Boggo Road

Cross River Rail Priority Development Area

Draft Infrastructure Plan Background Report

Not Government Policy

February 2022

CROSSRIVERRAIL

Queensland Government

Acknowledgement of Country

We acknowledge the Traditional Owners of the land on which we live and work
We pay our respects to the Elders, past and present

Throughout time, Brisbane, the land by the river, has been a path of transport for all people
A place of connection, a place of many tracks

The Ancestors and Elders travelled this terrain long ago
Following tracks that we follow today
We recognise their connection to this country, the waterways and community

As we build this path through Country
While we tunnel deep beneath our river
Laying tracks for greater connection, creating new places for the future
We acknowledge the rich traditions and stories of the past
At the many places we are working to bring this Project to life
Across Brisbane, the Gold Coast, and greater South-East Queensland

With an open heart and mind, we hope to learn from the traditions, stories, customs and practices of Australia's First Nations people

Together, as we build this track for the future.

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Important Notice

This report is confidential and is provided solely for the purposes of documenting information relevant to infrastructure planning and development charging for the Boggo Road Cross River Rail Priority Development Area (CRR PDA). The report will assist representatives from the CRRDA implementing the infrastructure plan within the development scheme and the Development Charges and Offset Plan (DCOP) to understand how infrastructure planning was undertaken and how development charges were determined. Additionally, Section 4 of this report outlines the Desired Standard of Service (DSS) for the Boggo Road CRR PDA. The DSS is a summary of the trunk and non-trunk infrastructure design standards used to inform the planning of the infrastructure networks in the Boggo Road CRR PDA. These standards also provide guidance that may be separately provided to applicants of the form, type and arrangement of infrastructure that is likely to be acceptable to the Minster for Economic Development Queensland (MEDQ) in the Boggo Road CRR PDA. This document will be used as a basis to prepare a publicly available version to assist applicants in the CRR PDA with development applications.

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1 Background

The Queensland Government's Cross River Rail Precincts Delivery Strategy (the strategy) sets a vision for each Cross River Rail (CRR) Station precinct that is aligned to the Government's policy priorities. The strategy sets out a vision for Boggo Road Precinct to be a world-class innovation precinct, specialising in health, science and education jobs of the future.

To facilitate the realisation of this potential, the Boggo Road precinct focus will be on:

- Creating a knowledge and innovation precinct with improved pedestrian connectivity to the internationally recognised knowledge hub of leading health, research, and education.
- Linking the precinct into the surrounding area with strong connections from Princess Alexandra Hospital (PAH) through to the University of Queensland (UQ).

The Strategy sets out a Boggo Road Precinct Intent, to provide direct opportunities to enhance the already established world-class health and technology precinct with a focus on health, science, and education. This will reinforce the precinct's role as a regional economic cluster, facilitating high skilled employment with supporting services and amenity, making it an inner-city destination for working, living and education.

New public realm will provide improved connectivity between rail, bus, and major institutional facilities within the precinct. A focal point to the area will be the linkage of the knowledge corridor connecting the UQ) to established major institutions including Ecosciences Precinct, the Translational Research Institute, the PAHand the Pharmacy Australia Centre of Excellence.

To support the Government's vision for the precinct, the Boggo Road CRR Priority Development Area (PDA) was declared on 2 October 2020 and an Interim Land Use Plan (ILUP) given effect. Boggo Road is one of the new underground stations with associated PDAs. The PDA was declared to assist with the delivery of the CRR Project's broader objectives.

The Boggo Road CRR PDA is approximately 39 hectares. It is a transit rich environment that includes a significant public transport interchange incorporating the new underground Boggo Road CRR station and tunnels (CRR Tunnels, Station and Development – CRR TSD), existing Park Road surface rail station and the CRR Rail Integration and Systems (CRR RIS) delivered new Dutton Park Station, (providing improved access to the PAH) and rail lines (Beenleigh/ Gold Coast and Cleveland lines), and existing Eastern Busway stations (PAH and Boggo Road) and tunnels. The PDA also includes significant existing and planned active transport infrastructure including the PAH cycleway and the new central pedestrian and cyclist bridge which is being delivered as part of the CRR project.

Significant existing facilities and government land holdings are located within the PDA which will support the continued focus and investment in health, science, innovation, research and education services. These facilities and land holdings include the Boggo Road Knowledge and Innovation Precinct (which includes the Ecosciences Precinct, Dutton Park Police Station and the heritage listed Boggo Road Gaol), the Pharmacy Australia Centre of Excellence, the Translational Research Institute and the Princess Alexandra Hospital.

The Boggo Road CRR PDA is generally bounded by Burke Street to the north, Cornwall Street to the south, Annerley Road to the west, and Ipswich Road to the east. The PDA does not include Dutton Park State Primary School or the new Inner City South State Secondary College although these facilities have an important relationship to the health, science, innovation, research and education focus of the PDA.

The Boggo Road CRR PDA regulates development on land within the Boggo Road CRR PDA. The Minister for Economic Development Queensland (MEDQ) has delegated certain functions and powers under the Economic Development Act 2012 (the ED Act) to the Cross River Rail Delivery Authority (CRRDA) including those to plan, carry out, promote or coordinate activities to facilitate economic development and development for community purposes.

The Boggo Road CRR PDA Development Scheme (the development scheme) is applicable to development on land within the boundaries of the Boggo Road CRR PDA. From the date of gazettal, the development scheme replaces the Boggo Road Cross River Rail PDA ILUP which commenced upon declaration.

The development scheme consists of the following:

1. a land use plan that regulates development in the PDA (section 2)

2. an infrastructure plan that describes infrastructure required to support achievement of the land use plan (section 3)

3. an implementation strategy that describes objectives and actions that complement the land use plan and infrastructure plan to achieve the main purpose of the ED Act (section 4).

The development scheme was prepared under delegation by the CRRDA in collaboration with Economic Development Queensland, State agencies, and other key stakeholders.

Figure 1-1: Boggo Road PDA Boundary (Source: CRRDA Boggo Road Interim Land Use Plan Oct 2020)

The Boggo Road CRR PDA Development Charges and Offset Plan (DCOP) provides a mechanism to facilitate the funding and delivery of trunk infrastructure to service the land uses and development yields assumed to be realised in the PDA, for the water supply, wastewater, stormwater, transport, parks and community facilities networks. The DCOP provides the MEDQ policy guidance to support the development scheme and sets out the development charge rates, schedule of works for trunk infrastructure and mapping which identifies trunk infrastructure upgrades or new trunk infrastructure necessary to be delivered in the PDA to 2041. The DCOP also sets out matters relevant to calculating development charges, credits, offsets and refunds for the provision of trunk infrastructure.

1.1 Purpose of Infrastructure Plan Background Report

This Infrastructure Plan Background Report (IPBR) documents information relevant to preparing the infrastructure plan and DCOP for the Boggo Road CRR PDA. The report will assist users of the infrastructure plan within the development scheme and the DCOP to understand how infrastructure planning was undertaken and how development charges were determined.

Additionally, Section 4 of this report outlines the Desired Standard of Service (DSS) for infrastructure for the Boggo Road CRR PDA. The DSS is a summary of the trunk and non-trunk design standards used to inform the planning of the infrastructure networks in the area. These standards also provide guidance to future development applicants of the form, type and arrangement of infrastructure that is likely to be acceptable to the MEDQ in the Boggo Road CRR PDA.

2 Growth projections

2.1 Introduction

The rate of growth projected for the Boggo Road CRR PDA is based on the potential residential and non-residential development in the area and forms the basis for the planning of the infrastructure services. The following sections detail the development and associated growth envisaged for the area.

2.2 Growth projection years

The Boggo Road CRR PDA growth projections were prepared for the following years:

- The base date 2020 and the following projection years:
  - year of opening of the new Boggo Road CRR Station 2025
  - 2025 - 2026
  - 2026 – 2031
  - 2032 - 2041
  - Ultimate development at 2041

2.3 Existing development demand

The Gross Floor Area (GFA) of existing buildings within the Boggo Road CRR PDA were estimated to form a demand on infrastructure at 2020.

2.4 Potential development capacity

The vision for the Boggo Road CRR PDA is to facilitate a mix of Health, science, and education land uses in the precinct. A Baseline Potential Development Scenario – Reference Scheme (the reference scheme) was adopted to forecast future servicing demand. The ultimate potential development capacity that may be achieved on premises within the PDA was calculated based on the type and density of development allowable under the reference scheme (the planned density), considering impacting factors such as existing development, land tenure and plot size to determine a likely development outcome.

Following calculation of the potential development yield (in GFA per m^2), these areas were then distributed between various land uses (commercial, retail, industrial and residential), in accordance with the development yields and reference scheme table (Appendix B).

The plot ratios and dwelling size assumptions are averages and they recognise that development may occur in individual circumstances at higher or lower densities. Appendix B states the plot ratios and GFA distribution assumptions assumed for land within each future development site within the PDA.

2.5 Development constraints

The projected growth for the PDA has been calculated taking into consideration known development constraints which may limit the potential yield of land. Absolute constraints (such as flooding, transport infrastructure, parkland, etc.) were addressed as part of the reference scheme. Refer Appendix B for the Boggo Road CRR PDA Development Constraints Map.

2.6 Growth rates

The rate of growth for residential and non-residential development in the PDA was determined by the CRRDA having regard to the anticipated timing of government land becoming available for development, the anticipated staging of future development, market analysis and industry engagement.

2.7 Growth projections summary

The growth projections for the PDA are summarised in Table 2-1 and Table 2-2.

Table 2-1: Future residential dwellings and non-residential floor space projections

DEVELOPMENT TYPE		PROJECTIONS BY YEAR				
	2020	2020-2025	2025-2026[1]	2027-2031	2032 - 2041[2]	2041 (ultimate)
Residential Dwellings	0		82	82	82	82
Non-residential floor space (m^2 GFA)	242,887	243,887	280,501	410,159	566,601	566,604

Table 2-2: Future population and employment projections

DEVELOPMENT TYPE		PROJECTIONS BY YEAR				
	2020	2020-2025	2025-2026	2027-2031	2032 - 2041	2041 (ultimate)
Residents	0		159	159	159	159
Employees	12,019	12,035	13,814	20,279	29,556	29,556

[1] Assumes demolition of existing Boggo Rd Sales Office

[2] Assumes demolition and/or redevelopment of PAH Buildings 07, 17, 31, 33, 35, 37, 39, 55

3 Demand projections

Growth projections are converted into demand projections to enable infrastructure planning to be undertaken.

Different infrastructure networks express infrastructure demand using different demand units. The demand units used by each local network in the PDA are as follows:

- for the water supply network, equivalent persons (EP)
- for the wastewater network, equivalent persons (EP)
- for the stormwater quantity network, impervious area expressed in hectares (Imp Ha)
- for the transport network, trips per day (trips)
- for the parks and community facilities network, persons.

The demand generation rates used by each network to convert growth projections into demand are stated in Appendix C.

The demand projections for each network are stated in Appendix D.

4 Desired standard of service

4.1 Water supply

The Desired Standards of Service (DSS) for the water supply network is consistent with:

- the design standards for the water supply network stated in the South East Queensland Design and Construction Code, as may be amended from time to time.

The latest DSS can be accessed on the SEQ Water Supply and Sewerage Design and Construction Code website.

4.2 Wastewater

The DSS for the wastewater network is consistent with:

- the design standards for the wastewater network stated in the South East Queensland Design and Construction Code, as may be amended from time to time.

The latest DSS can be accessed on the SEQ Water Supply and Sewerage Design and Construction Code website.

4.3 Stormwater

The DSS for the stormwater network is consistent with the Brisbane City Plan 2014, Schedule 6, Chapter 7 for the trunk infrastructure network and supporting policy, as may be amended from time to time.

The latest DSS can be accessed on the Brisbane City Council (BCC) website.

4.4 Transport

The desired standard of service for the road network is as follows:

- design the road network to comply with the following:
  - the standard road cross-sections in BCC's Infrastructure Design Planning Scheme Policy (IDPSP)
  - transport corridors are planned to cater for 2041 planning horizon.
  - active transport routes must always be publicly accessible, or a suitable alternative route must be provided during the operation of events.

CRRDA have adopted BCC's DSS, as per the Brisbane City Plan 2014 Local Government Infrastructure Plan (LGIP), for all transport networks as outlined in Boggo Road Priority Development Area – Transport Report prepared by SMEC. However, where BCC's DSS conflicts with the following standards, the standards listed below prevail:

- The Department of Transport and Main Roads Guideline, Selection and Design of Cycle Tracks.

The latest DSS can be accessed on the BCC website.

4.5 Parks and community facilities

The DSS for the parks and land for community facilities network is consistent with the BCC LGIP and supporting policy, as may be amended from time to time. Refer to the following sections of the Brisbane City Plan 2014 for the relevant DSS:

- Part 4 (LGIP)
- Public Parks and Land for Community Facilities Network – extrinsic material
- Planning Assumptions – extrinsic material.

The latest DSS can be accessed on the BCC website.

5 Infrastructure planning

5.1 Purpose

As described in section 3.1 of the development scheme, the purpose of the infrastructure plan is to ensure that the PDA vision is achieved through:

1. integrating infrastructure planning with land use planning identified in the development scheme
2. identifying the infrastructure requirements which may be delivered by the relevant infrastructure provider such as state government, BCC, Urban Utilities or applicants
3. providing a basis for imposing conditions on development approvals
4. responding to the increased demand on the relevant infrastructure networks.

This IPBR should be read in conjunction with the development scheme infrastructure plan (Section 3) and the DCOP. Section 3.2 of the development scheme identifies the various infrastructure networks and Section 3.3 describes three PDA infrastructure categories: trunk, non-trunk and other which inform future funding arrangements.

5.2 Planning horizon

The infrastructure plans for the Boggo Road CRR PDA have a planning horizon of 2041. This horizon was chosen to align with the anticipated staging of future development and the realisation of ultimate development in the Boggo Road CRR PDA. The PDA is assumed to be fully developed by 2041.

5.3 Water supply

The Boggo Road CRR PDA is currently generally well serviced in terms of water supply pressure and flow. Assessment of the existing water supply infrastructure indicated that upgrade works would be required on the following existing infrastructure to enable servicing of the assumed future development within the PDA:

- 150mm water main in Annerley Rd;
- 100mm water main in Railway Tce; and
- 150mm water main in Cornwall Street.

Further details relating to the planning of water supply infrastructure for the PDA is documented in Appendix E:

- Water Supply & Wastewater Technical Note – Technical Memo prepared by SMEC.
- Refer to Appendix H for overall existing and future Water Supply Infrastructure Network Plan identifying non-trunk, trunk and other infrastructure as may be applicable.

Refer to Appendix F and G for planned trunk infrastructure project mapping and cost schedules (where applicable).

A summary of whether the identified infrastructure may be trunk, non-trunk or other infrastructure is provided in Table 5-1.

5.4 Wastewater

The Boggo Road CRR PDA is generally divided into two main areas, separated by the Gold Coast / Beenleigh Railway Line. The western area is known as the Boggo Road Knowledge and Innovation Precinct, and the eastern catchment consists of the Railway Corridor and the Princess Alexandra Hospital Precinct, which includes PAH site, the Pharmacy Australia Centre of Excellence (PACE) Building and the Transitional Research Institute (TRI) Building. Both catchments are serviced by a DN630mm PE trunk sewer main (PAH-SEW-630) which forms part of the Woolloongabba Submain.

There is currently an identified capacity issue with the 225mm sewer that runs west to east in the northern section of the PAH site. Diversion of all flows to the DN630mm trunk sewer to the north will alleviate this issue and further upgrades of surrounding sewers.

Planning of wastewater infrastructure for the PDA is documented in Appendix E:

- Water Supply & Wastewater Technical Note – Technical Memo prepared by SMEC.

Refer to Appendix H for overall existing and future Wastewater Infrastructure Network Plan identifying non-trunk, trunk and other infrastructure as may be applicable.

Refer to Appendix F – Map 02 Wastewater - Future Trunk Infrastructure Plan and Appendix G for the planned trunk infrastructure project mapping and cost schedules.

A summary of whether the identified infrastructure may be trunk, non-trunk or other infrastructure is provided in Table 5-1.

5.5 Stormwater

SMEC's preliminary assessment of the trunk stormwater network has confirmed that the existing stormwater infrastructure within and downstream the Boggo Road CRR PDA does not have sufficient capacity to convey the stormwater runoff generated within the site to meet the nominated DSS for the PDA (10% AEP). It has also been determined that the constraints to the existing stormwater infrastructure network extends to much further beyond the PDA.

A flood study prepared for the CRR Tunnel, Stations and Development (TSD) Boggo Road Station works has identified the flooding characteristics for most of the PDA, and introduces mitigation measures to be included as part of the CRR TSD works. Whilst this alleviates some of the flooding and drainage issues, it doesn't address all flooding constraints within the PDA.

There are a number of matters that would need to be addressed as part of future development, to achieve the nominated DSS for the PDA. The additional works may include a combination of additional stormwater detention measures to be incorporated as part of future development within the PDA, improvements to the overland flow paths throughout the PDA, and augmentation of the existing underground drainage network. Any works adopted, however, will need to ensure that no worsening of the existing situation for the surrounding properties and roads. Thus, augmentation works may be required to be undertaken in areas downstream of the PDA.

Further details relating to the planning of stormwater infrastructure for the PDA is documented in Appendix E:

- Stormwater Technical Memo - Technical Memo prepared by SMEC.

Refer to Appendix H for an overall existing and future Stormwater Infrastructure Network Plan identifying non-trunk, trunk and other infrastructure as may be applicable.

Refer to Appendix F – Stormwater - Future Trunk Infrastructure Plan and Appendix G for the planned trunk infrastructure project mapping and cost schedules.

A summary of whether the identified infrastructure may be trunk, non-trunk or other infrastructure is provided in Table 5-1.

5.6 Transport

Planning of transport infrastructure to service the development within the PDA is documented in Appendix E:

- Boggo Road Priority Development Area – Transport Report prepared by SMEC.

Refer to Appendix H for overall existing and future Transport Infrastructure Network Plans identifying non-trunk, trunk and other infrastructure as may be applicable.

Refer to Appendix F - Map Transport (Road) - Future Trunk Infrastructure Plan and Map Transport (Active) – Future Trunk Infrastructure Plan and Appendix G for the planned trunk infrastructure project mapping and cost schedules.

Trunk infrastructure is represented by roads and intersections of higher-order road hierarchies, including Motorway, Arterial, Suburban, District roads. These road hierarchies are demonstrated in the Road Hierarchy Overlay contained within the Brisbane City Plan 2014. Within the road corridor, trunk infrastructure in the PDA includes the formation, carriageway, footpaths, street trees and furniture, cycleways, bridges, in-road drainage and intersections with at least three arms of trunk roads or where the MEDQ considers that the future project is considered on balance to have wider transport network benefits (e.g. car, pedestrian, cycle) and will service multiple future development sites.

Where transport upgrades required for the PDA intersect with other planned trunk infrastructure or development infrastructure (as per BCC's or Urban Utilities infrastructure planning policies), the transport upgrade is to provide for or accommodate the efficient delivery of all planned infrastructure. This may include the provision of other planned trunk infrastructure or development infrastructure where the delivery of that additional infrastructure is determined to be the most efficient and cost-effective solution.

A summary of whether the identified infrastructure may be trunk, non-trunk or other infrastructure is provided in Table 5-1.

5.7 Parks and community facilities

Existing trunk parks provisions within the Boggo Road CRR PDA is confined to Outlook Park which, prior to its temporary re-location to allow construction of the CRR TSD works, had a total area of approximately 2,100m2. The other existing park within the PDA is the non-trunk Boggo Road Gaol Park which has a total area of 3,503m2. There are no existing land for community facility sites within the neighbourhood catchment.

The local catchment is experiencing relatively high population growth and associated social change. Whilst there is no sports park within the PDA, rates of provision of local and district recreation park are reasonably high with Turley Street Park and Dutton Park making key contributions to overall supply. The rate of provision of urban commons is similarly high due to the Carl Street- Tottenham Street Urban Commons located approximately 300m to the east of the PDA. There are three land for community facilities sites within the local catchment providing 6,300m2 of total land area.

In the district catchment, there are very low rates of provision of local recreation park particularly to the north of the PDA. There is a reasonable supply of land for community facilities supporting a range of community infrastructure. In addition to BCC land for community facilities, there are a broad range of community

infrastructure including major health and education facilities provided by Federal and State Government along with private and other non-government sector entities.

Planning of parks and community facilities infrastructure to service development within the PDA was informed by the following reports in Appendix E:

- *Boggo Road CRR Precinct Community Infrastructure Assessment – Technical Memo* prepared by SMEC.

Refer to Appendix H for an overall existing and future Community Infrastructure Network Plan identifying non-trunk, trunk and other infrastructure as may be applicable.

A summary of whether the identified infrastructure may be trunk, non-trunk or other infrastructure is provided in Table 5-1.

Refer to Appendix F – Map Parks and Community Facilities - Future Trunk Infrastructure Plan, and Appendix G for the planned trunk infrastructure project mapping and cost schedules.

5.8 Power and Energy

Energex's Buranda Substation supplies electricity to the Boggo Road CRR PDA. Buranda Zone Substation is located on the north side of the PA Hospital busway station. It is a double modular zone substation. Each module comprises a prefabricated switch and control room building containing the 33kV switchgear, 11kV switchgear and associated control, protection and communications equipment. The two modules are tied together with 33kV and 11kV bus tie cables with the 33kV and 11kV buses run normally closed (in parallel) providing N-1 redundant supply.

The Buranda substation has a rating of 54MVA and current load of 24MVA. Energex have published their projection to 2024 which is 27.8MVA, an increase by 2024 of 3.8MVA. Energex stated that Buranda substation current N-1 spare capacity is between 10-15MVA.

The existing network will have capacity for future short and medium term developments, over the next 10-15 years. Future long term developments will likely necessitate the upgrade of Buranda substation or installation of a new Zone Substation in surrounding suburbs. This requirement will be heavily dependent on the nature and type of developments planned.

Due to forecast load growth in the West End, Woolloongabba and surrounding areas, there are potential emerging limitations in the West End and Woolloongabba areas. While refurbishment of Energex's existing substations are likely options to address these limitations, a new site in an area outside of Boggo Road CRR PDA, to the north is also a possible solution.

5.9 Infrastructure summary & categories

A summary of whether the identified infrastructure may be trunk, non-trunk or other infrastructure is provided in Table 5-1. Refer to sections 3.3 and 3.4 of the development scheme infrastructure plan for additional information regarding the relevant infrastructure categories and funding arrangements.

Table 5-1: Infrastructure summary table and categories

INFRASTRUCTURE IDS	INFRASTRUCTURE NETWORKS	INFRASTRUCTURE DETAILS (REFER APPENDIX E, F, G AND H)	INFRASTRUCTURE CATEGORY	POTENTIAL FUNDING
BGO-WAT-01	**Water supply**	Upgrade of watermain in Annerley Road to DN250 PE pipe (PDA associated land)	Trunk	Developer charges / other entity tbd
BGO-WAT-02		Upgrade of watermain in Railway Terrace to DN180 PE pipe (PDA associated land)	Trunk	Developer charges / other entity tbd

INFRASTRUCTURE IDS	INFRASTRUCTURE NETWORKS	INFRASTRUCTURE DETAILS (REFER APPENDIX E, F, G AND H)	INFRASTRUCTURE CATEGORY	POTENTIAL FUNDING
BGO-WAT-03		Upgrade of watermain in Cornwall Street to DN250 PE pipe (PDA associated land)	Other	Other entity tbd[3]
BGO-SEW-01	**Wastewater**	New DN315mm PE sewer main on O'Keefe Service Drive between Diamantina Road East and Laundry Drive redirecting flows to DN630mm trunk main.	Other	Other entity tbd[3]
		Potential alternative upgrades, subject to feasibility investigation strategy (refer to Appendix E – Boggo Road CRR PDA Water Supply & Wastewater Technical Analysis (map references BGO-SEW-02, BGO-SEW-03 and BGO-SEW-04)	Other	Other entity tbd[3]
BGO-SW-01	**Stormwater**	Stormwater detention basins on western side of Kent Street / Laundry Drive delivered as part of the CRR TSD project.	Other	CRR TSD
BGO-INT-01	**Transport**	Annerley Road and Railway Terrace Intersection	Other	Other entity tbd[3]
BGO-INT-02		Cornwall Street and Ipswich Road Intersection	Other	Other entity tbd[3]
BGO-INT-03		Ipswich Road and Alexandra Drive Intersection	Other	Other entity tbd[3]
BGO-INT-04		Ipswich Road and O'Keefe Street Intersection	Other	Other entity tbd[3]
BGO-INT-05		Ipswich Road and Diamantina Road East Intersection	Other	Other entity tbd[3]
BGO-INT-06		Annerley Road and Peter Doherty Street Intersection	Other	Other entity tbd[3]
BGO-RD-01		Kerbside allocation and carriageway width modification on Boggo Road and Joe Baker Street delivered as part of the CRR TSD underground station project	Other	CRR TSD
BGO-RD-02		Kerbside allocation and carriageway width modification on Kent Street delivered as part of the CRR RIS enhanced Dutton Park Rail Station project	Other	CRR RIS
BGO-RD-03		Kerbside allocation and carriageway width modification to Peter Doherty Street to accommodate potential on-road cycle paths	Other	Developer charges / other entity tbd
BGO-RD-04a		Kent Street interim upgrades	Trunk	Developer
BGO-RD-04b		Kent Street Ultimate upgrades	Other	Other entity tbd[3]
BGO-RD-04c		Kent Street ultimate upgrades	Other	Other entity tbd[3]

INFRASTRUCTURE IDS	INFRASTRUCTURE NETWORKS	INFRASTRUCTURE DETAILS (REFER APPENDIX E, F, G AND H)	INFRASTRUCTURE CATEGORY	POTENTIAL FUNDING
BGO-RD-05a		Laundry Drive ultimate upgrades	Other	Other entity tbd[3]
BGO-RD-5b		Laundry Drive ultimate upgrades	Other	Other entity tbd[3]
BGO-AT-01	**Active Transport**	Shared central active transport connection bridge (Central Bridge) delivered as part of the CRR TSD project.	Other	CRR TSD
BGO-AT-02		At grade footpath and zebra crossing across Kent Street delivered as part of the CRR TSD project	Other	CRR TSD
BGO-AT-03		Peter Doherty Street separated path upgrade (Northern side)	Trunk	Developer charges
BGO-AT-04		Kent Street Active Transport upgrade delivered as part of the CRR RIS project	Other	CRR RIS
BGO-AT-05a		Kent Street Active Transport upgrade (Interim)	Trunk	Developer charges
BGO-AT-05b		Kent Street Active Transport upgrade (Ultimate)	Other	Other entity tbd[3]
BGO-AT-05c		Kent Street Active Transport upgrade (Ultimate)	Other	Other entity tbd[3]
BGO-AT-06a		Laundry Drive western side Active transport Upgrade (Ultimate)	Trunk	Developer charges
BGO-AT-06b		Laundry Drive eastern side Active transport upgrade (Ultimate)	Other	Other entity tbd[3]
BGO-AT-06c		Laundry Drive Active transport upgrade north of PAH building PAH-07 (Ultimate)	Other	Other entity tbd[3]
BGO-AT-07a		Elevated pedestrian connection through future CRR Precincts Delivery Partner development sites R1 and R2	Non-trunk	Developer
BGO-AT-07b		Elevated bridge connection between future development site R2 and potential new vertical transport near TRI building	Trunk	Developer Charges
BGO-AT-08		Potential elevated passenger interchange and pedestrian connection between the Boggo Road CRR and Busway Stations, Park Road Station and Elliot Street	Other	Other entity tbd[3]
BGO-AT-09		Potential new elevated common podium level from new Central Bridge to centre of PAH	Other	Other entity tbd[3]
BGO-AT-10		Pedestrian arcade transition from Central Bridge to Joe Baker Street through future development site E-01	Non-trunk	Developer
BGO-AT-11a		Potential upgraded at grade link upgrade between Boggo Road and Merton Road	Other	Other entity tbd[3]
BGO-AT-11b		Potential upgraded elevated link upgrade between Boggo Road and Merton Road	Other	Other entity tbd[3]
BGO-AT-12		Separated path between Ecosciences building and Gaol connecting Peter Doherty Street and Boggo Road	Non-trunk	Other entity tbd[3]

INFRASTRUCTURE IDS	INFRASTRUCTURE NETWORKS	INFRASTRUCTURE DETAILS (REFER APPENDIX E, F, G AND H)	INFRASTRUCTURE CATEGORY	POTENTIAL FUNDING
BGO-AT-13, BGO-AT-14 & BGO-AT-15		Potential upgraded pedestrian connections within the PAH campus	Other	Other entity tbd[3]
BGO-AT-16		Upgraded pedestrian connection between new Boggo Road CRR station and existing Park Road rail station delivered as part of the CRR TSD project	Other	CRR TSD
BGO-AT-17		Upgraded pedestrian and cycle connection on northern side of Boggo Road between Annerley Road and AT11a	Other	Other entity tbd[3]
BGO-VT-01		Vertical transport connecting the Central Bridge to Joe Baker Street delivered as part of the CRR TSD project	Other	CRR TSD
BGO-VT-02		Vertical transport connecting the Central Bridge to Kent Street / Laundry Drive delivered as part of the CRR TSD project	Other	CRR TSD
BGO-VT-03		Vertical transport (lift and stairs) connecting Kent Street pedestrian footpath to TRI 2.0 building	Other	Other entity tbd[3]
BGO-PT-01	Public Transport	new Boggo Road CRR Station and tunnel delivered as part of the CRR TSD project	Other	CRR TSD
BGO-PT-02		new Boggo Road Metro Station	Other	Other entity tbd[3]
BGO-PT-03		Potential bus storage / waiting bay on western side of Joe Baker Street	Other	Other entity tbd[3]
		Enhanced Dutton Park Rail Station and PAH campus access improvements delivered as part of the CRR RIS project	Other	CRR RIS
BGO-PL-01	**Parks and community facilities**	Boggo Road CRR Station Plaza delivered as part of the CRR TSD project	Other	CRR TSD
BGO-PP-01		Potential new publicly accessible Plaza delivered as part of future PAH masterplanning (approx. 800m2)	Other	Other entity tbd[3]
BGO-PP-02a		Permanent establishment of Outlook Park (approx. 2,100m2) within the Outlook Park opportunity area	Non-trunk	Other entity tbd[3]
BGO-PP-02b		Permanent establishment of Outlook Park (approx. 2,100m2) within the Outlook Park opportunity area	Non-trunk	Developer
BGO-PP-03		Enhancements to existing Boggo Road Gaol Park embellishments.	Other	Other entity tbd[3]
BGO-PP-04		Public realm enhancements associated with new active transport connection bridge entrance adjoining Kent Street delivered as part of the CRR TSD project	Other	CRR TSD

INFRASTRUCTURE IDS	INFRASTRUCTURE NETWORKS	INFRASTRUCTURE DETAILS (REFER APPENDIX E, F, G AND H)	INFRASTRUCTURE CATEGORY	POTENTIAL FUNDING
BGO-PR-01		Publicly accessible public realm spaces within PAH building redevelopments as part of future PAH masterplanning	Other	Other entity tbd[3]
N/A		Streetscape improvements delivered on Peter Doherty Street, Joe Baker Street and Boggo Road as part of the CRR TSD project	Other	CRR TSD
BGO-CF-01		Potential additional uses of the Boggo Road Gaol as a community facility / community uses	Other	Other entity tbd[3]

[3] To be determined (funding arrangements and potential contributions to be discussed with relevant State Government Departments, local government, and water distributor-retailer)

6 Infrastructure costs

The cost of infrastructure has been determined as follows.

6.1 Cost of land

The assumptions regarding the cost of future infrastructure (land) was determined for each network as follows:

- No additional private land is proposed to be acquired for the infrastructure necessary to support the Boggo Road CRR PDA.
- If it is identified that a land value is required to provide an offset value for trunk infrastructure land, the value is to be based on the Valuer-General's annual valuation rate (rate per m^2 basis, in accordance with the land Valuation Act 2010) that is current at the time the offset is granted.

6.2 Cost of the works

The cost of future infrastructure (works) was determined for each network as detailed in the following sections.

6.2.1 Water

Water supply cost estimates were prepared by RLB. These costs are provided as lump sum costs per infrastructure item and are based on a detailed cost calculation adopting industry rates at FY2021/2022. The Future Trunk Infrastructure Cost Schedules (Appendix G) identifies the specific base cost for each infrastructure item.

6.2.2 Wastewater

There is currently no identified trunk stormwater infrastructure included in the draft Development Charges and Offset Plan (DCOP).

6.2.3 Stormwater

There is currently no identified trunk stormwater infrastructure included in the draft Development Charges and Offset Plan (DCOP). An indicative amount has been included to encourage investment in innovative stormwater harvesting / balancing outomes to benefit the wider catchment.

6.2.4 Transport

Future trunk infrastructure works for the transport network are based on several sources. These include:

- For trunk pathway, pathway bridge and vertical transport costs:
  - Unit rates for similar projects provided by Rider Levett Bucknall (RLB) at FY2021/22
  - Average unit rates for similar projects (between RLB andBCC LGIP Extrinsic Material unit rates at FY2016/17)
  - Nominal unit rates provided by PIE Solutions, where necessary.

The schedule of works (Appendix G) identifies the specific base cost for each infrastructure item.

6.2.5 Parks and community facilities

Future trunk infrastructure works for the parks and community facilities networks are based on the following sources:

- Recreation park embellishment:
  - Cost estimate at FY2021/22 for the permanent replacement of Outlook Park associated with the provision of a new public park having approximately the same size, planting type and equipment as the existing Outlook Park, prior to its temporary re-location.

The schedule of works (Appendix G) identifies the specific base cost for each infrastructure item.

6.3 On-cost allowances

On-costs represent the owner's project costs and may include:

- survey for the work
- geotechnical investigations for the work
- strategic planning
- detailed design for the work
- project management, procurement and contract administration
- environmental investigations for the work, and
- portable long service leave payment for a construction contract for the work.

The on-costs allowances that have been applied to infrastructure costs in the PDA are stated in Table 6-1.

Table 6-1: On-cost allowances

NETWORK	ON-COSTS ALLOWANCES
Water Supply	14% applied to the Base Cost (inclusive of cost factors)
Wastewater	N/A
Stormwater	N/A
Transport (Road / Intersection)	N/A
Transport (Active)	17% applied to the Base Cost (inclusive of cost factors)
Parks and Community Facilities	13 to 17% applied to the Base Cost (inclusive of cost factors)

6.4 Contingency allowances

A contingency allowance is included in the cost of future infrastructure works to deal with known risks. The contingency allowance typically reduces in accordance with the level of planning undertaken for the infrastructure item. The level of contingency allowance applied for infrastructure works in each network are stated in Table 6-2.

Table 6-2: Contingency allowance

NETWORK	CONTINGENCY ALLOWANCES
Water Supply	15% applied to the Base Cost (inclusive of on-costs and cost factors)
Wastewater	N/A
Stormwater	N/A
Transport (Road / Intersection)	N/A
Transport (Active)	15% applied to the Base Cost (inclusive of on-costs and cost factors)
Parks and Community Facilities	15 to 25% applied to the Base Cost (inclusive of on-costs and cost factors)

7 Development charges

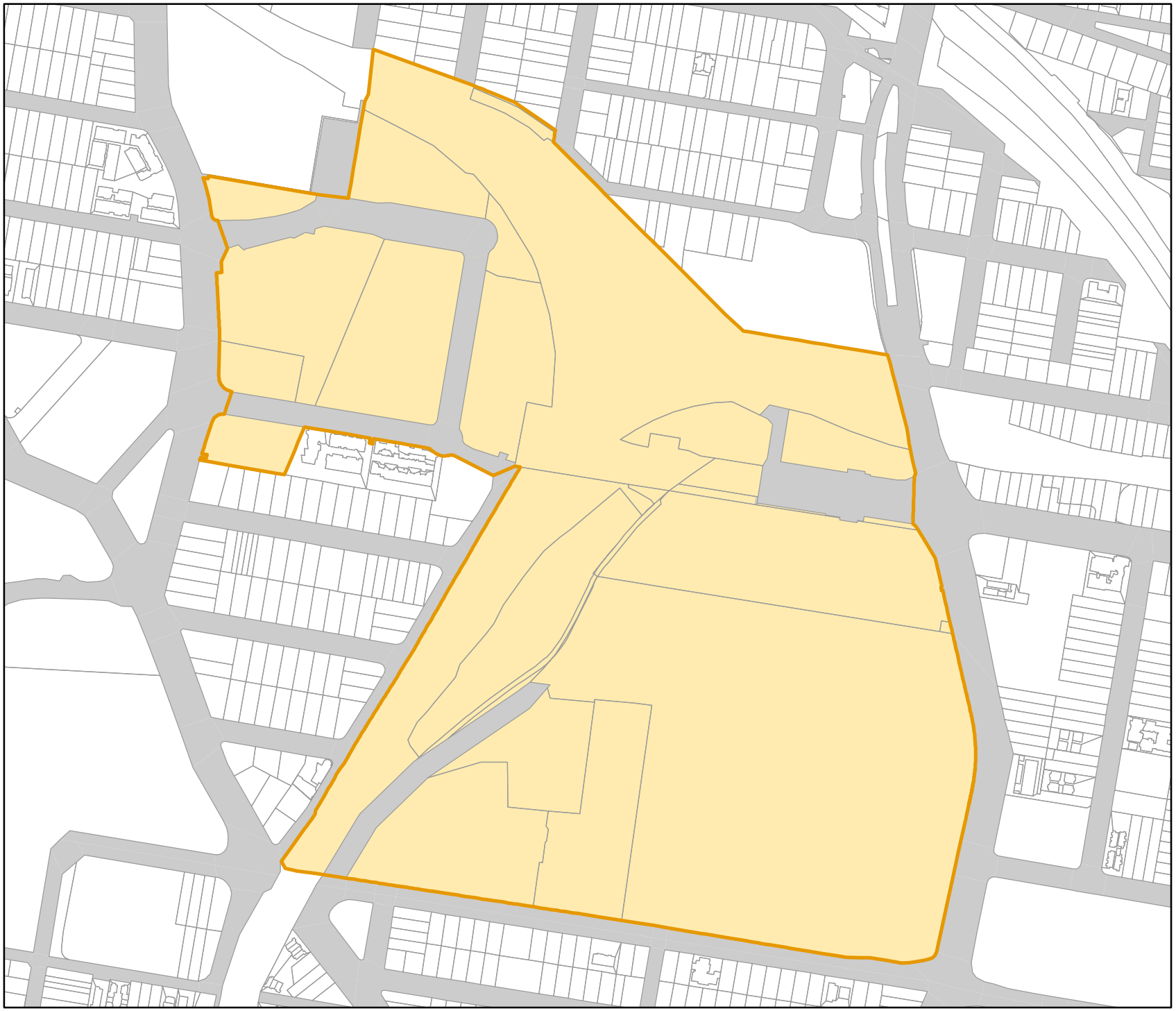
Development Charges have been adopted to be consistent with the current Adopted Infrastructure Charges currently levied by BCC and Urban Utilities.

8 Trunk infrastructure cost schedules

Detailed cost schedules were prepared for each trunk infrastructure item identified in the DCOP.

Refer to Appendix G for further details.

Appendix A PDA Boundary Map



Map No. PDA 18 - Boggo Road Cross River Rail Priority Development Area

Declared by Regulation on: 2/10/2020

Key

- Boggo Road CRR PDA
- Parcel boundaries
- Road casement
- Water casement

0 100 200
Metres

Source: Department of Natural Resources, Mines and Energy: Digital Cadastre Database.

Map generated by the Spatial Services Branch of the Department of State Development, Tourism and Innovation

Queensland Government

Document Path: S:\Projects\EDQ\Boggo Road\200903_BoggoRoadPPDA\mxd\200903_BoggoRoadPPDA_Reg_Map.mxd

Appendix B Development Constraints, Yields and Reference Scheme

Table B-1: Existing and Proposed Development Yields - Residential (incl. Short-term Accommodation)

SITES	DEVELOPMENT TYPE		PROJECTIONS BY YEAR				
		2020 (base date)	2020 - 2025 (TSD)	2025-2026	2027 - 2031	2032-2041	2041 (ultimate)
E5	1 Bedroom Dwelling	0		21	21	21	21
	2 Bedroom Dwelling	0		49	49	49	49
	3+ Bedroom Dwelling	0		12	12	12	12
Total		0		82	82	82	82

Note: Presented as cumulative totals

Table B-2: Existing and Proposed Development Yields – Non-residential GFA (m²)

Site	Development Type	2020	2020 - 2025 (TSD)	2025-2026	2027-2031	2032-2041	Ultimate (2041)
EX-101	Office	26,082	26,082.00	26,082.00	26,082.00	26,082.00	26,082.00
EX-102	Commercial	500	500.00	500.00	500.00	500.00	500.00
EX-103	Office	1,542	1,542.00	1,542.00	1,542.00	1,542.00	-
EX-104	Office	342	342.00	342.00	-	-	-
EX-105	Commercial	3,040	3,040.00	3,040.00	3,040.00	3,040.00	3,040.00
EX-201	Health	17,378	17,378.00	17,378.00	17,378.00	17,378.00	17,378.00
EX-202	Health	553	553.00	553.00	553.00	553.00	-
EX-203	Health	887	887.00	887.00	887.00	887.00	-
EX-204	Health	924	924.00	924.00	924.00	924.00	-
EX-205	Health	910	910.00	910.00	910.00	910.00	-
EX-206	Health	1,300	1,300.00	1,300.00	1,300.00	1,300.00	-
EX-207	Health	11,277	11,277.00	11,277.00	11,277.00	11,277.00	-
EX-208	Health	6,735	6,735.00	6,735.00	6,735.00	6,735.00	6,735.00
EX-209	Health	38,963	38,963.00	38,963.00	38,963.00	38,963.00	38,963.00
EX-210	Health	1,559	1,559.00	1,559.00	1,559.00	1,559.00	1,559.00
EX-211	Health	4,457	4,457.00	4,457.00	4,457.00	4,457.00	-
EX-212	Health	321	321.00	321.00	321.00	321.00	321.00
EX-213	Health	1,820	1,820.00	1,820.00	1,820.00	1,820.00	1,820.00
EX-214	Health	384	384.00	384.00	384.00	384.00	384.00
EX-215	Health	220	220.00	220.00	220.00	220.00	220.00
EX-216	Health	1,436	1,436.00	1,436.00	1,436.00	1,436.00	1,436.00

Site	Development Type	2020	2020 - 2025 (TSD)	2025-2026	2027-2031	2032-2041	Ultimate (2041)
EX-217	Health	290	290.00	290.00	290.00	290.00	290.00
EX-218	Health	6,251	6,251.00	6,251.00	6,251.00	6,251.00	6,251.00
EX-219	Health	9,335	9,335.00	9,335.00	9,335.00	9,335.00	9,335.00
EX-220	Health	3,250	3,250.00	3,250.00	3,250.00	3,250.00	-
EX-221	Health	99,131	99,131.00	99,131.00	99,131.00	99,131.00	99,131.00
EX-301	Industrial	4,000	4,000.00	4,000.00	4,000.00	4,000.00	-
EX-302	Commercial	-	-	-	-	-	-
TSD	Industrial	-	1,000.00	1,000.00	1,000.00	1,000.00	1,000.00
E1	Office	-	-	-	25,855.00	25,855.00	25,855.00
E4	Retail	-	-	-	1,935.00	1,935.00	1,935.00
	Commercial	-	-	-	2,550.00	2,550.00	2,550.00
E5	Residential	-	-	-	-	-	-
TRI2.0	Office	-	-	-	6,616.00	6,616.00	6,616.00
E2	Office	-	-	-	-	20,544.00	20,544.00
E3	Office	-	-	-	-	19,308.00	19,308.00
9	Office	-	-	-	-	36,036.00	36,036.00
R1	Health	-	-	-	-	14,550.00	14,550.00
05A	Hospital	-	-	-	-	39,220.00	39,220.00
R2	Research	-	-	-	-	-	9,570.00
PACE3	Office	-	-	-	-	-	8,500.00
2	Hospital	-	-	-	-	-	32,724.00
1	Hospital	-	-	-	-	-	22,620.00

Site	Development Type	2020	2020 - 2025 (TSD)	2025-2026	2027-2031	2032-2041	Ultimate (2041)
6	Hospital	-	-	-	-	-	14,288.00
8	Hospital	-	-	-	-	-	26,040.00
7	Health	-	-	-	-	-	26,505.00
10	Health	-	-	-	-	-	9,495.00
3A	Hospital	-	-	-	-	-	7,000.00
3B	Hospital	-	-	-	-	-	18,000.00
Police	Office	-	-	-	-	-	10,800.00
Total		**242,887**	**243,887**	**280,501**	**410,159**	**566,601**	**566,601**

Note: Presented as cumulative totals

Appendix C Demand Generation Rates

DEVELOPMENT CATEGORY	GENERATION RATES				
	Water supply network (EP)	Wastewater network (EP)	Stormwater quantity network (Imp Fr.)	Transport network (trips)	Parks and community facilities network (EP)
Commercial (Retail) (per m² GFA)	0.006	0.006	0.9	0.4	0.00102
Commercial (Office) (per m² GFA)	0.006	0.006	0.9	0.16	0.0037
Low Impact Industry (per m² GFA)	0.0048	0.0048	0.9	0.05	0.00115
Multi-Dwelling (1-2 Bedroom) (per dwelling)	1.75	1.75	0.9	4.2	1.78
Multi-Dwelling (3+ Bedroom) (per dwelling)	1.75	1.75	0.9	4.2	1.78
Community Purposes (per m² GFA)	0.006	0.006	0.9	0.15	0
Health Care Services (per m² GFA)	0.00206	0.003	0.9	0.389	
Research and Education (per m² GFA)	0.00041	0.0006	0.9	0.081	
Hospital (per m² GFA)	0.00618	0.009	0.9	0.123	
Emergency Services (per m² GFA)	0.00206	0.003	0.9	0.07	
Source	*SEQ Design and Construction Code (p. 44)*		*BCC LGIP Schedule 3 – SC3.1.3—Planned density and demand generation rate for a trunk infrastructure network (Principal Centre Zone)*	*BCC LGIP - Transport Extrinsic Material - Tables 4.3.1.1 to 4.3.1.3*	*BCC LGIP - Parks Extrinsic Material - Tables 4.3.1.1 to 4.3.1.2 - assumes 1 EP per person*

Appendix D Demand Projections

INFRASTRUCTURE		EXISTING AND PROJECT DEMAND (EP)				
	2020 (base date)	2020 - 2025 (TSD)	2025-2026	2027 - 2031	2032-2041	2041 (ultimate)
Water Supply Network	167		365	778	1,113	1,113
Wastewater Network	167		365	778	1,113	1,113
Stormwater Network	N/A		N/A	N/A	N/A	N/A
Transport Network	3,902		6,722	20,745	29,687	29,687
Communities Facility Network	103		278	480	687	687

Boggo Road Cross River Rail Priority Development Area
Baseline Potential Development Scenario
Staging Plan - Reference Scheme

Legend

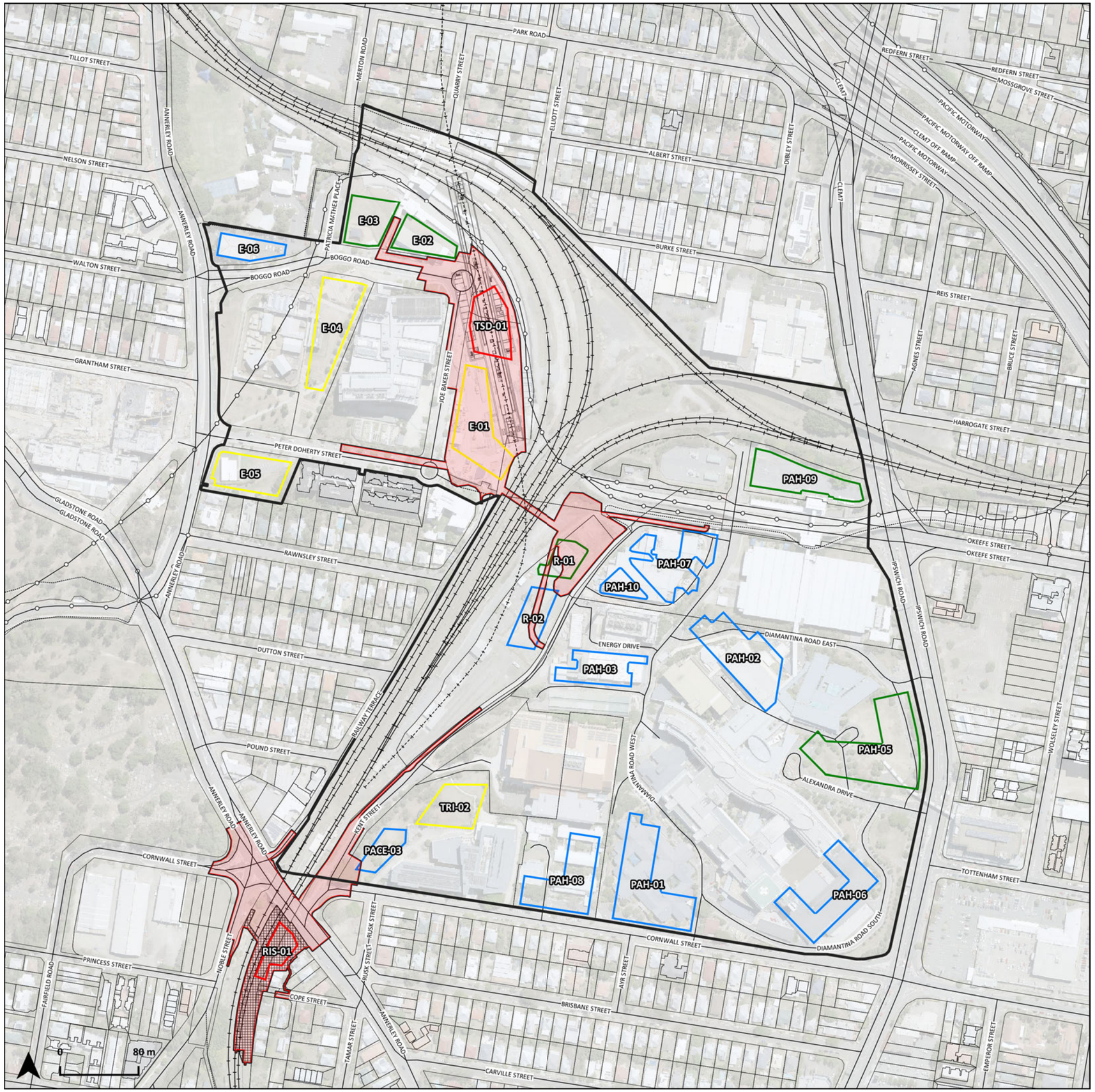
- Boggo Road CRR PDA Boundary
- CRR TSD and CRR RIS Delivery Area

PDA - Development Sites (by Stage & Year) (Indicative Only)
- Stage 1 (TSD & RIS) (2020 - 2025)
- Stage 2 (2025 - 2026)
- Stage 3 (2027 - 2031)
- Stage 4 (2032 - 2041)

Transport - Road, Transit
- Road
- Busways
- Tracks, Paths & Malls

Transport - Rail
- Operational
- Under Construction
- CRR TSD Boggo Road Station
- CRR RIS Dutton Park Station

Property - DCDB
- Base Parcels



NOTE:
Future PDA potential development opportunity sites and staging are conceptual and indicative only for infrastructure network analysis purposes.

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Revision: 05
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Data Sources
QLD Government 2021, Brisbane City Council 2021, Urban Utilities 2020

CROSSRIVERRAIL

Boggo Road Cross River Rail Priority Development Area Constraints

Legend

PDA
- Boggo Road CRR PDA Boundary

Buildings

Development Sites (by Stage & Year) (Indicative Only)
- Stage 1 (TSD & RIS) (2020 - 2025)
- Stage 2 (2025 - 2026)
- Stage 3 (2027 - 2031)
- Stage 4 (2032 - 2041)
- Existing Buildings

Stormwater

Flood Planning Control
- Flood Impact Assessment

Overlays & easements
- Heritage
- Busway Easement
- Constraints
- CRR RIS Dutton Park Station
- CRR TSD Boggo Road Station
- CRR TSD and CRR RIS Delivery Area

Note:
Future PDA potential development opportunity sites and staging are conceptual and indicative only for infrastructure network analysis purposes.

Ref	Stream	Owner	Name
C-01	Community & Infrastructure		Dutton Park State School carparking
C-02	Transport	CRRDA	Station Plaza
C-03	Transport	CRRDA	CRR Tunnel/Station Cavern
C-04A	Community & Infrastructure		Potential Outlook Park E-01
C-04B	Community & Infrastructure		Potential Outlook Park E-02 & E-03
C-05	Community & Infrastructure		Heritage Viewshed
C-06	Community & Infrastructure		Energex Substation
C-07	Stormwater		Proposed stormwater basin
C-08	Community & Infrastructure	PAH	Central Energy Unit
C-09	Stormwater		Flooding Area
C-10	Stormwater		Kent St Flooding (entire length of road)
C-11	Transport	CRRDA	QR Access & Maintenance Yard
C-12	PDA Development		Significant Tree
C-13	Community & Infrastructure		Medical Gas Storage & Loading Area
C-14	Community & Infrastructure		Shipping Container x 2
C-15	PDA Development		Laundry vehicle swept path conflict with other vehicles
C-16	PDA Development		Loading Bay x 3
C-17	PDA Development		Retaining wall
C-18	PDA Development		Retaining wall and stormwater pit
C-19	PDA Development		Laundry vehicle parking
C-20	PDA Development		Laundry loading bay x 2
C-21	Community & Infrastructure		Existing Boom Gate location
C-22	Transport		Current & future rail corridor access
C-23	Stormwater		Drainage Structure
C-24	Stormwater		New stormwater line with manhole access at ground level
C-25	Community & Infrastructure		Waste bins
C-26	PDA Development		Existing stairs
C-27	PDA Development		Existing access
C-28	PDA Development		Access to Building 62
C-29	PDA Development		Two way to/from TRI (& future TRI 2.0)
C-30	PDA Development		Existing Access
C-31	PDA Development		Existing Maintenance building - to remain

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Data Sources
QLD Government 2021, Brisbane City Council 2021, Urban Utilities 2020

CROSSRIVERRAIL

Appendix E Technical Memorandums / Network Summary Reports

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Technical Memo

Technical Memo No	30032260-SW-BOGGO-IPBR-001	**Date of Issue**	25 November 2021
Subject/Title	Boggo Road CRR PDA Stormwater Analysis		
Project Name	Cross River Rail	**Project Number**	30032260
Discipline	Stormwater Management		
Document Number	30032260–SW-BOGGO-IPBR-002		
Revision Details	03		
Authors	Sheyanne Frisby		
Reviewed by	Gustavo Pereira		
Approved by	Gustavo Pereira		
Prepared for	Cross River Rail Delivery Authority Purpose: **IPBR**	**Attention to**	Daniel Gallagher
Attachments	Attachment A – PDA Reference Design Plan Attachment B – Collated Norman Creek Stormwater Network Plan Attachment C – Currently Planned Stormwater Infrastructure Attachment D – BCC Flood Overlay – Overland Flow Attachment E – Proposed Trunk Stormwater Relocation (CRR) Attachment F – Trunk Stormwater Cost Estimate Attachment G – Flood Planning Map		

1 Executive Summary

This Technical Memo addresses the impact of the anticipated future development within the Boggo Road Priority Development Area (PDA) as part of the Cross River Rail (CRR) project, prepared for Cross River Rail Delivery Authority (CRRDA). The current scope of analysis will inform the preparation of the Boggo Road CRR PDA Development Scheme and associated Development Charges & Offset Plan (DCOP). This Technical Memo provides high level advice and recommendations to be adopted within the PDA.

The anticipated development (based on the indicative Reference Design prepared for planning purposes) will result in changes to the existing built form, both from the construction of new buildings and re-development of existing buildings. As result of those alterations, the total number of persons working and living within the Boggo Road CRR PDA is expected to increase considerably. The imperviousness of the site is also expected to increase by approximately 16% from the existing scenario.

In meetings held with Brisbane City Council (BCC), Officers advised that the existing downstream stormwater infrastructure in the major catchment is currently under capacity and no upgrades are proposed in the foreseeable future. BCC representatives also advised that given the projected increase in resident and employee population anticipated in the PDA, an improved stormwater network level of service is recommended to be applied in the PDA, to align with the Brisbane City Plan 2014 standards.

SMEC has undertaken a preliminary assessment of the existing stormwater infrastructure within the PDA and concluded that extensive works would be required to achieve a Desired Standard of Service (DSS) of 10% Annual Exceedance Probability (AEP) for the underground drainage network system. Furthermore, upgrades to

stormwater infrastructure within the PDA would increase flows to the already constrained external drainage system, potentially increasing the risk of flooding for downstream properties.

A separate assessment was prepared by others, as part of the CRR Tunnels, Stations and Development (TSD) scope of works, including the new Boggo Road CRR Station, to understand the potential flooding impacts of that scope of works. Following a review of that above material, it was identified that some of the land where new proposed buildings/civil works will be located is currently affected by flooding. Those works will therefore trigger a requirement for a more detailed Flood Impact Assessment which will identify impacts of future proposed development and the proposed mitigation measures. Building/civil works outside the flood affected areas will trigger stormwater assessment of the discharge increase generated by the works and control measures such as detention tanks.

As a result of the assessment, the following approach options were considered for adoption within the PDA in relation to the stormwater/flooding constraints:

- Accept a lower DSS across some areas of the CRR PDA. This may result in emergency evacuation plans and/or other restrictions to be adopted.
- Undertake additional flood and stormwater studies to identify potential mitigation measures to achieve the DSS required and identify whether the DSS can be achieved at different locations across the PDA, therefore directing the accepted type of development at each location.
- Undertake all augmentations necessary to the regional catchment (Norman Creek) stormwater infrastructure to achieve the DSS required. This will include works within the PDA and external works. It is understood that those works may be very extensive and could potentially be not feasible.

2 Introduction

2.1 Background

The Cross River Rail Delivery Authority (CRRDA) is preparing a Development Scheme for the Boggo Road Cross River Rail (CRR) Priority Development Area (PDA) to support the Queensland Government's Precincts Delivery Strategy (PDS) Boggo Road Precinct Vision.

The Boggo Road CRR PDA was declared on 2 October 2020 and covers approximately 39 hectares. It is generally bounded by Burke Street to the north, Cornwall Street to the south, Annerley Road to the west, and Ipswich Road to the east (refer Figure 2-1).

The vision for the Boggo Road CRR PDA is for a "World class innovation precinct, specialising in health, science and education jobs of the future".

