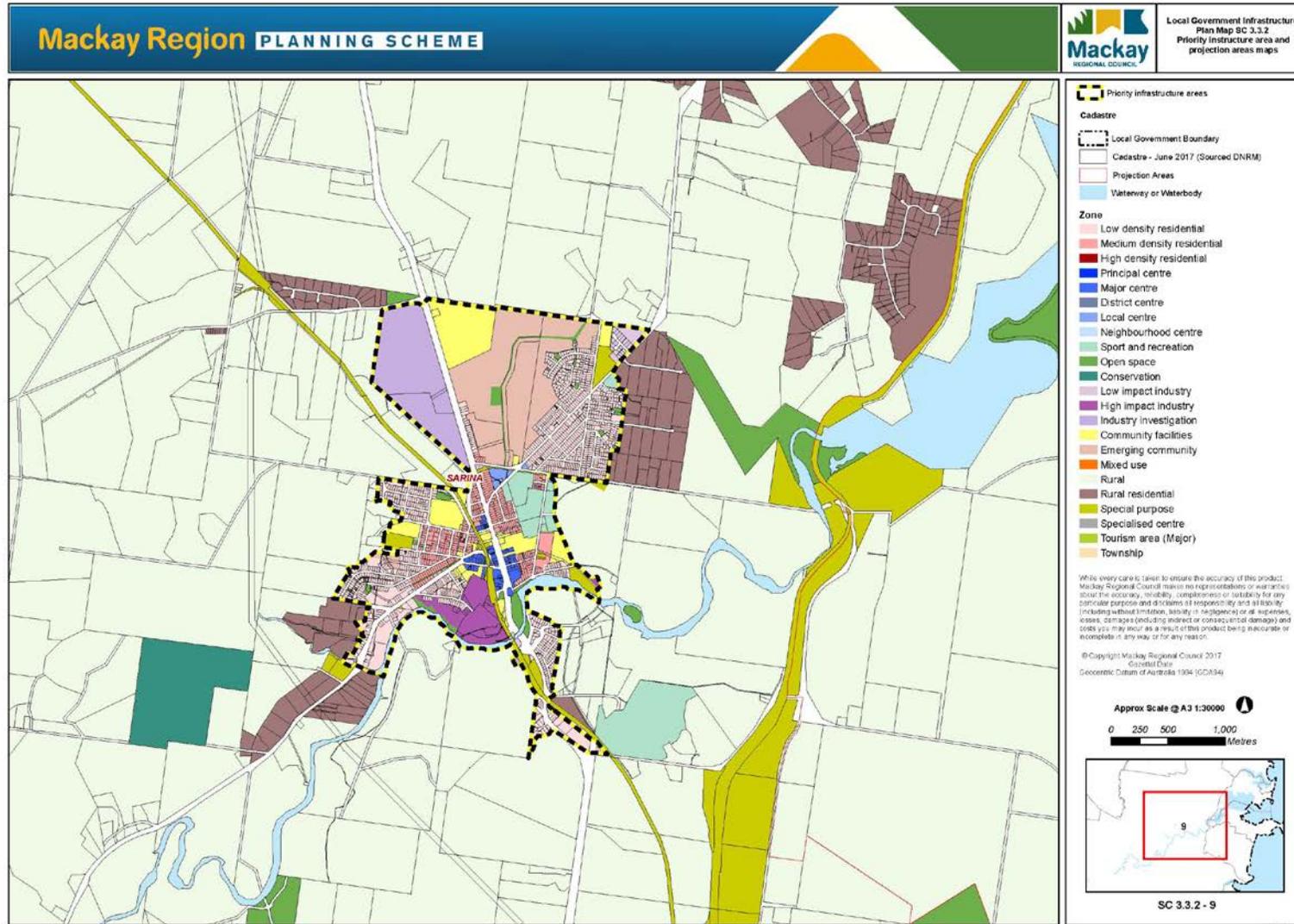




Figure 2.10 – Priority Infrastructure Area – Map 9 of 9





Mackay Regional Council Planning Assumptions Report

3. Population and Employment Projections

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 LGIP. As outlined schematically in Figure 1, development of the growth projections (and their allocation across the region) is a key input into the infrastructure planning and subsequent development of a schedule of trunk infrastructure works (which are developed in further detail in Chapter 4).

3.2 Population projections

In 2014, Mackay Regional Council engaged PIE Solutions to develop the MGAM. The MGAM was an in-house growth model that allocates residential dwellings and non-residential gross floor area (GFA) growth at the lot level to accommodate future population and employment growth for the region. Since its development, the MGAM has been used to model and compare the impacts of different growth scenarios on future development patterns for the Mackay Region.

Following the QGSO release of updated 2015 edition population projections in 2016, Council re-engaged PIE Solutions to model the output projections for a medium growth scenario from a new base date of 2016 up to a planning horizon of 2036 to assist in the preparation of the LGIP.

The outcomes from the MGAM 2016 modelling exercise have been used as the basis of the Draft LGIP. This includes:

- The PIA as amended through the development of the proposed LGIP;
- Finalising (residential and non-residential) growth projections and allocation of growth for use in the LGIP; and
- Informing the projections of infrastructure demand.

The process followed by PIE Solutions in undertaking this project is summarised in their Planning Assumption Report of May 2017 and then updated in September 2017. The September 2017 report reflects the refinements made to the PIA which is contained within the proposed LGIP

The PIE report (September 2017) provides a summary of the key model inputs and parameters, planning assumptions and a summary of the model run outputs under the development scenario that have been used in the development of the proposed LGIP. The model outputs have been used as the basis for input into the relevant components of the LGIP, including Tables 4.2 and 4.3 as reproduced below. Some minor modelling errors were corrected from the PIE report that dealt with growth allocation in the Ultimate projection period. More detailed projections are contained within Schedule 3 of the LGIP.

LGIP TABLE 4.2—POPULATION AND EMPLOYMENT ASSUMPTIONS SUMMARY

Column 1- Description	Column 2 Assumptions						
		Base date 2016	2021	2026	2031	2036	Ultimate
Population	No	122,807	132,635	143,345	155,723	167,891	199,660
	% change		8.0%	8.1%	8.6%	7.8%	
Employment	No	49,290	52,852	56,284	61,635	66,415	104,371
	% Change		7.2%	6.5%	9.5%	7.8%	



LGIP TABLE 4.3—RESIDENTIAL DWELLINGS AND NON-RESIDENTIAL FLOOR SPACE ASSUMPTIONS SUMMARY

Column 1- Description	Column 2 Assumptions						
		Base date 2016	2021	2026	2031	2036	Ultimate
Dwellings	No	50,281	54,458	59,005	65,005	71,321	86,575
	% change		8.3%	8.3%	10.2%	9.7%	
Non Res floor space (m ² GFA)	No	3,614,913	3,840,831	4,066,587	4,374,433	4,675,615	7,533,157
	% Change		6.2%	5.9%	7.6%	6.9%	

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 defined:

- How the projected growth manifests in terms of **demand for trunk infrastructure** based on the five (5) year cohorts of growth allocated from the MGAM. It should be noted that the infrastructure demand was informed by the initial version of the MGAM. The refinements made to the PIA and subsequent changes to planning assumptions were not considered to have any substantial impact to infrastructure demand. Population projections and infrastructure demand will be reviewed periodically over time based on updated QGSO population data and forecasts and Census data and where necessary amendments to the future LGIP will be made accordingly;
- 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 network** 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 Works** (SOW) 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. Projects on the SOW will be implemented as required by development conditions or by MRC subject to business case development as part of Council's Enterprise Project Management Framework and normal budget processes.