This is to be achieved through enhancing the already established world-class health and research facilities with a focus on health, science and education services. The PDA will reinforce and maximise the precinct's role as a regionally significant economic cluster and enhance its reputation as a globally significant innovation precinct, facilitating skilled employment.

The Minister for Economic Development Queensland (MEDQ) has delegated certain functions and powers under the Economic Development Act 2012 to the CRRDA including those to plan, carry out, promote or coordinate activities to facilitate economic development and development for community purposes. The CRRDA is preparing a Development Scheme for the Boggo Road CRR PDA which will be applicable to development on land within the boundaries of the Boggo Road CRR PDA.

Refer Attachment A for the proposed PDA Reference Scheme.

Figure 2-1: Boggo Road CRR PDA Boundary

2.2 Objective

This Technical Memo provides an overview of the stormwater assessment undertaken for the Boggo Road CRR PDA, primarily focussed on the Kent Street and Joe Baker Street sections of the PDA where the main stormwater and flooding issues have previously been identified.

In order to facilitate development in the PDA, it was necessary to understand the capacity of the existing and planned stormwater infrastructure in the area, and to ascertain its reliability to convey flow away from the site and mitigate flood nuisance. An assessment of flood risk and potential mitigation measures related to future development opportunities is also provided.

2.3 Service Provider Engagement

The primary external stormwater network service provider is Brisbane City Council (BCC). Metro South Health (MSH) currently owns and operates some of the land affected by flooding within the Boggo Road CRR PDA.

Additional engagement may be required following the completion of this technical note.

3 Development Scenarios

3.1 Existing Scenario

Existing buildings within the Boggo Road CRR PDA are shown in more detail in Attachment B and described in Table 3-1 Existing / Previous Buildings in PDA. The status of the existing buildings is defined as follows:

- Removed (TSD): buildings within the precinct that were removed in 2019/20 as part of the CRR TSD early works
- Future removal: buildings that remain in place at the time of this investigation, however may be removed / replaced as part of a future development scenario
- No Change: buildings that will not be removed or replaced under the future development scenarios investigated

Table 3-1 Existing / Previous Buildings in PDA

Map Reference	Name	Plan Area (m^2)	Current / Potential Future Status
EX-101	Existing Ecoscience Precinct	8,699	No Changes
EX-103	Existing Dutton Park Police Station	837	No Changes
EX-104	Existing Boggo Road Sales Office	379	Future Removal
EX-105	Existing Boggo Road Gaol	1,880	No Changes
EX-201	Existing PACE Building	5,333	No Changes
EX-202	Existing PAH Building 39	317	Future Removal
EX-203	Existing PAH Building 37	508	Future Removal
EX-204	Existing PAH Building 35	529	Future Removal
EX-205	Existing PAH Building 33	521	Future Removal
EX-206	Existing PAH Building 31	745	Future Removal
EX-207	Existing PAH Building 07 (GARU)	5826	Future Removal
EX-208	Existing Pantheon Biologics Building	1929	No Changes
EX-209	Existing TRI Building	6376	No Changes
EX-210	Existing PAH Building 63	1610	No Changes
EX-211	Existing PAH Building 61 (General Support Services)	2078	Future Removal
EX-212	Existing PAH Building 62	331	No Changes

Map Reference	Name	Plan Area (m^2)	Current / Potential Future Status
EX-213	Existing PAH Building 57 (Central Energy Unit)	1881	No Changes
EX-214	Existing PAH Building 59	397	No Changes
EX-215	Existing PAH Building 05 (Diamantina Health Care Museum)	228	No Changes
EX-216	Existing PAH Building 11 (Loading Dock)	1483	No Changes
EX-217	Existing PAH Building 13 (Aquatic Physiotherapy Pool)	300	No Changes
EX-218	Existing PAH Building 19 (Mental Health Services)	3,229	No Changes
EX-219	Existing PAH Building 15 (Executive Building)	1,929	No Changes
EX-220	Existing PAH Building 17 (Spinal Injuries Unit)	1,679	Future Removal
EX-221	Existing PAH Main Hospital	2,1775	No Changes
EX-301	Existing PAH Building 55 (Laundry)	4,759	Future Removal
EX-302	Existing PAH Carpark	9,588	No Changes

3.2 Development Projects & Scenarios

The potential future developments and staging for the PDA are shown in Figure 3-1 Boggo Road PDA Existing Buildings and Potential Developments (Reference Scheme) be low and further detailed in Attachment B.

Figure 3-1 Boggo Road PDA Existing Buildings and Potential Developments

Note: Future PDA potential development opportunity sites and staging are conceptual and indicative only for infrastructure network analysis purposes.

The potential future developments are divided into four (4) stages, which are summarised in Table 3-2 Development Stages.

Table 3-2 Development Stages

Stage	Timing (Approx.)	Description
1	2020 - 2025	TSD Works (Station, Station Services)
2	2025 - 2026	Residential, commercial/retail building developments under BCC Planning Scheme (E4 & E5), TRI2 under Ministerial Infrastructure Designation (MID), and CRRDA Precinct Development Partner (E1)
3	2027-2031	Mixed office, allied health and health buildings, and CRRDA Precinct Development Partner (R1 and E2 & E3)
4	2032-2041	Mixed office, allied health and health buildings, and CRRDA Precinct Development Partner (R2)

The Reference Scheme includes the construction of 18 new buildings, some of which will replace existing buildings, whilst others will occupy vacant land. The majority of new buildings are intended to be office/research or health related uses, with a few for commercial / retail use (E4) and residential use (E5).

As a result of the proposed works, there will be a significant increase in the Gross Floor Area (GFA) and subsequently an increase in the population projected for the CRR PDA, mostly future employees. The characterisation of the land within the BCC Planning Scheme as a Special Centre with higher density land uses aligns with a Desired Standard of Service (DSS) for the drainage system to have a minor drainage system design standard of a minimum desired 10% Annual Exceedance Probability (AEP) (minimum design standard established in BCC's Planning Scheme – Infrastructure Design Planning Scheme Policy).

The individual development projects / buildings within each stage are described in Table 3-3 Development Projects / Buildings in PDA below.

Table 3-3 Development Projects / Buildings in PDA

Scope Owner	Stage	Building Reference	Development Type	Site Cover (m^2)
CRR TSD	Stage 1	CRR Station	Rail Station	
CRR Development Partner	Stage 2	E1	Office	25,855
Stockwell	Stage 2	E4	Retail	4,485
Stockwell	Stage 2	E5	Residential	6,741
Translational Research Institute (TRI)	Stage 2	TRI 2.0	Office	6,616
CRR Development Partner	Stage 3	E2	Office	20,544

Scope Owner	Stage	Building Reference	Development Type	Site Cover (m^2)
CRR Development Partner	Stage 3	E3	Office	19,308
MSH	Stage 3	09	Office	36,036
CRR Development Partner	Stage 3	R1	Health	14,550
MSH	Stage 3	05A	Hospital	39,220
CRR Development Partner	Stage 4	R2	Research	9,570
University of Qld	Stage 4	PACE3	Office	8,500
MSH	Stage 4	01	Hospital	22,620
MSH	Stage 4	02	Hospital	32,724
MSH	Stage 4	3A and 3B	Hospital	25,000
MSH	Stage 4	06	Hospital	14,288
MSH	Stage 4	07	Health	26,505
MSH	Stage 4	08	Hospital	26,040
MSH	Stage 4	10	Health	9,495

3.3 Impervious Area Analysis

An impervious area assessment was performed to determine the impact on impervious area, and potential runoff, resulting from the potential future development in the Boggo Road CRR PDA.

This analysis was undertaken using a GIS union / overlay analysis of the existing and developed scenario base. Assumed imperviousness fractions were adopted as shown in Table 3-4.

Catchment Condition

The scenario prior to the commencement of any CRR related works was adopted as the as shown in Attachment B (existing buildings) and described in Table 3-1 of this report. The scenario for the Reference Design was adopted as per Figure 3-1 and Table 3-3.

Refer Table 3-4 Imperviousness Area Calculation below for the total imperviousness of the site at the existing case and for the Reference Design.

Table 3-4 Imperviousness Area Calculation

Land Use	Road	Park	Roof	Exposed Soil	Total
Fraction Impervious	90%	5%	100%	55%	
Total Area					
Existing (m2)	27,649	25,331	2,723	25,856	81,559
Reference Design (m2)	31,927	21,317	23,325	4,990	81,559
Impervious Area					
Existing	24,884	1,267	2,723	14,221	43,095
Reference Design (m2)	28,734	1,066	23,325	2,744	55,870
Existing Imperviousness					53%
Reference Design Imperviousness					69%

As shown in Table 3-4 Imperviousness Area Calculation, at ultimate development (2041) the total imperviousness of the Boggo Road CRR PDA is anticipated to increase by 16%. Proposed future development projects with the highest impact to the impervious area are:

- E-02
- E-03
- E-04
- PAH-05
- PACE-03
- TRI-02

The Boggo Road CRR PDA is currently well developed, and whilst the increase in the imperviousness will result in some minor increase in the total runoff generated by the site, this can be accommodated as part of the building design in the form of on-site detention systems.

3.4 Existing and Currently Planned Infrastructure

SMEC has undertaken a data gathering exercise to understand all the available stormwater information for the Boggo Road CRR PDA. This data was added into a GIS workspace along with the BCC Stormwater data to identify the accuracy of the BCC dataset and to determine which features could be used to extract attributes from. Figure 3-2 Existing Internal Main Stormwater Network (Boggo Road PDA), and Attachment C shows the known existing stormwater network.

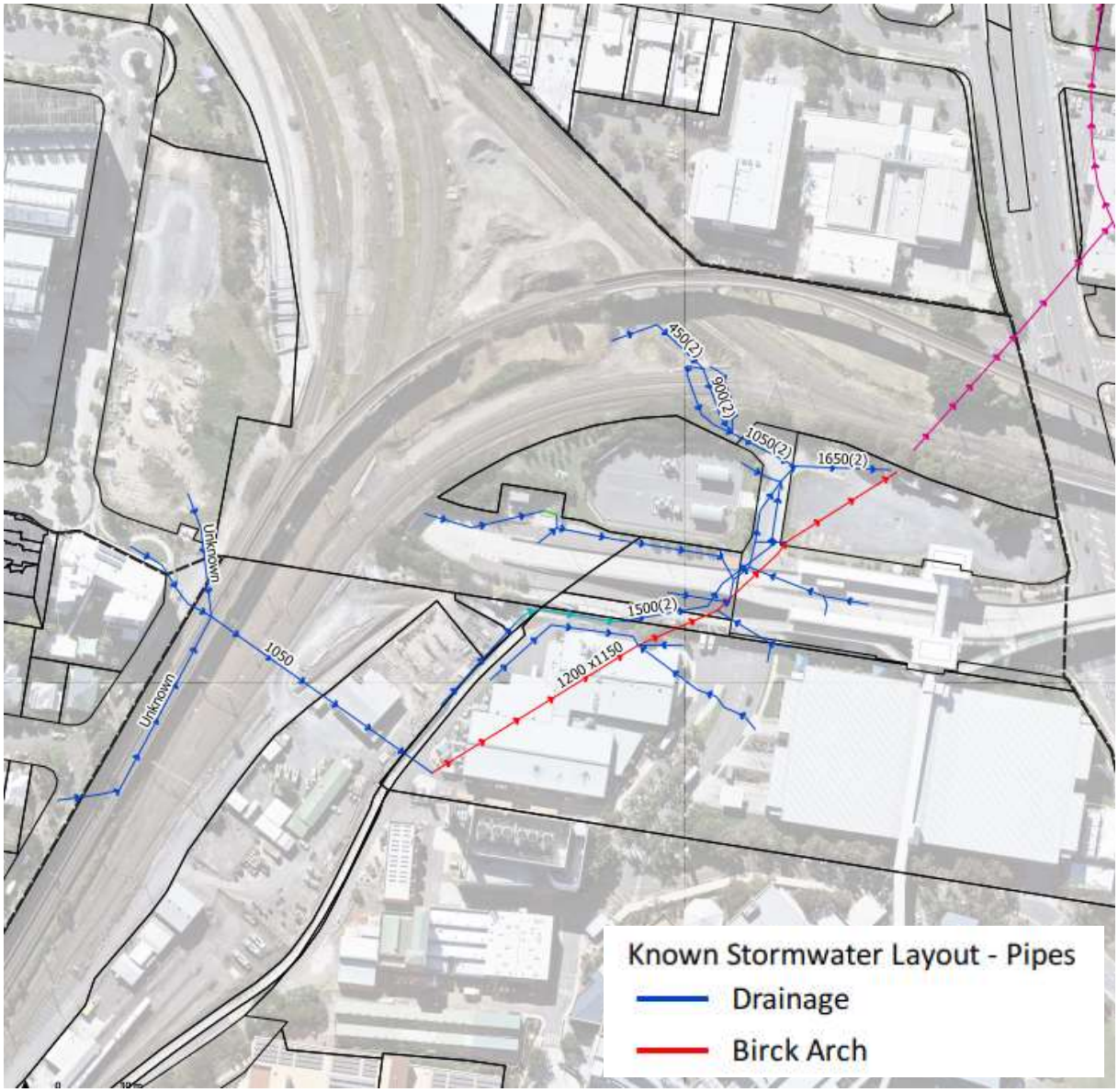


Figure 3-2 Existing Internal Main Stormwater Network (Boggo Road PDA)

BCC's Local Government Infrastructure Plan (LGIP) indicates future pipe relief works within the Norman Creek catchments, downstream of the PDA. The LGIP indicates those works are due to occur between 2021-2026, however Council has indicated in a meeting held in March 2021 that there are no currently planned infrastructure upgrades proposed for the catchment in the foreseeable future. Refer Attachment D for the currently LGIP stormwater plans for the area.

Some flooding mitigation works, including construction of detention basins are proposed as part of the CRR TSD works. The currently planned stormwater infrastructure as part of the TSD works is shown in Figure 3-3 Currently Planned Stormwater Infrastructure and Attachment D

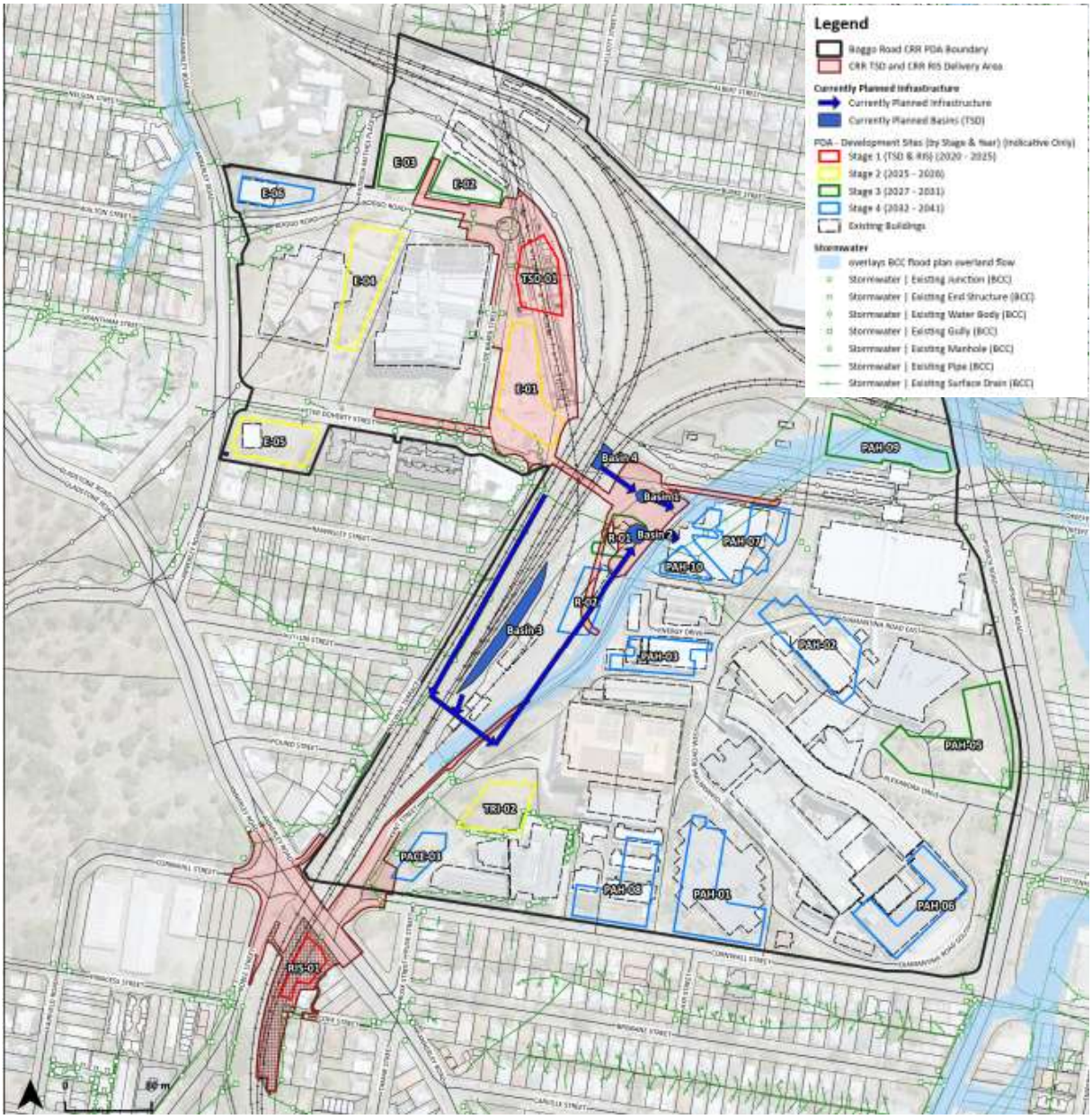


Figure 3-3 Currently Planned Stormwater Infrastructure

Note: Future PDA potential development opportunity sites and staging are conceptual and indicative only for infrastructure network analysis purposes.

4 Stormwater Assessment

4.1 Summary of Assessment

Further, BCC Planning Scheme (City Plan 2014) mapping identifies Kent Street and under the Eastern Busway as known locations for flooding nuisance with an overland flow path (BCC Flood Overlay) defined in this area (refer Figure 4-1 and Attachment E).

The trunk stormwater network was determined based on the available data and the catchments to the trunk network. The total catchment is 45 ha and includes the Ecosciences Precinct and nearby residential housing, Queensland Rail corridor, Princess Alexandra Hospital and Eastern Busway station.

The existing stormwater network was modelled using DRAINS software for the existing infrastructure located within and in the vicinity of the PDA, to identify existing constraints in the trunk network prior to the Boggo Road CRR PDA future development opportunities being realised. The major trunk network which begins in the suburb of Annerley, collects flow from the Boggo Road CRR PDA (Dutton Park) along Ipswich Road and continues through the suburbs of Woolloongabba and East Brisbane, collecting flow from auxiliary networks before discharging to Norman Creek near the Moorhen Flats Recreational Area along Lerna Street.

The tailwater for the network was chosen to be 9.5 m AHD, which is the approximate surface level of the stormwater infrastructure immediately downstream of the PDA. This was chosen as discussions with BCC during stakeholder meetings indicated that the network was known to be undersized and regularly flows full. Further, BCC advised that during the 10% AEP storm events, it is expected that the underground drainage network will be surcharging at that location.

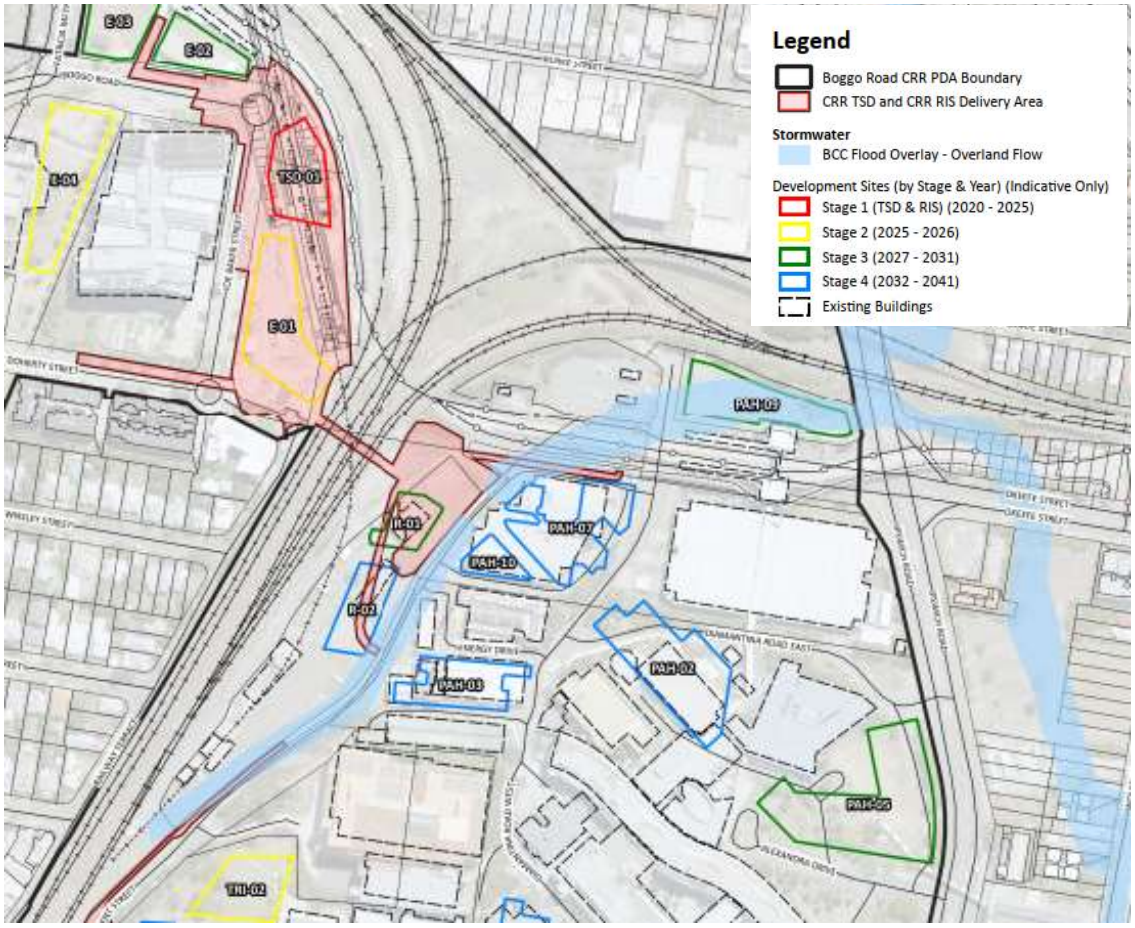


Figure 4-1 BCC Overland Flow Map for Boggo Road PDA

Note: Future PDA potential development opportunity sites and staging are conceptual and indicative only for infrastructure network analysis purposes.

4.2 Outcomes of Assessment

Initial DRAINS modelling undertaken by SMEC confirmed the trunk stormwater network was significantly undersized as suggested in the overland flow mapping (BCC City Plan, 2014) and stakeholder engagement meetings. Results showed that the trunk network could not convey the 10% Annual Exceedance Probably (AEP) event which is a desired level of service under the BCC City Plan 2014 for the planned future land uses. Multiple scenarios were modelled to determine the magnitude of the upgrades required to solve the stormwater conveyance issue. Outcomes were deemed unfeasible as the existing network, which is constructed underneath buildings, would require multiple parallel pipes to convey flow. Increasing the capacity of the

network in the Boggo Road CRR PDA would also increase pressures in already constrained, downstream pipes and would cause worsening in other areas. To fully understand the impact on the larger network, more detailed modelling would be required and potentially more upgrades beyond the PDA.

5 Preliminary Flooding Assessment of PDA

The flood report prepared for CRR TSD by Hatch dated February 2021 addresses the flooding conditions for part of the CRR PDA, following the completion of the CRR TSD works (scheduled for 2024/25). This provides an indication of the opportunities and constraints that will be presented for future development within the PDA.

5.1 External Constraints

A map of the existing Norman Creek catchment drainage infrastructure has been provided in Attachment C and shows the extent of the Norman Creek trunk network which is the greatest constraint of any potential infrastructure upgrades. As previously mentioned, upgrades to the stormwater network within the PDA may have impacts on the greater network that must be considered when determining the best option for stormwater mitigation within the PDA. Upgrades to the existing Norman Creek drainage infrastructure outside the PDA is not currently planned and is potentially unfeasible therefore has been considered as unchanged in all flood models completed to date.

5.2 Existing Flood Model

A flood model for the flood affected area of the CRR PDA area was prepared as part of the CRR TSD works.

The model completed analysed both scenarios, pre and post CRR TSD proposed works. It doesn't address however the additional impacts and mitigation required for the PDA development. As part of the CRR TSD works a number of mitigation measures, including augmentation of parts of the internal drainage network and the construction of on-site detention systems are proposed to mitigate the flooding impacts of the TSD works.

5.2.1 Outcomes of the Flood Model

As noted earlier, the CRR TSD works include a number of flood mitigation measures that will influence the further development of the PDA. The outcomes of the flood model identified the areas within the PDA that will remain affected by overland flooding after the TSD works, albeit in reduced scale that currently. This data has been used to define the planning controls for the development as described in the next sections.

6 Proposed Infrastructure Projects

As part of the CRR PDA development some further works may be required beyond the currently planned stormwater infrastructure. This may include the relocation of the trunk infrastructure located under future buildings PAH 03, 07 and 09 (items BGO-SW-01 and 02 as shown in Attachment F). The extent of trunk infrastructure to be relocated as part of the CRR PDA works is shown in Attachment F. Costs estimates for the trunk relocation is included in Attachment G.

To mitigate flooding within the PDA, one of the main opportunities is to safely store the excess stormwater volumes in dedicated areas that would not affect the nominated future development sites. Since the required flood storage volume may be very large, there is a potential stormwater harvesting opportunity by introducing the volume of water stored back into the PDA for water reuse. This will reduce the flooding issues within and possibly outside the PDA as well as introducing additional sustainability outcomes to the PDA. Further water balancing modelling is required to confirm the adequacy of this opportunity.

7 Conclusion and Recomendations

SMEC's preliminary assessment of the trunk stormwater network has confirmed that the existing stormwater infrastructure does not have enough capacity to safely convey the stormwater runoff generated within the site to meet the nominated DSS for the PDA (10% AEP). It has also been determined that the constraints to the existing stormwater infrastructure network extend much further beyond the PDA.

A flood study prepared for the CRR TSD works has identified the flooding characteristics for the PDA, and identified some mitigation measures to be included as part of the CRR TSD works. Whilst this alleviates some of the flooding and drainage issues, it doesn't address all flooding constraints within the PDA.

There are a number of flooding constraints that need to be addressed as part of future works to achieve the nominated DSS for the PDA. The additional works may include a combination of additional stormwater detention measures to be incorporated to the PDA, improvements to the overland flow paths throughout the PDA, and augmentation of the existing underground drainage network. Any works adopted, however, cannot cause any worsening to surrounding properties ,roads and rail transport infrastructure (both surface and underground). Thus, augmentation works may be required to be undertaken in areas downstream of the PDA.

The detailed options for the mitigation works, their feasibility, and practicality can only be determined once further studies are undertaken for the area. Based on the outcomes of the flooding study for CRR TSD, the following measures are recommended to be adopted as mitigation works and future assessment requirements:

- All future developments within the PDA are to provide an internal detention system.
- Development applications lodged within the Boggo Road CRR PDA are to include:
  - a Site-Specific Stormwater Assessment (SSSA) for future development of land mapped as "Discharge Control" on Figure 7-1 for the proposed development sites and buildings which are to provide mitigation measures as needed.
  - a Detailed Flood Modelling Assessment (DFMA) for future development of land mapped as or gaining access from land mapped as "Flood Impact Assessment" on Figure 7-1 for the proposed development sites and buildings which are to provide mitigation measures as needed.

  It is noted that this may result in reduced developable areas for some development sites.
- Future developments are to include a Flood Emergency Evacuation plan to mitigate risks due to limited accessibility during more intense storms.
- Residential uses to be avoided in areas affected by flooding (including those with limited accessibility), or land mapped as or gaining access from land mapped as "Flood Impact Assessment" on Figure 7-1.
- Future use of flood affected areas is to be in accordance with Brisbane City Plan (2014) Flood Overlay Code.
- Areas of ponding depth greater than 300mm to be protected from access by the public.
- PDA roads and open areas to be designed to ensure safe access is provided and unobstructed overland flow with safe depth vs velocity achieved.
- Unobstructed overland flow paths are incorporated into future PDA development and infrastructure designs, together with the relocation of pipes under existing buildings, to minimize the flooding hazard within the site.

The above items are to ensure the safety of both users and materials, assuming the DSS is not achieved for development sites within the PDA (due to existing and future stormwater/flooding issues). Some of the above will not be necessary if the drainage network (both underground and overland flow) is augmented in order to achieve the nominated DSS. It is anticipated however that this will require extensive works within and outside the PDA and may not be feasible. Refer to Attachment C for the catchment drainage system.

Some of the measures abovementioned may only be applicable to certain cases and not in all areas within the PDA. The main criteria that indicate what measures are relevant is the flooding impacts at the location of the proposed works. Areas within the PDA that are not flood prone do not require detailed flood modelling to be undertaken. For those areas, runoff discharge control measures should be in place (such as onsite detention

systems) to ensure there is no increase in peak flow runoff from the site or obstruction of flows from upstream catchment.

For development within flood affected areas, a flood impact assessment (supported by detailed flood modelling) is recommended to understand the impacts of the development and identify appropriate mitigation measures that may be incorporated into the development. This flood impact assessment is best undertaken using 2d flooding modelling, such as the most commonly used in Australia Tuflow, Mike Flood, Hec-Ras 2D.

The current BCC Overland Flow map indicates areas that are affected by overland flow type of flooding. However, the flood model prepared by Hatch provides a more accurate representation of the flooding within the site, due to the use of more site-specific data. It is recommended therefore that the information from the Hatch flood model be used to determine what level of assessment is required for each site. This is represented in Figure 7-1 Flooding Planning control below and in more detail in Attachment H.

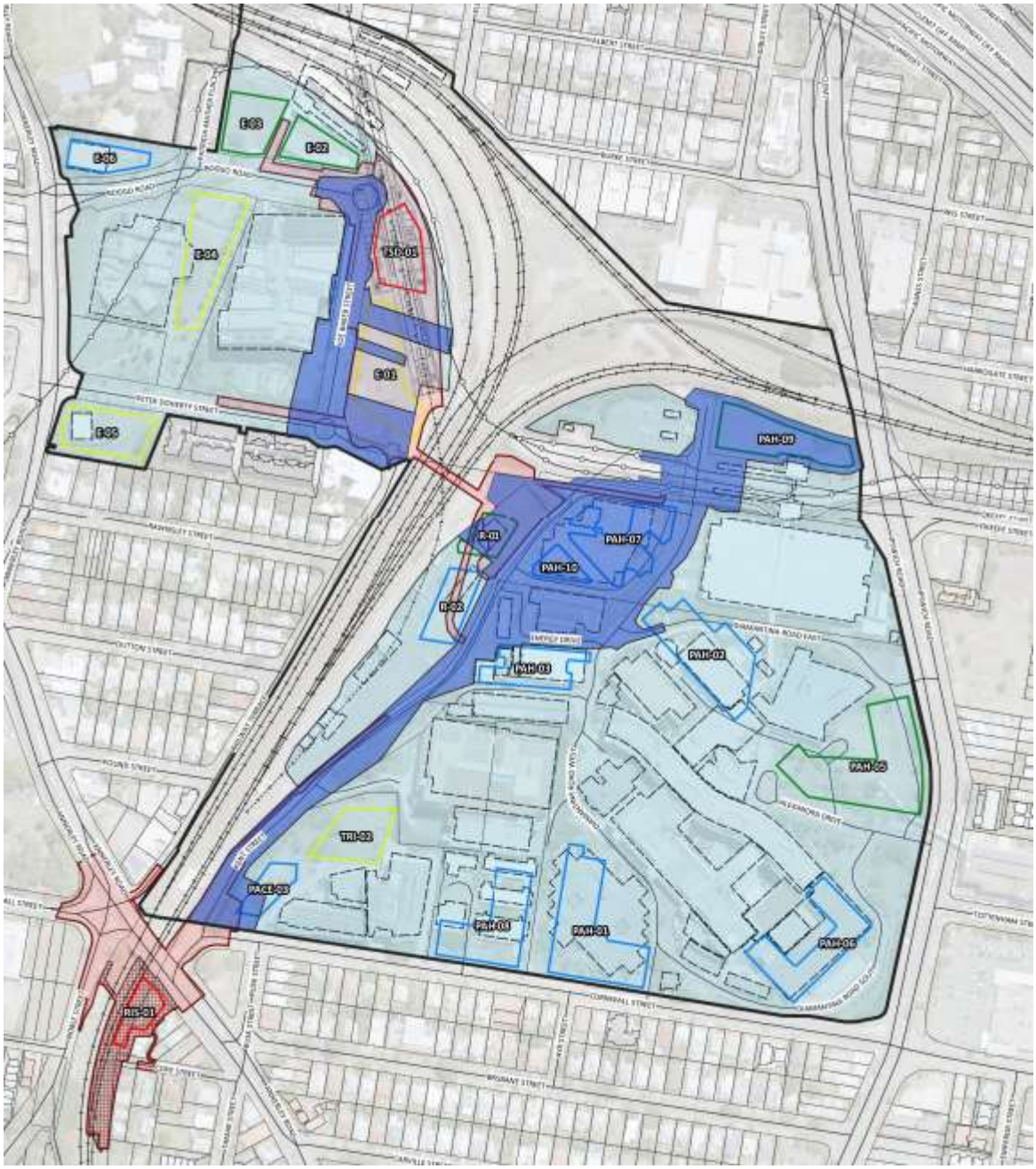


Figure 7-1 Flooding Planning control

Note: Future PDA potential development opportunity sites and staging are conceptual and indicative only for infrastructure network analysis purposes.

Appendix A PDA Potential Development Scenario Staging Plan

Boggo Road Cross River Rail Priority Development Area
Baseline Potential Development Scenario
Staging Plan - Reference Scheme

Legend

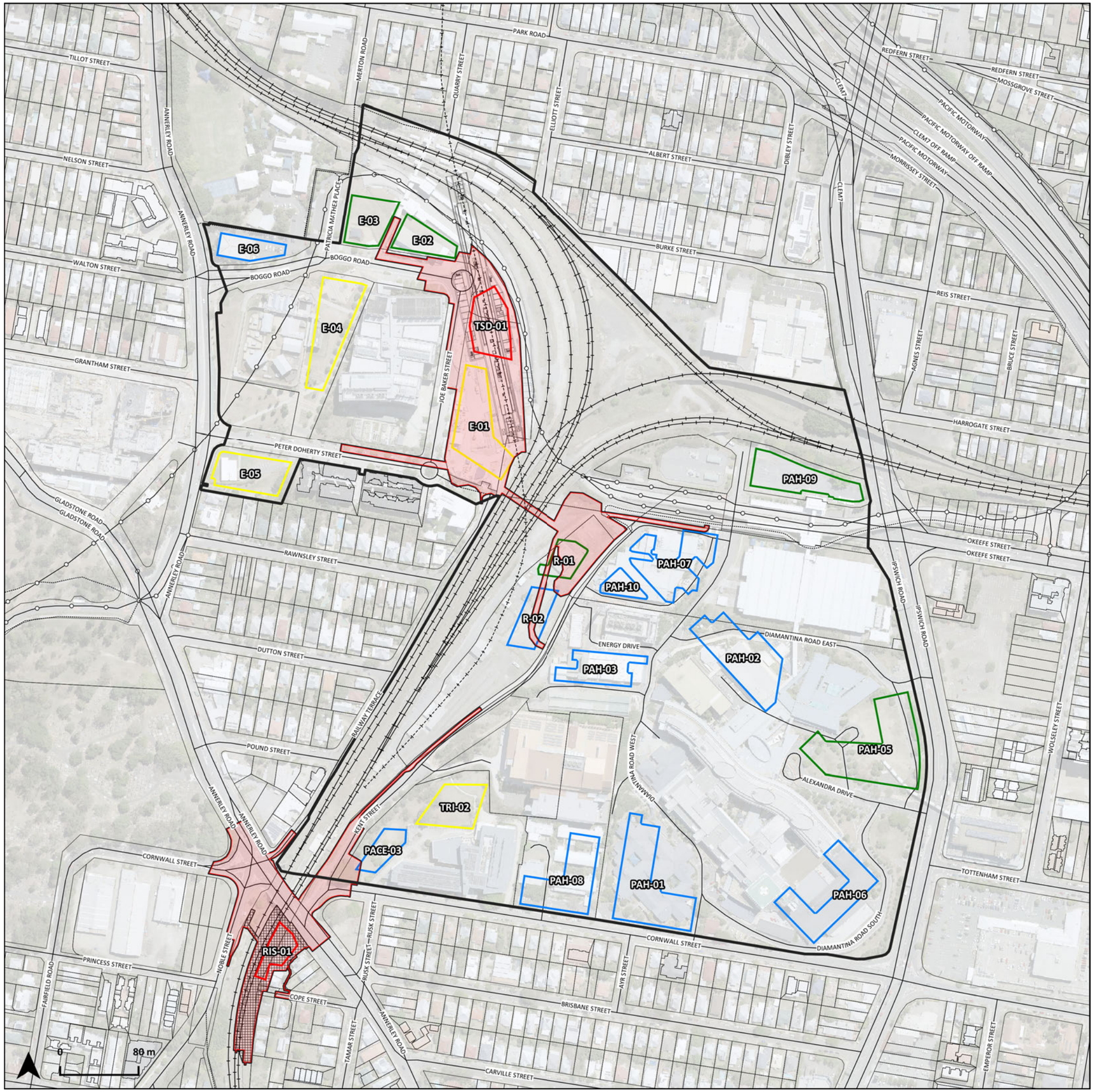
- Boggo Road CRR PDA Boundary
- CRR TSD and CRR RIS Delivery Area

PDA - Development Sites (by Stage & Year) (Indicative Only)
- Stage 1 (TSD & RIS) (2020 - 2025)
- Stage 2 (2025 - 2026)
- Stage 3 (2027 - 2031)
- Stage 4 (2032 - 2041)

Transport - Road, Transit
- Road
- Busways
- Tracks, Paths & Malls

Transport - Rail
- Operational
- Under Construction
- CRR TSD Boggo Road Station
- CRR RIS Dutton Park Station

Property - DCDB
- Base Parcels



NOTE:
Future PDA potential development opportunity sites and staging are conceptual and indicative only for infrastructure network analysis purposes.

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Data Sources
QLD Government 2021, Brisbane City Council 2021, Urban Utilities 2020

CROSSRIVERRAIL

Appendix B Collated Norman Creek Stormwater Network Plan

Boggo Road Cross River Rail Priority Development Area
Stormwater
Collated Norman Creek Stormwater Network Plan

Legend

PDA
- Boggo Road CRR PDA Boundary

Buildings

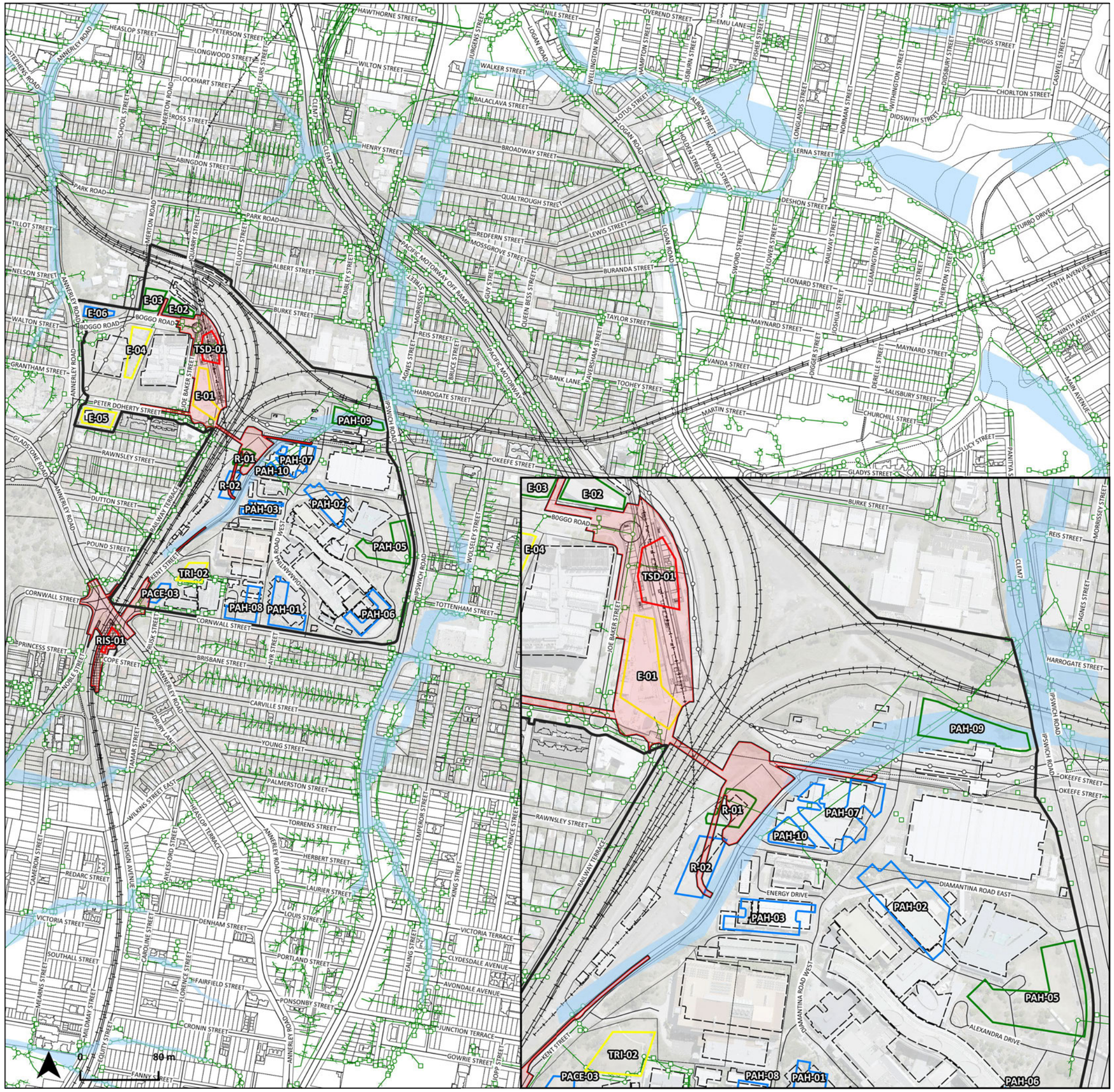
Development Sites (by Stage & Year) (Indicative Only)
- Existing Buildings

Stormwater
- Stormwater | Existing Junction (BCC)
- Stormwater | Existing End Structure (BCC)
- Stormwater | Existing Water Body (BCC)
- Stormwater | Existing Quality Improvement Device (BCC)
- Stormwater | Existing Gully (BCC)
- Stormwater | Existing Manhole (BCC)
- Stormwater | Existing Pipe (BCC)
- Stormwater | Existing Surface Drain (BCC)

Roads & Public Transport

Existing Rail
- CRR Alignment
- CRR TSD Boggo Road Station

Base
- Base Parcels



NOTE:
Future PDA potential development opportunity sites and staging are conceptual and indicative only for infrastructure network analysis purposes.

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Data Sources
QLD Government 2021, Brisbane City Council 2021, Urban Utilities 2020

CROSSRIVERRAIL

Appendix C Currently Planned Stormwater Infrastructure

BRISBANE CITY
City Plan
Local Government Infrastructure Plan

Future infrastructure

- Backflow prevention device
- Wetland
- Pipe - new
- Pipe - relief
- Natural channel
- Bioretention swale
- Culvert
- SQID
- Concrete lined channel
- Land acquisition - waterway corridor
- Natural channel
- Rehabilitation

Existing infrastructure

- Pipe
- Culvert
- SQID
- Natural channel
- Land acquisition
- Natural channel
- Rehabilitation
- SQID

Boundaries

- Suburb boundaries
- Priority infrastructure area
- Stormwater service catchments
- Property boundaries
- Individual network map boundaries
- Waterways

NOTES

This map is notional only and should not be used for interpreting City Plan provisions relating to specific sites. To properly interpret the maps, the planning scheme must be referred to.

As adopted by Council, effective as of XXth Xxxx 2021.

Based on Cadastral Data provided with the permission of the Department of Natural Resources and Mines.

While every care is taken to ensure the accuracy of this data, the Brisbane City Council and the copyright owners, in permitting the use of this data, make no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and disclaims all responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses, damages (including indirect or consequential damage) and costs which you might incur as a result of the data being inaccurate or incomplete in any way and for any reason.

Projection: Map Grid of Australia, Zone 56
Horizontal Datum: Geocentric Datum of Australia 1994

Approximate Scale @ A3 1:10,000

0 240 480
Metres

Plans for Trunk Infrastructure
Stormwater Network
Map SW213

Appendix D BCC Flood Overlay – Overland Flow

Boggo Road Cross River Rail Priority Development Area
BCC Overland Flow

Legend

- Boggo Road CRR PDA Boundary
- CRR TSD and CRR RIS Delivery Area

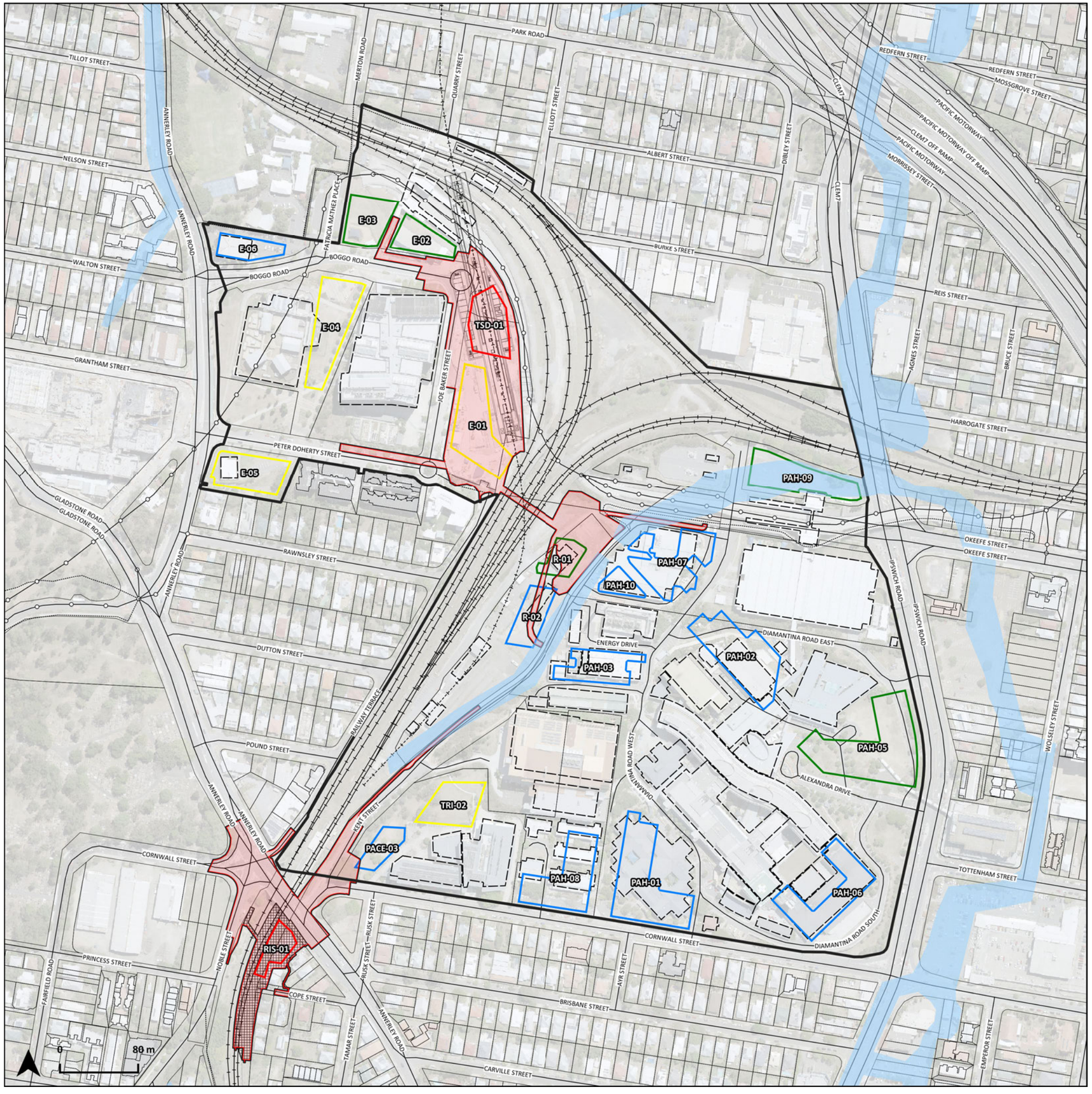
Stormwater
- BCC Flood Overlay - Overland Flow

Development Sites (by Stage & Year) (Indicative Only)
- Stage 1 (TSD & RIS) (2020 - 2025)
- Stage 2 (2025 - 2026)
- Stage 3 (2027 - 2031)
- Stage 4 (2032 - 2041)
- Existing Buildings

Transport - Road, Transit
- Road
- Busways
- Tracks, Paths & Malls

Transport - Rail
- Operational
- Under Construction
- CRR TSD Boggo Road Station
- CRR RIS Dutton Park Station

Property - DCDB
- Base Parcels



NOTE:
Future PDA potential development opportunity sites and staging are conceptual and indicative only for infrastructure network analysis purposes.

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Data Sources
QLD Government 2021, Brisbane City Council 2021, Urban Utilities 2020

CROSSRIVERRAIL

Appendix E Proposed Trunk Stormwater Relocation (CRR)

Boggo Road Cross River Rail Priority Development Area
Future Infrastructure Network Plan
Stormwater Infrastructure

Legend

- Boggo Road CRR PDA Boundary
- CRR TSD and CRR RIS Delivery Area

PDA - Development Sites (by Stage & Year) (Indicative Only)
- Stage 1 (TSD & RIS) (2020 - 2025)
- Stage 2 (2025 - 2026)
- Stage 3 (2027 - 2031)
- Stage 4 (2032 - 2041)
- Existing Buildings

Stormwater Projects

Stormwater Projects (All Stages)
- Stormwater Project Alignment

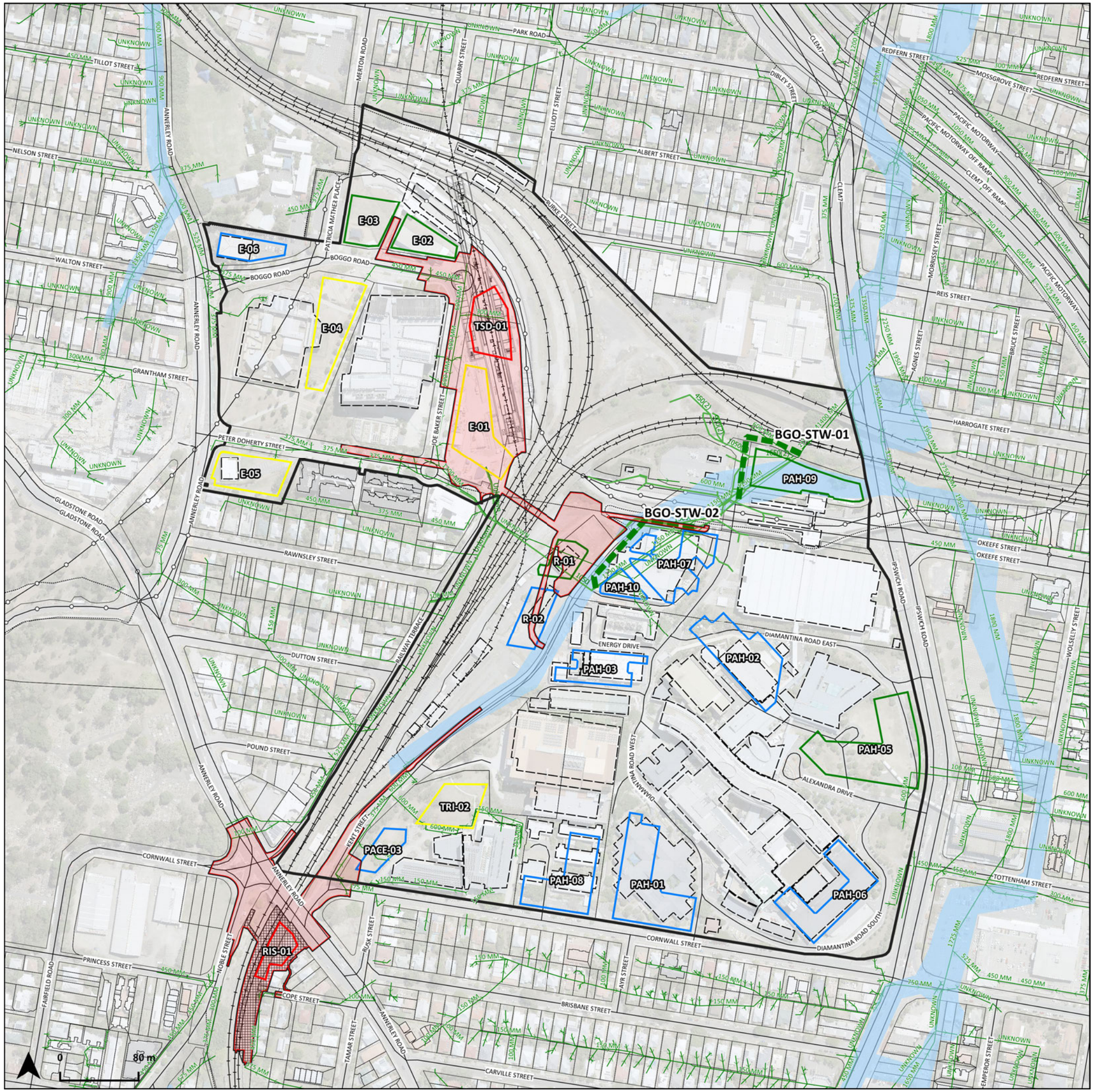
Known Stormwater Layout - Pipes
- Drainage
- Open Channel
- Pump Station

Flood Overlays
- overlays BCC flood plan overland flow
- Stormwater | Existing Pipe (BCC)

Transport - Road, Transit
- Road
- Busways
- Tracks, Paths & Malls

Transport - Rail
- Operational
- Under Construction
- CRR Alignment
- CRR TSD Boggo Road Station
- CRR RIS Dutton Park Station

Property - DCDB
- Base Parcels



NOTE:
Future PDA potential development opportunity sites and staging are conceptual and indicative only for infrastructure network analysis purposes.

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Data Sources
QLD Government 2021, Brisbane City Council 2021, Urban Utilities 2020

CROSSRIVERRAIL

Appendix F Trunk Stormwater Cost Estimate

Appendix G Flood Planning Map

Boggo Road CRR PDA
Stormwater
Map 30032260-BOG-STO-MAP-0003
BCC Overland Flow and Flood Impact

Legend

- Boggo Road CRR PDA Boundary

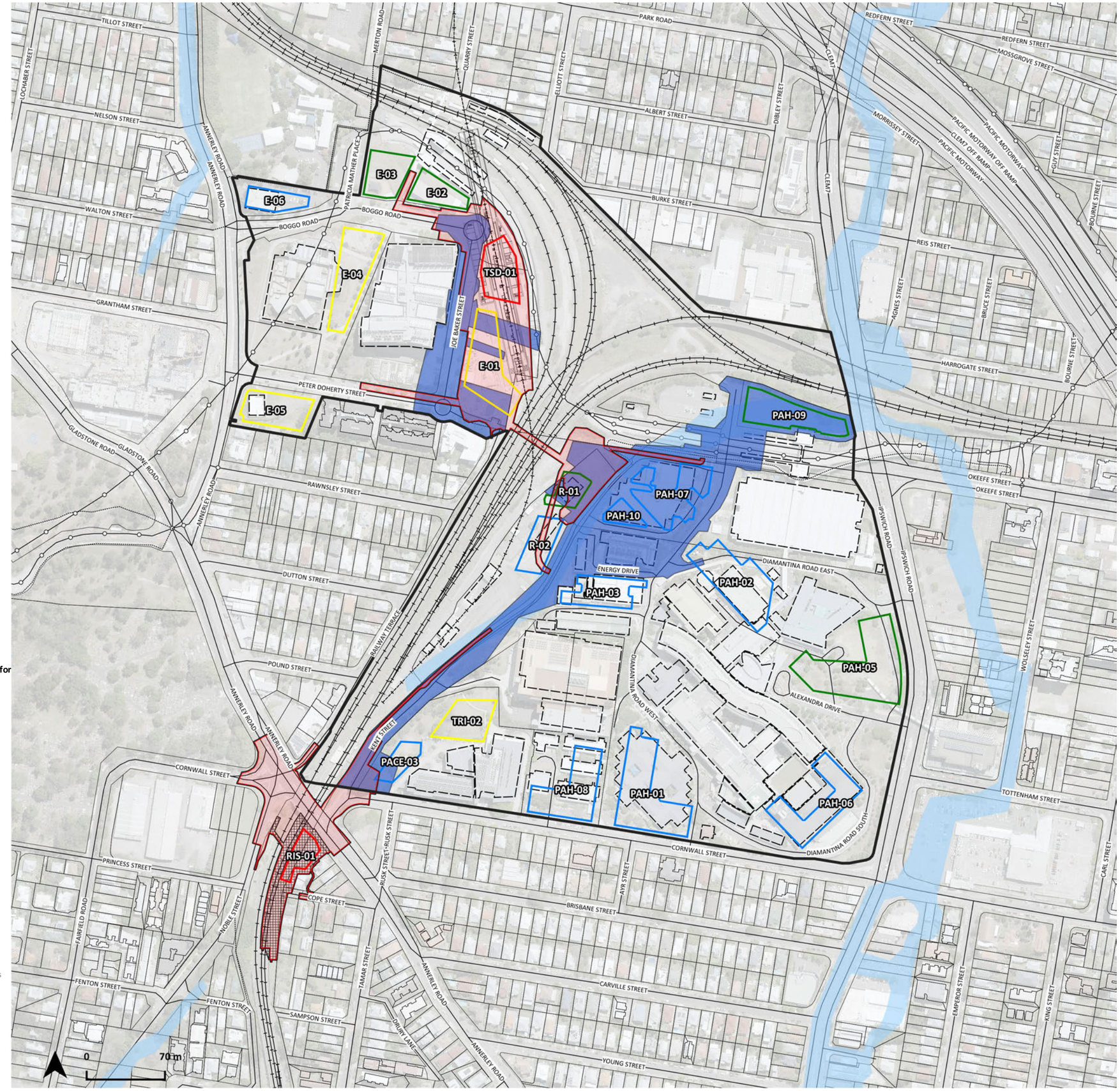
PDA | TSD Delivery Area

Development Sites (by Stage & Year) (Indicative Only)
- Existing Buildings
- Base Parcels

PDA - Development Sites (by Stage & Year) (Indicative Only)
- Stage 1 (TSD & RIS) (2020 - 2025)
- Stage 2 (2025 - 2026)
- Stage 3 (2027 - 2031)
- Stage 4 (2032 - 2041)

Flood Planning Control
- Discharge Control
- Flood Impact Assessment

NOTE:
Future PDA potential development opportunity sites and staging are conceptual and indicative only for infrastructure network analysis purposes.