Mackay Regional Council Planning Assumptions Report

4.2 Transport Infrastructure

4.2.1 Planned Infrastructure Demand

The key source of information regarding the scope, cost and timing of trunk transportation infrastructure is summarised in the “**Mackay Area Transport Modelling - Supporting the proposed Local Government Infrastructure Plan**” report developed for Council by Arup in May 2017. This comprehensive report of the transport modelling undertaken using the Mackay Area Transport Model (MATM) provides the basis for much of the LGIP and Schedule of Works Transport elements.

The MATM is a four-step strategic transport model developed using Cube Voyager modelling software. The scope of growth/demand contained in Arup’s assessment (Table 4-1) reflects the MGAM, which is based on the QGSO 2015 medium growth projects scenario for the demographic and land use inputs.

Due to the way in which the MGAM estimates transport demand, it is not practical to use the MATM to derive transport demand generation rates for the area classifications and development types identified in Table SC3.1.3. The transport demand rates identified in Table SC3.1.3 is based on generally accepted traffic generation rates for residential and non-residential uses.

In relation to Table SC3.1.8 and the projected demand, it should be noted that the projected demand between 2011 and 2036 is derived from the MATM, however the ultimate demand has been calculated based on an average of 6.5 trips per residential dwelling for the ultimate dwellings.

Although daily volumes (i.e. vehicles per day) are used to report existing and projected demand, the peak period demand is used as the main determinant for road network capacity. The modelling identifies those road segments that would operate above the target level of service in peak periods, and then tests a potential improvement program to determine its effect in the network.

The outcomes of the Arup modelling have been provided to TMR and are consistent with the State’s transport modelling undertaken for the Mackay area to date.

4.2.2 Desired Standard of Service

Total demand is only part of the equation relevant to the determination of scope of trunk infrastructure. 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.

The desired standard of service provided in Councils LGIP provides a basic series of requirements and reflects commonly used design parameters. The main parameters relevant to determining the efficiency of the local transport network (both now and into the future) is the degree of saturation as a key indicator of service outcomes. The Councils preferred outcome in terms of Levels of Service and degree of saturation is as follows:



Mackay Regional Council Planning Assumptions Report

Table 4.1 – Level of Service and Degree of Saturation

Desired standard of service (Maximum)		Urban	Rural
		Level of Service D	Level of Service C
Road link Degree of Saturation	Arterial	0.85	0.75
	Sub-arterial	0.85	NA
	Sub-Arterial Main Street	0.85	NA
	Traffic Distributor	0.8	0.75
	Controlled Distributor	0.8	NA
Intersection Degree of Saturation	Priority controlled	0.8	0.8
	Signalized	0.9	Generally, not accepted
	Roundabout	0.85	0.85

Arup's assessment of the network link and intersection capacities produced a series of performance parameters that are consistent with these measures.

4.2.3 Schedule of Works

Scope:

The analysis undertaken by Arup has identified transport planning initiatives that needed to be considered in the development of the regional network to ensure that traffic flows remain efficient and effective across the region.

The scope of transport initiatives proposed by Council to accommodate growth has been summarised in the Schedule of Works. These projects have been included in the Councils Long Term Financial Forecast (LTFF).

The scope and scale of **existing trunk infrastructure** assets contained within the Schedule of Works model have been drawn from earlier work (2011) in which the trunk assets were identified by GIS and translated into a charges model. The scope of existing trunk transportation assets contained in this list was subject to review prior to finalisation of the SOW.

Costing and Timing:

The assessment of the establishment cost for proposed trunk transport assets has been determined using Councils internal estimation 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.

The Schedule of Works Model includes provision for the cost of each initiative to be allocated across those catchment(s) that benefit from the infrastructure. This approach can assist Council in better understanding the cost structure of its infrastructure network and the scope of cost recovery relevant to individual development.

The timing of works was broadly linked to network performance triggers based on the peak hour network assessment undertaken by Arup. However, given uncertainties arising from the likely timing of development, potential heavy vehicle uses and limited traffic data means that the dates provided in the SOW model should be interpreted broadly (i.e. likely to fall in a 3-5-year window) rather than being an absolute date.



4.3 Trunk Water Supply

4.3.1 Planned Infrastructure Demand

Following the review and update of Councils Water Strategy for the Mackay urban area (as supplied by the Nebo Road Water Treatment Plant (WTP), Council engaged Montgomery Watson Harza (MWH) to assist to develop a robust, sustainable capital investment program for the Mackay urban area (up to ultimate demand) from which the LTFF was updated. The resultant **Water Strategy**² provides a detailed summary of options for the provision of potable water services to meet the growing needs of the Mackay region.

The demand projections applied within the modelling broadly align with the population projections provided by the QGSO and are reflected in LGIP Table SC3.1.1.

The generic demand generation rates provided in **LGIP Table SC3.1.3** assume EP/dwelling densities of around 2.6 (detached dwelling) which is broadly consistent with the density assumptions reflected in population and dwelling estimates cited in section 3.

The revised water strategy has considered the supply of Sarina as a demand export from the Mackay urban area via the Sarina pipeline, but has not quantified the ultimate transfer infrastructure upgrades required to supply Sarina into the future. Any such upgrades are likely to be beyond the LGIP timeframes.

4.3.2 Desired Standard of Service

The key operational and demand assumptions used in the assessment of the water supply network are reflected in the desired standard of service contained within the draft CTM Code and are reproduced in Table 4.2 below

Table 4.2 – Water Strategy Standards of Service

Criteria	Adopted Water Strategy Standards of Service
Average Day Demand	280L/EP/d
Non-Revenue Water	Included above
Peaking Factors: MDMM/AD PD/AD PH/AD	1.5 2 4
Minimum Service Pressure	22m at the property boundary
Hazen Williams Pipe Friction factors	N =150mm; C = 100 >150-300mm; C=110

In addition to the demand assumptions, the strategy included a broad range of performance based standards relevant to water supply across the region as summarised in Table 4.3. These parameters are broadly consistent with other regional water supply businesses.