Data Sources
QLD Government 2021, Brisbane City Council 2021, Urban Utilities 2020

CROSSRIVERRAIL

Boggo Road Cross River Rail Priority Development Area
Stormwater
Map 01 | Flood Planning Map

Legend

- Boggo Road CRR PDA Boundary
- CRR TSD and CRR RIS Delivery Area

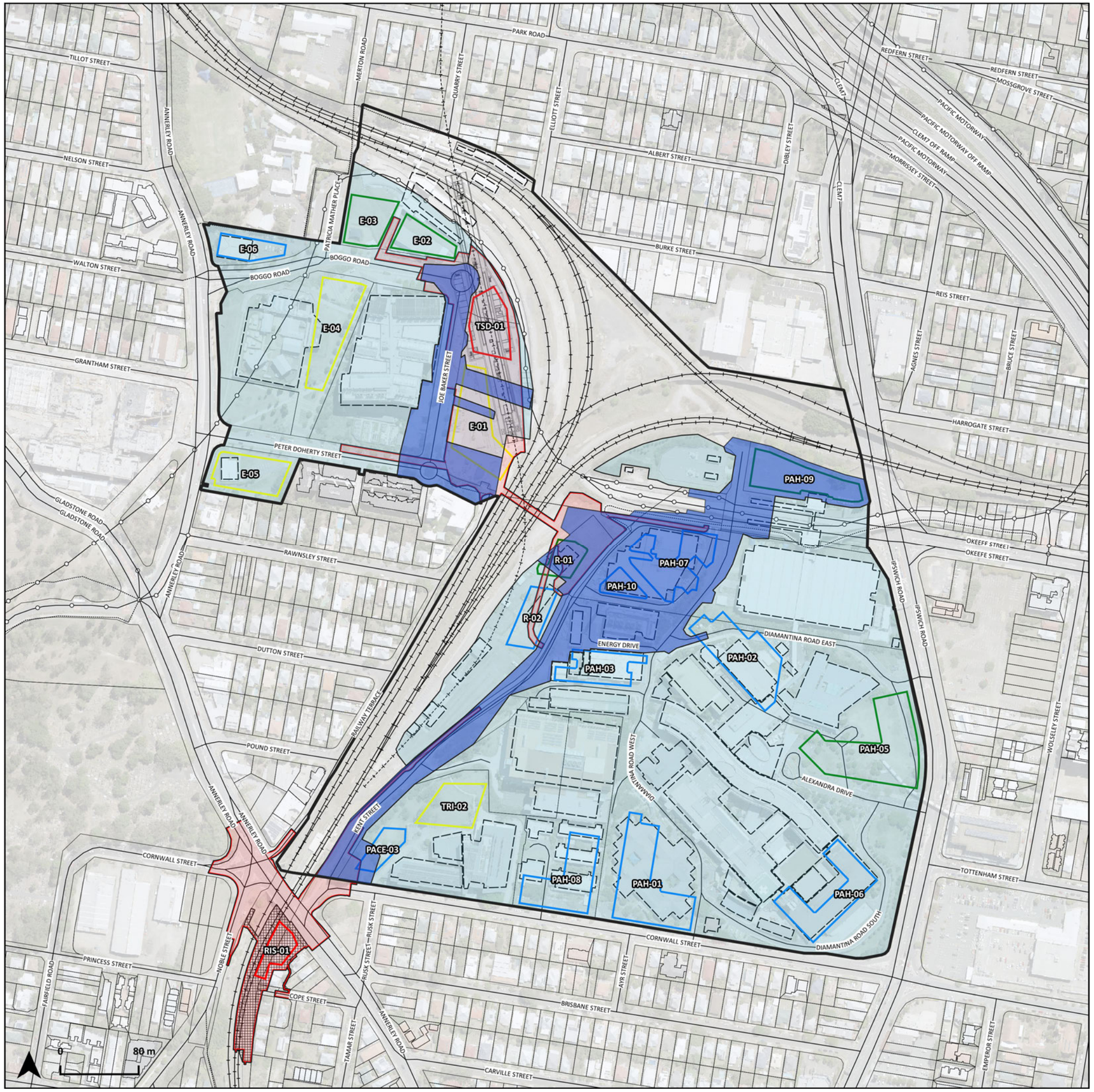
Flood Planning Control
- Discharge Control
- Flood Impact Assessment

Development Sites (by Stage & Year) (Indicative Only)
- Stage 1 (TSD & RIS) (2020 - 2025)
- Stage 2 (2025 - 2026)
- Stage 3 (2027 - 2031)
- Stage 4 (2032 - 2041)
- Existing Buildings

Transport - Road, Transit
- Road
- Busways
- Tracks, Paths & Malls

Transport - Rail
- Operational
- Under Construction
- CRR TSD Boggo Road Station
- CRR RIS Dutton Park Station

Property - DCDB
- Base Parcels



NOTE:
Future PDA potential development opportunity sites and staging are conceptual and indicative only for infrastructure network analysis purposes.

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Boggo Road CRR PDA Planning – Transport Summary Report

Cross River Rail Delivery Authority – Transport Summary - Infrastructure Plan Background Report

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1 Introduction

1.1 Background

This transport network summary report provides an assessment of the existing roads, public transport (PT) and active transport (AT) (pedestrians and cyclists) infrastructure supporting the Boggo Road Cross River Rail (CRR) Priority Development Area (PDA) and opportunities to enhance provision to ensure:

- Access to/from the new Boggo Road CRR Station
- Access to/from and between future Boggo Road CRR PDA developments
- Access within the wider network
- Increased AT and PT mode share as a result of both the above.

The Queensland Government's CRR Precincts Delivery Strategy (The Strategy) sets a vision for each CRR Station Precinct that is aligned to the Government's policy priorities. The Strategy sets out a vision for the Boggo Road Precinct to become a world class innovation precinct, specialising in health, science and education jobs of the future.

This is to be achieved through enhancing the already established world-class health and research facilities with a focus on health, science, and education services. The Boggo Road CRR PDA will reinforce and maximise the precinct's role as a regionally significant economic cluster and enhance its reputation as a globally significant innovation precinct, facilitating skilled employment.

To support the Government's vision for the precinct, the current Boggo Road CRR PDA was declared by the Minister for Economic Development Queensland (MEDQ) on 2 October 2020 and an Interim Land Use Plan (ILUP) given effect. The Boggo Road CRR PDA was declared to assist with the delivery of the CRR Project's broader objectives.

Significant existing facilities and government land holdings are located within the Boggo Road CRR PDA which will support the continued focus and investment in health, science, innovation, research and education services. These facilities and land holdings include the Boggo Road Knowledge and Innovation Precinct (which includes the Ecosciences Precinct, Dutton Park Police Station and the heritage listed Boggo Road Gaol), the Pharmacy Australia Centre of Excellence (PACE), the Translational Research Institute (TRI) and the PAH.

The Boggo Road CRR PDA is generally bounded by Burke Street to the north, Cornwall Street to the south, Annerley Road to the west, and Ipswich Road to the east. The Boggo Road CRR PDA does not include Dutton Park State Primary School or the new Brisbane South State Secondary College (BSSSC) although these facilities have an important relationship to the health, science, innovation, research and education focus of the Boggo Road CRR PDA.

The MEDQ has delegated certain functions and powers under the Economic Development Act 2012 to the Cross River Rail Delivery Authority (CRRDA) including to plan, carry out, promote or coordinate activities to facilitate economic development and development for community purposes. The CRRDA is preparing a Development Scheme for the Boggo Road CRR PDA which will be applicable to development on land within the boundaries of the Boggo Road CRR PDA. From the date of its approval, the development scheme will replace the Boggo Road CRR PDA ILUP.

1.2 Study Area

The Boggo Road CRR PDA, identified in Figure 1-1, is approximately 39 hectares. It is a transit rich environment that includes a significant public transport interchange incorporating the new underground Boggo Road CRR station and tunnels (CRR Tunnels, Station and Development – CRR TSD), existing Park Road surface rail station and the CRR Rail Integration and Systems (CRR RIS) delivered new Dutton Park Station (providing improved

access to the PAH), and rail lines (Beenleigh/Gold Coast and Cleveland lines), and existing Eastern Busway stations (Princess Alexandra Hospital (PAH) and Boggo Road) and tunnels. The Boggo Road CRR PDA also includes significant existing and planned AT infrastructure including the PAH cycleway and the new Central Active Transport Connection Bridge (Central Bridge) which is being delivered as part of the CRR project. Figure 1-1 shows the Boggo Road CRR PDA Boundary as declared in October 2020.

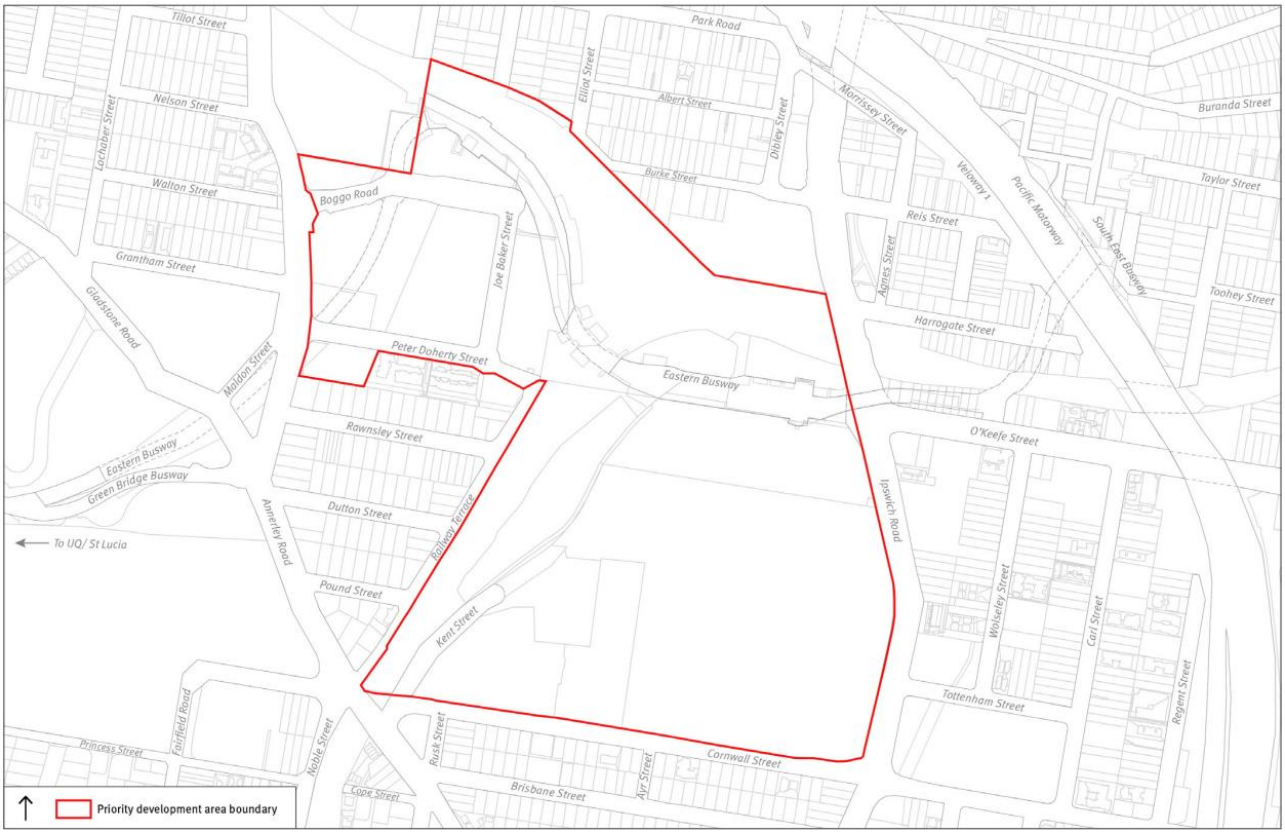


Figure 1-1: Boggo Road CRR PDA Boundary – Prepared by CRRDA (Map 1)

1.3 Objectives

This report provides a summary assessment of roads, PT and AT network infrastructure and identifies potential upgrades required to service future proposed development within the Boggo Road CRR PDA and the surrounding network. The outcomes of this report will assist in informing infrastructure plans for the Boggo Road CRR PDA Development Scheme and its supporting material, including a Development Charges and Offsets Plan (DCOP). This report sets out key transport infrastructure required to:

- Provide access and movement for all transport modes, with safety and convenience for walking and cycling prioritised over private and service vehicles
- Not impact on the efficiency or safety of surrounding transport networks
- Provide carparking and servicing to meet the functional requirements of the Boggo Road CRR PDA.

1.4 Assessment Methodology

This assessment was undertaken via onsite inspections, a desktop review of relevant documents research, and applying this to assess the proposed transport infrastructure. A range of relevant literature was reviewed, including:

- Brisbane City Council (BCC) City Plan 2014

- BCC Active Transport Strategy 2012-2026
- BCC Road Planning Notes
- Department of Transport and Main Roads (TMR): South East Queensland Principal Cycle Network Plan (SEQPCNP)
- TMR: Guideline, Selection and design of cycle tracks
- TMR: Queensland Walking Strategy 2019-2029
- TMR: Queensland Cycling Strategy 2017-2027
- Metro South Heath (MSH) PAH Masterplanning and technical reports
- Approved BCC development applications (DAs)
- Approved Ministerial Infrastructure Designation (MID) schemes
- Queensland Education Brisbane South State Secondary College (BSSSC) Masterplanning and technical reports.

The data, tools and research applied to undertake a desktop review of the proposed transport infrastructure include:

- Austraffic Classified Turn Counts 2021
- TTM Classified Turn Counts 2021 (Provided by MSH)
- TMR Open Data – Annual Cyclist Counts
- TransLink Ticketing Data 2019
- Brisbane Central Area Saturn Model (BCASM)
- Brisbane Strategic Transport Model (BSTM)
- Level of Service for Metrics (for Network Operations Planning) by Austroads (AP-R47515), Jan 2015
- SIDRA 9 to calculate intersection operation and performance
- Strava Global Heatmaps.

1.5 Desired Level of Service

In planning for future infrastructure provision and determining appropriate upgrades, it is noted that BCC's transport network Desired Standard of Service (DSS) contained in Part 4 – Local Government Infrastructure Plan (LGIP) of BCC's City Plan 2014 sets the following benchmarks:

- LGIP DSS Section 4.4.2.1 (d) – Road Networks:
    - (i) The off-peak operation of the road network provides a Level of Service (LoS) C
    - (ii) The peak period operation of the road network provides a LoS C, except where the road network is highly constrained and the use of alternative modes of transport in these areas is anticipated in the mode share targets stated in Map C3 Transport Network DSS Mode Share Targets.
- LGIP DSS Section 4.4.2.2 – Pathway Network:
    - (a) Provide a safe, attractive and convenient pedestrian and cycle pathway network that links residential areas to employment areas, major activity nodes, education facilities and PT interchanges, thereby encouraging walking and cycling as acceptable travel alternatives

(b) Plan, design and deliver the pathway network and associated infrastructure to comply with the following:

(i) The pathway network classification (as identified on the Bicycle network overlay map), connectivity, safety and access in accordance with the Infrastructure design planning scheme policy and the Bicycle network overlay code

(ii) Infrastructure design planning scheme policy (Chapters 1 and 4)

(iii) Bicycle network overlay code

(iv) Pathways are planned to provide for future demand needs in accordance with the Bicycle network overlay map and the Bicycle network overlay code.

It is noted that the Pathway Network does not apply a LoS, however, LoS C has been considered for typical commuter peaks noting a better LoS may be appropriate within and surrounding the PAH. Whilst future proofing for the use of micro-transport within the Boggo Road CRR PDA could encourage greater integration between Precinct 1 and Precinct 3 as described in section 2.1.

Future upgrades to or new AT infrastructure are recommended as options for consideration and discussion. These options have considered the feasibility of connections to the existing AT infrastructure internal and external to the Boggo Road CRR PDA.

For roads and PT, given the Boggo Road CRR PDA is within an existing concentrated urban environment which includes built-up land-uses along surrounding arterials and existing network congestion, there are limited opportunities to upgrade existing infrastructure. The assessment criteria of no net worsening of the physical condition or operating performance of state transport infrastructure and the associated transport network has been applied to this assessment. BCC road planning notes have been provided which are not committed works but identify the intention to plan for future network visions and provisioning of corridors for all transport modes.

1.6 Exclusions and Limitations

This report is not providing detailed design of proposed future transport infrastructure or built form details such as carparking and service requirements. This report has assessed a Baseline Potential Development Scenario with potential land use yields and staging.

Further, the final land-use proportions are unknown, and the values outlined within this report are indicative for planning purposes. Finally, whilst the PAH campus is within the Boggo Road CRR PDA and assumptions have been made to accommodate this assessment at the time of writing, it is noted that PAH Masterplanning is being revised, and includes a transport assessment and a car parking management strategy which in turns drives a traffic impact assessment (TIA), and if required, any mitigation measures.

2 Boggo Road CRR PDA

2.1 Overview

2.1.1 Transport Vision and Connectivity by Precinct

The Boggo Road CRR PDA created the opportunity to reinforce the Precinct as a key southern city destination and transport interchange with direct connections to the CRR rail network and Brisbane Metro services.

New and enhanced high-quality, sub-tropical, public realm will provide improved connectivity for pedestrians and cyclists between rail, bus and major institutional facilities within and surrounding the precinct. New civic spaces will be vibrant, open, and green, and revitalisation of landmarks such as the Boggo Road Gaol will celebrate the precinct's unique history and identity and contribute to its distinct character.

The current draft proposed Boggo Road CRR PDA Development Scheme (August 2021) refers to the Boggo Road CRR PDA being made up of three precincts, each having its own precinct intent, preferred uses and sub-areas. Figure 2-1 shows the Boggo Road CRR PDA boundary and describes the intent for each of the three precincts defined within the Boggo Road CRR PDA.

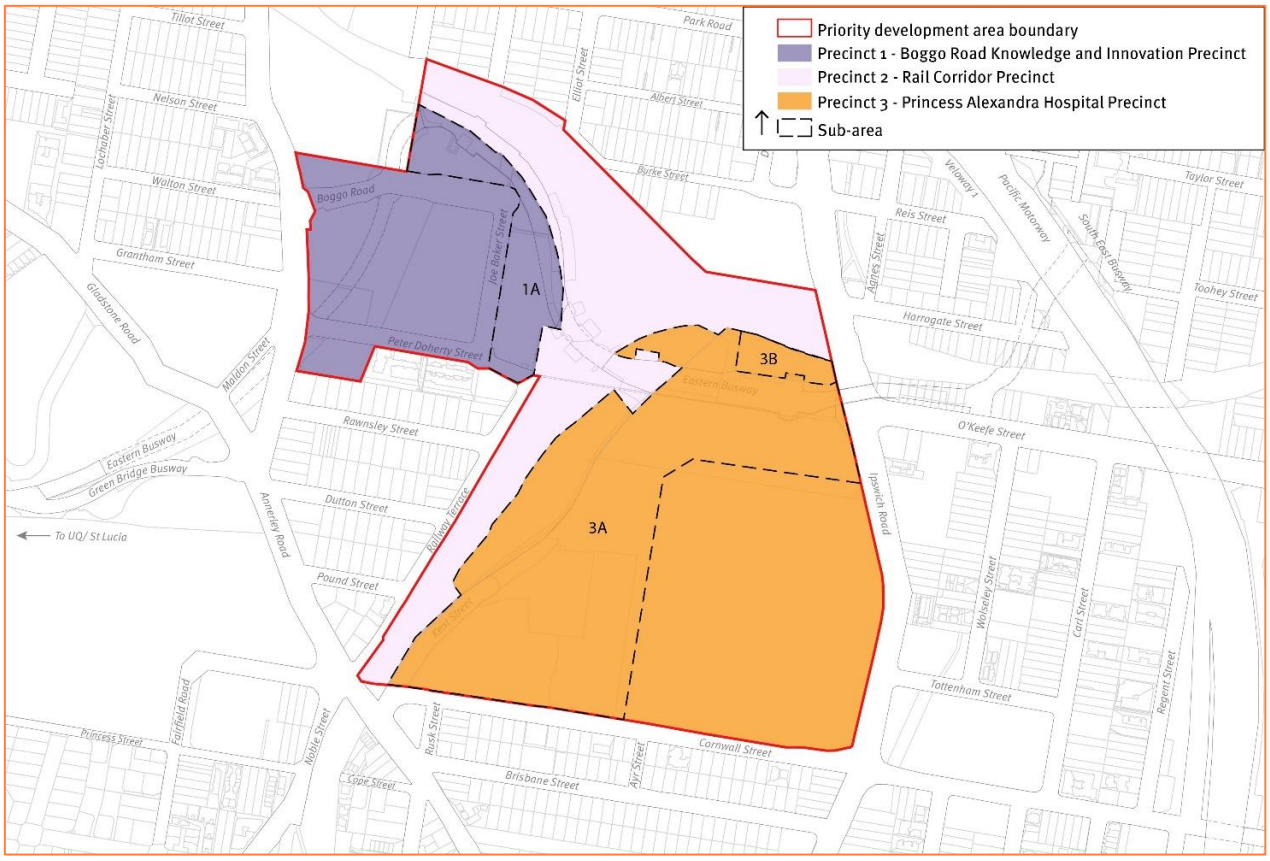


Figure 2-1: Boggo Road CRR PDA draft Proposed Development Scheme – Precinct Boundary Map (10/08/2021) – Prepared by Place Design Group

2.1.1.1 Precinct 1 – Boggo Road Knowledge and Innovation Precinct (Boggo Road Precinct) – Precinct Intent

This is a vibrant mixed-use precinct, with concentration on knowledge, research and innovation activities integrated with high-quality public realm. The precinct will be a high frequency transit destination and thriving hub of activity, providing a memorable and engaging experience for commuters, workers, visitors, students, and local community. The precinct is not intended to accommodate additional residential development, however, a site has an existing approved development application (DA) (lodged with Brisbane City Council (BCC) prior to the Boggo Road CRR PDA being declared) for up to 82 units.

2.1.1.2 Precinct 2 – Rail Corridor Precinct – Precinct Intent

This precinct is intended to maintain the primary function of accommodating key state transport corridors, including the heavy railway and busway corridors that traverse the Boggo Road CRR PDA. Through the delivery of the Central Bridge, the precinct will serve an important role in resolving a complex physical barrier between Boggo Road and PAH Precincts by improving AT functionality and access.

The precinct will maintain appropriate interfaces to development and infrastructure both within the precinct, and as it interfaces with the Boggo Road Precinct and PAH Precinct. Major development activity beyond core transit functions is not readily anticipated within the precinct.

2.1.1.3 Precinct 3 – Princess Alexandra Hospital (PAH) Precinct – Precinct Intent

This precinct is anchored by the PAH, a national leading tertiary health care centre and associated world-class academic and research institutions, the TRI and PACE. The continued growth and advancement of these major health and knowledge facilities will drive renewal and redevelopment across the precinct.

The precinct will accommodate new hospital and research related development and facilities that respond to the changing community health needs, optimised clinical operations and renewal of ageing buildings or non-essential uses. Through staged renewal and redevelopment, the precinct will provide new and enhanced public spaces, improved wayfinding, and support complementary uses and improved amenity for patients, employees, and visitors. Development within Sub-Area 3A will accommodate clinical uses and a greater intensity of research, innovation, and allied commercial activity, situated along the rail corridor, and leveraging off the improved AT functionality of the Central Bridge.

2.2 Land Use Scenario and Indicative Strategy

The land use mix for the Boggo Road CRR PDA is anticipated to be predominantly office, Hospital/health, research, and education, with a minor amount of residential, retail and commercial uses. The Baseline Potential Development Scenario – Reference Scheme and the potential land uses are as listed in Table 2-1 noting it is a reference scheme and subject to change both in scale and timing. Whilst Appendix C includes the potential development yields and indicative staging plans for Boggo Road CRR PDA planning, there are three (3) potential development stages and associated sites being investigated, as illustrated below in Figure 2 1.

Table 2-1: Boggo Road CRR PDA Potential Land Uses (GFA) and Units – Reference Scheme (Indicative Only)

Stage (Timing)	Building Name	Land Use	GFA/Dwelling	Units
Stage 2 (2025 – 2026)	E-01	Office	25,855	GFA
	E-04	Retail	1,935	GFA
		Commercial	2,550	GFA
	E-05	Residential	82	Dwellings
	TRI2.0	Office	6,616	GFA
Stage 3 (2027 – 2031)	E-02	Office	20,544	GFA
	E-03	Office	19,308	GFA
	PAH-9	Office	36,036	GFA
	R-01	Health	14,550	GFA
	PAH-05	Hospital	39,220	GFA
Stage 4 (2032 – 2041)	R-02	Research	9,570	GFA
	PACE3	Office	8,500	GFA
	PAH-2	Hospital	32,724	GFA
	PAH-1	Hospital	22,620	GFA
	PAH-6	Hospital	14,288	GFA
	PAH-8	Hospital	26,040	GFA

Stage (Timing)	Building Name	Land Use	GFA/Dwelling	Units
	PAH-7	Health	26,505	GFA
	PAH-10	Health	9,495	GFA
	PAH-3A	Hospital	7,000	GFA
	PAH-3B	Hospital	18,000	GFA
	E-06	Office	10,800	GFA

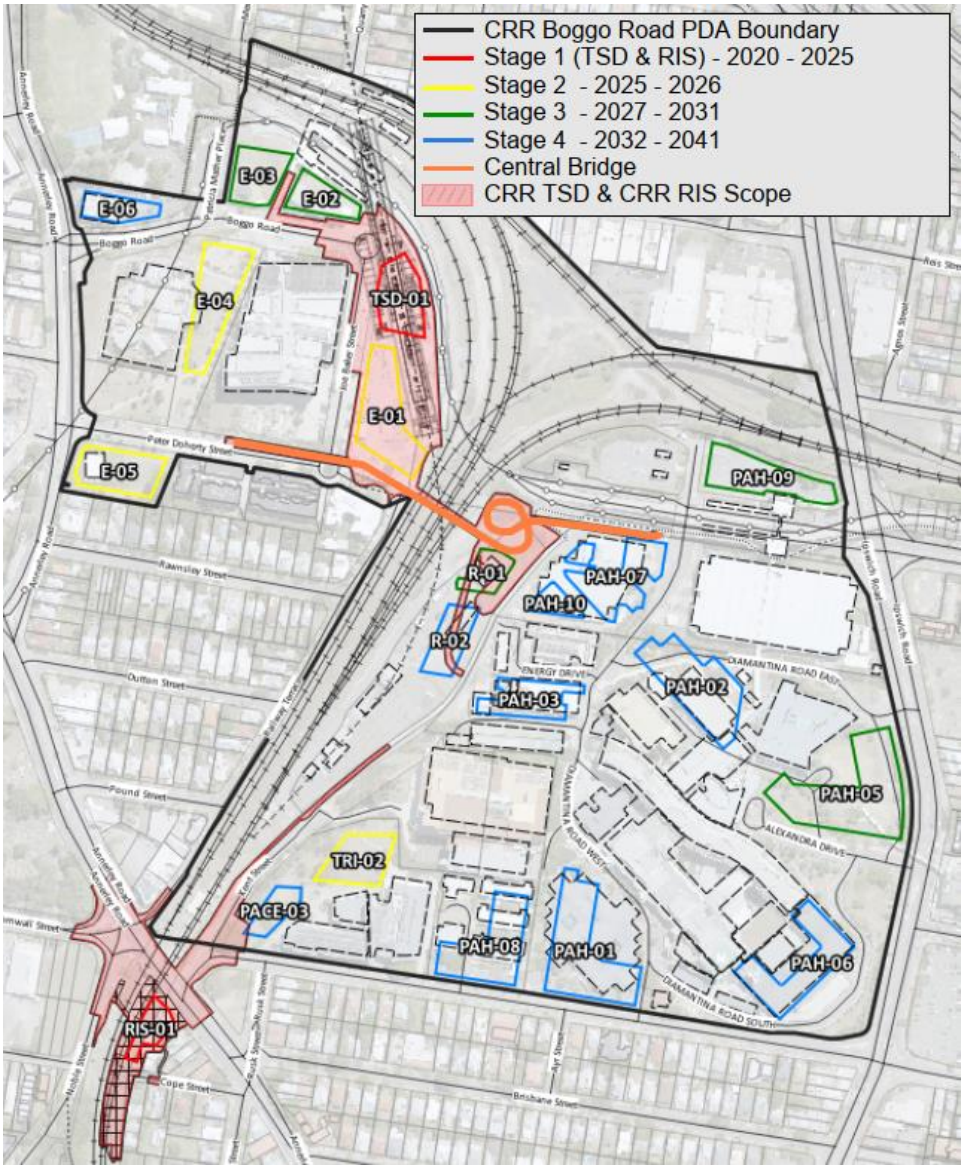


Figure 2-2: Boggo Road CRR PDA Potential Future Development Sites – Reference Scheme

Note, future PDA potential development opportunity sites and staging are conceptual and indicative only for infrastructure network analysis purposes.

Each of these land uses will generate some traffic demand, however, given the Boggo Road CRR PDA has access to excellent PT accessibility with three (3) existing major PT stations and AT infrastructure, it is expected that a significant proportion of the travel demand will be satisfied by non-private vehicle mode share. Further, the future re-development will be replacing some previous land uses where the traffic generated will be offset against the new developments.

Note, the final land-use proportions are unknown, and these values are for planning purposes only, making the list above indicative only. It should be noted that splits between certain land uses, particularly commercial and

office, are not known at this stage. Reasonable assumptions and sensitivity analysis have been applied where possible for the assessment.

2.3 Trip Rate Development

The assessments outlined in this report are based on a traffic model developed to determine the impacts (if any) on existing roads, PT and AT transport infrastructure by the ultimate development year (2032 – 2041). Trip generation rates were developed by:

- Determining the potential land uses of the Boggo Road CRR PDA
- Sourcing acceptable traffic generation rates for each of the land-uses, while considering PT and AT mode shares
- Applying the traffic demand to the traffic model to distribute according to existing travel patterns
- Using the assigned traffic demands to determine the impacts on the infrastructure.

2.3.1 Mode Share

CRR Station trip modelling assisted in evaluating the future mode share forecasts for this precinct. Whilst individual Precincts may have localised mode shares (e.g. PAH more car focused than the Boggo Road CRR PDA overall due to the nature of its land use), the overall mode share forecasts anticipate a reduction in car usage in favour of PT by the ultimate development year, aligning with the vision for the Boggo Road CRR PDA.

2.3.2 Broad Study Assumptions

The following assumptions were applied to the trip generation calculations:

- Current trip rates have an amount of mode share (i.e. non-vehicle trips). Rates were pro-rated to account for current mode share to proposed mode share for future long-term stages
- Hospital trip rates were based off existing boom gate data provided by MSH for the PAH's existing multistorey carpark facility. It is acknowledged as a limitation of the current assessment that future trip rates will be revised by MSH as part of the revised PAH Masterplan.
- Given the forecasted mode share shift to PT, and PT focus of the Boggo Road CRR PDA, high mode share shifts are applicable for the associated trip generation rates
- The proportions of trips to and from the Boggo Road CRR PDA for each trip purpose and peak period assume the current in/out splits of the existing road network.

2.4 Trip Generation

It is assumed that the minor retail land uses do not contribute to additional trips as they most likely consist of smaller scale stores that people visit as part of other trip or work purposes. A range of trip generation rates were used to assess different rates of PT and AT take-up. Based on the typical industry standard peak hour trip generation rates, Table 2-2 provides trips for the AM and PM peak periods for the high mode share scenario.

Table 2-2: Boggo Road CRR PDA – AM and PM Trip Generation by Typical Rates (Vehicles Per Hour)

Stage	Precinct 1				Precinct 3				Total			
	AM		PM		AM		PM		AM		PM	
	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
Stage 1	0	0	0	0	0	0	0	0	0	0	0	0
Stage 2	104	28	34	88	18	2	3	13	122	30	37	101
Stage 3	109	15	20	80	161	24	28	126	270	39	48	206

Stage 4	0	0	0	0	141	28	20	136	141	28	20	136
TOTAL	213	42	54	168	319	54	51	275	532	96	105	443

2.5 Carparking Rates

The purpose of this section is to identify maximum proposed parking spaces for existing GFA/land uses for sites within the Boggo Road CRR PDA for which parking will be available. It has been noted that future proposed developments E-04 and E-05 have BCC approved development permits, whilst TRI2.0 has and approved Ministerial Infrastructure Designation (MID), with PACE3 anticipated to be approved in the near future (at the time of writing). It is also noted that MSH are undertaking a carparking management strategy of the PAH which could feed into this assessment at a later stage. Car parking rates applicable to the draft proposed Boggo Road CRR PDA Development Scheme (10 September 2021 version) have been adapted from BCC City Plan 2014 as per Table 2-3.

Table 2-3: Recommended Carparking Rates

Use	Carparking Rates – Maximum number of spaces
Uses other than multiple dwelling, parking station, rooming accommodation and short-term accommodation (which are separately identified below)	**Boggo Road knowledge and innovation Precinct 1:** • 1 space per 100m^2 gross floor area (GFA) **Princess Alexandra Hospital Precinct 3 – Area A (refer Figure 2-3):** • 1 space per 300m^2 gross floor area (GFA) **Princess Alexandra Hospital Precinct 3 – Area B (refer Figure 2-3):** • 0.5 spaces per bed plus 0.8 spaces per staff for Hospital • 1 space per 200m^2 gross floor area (GFA) for uses other than Hospital.
Multiple dwelling	• 0.5 space per 1-bedroom dwelling • 1 space per 2-bedroom dwelling • 1.5 spaces per 3-bedroom dwelling • 2 spaces per 4 and above bedroom dwelling • 1 visitor space for every 20 dwelling units • Parking may be provided in tandem spaces where 2 spaces are provided for 1 dwelling • At least 50% of visitor parking is provided in communal areas, and not in tandem with resident parking.
Rooming accommodation, and Short-term accommodation	• 0.25 spaces per room

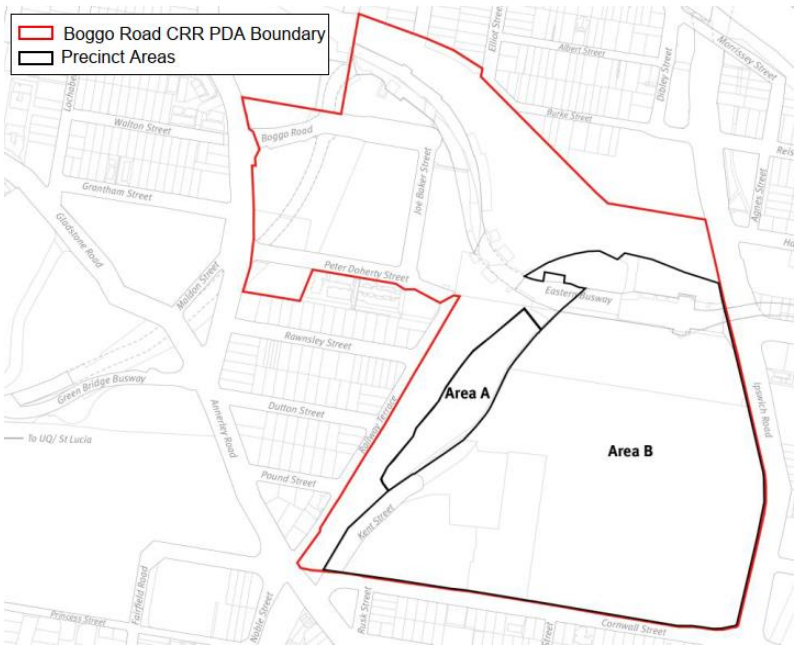


Figure 2-3: Boggo Road CRR PDA Parking Precinct Areas (Source: Boggo Road CRR PDA Map 13)

3 Existing Network Provisions

3.1 Key Features

The key features, prior to any CRR TSD works, of the Boggo Road CRR PDA include:

- PAH campus which includes TRI, and PACE
- Ecosciences Building
- Boggo Road Gaol
- Eastern Busway including PAH Busway Station and Boggo Road Station connecting through to University of Queensland (UQ)
- Cleveland and Gold Coast Rail Lines including:
  - Park Road Station
  - Dutton Park Station
  - Dutton Park to Fisherman's Island Dual Guage (Frieght) Rail Line.

3.2 Active Transport

3.2.1 Pedestrians

At present the study area has a footpath network of standard widths on all roads with typical street furniture such as trees, bike parking, benches, mailboxes and bus shelters creating pinch points, and pedestrian crossings as illustrated in Figure 3-1. Due to the high-capacity road network around the Boggo Road CRR PDA, it is necessary for pedestrian crossings to utilise pedestrian refuges and islands when navigating intersections. Often the segments between the islands and the footpaths have no signage or furniture to indicate a crossing, which is undesirable from a road safety perspective. Moreover, this staged approach is often undesirable for disabled pedestrians, which is an issue in this precinct given the proximity to the PAH. Overall, the Boggo Road CRR PDA has opportunities yet to be realised in terms of safe and efficient pedestrian movements. There may be opportunities to improve pedestrian amenities by adding in pedestrian crossings on the missing legs, and revising the free left slip turns specifically.

There is poor pedestrian permeability between Precinct 1 and Precinct 3 as the rail corridor (Precinct 2) forms a significant barrier to all forms of transport. The CRR TSD delivered Central Bridge for pedestrians and cyclists will shorten the journey between the landing points of the bridge from over 1 km to approximately 100 m, making the pedestrian journey far more attractive. Major rail stations surrounding the study area are at present poorly integrated with the local major employers (such as the PAH) and require pedestrians to walk long distances (over 1 km) through poorly sign posted areas with low levels of passive surveillance.

The previous PAH Masterplan (currently being updated) notes that there will be high pedestrian and/or cyclist volumes:

- Precinct 1 and Precinct 3 of the Boggo Road CRR PDA via the Central Bridge
- The Dutton Park Rail station, along Kent Street through to the eastern landing point of the Central Bridge
- The centre point of Kent Street, through the centre of the PAH campus through to Ipswich Road.

Lower volume paths are noted through the centre of the PAH campus between O'Keefe Street and Cornwall Street.

Major pedestrian desire lines appear to reflect users of the application, with T.J. Doyle Memorial Drive and Sir William MacGregor Drive being popular recreational running routes. Further, Kent Street, Annerley Road, Gladstone Road and Cornwall Street form the remainder of the large pedestrian desire lines. It is noted that the future Central Bridge will also accommodate pedestrians and thus, it is expected that Kent Street desire will be shifted to this bridge once constructed, leaving Kent Street as an access road to End of Trip Facilities (EOTF) at the PAH and the future stages development sites. Local trips not directly to the Boggo Road CRR PDA developments sites may occur but they are expected to be low in quantity.

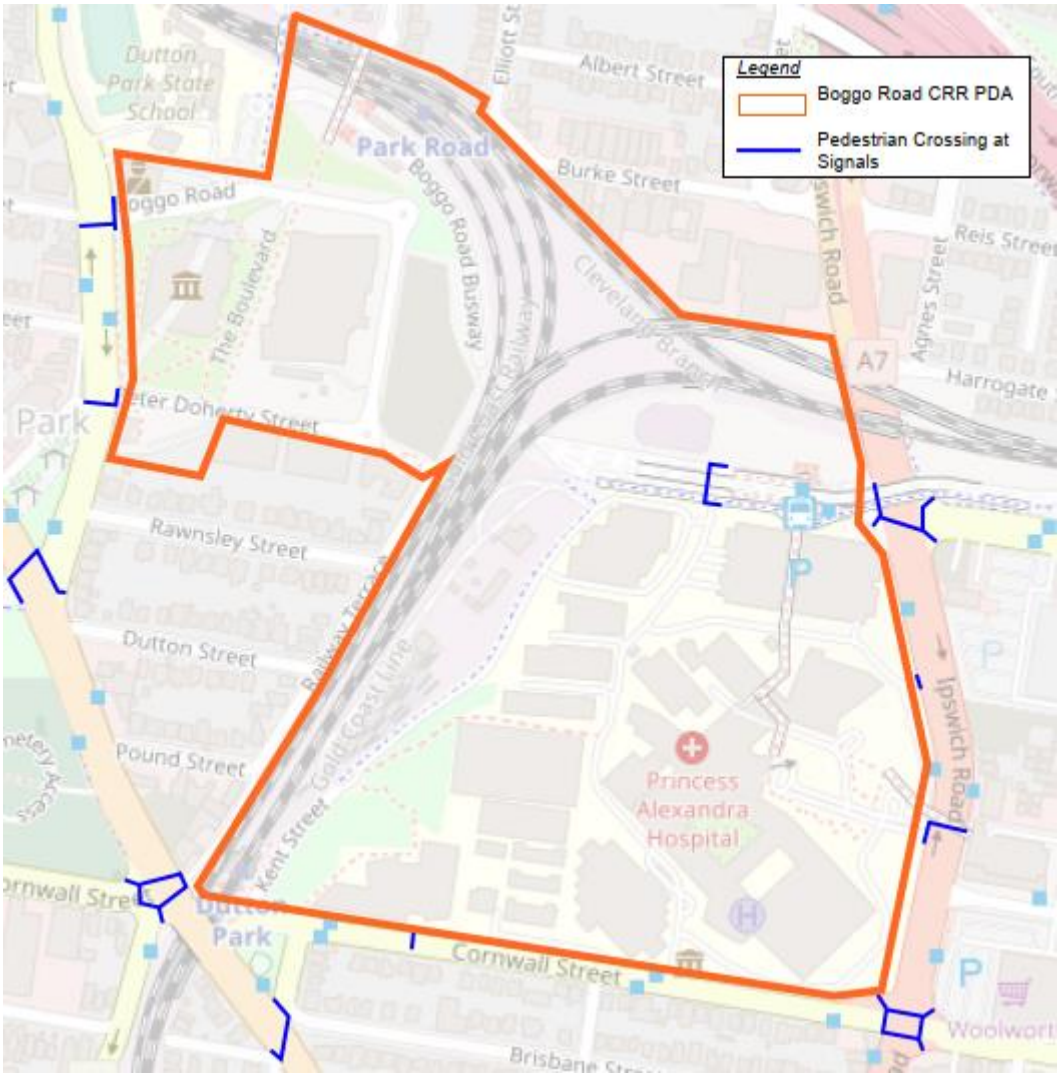


Figure 3-1: Pedestrian signalised crossings within and surrounding the Boggo Road CRR PDA

3.2.2 Pedestrian Infrastructure Provision

Pedestrian access to the Boggo Road CRR PDA is currently provided as indicated via staged, signalised crossings at:

- O'Keefe Street/Ipswich Road
- Ipswich Road/Diamantina Road East
- Ipswich Road/Alexandra Drive (the main PA Hospital entrance (Gate 3))
- Cornwall Street/Ipswich Road
- Cornwall Street/the QML Pathology Collection Centre
- Cornwall Street/Kent Street

- Annerley Road/Rusk Street/Tamar Street intersection
- Annerley Road/Cornwall Street/Noble Street/Railway Terrace
- Annerley Road/Gladstone Road
- Annerley Road/Peter Doherty Street
- Annerley Road/Boggo Road.

3.3 Cycling

At present there is a strong desire line for cyclists to travel between the UQ via the Eleanor Schonell Bridge in the west, the Veloway 1 (V1)/O'Keefe Street in the east and the CBD via the Woolloongabba Bikeway on Annerley Road. However, under existing conditions, the railway lines create a barrier in achieving east-west connectivity of the Boggo Road CRR PDA. The future introduction of the Central Bridge is fundamental to achieving accessibility outcomes, unlocking cycle network connectivity for commuters in and beyond the Boggo Road CRR PDA.

3.3.1 Cycling Infrastructure Provision

Cycling access to the Boggo Road CRR PDA is currently via:

- V1 via the Eastern Veloway (parallel to the Boggo Road Busway)
- A 3.6 m shared path along Kent Street
- Narrow footpaths/busy road along Annerley Road between Kent Street/Annerley Road and Gladstone Road/Annerley Road intersection
- Separated bike paths along Annerley Road, Gladstone Road and the Eleanor Schonell Green Bridge
- Narrow footpaths along Ipswich Road.

3.4 Road Network

Given its central location relative to the CBD, the Boggo Road CRR PDA is a hub for transport of all modes. As illustrated below in Figure 3-2, the key features of the existing Roads and PT network are:

- Major Arterial roads bounding the Boggo Road CRR PDA:
  - Ipswich Road
  - Annerley Road
  - Cornwall Street
- Neighbourhood roads within the Boggo Road CRR PDA:
  - Boggo Road
  - Joe Baker Street
  - Peter Doherty Street
  - Kent Street (partial - southern end)
- Private roads within the PAH campus. Of note in this assessment, Kent Street is partially a BCC managed neighbourhood road and Kent Street /Laundry Drive
  - On-street bus services and the Eastern Busway (mixture of medium to high frequency services to/from The UQ

- Gold Coast and Cleveland passenger rail lines
- Dutton Park to Fisherman's Island dual gauge (Freight) rail line.

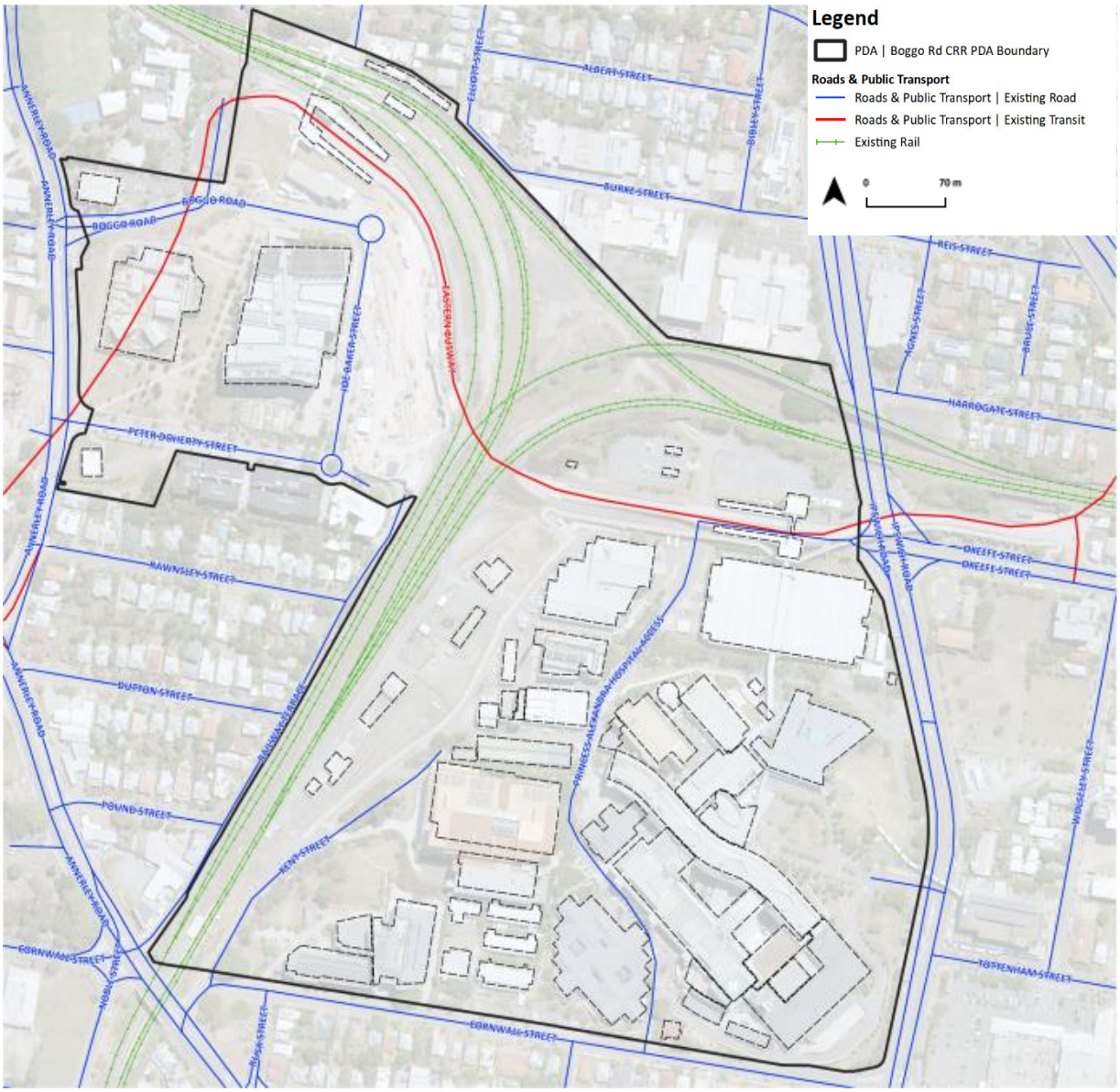


Figure 3-2: Existing Roads and PT within and surrounding the Boggo Road CRR PDA

3.5 Existing Public Transport Patronage

PT journeys involve pedestrian legs either between stops or to origins or destinations and are therefore an important component of the AT assessment. Within the existing context of the Boggo Road CRR PDA, a significant number of transfers occur between Boggo Road Busway and Park Road Rail Station, as well as trips to and from the PAH and Ecosciences Building from either Park Road or Dutton Park Rail Stations and Boggo Road and PAH Busway Stations. As detailed in Table 3-1 below, transfers between Park Road and Boggo Road total more than 10,000 passengers over a typical day, cementing the Boggo Road CRR PDA as a transport hub. Refer to Attachment F for detailed information.

Table 3-1: Existing PT Transfers (Source: TransLink Ticketing Data 2019)

PT Station	Daily Totals		
	Boarding	Alighting	Transfers
Park Road Rail Station	15,702	18,686	11,298
Boggo Road Busway Station	12,926	13,289	10,661
PAH Busway Station	6,760	6,910	394
Dutton Park Rail Station	4,283	3,692	79

4 Network Upgrades

4.1 Modelling Methodology

The future year trips for the Boggo Road CRR PDA were applied to a future year (2041) SIDRA Network models for Annerley Road and Ipswich Road separately. The modelling process has assessed the roads, PT & AT network connections and internal road network layout, in order to inform the longer-term infrastructure requirements necessary to support the anticipated future development in the Boggo Road CRR PDA. The following approach was presented to and agreed in principle by stakeholders (BCC/TMR/MSH/PAH) and summarised as follows:

- Gather data from existing resources and stakeholders including both planning reports and roads, PT & AT existing and future demands
- Identify gaps and risks for the gathered data
- Identify constraints (gaps/deficiencies) and opportunities for the roads, PT & AT existing and planned network including proposed designs
- Calculation of background traffic growth factors to be applied to future year (2041) scenarios
- Calculation of the potential new trips generated by the proposed development scenarios by stages, for the AM and PM peak periods
- Apply the delta (positive or negative differences) of the trips from the development scenarios, compared to the future year (2041)
- Modelling the development scenarios in SIDRA, allowing the distribution of development vehicle trips onto the road network by utilising existing (2021) AM and PM demand patterns. This included applying the BCC Road Planning Note long term recommended upgrades as the assumed future year (2041) base upgrades.
- Assess the impact, if any, of queues and delays at intersections and apply upgrades as appropriate, noting Council's DSS contained in Part 4 – LGIP of BCC's City Plan 2014 sets the following benchmark:
  - (iv) the off-peak operation of the road network provides a Level of Service (LoS) C
  - (v) the peak period operation of the road network provides a LoS C, except where the road network is highly constrained and the use of alternative modes of transport in these areas is anticipated in the mode share targets stated in Map C3 Transport Network DSS Mode Share Targets
- The modelling of pedestrians and cyclists is focussed around pedestrian crossings at key intersections using SIDRA. A pathway LoS assessment using a target of LoS C for typical commuter peaks was completed.

4.2 Future Network Opportunities and Treatments

4.2.1 Roads and Public Transport

The proposed Roads and PT Network Plan (RPTNP) for the Boggo Road CRR PDA are delivered via a staged approach as appended in Appendix A.

The following are of key interest from a Roads and PT infrastructure perspective:

- Stage 1 (2020 - 2025):
  - BGO-RD-01 – Kerbside allocation and carriageway width modification on Boggo Road and Joe Baker Street (Delivery by CRR TSD)
  - BGO-RD-02 – Kerbside allocation and carriageway width modification on Peter Doherty Street (Potential delivery by others)
  - BGO-RD-03 – Two-way 4.25m vehicle lanes noting kerbside allocations to be resolved by BCC and RIS (Delivery by CRR RIS)
  - BGO-INT-06 – Intersection of Peter Doherty Road and Annerley Road – Provision of separated bicycle crossings on all legs of signalised intersection and tie into BGO-AT-03 works which is linked to BGO-AT-03 under the Active Transport Network Plan (Potential delivery by others).
- Stage 2 (2025 – 2026):
  - No Roads or PT upgrades are proposed as part of this stage.
- Stage 3 (2027 – 2031):
  - BGO-RD-04a – Two-way 3.3 m lanes for vehicles and cyclists – cycle street (Potential delivery by R-01 & R-02 developers – with R-01 & R-02).
- Stage 4 (2032 – 2041):
  - BGO-RD-04b –Two-way 3.3 m vehicle lanes (Potential delivery by others – with PAH-07 & PAH-10)
  - BGO-RD-04c –Two-way 3.3 m vehicle lanes (Potential delivery by others – with PAH-07 & PAH-10)
  - BGO-RD-05a –Two-way 3.3 m vehicle lanes (Potential delivery by others – with PAH-07 & PAH-10)
  - BGO-RD-05b –Two-way 3.3 m vehicle lanes (Potential delivery by others – with PAH-07 & PAH-10)
  - BGO-INT-01 – Intersection of Annerley Road and Noble Street (Potential Delivery by others):
    - New right turn lane from Annerley Road to Railway Terrace
    - Widening on both directions for provision of on-road cycle lanes
  - BGO-INT-02 – Intersection of Cornwall Street and Ipswich Road (Potential Delivery by BCC - Road Planning Notes / LGIP):
    - Widening of the northbound carriageway of Ipswich Road near Cornwall Street to three (3) lanes and provision of on-road cycle lanes
    - Widening of the eastbound carriageway of Cornwall Street near Ipswich Road to three (3) lanes and provision of on-road cycle lanes
    - A second right turn from Ipswich Road to Cornwall Street introduced
    - A short right turn lane from Cornwall Street to Ipswich Road introduced
    - Potential closure of the westbound bus jump lane across Ipswich Road along Cornwall Street

- BGO-INT-03 – Intersection of Alexandra Drive and Ipswich Road (Potential Delivery by others):
  - Lengthening of existing right turn lane from Ipswich Road to Alexandra Drive (PAH)
  - A new left turn lane from Ipswich Road to Alexandra Drive (PAH)
  - Widening on both directions of Ipswich Road for provision of on-road cycle lanes
- BGO-INT-04 – Intersection of O'Keefe Street and Ipswich Road (Potential Delivery by others):
  - A second right turn from Ipswich Road to O'Keefe Street introduced
  - Widening on both directions for provision of on-road cycle lanes
- BGO-INT-05 – Intersection of Diamantina Road East and Ipswich Road (Potential Delivery others):
  - Widening in both directions of Ipswich Road for provision of on-road cycle lanes
  - Additional short right turn lane southbound on Ipswich Road into Diamantina Road East
  - Provision of pedestrian crossing on southern leg of signalised intersection.

4.2.2 Active Transport

The proposed AT Network Plan (ATNP) for the Boggo Road CRR PDA are delivered via a staged approach as appended in Appendix B.

The following are of key interest from an AT infrastructure perspective:

- Stage 1 (2020 - 2025):
  - BGO-AT-01 – Central Bridge, between Peter Doherty Street and the Eastern Veloway (Delivery by CRR TSD)
  - BGO-AT-02 – At grade footpath (and zebra crossing at Kent Street) from BGO-VT-02 to Kent Street (Delivery by CRR TSD)
  - BGO-AT-03 – Dedicated on-road 3.0 m cycle path, between the Central Bridge and the intersection of Peter Doherty Street / Annerley Road (Potential delivery by others) which is linked to BGO-INT-06 under the Roads and PT Network Plan
  - BGO-AT-04 – Off road separated 2.5 m cycle path, 0.5 m buffer, 2.0 m pedestrian path on the western side, and 4.0 m pedestrian path on the eastern side, along the BCC land tenure from Annerley Road to the TRI driveway – desired outcome is for PNCP connection as discussed in Section 2.3 noting exact dimensions to be resolved between BCC and CRR RIS (Delivery by CRR RIS)
  - BGO-AT-16 – Interstation footpath between CRR Boggo Road Station and existing Boggo Road Busway/Park Road Rail Stations (Delivery by CRR TSD)
  - BGO-VT-01 – Vertical Transport Lift and Stairs near Joe Baker Street (Delivery by CRR TSD)
  - BGO-VT-02 – Vertical Transport Lift and Stairs near R-01 (Delivery by CRR TSD)
- Stage 2 (2025 – 2026):
  - BGO-AT-10 – Pedestrian Arcade Transition connecting the Central Bridge to Joe Baker Street through future development site E-01 (Potential delivery by E-01 developers – with E-01)
  - BGO-AT-12 – Off road separated 2.5 m cycle path and footpath at minimum of 2.5 m adjacent potential outside dining and retail (Potential delivery by E-04 developers – with E-04).
- Stage 3 (2027 – 2031):
  - BGO-AT-05a – 1.5 m pedestrian paths to both sides and cycle street in the interim between BGO-AT-04 and BGO-AT-06a which includes BCC Land Tenure. The northern end includes a new turning head and boom gate to allow only service vehicles onto AT-06a which is strictly back-of-house servicing in the interim (Potential delivery by R-01 & R-02 developers – with R-01 & R-02)
  - BGO-AT-06a – Delivery of ultimate AT form to western side of this Laundry Drive segment - Off road separated 2.5 m cycle path, 0.5 m buffer, 2.5 m pedestrian path (Potential delivery by R-01 & R-02 developers – with R-01 & R-02)
  - BGO-AT-07a – Elevated podium level walkway through future development sites R-01 and R-02, between BGO-VT-02 and BGO-AT-07b. Opportunity to deliver in 2031 if R-01 and R-02 buildings are co-timed. Alternative access arrangements are Kent Street via VT-02 during construction. (Potential delivery by R-01 & R-02 developers – with R-01 & R-02)
  - BGO-AT-07b – Elevated bridge connection between future development site R-02 and VT-03. Opportunity to deliver in 2031 if R-01 and R-02 buildings are co-timed. Alternative access arrangements are Kent Street via VT-02 during construction. (Potential delivery by R-01 & R-02 developers – with R-01 & R-02)

- BGO-AT-08 – Potential elevated passenger interchange and pedestrian connection between the Boggo Road CRR and Busway Stations, Park Road Station and Elliot Street. (Potential delivery by others, timing to be determined)
- BGO-VT-03 – Vertical Transport Lift and Stairs near TRI building (Potential delivery by others).