² MWH & MRC, “Mackay Water Strategy” (PPB-029), March 2016



Mackay Regional Council Planning Assumptions Report

Table 4.3 - Performance Based Water Supply Standards

Parameter	Guideline Standard
Network Performance	
Fire flow - Urban	15L/s for 2 hours for residential and 30L/s for 4 hours for commercial and industrial and achieving 12m at the hydrant
Water Pump Stations	
Servicing Ground Level Reservoirs	Supply of MDMM Demand over 20 hours
Direct Booster Pump Stations	Greater of Peak Hour OR Peak instantaneous flow + Fire flow capacity
Storage Reservoirs	
Reservoir Storage	3 x (PD-MDMM) for spare capacity assessment and persistence analysis for major trunk reservoirs
Network	
Pipeline Capacity Requirements	Transport: MDMM in 20 hours Reticulation Mains: Maintain pressure for Peak Hour and fire flow performance
Max allowable velocity	As a guideline, 2.5m/s for peak hour As a guideline, 4m/s for fire flow

4.3.3 Schedule of Works

Scope:

The analysis undertaken by MWH suggested a broad range of potential deficiencies (and associated upgrades) for the water network. The overall network strategies prescribed in the strategy are intended to resolve current and existing deficiencies and facilitate the anticipated growth within the region. The preferred options have been selected based on a comparison of the whole of life cost as well as a multicriteria analyses. The scope of works necessary to give effect to the proposed strategy was used as the basis of the Schedule of Works.

The scope and scale of existing assets contained within the Schedule of Works is based on a review of 2016 asset data from council's asset database and translated into the charges model.

Costing and Timing:

The costing of upgrades has been developed using current industry rates. These costs are considered to be design estimates with an allowance for contingency but no specific consideration of factors such as geological (soil type), technology or access issues.

4.4 Trunk Sewerage Network

4.4.1 Planned Infrastructure Demand

Modelling of the sewerage network has been undertaken on a progressive basis by Mackay Water. The current projection of demand reflects data from 2015. These figures broadly reconcile with current projections of growth.

4.4.2 Desired Standard of Service

The desired standards of service for the sewerage network is contained within the draft CTM Code with key design parameters including:

- Average Dry Weather Flow (ADWF) of 230 L/EP/day across the region;
- Peak wet weather flow of 5 x ADWF;



Mackay Regional Council Planning Assumptions Report

- Pump stations operating on a duty/assist arrangement with a single pump capacity of 3.5 x ADWF and dual pump capacity of 5 x ADWF;
- The design level of emergency storage within the network is 4hours at ADWF;
- New gravity sewers designed to transport full LGIP capacity with no surcharge or overflow. Flow into existing sewerage to not surcharge beyond 1m below surface level at PWWF; and
- Sewerage treatment/release complying with future EPA licences conditions for flow.

These assumptions are consistent with the State's Water Services Planning Guidelines and comparable with other regional water services providers.

Where failures of these standards are identified due to growth, upgrade and augmentations are proposed.

4.4.3 Schedule of Works

Scope:

The scope of trunk sewerage 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 of sewerage infrastructure is reflected in Councils LTFF for this trunk infrastructure network.

The scope and scale of existing assets contained within the Schedule of Works is based on a review of 2016 asset data from council's asset database and translated into a charges model.

Costing and Timing:

The process for determining the establishment cost of trunk sewerage transportation assets was the same as that applied to water supply and transportation assets. Unit Rates have been developed based on current contracted prices and are applied (together with a contingency allowance) in providing an initial estimate for capital projects. As capital projects progress to the design phase, a more detailed estimate of cost is undertaken and the capital program updated accordingly.

4.5 Parks and Land for Community Purposes

4.5.1 Planned Infrastructure Demand

The key source of information regarding the scope, cost and timing of parks infrastructure is the Draft Recreational Open Space Strategy, for the Mackay Region. This strategy provides the basis for much of the LGIP and Schedule of Works elements for parks infrastructure.

The demand for parks and community infrastructure is directly linked to projected population growth across the region.

4.5.2 Desired Standard of Service

The standards for recreational open space are intended to ensure provision of suitable land and appropriate diversity of recreational opportunities within recreational parks. The overall objective of the Draft Recreational Open Space Strategy is to ensure that a minimum of 75% of the resident population in the key urban areas of Mackay, Walkerston, Marian, Mirani and Sarina have access to a recreational park opportunity within a radius of 400m from residences. This means having access to a local, district or regional recreation park within 400 metres and



Mackay Regional Council Planning Assumptions Report

considers access to recreational park opportunities created through co-location with community facilities and sports parks.

4.5.3 Schedule of Works

Scope:

Council's assessment of the need for parks and community facilities had identified deficiencies in certain areas. In recent years, Council has taken a proactive approach to secure parkland and land for community facilities. Hence, the need for acquisition of land is limited. However, deficiencies still exist in terms of making existing parkland fit for purpose to satisfy minimum desired standards of service. Hence, parks have been retained in the LGIP in recognition of the fact that Council has invested community capital into the acquisition of these lands and, as such, they are an important element of the Council overall trunk infrastructure service provision,

The scope and scale of existing assets contained within the Schedule of Works is based on a review of 2016 asset data from council's asset database and translated into a charges model. The land value costs are based on a unit rate.

Costing and Timing:

The costs of **existing trunk infrastructure** works have been estimated using known values of land and embellishment. This cost of land does not include costs associated with design, planning and supervision of the development of the land in a manner that makes the land fit for purpose. In addition, no contingency has been applied in the estimation of cost. The full scope of open space works over the ten (10) year planning horizon is not currently fully reflected in Council's LTFF.

4.6 Stormwater

4.6.1 Planned Infrastructure Demand

Council has recently completed a detailed long-term management strategy for flood and stormwater management³. The objective of this strategy is providing a detailed framework for Councils ongoing management of stormwater across the region. This includes consideration of land use planning to ensure sustainable development, asset management activities to optimise networks in flood affected areas and supports Council's flood emergency efforts by creating and maintaining appropriate flood emergency decision support tools.

The projected demand has been measured in terms of impervious hectares for key growth centres of Mackay, Paget, Walkerston, Sarina and Marian/Mirani. Estimate of current and projected demand (imp ha) for each site has been based on earlier studies undertaken by Council in each catchment.

4.6.2 Desired Standard of Service

The desired standards of service have been established with reference to contemporary benchmarks including the Queensland Urban Drainage Manual as well as being influenced by detailed hydrologic modelling undertaken by Council over recent years. The service standards are intended to convey stormwater flows for both major and minor flood events in a manner that

³ AECOM, "Mackay Region Flood and Stormwater Management Strategy" November 2016



Mackay Regional Council Planning Assumptions Report

protects life, limits nuisance and inundation of habitable areas and facilitates appropriate flood immunity for the regions critical transport infrastructure.

4.6.3 Schedule of Works

Scope:

The proposed trunk stormwater infrastructure works contained within the Schedule of Works model have been drawn from a range of studies undertaken by Council in recent years. These studies have largely focussed on catchments which may have future growth potential. The scope of initiative proposed by Council to accommodate growth has been summarised in the Schedule of Works. These projects have been included in the Council's LTFF.

No existing stormwater infrastructure is identified in the LGIP or extrinsic material. Council is currently working on a reconciliation and update of existing stormwater asset data and will include this as part of a future review of the LGIP.

Costing and Timing:

The assessment of the establishment cost for proposed trunk stormwater assets has been determined using Council's internal estimation processes. This approach ensures that all projects are valued in a consistent manner. The unit rates applied in the valuation are representative of market costs for the provision of stormwater infrastructure.

The timing of works was broadly linked to anticipated need based on growth estimates.

4.7 Schedule of Works (SOW) General Assumptions

4.7.1 Financial Assumptions

The calculations contained in the Schedule of Works (SOW) modelling are underpinned by the following assumptions:

- **Weighted Average Cost of Capital** has been estimated at 7.39% per annum (which reflects the baseline margin of 3.89% on the ten (10) year bond rate of 3.5% 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 2.71% being the ten (10) year average **Roads and Bridges Index (ABS 6427, Table 15, Index 3101)** as at March 2017;
- **Escalation of land** has been taken as 6.0%; and
- The Infrastructure **Charges inflator** has also been set at 2.5%.
- Project owner's costs have been assumed at 15% which aligns to the Council's Cost Estimation Manual which recommends between 15%-30% depending on the project.
- The **term of the calculations** undertaken in the Schedule of Works is twenty (20) years

4.7.2 Revenue projections:

Revenue projections have been calculated in the Schedule of Works model assuming adopted charges as outlined in the Council's **Adopted Infrastructure Charges Resolution 2017** with an assumed discount factor applied



Mackay Regional Council Planning Assumptions Report

Council recently adopted the State's capped charge rates, which will apply from 1 February 2018. Council also provides for incentives through its Facilitating Development in the Mackay Region policy (updated in 2017). This policy provides for between 20% and 75% discount on infrastructure charges for qualifying development. A discount factor of 20-25% has been applied for residential development and 20-50% for non-residential uses in the revenue projections. This has been applied to reflect the potential discounts for infrastructure charges under this policy. If the policy is amended or rescinded in the future, the discount rates will be reviewed as part of future amendments.

4.7.3 Alignment of SOW with LTFF

The proposed Schedule of Works (SOW) generally aligns to the Council's LTFF as adopted at for the 2017/18 budget. There are several future infrastructure projects in the SOW that do not directly align with the LTFF either based on their timing or cost. This is as a result of more recent planning and/or updated timing. In these instances, where the SOW and LTFF do not currently align, these are intended to be aligned in the LTFF as part of future Council budget reviews. Asset Management

4.7.4 Alignment of SOW with Asset management plans

The below table identifies the existing asset management plans as relevant to each infrastructure network and highlights the forward program for asset management plans.

Infrastructure Network	Existing asset management plan	Forward program for asset management plan
Roads	Road Asset Management Plan 2013	To be reviewed in 2018-19 financial year
Stormwater	None	Currently being developed – target date June 2018
Water	Water Network Asset Management Plan 2015 Water Treatment Asset Management Plan 2015	To be reviewed – target date June 2018
Sewer	Sewage Network Asset Management Plan 2014 Sewage Treatment Asset Management Plan 2014	To be reviewed – target date June 2018
Parks	Parks and Environment Asset Management Plan 2015	No specific update programmed

The proposed LGIP aligns with the existing asset management plans to the extent that the proposed LGIP aligns to the LTFF (with those exceptions highlighted in section 4.7.3), which incorporates the required renewals and operational requirements for the respective infrastructure networks.



Mackay Regional Council Planning Assumptions Report

Into the future, greater alignment will be achieved through the delivery of the forward program for asset management plans with consideration of the LGIP (either as proposed or adopted). Then as the LGIP is reviewed and amended over time it will also be better aligned to the asset management plans. Furthermore, the program areas responsible for the asset management plans across each infrastructure network, are also responsible for the network planning which directly informs the development of the LGIP.