- Stage 4 (2032 – 2041):
  - BGO-AT-05b – Off road separated 2.5 m cycle path, 0.5 m buffer, 2.0 m pedestrian path on the western side, 2.0 m pedestrian path on the eastern side, along the BCC Land Tenure between BGO-AT-04 and BGO-AT-05c (Potential delivery by others – with PAH-07 & PAH-10)
  - BGO-AT-05c – Off road separated 2.5 m cycle path, 0.5 m buffer, 2.5 m pedestrian path on the western side, pedestrian path to the eastern side (width to be resolved based on future PAH service requirements), between BGO-AT-05b and BGO-AT-06b. (Potential delivery by others – with PAH-07 & PAH-10)
  - BGO-AT-06b – Delivery of ultimate AT form to eastern side of Laundry Drive section – 4.25 m pedestrian path between BGO-AT-05b and BGO-AT-06b. (Potential delivery by others – with PAH-07 & PAH-10)
  - BGO-AT-06c – Typical 4.25 m pedestrian paths to both sides. (Potential delivery by others – with PAH-07 & PAH-10)
  - BGO-AT-09 – Potential elevated link between VT-02 and PAH Main Building, connection and feasibility to be resolved (Potential delivery by others – with PAH-02, PAH-07 & PAH-10)
  - BGO-AT-11a – Potential uplift of existing shared path (Potential delivery by others, timing to be determined)
  - BGO-AT-11b – Potential uplift of existing rail overpass (Potential delivery by others, timing to be determined)
  - BGO-AT-13 – Pedestrian path enhancements (Potential delivery by others – With PAH-01 & PAH-08)
  - BGO-AT-14 – Pedestrian path enhancements (Potential delivery by others – With PAH-02, PAH-03 & PAH-07)
  - BGO-AT-15 – Pedestrian path enhancements (Potential delivery by others – With PAH-03)
  - BGO-AT-17 – Pedestrian path enhancements (Potential delivery by others – With E-06).

4.4 Potential Future Internal Network and Cross Sections

Kent Street/Laundry Drive is the primary internal road infrastructure that has been identified as requiring an upgrade as part of future development as part of the Boggo Road CRR PDA. Prior to the declaration of the Boggo Road CRR PDA, Kent Street served as the public access road to the TRI and PACE building carparks, becoming a private road (PAH) from a boom gate which currently services back-of-house facilities for PAH. These services and servicing arrangements, buildings, land tenures, and geometry restrictions form the basis of constraints on Kent Street/Laundry Drive.

At the time of writing, the Kent Street boom gate has been removed to allow one-way northbound circulation of general traffic to accommodate CRR TSD Construction activities.

In future, Kent Street will be required to support proposed future development sites R-01 and R-02 as well as potential future PAH Buildings TRI2.0, PACE3, PAH-07, and PAH-03, with potential demolition of the existing Laundry (building 55) and support services buildings 61 and 62. Therefore, the design principles for Kent Street are that a two-way cross-section be achieved up to Laundry Drive in the interim with minimal land take in order to service R-01/R-02 sites, with opportunities to expand to ultimate cross sections in Stage 4 with the removal of existing buildings which are constraining this outcome from being achieved earlier.

Whilst the final form and tenure of Kent Street is still to be resolved, the Boggo Road CRR PDA outcome recommended for the internal streets are for shared, slow speed street environments promoting calmer, people focused streets while allowing circulation within the Boggo Road CRR PDA to the major PT station (Dutton Park Station) for drop off/pick up, and access the PAH and future developments. The urban design treatment of this street should utilise best practice urban design e.g. continuous footpaths where pedestrians have the natural priority and the surface treatment is more footpath than it is road.

Example of possible cross sections are shown in Figure 4-1, Figure 4-2 and Figure 4-3. Figure 4-4 provides an example of a shared zone for the interaction between RD-02, RD-04 & RD-05 as well as AT-03, AT-05 & AT-06. For further guidance regarding the future design intent for the Kent Street corridor, refer to the following:

- Kent Street Movement Corridor, as referenced in the Boggo Road CRR PDA draft proposed development scheme
- Draft Kent Street Movement Corridor Guideline, which provides supporting material to the Boggo Road CRR PDA draft proposed development scheme

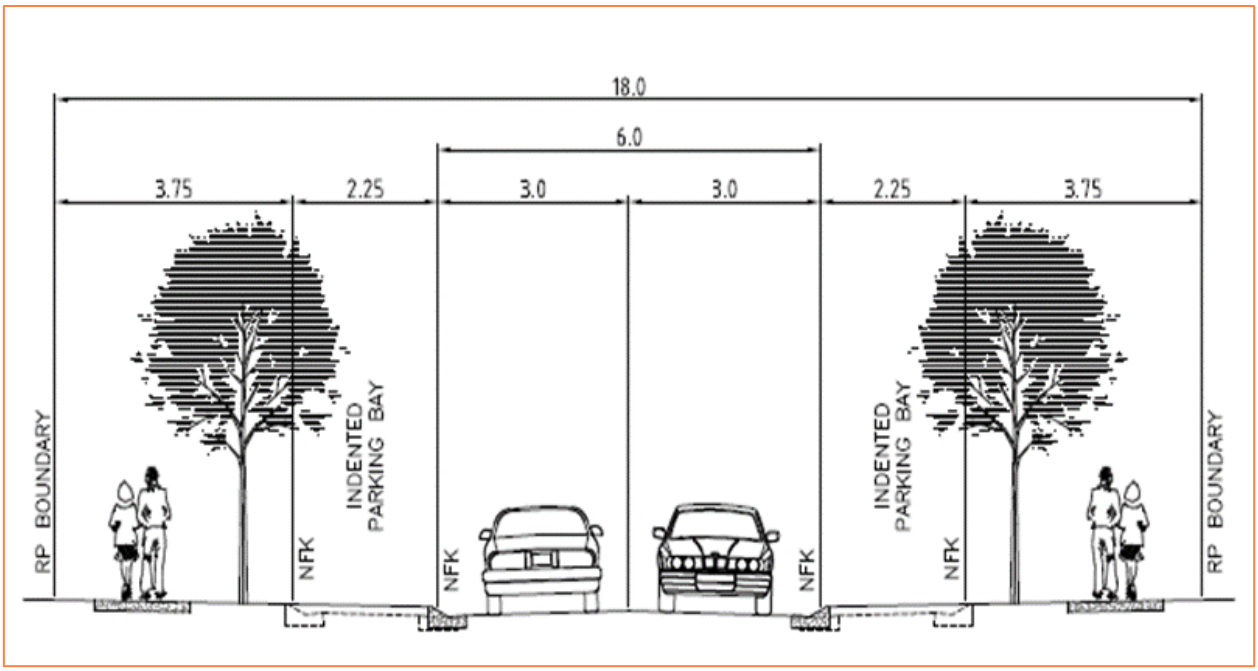


Figure 4-1: Council Typical Example – Neighbourhood Road (City Plan – BSD1021)

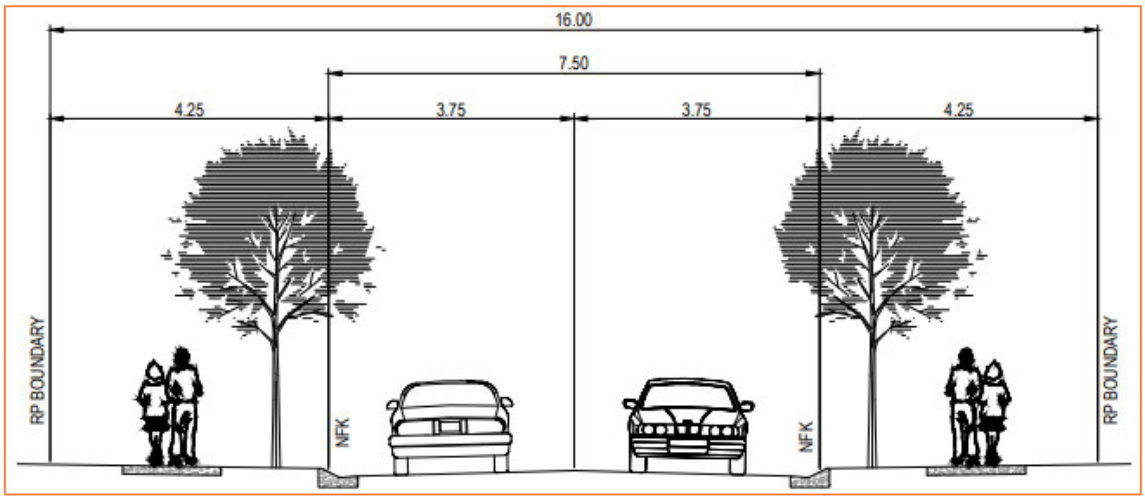


Figure 4-2: Council Typical Example with No Parking – Neighbourhood Road (City Plan – BSD1021)

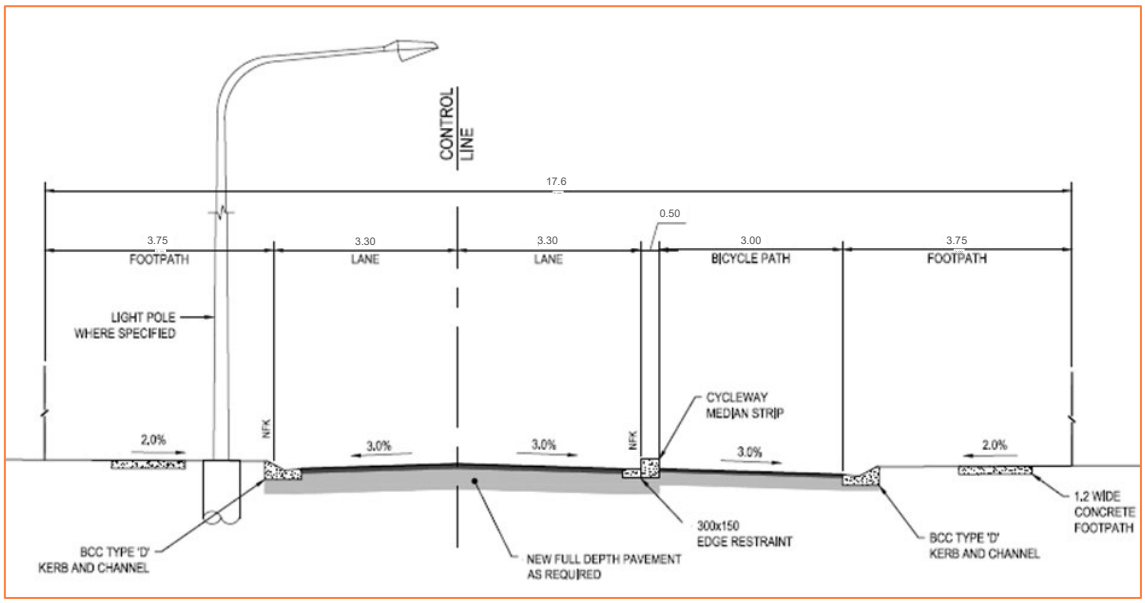


Figure 4-3: Possible Cross Section with no Parking and Separated Bicycle Facility (17.6 m)

Figure 4-4: Shared Zone Example – Drachten, Netherlands

5 Conclusions and Recommendations

There are existing constraints for pedestrian and cyclist movement within the Boggo Road CRR PDA including:

- The existing Rail Corridor (Precinct 2) creates a barrier for AT permeability
- PAH and CRRDA planning interfaces including permeability to the new CRR Station
- Accessibility, connections and entrances to the Boggo Road CRR PDA from Annerley Road and Dutton Park Station.

BCC, TMR and PAH/MSH have identified the opportunity for a number of these issues to be addressed with the redevelopment of the developable land in the Boggo Road CRR PDA.

Overall, the proposed ATNP offers many opportunities to ameliorate the existing issues for pedestrian and cyclist connectivity. Whilst constraints such as the Kent Street back-of-house services may constrain the network is the medium term, the overarching goals for the AT network within the Boggo Road CRR PDA over the course of its development are to provide:

- Central Bridge to fill the missing link in the PCN
- A safe and efficient connection between the new CRR Station and existing Boggo Road Busway and Park Road Rail Station
- Resolution to the desire lines within and surrounding the PAH providing a more permeable Boggo Road CRR PDA
- Activation of underutilised streetscapes, and development of internal precinct streetscapes to enhance liveability and connectivity.

To address the existing road challenges, it is recommended that trunk road upgrades proposed are as follows:

- Kerbside allocation and carriageway width modification as per CRR TSD Scope
- Kerbside allocation and carriageway width modification as per CRR RIS Scope
- Peter Doherty Street kerbside allocation and carriageway width modification to accommodate potential on-road cycle paths
- Interim and ultimate cross section modifications to Kent Street
- Ultimate cross section of Laundry Drive following the future redevelopment of Building 55
- Short right turn lane from Annerley Road to Railway Terrace introduced
- Lengthening of existing right turn lane from Ipswich Road to Alexandra Drive (PAH)
- A short left turn lane from Ipswich Road to Alexandra Drive (PAH) introduced
- Widening of the northbound carriageway of Ipswich Road near Cornwall Street to three (3) lanes
- Widening of the eastbound carriageway of Cornwall Street near Ipswich Road to three (3) lanes
- A second right turn from Ipswich Road to Cornwall Street introduced
- A short right turn lane from Cornwall Street to Ipswich Road introduced
- Closure of the westbound bus jump lane across Ipswich Road along Cornwall Street
- A second right turn from Ipswich Road to O'Keefe Street introduced

Lastly, carparking rates recommended for are as follows to promote higher AT and PT mode share as per Table 5-1.

Table 5-1: Adopted Carparking Rates

Use	Carparking Rates – Maximum number of spaces
Uses other than multiple dwelling, parking station, rooming accommodation and short-term accommodation (which are separately identified below)	**Boggo Road knowledge and innovation Precinct 1:** • 1 space per 100m^2 gross floor area (GFA) **Princess Alexandra Hospital Precinct 3 – Area A (refer Figure 2-3):** • 1 space per 300m^2 gross floor area (GFA) **Princess Alexandra Hospital Precinct 3 – Area B (refer Figure 2-3):** • 0.5 spaces per bed plus 0.8 spaces per staff for Hospital • 1 space per 200m^2 gross floor area (GFA) for uses other than Hospital.
Multiple dwelling	• 0.5 space per 1-bedroom dwelling • 1 space per 2-bedroom dwelling • 1.5 spaces per 3-bedroom dwelling • 2 spaces per 4 and above bedroom dwelling • 1 visitor space for every 20 dwelling units • Parking may be provided in tandem spaces where 2 spaces are provided for 1 dwelling • At least 50% of visitor parking is provided in communal areas, and not in tandem with resident parking.
Rooming accommodation, and Short-term accommodation	• 0.25 spaces per room

Appendix A **Roads and Public Transport Infrastructure Elements Plans**

Boggo Road Cross River Rail Priority Development Area
Future Infrastructure Network Plan
Roads and Public Transport - Stage 1 (2020 - 2025) (Indicative)

Legend

- Boggo Road CRR PDA Boundary
- CRR TSD and CRR RIS Delivery Area

Road Projects (Stage 1)

- Road Intersection Upgrade (Stage 1)
- Road Corridor (Stage 1)

PDA - Development Sites (by Stage & Year) (Indicative Only)

- Stage 1 (TSD & RIS) (2020 - 2025)
- Stage 2 (2025 - 2026)
- Stage 3 (2027 - 2031)
- Stage 4 (2032 - 2041)
- Existing Buildings

Transport - Road, Transit

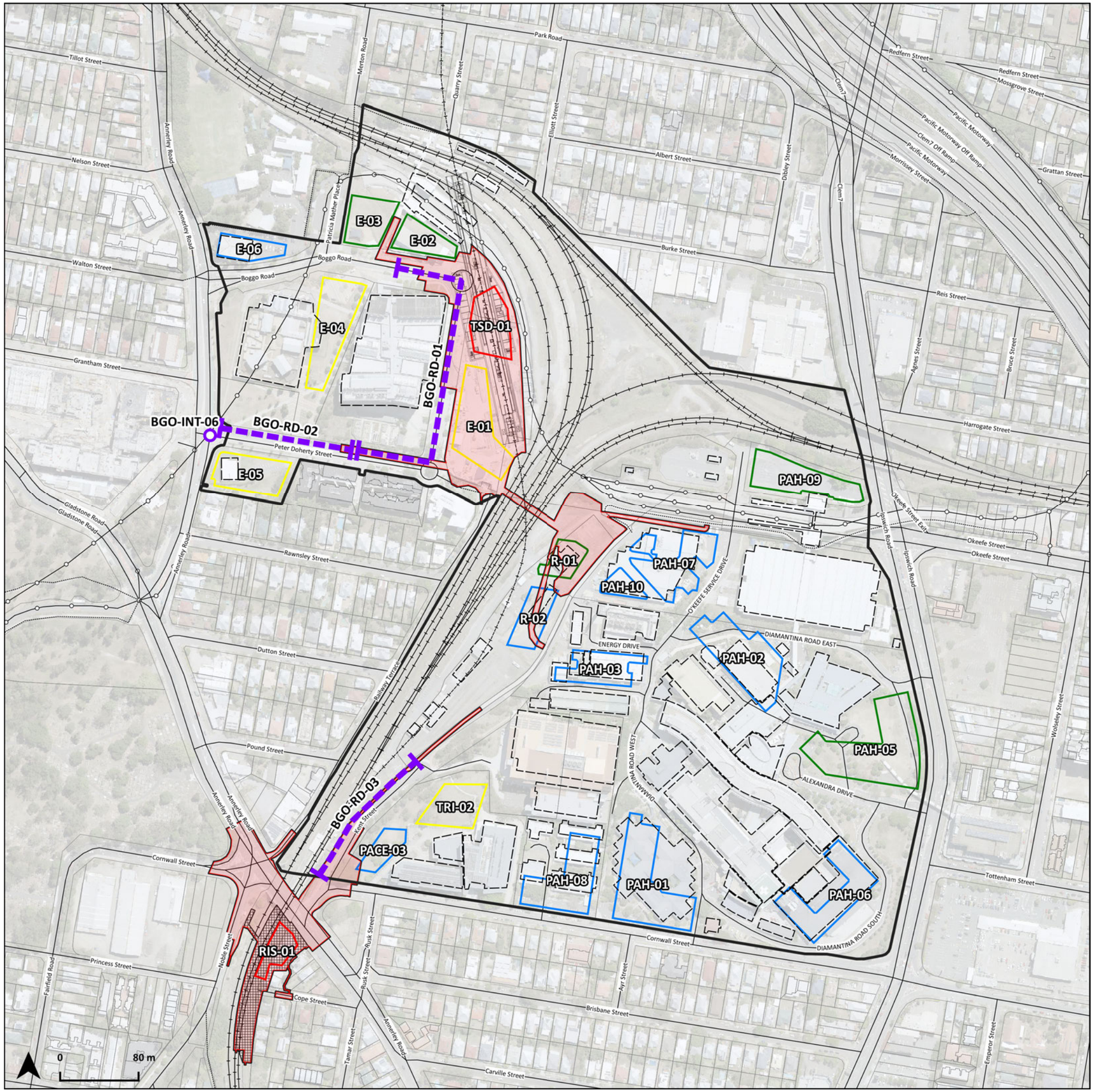
- Road
- Busways
- Tracks, Paths & Malls

Existing Rail

- Operational
- CRR Alignment
- CRR TSD Boggo Road Station
- CRR RIS Dutton Park Station

Property - DCDB

- Base Lot



NOTE:
Future PDA potential development opportunity sites and staging are conceptual and indicative only for infrastructure network analysis purposes.

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Data Sources
QLD Government 2021, Brisbane City Council 2021, Urban Utilities 2020

CROSSRIVERRAIL

Boggo Road Cross River Rail Priority Development Area
Future Infrastructure Network Plan
Roads and Public Transport - Stage 2 (2025 - 2026) (Indicative)

Legend

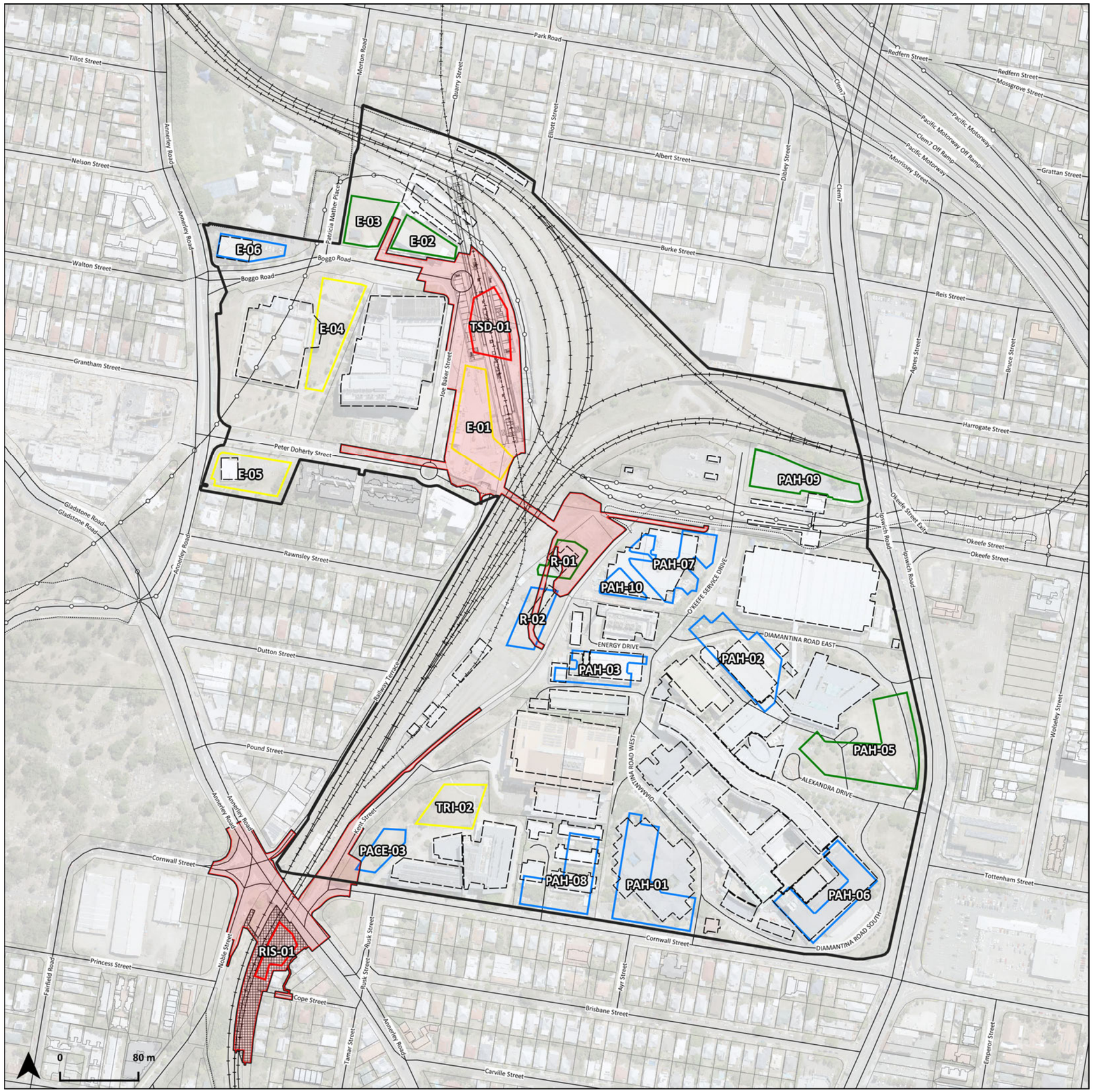
- Boggo Road CRR PDA Boundary
- CRR TSD and CRR RIS Delivery Area

PDA - Development Sites (by Stage & Year) (Indicative Only)
- Stage 1 (TSD & RIS) (2020 - 2025)
- Stage 2 (2025 - 2026)
- Stage 3 (2027 - 2031)
- Stage 4 (2032 - 2041)
- Existing Buildings

Transport - Road, Transit
- Road
- Busways
- Tracks, Paths & Malls

Existing Rail
- Operational
- CRR Alignment
- CRR TSD Boggo Road Station
- CRR RIS Dutton Park Station

Property - DCDB
- Base Lot



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Data Sources
QLD Government 2021, Brisbane City Council 2021, Urban Utilities 2020

CROSSRIVERRAIL

Boggo Road Cross River Rail Priority Development Area
Future Infrastructure Network Plan
Roads and Public Transport - Stage 3 (2027 - 2031) (Indicative)

Legend

- Boggo Road CRR PDA Boundary
- CRR TSD and CRR RIS Delivery Area

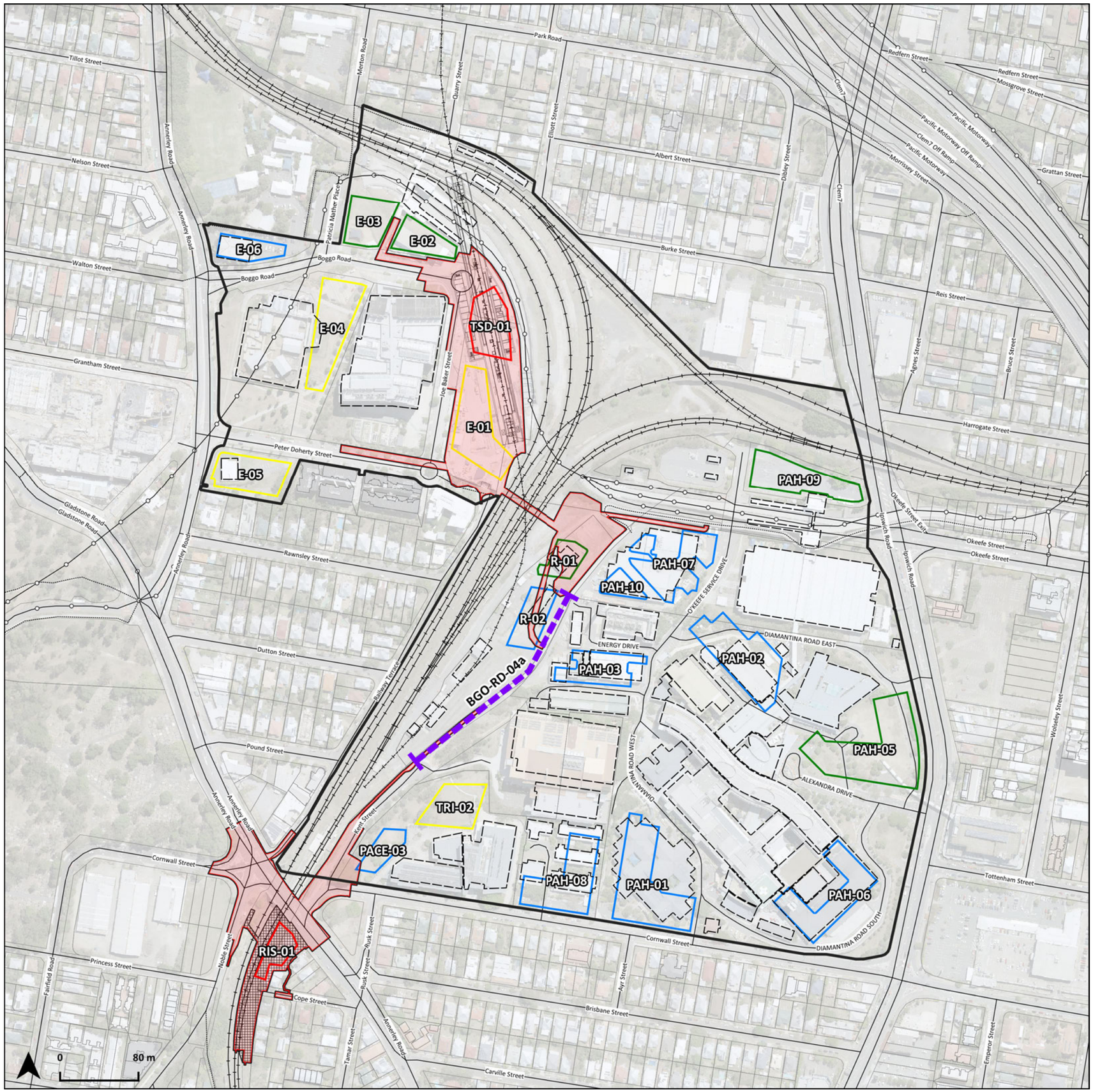
Road Projects (Stage 3)
- Road Corridor (Stage 3)

PDA - Development Sites (by Stage & Year) (Indicative Only)
- Stage 1 (TSD & RIS) (2020 - 2025)
- Stage 2 (2025 - 2026)
- Stage 3 (2027 - 2031)
- Stage 4 (2032 - 2041)
- Existing Buildings

Transport - Road, Transit
- Road
- Busways
- Tracks, Paths & Malls

Existing Rail
- Operational
- CRR Alignment
- CRR TSD Boggo Road Station
- CRR RIS Dutton Park Station

Property - DCDB
- Base Lot



NOTE:
Future PDA potential development opportunity sites and staging are conceptual and indicative only for infrastructure network analysis purposes.

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Data Sources
QLD Government 2021, Brisbane City Council 2021, Urban Utilities 2020

CROSSRIVERRAIL

Boggo Road Cross River Rail Priority Development Area
Future Infrastructure Network Plan
Roads and Public Transport - Stage 4 (2032 - 2041 / Ultimate) (Indicative)

Legend

- Boggo Road CRR PDA Boundary
- CRR TSD and CRR RIS Delivery Area

Road Projects (Stage 4)

- Road Intersection Upgrade (Stage 4)
- Road Corridor (Stage 4)

PDA - Development Sites (by Stage & Year) (Indicative Only)

- Stage 1 (TSD & RIS) (2020 - 2025)
- Stage 2 (2025 - 2026)
- Stage 3 (2027 - 2031)
- Stage 4 (2032 - 2041)
- Existing Buildings

Transport - Road, Transit

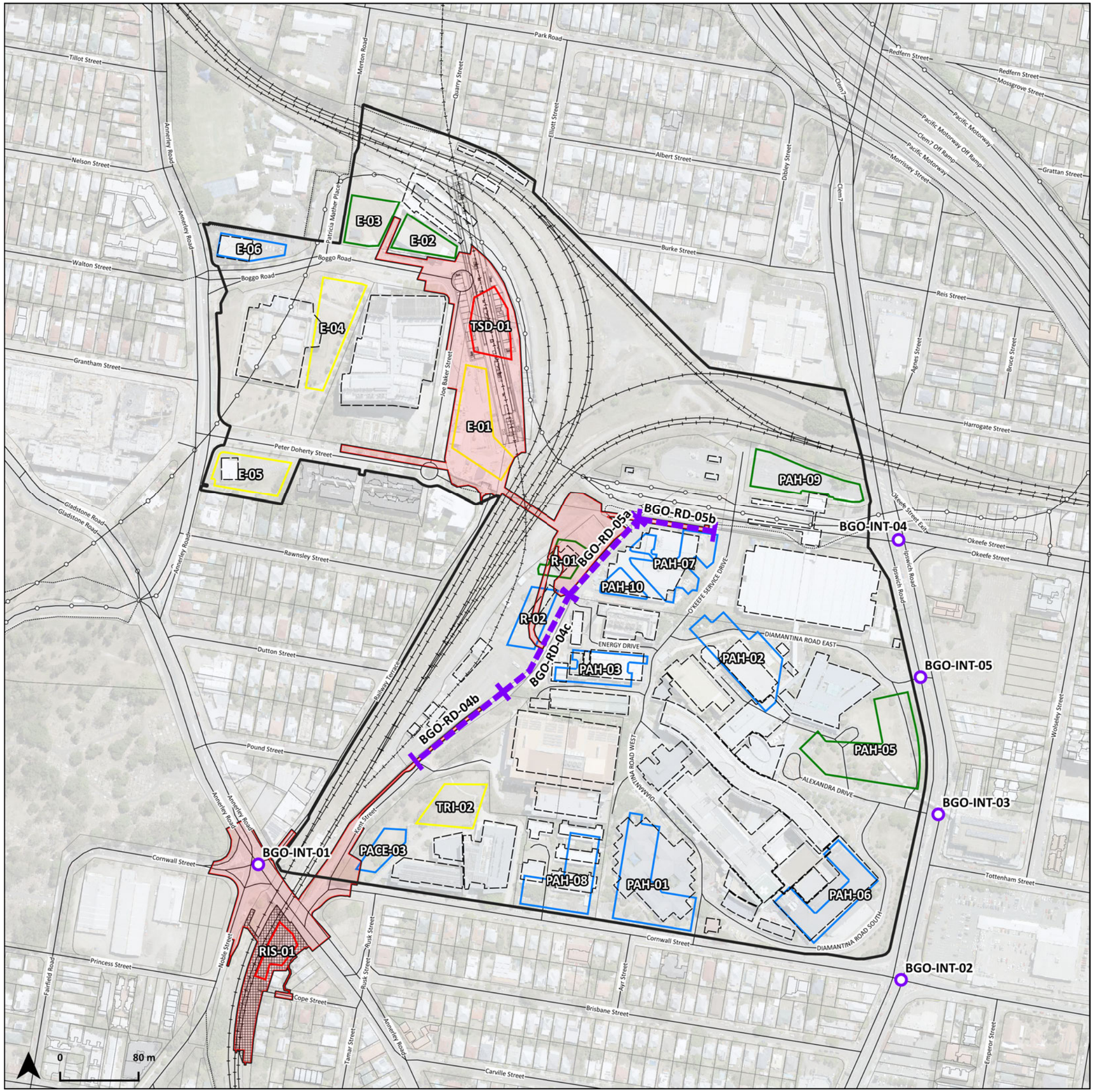
- Road
- Busways
- Tracks, Paths & Malls

Existing Rail

- Operational
- CRR Alignment
- CRR TSD Boggo Road Station
- CRR RIS Dutton Park Station

Property - DCDB

- Base Lot



NOTE:
Future PDA potential development opportunity sites and staging are conceptual and indicative only for infrastructure network analysis purposes.

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Data Sources
QLD Government 2021, Brisbane City Council 2021, Urban Utilities 2020

CROSSRIVERRAIL

Appendix B **Active Transport Infrastructure Elements Plans**

Boggo Road Cross River Rail Priority Development Area
Future Infrastructure Network Plan
Active Transport - Stage 1 (2020 - 2025) (Indicative)

Legend

- Boggo Road CRR PDA Boundary
- CRR TSD and CRR RIS Delivery Area

Active Transport Projects (Stage 1)

- Vertical Transport Upgrade (Stage 1)
- Active Transport Link (Stage 1)
- Active Transport Link (TSD)

PDA - Development Sites (by Stage & Year) (Indicative Only)

- Stage 1 (TSD & RIS) (2020 - 2025)
- Stage 2 (2025 - 2026)
- Stage 3 (2027 - 2031)
- Stage 4 (2032 - 2041)
- Existing Buildings

Transport - Road, Transit

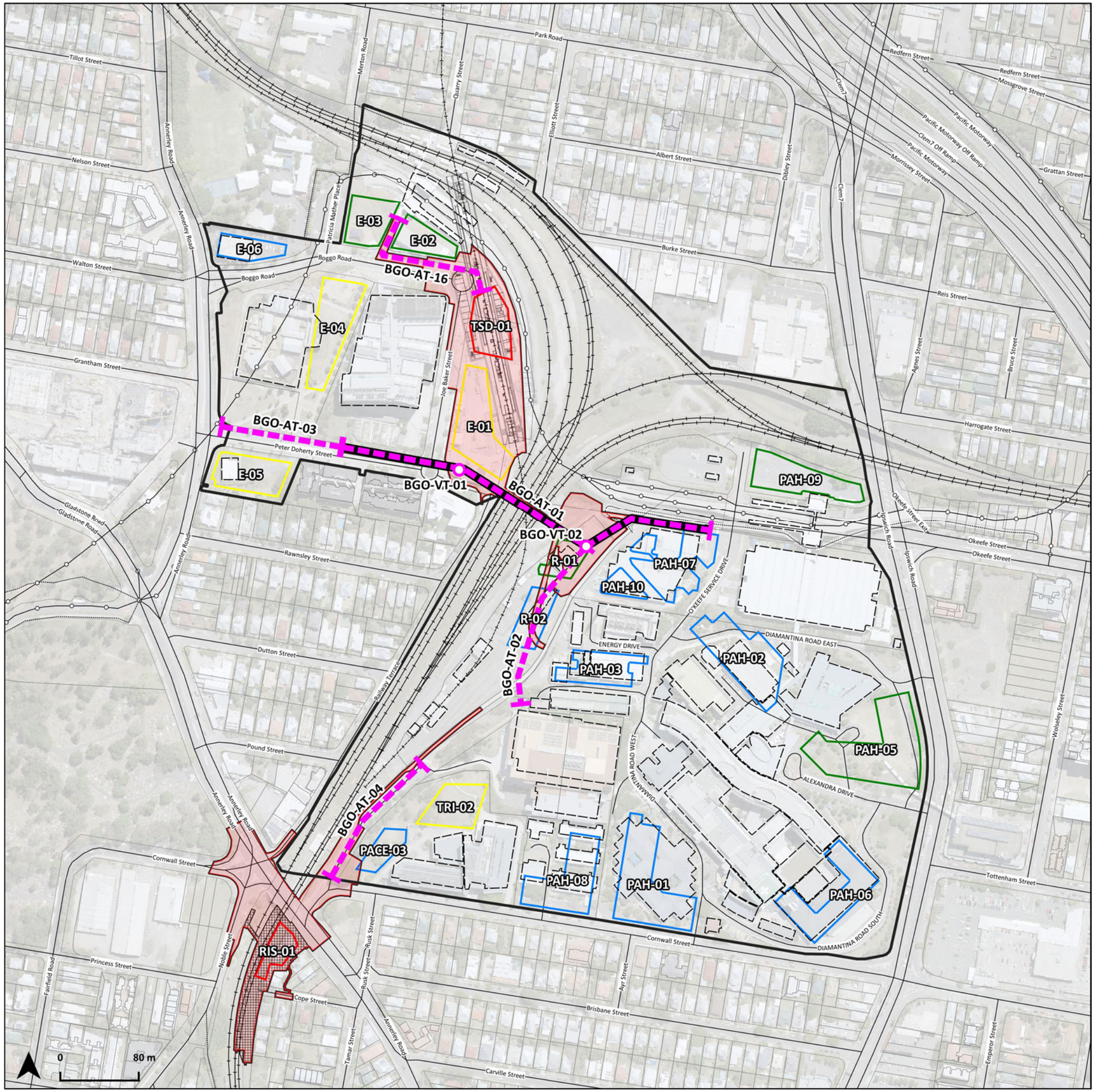
- Road
- Busways
- Tracks, Paths & Malls

Existing Rail

- Operational
- CRR Alignment
- CRR TSD Boggo Road Station
- CRR RIS Dutton Park Station

Property - DCDB

- Base Lot



NOTE:
Future PDA potential development opportunity sites and staging are conceptual and indicative only for infrastructure network analysis purposes.

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Data Sources
QLD Government 2021, Brisbane City Council 2021, Urban Utilities 2020

CROSSRIVERRAIL

Boggo Road Cross River Rail Priority Development Area
Future Infrastructure Network Plan
Active Transport - Stage 2 (2025 - 2026) (Indicative)

Legend

- Boggo Road CRR PDA Boundary
- CRR TSD and CRR RIS Delivery Area

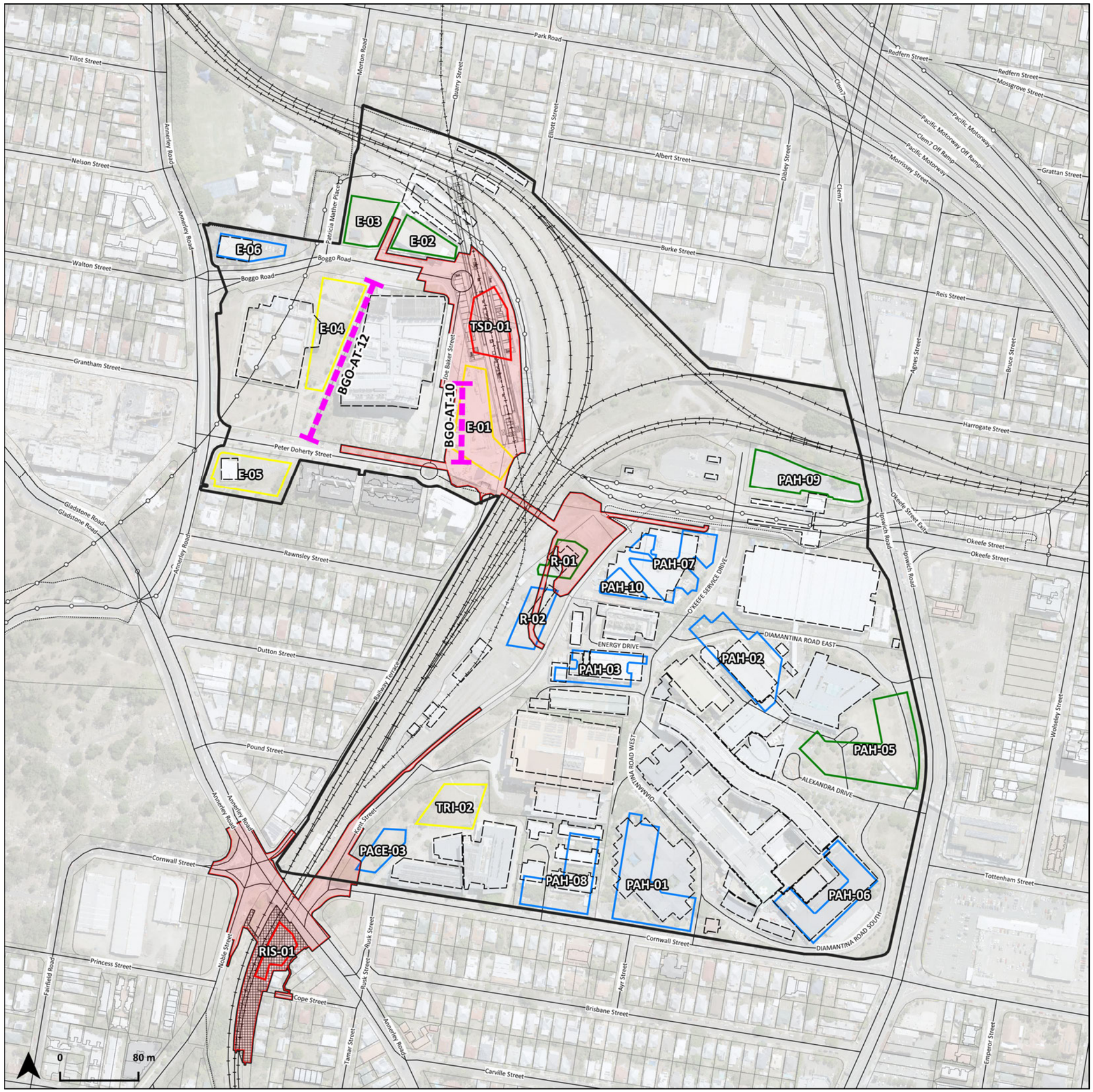
Active Transport Projects (Stage 2)
- Active Transport Link (Stage 2)

PDA - Development Sites (by Stage & Year) (Indicative Only)
- Stage 1 (TSD & RIS) (2020 - 2025)
- Stage 2 (2025 - 2026)
- Stage 3 (2027 - 2031)
- Stage 4 (2032 - 2041)
- Existing Buildings

Transport - Road, Transit
- Road
- Busways
- Tracks, Paths & Malls

Existing Rail
- Operational
- CRR Alignment
- CRR TSD Boggo Road Station
- CRR RIS Dutton Park Station

Property - DCDB
- Base Lot



NOTE:
Future PDA potential development opportunity sites and staging are conceptual and indicative only for infrastructure network analysis purposes.

DOCUMENT CONTROL
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Data Sources
QLD Government 2021, Brisbane City Council 2021, Urban Utilities 2020

CROSSRIVERRAIL

Boggo Road Cross River Rail Priority Development Area
Future Infrastructure Network Plan
Active Transport - Stage 3 (2027 - 2031) (Indicative)

Legend

- Boggo Road CRR PDA Boundary
- CRR TSD and CRR RIS Delivery Area

Active Transport Projects (Stage 3)

- Vertical Transport Upgrade (Stage 3)
- Active Transport Link (Stage 3)

PDA - Development Sites (by Stage & Year) (Indicative Only)

- Stage 1 (TSD & RIS) (2020 - 2025)
- Stage 2 (2025 - 2026)
- Stage 3 (2027 - 2031)
- Stage 4 (2032 - 2041)
- Existing Buildings

Transport - Road, Transit

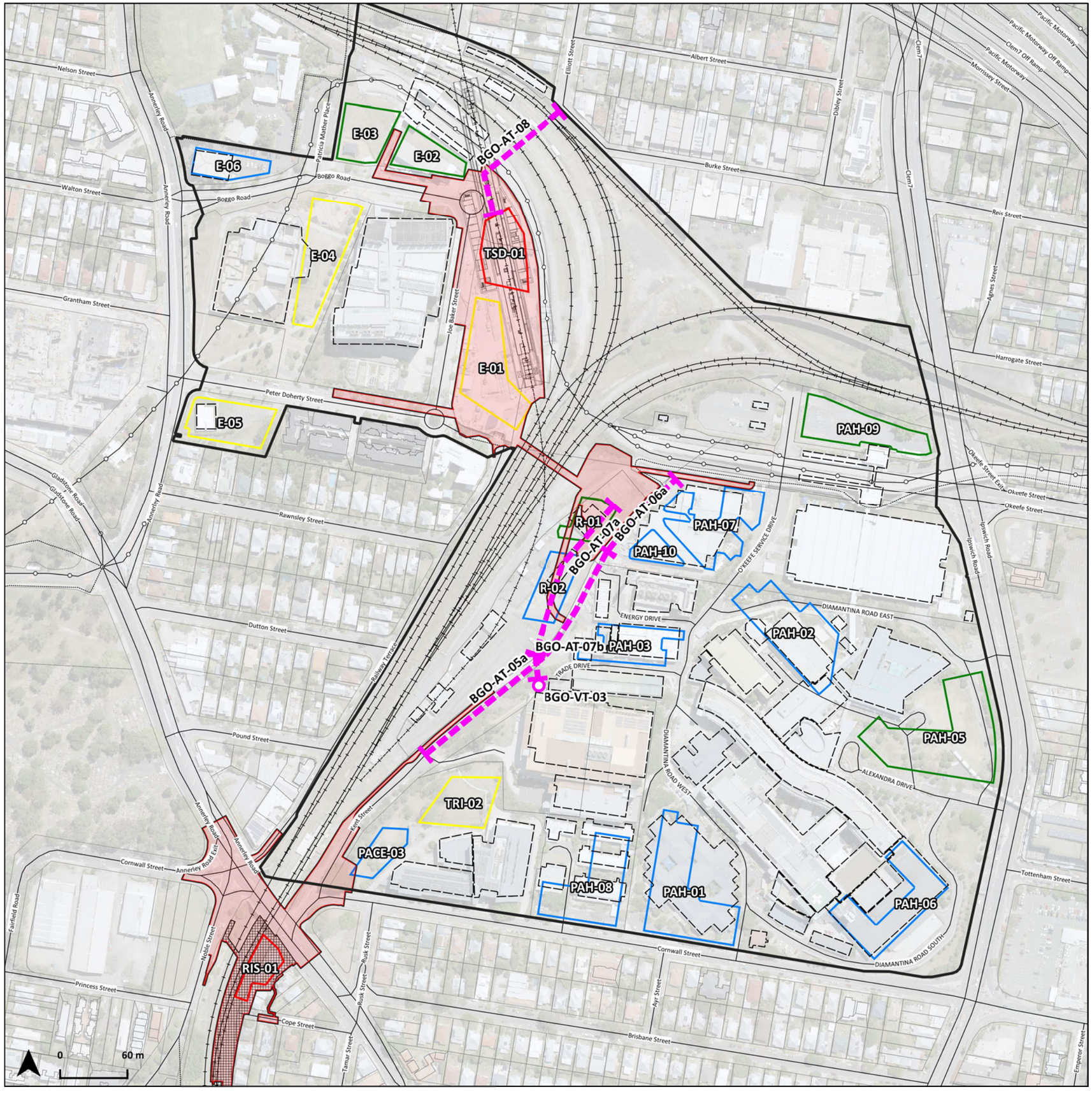
- Road
- Busways
- Tracks, Paths & Malls

Existing Rail

- Operational
- CRR Alignment
- CRR TSD Boggo Road Station
- CRR RIS Dutton Park Station

Property - DCDB

- Base Lot



NOTE:
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Data Sources
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CROSSRIVERRAIL

Boggo Road Cross River Rail Priority Development Area
Future Infrastructure Network Plan
Active Transport - Stage 4 (2032 - 2041 / Ultimate) (Indicative)

Legend

- Boggo Road CRR PDA Boundary
- CRR TSD and CRR RIS Delivery Area

Active Transport Projects (Stage 4)
- Active Transport Link (Stage 4)

PDA - Development Sites (by Stage & Year) (Indicative Only)
- Stage 1 (TSD & RIS) (2020 - 2025)
- Stage 2 (2025 - 2026)
- Stage 3 (2027 - 2031)
- Stage 4 (2032 - 2041)
- Existing Buildings

Transport - Road, Transit
- Road
- Busways
- Tracks, Paths & Malls

Existing Rail
- Operational
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- CRR TSD Boggo Road Station
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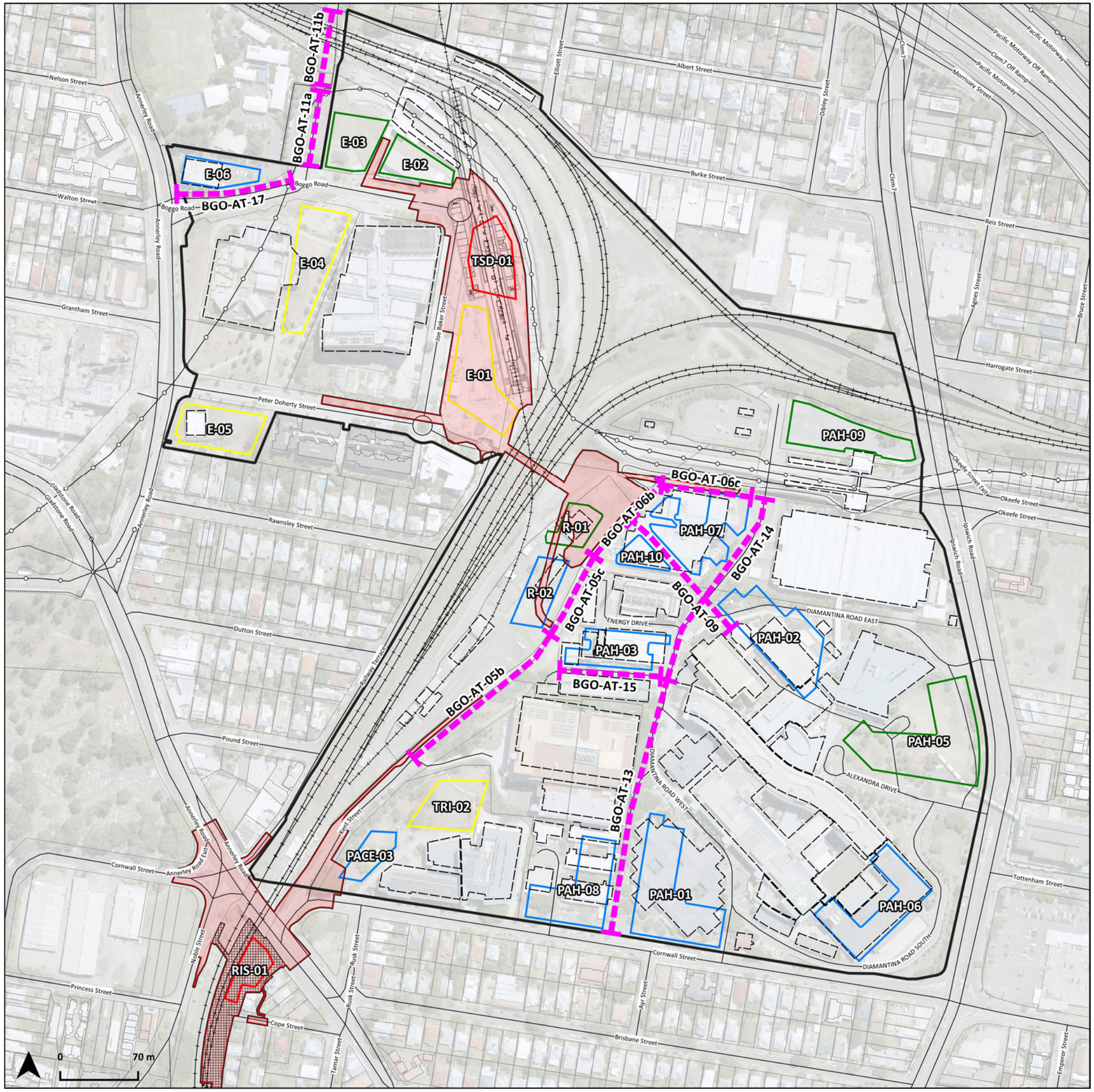

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Technical Memorandum

Memo No.	30032260-W&WW-BOGGO-IPBR-001	**Date of Issue**	19/11/2021
Subject	Boggo Road CRR PDA Water Supply & Wastewater Technical Analysis – Infrastructure Plan Background Report (IPBR)	**Discipline**	Water
Project Name	Boggo RD CRR PDA	**Project No.**	30032260
Document No.	30032260-W&WW-BOGGO-IPBR-002	**Revision**	01
Author	David Morrow		
Reviewed by	Anna West	**Approved by**	Gustavo Perreira
Prepared for	Cross River Rail Delivery Authority	**Attention to**	Daniel Gallagher
Attachments	Attachment A - Scenario 1 Yields Attachment A - Scenario 2 Yields Attachment B - Scenario 1 EPs Sewerage Attachment B - Scenario 1 EPs Water Attachment B - Scenario 2 EPs Sewerage Attachment B - Scenario 2 EPs Water Attachment C - Netserv Plan Extract Attachment D - Cost Estimates Attachment E – Future Infrastructure Network Maps		

Executive Summary

This Technical Memo outlines the key findings of an assessment of water supply and wastewater infrastructure and resultant proposed recommendations for consideration in the drafting of the Boggo Road Cross River Rail (CRR) Priority Development Area (PDA) Development Scheme and associated supporting materials.

Key findings and recommendations of the water and wastewater investigations are as follows:

General:

- Urban Utilities is the sole registered water and wastewater service provider for the Boggo CRR PDA and Brisbane area. Princess Alexandra Hospital (PAH) a water and sewerage customer of Urban Utilities manages on site its own private internal water and sewerage needs. It is recommended that ongoing

and effective engagement with Urban Utilities and the PAH occur throughout the planning and delivery stage to ensure that cost efficient and optimising servicing solutions are delivered.

- Equivalent Persons (EP) estimates have been prepared for existing development and future development scenarios. Notable findings include:
    - There is an increase in water and wastewater service demand associated with the potential future development opportunities in the Boggo Road CRR PDA.
    - Scenario 1 (Baseline) results in a +3,292 net increase in EP for water and +2855 net increase in EP for sewerage.

Water Supply:

- The Boggo Road CRR PDA is generally well-serviced in terms of water supply pressure and flow, meeting Urban Utilities minimum standards of service in all planning scenarios.
- It was identified however there were sections of water main in the network servicing the PDA that had existing head losses exceeding Urban Utilities planning guidelines requirements and water mains that experienced moderate pressure drops during emergency fire scenarios. Computer hydraulic modelling of the network with and without the developments ultimate loading identified sections of main to upgrade directly affected as a result of the development, although it is noted that these assets are at or are approaching the end of their design lives.
- Water upgrades required to offset these identified issues are;
    - BGO-WAT-01, Replace approximately 215m of 150mm water main with a DN250mm PE pipe in Annerley Rd between the Gladstone Rd 225mm branch tee near Dutton St and Joe Doherty St,
    - BGO-WAT-02, Replace approximately 112m of 100mm water main with a DN180mm PE pipe in Railway Tce between Annerley Rd and Pound St.
    - BGO-WAT-03, Replace approximately 200m of 150mm water main in Cornwall St between Rusk St and 67 Cornwall St with a DN250mm PE pipe.

Wastewater:

- The Boggo Road CRR PDA is generally well-serviced in terms of wastewater network capacity.
- The existing 225mm sewer running west to east through the northern part of the PAH site is noted as being at capacity with existing loads.
- The 225mm sewer running along Ipswich Road just north of Cornwall Street is near capacity and will be over capacity if proposed PAH Buildings 1, O5A and 6 are permitted to drain into it.
- Based on the assumption proposed PAH buildings 1 (part), 2, 7 and 10 will drain to the 225mm sewer (PAH-SE2-225) running west to east through the PAH site and buildings 1(part), 5 and 6 will drain to the 225mm sewer (PAH-SE3-225) in Ipswich Rd just north of Cornwall St the following sewer upgrades will required to offset this surcharging:
    - BGO-SEW-02: Replacement of the existing 225mm sewer with a DN315mm PE sewer between MH166068 to MH163287 – approximately 420m long. 180m of which is in Ipswich Road,
    - BGO-SEW-03: Replacement of the existing 225mm sewer with a DN315mm PE sewer between MH163302 and MH163286 – approximately 260m long. 80m of which is in Ipswich Road
    - BGO-SEW-04 – Replacement of the existing 300mm sewer with DN400mm PE pipe between MH166054 and MH166021 - approximately 530m long. 205m of which is in Ipswich Rd.
- These upgrades can be avoided if all flow both current and future draining to the 225mm sewer (PAH-SE2-225) running west to east through the northern part of the site and any additional future loads proposed to be drained to the 225mm sewer (PAH-SE3-225) in Ipswich Rd to the east are redirected to the DN630mm sewer (PAH-SE1-630) located to the north under the busway (BGO-SEW-01).