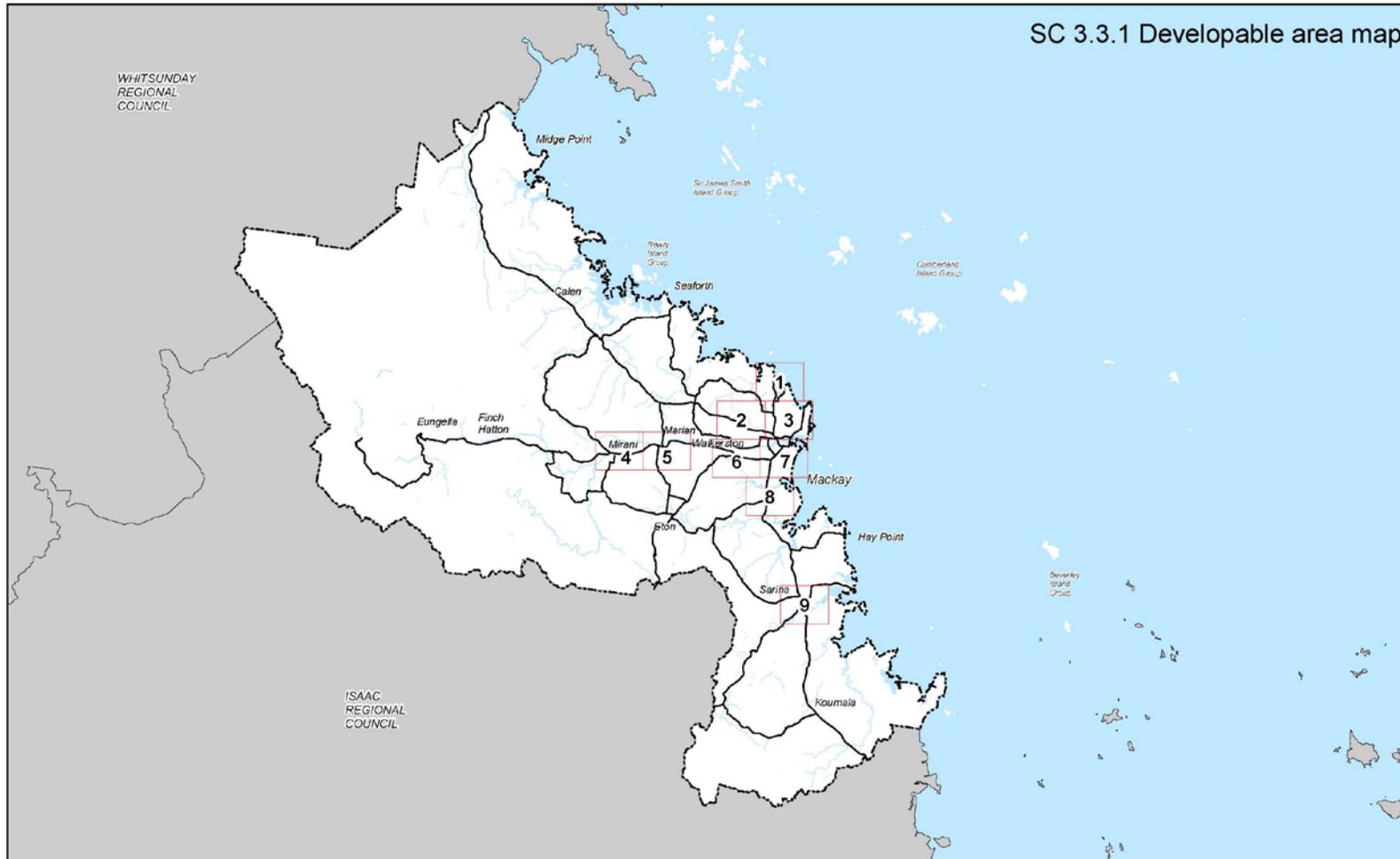


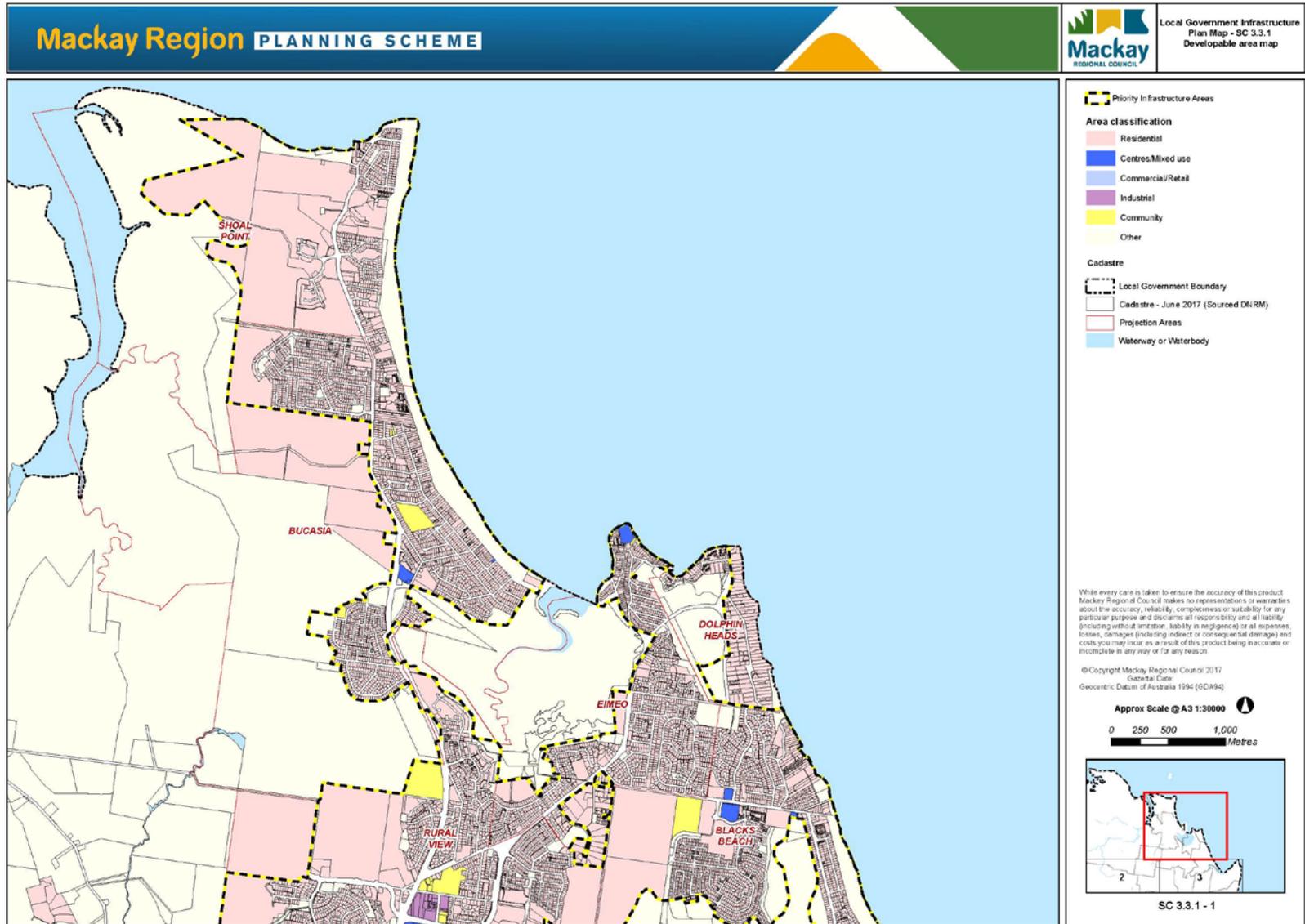
Attachment A – Developable Area Mapping