1 Introduction

1.1 Background

The Queensland Government's Cross River Rail Precincts Delivery Strategy (the Strategy) sets a vision for each Cross River Rail (CRR) Station Precinct that is aligned to the Government's policy priorities. The Strategy sets out a vision for the Boggo Road Precinct to become a "World class innovation precinct, specialising in health, science and education jobs of the future".

This is to be achieved through enhancing the already established world-class health and research facilities with a focus on health, science and education services. The PDA will reinforce and maximise the precinct's role as a regionally significant economic cluster and enhance its reputation as a globally significant innovation precinct, facilitating skilled employment.

The Strategy also sets out an intent for the Boggo Road Precinct to provide direct opportunities for significant private investment, in addition to Government investment, to develop residential, commercial, recreational and health-focused facilities to create a destination where the built form supports people, jobs and businesses, with ease of accessibility through world class public transport.

To support the Government's vision for the precinct, the current Boggo Road CRR Priority Development Area (PDA) was declared on 2 October 2020 and an Interim Land Use Plan (ILUP) given effect. The Boggo Road CRR PDA covers approximately 39 hectares and is generally bounded by Burke Street to the north, Cornwall Street to the south, Annerley Road to the west, and Ipswich Road to the east.

The Minister for Economic Development Queensland (MEDQ) has delegated certain functions and powers under the Economic Development Act 2012 to the Cross River Rail Delivery Authority (CRRDA) including to plan, carry out, promote or coordinate activities to facilitate economic development and development for community purposes. The CRRDA is preparing a Development Scheme for the Boggo Road CRR PDA which will be applicable to development on land within the boundaries of the Boggo Road CRR PDA. From the date of its approval, Boggo Road CRR PDA Development Scheme (the development scheme) will replace the Boggo Road PDA Interim Land Use Plan (ILUP).

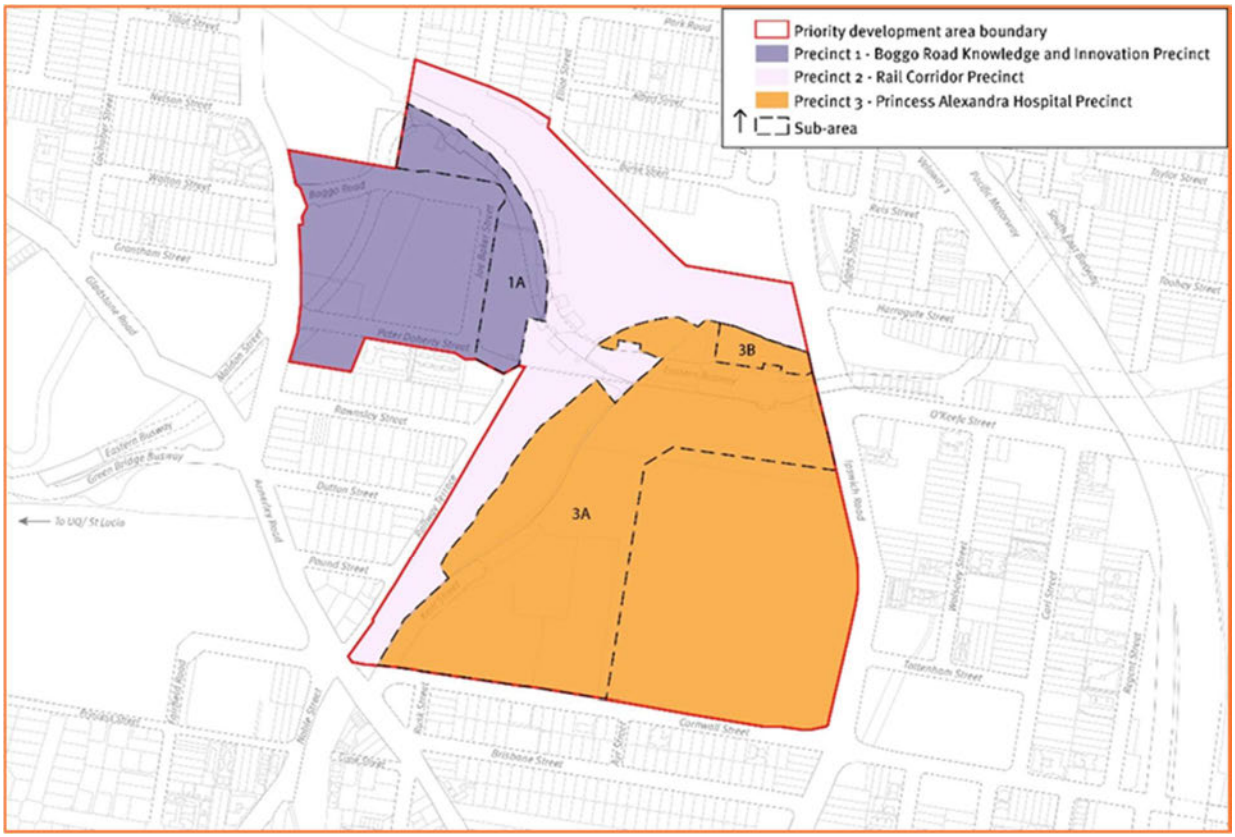
1.2 Study Area

The Boggo Road CRR PDA is shown in Figure 1. A notable feature of the PDA is that the eastern and western portions are separated by major transport infrastructure in the form of the Beenleigh/ Gold Coast rail line, Cleveland rail line and Eastern Busway.

Figure 1 - Map of Boggo Road CRR PDA

The current draft proposed Boggo Road CRR PDA Development Scheme refers to the PDA being made up of three precincts, each having its own precinct intent, preferred uses and sub-areas, these are: Precinct 1 – Boggo Road Knowledge and Innovation Precinct, Precinct 2 – Rail Corridor Precinct and Precinct 3: Princess Alexandra Hospital Precinct. Precincts and sub-areas are shown in Figure 2.

Figure 2 - Map of Boggo Road CRR PDA precinct boundaries (Source: Unpublished draft proposed Development Scheme, August 2021)



Section 2.6 of the unpublished draft proposed Boggo Road CRR PDA Development Scheme (August 2021) describes the intent for each of these three precincts as follows:

Precinct 1 - Boggo Road Knowledge and Innovation Precinct - Precinct intent

The Boggo Road Knowledge and Innovation (Boggo Road) Precinct is a vibrant mixed-use precinct, with a concentration of knowledge, research and innovation activities integrated with high-quality public realm. The precinct will be a high frequency transit destination and thriving hub of activity, providing a memorable and engaging experience for commuters, workers, visitors, students, and local community. The precinct is not intended to accommodate new residential development.

Precinct 2 – Rail Corridor Precinct - Precinct intent

The Rail Corridor Precinct is intended to maintain the primary function of accommodating key State transport corridors, including the heavy railway and busway corridors that traverse the PDA. Through the delivery of the central connection, the Rail Corridor Precinct will serve an important role in resolving a complex physical barrier between Boggo Road and PAH Precincts by improving active transport functionality and access.

The Rail Corridor Precinct will maintain appropriate interfaces to development and infrastructure both within the Precinct, and as it interfaces with the Boggo Road Precinct and Princess Alexandra Hospital Precinct. Major development activity beyond core transit functions is not readily anticipated within the precinct.

Precinct 3 – Princess Alexandra Hospital Precinct - Precinct intent

The Princess Alexandra Hospital (PAH) Precinct is anchored by the PAH, a national leading tertiary health care centre and associated world-class academic and research institutions, the Translational Research Institute (TRI) and Pharmacy Australia Centre of Excellence (PACE). The continued growth and advancement of these major health and knowledge facilities will drive renewal and redevelopment across the precinct.

The precinct will accommodate new hospital and research related development and facilities that respond to the changing community health needs, optimised clinical operations and renewal of ageing buildings or non-essential uses. Through staged renewal and redevelopment, the precinct will provide new and enhanced public spaces, improved wayfinding, and support complementary uses and improved amenity for patients, employees, and visitors. Development within sub-area 1 will accommodate clinical uses and a greater intensity of research, innovation, and allied commercial activity, situated along the rail corridor, and leveraging off the improved active transport functionality of the central connection.

1.3 Objective

This Technical Memo provides an assessment of the water and wastewater network infrastructure requirements to understand and address the impacts related to the Boggo Road CRR PDA future development opportunities. The outcomes will assist in informing infrastructure plans for the Boggo Road CRR PDA Development Scheme (the development scheme) and its supporting material, including a Development Charges and Offsets Plan (DCOP).

2 Development Scenario(s)

2.1 Existing Scenarios

Existing buildings within the Boggo Road CRR PDA are shown in Figure 3 and described in Table 1. The status of the existing buildings is defined as follows:

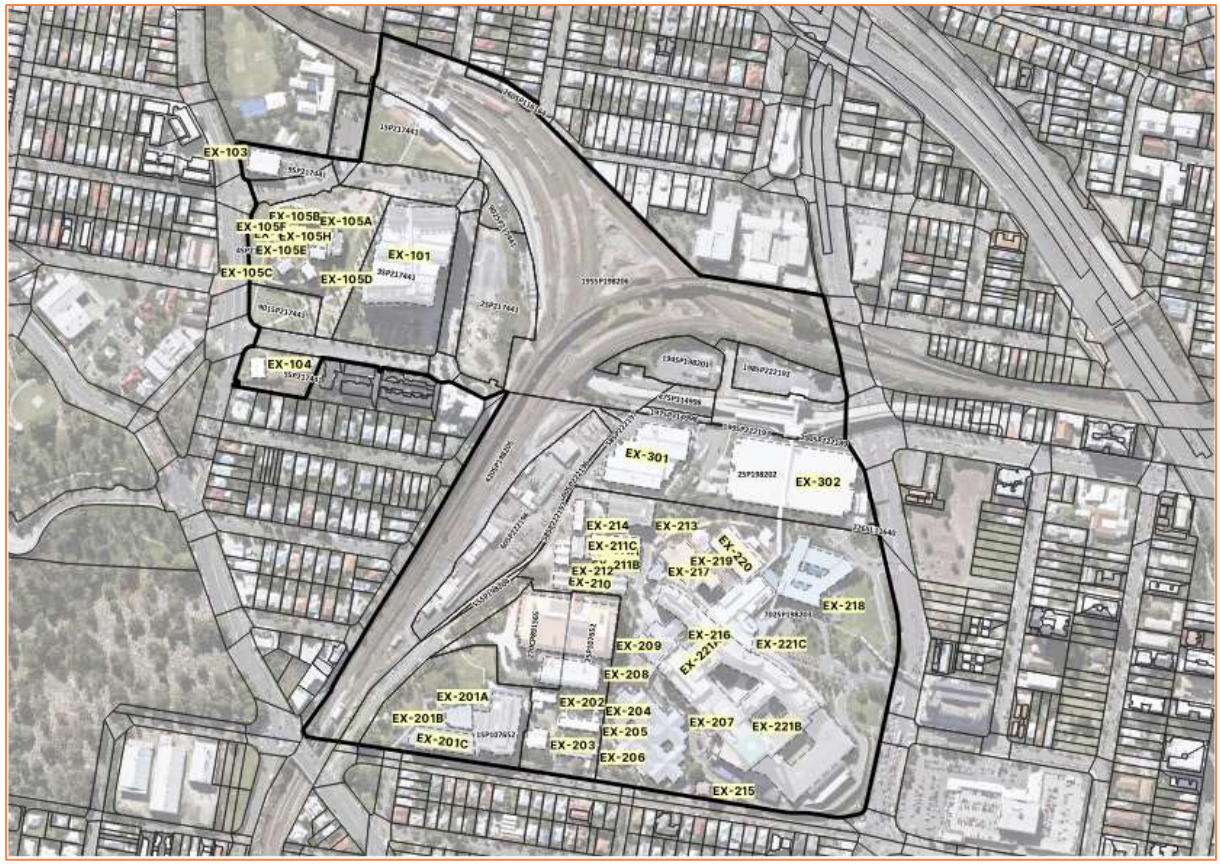
- Removed (TSD): No existing buildings were removed as part of the CRR TSD early works
- Future Removal: buildings that remain in place at the time of this investigation, however, may be removed / replaced as part of a future development scenario
- No Change: buildings that will not be removed or replaced under the future development scenarios investigated

Table 1 - Existing Buildings in PDA

Site	Description	Development Type	GFA m^2	Staged identified Building Removed
EX-101	Existing Ecoscience Precinct	Office	26082	No Change
EX-102	Existing Dutton Park Rail Station	Commercial	500	Station Relocated
EX-103	Existing Dutton Park Police Station	Emergency Services	1542	No Change
EX-104	Existing Boggo Rd Sales Office	Office	342	Future Removal - Stage 02
EX-105	Existing Boggo Rd Gaol	Commercial	3040	No Change
EX-201	Existing PACE Building	Health	17378	No Change
EX-202	Existing PAH Building 39	Health	553	Future Removal - Stage 04
EX-203	Existing PAH Building 37	Health	887	Future Removal - Stage 04
EX-204	Existing PAH Building 35	Health	924	Future Removal - Stage 04

Site	Description	Development Type	GFA m^2	Staged identified Building Removed
EX-205	Existing PAH Building 33	Health	910	Future Removal - Stage 04
EX-206	Existing PAH Building 31	Health	1300	Future Removal - Stage 04
EX-207	Existing PAH Building 07 (GARU)	Health	11277	Future Removal - Stage 04
EX-208	Existing Pantheon Biologics Building	Health	6735	No Change
EX-209	Existing TRI Building	Health	38963	No Change
EX-210	Existing PAH Building 63	Health	1559	No Change
EX-211	Existing PAH Building 61 (General Support Services)	Health	4457	Future Removal - Stage 04
EX-212	Existing PAH Building 62	Health	321	No Change
EX-213	Existing PAH Building 57 (Central Energy Unit)	Health	1820	No Change
EX-214	Existing PAH Building 59	Health	384	No Change
EX-215	Existing PAH Building 05 (Diamantina Health Care Museum)	Health	220	No Change
EX-216	Existing PAH Building 11 (Loading Dock)	Health	1436	No Change
EX-217	Existing PAH Building 13 (Aquatic Physiotherapy Pool)	Health	290	No Change
EX-218	Existing PAH Building 19 (Mental Health Services)	Health	6251	No Change
EX-219	Existing PAH Building 15 (Executive Building)	Health	9335	No Change
EX-220	Existing PAH Building 17 (Spinal Injuries Unit)	Health	3250	Future Removal - Stage 04
EX-221	Existing PAH Main Hospital	Health	99131	No Change
EX-301	Existing PAH Building 55 (Laundry)	Industrial	4000	Future Removal - Stage 04
EX-302	Existing PAH Carpark	Commercial	0	No Change

Figure 3 - Existing Building Layout(2020)



2.2 Developed Scenario(s)

2.2.1 Overview

A baseline scenario using standard population densities based on SEQCode has been assessed. Planned additional non-residential GFA is 342,356m2, plus 82 residential units

2.2.2 Staging

The potential future development has been assessed as occurring in three stages spanning 20 years. Timing is proposed as shown below in Table 2.

Table 2 - Stages in Scenario

Stage	Timing	Description
Stage 1	Between years 2020 - 2025	Includes proposed buildings CRR Tunnels, Station and Development (TSD)
Stage 2	Between years 2025 - 2026	E1, E4, E5 and TRI2.0
Stage 3	Between years 2027 - 2031	Includes proposed buildings E2, E3, R1, O5A and 9
Stage 4	Between years 2032 - 2041	Includes proposed buildings 1, 2, 3A, 3B, 6, 7, 8, 10, R2 and PACE3

2.2.3 Yields

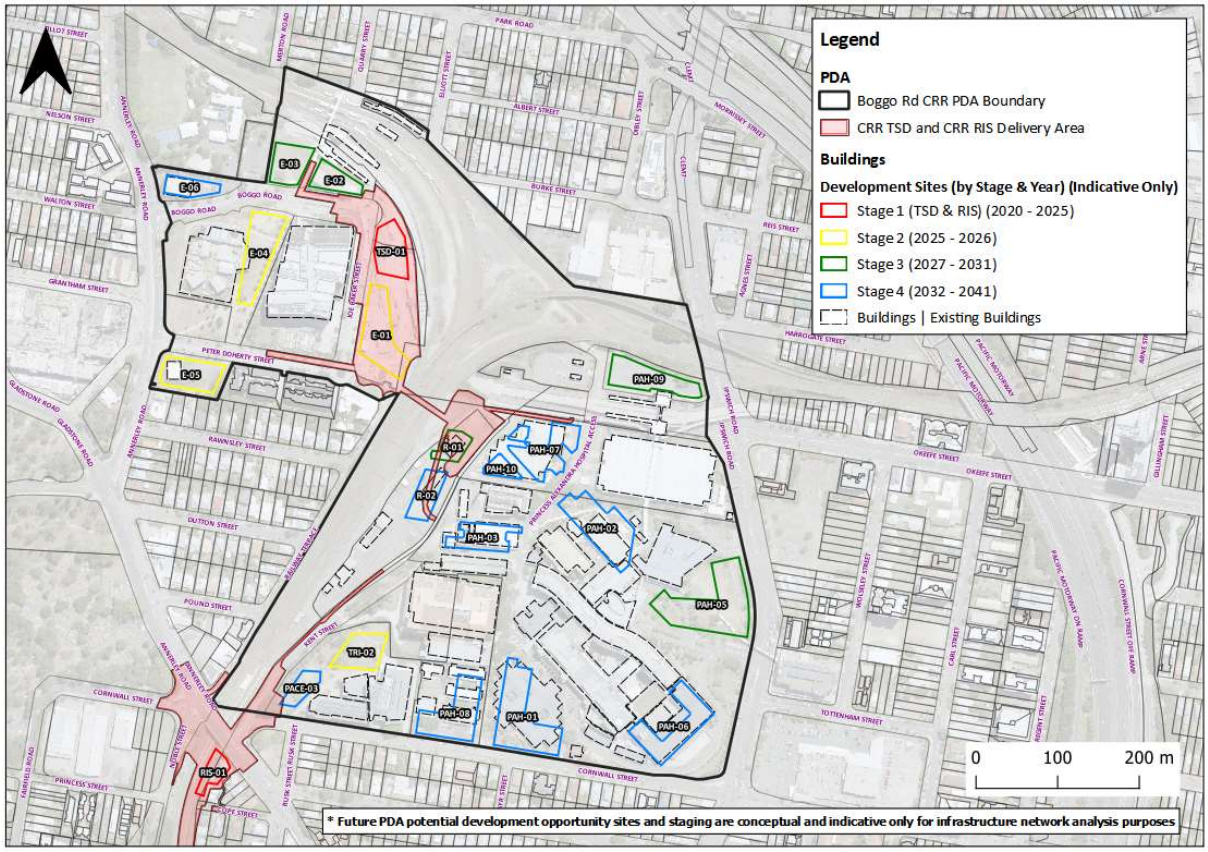
The potential future development yields based on the Reference Scheme and timing is as shown below in Table 3;

Table 3 - Proposed Building Yields and Timings

Site	Description	Development Type	GFA m^2	Stage
TSD-01	CRR Tunnels, Station and Development	Industrial	1000	Stage 01
E-01	Lot 2- Central Collaboration Building 1	Office	31026	Stage 02
E-04	Retail Spine 21-41 Boggo Road	Retail/Commercial	4485	Stage 02
E-05	Stockwell E5 4 Annerley Road	Residential	82 (units)	Stage 02
TRI-02	Proposed Office Building	Office	6616	Stage 02
E-02	Proposed Office Building	Office	24653	Stage 03
E-03	Proposed Office Building	Office	23170	Stage 03
PAH-09	Proposed Office Building	Office	43243	Stage 03
R-01	Proposed Allied Health Building	Health	17460	Stage 03
PAH-05A	PA Outpatients Services	Hospital	47064	Stage 03
R-02	Proposed Laboratory Building	Research	11484	Stage 04
PACE-03	Proposed Office Building	Office	10200	Stage 04
PAH-02	Proposed Hospital Building	Hospital	39269	Stage 04
PAH-01	Proposed Hospital Building	Hospital	27144	Stage 04
PAH-06	Proposed Hospital Building	Hospital	17146	Stage 04
PAH-08	Proposed Hospital Building	Hospital	31248	Stage 04
PAH-07	PAH Health, Out Patient, Allied Health And Research Buildings	Health	31806	Stage 04
PAH-10	PAH Health, Out Patient, Allied Health And Research Buildings	Health	11394	Stage 04
PAH-03A	Proposed Hospital Building	Hospital	8400	Stage 04
PAH-03B	Proposed Hospital Building	Hospital	21600	Stage 04
E-06	Proposed Office Building	Office	12,960	Stage 04

The locations of potential future development projects within the PDA Reference Scheme are shown in Figure 4.

Figure 4 - Potential Development Scenario Staging Plan - Reference Scheme



2.2.4 Equivalent Person Estimate

2.2.4.1 Methodology

To assess the impacts of development on the Urban Utilities water and wastewater infrastructure, building yields needed to be converted to Equivalent Persons (EP) figures for both existing development and future proposed buildings within the Boggo Road CRR PDA.

The EPs were calculated in accordance with the SEQ Water Supply and Sewerage Design and Construction Code (the SEQ Code) planning density rates based on development type classification as used in Brisbane City Council City Plan.

The calculated EPs are shown in Attachment B – EP, Water & Wastewater Demands Estimate. Total EPs equals 1452.

The combined EP loadings for the Boggo Road Precinct and PAH Precinct each totalled;

- Boggo Road Precinct – 188 EP
- PAH Precinct (including PACE and TRI Building) – 1,264 EP

These figures were compared to the year 2021 EP loadings used in the supplied Urban Utilities WaterGEM water model. It was identified the Ecoscience Building had an EP loading almost five times greater than calculated (760.422 EP) and the PAH site had a combined EP loading of 4146.8 EP which was just over three times that calculated.

It was also identified that the PAH meter loading points did not align with the actual service locations or number of.

Water consumption data was requested from CRR TSD, Department of Health – PAH, and Urban Utilities to help verify the model's EP loadings.

Metering location data from PAH was able to be cross referenced with Urban Utilities metering data to identify the location of the six boundary meters across the site. Converting the monthly meter readings for the period 22/06/2020 – 27/05/2021 into EPs gave an average EP loading of 3,370EP for the site (excluding PACE and TRI buildings). The maximum was 4,300 EP for the month of February 2021. This compared well to the model's EP loading of 3725 EP. The model EP loadings were therefore accepted as the total generated EP loading by PAH.

The meter results for all six boundary meters over the same meter period allowed a percentage split to be determined of the total existing load. Due to the variability between meter and metering period it was decided to average each meter's reading over the full period and assume the percentage split of the total. These percentage ratios were then applied to the Urban Utilities total EP figure for PAH.

Table 4 shows the monthly meter readings and the associated EP split between metered service connections across the PAH site.

Table 4 - Monthly Meter Readings and EP Split PAH Site

Reading Date	JEB1700003	GEB1800017	FC00078	FC00080	IEB1800004	GES1900055	KL/month	days	KL/d	EP
27/05/2021	756	820	2878	6757	13615	2	24828	30	828	3598
27/04/2021	563	667	2607	6131	11810	31	21809	27	808	3512
31/03/2021	1226	907	3628	6880	14646	1	27288	35	780	3390
24/02/2021	1118	1214	5487	8653	17091	63	33626	34	989	4300
21/01/2021	1080	887	4341	8340	10137	1	24786	31	800	3476
21/12/2020	1243	935	4001	6533	9957	101	22770	27	843	3667
24/11/2020	1237	1041	3833	6339	10187	58	22695	29	783	3403
26/10/2020	1641	1273	4958	7666	10733	37	26308	35	752	3268
21/09/2020	1357	1010	4164	5691	7526	30	19778	27	733	3185
25/08/2020	1197	955	4811	6481	8281	60	21785	32	681	2960
24/07/2020	1075	879	4602	6343	9250	25	22174	32	693	3013
22/06/2020	784	615	3568	5418	8546	73	19004	31	613	2665
Average	1106	934	4073	6769	10982	40	23904		Average	3370
% split	0.046	0.039	0.170	0.283	0.459	0.002			Median	3396

As it is anticipated that most of the future development within the PAH Precinct will be replacing existing buildings, the EP loading was further broken down to individual buildings. Existing building use categories were also broken down further into more specific uses and designated EP densities were derived as follows;

- Industry (workshops) – 0.006 EP/m2
- Administration/ Clinical – 0.006 EP/m2
- Administration/ Commercial – 0.006 EP/m2
- Laundry – 0.197 EP/m2
- Energy Building/ Cooling – 260 KL/day
- Hospital Wards/ Beds – 0.014 EP/m2

The laundry facility EP density was based on EP rates determined from EP loads taken from the Urban Utilities Brisbane_v2 model for known commercial laundries and building area measured on Google Maps, approx. 1970 EP/Ha.

The Central Energy Unit consumption was determined based on supplied meter data by PAH for the cooling tower potable water feed. 260 KL/day – 1100 EP.

The hospital Wards / Beds EP rate was derived from the remainder, once other EP loads were subtracted from the total of 3,725 EP (4146.8 EP less PACE and TRI buildings). The resultant loading of 0.014 EP/m2 is equivalent to approximately 1.8 EP/bed based on 966 Beds at PAH. Which is comparable to published data ranging from 1.4 to 2.5 EP/bed for a hospital.

The EP loads for the TRI and PACE buildings were also reviewed. It was found the PACE building EPs in the Urban Utilities model were comparable to published data for a tertiary education facility. The TRI building EP rate

of 0.09 EP/m2 or 88.6 EP/ha was deemed acceptable and was used for future research facilities to be built on the site.

These revised EP loading rates were then applied to the future potential development buildings and a future EP derived. These are detailed in Attachment A.

2.2.4.2 Findings

The EP credits associated with the existing buildings and demand for water and sewerage in the Boggo Road CRR PDA are summarised in Tables 5 and 6. Credits and debits are shown as negative and positive numbers respectively. The equivalent commercial/ retail and residential yields for the EP estimates are detailed in Table 7

Key observations were as follows:

- A total of 1072 EP credits were identified, which is equivalent to:
  - 29,780 m^2 GFA of commercial / retail.
  - 82 attached dwellings.
- The Baseline Scenario results in a +3,292-net increase in EP for water and a +2,855-net increase in EP for sewerage.

Table 5 - Change EP estimates by Stage and Development Scenario - Water

Scenario	Demand Change Type	Stage 1 (2021 – 2025)	Stage 2 (2025 – 2026)	Stage3 (2027-2031)	Stage 4 (2032-2041)	Total
Baseline	Credit	0	-6	0	-1,066	**-1,072**
	Debit	648	365	1,135	2,216	**4,364**
	Total	**648**	**359**	**1,135**	**1,150**	**3,292**

Table 6 - Change EP estimates by Stage and Development Scenario - Sewerage

Scenario	Demand Change Type	Stage 1 (2021 – 2025)	Stage 2 (2025 – 2026)	Stage3 (2027-2031)	Stage 4 (2032-2041)	Total
Baseline	Credit	0	-6	0	-1,066	**-1,072**
	Debit	211	365	1,135	2,216	**3,927**
	Total	**211**	**359**	**1,135**	**1,150**	**2,855**

Table 7 - EP Change Estimates and Equivalent GFA, Attached Dwelling Yields

Scenario	Demand Change Type	Total EP Change Water	Total EP Change Sewerage	Equiv. Yield Quantity (GFA m2)	Equiv. Yield Quantity (Att. Dwells)
Baseline	Credit	-1,072	-1,072	-29,780	0
	Debit	4,364	3,927	353,156	82
	Total	**3,292**	**2,855**	**323,376**	**82**

2.3 Water Supply

2.3.1 Existing and Currently Planned Infrastructure

2.3.1.1 Asset Owners

The water supply service provider for the Boggo Road CRR PDA is Urban Utilities. Within the PAH Precinct, all existing water mains are privately owned and maintained by the Metro South Health, connecting to five metered connections at the property boundary from Urban Utilities water mains located in Kent Street, Cornwall Street and Ipswich Road.

2.3.1.2 Existing Water Infrastructure

The existing water supply infrastructure within the Boggo Road CRR PDA effectively consists of two separate areas separated by the Gold Coast/ Beenleigh Railway line. The western area known as the Boggo Road Knowledge and Innovation Precinct is serviced by a 150/100mm water main running along Railway Terrace and a 225/150mm water main running along Annerley Road. Both feed from a 300mm connection off a 600mm trunk main located in Annerley Road near Brisbane Street with additional supply coming from another 300mm trunk main connection in Gladstone Rd when demand for the area becomes high. The water main internally serving the precinct is a 150mm ring main connected to mains along Annerley Road and Railway Terrace.

The eastern area consists of the Railway Corridor Precinct which contains all land currently within Queensland Railways land and Princess Alexandra Hospital Precinct which includes PAH site, the Pharmacy Australia Centre of Excellence (PACE) Building and the Transitional Research Institute (TRI) Building. The area is serviced by mains on three boundaries. A 225/150mm ringed watermain in Kent Street, a 150mm watermain in Cornwall Street, and a 225mm watermain in Ipswich Road.

All watermains are interconnected and connect indirectly to a 600mm trunk water main in Annerley Road and a 410mm trunk water main in Ipswich Road. The Ipswich Road trunk main has two connections that feed the PAH area. One directly connects into the 225mm water main in front of the hospital site north of Cornwall St and the other further south connecting into a dual 150mm retic system that runs north along Ipswich Road from Juliette Street before connecting with the 150mm and 225mm watermains fronting the hospital at the corner of Cornwall Street and Ipswich Road. For layout refer Figure 6.

2.3.1.3 Existing Water Network Performance (pre-development)

Standards of service requirements based on the SEQ Water Supply and sewerage Design and Construction Code (SEQ Code) are;

- Minimum pressure Peak Hour (PH) at property boundary 22m,
- Minimum pressure during emergency for operating conditions – 12m minimum in the main at the flowing hydrant, 6m elsewhere in the mains that have customer connections, positive pressure throughout,
- Medium density Res (4-6 storeys) and Commercial/ Industrial Brownfield 30 L/s for 4 hrs by up to 3 hydrants.

Indicative available peak hour pressure and flow rates for water mains in the PDA are shown in Table 8, which has been obtained from Urban Utilities computer hydraulic model year 2026 scenario pre-PDA.

Table 8 - Typical modelled current available flow rates Peak Hour

Street: Boggo Rd		Street: Joe Baker St		Street: Peter Doherty St		Street: Kent St		Street: Cornwall St		Street: Ipswich Rd	
Location: RV13358		Location: RHY152018		Location: RHY152023		Location: RDE102788		Location: RHY37565		Location: RV29751	
Flow (L/s)	Pressure (m)	Flow (L/s)	Pressure (m)	Flow (L/s)	Pressure (m)	Flow (L/s)	Pressure (m)	Flow (L/s)	Pressure (m)	Flow (L/s)	Pressure (m)
0	35	0	40	0	34	0	48	0	33	0	54
6	35	12	39	6	33	30	47	6	32	12	53
12	34	24	37	12	33	72	44	12	32	18	53
18	33	30	36	18	32	96	41	18	30	42	52
24	32	36	35	24	31	120	37	24	29	60	51
30	31	42	33	30	31	144	33	30	27	96	48
36	29	48	31	36	29	168	28	36	24	120	45
42	28	54	29	42	28	174	26	42	22	162	39
48	26	60	27	48	27	180	25	48	19	186	35
54	24	66	24	54	25	186	23	-	-	210	30
60	22	72	22	60	23	192	22	-	-	252	21
66	19	78	19	66	21	198	20	-	-	-	-

Based on computer hydraulic modelling the area is well serviced with peak hour supply pressures above minimum requirements. It is noted the trunk mains feeding the area are operating with head losses above maximum permitted based on Urban Utilities planning guidelines. Figure 5 shows minimum pressures are adequate in the area with some mains with head losses greater than 3m/km.

Sections of 225mm water main in Annerley Rd, the 100mm water main in Railway Tce and the 225mm water main in Ipswich Rd are also exceeding head loss guidelines.

In relation to fire flow the network in all areas of the PDA meets Urban Utilities minimum service standards in relation to fire flow based on 30 L/s out of a maximum of three FHs. The worst performing area is Cornwall St requiring 3 FHs to meet the 30 L/s requirement. All other streets in the PDA obtained in modelling 30 L/s flow out of two hydrants.

Pressure drops caused by emergency fire flow demand varied throughout the PDA with Boggo Rd Knowledge and Innovation Precinct experiencing pressure drops of up to 4m while Cornwall St experienced pressure drops of over 5m. Ipswich Rd and Kent St experienced pressure drops of around 1m.

For private fire demands greater than 30 L/s pressure drops were noted to be more severe. Modelling a single point fire demand of 40 L/s identified Cornwall St has capacity issues with a pressure drop of 10m which is outside of Urban Utilities desirable pressure drop to be experienced by surrounding customers. Within the Boggo Rd Knowledge and Innovation Precinct pressure drops experienced are at the upper desirable limit in Boggo Rd and Joe Baker St with a pressure drop of up to 6m.

It is recommended that the existing network, pre-PDA and PAH developments, be discussed with Urban Utilities when determining potential upgrade requirements in terms of levels of service, timing of delivery for new or upgraded assets, delivery and funding responsibilities. In this regard, it is noted that the following existing assets

are at or are approaching the end of their design lives: 150mm water main in Annerley Road (age 94 yrs), 100mm water main in Railway Terrace (age 53 yrs), 150mm water main in Cornwall Street (age 109 yrs).

Figure 5 - Modelled performance of network year 2026 scenario no PDA loads

2.3.1.4 Currently Planned Infrastructure

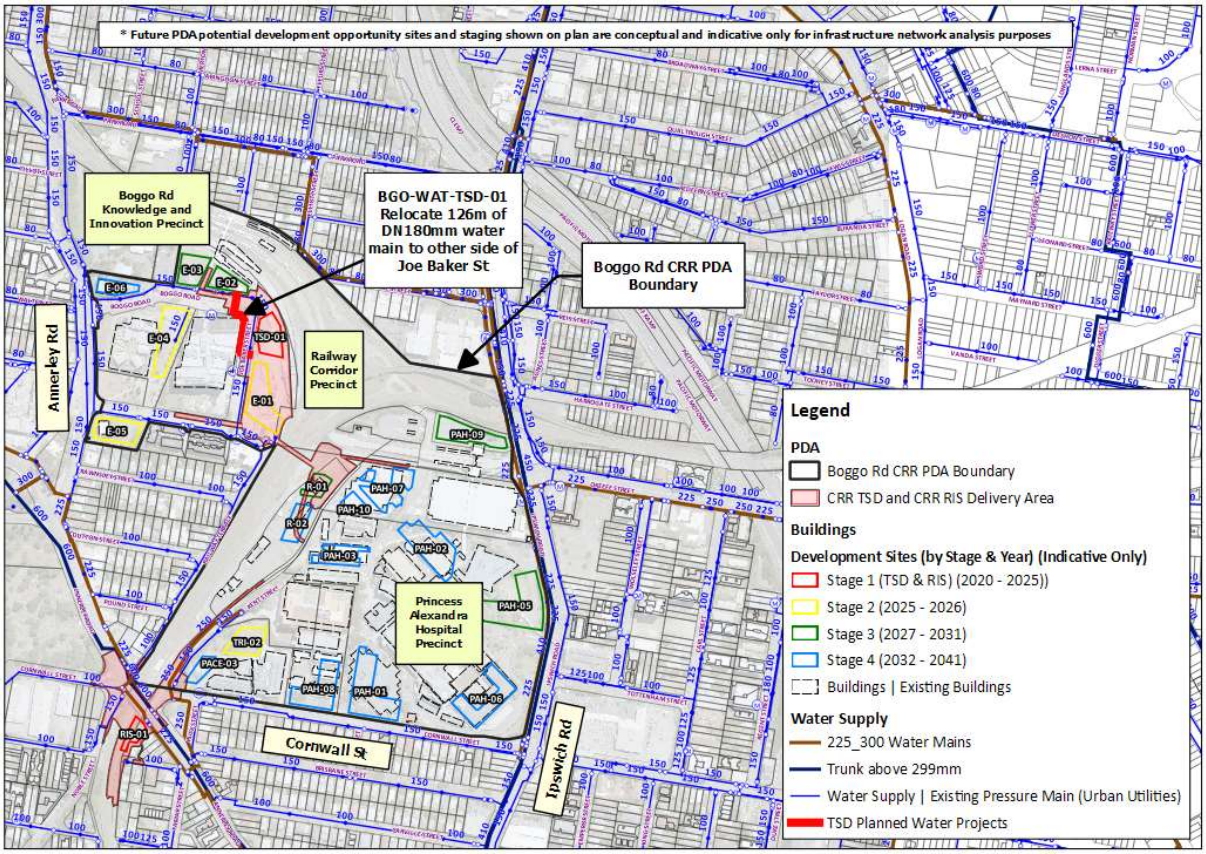
The current Urban Utilities Netserv plan does not identify any water infrastructure upgrades for the area (refer Attachment C, Netserv Plan Map 55 water).

Developments on proposed future sites E-04, E-05 and TRI-02 have been approved by BCC. Advice as to whether any water approvals have been issued by Urban Utilities for these developments and any water augmentation works required been requested from Urban Utilities but has not yet been provided.

CRR TSD has prior to the commencement of excavation of the Boggo Rd TSD relocated part of the existing 150mm water main in Baker St (BGO-WAT-TSD-01) to the opposite side of the road to enable construction work to commence unimpeded. Refer Figure 6.

In relation to PAH Campus there has been no advice of any new works proposed on the private internal water main network. There will be a requirement to review the internal water main network by Metro South Health once proposed building works are planned to occur on the site associated with the proposed future master planning.

Figure 6 - Existing and Currently Planned water Infrastructure



2.3.2 Demand Estimates

Water demand and flow estimates for the Existing and Developed Scenarios were developed based on the SEQ code guidelines and measured water meter consumption of existing development sites.

Demand estimates (EP and water flows) were quantified in terms of both the change in demand and residual demand. Demands were estimated for all existing and potential future buildings within the Boggo Road CRR PDA, including those that have recently been approved by other parties including by BCC, CRR TSD and MIDs. The estimates are contained in Attachment B EP, Water & Wastewater Demands Estimates.

2.3.3 Development Impacts

2.3.3.1 Assessment of Existing Water Network with Future Demand

Computer Hydraulic modelling was undertaken to determine the impact of the potential PDA development based on the Reference Scheme on the existing network. Multiple scenarios were run for the Boggo Road CRR PDA based on 2021, 2026, 2036 and ultimate (2041) loads. Results revealed the network is approaching its limit at ultimate with sections of water main experiencing head loss gradients greater than specified for new pipes. Sections of water main exceeding head loss gradient standards include the 225mm watermain fronting the PAH in Ipswich Road, sections of 150mm water main in Annerley Road feeding water to the Boggo Road Precinct and a section of 100mm water main in Railway Terrace also indirectly supplying water to Boggo Road Precinct. The Ipswich and Annerley Rd water mains are at or approaching the end of their design lives.

The net impact on the hydraulic Grade Line (HGL) for the area by the anticipated future PDA development at peak hour year 2036 will vary between 0.370m and 1.6m. The Boggo Road Knowledge and Innovation Precinct area will experience a 1.6m drop in pressure in the immediate vicinity of Boggo Road and Joe Baker Street decreasing to 0.46 away from the site at the corner of Annerley Road and Railway Terrace. The PAH Campus will experience a 0.94m drop in pressure along Ipswich Road reducing to 0.37m at Kent Street to the west. Minimum

pressures in the water network surrounding the Boggo Road CRR PDA boundaries remain greater than 26m minimum which is above minimum standards of service.

Review of the peak hour performance with full development load applied indicates there are two sections of water main directly affected by its addition. These sections of water main affect the Boggo Rd Knowledge and Innovation Precinct in terms of their head loss performance exceeding maximum head loss design requirements. The sections of water main identified are:

- approximately 215m of 150mm water main in Annerley Rd between the Gladstone Rd 225mm branch tee near Dutton St and Joe Doherty St to be replaced with a DN250mm PE pipe,
- approximately 112m of 100mm water main within Railway Tce between Annerley Rd and Pound St to be replaced with a DN180mm PE pipe.

Modelling indicates increasing their diameter one size up based on the Urban Utilities approved product list pipe sizes will eliminate the head loss issue and improve pressure drop during fire demands by 2 to 3m in the Boggo Rd Rd Knowledge and Innovation Precinct.

Review of fire flow pressure performance indicates the network meets minimum standards of service maintaining pressures above minimum pressure both at and nearby to placed fire hydrant flow demands. Fire hydrant flow exceeds minimum standards of service with all hydrants able to supply a combined flow of more than 30 l/s out of three maximum fire hydrants and individually can deliver at least 13 L/s. Cornwall St is the only street that the water main could not supply 30 L/s out of two FHs in the model.

Pressure drops during an emergency 30 L/s fire scenario were mixed. In Ipswich Rd and Kent St pressure drops were in the order of less than 1m. In Cornwall Street pressure drop was up to 6.1m, while the water mains within the Boggo Road Knowledge and Innovation Precinct experience pressure drops depending on location of between 4.5m and 5.25m. The worst section located in the north eastern corner of Boggo Road and Joe Baker Street.

While excessive pressure drops are acceptable during an emergency fire scenario, it is not acceptable if it occurs during private fire service testing. Review of AS2419.1, PAH fire flow testing results and information obtained from CRR and PAH indicates internal fire flow requirements for buildings within the Boggo Road CRR PDA will be up to 35 L/s. Modelling, assuming an internal fire demand of 40 L/s at the worst location previously identified for pressure during a 30 L/s FH fire event (Boggo Road, eastern end) identifies the maximum pressure drop will be 8.4m. This amount is just outside of Urban Utilities Water and Sewerage Planning Guidelines requirement of 6-8m maximum pressure drop to be experienced by surrounding customers. This pressure drop can be managed by conditioning any future development proposals to install fire facilities that allow only offline testing and filling of tanks outside of normal business hours and residential peaks using restricted inflow.

For the Boggo Rd Knowledge and Innovation Precinct modelling of the network including the above identified head loss mains upgrades improves indicates pressure drops with the worst-case pressure drop scenario for 40 L/s internal fire demand previously modelled decreasing from 8.4m to 6.1m.

For Cornwall St when a 40 L/s private internal flow demand is placed in the street at the worst identified location the resultant pressure drop is 11.2m. This exceeds Urban Utilities planning guideline requirements and therefore must be augmented. The required augmentation to reduce the pressure drop to acceptable levels Is to upgrade a 200m section of 150mm water main in Cornwall St between Rusk St and 67 Cornwall St with a DN250mm PE pipe (Refer Figure 7).

2.3.4 Development Risks and Opportunities

The potential water supply risks and opportunities associated with the Boggo Road CRR PDA are summarised in Table 9. These risks and opportunities were identified through service provider engagement, demand estimates and previous investigations.

Table 9 - Summary of Development Risks and Opportunities on Water Supply Network

Aspect	Development Considerations
Cast Iron Water Mains	• Many mains supplying water to the Boggo Rd CRR PDA are Cast Iron (CI) pipes of varying ages. The head loss in CI pipes can be quite variable and it is recommended that field testing of actual flow/ pressures is performed where key demands are to be placed to ensure standards of service are maintained with new development.
Flow and Pressure Demand (Fire)	• There is a notable drop in pressure experienced in the Boggo Rd Knowledge and Innovation Precinct area during modelled onsite emergency fire events. As supply mains to the area are aged, CI pipe flow testing should be undertaken for all proposed sites to determine if available fire flow will meet Urban Utilities standards of service. • If pipe flow testing demonstrates that standards of service regarding pressure drop under fire flow scenarios exceeds 8m it is recommended that future development should be conditioned to ensure only off main internal fire system testing is undertaken and any water draw required for filling onsite emergency storage be undertaken using a reduced constant flow rate that will not detrimentally affect surrounding customer's pressure..
	• If flow testing identifies the above approach is not enough, then implementation of the augmentation must be enforced.
PAH internal water infrastructure	• No investigation of the capacity of internal water mains has been undertaken for internal PAH water supply infrastructure, only metered property connection points associated with the Urban Utilities water network and the networks capacity to accept hospital flows. • Internal water reticulation will need to be reassessed for any new buildings within the PAH site and to ensure the network meets building code and Australian standards for fire throughout the site.

2.3.5 Preliminary Servicing Strategy

2.3.5.1 Objectives

A preliminary water servicing strategy for the Boggo Road CRR PDA has been identified based on the following objectives:

- Satisfying water supply requirements of the SEQ Code, to the extent practical based on the level of information available at the time of this investigation.

2.3.5.2 Water Supply Network Connection Points

The proposed water supply network connection location for each development project / building is set out in Table 10. This servicing strategy will be confirmed with Urban Utilities upon a request for a SAN advice or water connection application from Urban Utilities.

Table 10 - Proposed Water Connection Locations

Building(s)	Preferred Connection Location	Comments, Alternatives
CRR Station (TSD-01)	Existing DN150 uPVC main in Joe Baker Street	- Urban Utilities has previously approved water main relocation and service connections in relation to the CRR TSD project scope.
E-01	Existing DN150 uPVC main in Joe Baker Street	- Development to be conditioned to only permit onsite offline fire flow testing.

Building(s)	Preferred Connection Location	Comments, Alternatives
E-02, E-03	Existing DN150 uPVC main in Boggo Road	- Development to be conditioned to only permit onsite offline fire flow testing.
E-04	Existing DN150 uPVC main in Boggo Road	- Development to be conditioned to only permit onsite offline fire flow testing.
E-05	Existing DN150 uPVC main in Peter Doherty Street	- Development to be conditioned to only permit onsite offline fire flow testing.
PAH-03A, PAH-03B, PAH-08, PAH-01, PAH-02, PAH-07, PAH-10, PAH-05, PAH-06	Connect into PAH internal water supply network	- To Be Advised by Metro South Health prior to commencement of development
TRI-02	Existing DN150 uPVC main in Kent Street	- Alternative is to connect to existing DN250 PE main on western side of Kent Street (requires road crossing)
PACE-03	Existing DN150 uPVC main in Kent Street	- Alternative is to connect to existing DN250 PE main on western side of Kent Street (requires road crossing)
PAH-09	Existing DN225 CICL main in Ipswich Road	- Alternative is to connect to existing 200mm service connection off DN250 DICL pipe in O'Keefe Street under Busway
R-01, R-02	Connect to DN250 PE main via easement.	- Buildings in QR land which is separate from PAH land. Require finalisation of how access to site for services will occur prior to development approval. Buildings potentially land locked at this stage as no further information available.

2.3.5.3 Facilitating (Proposed) Infrastructure Projects

Infrastructure projects may be required to facilitate the preferred servicing strategy.

Computer hydraulic modelling has identified two sections of water main with excessive head loss that are directly attributable to the Boggo Rd CRR PDA in Annerley Rd and Railway Tce. Upgrade of these sections improve fire flow to the Boggo Rd Knowledge and Innovation Precinct area. It also identified a capacity issue in Cornwall St in relation to fire flow pressure drop exceeding Urban Utilities planning guidelines. Upgrade of a section of this water main will improve fire flow performance to Princess Alexandra Hospital Precinct development along Cornwall St. The above upgrade projects are described in Table 11 and shown in Figure 7. The upgrade projects are also identified in Attachment E – Future Infrastructure Network Maps

High-level cost estimates for projects are contained in Attachment D Cost Estimates

Table 11 - Potential Future Water Supply Infrastructure Projects

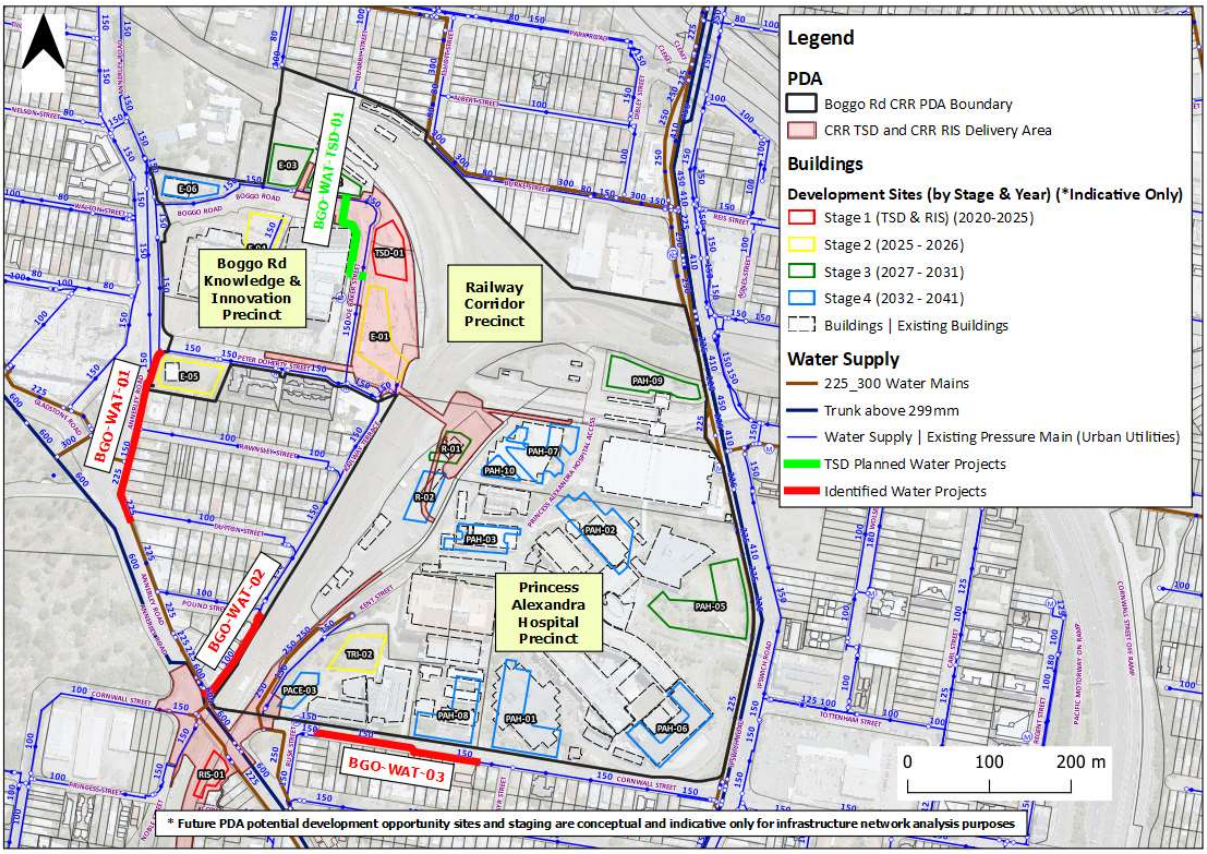
No	Description of Works
BGO-WAT-01	• Objective: to reduce head loss in pipe directly attributed to Boggo Rd Knowledge and Innovation Precinct Development. Benefits include improved main capacity and reduced pressure drops in Precinct during emergency fire scenarios. • Assumed Infrastructure: - 215m x of DN250 PE pipe (or equivalent ID size) located in Annerley Road between Peter Doherty Rd and the Gladstone Rd 225mm branch tee near Dutton St • Timing / Trigger: - Prior to first new approved development in Boggo Rd Knowledge and Innovation Precinct Development. It is noted that based on the Reference Scheme indicative staging plan, this project may be required to be delivered between 2021 – 2026 by Urban Utilities or developers with BCC approved development permits (Reference Scheme projects E-04 or E-05) in advance of any potential CRR PDA assessed developments (Reference Scheme projects: E-01, E-02, E-03) • Indicative Cost: $1,306,160
BGO-WAT-02	• Objective: to reduce head loss in pipe directly attributed to Boggo Rd Knowledge and Innovation Precinct Development. Benefits include improved main capacity and reduced pressure drops in Precinct during emergency fire scenarios. • Assumed Infrastructure: - 112m x of DN1801 PE pipe (or equivalent ID size) located in Railway Tce between Annerley Rd and Pound St • Timing / Trigger: - Prior to first new approved development in Boggo Rd Knowledge and Innovation Precinct Development. It is noted that based on the Reference Scheme indicative staging plan, this project may be required to be delivered between 2021 – 2026 by Urban Utilities or developers with BCC approved development permits (Reference Scheme projects E-04 or E-05) in advance of any potential CRR PDA assessed developments (Reference Scheme projects: E-01, E-02, E-03). • Indicative Cost: $513,840
BGO-WAT-03	• Objective: to reduce to reduce pressure drop for surrounding customers during an emergency fire scenario directly attributed to Princess Alexandra Hospital Precinct Development. Benefits include improved main capacity and reduced pressure drops in Cornwall St during emergency fire scenarios. • Assumed Infrastructure: - 200m x of DN250mm PE pipe (or equivalent ID size) located in Cornwall St between Rusk St and 67 Cornwall St • Timing / Trigger: - Prior to first new approved development in Princess Alexandra Hospital campus requiring fire supply from Cornwall St, e.g. TRI-02, PAH-08, PAH-01, PAH-06, PACE-03. • Indicative Cost: $421,632

2.3.5.4 Additional Servicing Requirements

Servicing of the Boggo Road CRR PDA Water Supply demands accommodate the following:

- **Early and Ongoing Engagement with Service Provider:** it is recommended that CRR Precinct Delivery Partners engage with Urban Utilities early in the process to understand the opportunities and constraints relating to their specific development and timing.
- **Detailed Modelling & Optimisation of Staging:** it is recommended that the water model of the Boggo Road CRR PDA development outcomes be updated to model the preferred development scenario as it is refined. This model should include flow and pressure results from field testing, both before and after each development stage.
- **Demand Reduction:** It is recommended that CRR Precinct Delivery Partners take the opportunity to reduce water network demand through an integrated water system that may include stormwater and wastewater reuse systems
- **Transient Analysis:** where fire systems or potable water demands include large flow rates drawn or pumped directly from the town centre mains, transient analysis may be required to demonstrate that the proposed design does not present a risk to the Urban Utilities water supply network.

Figure 7 - Map of Existing, Currently Planned and Proposed Water Infrastructure



2.4 Wastewater

2.4.1 Existing and Currently Planned Infrastructure

2.4.1.1 Asset Owners

The Boggo Road CRR PDA comprises land within the Boggo Road Knowledge and Innovation Precinct which includes the Ecoscience Building and the Boggo Road Gaol, the Railway Corridor Precinct comprising the existing railway land, and the Princess Alexandra Hospital Precinct which includes the PAH Campus, the University of Queensland's PACE building and the TRI building.

The wastewater service provider for the Boggo Road CRR PDA is Urban Utilities. Within the PAH site all sewerage mains are privately owned and maintained by Metro South Health connecting into the local Urban Utilities sewerage network via five property connections spread around the site.

2.4.1.2 Existing Infrastructure

All three Precincts are serviced by a DN630mm PE trunk sewer main (PAH-SEW-630) which forms part of the Woolloongabba Submain. It runs from the PAH east along O'Keefe Street connecting into the Norman Creek sewer near Old Cleveland Road. The Boggo Road Knowledge and Innovation Precinct is serviced by a DN 400mm PE sewer (BGO-SE1-400) connecting into the DN630mm trunk sewer. The western section of Princess Alexandra Hospital Precinct and the Railway Corridor Precinct along Kent Street are serviced by a 225mm sewer (PAH-SE5-225) in Kent St that discharges into the DN630mm trunk main. The PAH campus is serviced by a 150mm sewer on its southern boundary which drains east into a 225mm sewer (PAH-SE3-225) running along Ipswich Road which in turn drains north into a 500mm VC trunk sewer immediately downstream of the DN630

trunk main in O'Keefe Street. An existing 225mm sewer (PAH-SE2-225) runs west/east through the northern part of PAH. Prior to the DN630mm trunk sewer it was the main servicing line for the PAH campus. It drains northwards along Ipswich Rd (PAH-SE4-300) eventually connecting into the old 450mm Woolloongabba Submain in Logan Road, Woolloongabba which drains into the Norman Creek sewer. The 225mm sewer (PAH-SE2-225) running west/east through the PAH site is isolated from the upstream Kent St and Boggo Rd sewers on the western side of the PAH Campus having been permanently plugged when the DN630mm trunk sewer (PAH-SE1-630) was constructed. For a layout of the site and identified sewerage infrastructure refer to Figure 8 below.

2.4.1.3 Existing Network performance (Pre-Development)

For this exercise the Standards of service requirements used for sewerage are:

- ADWF equals 210 L/EP/day
- PWWF equals 5xADWF (1050 L/EP/day)
- Maximum depth of flow at PWWF is 75% depth of pipe.

Computer hydraulic modelling using existing PWWF identified the existing 225mm sewer (PAH-SE2-225) that runs west to east through the northern part of the site is at full pipe capacity operating slightly surcharged. The downstream 225/300mm receiving sewer (PAH-SE4-300) in Ipswich Rd Woolloongabba is also over capacity with surcharging above pipe between Ipswich Rd and Logan Rd.

The existing 225mm sewer (PAH-SE2-225) running north in Ipswich Road from Cornwall Street is however noted as operating close to capacity. The remainder of the Boggo Road CRR PDA sewers in Kent St and the Boggo Rd Knowledge and Innovation Precinct were identified as having adequate capacity with flow within all pipes at PWWF.

Further downstream of the site there are no identified capacity issues that directly affect the Boggo Road CRR PDA, but it is noted there is existing surcharging of the network in the Norman Creek sewer around Caswell Street pump Station where the DN630mm sewer connects into it and in Logan Road at Woolloongabba where the 225mm sewer from the northern end of the PAH site connects downstream into the old Woolloongabba Submain.

It is recommended potential cost sharing of future upgrades to currently over-capacity assets be discussed with Urban Utilities.

2.4.1.4 Currently Planned Infrastructure

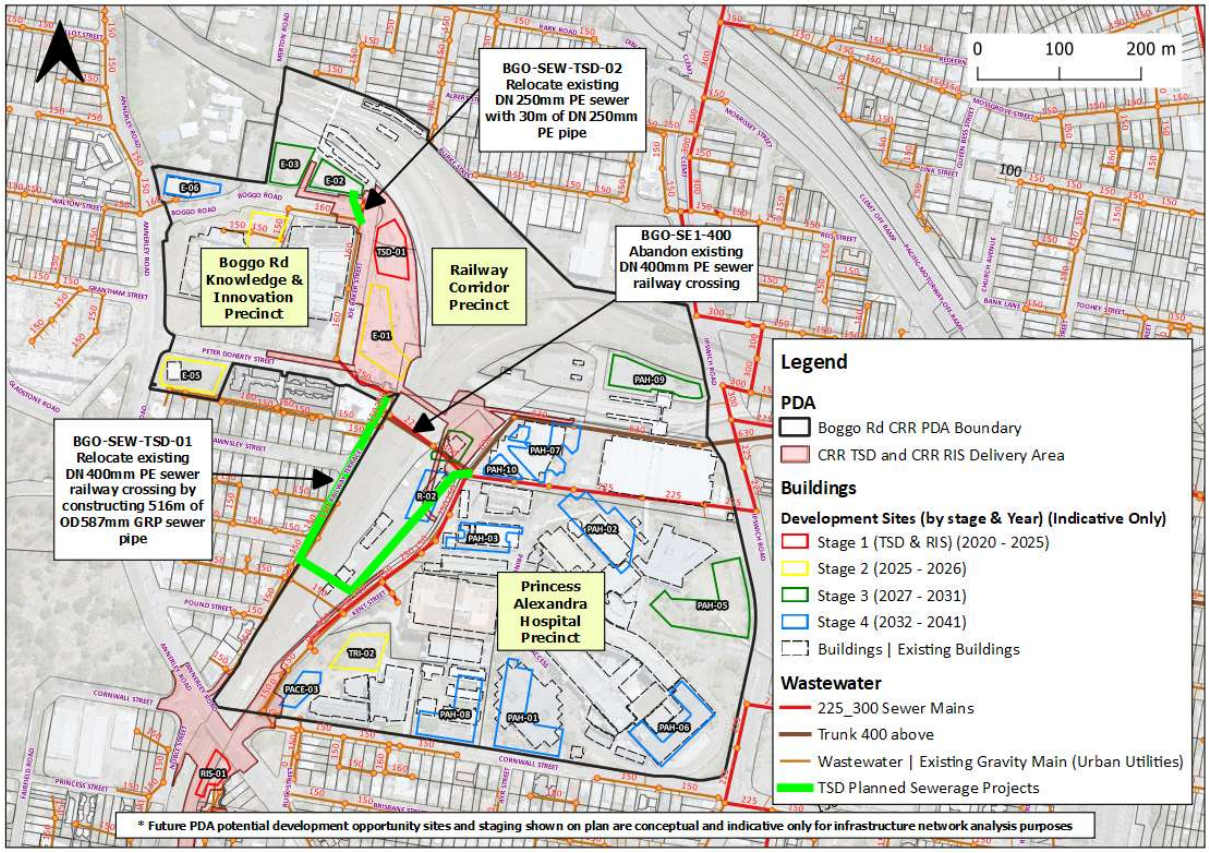
In terms of Urban Utilities infrastructure there are no planned wastewater upgrades identified in Urban Utilities' Netserv Plan for infrastructure within the Boggo Road CRR PDA. The closest identified works is 957m of 600mm trunk sewer main to be constructed on the Norman Creek sewer upstream of the Boggo Road CRR PDA between Stones Corner and the Green Slopes Private Hospital. Refer Attachment C, Netserv Plan Map 55 sewer, Map Reference BWWCAA07D47.

Developments on proposed future sites E-04, E-05 and TRI-02 have been approved by BCC. Advice as to whether any sewer approvals have been issued by Urban Utilities for these developments and any water augmentation works required been requested from Urban Utilities but has not yet been provided.

In terms of the PAH Campus site there has been no advice on any new works proposed for the private internal water main network. There will be a requirement to review the internal water main network by Metro South Health once proposed building works is planned to occur on the site associated with future PAH master planning.

CRR TSD has undertaken relocation work of part of the existing 150mm sewer (BGO-WAT-TSD-02) in Joe Baker/ Boggo Rd to allow excavation of the TSD station. It is also relocating the existing DN400mm PE sewer (BGO-SE1-400) crossing the railway corridor due to its existing location being in the way of the new cross river railway where it connects into the existing railway network. It is being relocated south of the existing sewer's location (BGO-WAT-TSD-01) out of the way of construction works reconnecting to the DN630mm trunk sewer (PAH-SE1-630). Refer Figure 8.

Figure 8 - Existing and Currently Planned Sewerage Infrastructure



2.4.2 Demand Estimates

Wastewater demand and flow estimates for the Existing and Developed Scenarios were developed based on the SEQ Code guidelines.

Demand estimates (EP and wastewater flows) were quantified in terms of both the change in demand and residual demand. Demands were estimates for all existing and potential future buildings within the PDA, including those that have recently been approved by other parties including by BCC, CRR TSD and MIDs.

The estimates are contained in Attachment B - EP, Water & Wastewater Demands Estimate.

2.4.3 Development Impacts

2.4.3.1 Assessment of Existing Wastewater Network with Future Demand

The site was modelled for ultimate development. New PAH buildings O5A, 6 and half of building 1 flows were assumed to drain south into the 225mm sewer (PAH-SE3-225) running north along Ipswich Rd from Cornwall Street.

The results indicated that at ultimate development the 225mm sewer (PAH-SE1-225) that runs west to east through the northern part of the site will be surcharged by approximately 0.5m and further downstream in Woolloongabba in Ipswich Rd the 225mm sewer (PAH-SE4-300) running north along Ipswich Road will also be surcharged up to 2m from Qualtrough St, Ipswich Rd to Walker St Logan Rd. The 225mm sewer (PAH-SE3-225) in Ipswich Rd running north from Cornwall St will also be over capacity with surcharge up to 250mm above pipe.

The 225mm sewer (PAH-SE5-225) in Kent St was identified as being within capacity as well as the Boggo Rd Knowledge and Innovation Precinct sewers.

These impacts can be offset by undertaking the following augmentations (Refer Figure 10);

- Upgrade of the existing 225mm sewer with a DN315mm PE sewer (BGO-SEW-02) between MH166068 to MH163287 – approximately 420m long. 180m of which is in Ipswich Road,
- Upgrade of the existing 225mm sewer with a DN315mm PE sewer (BGO-SEW-03) between MH163302 and MH163286 – approximately 260m long. 80m of which is in Ipswich Road,
- Upgrade of the existing 300mm sewer with a DN400mm PE sewer (BGO-SEW-04) between MH166054 and MH166021 – approximately 530m long. 200m of which is in Ipswich Road,

It was noted however that if the new Boggo Rd CRR Station (CRR TSD scope) discharges its cooling tower water into the 150mm in Joe Baker St simultaneously with its peak base load in a PWWF event the receiving 150mm sewer will exceeds its PWWF capacity. It will however still be within pipe. Because it is understood the draining of the cooling towers cooling water is a periodic maintenance need this should not be an issue. CRR will seek to ensure that the timing of cooling tower maintenance requiring draining of the tower be undertaken outside of peak hours and wet weather events or reduce the discharge rate and drain over a longer period.

On review of PAH site contours and the depth of northern sewers it is possible to drain the entire site to the DN630mm sewer located at the northern end of the site. Redirecting all existing and future flows within the PAH Campus draining to the northern (PAH-SE2-225)and eastern (PAH-SE2-225) 225mm sewers that run along Ipswich Rd into the DN630mm sewer (PAH-SE1-630) will negate all identified upgrade works noted above.

In terms of the PDAs total contribution to flows within the S1 catchment Urban Utilities models use a planned ultimate EP loading for the Boggo Rd CRRA PDA of 6,855 EP. The proposed PDA's ultimate EP based on Scenario 2 yields has been calculated as 8170 EP. This is an additional 1315 EP above Urban Utilities Ultimate Planned Population. The net effect is an additional 16 L/s flow into the network based on a generated PWWF of 1050 L/EP/day. The total EP population of the S1 catchment based on the supplied S1 model EP loads is 1,048,192.2 EP. Including the additional 1315 EP increases it will be 1,049,507.2 EP. Based on these assumptions, the net contribution of the Boggo Rd CRRA PDA to the S1 catchment flow therefore will be 0.78%.

2.4.3.2 Risks and Opportunities

The potential wastewater risks and opportunities associated with the Boggo Road CRR PDA are summarised in Table 13. These risks and opportunities were identified through service provider engagement, demand estimates and other investigations.

Table 12 - Summary of Development Risks and Opportunities on Wastewater Network

Aspect	Development Considerations
Protections / Relocations for Individual Developments / Structures	• Individual developments or projects within the PDA may require specific localised upgrades (e.g. at the connection point), protection and/or relocations. • Proposed future buildings E-04, R-01, PAH-07, and PAH-04 have been identified as potentially clashing with existing infrastructure and may require, depending on final layout, relocation of existing sewerage infrastructure.
PAH internal Sewerage Infrastructure	• No investigation of the capacity of internal sewerage mains has been undertaken, only from discharge points into Urban Utilities sewer network and the networks capacity to accept hospital flows. • Internal sewerage reticulation will need to be re-assessed for any new buildings within the PAH site and to ensure it directs flows to the desired external connection points identified in this report.

2.4.4 Preliminary Servicing Strategy

2.4.4.1 Objectives

A preliminary sewerage servicing strategy for the Boggo Road CRR PDA has been identified based on the following objectives:

- Satisfying sewerage servicing requirements of the SEQ Code, to the extent practical based on the level of information available at the time of this investigation.

2.4.4.2 Wastewater Network Connection Point

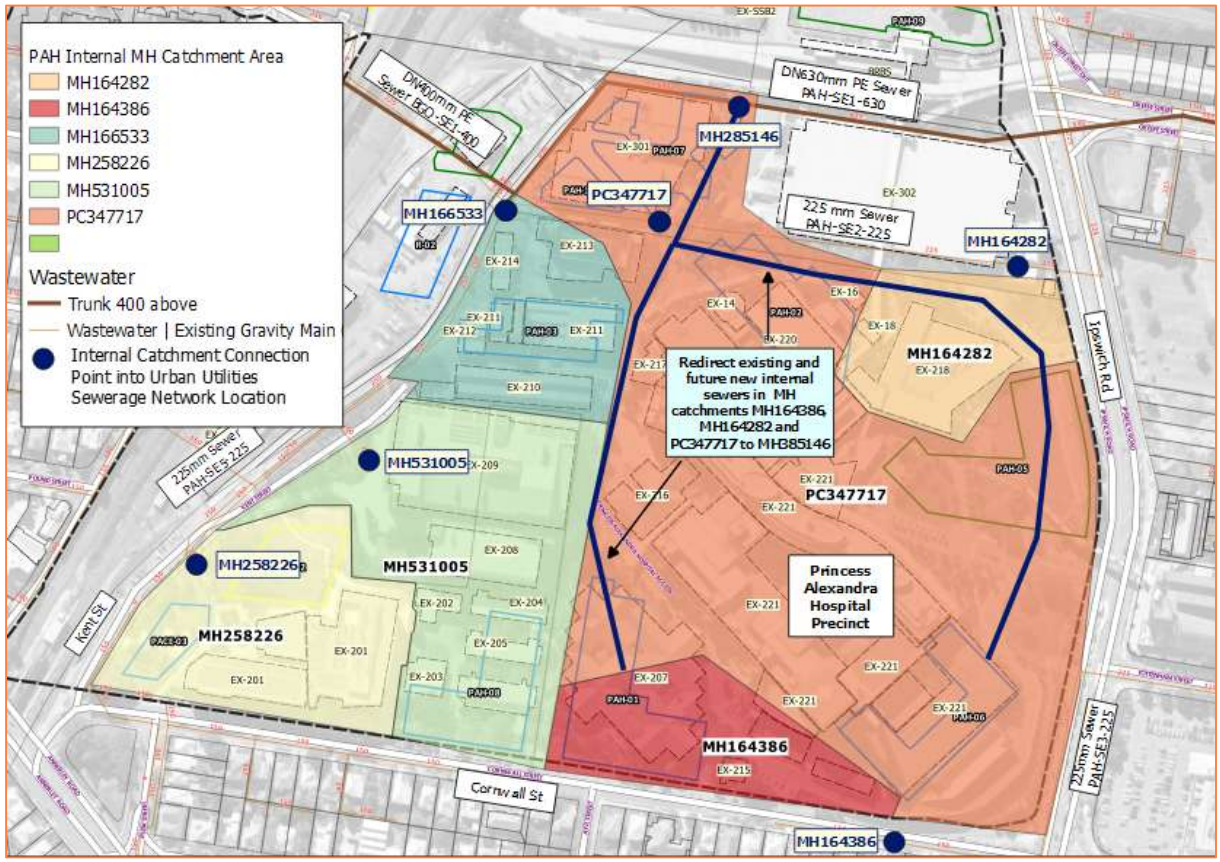
The proposed wastewater network connection location for each development project / building is set out in Table 14 and shown in Figure 9 (PAH campus only). This servicing strategy has been confirmed with Urban Utilities.

Table 13 - Development Sewerage Connection Point

Building(s)	Preferred Connection Location	Comments, Alternatives
CRR Station (TSD-01)	Existing MH280174	- Sewer line in front of property. May require new MH over. Urban Utilities has confirmed this in relation to the CRR TSD Scope.
E-01	Existing MH280173	- Sewer line in front of property. May require new MH over line.
E-02	Existing MH280177	- Sewer line in front of property. May require new MH over line.
E-03	Existing MH280178	- Sewer line in front of property. May require new MH over line.
E-04	Existing MH280179	- Sewer line in front of property. May require new MH over line.
E-05	Existing MH544706	- Sewer line in front of property. May require new MH over line.
PAH-01, PAH-02, PAH-07, PAH-06, PAH-10	Existing MH285146	- Existing buildings EX-207;216;217;218;219;220;221; and 301 flows must also be redirected to MH285146 to alleviate surcharge in existing 225mm line if any changes to the internal reticulation is undertaken in response to new building works.
PAH-05A	Existing MH285146	- Alternative MH163382 if can't drain to MH285146. May still require all or part of identified upgrade projects to reduce impact of development on sewer.
PAH-06	Existing MH285146	- Alternative MH163382 if can't drain to MH285146. May still require all or part of identified upgrade projects to reduce impact of development on sewer.
PAH-09	Existing MH285147	- Alternative MH166067 if can't drain to MH285147. May still require all or part of identified upgrade projects to reduce impact of development on sewer.
PAH-08	Existing MH531005	- Sewer line in front of property. May require new MH over line.
R-01, R-02,	Existing MH166533	- Sewer line in front of property. May require new MH over line.
PAH-03A, PAH-03B	Existing MH166533	- Sewer line in front of property. May require new MH over line.

Building(s)	Preferred Connection Location	Comments, Alternatives
TRI-02, PACE-03	Existing MH285226	- Sewer line in front of property. May require new MH over line.

Figure 9 - PAH Campus MH Catchment Loading Points



2.4.4.3 Facilitating (Proposed) Infrastructure Projects

Future infrastructure projects are required to facilitate the preferred servicing strategy.

Computer hydraulic modelling of the sewer network has identified the following infrastructure projects are required should PAH proposed buildings PAH-05 & PAH-06 connect into the 225mm sewer (PAH-SE3-225) in Ipswich Road running immediately north of Cornwall Street and existing and future buildings continue discharging into the 225mm sewer running west to east through the northern part of the PAH site.

It should be noted however this will be avoided if current flows directed to the northern 225mm sewer running west to east, as well as flows from potential new buildings PAH-01, PAH-05, PAH-06, PAH-07 and PAH-10, are redirected to the DN630mm sewer (PAH-WE2-630) to the north.

Future wastewater upgrade projects to facilitate the servicing of the strategy and connection regime are summarised in Table 17 and shown in Figure 10. The upgrade projects are also identified in Attachment H – Future Infrastructure Network Maps

High-level cost estimates for projects are contained in Attachment D Cost Estimates.

Table 14 - Potential Future Wastewater Infrastructure Projects

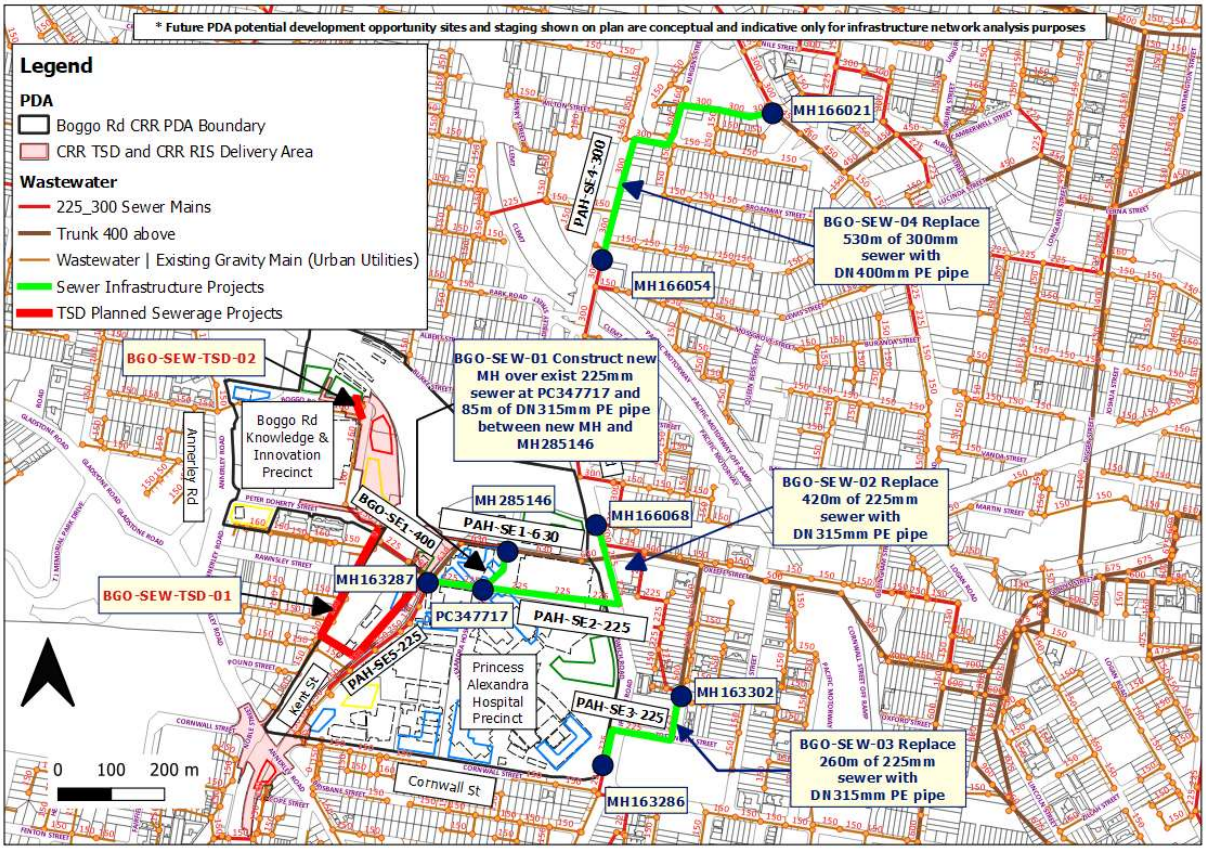
No	Description of Works
SEW-01 (Preferred Strategy)	• Objective: To negate the requirement to construct projects SEW-02, SEW-03, SEW-04: • Assumed Infrastructure - Construct a new manhole over PC347717 into which existing buildings EX207, EX-217, EX-219, EX-220, EX-221 drain. Construct approximately 85m of DN315mm PE pipe between new manhole and MH285146 on the DN630mm PE trunk sewer. Seal the 225mm downstream outlet in new manhole and bench manhole. Also, direct future buildings 1, 2, 5, 6, 7 and EX218 to DN315mm line. • Timing / Trigger: - Prior to construction of any new buildings to be drained to the 225mm sewer (PAH-SE2-225) (e.g. Buildings PAH-01, PAH-02, PAH-05, PAH-06, PAH-07, PAH-10). • Indicative Cost: $423,978
SEW-02 (Secondary Strategy)	• Objective: To offset surcharging in existing 225mm pipe (PAH-SE2-225) running west to east through northern part of PAH site caused by not redirecting all flows in line to DN630 sewer north of 225mm sewer. • Assumed Infrastructure: - Replacement of the existing 225mm sewer with a DN315mm PE sewer between MH166068 to MH163287 – approximately 420m long. 180m of which is in Ipswich Rd • Timing / Trigger: - Prior to construction of any new buildings to be drained to the noted 225mm sewer rather than north to DN630 sewer as specified (e.g Buildings PAH-01, PAH-02, PAH-05, PAH-06, PAH-07, PAH-10). • Indicative Cost: $1,517,526
SEW-03 (Secondary Strategy)	• Objective: To offset surcharging in 225mm pipe (PAH-SE3-225) in Ipswich Road immediately north of Cornwall Street directly caused by directing PAH buildings 1, 5 and 6 flows to sewer • Assumed Infrastructure: - Replacement of the existing 225mm sewer with a DN315mm PE sewer between MH163302 and MH163286 – approximately 260m long. 80m of which is in Ipswich Road • Timing / Trigger: - Prior to construction of PAH buildings 1, 5 or 6 or any other proposed new building directed to sewer rather than north to DN630 sewer as specified. • Indicative Cost: $1,336,025
SEW-04 (Secondary Strategy)	• Objective: To offset surcharging in 225mm pipe (PAH-SE4-300) in Ipswich Road, Balaclava St, Jurgens St, Walker St, Woolloongabba caused by existing and future PAH building loads to sewer • Assumed Infrastructure: - Replacement of the existing 225mm sewer with a DN400mm PE sewer between MH166054 and MH166021 – approximately 530m long. 230m of which is in Ipswich Road • Timing / Trigger: - Prior to construction of any new buildings to be drained to the noted 225mm sewer rather than north to DN630 sewer as specified (e.g. Buildings PAH-01, PAH-02, PAH-05, PAH-06, PAH-07, PAH-10). • Indicative Cost: $2,192,416

2.4.4.4 Additional Servicing Requirements

Servicing of the Boggo Road CRR PDA wastewater demands accommodate the following:

- **Early and Ongoing Engagement with Service Provider:** Urban Utilities are currently undertaking work to optimise their wastewater network management, particularly regarding wet weather flow management and innovations such as local treatment. It is recommended that Precinct Delivery Partners engage with Urban Utilities early in the process to understand the opportunities and constraints relating to their specific development and timing.
- **Local Wastewater Treatment:** where there is an appropriate economic and/or sustainability driver, it is recommended that Precinct Delivery Partners should investigate the inclusion of local wastewater treatment solutions as part of their integrated water management system. This may reduce the external wastewater network demands and increase the yield possible without significantly impacting external infrastructure.

Figure 10 - Map of Existing, Currently Planned and Proposed Future Wastewater Network



2.5 Summary

Key findings and recommendations of the water and wastewater investigations were as follows:

- **General:**
  - EP estimates were prepared for existing development and future potential development scenarios. Future potential development Scenario 1 is the "Baseline scenario" which has been the focus of the Reference Scheme planning Scenario 2's development density is equal to the Reference Scheme demand plus 20 percent, and has been modelled to provide some sensitivity analysis to mitigate the risk of under-sizing the future network.
  - The additional EPs generated by the Boggo Rd CRR PDA site will be 3,292 EP for water and 2,855 EP for Sewerage.
- **Water Supply:**
  - The Boggo Road CRR PDA is generally well-serviced in terms of water supply pressure and flow meeting Urban Utilities Standards of Service.
  - Directly attributable to the Boggo Rd CRR PDA demands are a section of 150mm water main in Annerley Rd and 100mm water main in Railway Tce having head losses in pipe greater than Urban Utilities planning guidelines specifications. Upgrading the pipes will see fire flow performance improve in the Boggo Rd Knowledge and Innovation Precinct in respect of pressure drop reduction by up to up to 3m, It is also noted that these existing assets have reached or are nearing the end of their useful life.
  - Also, directly attributable to the Boggo Rd CRR PDA demands is the existing 150mm water main in Cornwall St experiences large pressure drops greater than Urban Utilities desired standards when an internal 40 L/s fire demand for the PAH Campus is imposed on the water main. It is also noted that this existing asset has reached or is nearing the end of its useful life.
  - These identified issues will be remedied when the specified project items in Table 14 are constructed.
  - It is recommended that the existing network issues, pre-PDA and PAH developments, be discussed with Urban Utilities when determining the above upgrade requirements in terms of levels of service, timing of

delivery for new or upgraded assets, delivery and funding responsibilities. Given the circumstances, a shared funding arrangement may be considered reasonable.

- **Wastewater:**
  - The Boggo Road CRR PDA is generally well-serviced in terms of wastewater network capacity.
  - There is an identified capacity issue with the 225mm sewer (PAH-WE1-225) that runs west to east in the northern section of the PAH site and downstream in the 300mm sewer between Ipswich Rd and Logan Rd.
  - There is also a capacity issue in the 225mm sewer in Ipswich Rd north of Cornwall St if additional flow from the PAH Campus is added to the sewer.
  - Diversion of all flows within the PAH Campus that drain to the 225mm sewers east and north serving the site into the DN630mm trunk sewer to the north will alleviate this issue and mitigate the need for further upgrades of surrounding mains.
  - It is recommended that potential shared funding arrangements for the delivery of future upgrades to resolve existing network issues be discussed with Urban Utilities. Particularly where assets are currently over-capacity or where assets have reached or are nearing the end of their design life.

Attachment A – Development Yield Table

Existing and Proposed Development Yields - Residential

Site	Development Type	2021-2025	2025-2026	2027-2031	2032-2041	Ultimate
E01	1 Bedroom Dwelling	0	0	0	0	0
E01	2 Bedroom Dwelling	0	0	0	0	0
E01	3+ Bedroom Dwelling	0	0	0	0	0
E04	1 Bedroom Dwelling	0	0	0	0	0
E04	2 Bedroom Dwelling	0	0	0	0	0
E04	3+ Bedroom Dwelling	0	0	0	0	0
E05	1 Bedroom Dwelling	0	21	0	0	21
E05	2 Bedroom Dwelling	0	49	0	0	49
E05	3+ Bedroom Dwelling	0	12	0	0	12
TRI2.0	1 Bedroom Dwelling	0	0	0	0	0
TRI2.0	2 Bedroom Dwelling	0	0	0	0	0
TRI2.0	3+ Bedroom Dwelling	0	0	0	0	0
E02	1 Bedroom Dwelling	0	0	0	0	0
E02	2 Bedroom Dwelling	0	0	0	0	0
E02	3+ Bedroom Dwelling	0	0	0	0	0
E03	1 Bedroom Dwelling	0	0	0	0	0
E03	2 Bedroom Dwelling	0	0	0	0	0
E03	3+ Bedroom Dwelling	0	0	0	0	0
PAH09	1 Bedroom Dwelling	0	0	0	0	0
PAH09	2 Bedroom Dwelling	0	0	0	0	0
PAH09	3+ Bedroom Dwelling	0	0	0	0	0
R01	1 Bedroom Dwelling	0	0	0	0	0
R01	2 Bedroom Dwelling	0	0	0	0	0
R01	3+ Bedroom Dwelling	0	0	0	0	0
PAH05A	1 Bedroom Dwelling	0	0	0	0	0
PAH05A	2 Bedroom Dwelling	0	0	0	0	0
PAH05A	3+ Bedroom Dwelling	0	0	0	0	0
R02	1 Bedroom Dwelling	0	0	0	0	0
R02	2 Bedroom Dwelling	0	0	0	0	0
R02	3+ Bedroom Dwelling	0	0	0	0	0
PACE3	1 Bedroom Dwelling	0	0	0	0	0
PACE3	2 Bedroom Dwelling	0	0	0	0	0
PACE3	3+ Bedroom Dwelling	0	0	0	0	0
PAH02	1 Bedroom Dwelling	0	0	0	0	0
PAH02	2 Bedroom Dwelling	0	0	0	0	0
PAH02	3+ Bedroom Dwelling	0	0	0	0	0
PAH01	1 Bedroom Dwelling	0	0	0	0	0
PAH01	2 Bedroom Dwelling	0	0	0	0	0
PAH01	3+ Bedroom Dwelling	0	0	0	0	0
PAH06	1 Bedroom Dwelling	0	0	0	0	0
PAH06	2 Bedroom Dwelling	0	0	0	0	0
PAH06	3+ Bedroom Dwelling	0	0	0	0	0
PAH08	1 Bedroom Dwelling	0	0	0	0	0
PAH08	2 Bedroom Dwelling	0	0	0	0	0
PAH08	3+ Bedroom Dwelling	0	0	0	0	0
PAH07	1 Bedroom Dwelling	0	0	0	0	0
PAH07	2 Bedroom Dwelling	0	0	0	0	0
PAH07	3+ Bedroom Dwelling	0	0	0	0	0
PAH10	1 Bedroom Dwelling	0	0	0	0	0
PAH10	2 Bedroom Dwelling	0	0	0	0	0
PAH10	3+ Bedroom Dwelling	0	0	0	0	0
PAH3A	1 Bedroom Dwelling	0	0	0	0	0
PAH3A	2 Bedroom Dwelling	0	0	0	0	0
PAH3A	3+ Bedroom Dwelling	0	0	0	0	0
PAH3B	1 Bedroom Dwelling	0	0	0	0	0
PAH3B	2 Bedroom Dwelling	0	0	0	0	0
PAH3B	3+ Bedroom Dwelling	0	0	0	0	0
E06	1 Bedroom Dwelling	0	0	0	0	0
E06	2 Bedroom Dwelling	0	0	0	0	0
E06	3+ Bedroom Dwelling	0	0	0	0	0
Total		0	82	0	0	82

Existing and Proposed Development Yields - Non-Residential

Source	Site	Development Type	2021-2025	2025-2026	2027-2031	2032-2041	Ultimate
T_existing[site]	EX-101	Office	26,082.00	26,082.00	26,082.00	26,082.00	26,082.00
T_existing[site]	EX-102	Commercial	500.00	500.00	500.00	500.00	500.00
T_existing[site]	EX-103	Emergency Services	1,542.00	1,542.00	1,542.00	-	-
T_existing[site]	EX-104	Office	342.00	-	-	-	-
T_existing[site]	EX-105	Commercial	3,040.00	3,040.00	3,040.00	3,040.00	3,040.00
T_existing[site]	EX-201	Health	17,378.00	17,378.00	17,378.00	17,378.00	17,378.00
T_existing[site]	EX-202	Health	553.00	553.00	553.00	-	-
T_existing[site]	EX-203	Health	887.00	887.00	887.00	-	-
T_existing[site]	EX-204	Health	924.00	924.00	924.00	-	-
T_existing[site]	EX-205	Health	910.00	910.00	910.00	-	-
T_existing[site]	EX-206	Health	1,300.00	1,300.00	1,300.00	-	-
T_existing[site]	EX-207	Health	11,277.00	11,277.00	11,277.00	-	-
T_existing[site]	EX-208	Health	6,735.00	6,735.00	6,735.00	6,735.00	6,735.00
T_existing[site]	EX-209	Health	38,963.00	38,963.00	38,963.00	38,963.00	38,963.00
T_existing[site]	EX-210	Health	1,559.00	1,559.00	1,559.00	1,559.00	1,559.00
T_existing[site]	EX-211	Health	4,457.00	4,457.00	4,457.00	-	-
T_existing[site]	EX-212	Health	321.00	321.00	321.00	321.00	321.00
T_existing[site]	EX-213	Health	1,820.00	1,820.00	1,820.00	1,820.00	1,820.00
T_existing[site]	EX-214	Health	384.00	384.00	384.00	384.00	384.00
T_existing[site]	EX-215	Health	220.00	220.00	220.00	220.00	220.00
T_existing[site]	EX-216	Health	1,436.00	1,436.00	1,436.00	1,436.00	1,436.00
T_existing[site]	EX-217	Health	290.00	290.00	290.00	290.00	290.00
T_existing[site]	EX-218	Health	6,251.00	6,251.00	6,251.00	6,251.00	6,251.00
T_existing[site]	EX-219	Health	9,335.00	9,335.00	9,335.00	9,335.00	9,335.00
T_existing[site]	EX-220	Health	3,250.00	3,250.00	3,250.00	-	-
T_existing[site]	EX-221	Health	99,131.00	99,131.00	99,131.00	99,131.00	99,131.00
T_existing[site]	EX-301	Industrial	4,000.00	4,000.00	4,000.00	-	-
T_existing[site]	EX-302	Commercial	-	-	-	-	-
T_existing[site]	TSD	Industrial	1,000.00	1,000.00	1,000.00	1,000.00	1,000.00
Table_Project[Sta	E01	Office	-	25,855.00	25,855.00	25,855.00	25,855.00
Table_Project[Sta	E04	Retail	-	1,935.00	1,935.00	1,935.00	1,935.00
Table_Project[Sta	E04	Commercial	-	2,550.00	2,550.00	2,550.00	2,550.00
Table_Project[Sta	E05	Residential	-	-	-	-	-
Table_Project[Sta	TRI2.0	Office	-	6,616.00	6,616.00	6,616.00	6,616.00
Table_Project[Sta	E02	Office	-	-	20,544.00	20,544.00	20,544.00
Table_Project[Sta	E03	Office	-	-	19,308.00	19,308.00	19,308.00
Table_Project[Sta	PAH09	Office	-	-	36,036.00	36,036.00	36,036.00
Table_Project[Sta	R01	Health	-	-	14,550.00	14,550.00	14,550.00
Table_Project[Sta	PAH05A	Hospital	-	-	39,220.00	39,220.00	39,220.00
Table_Project[Sta	R02	Research	-	-	-	9,570.00	9,570.00
Table_Project[Sta	PACE3	Office	-	-	-	8,500.00	8,500.00
Table_Project[Sta	PAH02	Hospital	-	-	-	32,724.00	32,724.00
Table_Project[Sta	PAH01	Hospital	-	-	-	22,620.00	22,620.00
Table_Project[Sta	PAH06	Hospital	-	-	-	14,288.00	14,288.00
Table_Project[Sta	PAH08	Hospital	-	-	-	26,040.00	26,040.00
Table_Project[Sta	PAH07	Health	-	-	-	26,505.00	26,505.00
Table_Project[Sta	PAH10	Health	-	-	-	9,495.00	9,495.00
Table_Project[Sta	PAH3A	Hospital	-	-	-	7,000.00	7,000.00
Table_Project[Sta	PAH3B	Hospital	-	-	-	18,000.00	18,000.00
Table_Project[Sta	E06	Office	-	-	-	10,800.00	10,800.00
	Total		243,887.00	280,501.00	410,159.00	566,601.00	566,601.00

Future Residential Dwellings and non-Residential floor space projections

Development Type	2020	2021-2025	2025-2026	2027-2031	2032-2041	Ultimate
Residential Dwellings	0	0	82	0	0	82
Non-residential floor space (m2 GF	242,887.00	243,887.00	280,501.00	410,159.00	566,601.00	566,601.00

Future Population and employment projections

Development Type	2020	2021-2025	2025-2026	2027-2031	2032-2041	Ultimate
Residents	0	0	159	159	159	159
Employees	12,019.00	12,035.00	13,814.00	20,279.00	29,556.00	29,556.00

Scenario (Select one)
Scenario_01

Attachment B – EP, Water & Wastewater Demands Estimate

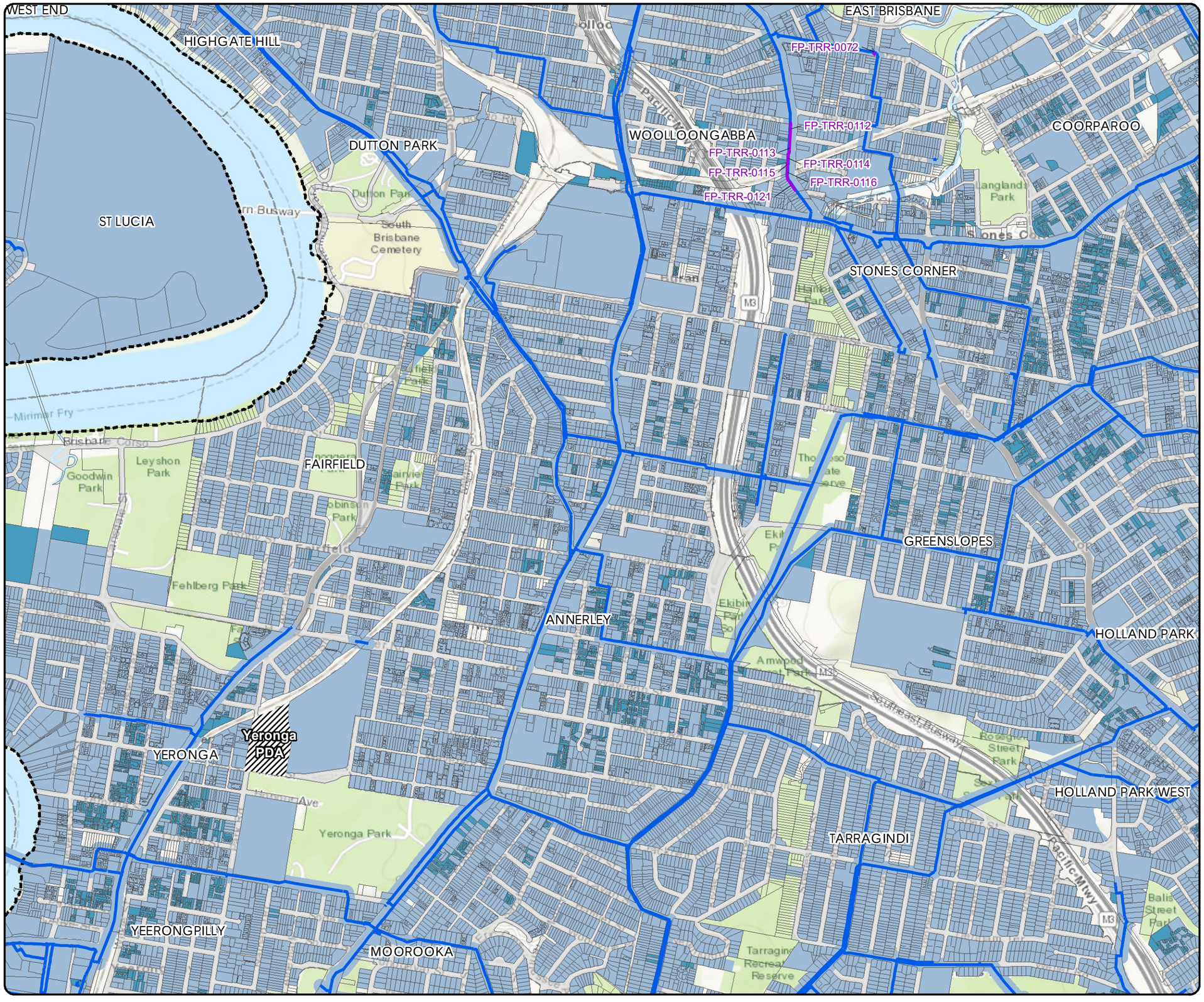
Scenario 1 - Sewerage EPs

Site	Description	Type	GFA	EP/Ha	EP/m2	EP	Existing	2025	2026	2027	2032	Ult
EX-101	Existing Ecoscience Precinct	Office	26082	164	0.016	427	427	427	427	427	427	427
EX-103	Existing Dutton Patk Police Station	Office	1542	60	0.006	9	9	9	9	9		
EX-104	Existing Boggo Rd Sales Office	Office	342	60	0.006	2	6					
EX-105	Existing Boggo Rd Gaol	Commercial	3040	60	0.006	18	3	18	18	18	18	18
EX-201	Existing PACE Building	Health	17378	14	0.001	25	23	25	25	25	25	25
EX-202	Existing PAH Building 39	Health	553	60	0.006	3	3	3	3	3		
EX-203	Existing PAH Building 37	Health	887	60	0.006	5	5	5	5	5		
EX-204	Existing PAH Building 35	Health	924	60	0.006	6	6	6	6	6		
EX-205	Existing PAH Building 33	Health	910	60	0.006	5	5	5	5	5		
EX-206	Existing PAH Building 31	Health	1300	60	0.006	8	8	8	8	8		
EX-207	Existing PAH Building 07 (GARU)	Health	11277	140	0.014	158	158	158	158	158		
EX-208	Existing Pantheon Biologics Building	Health	6735	89	0.009	60	60	60	60	60	60	60
EX-209	Existing TRI Building	Health	38963	89	0.009	345	345	345	345	345	345	345
EX-210	Existing PAH Building 63	Health	1559	60	0.006	9	9	9	9	9		
EX-211	Existing PAH Building 61 (General Support Services)	Health	4457	60	0.006	27	27	27	27	27		
EX-212	Existing PAH Building 62	Health	321	60	0.006	2	2	2	2	2		
EX-213	Existing PAH Building 57 (Central Energy Unit)	Health	1820	measured	260KL/d	1100	1100	1100	1100	1100	1100	1100
EX-214	Existing PAH Building 59	Health	384	60	0.006	2	2	2	2	2	2	2
EX-215	Existing PAH Building 05 (Diamantina Health Care Museum)	Health	220	60	0.006	1	1	1	1	1	1	1
EX-216	Existing PAH Building 11 (Loading Dock/ Prisoner Ward)	Health	1436	141	0.014	20	20	20	20	20	20	20
EX-217	Existing PAH Building 13 (Aquatic Physiotherapy Pool)	Health	290	60	0.006	2	2	2	2	2	2	2
EX-218	Existing PAH Building 19 (Mental Health Services)	Health	6251	141	0.014	88	88	88	88	88	88	88
EX-219	Existing PAH Building 15 (Executive Building)	Health	9335	60	0.006	56	56	56	56	56	56	56
EX-220	Existing PAH Building 17 (Spinal Injuries Unit)	Health	3250	141	0.014	46	46	46	46	46		
EX-221	Existing PAH Main Hospital	Health	99131	141	0.014	1398	1398	1398	1398	1398	1398	1398
EX-301	Existing PAH Building 55 (Laundry)	Industrial	4000	1970	0.197	788	788	788	788	788		
EX-302	Existing PAH Carpark	Commercial	0	0		0	0	0	0	0	0	0
TSD-01	Future Boggo Rd CRR Station	Industrial	1000	60	0.006	6		211	211	211	211	211
E-01	Lot 2- Central Collaboration Building 1	Office	25855	60	0.006	155			155	155	155	155
E-04	Retail Spine 21-41 Boggo Road	Retail	4485	60	0.006	27			27	27	27	27
E-05	Stockwell E5 4 Annerley Road	Residential	82	45	1.750	144			144	144	144	144
TRI-02	TRI 2.0	Office	6616	60	0.006	40			40	40	40	40
E-02	E2	Office	20544	60	0.006	123				123	123	123
E-03	E3	Office	19308	60	0.006	116				116	116	116
PAH-09	9	Office	36036	60	0.006	216				216	216	216
R-01	Proposed Allied Health Building	Health	14550	90	0.009	131				131	131	131
PAH-05A	PA Outpatients Services	Hospital	39220	140	0.014	549				549	549	549
R-02	Proposed Laboratory Building	Research	9570	90	0.009	86					86	86
PACE-03	PACE 3	Office	8500	60	0.006	51					51	51
PAH-02	2	Hospital	32724	140	0.014	458					458	458
PAH-01	1	Hospital	22620	140	0.014	317					317	317
PAH-06	additional 14,288m2 on top	Hospital	14288	140	0.014	200					200	200
PAH-08	8	Hospital	26040	140	0.014	365					365	365
PAH-07	PAH HEALTH, OUT PATIENT, ALLIED HEALTH AND RESEARCH BUILDINGS	Health	26505	90	0.009	239					239	239
PAH-10	PAH HEALTH, OUT PATIENT, ALLIED HEALTH AND RESEARCH BUILDINGS	Health	9495	90	0.009	85					85	85
PAH-03A	3A	Hospital	7000	140	0.014	98					98	98
PAH-03B	3B	Hospital	18000	140	0.014	252					252	252
E-06	Police Station	Office	10800	60	0.006	65					65	65
						EP Total	8333	4596	4820	5185	6320	7469	7469
						PAH Total	6720	3725	3725	3725	4621	5663	5663

Scenario 1 - Water EPs

Site	Description	Type	GFA	EP/Ha	EP/m2	EP	Existing	2025	2026	2027	2032	Ult
EX-101	Existing Ecoscience Precinct	Office	26082	292	0.029	760	760	760	760	760	760	760
EX-103	Existing Dutton Patk Police Station	Office	1542	60	0.006	9	9	9	9	9		
EX-104	Existing Boggo Rd Sales Office	Office	342	60	0.006	2	6					
EX-105	Existing Boggo Rd Gaol	Commercial	3040	60	0.006	18	3	18	18	18	18	18
EX-201	Existing PACE Building	Health	17378	14	0.001	25	23	25	25	25	25	25
EX-202	Existing PAH Building 39	Health	553	60	0.006	3	3	3	3	3		
EX-203	Existing PAH Building 37	Health	887	60	0.006	5	5	5	5	5		
EX-204	Existing PAH Building 35	Health	924	60	0.006	6	6	6	6	6		
EX-205	Existing PAH Building 33	Health	910	60	0.006	5	5	5	5	5		
EX-206	Existing PAH Building 31	Health	1300	60	0.006	8	8	8	8	8		
EX-207	Existing PAH Building 07 (GARU)	Health	11277	140	0.014	158	158	158	158	158		
EX-208	Existing Pantheon Biologics Building	Health	6735	89	0.009	60	60	60	60	60	60	60
EX-209	Existing TRI Building	Health	38963	89	0.009	345	345	345	345	345	345	345
EX-210	Existing PAH Building 63	Health	1559	60	0.006	9	9	9	9	9		
EX-211	Existing PAH Building 61 (General Support Services)	Health	4457	60	0.006	27	27	27	27	27		
EX-212	Existing PAH Building 62	Health	321	60	0.006	2	2	2	2	2		
EX-213	Existing PAH Building 57 (Central Energy Unit)	Health	1820	measured	260KL/d	1100	1100	1100	1100	1100	1100	1100
EX-214	Existing PAH Building 59	Health	384	60	0.006	2	2	2	2	2	2	2
EX-215	Existing PAH Building 05 (Diamantina Health Care Museum)	Health	220	60	0.006	1	1	1	1	1	1	1
EX-216	Existing PAH Building 11 (Loading Dock/ Prisoner Ward)	Health	1436	141	0.014	20	20	20	20	20	20	20
EX-217	Existing PAH Building 13 (Aquatic Physiotherapy Pool)	Health	290	60	0.006	2	2	2	2	2	2	2
EX-218	Existing PAH Building 19 (Mental Health Services)	Health	6251	141	0.014	88	88	88	88	88	88	88
EX-219	Existing PAH Building 15 (Executive Building)	Health	9335	60	0.006	56	56	56	56	56	56	56
EX-220	Existing PAH Building 17 (Spinal Injuries Unit)	Health	3250	141	0.014	46	46	46	46	46		
EX-221	Existing PAH Main Hospital	Health	99131	141	0.014	1398	1398	1398	1398	1398	1398	1398
EX-301	Existing PAH Building 55 (Laundry)	Industrial	4000	1970	0.197	788	788	788	788	788		
EX-302	Existing PAH Carpark	Commercial	0	0		0	0	0	0	0	0	0
TSD-01	Future Boggo Rd CRR Station	Industrial	1000	60	0.006	6		648	648	648	648	648
E-01	Lot 2- Central Collaboration Building 1	Office	25855	60	0.006	155			155	155	155	155
E-04	Retail Spine 21-41 Boggo Road	Retail	4485	60	0.006	27			27	27	27	27
E-05	Stockwell E5 4 Annerley Road	Residential	82	45	1.750	144			144	144	144	144
TRI-02	TRI 2.0	Office	6616	60	0.006	40			40	40	40	40
E-02	E2	Office	20544	60	0.006	123				123	123	123
E-03	E3	Office	19308	60	0.006	116				116	116	116
PAH-09	9	Office	36036	60	0.006	216				216	216	216
R-01	Proposed Allied Health Building	Health	14550	90	0.009	131				131	131	131
PAH-05A	PA Outpatients Services	Hospital	39220	140	0.014	549				549	549	549
R-02	Proposed Laboratory Building	Research	9570	90	0.009	86					86	86
PACE-03	PACE 3	Office	8500	60	0.006	51					51	51
PAH-02	2	Hospital	32724	140	0.014	458					458	458
PAH-01	1	Hospital	22620	140	0.014	317					317	317
PAH-06	additional 14,288m2 on top	Hospital	14288	140	0.014	200					200	200
PAH-08	8	Hospital	26040	140	0.014	365					365	365
PAH-07	PAH HEALTH, OUT PATIENT, ALLIED HEALTH AND RESEARCH BUILDINGS	Health	26505	90	0.009	239					239	239
PAH-10	PAH HEALTH, OUT PATIENT, ALLIED HEALTH AND RESEARCH BUILDINGS	Health	9495	90	0.009	85					85	85
PAH-03A	3A	Hospital	7000	140	0.014	98					98	98
PAH-03B	3B	Hospital	18000	140	0.014	252					252	252
E-06	Police Station	Office	10800	60	0.006	65					65	65
					EP Total	8666	4930	5590	5955	7091	8240	8240
					PAH Total	6504	3725	3725	3725	4405	5447	5447

Attachment C – Netserv Plan Extract



Legend

- Priority infrastructure area
- Property Boundary (DCDB)
- Development Area (outside scope)
- Future Water Reservoir
- Future Water Trunk Main
- Existing Water Treatment Plant
- Existing Pump Station (Urban Utilities)
- Existing Pump Station (Seqwater)
- Existing Reservoir (Urban Utilities)
- Existing Reservoir (Seqwater)
- Existing Water Trunk Main
- Water Connection Area
- Water Future Connection Area

UrbanUtilities

0 100 200 300 400 500
Meters

Production Scale 1:15,000 @A3 1 cm = 150 m

PUBLISHER: PLANNING GROUP
REVISION DATE : Tuesday, 27 October 2020
FILENAME : NETSERV PLAN mapping series Version 6
PROJECTION: MAP GRID OF AUSTRALIA, ZONE 56
HORIZONTAL DATUM: GEOCENTRIC DATUM OF AUST 1994

PROJECT

NETSERV PLAN
mapping series

TITLE

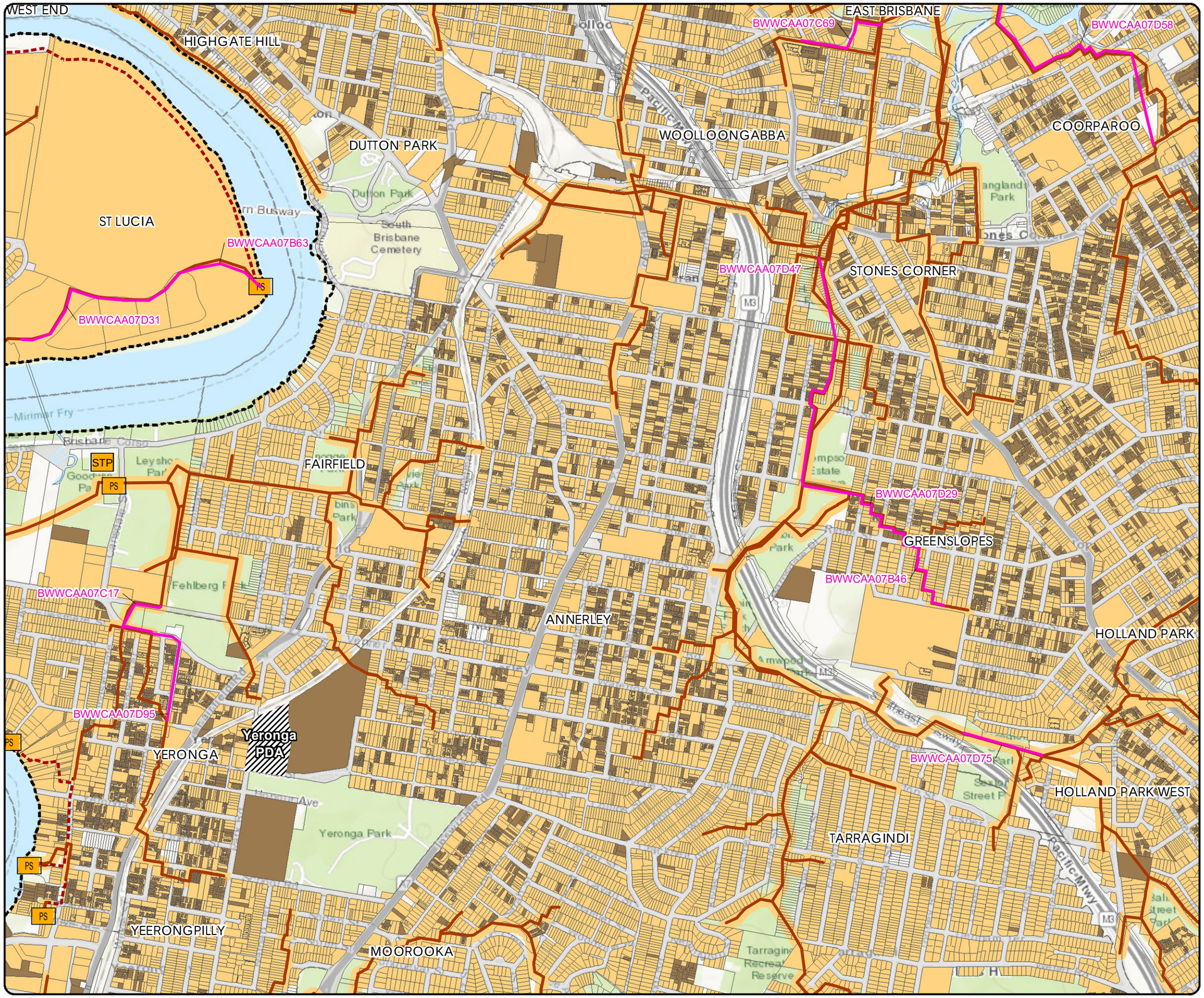
Map index number

55

ANNERLEY
BRISBANE CITY

netserv@urbanutilities.com.au

Map number	Map reference	Description	Est timing	Establishment cost
55	FP-TRR-0112	126m of 250dia watermain		
55	FP-TRR-0113	10m of 250dia watermain		
55	FP-TRR-0114	26m of 250dia watermain	2031	$139,461
55	FP-TRR-0115	16m of 250dia watermain		
55	FP-TRR-0116	64m of 250dia watermain		
55	FP-TRR-0121	49m of 250dia watermain	2041	$15,587
59	FP-MCN-0002	163m of 300dia watermain	2018	$316,513
59	FP-MCN-0006	2m of 300dia watermain	2018	$3,884
59	FP-MCN-0011	192m of 300dia watermain	2018	$372,825
59	FP-MCN-0034	1m of 300dia watermain	2018	$1,942
65	FP-MCN-0027	11m of 300dia watermain	2018	$21,360
65	FP-MCN-0044	1,009m of 250dia watermain	2021	$1,666,772
65	FP-MCN-0047	399m of 300dia watermain	2018	$774,776
66	FP-MTO-0003	25m of 300dia watermain	2018	$48,545
67	FP-MTO-0021	81m of 250dia watermain	2018	$133,804
70	FP-MGH-0006	58m of 200dia watermain	2021	$83,395
75	FP-MCS-BW011	17m of 250dia watermain	2019	$28,082
76	FP-ACR-5001	87m of 250dia watermain	2020	$143,716
76	FP-ACR-5002	116m of 200dia watermain	2020	$166,790
76	FP-ACR-5003	118m of 200dia watermain	2020	$169,666
77	FP-MGH-0005	24m of 300dia watermain	2021	$46,603
80	FP-ACR-0005-02	410m of 300dia watermain	2036	$796,136
80	FP-ACR-0005-04	224m of 300dia watermain	2036	$434,962
80	FP-ACR-0006	119m of 300dia watermain	2036	$231,074
80	FP-ACR-0008	424m of 200dia watermain	2036	$609,648



Legend

- Priority infrastructure area
- Property Boundary (DCDB)
- Development Area (outside scope)
- PS — Future Wastewater Structure
- Future Wastewater Trunk Main
- Future Wastewater Rising Main
- STP — Existing Sewer Treatment Plant
- PS — Existing Sewer Pump Station
- Existing Wastewater Trunk Main
- Existing Wastewater Rising Main
- Wastewater Connection Area
- Wastewater Future Connection Area

UrbanUtilities

N

0 100 200 300 400 500
Meters

Production Scale 1:15,000 @A3 1 cm = 150 m

PUBLISHER: PLANNING GROUP
REVISION DATE : Wednesday, 28 October 2020
FILENAME : NETSERV PLAN mapping series Version 6
PROJECTION: MAP GRID OF AUSTRALIA, ZONE 56
HORIZONTAL DATUM: GEOCENTRIC DATUM OF AUST 1994

PROJECT

NETSERV PLAN mapping series

TITLE

Map index number

55

ANNERLEY
BRISBANE CITY

netserv@urbanutilities.com.au

Map number	Map reference	Description	Est timing	Establishment cost
47	BWWCAB39	363m of 350mm rising main	2026	$2,678,000
47	BWWCAB39	349m of 350mm rising main		
47	BWWCAB39	284m of 750mm gravity main		
47	BWWCAB39	334m of 700mm rising main		
47	BWWCAB48	1007m of 300mm rising main	2026	$6,513,000
47	BWWCAA07D58	1127m of 375mm gravity main	2026	$2,913,588
47	BWWCAA07D63	207m of 225mm gravity main	2026	$2,082,000
48	BWWCAA07D58	1127m of 375mm gravity main	2026	$2,913,588
48	BWWCAA96	3740m of 1350mm gravity main	2026	$122,239,225
48	BWWCAA07B51	491m of 300mm gravity main	2031	$1,124,276
49	BWWCAA43	1573m of 825mm gravity main	2026	$9,521,730
50	BWWCAA43	1573m of 825mm gravity main	2026	$9,521,730
50	BWWCAB37	3308m of 1500mm gravity main	2041	$78,583,035
54	BWWCAA57	824m of 710mm rising main	2026	$68,560,000
54	BWWCAA57	6824m of 900mm rising main	2026	$68,560,000
54	BWWCAA57	672m of 600mm gravity main	2026	$68,560,000
54	BWWCAA07B45	400m of 300mm gravity main	2026	$913,933
54	BWWCAA07D31	516m of 400mm gravity main	2026	$1,458,084
54	BWWCAA07B98	1589m of 375mm gravity main	2031	$3,445,000
54	BWWCAA07B98	105m of 300mm gravity main		
55	BWWCAA07D31	516m of 400mm gravity main	2026	$1,458,084
55	BWWCAA07D47	957m of 600mm gravity main	2036	$4,244,210
55	BWWCAA07B63	612m of 380mm gravity main	2026	$2,592,594
55	BWWCAA07B46	295m of 300mm gravity main	2026	$1,010,707
55	BWWCAA07C17	208m of 300mm gravity main	2026	$287,947
55	BWWCAA07C17	123m of 225mm gravity main		
55	BWWCAA07D29	692m of 500mm gravity main	2031	$2,532,487
55	BWWCAA07D75	321m of 525mm gravity main	2026	$1,010,707
55	BWWCAA07D95	425m of 225mm gravity main	2041	$282,866
56	BWWCAA07D58	1127m of 375mm gravity main	2026	$2,913,588
57	BWWCAB37	3308m of 1500mm gravity main	2041	$78,583,035
59	BDEVAA03A10	297m of 225mm gravity main	2026	$212,775
59	BDEVAA03A15	122m of 225mm gravity main	2026	$75,660
59	BDEVAA03A16	88m of 225mm gravity main	2026	$52,631
59	BDEVAA03A17	203m of 225mm gravity main	2026	$174,027
59	BDEVAA03A18	284m of 225mm gravity main	2026	$177,730