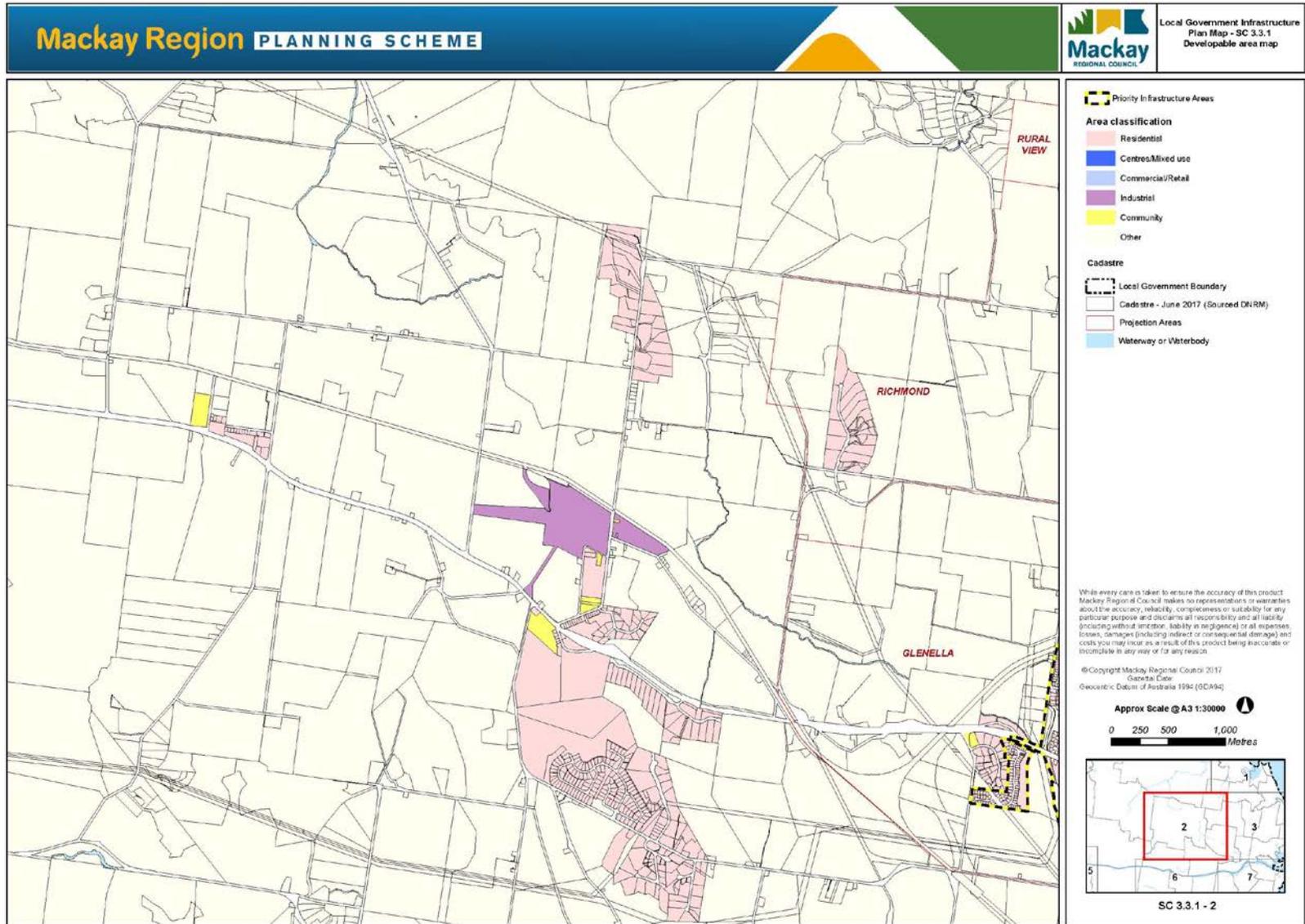


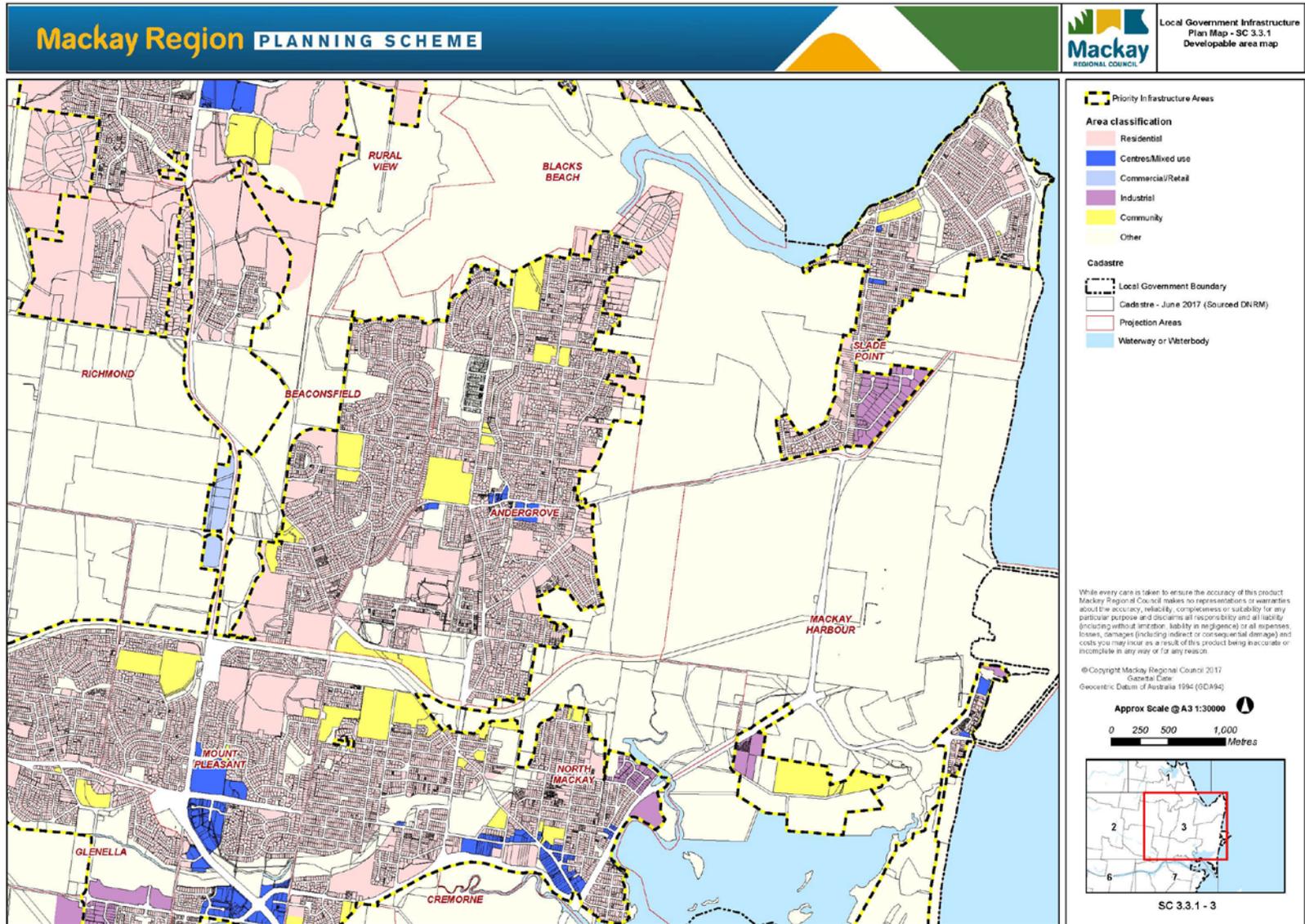
Mackay Region PLANNING SCHEME  Local Government Infrastructure Plan Maps

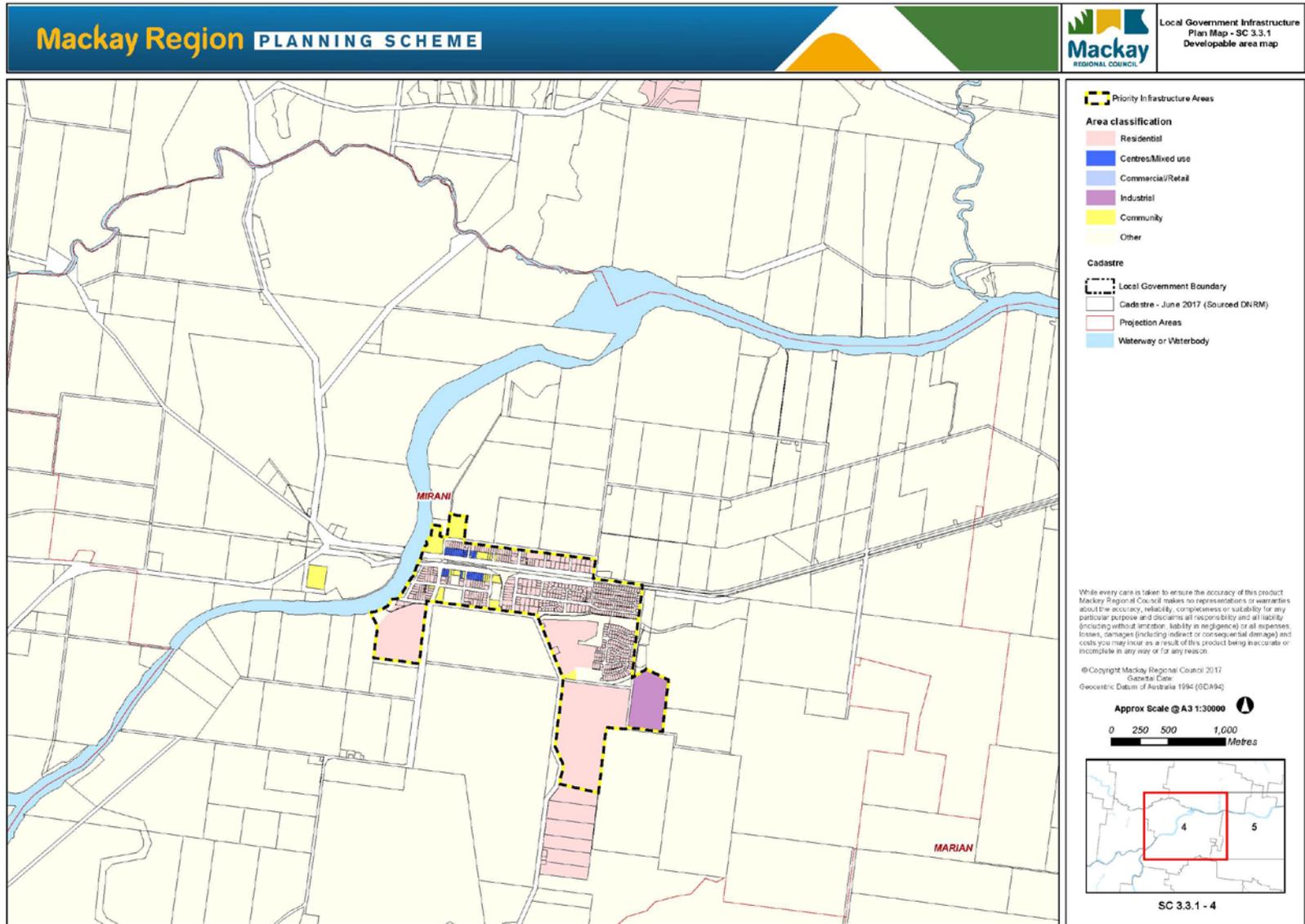
GRID INDEX - LOCAL GOVERNMENT INFRASTRUCTURE PLAN MAPS

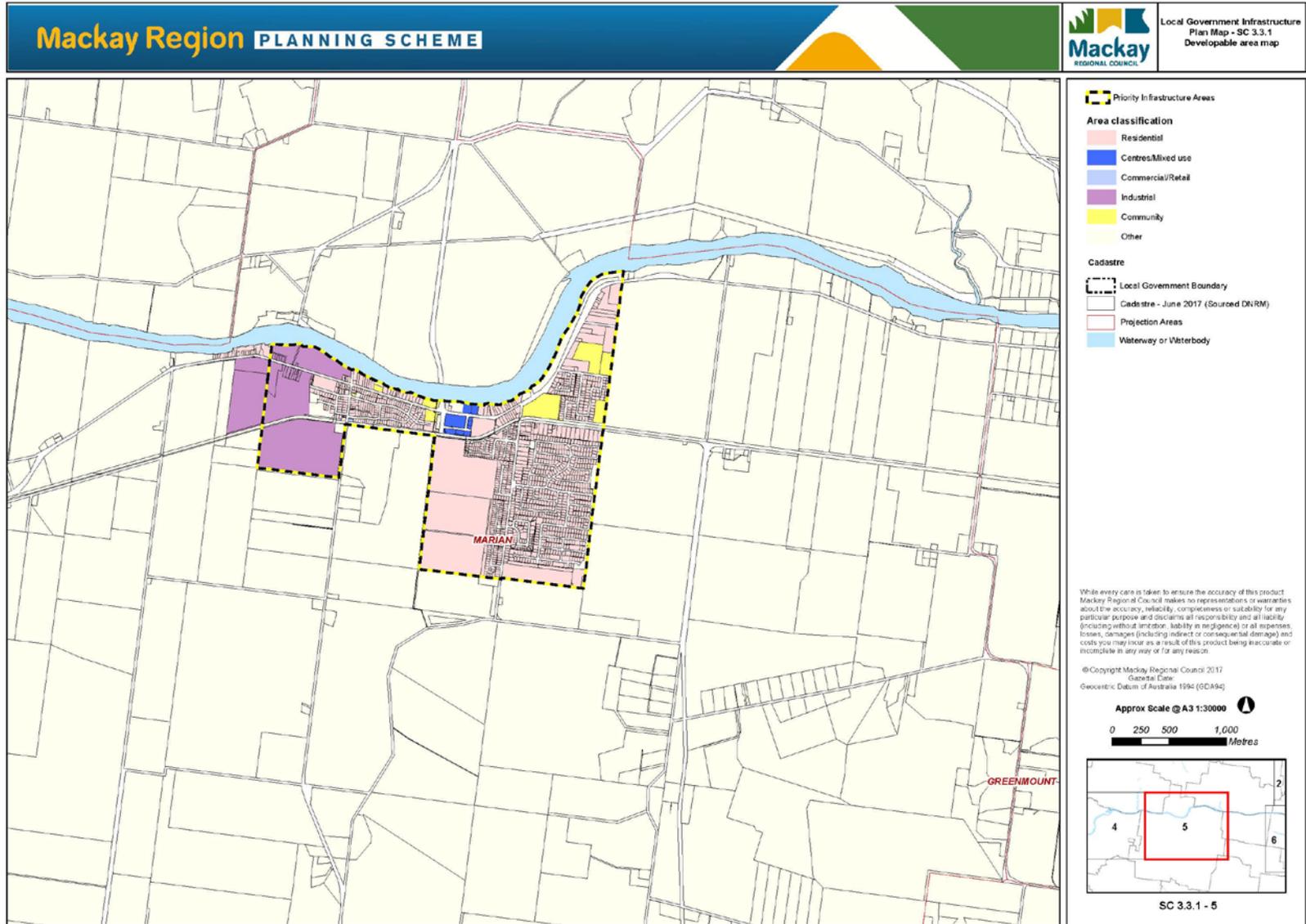