Attachment D – Preliminary Project Cost Estimates

BGO-SEW-01 PC347717 to MH285146 - 85m of DN315mm sewer main	PROJECT ID:	30032260
	PROJECT PHASE	Capital Planning
Prepared by:	DATE:	0
Checked by:	DATE:	0
Approved by:	DATE:	0

DIRECT COSTS SUMMARY

Description			Cost	
Site Preparation and General Earthworks			$	-
Trenched Pipework Costs:		85	$	95,958.06
Trenchless Pipe Costs:			$	-
Manholes and Thrust Blocks:			$	106,326.79
Inline Structures:			$	-
Sewer Pump Stations:			$	-
Water Pump Stations:			$	-
Switchboard and Electrical:			$	-
Sewer Rehabilitation:			$	-
Emergency Storage:			$	-
Reservoirs:			$	-
Miscellaneous:			$	23,791.10
Day Rates:			$	-
Total Direct Costs:			$	226,075.96

CONTRACTOR INDIRECT COSTS SUMMARY

Description	Percentage		Cost	
Temporary Works:		5%	$	11,303.80
Traffic Management:		5%	$	11,303.80
Testing and Commissioning:		4%	$	9,043.04
Mobilisation and Demobilisation		4%	$	9,043.04
General Preliminaries and Site Running Costs		8%	$	18,086.08
Head Contractor Margin:		0%	$	-
Design Survey and Geotechnical:		10%	$	28,485.57
Contingency on Contractor's Costs:		20%	$	62,668.25

INDIRECT COSTS SUMMARY

Description	Percentage		Cost	
Q-Leave:		0.475%	$	1,786.05
Permits and Approvals:			$	-
Land and Easements Costs:			$	-
Miscellaneous Owners Costs:			$	10,000.00
Project Management:		4%	$	11,394.23
Fixed Overhead Costs:		6%	$	17,091.34
Contingency on Owner's Costs:		20%	$	7,697.11
Total Project Value:			$	423,978.26
	Percentage		Cost	
Indexing of Rates:		0.00%	$	-
Escalation:		0.000%	$	-
Total Costs with Escalation:			$	423,978.26

BGO-SEW-02 Sewer Main Upgrade - 420m of DN315mm water main replacing 225mm sewer main	PROJECT ID:	30032260
	PROJECT PHASE	Capital Planning
Prepared by:	DATE:	0
Checked by:	DATE:	0
Approved by:	DATE:	0

DIRECT COSTS SUMMARY

Description			Cost
Site Preparation and General Earthworks		$	-
Trenched Pipework Costs:	420	$	455,209.36
Trenchless Pipe Costs:		$	-
Manholes and Thrust Blocks:		$	325,047.73
Inline Structures:		$	-
Sewer Pump Stations:		$	-
Water Pump Stations:		$	-
Switchboard and Electrical:		$	-
Sewer Rehabilitation:		$	-
Emergency Storage:		$	-
Reservoirs:		$	-
Miscellaneous:		$	45,911.09
Day Rates:		$	-
Total Direct Costs:		$	826,168.18

CONTRACTOR INDIRECT COSTS SUMMARY

Description	Percentage		Cost
Temporary Works:	5%	$	41,308.41
Traffic Management:	5%	$	41,308.41
Testing and Commissioning:	4%	$	33,046.73
Mobilisation and Demobilisation	4%	$	33,046.73
General Preliminaries and Site Running Costs	8%	$	66,093.45
Head Contractor Margin:	0%	$	-
Design Survey and Geotechnical:	10%	$	104,097.19
Contingency on Contractor's Costs:	20%	$	229,013.82

INDIRECT COSTS SUMMARY

Description	Percentage		Cost
Q-Leave:	0.475%	$	6,526.89
Permits and Approvals:		$	-
Land and Easements Costs:		$	-
Miscellaneous Owners Costs:		$	10,000.00
Project Management:	4%	$	41,638.88
Fixed Overhead Costs:	6%	$	62,458.31
Contingency on Owner's Costs:	20%	$	22,819.44
Total Project Value:		$	1,517,526.44
	Percentage		Cost
Indexing of Rates:	0.00%	$	-
Escalation:	0.000%	$	-
Total Costs with Escalation:		$	1,517,526.44

BGO-SEW-03 Ipswich Rd near Cornwall St Sewer Main Upgrade - 260m of DN315mm sewer main replacing 225mm sewer main	PROJECT ID:	30032260
	PROJECT PHASE	Capital Planning
Prepared by:	DATE:	0
Checked by:	DATE:	0
Approved by:	DATE:	0

DIRECT COSTS SUMMARY

Description			Cost
Site Preparation and General Earthworks		$	-
Trenched Pipework Costs:	260	$	321,540.05
Trenchless Pipe Costs:		$	-
Manholes and Thrust Blocks:		$	339,164.39
Inline Structures:		$	-
Sewer Pump Stations:		$	-
Water Pump Stations:		$	-
Switchboard and Electrical:		$	-
Sewer Rehabilitation:		$	-
Emergency Storage:		$	-
Reservoirs:		$	-
Miscellaneous:		$	65,863.60
Day Rates:		$	-
Total Direct Costs:		$	726,568.05

CONTRACTOR INDIRECT COSTS SUMMARY

Description	Percentage		Cost
Temporary Works:	5%	$	36,328.40
Traffic Management:	5%	$	36,328.40
Testing and Commissioning:	4%	$	29,062.72
Mobilisation and Demobilisation	4%	$	29,062.72
General Preliminaries and Site Running Costs	8%	$	58,125.44
Head Contractor Margin:	0%	$	-
Design Survey and Geotechnical:	10%	$	91,547.57
Contingency on Contractor's Costs:	20%	$	201,404.66

INDIRECT COSTS SUMMARY

Description	Percentage		Cost
Q-Leave:	0.475%	$	5,740.03
Permits and Approvals:		$	-
Land and Easements Costs:		$	-
Miscellaneous Owners Costs:		$	10,000.00
Project Management:	4%	$	36,619.03
Fixed Overhead Costs:	6%	$	54,928.54
Contingency on Owner's Costs:	20%	$	20,309.51
Total Project Value:		$	1,336,025.11
	Percentage		Cost
Indexing of Rates:	0.00%	$	-
Escalation:	0.000%	$	-
Total Costs with Escalation:		$	1,336,025.11

BGO-SEW-04 Woolloongabba Sewer Main Upgrade - 530m of DN400mm water main replacing 300mm sewer main	PROJECT ID:	30032260
	PROJECT PHASE	Capital Planning
Prepared by:	DATE:	0
Checked by:	DATE:	0
Approved by:	DATE:	0

DIRECT COSTS SUMMARY

Description			Cost
Site Preparation and General Earthworks		$	-
Trenched Pipework Costs:	530	$	645,438.24
Trenchless Pipe Costs:		$	-
Manholes and Thrust Blocks:		$	417,918.51
Inline Structures:		$	-
Sewer Pump Stations:		$	-
Water Pump Stations:		$	-
Switchboard and Electrical:		$	-
Sewer Rehabilitation:		$	-
Emergency Storage:		$	-
Reservoirs:		$	-
Miscellaneous:		$	133,162.17
Day Rates:		$	-
Total Direct Costs:		$	1,196,518.92

CONTRACTOR INDIRECT COSTS SUMMARY

Description	Percentage		Cost
Temporary Works:	5%	$	59,825.95
Traffic Management:	5%	$	59,825.95
Testing and Commissioning:	4%	$	47,860.76
Mobilisation and Demobilisation	4%	$	47,860.76
General Preliminaries and Site Running Costs	8%	$	95,721.51
Head Contractor Margin:	0%	$	-
Design Survey and Geotechnical:	10%	$	150,761.38
Contingency on Contractor's Costs:	20%	$	331,675.04

INDIRECT COSTS SUMMARY

Description	Percentage		Cost
Q-Leave:	0.475%	$	9,452.74
Permits and Approvals:		$	-
Land and Easements Costs:		$	-
Miscellaneous Owners Costs:		$	10,000.00
Project Management:	4%	$	60,304.55
Fixed Overhead Costs:	6%	$	90,456.83
Contingency on Owner's Costs:	20%	$	32,152.28
Total Project Value:		$	2,192,416.67
	Percentage		Cost
Indexing of Rates:	0.00%	$	-
Escalation:	0.000%	$	-
Total Costs with Escalation:		$	2,192,416.67

CROSS RIVER RAIL
BOGGO RD WATER SUPPLY PDA

WAT01 ANNERLY ROAD BGO-WAT 01 SUMMARY

Rates Current At November 2021

Ref	Location	Total Cost $
A1	**WAT01 Annerly Road BGO-WAT 01**	
A1A	Road Surface Saw Cutting	28,210
A1B	Trenching	59,830
A1C	Pipe Supply and Installation in Trench	53,750
A1D	Inline Structures - Values	59,450
A1E	Reinstatement	250,000
	WAT01 Annerly Road BGO-WAT 01	**451,240**
	ESTIMATED NET COST	**451,240**

MARGINS & ADJUSTMENTS		
Planning, sundries, BWIC, Intervention planning	3.3%	15,000
Traffic Control Allowance (2.5 weeks)	23.6%	110,000
Provisional Allowance for BCC Traffic Lights adjustments, PUP issues	21.7%	125,000
Preliminaries	22.0%	154,271
Margin	8.0%	68,440
Design Contingency	10.0%	92,395
Construction Contingency	10.0%	101,633
Authority Fees & Charges	0.3%	3,353
Headworks		Excl.
Professional Fees	12.0%	134,558
Project Management and Overheads	3.3%	42,000
Qleave (0.575%)	0.6%	8,270
Client Costs / Client Internal Costs		Excl.
Escalation Beyond 2021		Excl.
All costs relating to the Building Industry Fairness (Security of Payment) Act 2017		Excl.
Potential Impacts of COVID-19		Excl.
Goods and Services Tax		Excl.
ESTIMATED TOTAL COST		**1,306,160**

CROSS RIVER RAIL
BOGGO RD WATER SUPPLY PDA

Rider Levett Bucknall

WAT02 RAILWAY TERRACE SUMMARY

Rates Current At November 2021

Ref	Location	Total Cost $
A2	**WAT02 Railway Terrace**	
A2A	Road Surface Saw Cutting	15,470
A2B	Trenching	27,920
A2C	Pipe Supply and Installation in Trench	29,880
A2D	Inline Structures - Values	37,320
A2E	Reinstatement	75,000
	WAT02 Railway Terrace	**185,590**
	ESTIMATED NET COST	**185,590**

MARGINS & ADJUSTMENTS		
Planning, sundries, BWIC, Intervention planning	8.1%	15,000
Traffic Control Allowance (2 weeks)	37.4%	75,000
Preliminaries	22.0%	60,632
Margin	8.0%	26,899
Design Contingency	10.0%	36,313
Construction Contingency	10.0%	39,945
Authority Fees & Charges	0.3%	1,320
Headworks		Excl.
Professional Fees	12.0%	52,886
Project Management and Overheads	3.4%	17,000
Qleave (0.575%)	0.6%	3,255
Client Costs / Client Internal Costs		Excl.
Escalation Beyond 2021		Excl.
All costs relating to the Building Industry Fairness (Security of Payment) Act 2017		Excl.
Potential Impacts of COVID-19		Excl.
Goods and Services Tax		Excl.
ESTIMATED TOTAL COST		**513,840**

BGO-WAT-03 Revised Cornwall St Water Main Upgrade - 200m of DN250mm water main replacing 150mm water main	PROJECT ID:	30032260
	PROJECT PHASE	Capital Planning
Prepared by:	DATE:	0
Checked by:	DATE:	0
Approved by:	DATE:	0

DIRECT COSTS SUMMARY

Description			Cost
Site Preparation and General Earthworks		$	-
Trenched Pipework Costs:	200	$	143,213.39
Trenchless Pipe Costs:		$	-
Manholes and Thrust Blocks:		$	-
Inline Structures:		$	12,172.95
Sewer Pump Stations:		$	-
Water Pump Stations:		$	-
Switchboard and Electrical:		$	-
Sewer Rehabilitation:		$	-
Emergency Storage:		$	-
Reservoirs:		$	-
Miscellaneous:		$	69,402.01
Day Rates:		$	-
Total Direct Costs:		$	224,788.36

CONTRACTOR INDIRECT COSTS SUMMARY

Description	Percentage		Cost
Temporary Works:	5%	$	11,239.42
Traffic Management:	5%	$	11,239.42
Testing and Commissioning:	4%	$	8,991.53
Mobilisation and Demobilisation	4%	$	8,991.53
General Preliminaries and Site Running Costs	8%	$	17,983.07
Head Contractor Margin:	0%	$	-
Design Survey and Geotechnical:	10%	$	28,323.33
Contingency on Contractor's Costs:	20%	$	62,311.33

INDIRECT COSTS SUMMARY

Description	Percentage		Cost
Q-Leave:	0.475%	$	1,775.87
Permits and Approvals:		$	-
Land and Easements Costs:		$	-
Miscellaneous Owners Costs:		$	10,000.00
Project Management:	4%	$	11,329.33
Fixed Overhead Costs:	6%	$	16,994.00
Contingency on Owner's Costs:	20%	$	7,664.67
Total Project Value:		$	421,631.87
	Percentage		Cost
Indexing of Rates:	0.00%	$	-
Escalation:	0.000%	$	-
Total Costs with Escalation:		$	421,631.87

Attachment E – Future Infrastructure Network Maps

Boggo Road Cross River Rail Priority Development Area
Future Infrastructure Network Plan
Wastewater Infrastructure

Legend

- Boggo Road CRR PDA Boundary
- CRR TSD and CRR RIS Delivery Area

Wastewater Projects

Wastewater Projects (All Stages)
- Wastewater Project Alignment

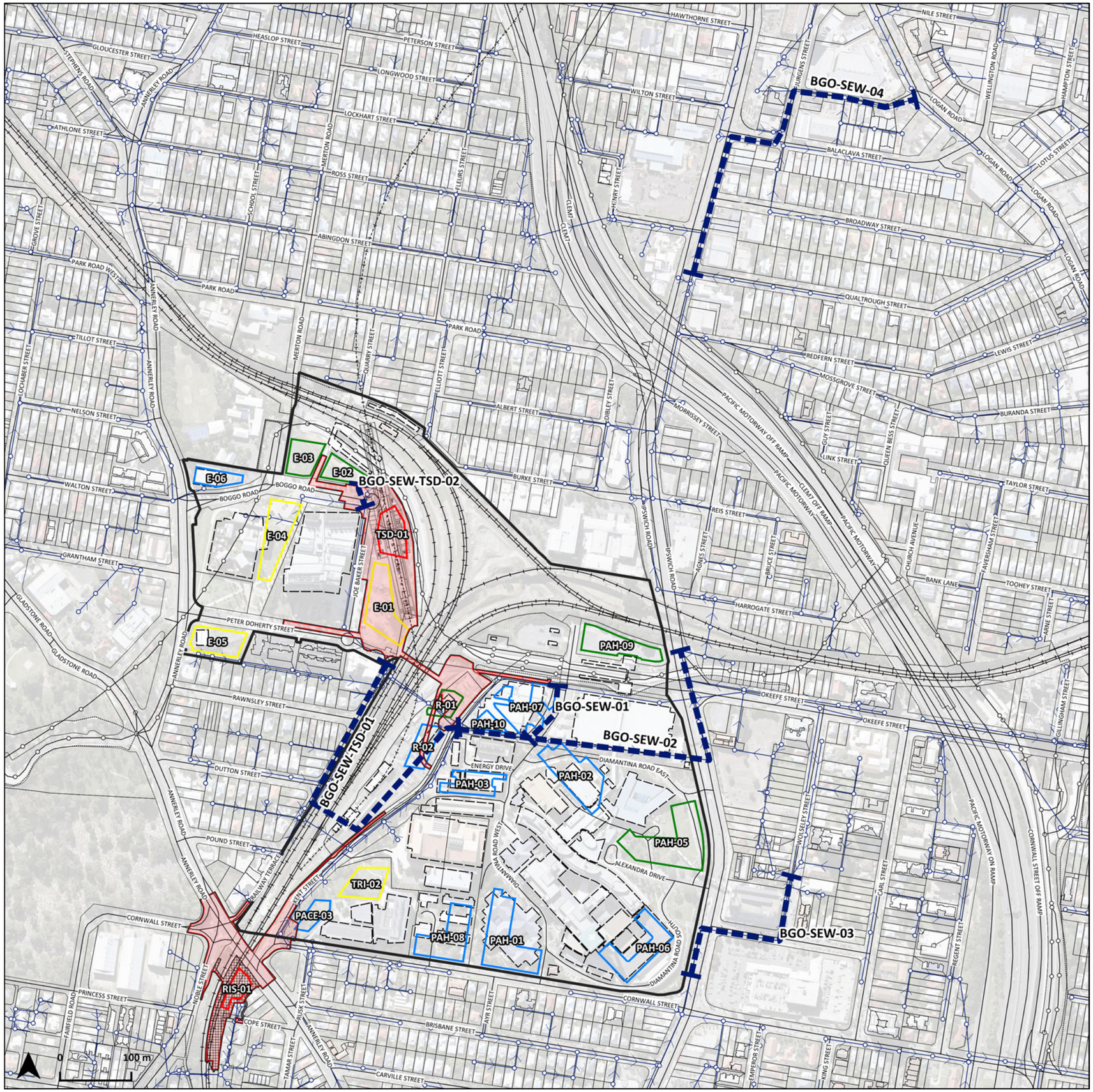
PDA - Development Sites (by Stage & Year) (Indicative Only)
- Stage 1 (TSD & RIS) (2020 - 2025)
- Stage 2 (2025 - 2026)
- Stage 3 (2027 - 2031)
- Stage 4 (2032 - 2041)
- Buildings | Existing Buildings

Wastewater
- Wastewater | Existing Manhole (Urban Utilities)
- Wastewater | Existing Gravity Main (Urban Utilities)

Transport - Road, Transit
- Road
- Busways
- Tracks, Paths & Malls

Transport - Rail
- Operational
- Under Construction
- CRR TSD Boggo Road Station
- CRR RIS Dutton Park Station

Property - DCDB
- Base Parcels



NOTE:
Future PDA potential development opportunity sites and staging are conceptual and indicative only for infrastructure network analysis purposes.

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Data Sources
QLD Government 2021, Brisbane City Council 2021, Urban Utilities 2020

CROSSRIVERRAIL

Boggo Road Cross River Rail Priority Development Area
Future Infrastructure Network Plan
Water Supply Infrastructure

Legend

- Boggo Road CRR PDA Boundary
- CRR TSD and CRR RIS Delivery Area

Water Projects

Water Projects (All Stages)
- Water Project Alignment

Water Supply | Existing Node (Urban Utilities)
- Meter
- Valve
- Hydrant
- Water Supply | Existing Pressure Main (Urban Utilities)

PDA - Development Sites (by Stage & Year) (Indicative Only)
- Stage 1 (TSD & RIS) (2020 - 2025)
- Stage 2 (2025 - 2026)
- Stage 3 (2027 - 2031)
- Stage 4 (2032 - 2041)
- Existing Buildings

Transport - Road, Transit
- Road
- Busways
- Tracks, Paths & Malls

Transport - Rail
- Operational
- Under Construction
- CRR TSD Boggo Road Station
- CRR RIS Dutton Park Station

Property - DCDB
- Base Parcels

NOTE:
Future PDA potential development opportunity sites and staging are conceptual and indicative only for infrastructure network analysis purposes.

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Data Sources
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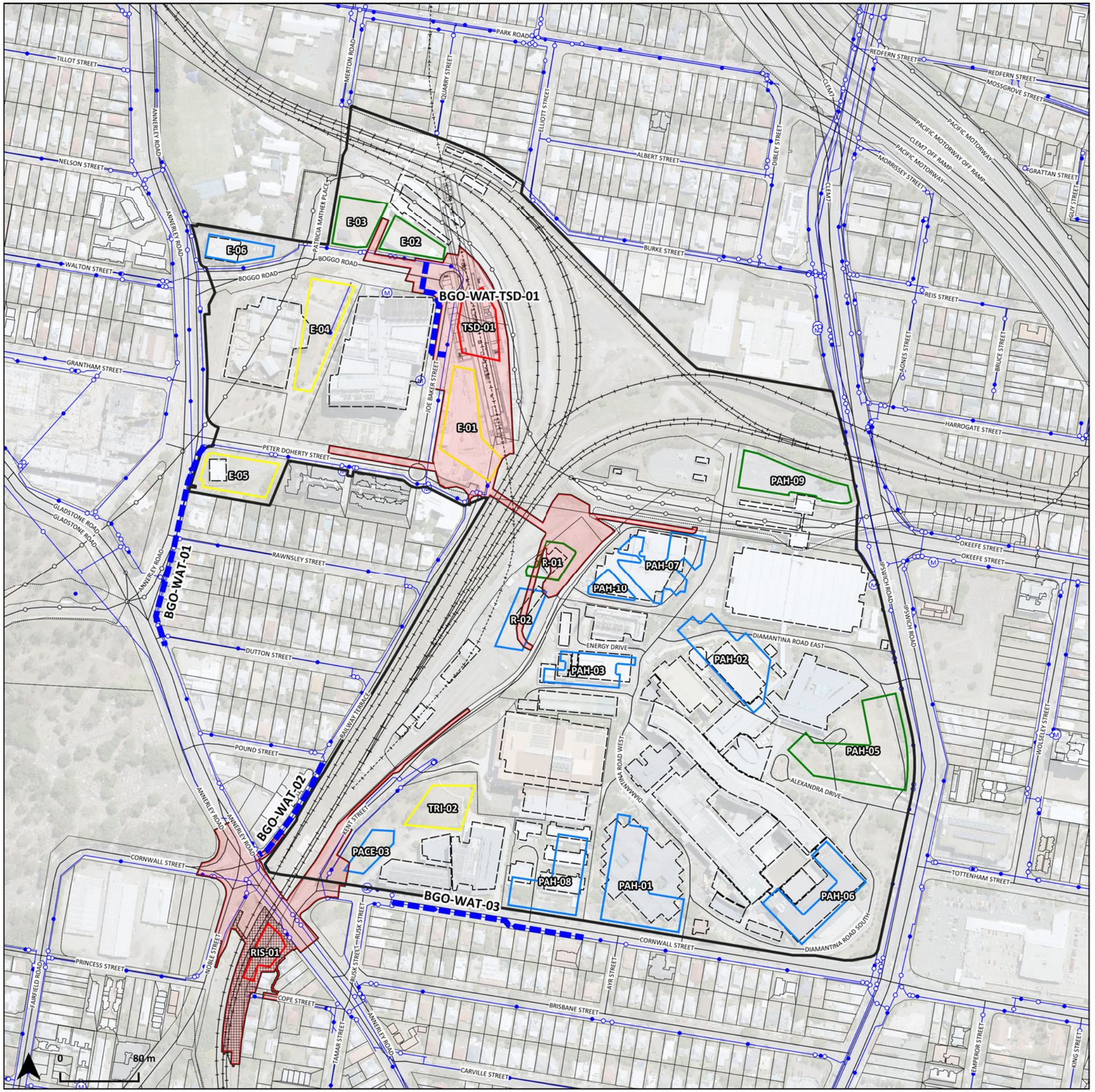
CROSSRIVERRAIL



Member of the Surbana Jurong Group

Technical Memorandum

CRRDA Doc. No.	TBA
SMEC Doc. No.	30032260-BOG-COM-IPBR-002
Issued Date	24/11/2021
Author(s)	Chris Mahoney
Reviewer(s)	Gustavo Pereira
Approver(s)	Gustavo Pereira
Title	Boggo Road CRR PDA Community Infrastructure Technical Analysis – IPBR Report
Revision	04
Attachments	Attachment A Maps Attachment B Parks Data Attachment C Existing Development Plans

1 Executive Summary

This Technical Memo outlines the key findings of an assessment of parks and community infrastructure and resultant proposed recommendations for consideration in the drafting of the Boggo Road Cross River Rail (CRR) Priority Development Area (PDA) Development Scheme and associated supporting materials.

An assessment was completed of existing and future (with the CRR PDA and without the CRR PDA) provision of Local recreation, District and Sports park and Urban commons areas along with land for community facilities against Desired Standards of Service (DSS) as per the Brisbane City Council (BCC) City Plan 2014 (LGIP Extrinsic Materials- 2018).

The methodology adopted by the Boggo Road CRR Precinct Community Infrastructure Baseline Assessment (completed by SMEC for the CRRDA in 2019) involved the definition of the following catchment areas (refer to Figure 2):

- Neighbourhood: The neighbourhood catchment encompasses the 39-hectare area within the Boggo Road CRR PDA
- Local: The local catchment is the area within a 750m walk from the boundary of the PDA
- District: The district catchment is the area within 2km (straight line) from the boundary of the PDA

In the neighbourhood catchment there is no existing residential population and the estimated number of jobs prior to the demolition of buildings to enable CRR Tunnel and Station Delivery (TSD) early works was 7,341. Existing trunk park within the PDA is confined to Outlook Park which, prior to its temporary re-location to allow construction of the new Boggo Road CRR Station (CRR TSD scope), had a total area of 2,161m^2. The other existing park within the PDA is the non-trunk Boggo Road Gaol Park which has a total area of 3,503m^2. There are no existing land for community facility sites within the neighbourhood catchment.

The local catchment is experiencing relatively high population growth and associated social change. Whilst there is no sports park, rates of provision of local and district recreation park are reasonably high with Turley Street Park and Dutton Park making key contributions to overall supply. The rate of provision of urban commons is similarly reasonably high due to the Carl Street- Tottenham Street Urban Common being located approximately 300m to the east of the Boggo Road CRR PDA. There are three land for community facilities sites within the local catchment providing 6,300m^2 of total land area.

In the district catchment, there are very low rates of provision of local recreation park particularly to the north of the Boggo Road CRR PDA. There is a reasonable supply of land for community facilities in the district catchment supporting a range of community infrastructure. In addition to BCC land for community facilities, there is a broad

range of community infrastructure including major health and education facilities provided by Federal and State Government along with private and other non-government sector entities.

The vision for the PDA set out in section 2.3 of the draft proposed Development Scheme seeks development to deliver outcomes including:

- a central active transport connection that will support active transport functionality, providing improved connectivity for pedestrians and cyclists between rail, bus, and major institutional facilities within and surrounding the PDA.
- new and enhanced high-quality public realm that will exhibit sub-tropical design excellence, providing a comfortable and safe urban environment which is permeable and inviting.
- new civic spaces that will be vibrant, open, and green.
- Revitalisation of landmarks such as the Boggo Road Gaol, celebrating the PDA's unique history, distinct character, and sense of place.

In order to support the PDA vision, it is recommended that the following investments in parks and community facilities be advanced through the PDA Development Scheme:

- Maintain the supply of local recreation park through the permanent establishment of Outlook Park inclusive of play equipment and other embellishments on 2,161m^2 of land within reasonable proximity to the proposed new CRR Station in PDA Precinct 1: Boggo Road Knowledge and Innovation Precinct, commensurate with the former Outlook Park.
- Further embellish the existing Boggo Road Gaol Park to a local recreation park trunk infrastructure standard. Boggo Road Gaol Park presents an excellent opportunity to increase the supply of inner-city local recreation park with an additional 3,503m^2, through a trunk local recreation park upgrade.
- To cater for demand by health workers and users of hospital and health services in the PDA Precinct 3: Princess Alexandra Hospital Precinct, it is proposed that a minimum area of 800m^2 of accessible public plaza be delivered through the future Princess Alexandra Hospital (PAH) master-planning.
- Upgrade of pedestrian and cycle linkages throughout the Boggo Road CRR PDA to enable access to community facilities and services provided in the local and district catchments.
- Investigate the opportunity to utilise open space which buffers the Boggo Road Knowledge and Innovation Precinct from Annerley Road to provide a designated area for community gardens or other open space uses.
- Collaboration between state government agencies, local government, community and industry stakeholders to identify and establish preferred future uses of the Boggo Road Gaol that balance heritage values with activation of the space for community purposes. Based on a review of previously proposed plans for the facility, it could provide an overall addition of 4,000m^2 of community space for a variety of purposes including community meeting space, flexible indoor/ outdoor recreational space and an art and events venue for live music, theatre and entertainment.

The Boggo Road CRR PDA declaration and development scheme framework provides a once in a generation opportunity to realise the exceptional potential provided by this site. There are solid foundations already in place, the potential of which may be realised through strategic collaboration.

2 Introduction

2.1 Context

The Queensland Government's Cross River Rail Precincts Delivery Strategy (the Strategy) sets a vision for each Cross River Rail (CRR) Station Precinct that is aligned to the Government's policy priorities. The Strategy sets out a vision for the Boggo Road Precinct to become a world class innovation precinct, specialising in health, science and education jobs of the future.

This is to be achieved through enhancing the already established world-class health and research facilities with a focus on health, science and education services. The PDA will reinforce and maximise the precinct's role as a regionally significant economic cluster and enhance its reputation as a globally significant innovation precinct, facilitating skilled employment.

The Strategy also sets out an intent for the Boggo Road Precinct to provide direct opportunities for significant private investment, in addition to Government investment, to develop residential, commercial, recreational and health-focused facilities to create a destination where the built form supports people, jobs and businesses, with ease of accessibility through world class public transport. The Strategy also seeks to enhance, promote and deliver on new public open spaces and existing streetscapes which contribute to collaboration and information sharing as well as revitalising Boggo Road's unique heritage through community engagement and awareness. The Strategy sees investment in new public realm to provide improved connectivity between rail, bus and major institutional facilities within the precinct.

To support the Government's vision for the precinct, the current Boggo Road CRR Priority Development Area (PDA) was declared on 2 October 2020 and an Interim Land Use Plan (ILUP) given effect. The Boggo Road CRR PDA covers approximately 39 hectares and is generally bounded by Burke Street to the north, Cornwall Street to the south, Annerley Road to the west, and Ipswich Road to the east.

The MEDQ has delegated certain functions and powers under the Economic Development Act 2012 to the Cross River Rail Delivery Authority (CRRDA) including to plan, carry out, promote or coordinate activities to facilitate economic development and development for community purposes. The CRRDA is preparing a Development Scheme for the Boggo Road CRR PDA which will be applicable to development on land within the boundaries of the Boggo Road CRR PDA. From the date of its approval, Boggo Road CRR PDA Development Scheme (the development scheme) will replace the Boggo Road PDA ILUP.

2.2 Study Area

The Boggo Road CRR PDA is shown in Figure 1. A notable feature of the PDA is that the eastern and western portions are separated by major transport infrastructure in the form of the Beenleigh rail line, Cleveland rail line and Eastern Busway.

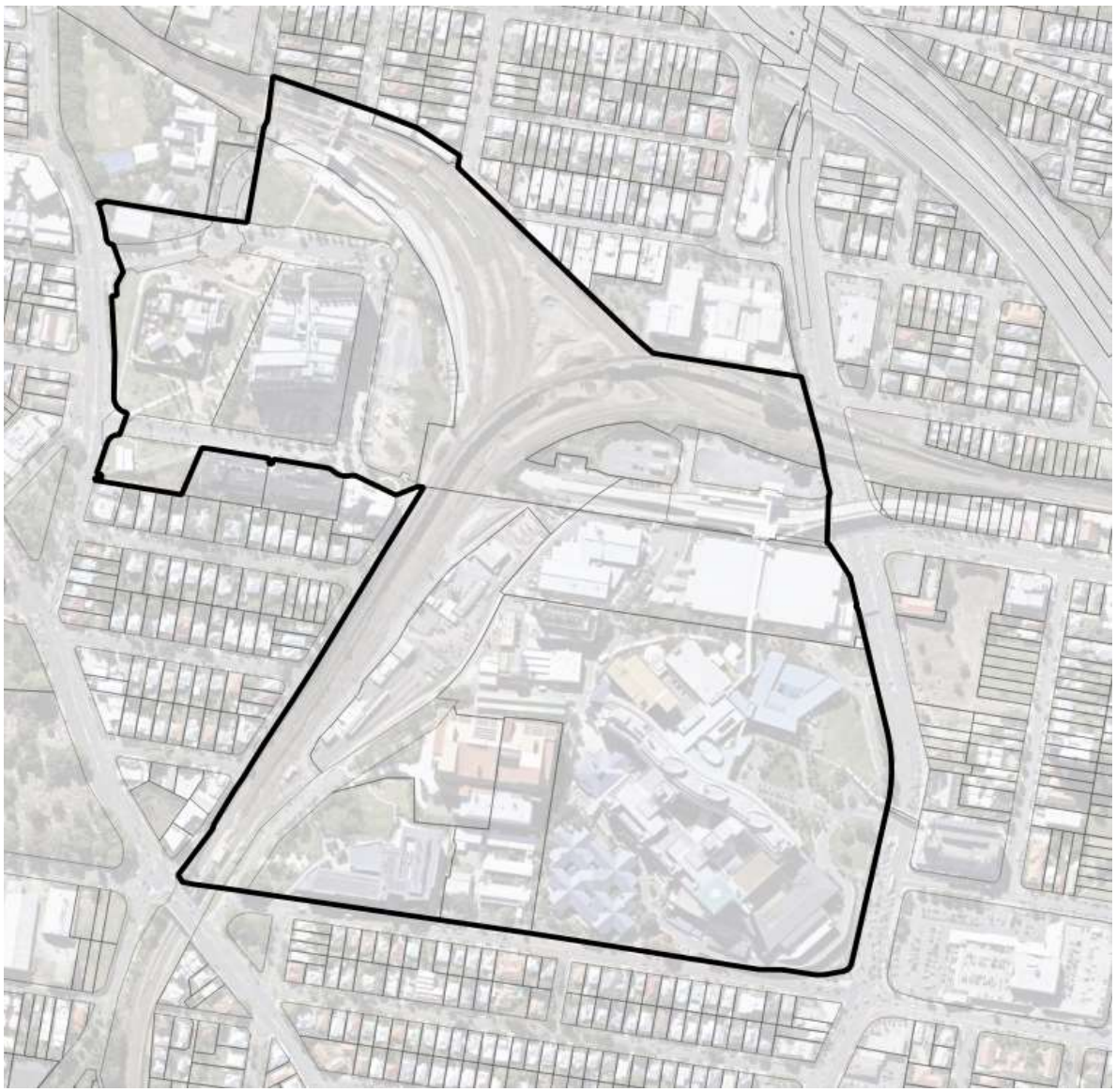


Figure 1 Map of Boggo Road CRR PDA

The current draft proposed Boggo Road CRR PDA Development Scheme refers to the PDA being made up of three precincts, each having its own precinct intent, preferred uses and sub-areas, these are:

- Precinct 1: Boggo Road Knowledge and Innovation Precinct
- Precinct 2: Rail Corridor Precinct
- Precinct 3: Princess Alexandra Hospital Precinct.

Precincts and sub-areas are shown in Figure 2.

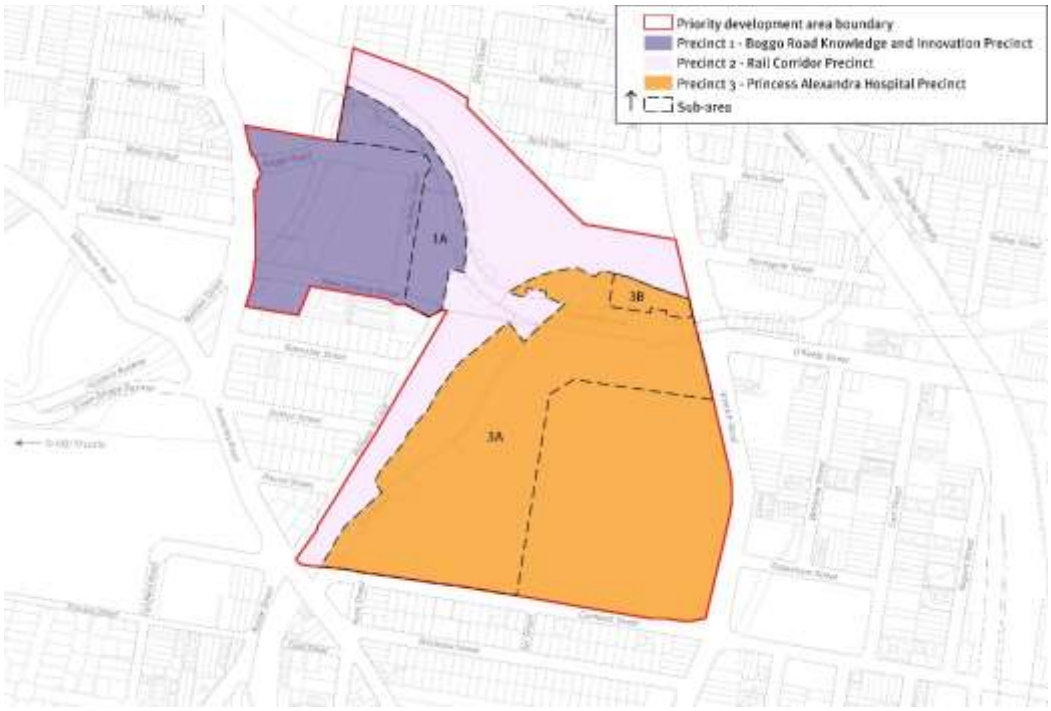


Figure 2 Map of Boggo Road CRR PDA precinct boundaries (Source: Unpublished draft proposed Development Scheme, August 2021)

Section 2.6 of the unpublished draft proposed Boggo Road CRR PDA Development Scheme (August 2021) describes the intent for each of these three precincts as follows.

Precinct 1 - Boggo Road Knowledge and Innovation Precinct

The Boggo Road Knowledge and Innovation (Boggo Road) Precinct is a vibrant mixed-use precinct, with a concentration of knowledge, research and innovation activities integrated with high-quality public realm. The precinct will be a high frequency transit destination and thriving hub of activity, providing a memorable and engaging experience for commuters, workers, visitors, students, and local community. The precinct is not intended to accommodate new residential development.

Precinct 2 – Rail Corridor Precinct

The Rail Corridor Precinct is intended to maintain the primary function of accommodating key State transport corridors, including the heavy railway and busway corridors that traverse the PDA. Through the delivery of the central connection, the RCP will serve an important role in resolving a complex physical barrier between Boggo Road and PAH Precincts by improving active transport functionality and access.

The Rail Corridor Precinct will maintain appropriate interfaces to development and infrastructure both within the precinct, and as it interfaces with the Boggo Road Precinct and PAH Precinct. Major development activity beyond core transit functions is not readily anticipated within the precinct.

Precinct 3 – Princess Alexandra Hospital Precinct

The Princess Alexandra Hospital (PAH) Precinct is anchored by the PAH, a national leading tertiary health care centre and associated world-class academic and research institutions, the Translational Research Institute (TRI) and Pharmacy Australia Centre of Excellence (PACE). The continued growth and advancement of these major health and knowledge facilities will drive renewal and redevelopment across the precinct.

The precinct will accommodate new hospital and research related development and facilities that respond to the changing community health needs, optimised clinical operations and renewal of ageing buildings or non-essential uses. Through staged renewal and redevelopment, the precinct will provide new and enhanced public spaces, improved wayfinding, and support complementary uses and improved amenity for patients, employees, and visitors. Development within sub-area 1 will accommodate clinical uses and a greater intensity of research, innovation, and allied commercial activity, situated along the rail corridor, and leveraging off the improved active transport functionality of the central connection.

2.3 Objective

Baseline infrastructure assessments have been prepared to inform outcomes of the development scheme, one of which is a baseline assessment of community infrastructure. This specifically investigates current and projected provision of parks and open space and land for community facilities as per the Brisbane City Council (BCC) Public Parks Network and Land for Community Facilities Network whilst also considering other forms of community infrastructure in the vicinity of the PDA.

This Technical Memorandum provides a summary of existing and currently planned future community infrastructure provision, the key findings of the community infrastructure assessment and resultant proposed recommendations for consideration in the drafting of the Boggo Road CRR PDA Development Scheme and Development Charges & Offsets Plan (DCOP).

3 Development Scenarios

3.1 Existing Scenario

Existing yields within the Boggo Road CRR PDA are shown in Table 1. There is no existing residential population within the PDA.

The PAH Precinct is currently dominated by the existing PAH buildings along with the existing TRI and the PACE buildings. These facilities combine to provide an existing 211,381m^2 of GFA committed to clinical health, research and related services.

The Boggo Road Precinct, comprising the western portion of the PDA includes the existing Eco-sciences Precinct which provides 31,506m^2 GFA of office and research space along with the Dutton Park Police and railway station, and the heritage listed Boggo Road Gaol.

Table 1 Existing Non-Residential Yields

Precinct	Building	Land Use	Gross Floor Area (m2)
PAH	PACE Building	Health	17,378
	PAH Building 39	Health	553
	PAH Building 37	Health	887
	PAH Building 35	Health	924
	PAH Building 33	Health	910
	PAH Building 31	Health	1,300
	PAH Building 07 (GARU)	Health	11,277
	Pantheon Biologics Building	Health	6,735
	TRI Building	Health	38,963
	PAH Building 63	Health	1,559
	PAH Building 61 (General Support Services)	Health	4,457
	PAH Building 62	Health	321
	PAH Building 57 (Central Energy Unit)	Health	1,820
	PAH Building 59	Health	384
	PAH Building 05 (Diamantina Health Care Museum)	Health	220
	PAH Building 11 (Loading Dock)	Health	1,436
	PAH Building 13 (Aquatic Physiotherapy Pool)	Health	290
	PAH Building 19 (Mental Health Services)	Health	6,251
	PAH Building 15 (Executive Building)	Health	9,335
	PAH Building 17 (Spinal Injuries Unit)	Health	3,250
	PAH Main Hospital	Health	99,131
	PAH Building 55 (Laundry)	Health/ Industrial	4,000
		Sub-Total	***211,381***
Boggo Road	Ecoscience Precinct	Office	26,082
	Dutton Park Rail Station	Commercial	500
	Dutton Park Police Station	Office	1,542
	Boggo Road Sales Office	Office	342
	Boggo Road Gaol	Commercial/Historical	3,040

Precinct	Building	Land Use	Gross Floor Area (m2)
		Sub-Total	***31,506***
		Total	**242,887**

3.2 Developed Scenario

Delivery of the proposed new Boggo Road CRR station as part of the CRR Tunnel, Station & Development (TSD) project is anticipated to stimulate the further growth of existing health, science, innovation, research and education sector jobs.

The potential future development yields of development sites under the Boggo Road CRR PDA are shown in shown in Table 2 and Table 3. While a development scheme is yet to be finalised for the PDA, a Baseline Potential Development Scenario Staging Plan – Reference Scheme (the Reference Scheme) was adopted to forecast future serving demand – refer to Figure 3 below and also Map 1 in Attachment A Maps.

Under the Reference Scheme, future development in the PDA has been assumed to be delivered in several stages:

- Stage 1: (CRR TSD & CRR RIS) 2020 - 2025
- Stage 2: 2025 - 2026
- Stage 3: 2027 - 2031
- Stage 4: 2032 - 2041

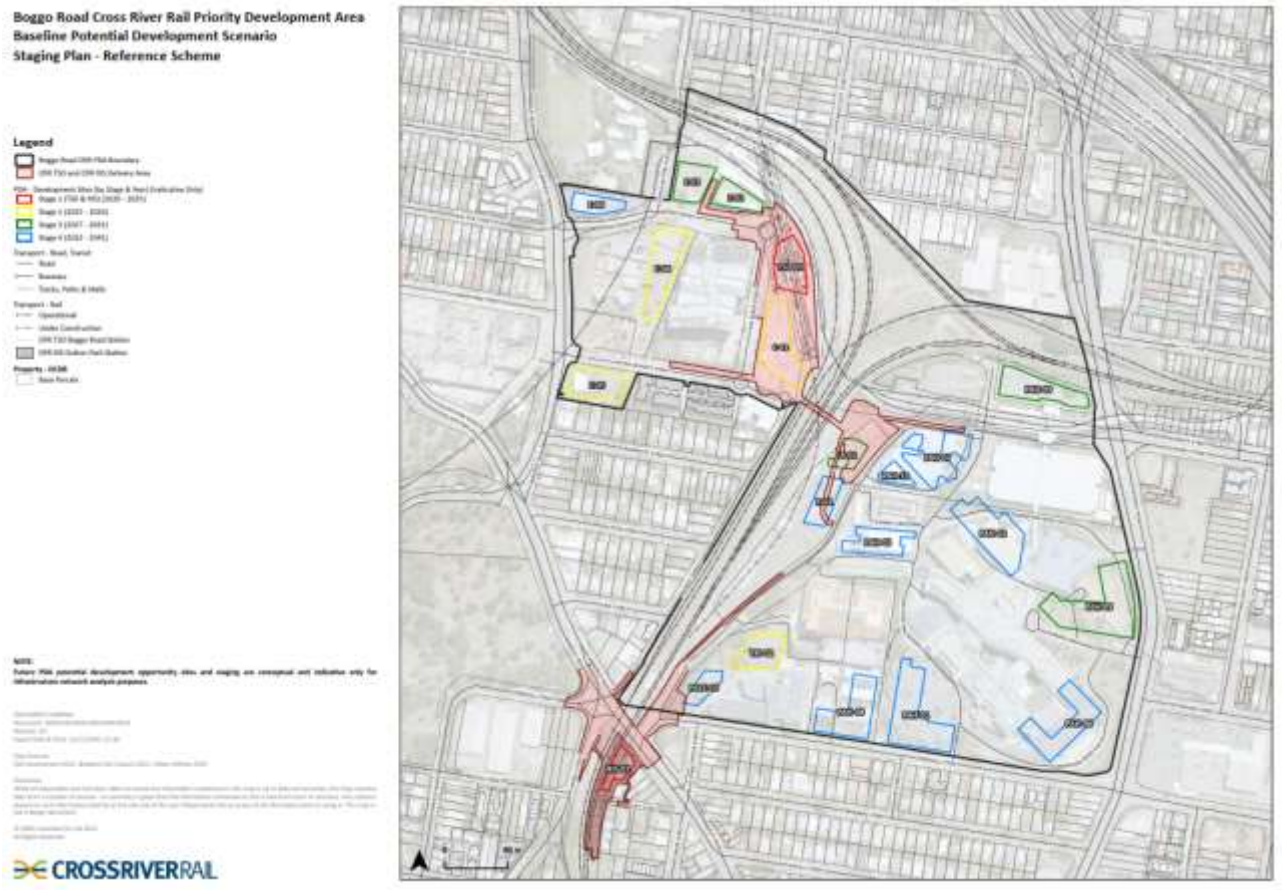


Figure 3 Boggo Road CRR PDA Potential Development Scenario Staging Plan

The CRR PDA assumes the delivery of a substantial increase in available GFA.

The draft proposed Boggo Road CRR PDA Scheme envisages predominantly non-residential research and innovation type land uses to be delivered within the PDA. It is noted that BCC has recently approved a development application (submitted for assessment prior to the PDA being declared) for a developer to deliver 82 residential dwellings (medium density apartments) on the corner of Annerley Road and Peter Doherty Street

(refer to Project Ref. E5 on the Reference Scheme). This is assumed to result in an increased residential population of 159 persons in the Boggo Road Precinct within the PDA by 2026.

The Reference Scheme assumes the remaining future development in the PDA to be non-residential in nature, although does not preclude further residential development occurring.

Table 2 Developed Yields (Non-Residential)

Stage	**Precinct**	**Project Ref.**	**Type**	**GFA**	**Jobs**
Stage 1 (CRR TSD)	Boggo Road	CRR TSD	Rail Station	TBC	TBC
			Sub total		
Stage 2	Boggo Road	E1	Office	25,855	1,293
	Boggo Road	E4	Retail / Commercial	4,485	155
	PAH	TRI 2.0	Office	6,616	331
			Sub-total	***36,956***	***1,779***
Stage 3	Boggo Road	E2	Office	20,544	1,027
	Boggo Road	E3	Office	19,308	965
	PAH	9	Office	36,036	1,802
	PAH	R1	Health	14,550	728
	PAH	05A	Hospital	39,220	1,961
			Sub-total	***129,658***	***6,483***
Stage 4	PAH	R2	Research	9,570	479
	PAH	PACE 3	Office	8,500	425
	PAH	2	Hospital	32,724	1,636
		1	Hospital	22,620	1,131
		6	Hospital	14,288	714
		8	Hospital	26,040	1,302
		7	Health	26,505	1,325
		10	Health	9,495	475
		3A	Hospital	7,000	350
		3B	Hospital	18,000	900
	Boggo Road	Police	Office	10,800	540
			Sub-total	***185,542***	***9,277***
			Total	**352,156**	**17,539**

Table 3 Developed Yields (Residential)

Stage	Precinct	Project Ref.	Type	Dwellings	Population
Stage 2	Boggo Road	E5	Residential	82	159
			Total	**82**	**159**

4 Methodology

4.1 General Approach

Community infrastructure refers to a broad range of facilities and services which are used by individuals, families, groups and communities to meet social needs and enhance community wellbeing. The BCC Planning Scheme (City Plan 2014) and associated Local Government Infrastructure Plan (LGIP) define community infrastructure in the context of the planning framework and includes:

- Premises used for providing artistic, social or cultural facilities or community services to the public
- Accessible and multi-purpose community facilities, services and open spaces which meet the physical, social and cultural needs of the local wider community
- Urban commons that form civic nodes and act as local gathering spaces with high patronage levels
- Parks and open spaces that provide a diversity of experiences
- Sport and recreation facilities

This encompasses a broad array of facilities and services provided through a variety of public and private entities. As outlined in further detail below, the methodology for the Boggo Road CRR PDA community infrastructure assessment entails the following:

- Definition of assessment catchment areas
- Assessment of current and future provision of local recreation, district and sports parks and urban commons as per the BCC Public Parks Network
- Assessment of current and future provision of land for community facilities as per BCC Land for Community Facilities Network
- Assessment of current provision of all forms of community infrastructure

CRRDA is committed to ensuring that the approach adopted in the assessment of parks, the public realm and community infrastructure is both transparent and technically appropriate. Accordingly, key stakeholders, including BCC, were engaged specifically to test and refine the methodological approach.

4.2 Catchment Analysis

Underpinning the methodological approach is the definition of assessment catchment areas. These provide a locational framework for the assessment whilst recognising that different forms of community infrastructure service different catchment areas according to the type of facility and the characteristics of the community for which it provides.

Three catchment areas have been applied, summarised as follows:

- Neighbourhood: The neighbourhood catchment encompasses the 39-hectare area within the Boggo Road CRR PDA. It is acknowledged that community infrastructure demand and supply is fluid in terms of locational characteristics, however the objective of this catchment is to detail the specific changes which would occur within the CRR PDA boundary.
- Local: The local catchment assessment captures how development proposed within the CRR PDA interacts with the immediately surrounding area. It is defined as the area within 750m walkable distance from the from the centre point of the lots in the PDA. The 750m walkable catchment area is based on the desired accessibility standard for local recreation park and urban commons as per the BCC Planning Scheme (City Plan 2014- LGIP).
- District: The district catchment assessment provides a broader contextual understanding of the supply and demand of community infrastructure and any effect of development proposed within the CRR PDA. The catchment is defined as within 2km road service area from the centre point of the lots in the PDA. This is based on the accessibility standard of district level community facilities as per the BCC Planning Scheme (City Plan 2014 LGIP).

The catchments are shown in Figure 4.

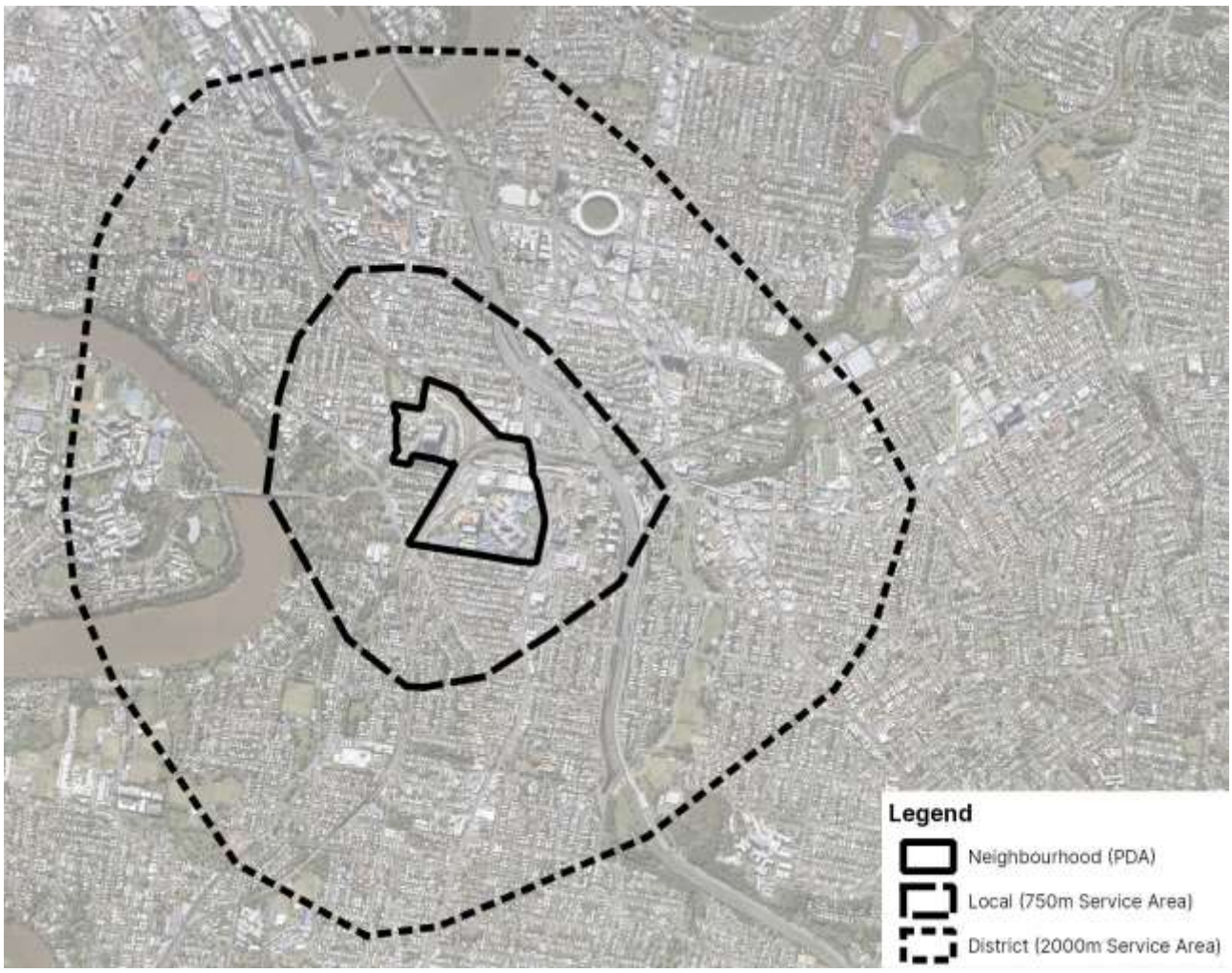


Figure 4 Map of Analysis Catchments

4.3 Estimating Parks & Community Facilities Supply

The location, area and trunk type / hierarchy of existing parks and land for community facilities were based on Open Space GIS data provided by BCC. A park or community facility was deemed to be within an analysis catchment if the catchment boundary overlapped any part of the polygon.

Additions or changes to the park area were derived from the BCC Planning Scheme LGIP 2014 and BCC Planning Scheme Long-Term Infrastructure Plan (LTIP) 2014.

4.4 Estimating Demand (Population / Jobs)

Current and future state of supply within each catchment is defined and assessed against the latest available BCC planning assumptions data as generated by the Brisbane Urban Growth (BUG) residential model and non-residential data which provides projections of residential population and jobs data for the years of 2016, 2021, 2026 and 2036.

For the Future (with CRR PDA) scenario, it was assumed that CRR PDA development changes would replace the existing growth in the parcels within the CRR PDA. The BUG parcels where this scenario applies is shown in Figure 5.

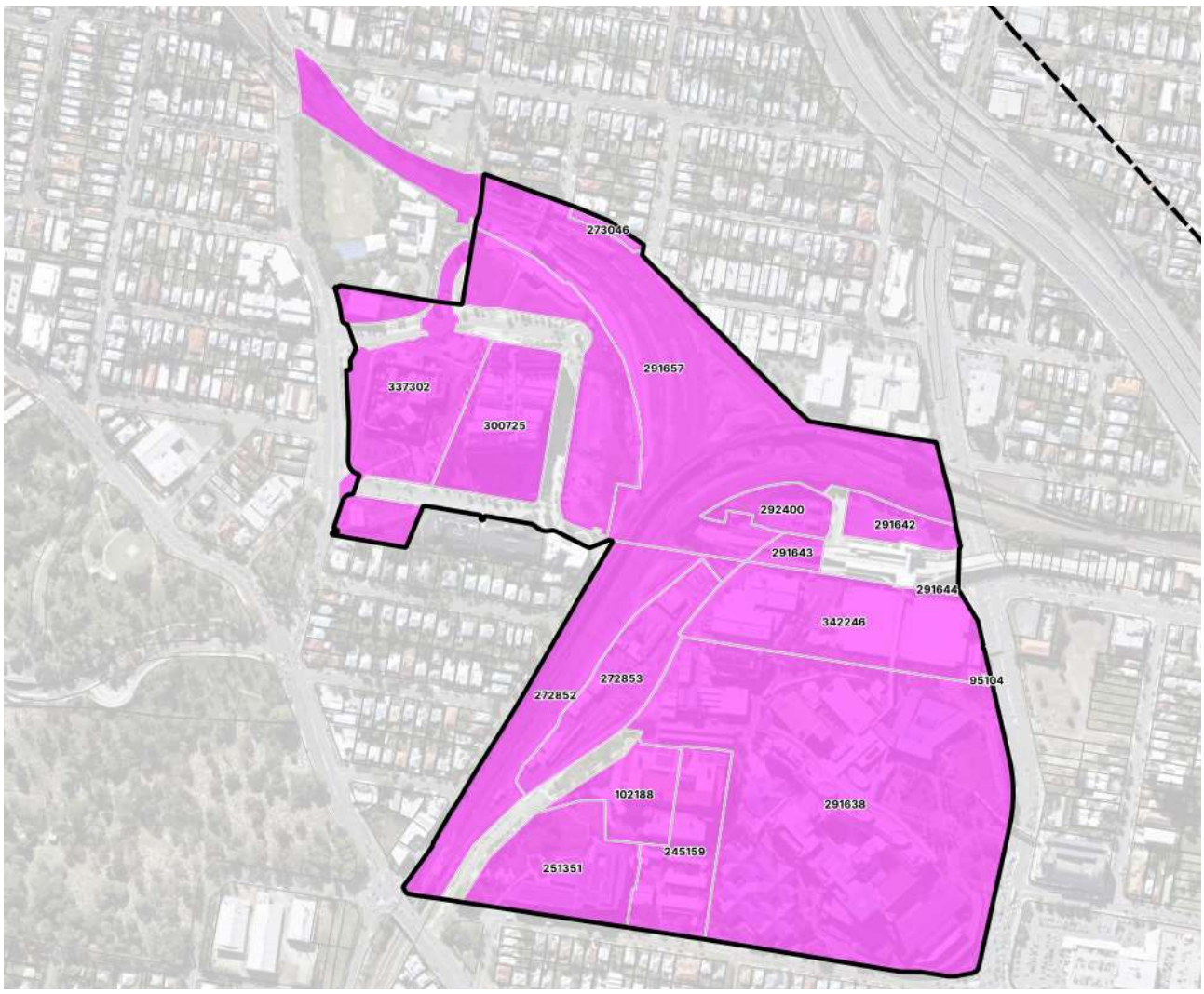


Figure 5 BUG Lots where PDA growth replaces BUG growth in Future (with PDA) scenario

4.5 Parks Provision Rate Analysis

To assess the effect of future CRR PDA development on the rates of supply and demand for parks and urban commons, calculations are made for without the CRR PDA and with the CRR PDA scenarios. This enables identification of the level of impact which assumed future CRR PDA development has on the provision of parks and urban commons.