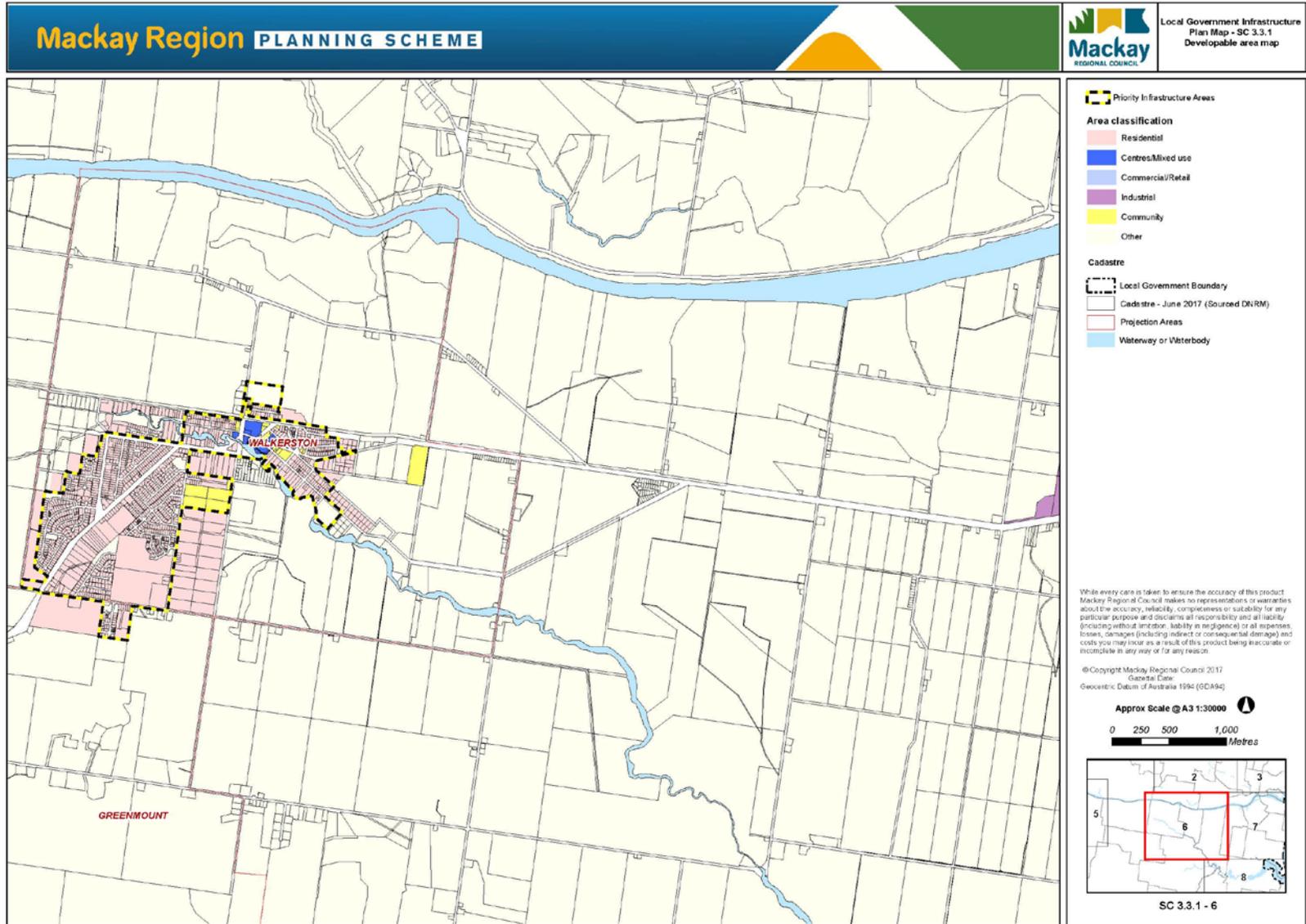


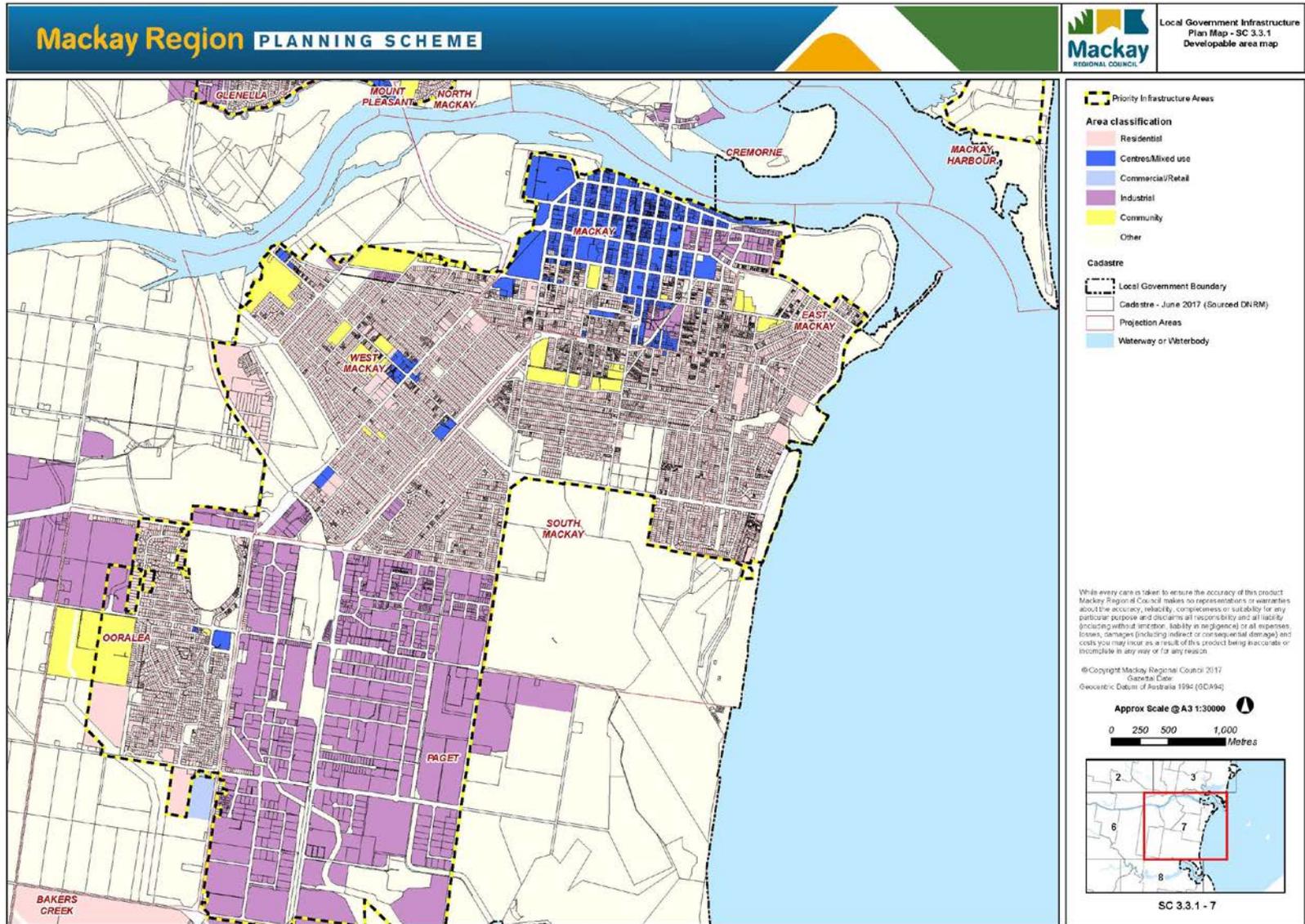












Version A.1