The Desired Standard of Service (DSS) Provision Rate was largely adopted from Table 4.4.3.1.2—Provision standard for the public parks trunk infrastructure network in section 4.4.3.1 of the BCC City Plan 2014. Park categories and their respective DSS are summarised in Table 4.

The rate of demand for parks is based on either residents or employees (not the aggregate of both), whichever is higher.

Table 4 DSS for Parks Provision Rate

Trunk Type – Park Hierarchy	**Population-Driven Demand (ha / 1000 person)**	**Jobs-Driven Demand (ha / 1000 jobs)**	**Applicable catchment areas**
Sport	1.2	-	Local District
Recreation (Urban) - Local	0.8	0.1	Neighbourhood Local District

Trunk Type – Park Hierarchy	Population-Driven Demand (ha / 1000 person)	Jobs-Driven Demand (ha / 1000 jobs)	Applicable catchment areas
Recreation (Urban) - District / Metropolitan	0.8	0.2	Local District
Recreation (Urban) - Urban Common	0.006	0.006	Neighbourhood Local District
Recreation (Natural) - Local	0.6	-	Local District
Recreation (Natural) - District / Metropolitan	0.8	-	District
Non-Trunk / Unclassified	N/A	N/A	Neighbourhood

4.6 Parks Accessibility Analysis

Parks Accessibility was assessed in terms of:

- Ensuring park accessibility standards are achieved for users (employee / resident) within the CRR PDA
- Impact of potential parks within the CRR PDA on improving accessibility for users outside the CRR PDA

The DSS for Parks Accessibility were largely adopted from Table 4.4.3.1.3—Accessibility standard for the public parks trunk infrastructure network in section 4.4.3.1 of the BCC City Plan 2014. The PDA was interpreted as being inside the "Local Recreation Needs Area".

Park categories and their respective accessibility DSS are summarised in Table 5.

Table 5 DSS for Park Accessibility

Trunk Type – Park Hierarchy	Distance to Nearest Park (m)
Sport	3,000
Recreation (Urban) - Local	750
Recreation (Urban) - District / Metropolitan	3,000
Recreation (Urban) - Urban Common	750
Recreation (Natural) - Local	750
Recreation (Natural) - District / Metropolitan	3,000
Non-Trunk / Unclassified	N/A

4.7 Land for Community Facilities Provision & Accessibility Analysis

The BCC land for community facilities network seeks to provide an accessible network of land for community facilities that meets the needs of the population and employees. Assessment of existing and future (with the CRR PDA and without the CRR PDA) provision of land for community facilities is made against DSS as per 2014 BCC City Plan (LGIP Extrinsic Materials- 2018). It must be noted that the DSS for the Land for Community Facilities Network is a mechanism to assist BCC to achieve the equitable distribution of community facilities across the city. It is a "desired" standard of service and should not be interpreted as a guaranteed level of performance.

Applicable land provision standards and service population standards for the land for community facilities network are outlined in Table 6, noting that the catchment is inside Area B- 'General urban' as per the BCC City Plan 2014 (LGIP Extrinsic Materials- 2018).

Table 6 Land provision standards and service population standards

Land for network type	**Service level**	**Land provision (m^2/1,000 persons)[1]**		**Service population standard**	
		Area B General Urban		Area B General urban	
		Population	Employees	Population	Employees
Community service/leisure	Local	360	60	5,000	20,000
Community service/leisure	District	550	N/A	20,000 - 30,000	N/A
Community service/leisure	Principal	83	N/A	150,000	N/A
Community service/leisure	Metro	11	N/A	1,200,000	N/A
Arts and culture	District	200	N/A	20,000	N/A
Arts and culture	Principal	53	N/A	150,000	N/A
Sport and recreation	District	625	200	40,000	40,000
Sport and recreation	Principal	233	N/A	150,000	N/A

Notes: 1 The rate of land provision is based on the peak demand arising from the population or employees and therefore is not the aggregate of the population and employee demand

Calculation of the demand for community facilities generated by the CRR PDA is proportionate with the relative contribution to the service population. For instance, the service population standard for local level community service/ leisure facilities is 5,000 residents or 20,000 employees; whilst for a district level facility is 20,000 – 30,000 residents. Application of these standards to a DSS for respective catchment areas along with associated accessibility standards are outlined in Table 7.

Table 7 Land provision standards and accessibility standards in each catchment

Catchment	**Provision Rate (m^2/1,000 persons)**		**Accessibility**	
	Population	Employees	Population	Employees
Neighbourhood catchment	360	60	1km	2km
Local catchment	360	60	1km	2km
District catchment	1,376	200	2km	NA

5 Analysis

5.1 Neighbourhood Catchment

5.1.1 Catchment Yields

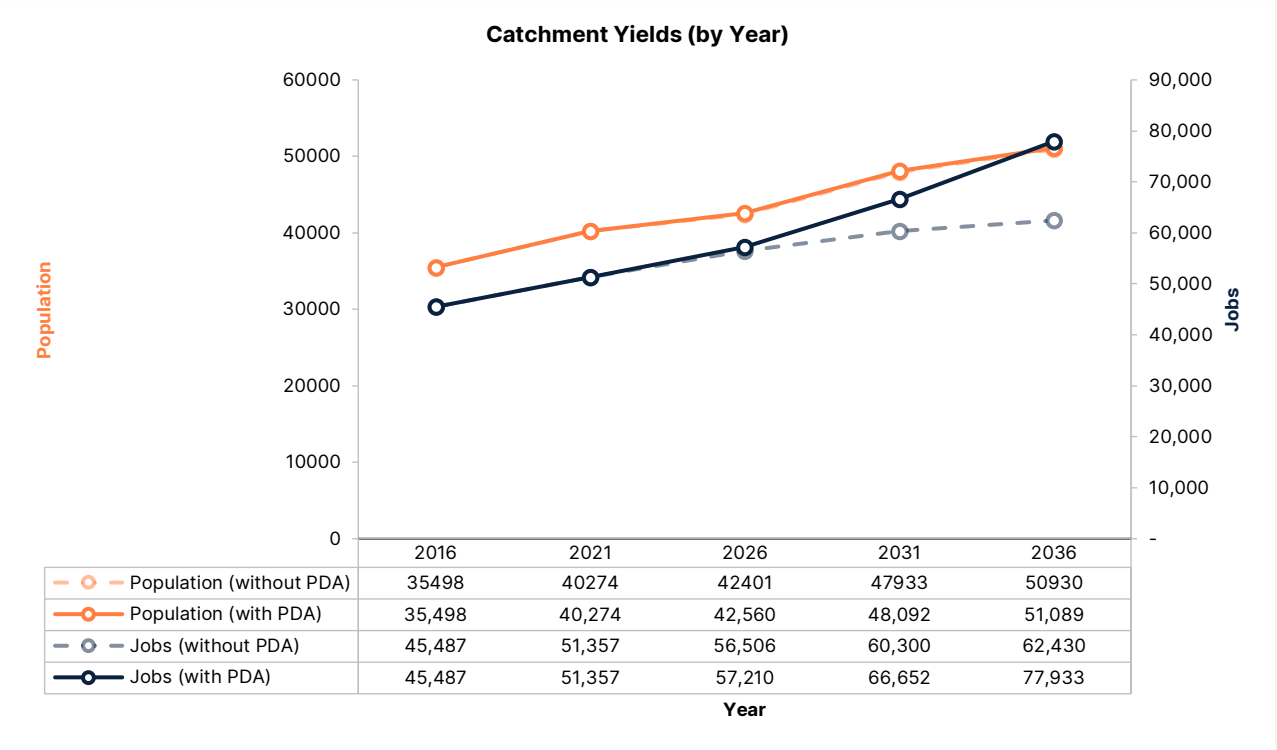
Analysis at the neighbourhood catchment facilitates an assessment of specific changes to the demand and supply of parks, urban commons and community infrastructure which would occur within the CRR PDA boundary itself. As presented in Map 02 of Attachment A Maps, the neighbourhood catchment aligns with the PDA boundary. It is dominated by land uses supporting hospital and medical services, transport infrastructure and commercial uses.

The Boggo Road CRR PDA Reference Scheme does not assume any additional dwellings or residential growth other than incorporation of the recent BCC approved development on the corner of Annerley Road and Peter Doherty Street (Project Ref. E5), assumed to deliver 82 dwellings by 2026, which is assumed to result in an increased residential population of 159 persons.

The Boggo Road CRR PDA Reference Scheme assumes a substantial increase in the supply of non-residential development, including health, research and commercial floorspace, assumed to ultimately deliver an additional 17,539 jobs.

The PAH precinct currently supports approximately 7,141 jobs based on the information extracted from the BUG date. Under the proposed CRR PDA development, the jobs in this precinct will increase significantly to 26,044 jobs by 2036.[1]

The residential population and number of jobs in the neighbourhood catchment (with and without PDA) is shown in Figure 6.



	2016	2021	2026	2031	2036
Population (without PDA)	35498	40274	42401	47933	50930
Population (with PDA)	35,498	40,274	42,560	48,092	51,089
Jobs (without PDA)	45,487	51,357	56,506	60,300	62,430
Jobs (with PDA)	45,487	51,357	57,210	66,652	77,933

Figure 6 Neighbourhood Catchment Yields

[1] For the purpose of this assessment, numbers from the BUG data were adopted in this report. The BCC BUG data provides the expected populational and jobs growth for the catchments without the PDA.

5.1.2 Parks & Land for Community Facilities Supply

5.1.2.1 Existing Supply

Existing parks within the neighbourhood catchment are shown in Table 8 and in Map 2 Parks & Land for Community Facilities in Neighbourhood Catchment in Attachment A Maps.

Existing trunk parkland within the neighbourhood catchment is confined to Outlook Park which is a local recreation park providing a total area of 2,161m^2. To enable initiation of construction of the new Boggo Road CRR Station as part of CRR TSD works, Outlook Park was required to be temporarily re-located to a site adjacent to the Park Road Rail Station and Boggo Road Busway Station.

The only other park within the CRR PDA is Boggo Road Gaol Park which is adjacent to the south of the Boggo Road Gaol facility. This is a non-trunk district landscape amenity park providing a total area of 3,503m^2. A heritage overlay associated with the Boggo Road Gaol lies over approximately 50% of the total area of Boggo Road Gaol Road Park, the purpose of which is to retain viewpoints to the Gaol from Annerley Road.

Table 8 Area of Existing Parks in Neighbourhood catchment

Name	Sport	Recreation (Urban) - Urban Common	Recreation (Urban) - Local	Recreation (Urban) - District / Metropolitan	Recreation (Natural) - Local	Recreation (Natural) - District / Metropolitan	Non-Trunk / Unclassified	Grand Total
Boggo Road Gaol Park	-	-	-	-	-	-	0.35	0.35
Outlook Park	-	-	0.213	-	-	-	-	0.213
Total	**-**	**-**	**0.213**	**-**	**-**	**-**	**0.35**	**0.563**

Whilst not part of the BCC public parks network, there is an unclassified park space of approximately 5,000m^2 located at 20 Cornwall Street, bound by the PACE and TRI buildings and the rail corridor. Referred to as 'Translational Park', it serves as a primary access point to the TRI building; however the land is part of the lot on which the PACE building is located. The land was donated by the Queensland Government to enable development of the PACE and TRI facilities. Under the BCC City Plan (2014), the zoning of the land is 'Community facility (Education).

There are some additional areas of informal open space throughout the neighbourhood catchment- particularly in the Boggo Road Precinct. This includes undesignated:

- Green space and walkways along Joe Baker Drive
- Green space embellished with park seating, tree plantings, landscaping along Boggo Road
- Open areas without embellishments around Park Road station
- Open areas along the northern side of the Eco-Sciences Precinct buildings
- Open areas between the Eco-Sciences Precinct buildings and the Boggo Road Gaol, which will be directly affected by the proposed retail / commercial development that was recently approved by BCC (submitted for assessment prior to the PDA being declared) (refer to Project Ref. E4 on the Reference Scheme).
- Open areas without embellishments along western side of Boggo Road Gaol between Annerley Road and the Boggo Road Gaol- entry point to Boggo Road Village
- Embellished boulevard/ urban commons areas on northern side of the Boggo Road Gaol
- Open area/ car parking area- unimproved with no embellishments along southern side of Peter Doherty Street (the site of the proposed residential apartment development – Reference Scheme Project Ref. 4).
- Improved open space including mature trees along Kent Street and in front of the existing TRI and PACE buildings.
- Improved open space including embellishments, mature trees and plantings along Ipswich Road and entry to the PAH.

There is no quantity of land designated under the BCC land for community facilities network within the neighbourhood catchment.

With regard to other forms of community infrastructure, the historic Boggo Road Gaol is a key facility within the neighbourhood catchment (refer to Map 03 in Attachment A Maps). Opened in 1883 as Brisbane Gaol, it served

as Queensland's largest prison and was eventually decommissioned in 1989. As the only surviving intact prison reflecting the penological principles and architecture of the 19th century, the No. 2 Division and remnants of the No.1 Division were listed on the Queensland Heritage Register in 1993 and the No. 2 Division buildings and wall retained. In 2012 it was opened as a tourism and heritage facility and currently supports a museum along with guided tours and a venue for private functions and community events.

As shown in the Existing Scenario yields, there are a large number of buildings dedicated to the provision of health services- a total of 211,381m^2 of GFA. Further community infrastructure within the neighbourhood catchment includes the Dutton Park Police Station, Dutton Park Rail Station and Busway Station and the Eco-sciences Precinct.

5.1.2.2 Future Supply (without PDA)

As per the BCC LGIP, there is no proposed supply of additional trunk or non-trunk park space in the neighbourhood catchment within the planning horizon.

As per the BCC LTIP, there is no proposed supply of additional trunk or non-trunk park space in the neighbourhood catchment within the planning horizon.

There is no supply of land for community facilities proposed in the neighbourhood catchment in the LGIP and LTIP through to 2036.

5.1.2.3 Future Supply (with PDA)

Whilst the final development and design outcomes for the Boggo Road CRR PDA have not yet been determined, community infrastructure (parks, plazas, public realm and community facilities) would be delivered both as part of the CRR TSD delivery (Stage 1) and through the realisation of future development opportunities (identified on the Figure 3 and Figure 7 (the indicative Proposed Community Infrastructure Plan – Refer Map 6 in Attachment A for larger copy of the map) within the broader CRR PDA (Stages 1 - 4).

CRR TSD (Stage 1) will involve delivery of the following community infrastructure:

- Boggo Road CRR Station Plaza – provision of 1,100m^2 of embellished (trunk) urban commons/ public realm space by 2025
- Provision of approximately 4,500m^2 of (non-trunk) landscape amenity park/ (public realm/waterway enhancement area adjacent to the eastern entry to the Central Bridge
- Streetscape improvements delivered on Peter Doherty Street, Joe Baker Street and Boggo Road

Whilst the timing is not yet determined, Stage 2 and Stage 3 are anticipated to deliver:

- Permanent establishment of Outlook Park in the Boggo Road Precinct (on either Lot 1 or Lot 2), providing approximately 2,100m^2 of trunk local recreation park
- Enhancement of the existing Boggo Road Gaol Park, to provide an additional 3,503m^2 of trunk local recreation park

Following preliminary analysis undertaken by the CRRDA regarding the optimal permanent location for Outlook Park, it is proposed that Outlook Park (approximately 2,100m^2) be located inclusive of play equipment and other embellishments in close proximity to the Boggo Road CRR Station and the residential catchment area to the north.

It is recommended that the existing Boggo Road Gaol Park be further embellished to serve as a trunk local recreation park. Boggo Road Gaol Park is highly accessible and very well positioned on the corner of Annerley Road and Peter Doherty Street. It is flat and already supports modest embellishments which may be further upgraded to meet all specifications of a trunk parkland facility. There is a heritage overlay across 50% of the site. However, if the viewpoint to the Gaol from Annerley Road is not impeded, this overlay would not prevent Boggo Road Park being upgraded to a trunk level local recreation park of 3,503m^2.

Stage 4 is anticipated to deliver:

- Provision of approximately 800m^2 of public plaza (urban commons) in the PAH Precinct.
- Additional new publicly accessible public realm spaces within PAH building redevelopments as part of future PAH master planning.
- Utilisation of the Boggo Road Gaol for community purposes / community uses providing up to 4,000m^2 of additional floorspace for community facilities.

There is very limited existing provision of public realm space to cater for the needs of employees and hospital patients under the existing and future scenarios. This will be further exacerbated by the loss of the open space referred to as 'Translational 'Park'.

To address current and future need, the CRR PDA proposes a new public plaza, generally located near the eastern end of the new shared bridge and the PAH. Whilst delivery of this public plaza is dependent on the master planning outcomes of the PAH, the plaza should be of a minimum size of 800m^2 as well as allowing for a further 700m^2 open space useable by workers and visitors provided within the PAH campus redevelopments and, a central connection through the PAH to Ipswich Road and Cornwall Street (based on 26,044 jobs). Also provided is approximately 4,500m^2 of (non-trunk) landscape amenity park/ public realm/waterway enhancement area adjacent to the eastern entry to the Central Bridge.

There is an opportunity for expanded community utilisation of the Boggo Road Gaol. Whilst its heritage status places some restrictions on the extent of physical upgrades to the site, the Gaol is an expansive community facility which could be further utilised as an events venue for live music, theatre and other entertainment. It also could accommodate a community meeting space. Guidance as to potential community uses is further provided by the (approved) development application lodged by Calile Malouf Investments in 2015. As shown in Attachment D, extensive areas were proposed for community uses - refer to Building 10, Building 6 and Building 3). Were a similar development outcome achieved, an assumed breakdown of floor area against BCC land for community facility types which may be achieved is outlined in Table 9.

Table 9 Potential community infrastructure floorspace delivered through Boggo Road Gaol

Network type	**Service level**	**Potential floorspace achieved (m^2)**
Community service/leisure	Local	500
Community service/leisure	District	1,800
Community service/leisure	Principal/ Metro	-
Arts and culture	District	1,200
Arts and culture	Principal	-
Sport and recreation	District	500
Sport and recreation	Principal	-
Total		**4,000**

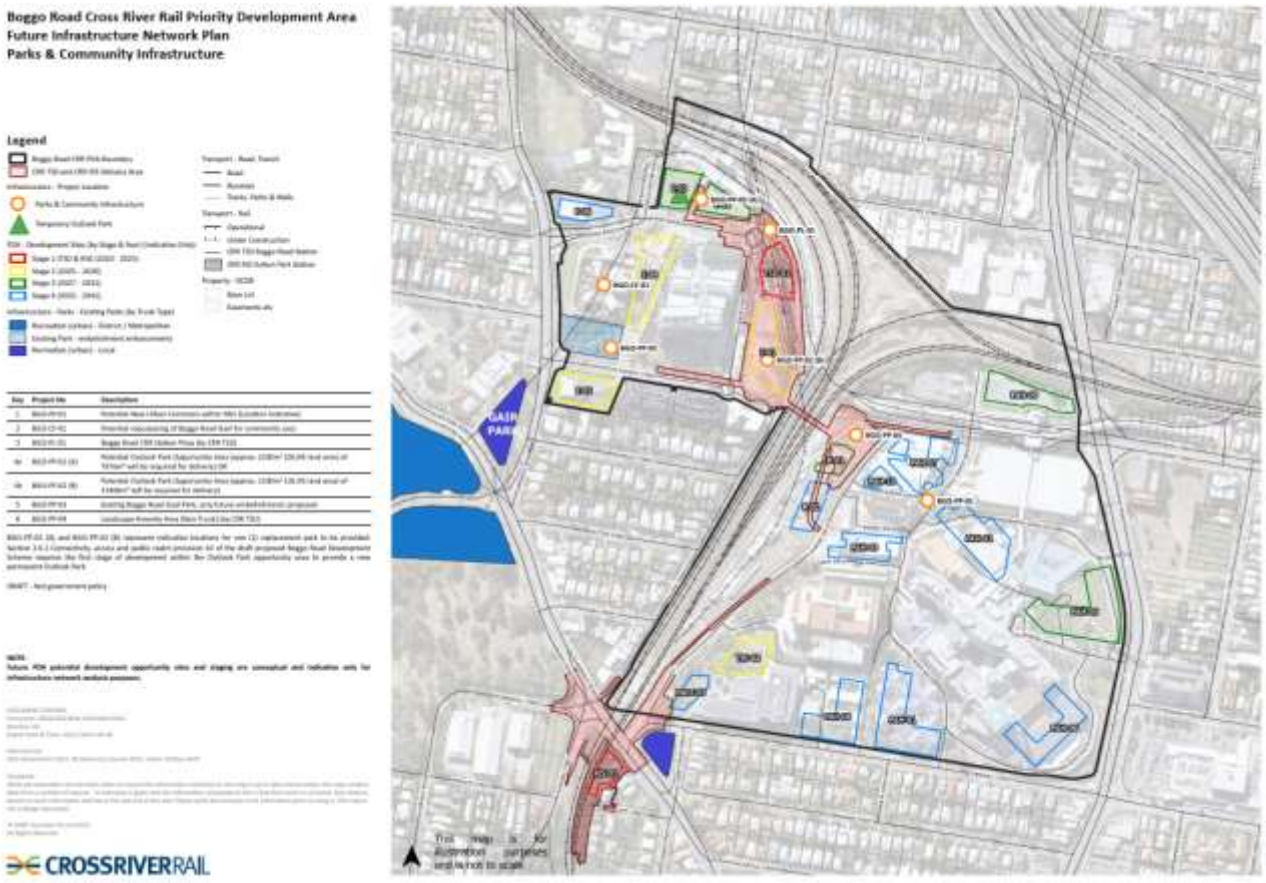


Figure 7 Proposed Community Infrastructure Plan

5.1.2.4 Existing & Future Supply Summary

Parks supply within the Neighbourhood catchment is shown in Figure 8.

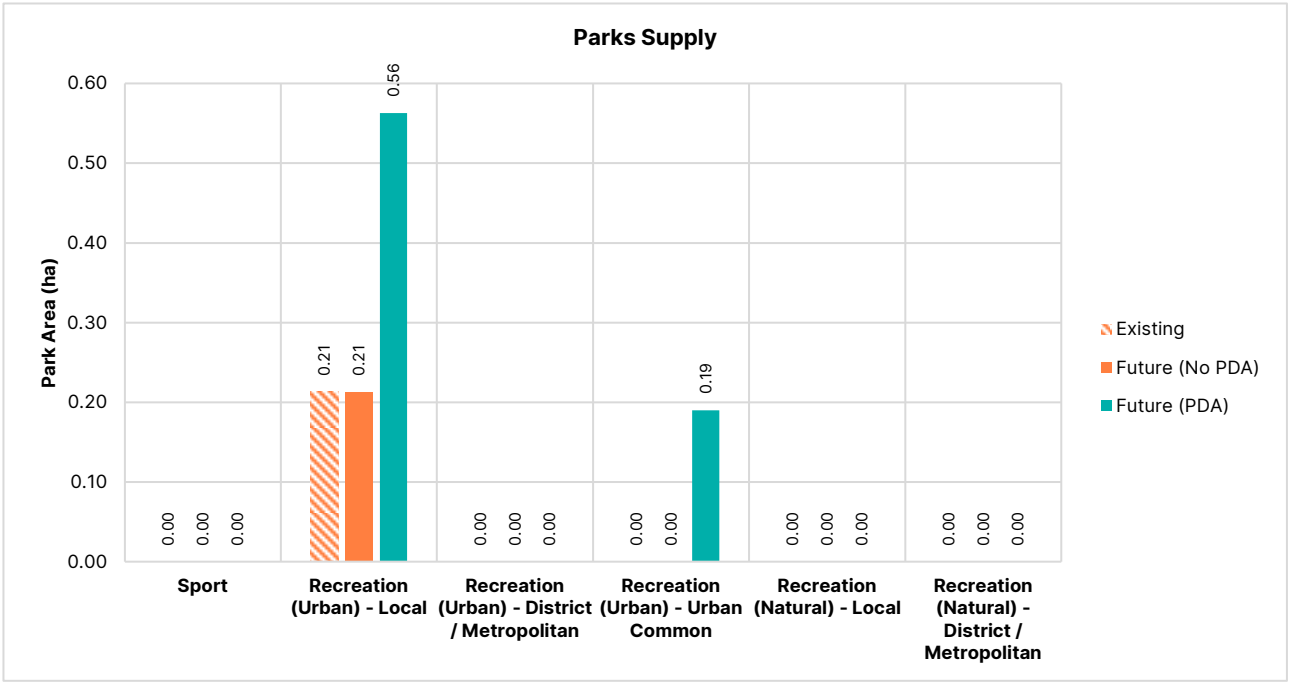


Figure 8 Parks Supply in the Neighbourhood catchment

5.1.3 Servicing Analysis

5.1.3.1 Parks Provision Rate Analysis

The results of the Provision Rate Analysis for parks in the neighbourhood catchment are summarised in Table 10. Detailed calculation sheets are contained in **Error! Reference source not found.**.

Table 10 Parks Provision Rates Analys Result for Neighbourhood Catchment

	Existing	Future (No PDA)	Future (PDA)	Change
Yields				
Population	-	-	159	159
Jobs	7,341	10,541	26,044	15,503
Sport				
Demand Driver	No Demand	No Demand	Population	
Demand (ha)	0.000	0.000	0.191	0.191
Supply (ha)	0.000	0.000	0.000	0.000
Supply Balance (ha)	0.000	0.000	-0.191	-0.191
Provision Rate (ha/1000p)			0.000	
% DSS Achieved (Population)	N/A	N/A	0%	
Provision Rate (ha/1000j)				
% DSS Achieved (Jobs)	N/A	N/A	N/A	
Supply Status			Under Supply	
Recreation (Urban) - Local				
Demand Driver	Jobs	Jobs	Jobs	
Demand (ha)	0.734	1.054	2.604	1.550
Supply (ha)	0.213	0.213	0.563	0.350
Supply Balance (ha)	-0.521	-0.841	-2.041	-1.200
Provision Rate (ha/1000p)				
% DSS Achieved (Population)	N/A	N/A	N/A	
Provision Rate (ha/1000j)	0.029	0.020	0.022	0.002
% DSS Achieved (Jobs)	29%	20%	22%	1%
Supply Status	Under Supply	Under Supply	Under Supply	
Recreation (Urban) - District / Metropolitan				
Demand Driver	Jobs	Jobs	Jobs	
Demand (ha)	1.468	2.108	5.209	3.101
Supply (ha)	0.000	0.000	0.000	0.000
Supply Balance (ha)	-1.468	-2.108	-5.209	-3.101
Provision Rate (ha/1000p)				
% DSS Achieved (Population)	N/A	N/A	N/A	
Provision Rate (ha/1000j)	0.000	0.000	0.000	0.000
% DSS Achieved (Jobs)	0%	0%	0%	0%
Supply Status	Under Supply	Under Supply	Under Supply	
Recreation (Urban) - Urban Common				
Demand Driver	Jobs	Jobs	Jobs	
Demand (ha)	0.044	0.063	0.156	0.093

	Existing	Future (No PDA)	Future (PDA)	Change
Supply (ha)	0.000	0.000	0.190	0.190
Supply Balance (ha)	-0.044	-0.063	0.034	0.097
Provision Rate (ha/1000p)				
% DSS Achieved (Population)	N/A	N/A	N/A	
Provision Rate (ha/1000j)	0.000	0.000	0.007	0.007
% DSS Achieved (Jobs)	0%	0%	122%	122%
Supply Status	Under Supply	Under Supply	Over Supply	
Recreation (Natural) - Local				
Demand Driver	No Demand	No Demand	Population	
Demand (ha)	0.000	0.000	0.095	0.095
Supply (ha)	0.000	0.000	0.000	0.000
Supply Balance (ha)	0.000	0.000	-0.095	-0.095
Provision Rate (ha/1000p)			0.000	
% DSS Achieved (Population)	N/A	N/A	0%	
Provision Rate (ha/1000j)				
% DSS Achieved (Jobs)	N/A	N/A	N/A	
Supply Status			Under Supply	
Recreation (Natural) - District / Metropolitan				
Demand Driver	No Demand	No Demand	Population	
Demand (ha)	0.000	0.000	0.127	0.127
Supply (ha)	0.000	0.000	0.000	0.000
Supply Balance (ha)	0.000	0.000	-0.127	-0.127
Provision Rate (ha/1000p)			0.000	
% DSS Achieved (Population)	N/A	N/A	0%	
Provision Rate (ha/1000j)				

5.1.3.2 Parks Accessibility Analysis

The results of the Parks Accessibility analysis for the neighbourhood catchment are shown in Table 11 and in Map 5 Existing and Future Parks Accessibility.

Table 11 Parks accessibility analysis for neighbourhood catchment

Trunk Type – Park Hierarchy	DSS (Max Distance to Park) (m)	DSS Achieved (without PDA)	DSS Achieved (with PDA)
Sport	3,000	Yes	Yes
Recreation (Urban) - Local	750	Yes	Yes
Recreation (Urban) - District / Metropolitan	3,000	Yes	Yes
Recreation (Urban) - Urban Common	750	Yes	Yes
Recreation (Natural) - Local	N/A	-	-
Recreation (Natural) - District / Metropolitan	N/A	-	-

5.1.3.3 Land for Community Facilities Supply / Demand Balance

Application of land provision standards and service population standards for the land for community facilities network is outlined in Table 12.

Table 12 Land for Community Facilities Supply & Demand Results for neighbourhood catchment

Land for network type	Existing			Without PDA (2036)			With PDA (2036)		
	Demand (ha)	Supply (ha)	Difference (ha)	Demand (ha)	Supply (ha)	Difference (ha)	Demand (ha)	Supply (ha)	Difference (ha)
Community service/ leisure- Local	0.02	Nil	-0.02	0.03	Nil	-0.03	0.19	0.23(1)	+0.04
Community service/ leisure- District	Nil	Nil	Nil	0.01	Nil	-0.01	0.01	0.23(1)	+0.22
Community service/ leisure- Principal	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
Arts and culture- District	Nil	Nil	Nil	0.01	Nil	-0.01	0.01	0.12	+0.11
Arts and culture- Principal	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Sport and recreation- District	0.03	Nil	-0.03	0.55	Nil	-0.55	0.32	0.05	-0.27
Sport and recreation- Principal	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Without the proposed future Boggo Road CRR PDA development, there is an undersupply against the indicative DSS for the network types of community service (local), community service (district), arts and culture (district) and sport and recreation (district). With the PDA, each of these network types record a rate of provision which is higher than the indicate DSS, with the exception of sport and recreation (district) where the deficiency of provision is substantially reduced.

Across all network types, cumulative supply is 0.10ha higher than the indicative DSS for the with PDA scenario.

The accessibility standard for land for community facilities in the neighbourhood catchment is 1km for residents and 2km for employees. Under both the without and with PDA scenarios, these accessibility standards are met.

5.1.4 Key Findings

Key findings from the assessment of the Neighbourhood catchment are as follows:

- There is no residential population within the CRR PDA until 2026, growing to a total of 159 residents
- There is a significant increase in the quantity of jobs between the without and with CRR PDA scenarios
- Without the CRR PDA, the total number of jobs grows to a total of 10,541 by 2036
- With the CRR PDA scenario sees the number of jobs increase substantially from 2026, resulting in a total of 26,044 jobs by 2036
- Existing trunk park is limited to Outlook Park which is a local recreation park providing a total area of 2,161m^2
- Non-trunk park is confined to Boggo Road Gaol Park which provides a total area of 3,503m^2
- There is no additional supply of parks or land for community facilities proposed in the LGIP or LTIP
- The existing rate of supply of local recreation park is 0.029ha/ 1,000j which meets 30% of demand as per the DSS. Without the PDA, the rate of provision is 0.020ha/1,000j which meets 20% of DSS demand. With the PDA, the rate of provision is 0.022ha/1,000j which meets 22% of DSS demand.
- The accessibility standards for all park types are met both with and without the PDA

- There is no existing supply of urban common. In the PAH Precinct there is a shortage of public realm and open space to support workers and users of the PAH. It is estimated that there are currently 7,240 jobs in the PAH precinct.
- To meet the DSS, there is a requirement for a minimum of 430m^2 of urban common space
- With the PDA, it is estimated that the total number of jobs in the PAH Precinct of the PDA would increase to 26,044. To meet the DSS there is a requirement for a minimum of 1,560m^2 of urban common space. In light of this and in order to cater for demand by health workers and users of hospital and health services in the eastern portion of the PDA, it is proposed that a minimum of 1,560m^2 of accessible public plaza should be delivered through the PAH Masterplan
- CRR TSD (Stage 1) will involve delivery of the Boggo Road CRR Station Plaza which would provide 1,100m2 of embellished (trunk) urban commons/ public realm space. Stage 1 would also involve the provision of approximately 4,500m2 of (non-trunk) landscape amenity park adjacent to the eastern entry to the Central Bridge along with streetscape improvements on Peter Doherty Street, Joe Baker Street and Boggo Road.
- Stage 2 and Stage 3 are anticipated to deliver the permanent establishment of Outlook Park in the Boggo Road Precinct, with no net loss of area, either on Lot 1 or Lot 2 (subject to further detailed analysis and design consideration) along with the enhancement of Boggo Road Gaol Park, to provide an additional 3,503m2 of trunk local recreation park.
- Stage 4 is anticipated to deliver additional new publicly accessible public realm spaces within PAH building redevelopments as part of future PAH master planning. Furthermore, the Boggo Road Gaol presents as a major opportunity to increase the provision of community infrastructure. Based on the assessment of previously proposed plans for the facility, it could provide an overall addition of 4,000m^2 of community space for a variety of purposes including community meeting space, events venue for live music, theatre and entertainment and flexible indoor/ outdoor recreational space

5.2 Local Catchment

5.2.1 Catchment Yields

The current and predicted resident population and number of jobs in the local catchment is outlined in Figure 9.

Residential population is predicted to grow steadily from 7,385 in 2016 to 9,462 by 2036. Predicted growth in jobs is slightly higher than growth in population, increasing from 11,690 in 2016 to 16,756 by 2036.

Under the 'with PDA' scenario', the rate of residential growth remains very similar; however, the rate of jobs growth is substantially higher - almost double to that under the 'without PDA scenario' to provide a total of 31,626 jobs by 2036.

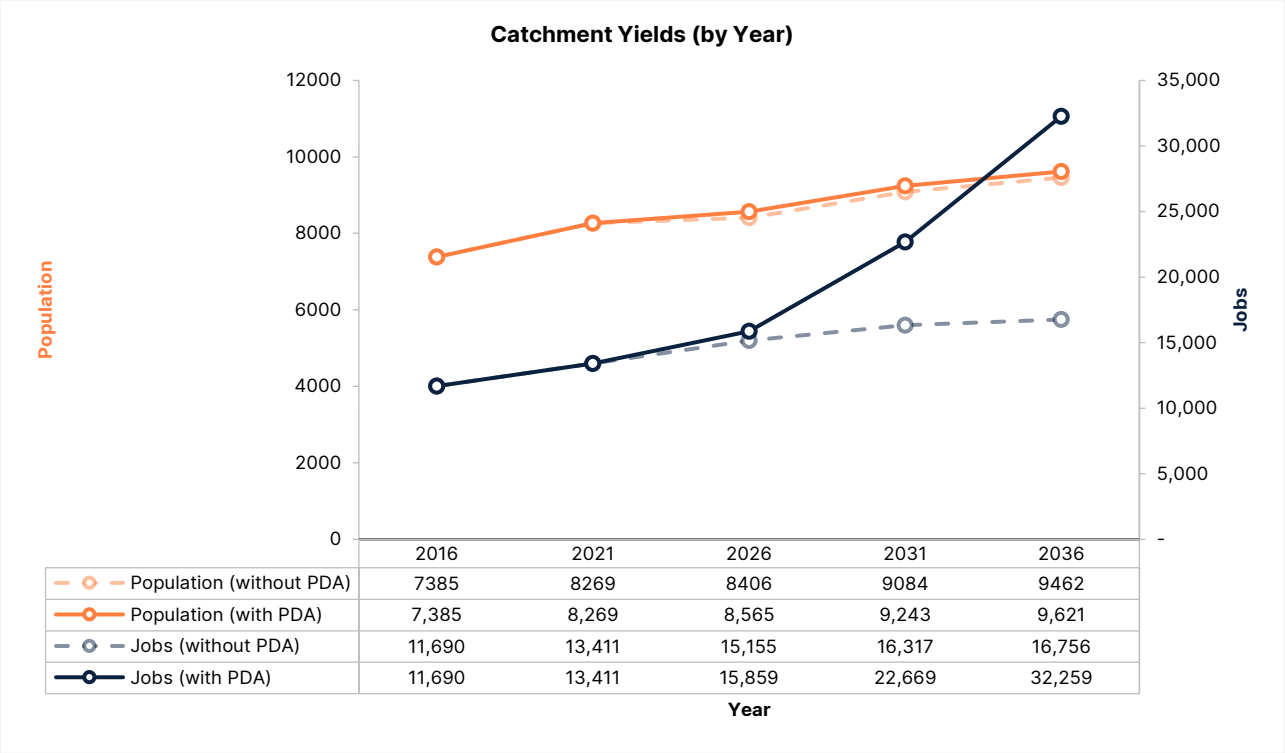


Figure 9 Local Catchment Yields

5.2.2 Parks & Land for Community Facilities Supply

5.2.2.1 Existing

Existing provision of parks in the local catchment is presented in Table 13 and Map 3 Parks & Land for Community Facilities in Local Catchment in Attachment A Maps. The only trunk park types in the local catchment are local recreation park, district and metropolitan recreation park and urban common. There is no supply of sports park or natural local or district park.

Table 13 Area of Existing Parks in Local Catchment

Name	Recreation (Urban) - Urban Common	Recreation (Urban) - Local	Recreation (Urban) - District / Metropolitan	Non-Trunk / Unclassified	Total Area (ha)
Boggo Road Gaol Park				0.35	0.35
Outlook Park		0.213			0.213
Dutton Park			8.271	1.181	9.452
Gair Park		0.291			0.291
Ovens Head Reserve				0.272	0.272
Princess Street Park (No. 5-21)		0.59			0.59
Heffernan Park		0.15			0.15
Fairfield Park		1.645			1.645
Turley Street Park		1.921			1.921
Faversham Street Park		0.11			0.11
Home Street Park (No. 104)				0.018	0.018
Dibley Street Park		0.138			0.138
Carl Street Park	0.428				0.428

Name	Recreation (Urban) - Urban Common	Recreation (Urban) - Local	Recreation (Urban) - District / Metropolitan	Non-Trunk / Unclassified	Total Area (ha)
Total	**0.428**	**5.058**	**8.271**	**1.821**	**15.578**

Whilst the level of total parks provision is reasonably high, there is a notable absence of any form of park in the northern section of the local catchment. A substantial proportion of total supply of local recreation park (50,595 m^2) is provided through Fairfield Park (16,448m^2) and Turley Street Park (19,210m^2) which are on the southern periphery of the local catchment. It should be noted that a majority of Turley Street Park is outside of the local catchment, however it is captured due to land parcel being contiguous with the portion within the catchment area. All of the supply of district and metropolitan recreation park is provided by Dutton Park (82,708m^2) which is just to the east of the PDA.

With regard to the land for community facilities network, there are three sites within the Local catchment as outlined in Table 14.

Table 14 Existing Land for Community Facilities in Local catchment

LGIP_ID	Type	Description	Area (ha)
EXIT-CF-X71	Community service / group space	Link Vision and Accommodation Centre	0.36
EXIT-CF-X49	General community space	Birds Queensland and Bird Life Southern Queensland	0.03
EXIT-CF-X118	Community service / group space	Brisbane Multicultural Centre- Multicultural Australia	0.25
Total			**0.64**

Most of the total supply of land for community facilities (0.64 ha) is classified as community service/ group space. Most proximal to the CRR PDA is the land utilised for the Brisbane Multicultural Centre and headquarters of Multicultural Australia. The other, larger site is to the south of the CRR PDA and is utilised to provide accommodation options for those with severe visual impairment. It is also the headquarters of Link Vision Australia. The remaining site is within Dutton Park and is the small building used as the headquarters of Birds Queensland.

5.2.2.2 Future (without PDA)

As per the BCC LGIP, there is no proposed supply of additional trunk or non-trunk park space in the neighbourhood catchment within the planning horizon. The only additional park provision which had been provided for in the LGIP was the Carl Street urban commons which has now been delivered and recognised as part of existing supply.

As per the BCC Long Term Infrastructure Plan (LTIP), there is no proposed supply of additional trunk or non-trunk park space in the neighbourhood catchment within the planning horizon.

There is no supply of land for community facilities proposed in the local catchment in the LGIP and LTIP through to 2036.

5.2.2.3 Future (with PDA)

As outlined under the neighbourhood catchment analysis.

5.2.2.4 Supply Summary

Parks supply within the Local catchment is summarised in Figure 10.

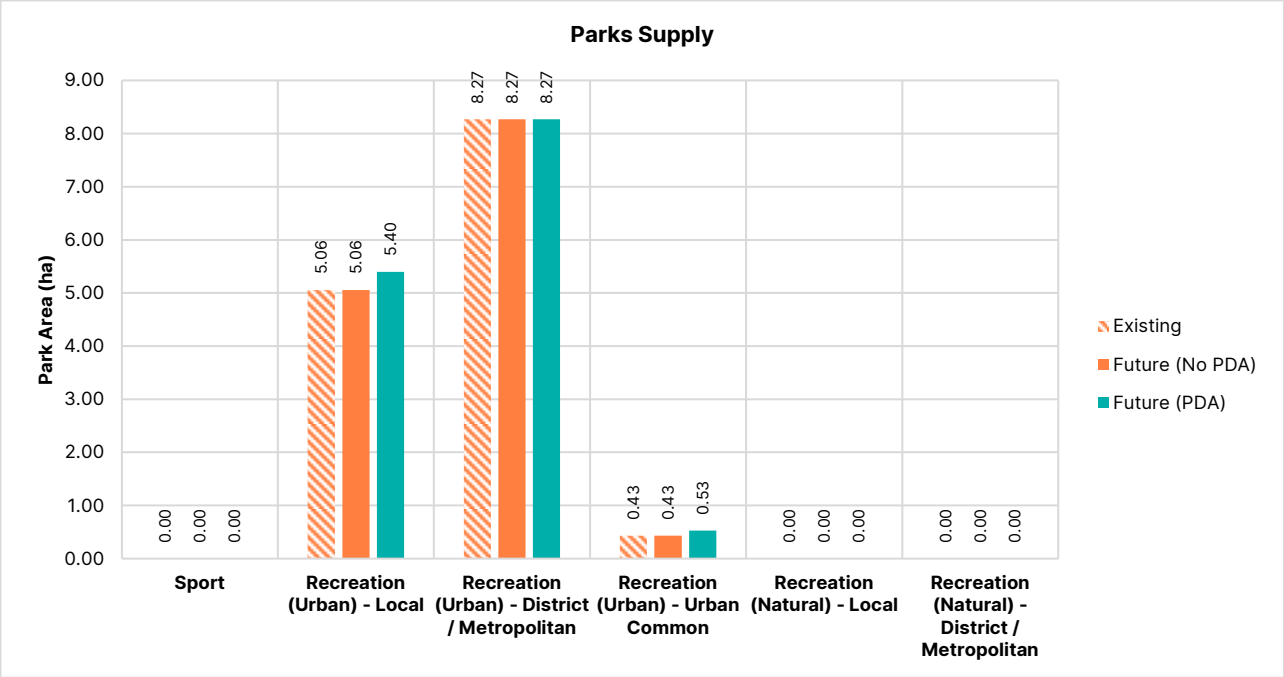


Figure 10 Parks Supply in Local Catchment

5.2.3 Servicing Analysis Results

5.2.3.1 Parks Provision Rate Analysis

The results of the Provision Rate Analysis for the Local catchment are summarised in Table 15. Detailed calculation sheets are contained in **Error! Reference source not found.**

Table 15 Parks Provision Rates Analysis Results for local catchment

	Existing	Future (No PDA)	Future (PDA)	Change
Yields				
Population	7,385	9,462	9,621	159
Jobs	11,690	16,756	32,259	15,503
Sport				
Demand Driver	Population	Population	Population	
Demand (ha)	8.862	11.354	11.545	0.191
Supply (ha)	0.000	0.000	0.000	0.000
Supply Balance (ha)	-8.862	-11.354	-11.545	-0.191
Provision Rate (ha/1000p)	0.000	0.000	0.000	0.000
% DSS Achieved (Population)	0%	0%	0%	0%
Provision Rate (ha/1000j)				
% DSS Achieved (Jobs)	N/A	N/A	N/A	
Supply Status	Under Supply	Under Supply	Under Supply	
Recreation (Urban) - Local				
Demand Driver	Population	Population	Population	
Demand (ha)	5.908	7.570	7.697	0.127
Supply (ha)	5.058	5.058	5.408	0.350
Supply Balance (ha)	-0.850	-2.512	-2.289	0.223

	Existing	Future (No PDA)	Future (PDA)	Change
Provision Rate (ha/1000p)	0.685	0.535	0.562	0.027
% DSS Achieved (Population)	86%	67%	70%	3%
Provision Rate (ha/1000j)				
% DSS Achieved (Jobs)	N/A	N/A	N/A	
Supply Status	Adequate	Under Supply	Under Supply	
Recreation (Urban) - District / Metropolitan				
Demand Driver	Population	Population	Population	
Demand (ha)	5.908	7.570	7.697	0.127
Supply (ha)	8.271	8.271	8.271	0.000
Supply Balance (ha)	2.363	0.701	0.574	-0.127
Provision Rate (ha/1000p)	1.120	0.874	0.860	-0.014
% DSS Achieved (Population)	140%	109%	107%	-2%
Provision Rate (ha/1000j)				
% DSS Achieved (Jobs)	N/A	N/A	N/A	
Supply Status	Over Supply	Adequate	Adequate	
Recreation (Urban) - Urban Common				
Demand Driver	Jobs	Jobs	Jobs	
Demand (ha)	0.070	0.101	0.194	0.093
Supply (ha)	0.428	0.428	0.618	0.190
Supply Balance (ha)	0.358	0.327	0.424	0.097
Provision Rate (ha/1000p)				
% DSS Achieved (Population)	N/A	N/A	N/A	
Provision Rate (ha/1000j)	0.037	0.026	0.019	-0.007
% DSS Achieved (Jobs)	611%	424%	319%	-105%
Supply Status	Over Supply	Over Supply	Over Supply	
Recreation (Natural) - Local				
Demand Driver	Population	Population	Population	
Demand (ha)	4.431	5.677	5.773	0.096
Supply (ha)	0.000	0.000	0.000	0.000
Supply Balance (ha)	-4.431	-5.677	-5.773	-0.096
Provision Rate (ha/1000p)	0.000	0.000	0.000	0.000
% DSS Achieved (Population)	0%	0%	0%	
Provision Rate (ha/1000j)				
% DSS Achieved (Jobs)	N/A	N/A	N/A	
Supply Status	Under Supply	Under Supply	Under Supply	
Recreation (Natural) - District / Metropolitan				
Demand Driver	Population	Population	Population	
Demand (ha)	5.908	7.570	7.697	0.127
Supply (ha)	0.000	0.000	0.000	0.000
Supply Balance (ha)	-5.908	-7.570	-7.697	-0.127

	Existing	Future (No PDA)	Future (PDA)	Change
Provision Rate (ha/1000p)	0.000	0.000	0.000	0.000
% DSS Achieved (Population)	0%	0%	0%	
Provision Rate (ha/1000j)				

5.2.3.2 Parks Accessibility Analysis

The results of the parks accessibility analysis for the Local catchment are shown in Table 16 and in Map 5 Existing and Future Parks Accessibility.

Table 16 Park Accessibility Analysis for local catchment

Trunk Type – Park Hierarchy	DSS (Max Distance to Park) (m)	DSS Achieved- without PDA	DSS Achieved- with PDA
Sport	3,000	Yes	Yes
Recreation (Urban) - Local	750	No	No
Recreation (Urban) - District / Metropolitan	3,000	Yes	Yes
Recreation (Urban) - Urban Common	750	Yes	Yes
Recreation (Natural) - Local	N/A	-	-
Recreation (Natural) - District / Metropolitan	N/A	-	-

5.2.3.3 Land for Community Facilities Supply / Demand Balance

Application of land provision standards and service population standards for the land for community facilities network is outlined in Table 17.

Table 17 Land for Community Facilities Supply & Demand Results for Local catchment

Land for network type	Existing			Without PDA (2036)			With PDA (2036)		
	Demand (ha)	Supply (ha)	Difference (ha)	Demand (ha)	Supply (ha)	Difference (ha)	Demand (ha)	Supply (ha)	Difference (ha)
Community service/ leisure- Local	0.37	0.03	-0.34	0.64	0.03	-0.61	0.66	0.08	-0.58
Community service/ leisure- District	0.15	0.61	+0.46	0.25	0.61	+0.36	0.25	0.79	+0.53
Community service/ leisure- Principal	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Arts and culture- District	0.05	Nil	-0.05	0.09	Nil	-0.09	0.09	0.12	+0.03
Arts and culture- Principal	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Sport and recreation- District	0.08	Nil	-0.08	0.14	Nil	-0.14	0.14	0.05	-0.09

Land for network type	Existing			Without PDA (2036)			With PDA (2036)		
	Demand (ha)	Supply (ha)	Difference (ha)	Demand (ha)	Supply (ha)	Difference (ha)	Demand (ha)	Supply (ha)	Difference (ha)
Sport and recreation-Principal	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

5.2.4 Key Findings

Key findings from the assessment of the Local catchment are as follows:

- Residential population is predicted to grow steadily to 9,462 by 2036
- There are more jobs in the catchment than residents. This trend is predicted to continue to 2036, at which point there would be an estimated 16,756 (without the PDA)
- Under the 'with PDA' scenario', the rate of jobs growth is substantially higher with a total of 32,259 jobs provided by 2036
- Existing supply of local recreation park totals 50,595m^2 with Fairfield Park (16,448m^2) and Turley Street Park (19,210m^2) providing a major contribution to total supply
- Dutton Park provides the total supply of district and metropolitan park (82,708m^2)
- The recently completed Carl Street urban commons provides 4,278m^2 of supply
- There is an absence of any form of park to the north of the PDA and there is an accessibility gap with regard to the provision of local recreation park (refer to Map 5 Existing and Future Parks Accessibility)
- There is no additional supply of parks or land for community facilities proposed in the LGIP or LTIP
- The existing rate of provision of local recreation park is 0.685ha/ 1,000p which meets 86% of DSS demand. Without the PDA, the 2036 rate of provision is 0.535ha/ 1,000p which meets 67% of DSS demand. With the PDA there would be a slight increase in the rate of provision to 0.562ha/ 1,000p which meets 70% of DSS demand
- The existing rate of provision of district/ metropolitan recreation park is 1.12ha/ 1,000p (140% of DSS). Without the PDA this would fall to 109% of the DSS and with the PDA to 107% of DSS demand
- The existing provision of urban common is 0.037ha/ 1,000j which is substantially higher than the DSS demand. The rate of supply would ultimately fall to 0.019ha/ 1,000j which remains higher than the DSS rate of demand.
- Existing supply of land for community facilities totals 6,400m^2 across three sites
- The existing rate of provision of land for community facilities is slightly lower (197m^2) than the indicative DSS
- Without the PDA, the rate of supply of land for community facilities would reduce to be 4,781m^2 lower than the indicative DSS
- With the PDA, the rate of supply of land for community facilities would be 1,342m^2 lower than the indicative DSS

5.3 District Catchment

5.3.1 Catchment Overview & Demand Yields

The district catchment provides a broader contextual understanding of the supply and demand of community infrastructure and any effect of development proposed within the CRR PDA. The catchment is defined as within 2km from the centre point of the lots in the PDA. This is based on the accessibility standard of district level community facilities as per the BCC City Plan 2014 (LGIP). As presented in Map 4 Parks & Land for Community Facilities in District Catchment, the district catchment encompasses a substantial proportion of the inner-city south area of Brisbane.

The catchment yields for the district catchment are shown in Figure 11.

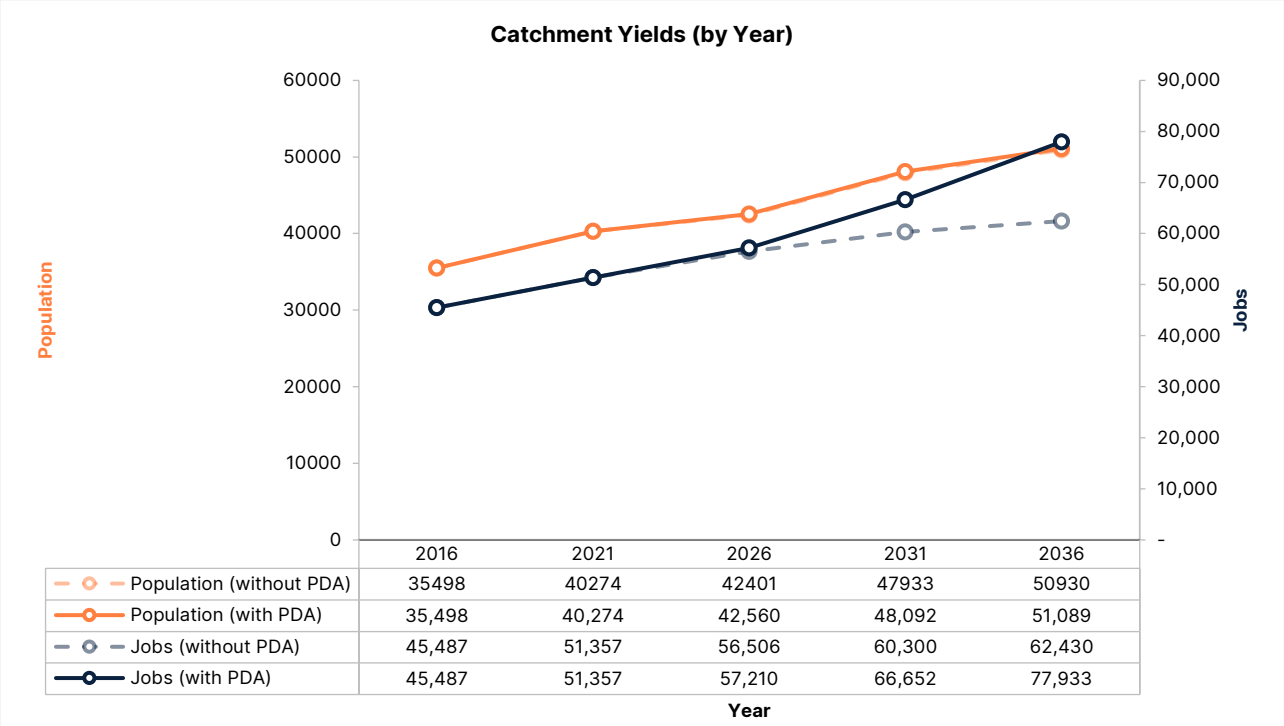


Figure 11 District Catchment Yields

5.3.2 Parks & Land for Community Facilities Supply

5.3.2.1 Existing

A list of existing parks within the catchment is shown in Attachment B Parks Data and Map 4 Parks & Land for Community Facilities in District Catchment.

A breakdown of parks provision according to park type is presented in Table 18.

Table 18 Existing Parks Supply in District Catchment

Type	Local recreation - urban	Local recreation - natural	District/ metropolitan recreation - urban	District/ metropolitan recreation - natural	Sport	Urban commons	Non-trunk/ Unclassified	Total
Total supply (ha)	12.56	Nil	50.43	17.48	27.79	0.671	14.16	123.1

Existing supply of parks across all BCC park types totals 123.11ha. District/ metropolitan recreation park (urban and natural) accounts for 55% of total park provision. This followed by sport park (23%), non-trunk/ unclassified park (12%) and local recreation park (10%).

Existing land for community facilities (additional to those in the local catchment) is shown in Table 19 and in Map 4 in Attachment A Maps.

Table 19 Existing Land for Community Facilities in District Catchment

LGIP_ID	Type	Description	Trunk/ non-Trunk	Area (ha)
EXIT-CF-165	Community service / group space	Norman Creek Catchment Committee Headquarters	Trunk	0.01
EXIT-CF-184	Community service / group space	Stones Corner Kindergarten and Pre-school	Trunk	0.19
EXIT-CF-207	Visual arts or display space	Art and craft space- Woodturners Society of Queensland	Trunk	0.13
EXIT-CF-209	Performing arts	Outdoor Riverstage	Trunk	0.85
EXIT-CF-365	General community space	Annerley Community Hall	Trunk	0.22
EXIT-CF-366	Library	Annerley Library	Trunk	0.1
EXIT-CF-367	Library	Fairfield Gardens Library	Trunk	0.05
EXIT-CF-374	Library	Stones Corner Library	Trunk	0.16
EXIT-CF-375	Community service / group space	Eastern Suburbs District Rugby League Club	Trunk	1.09
EXIT-CF-376	Aqua/Swimming	Langlands Park Swimming Pool	Trunk	0.55
EXIT-CF-378	Aqua/Swimming	UQ David Thiele Swimming Pool	Non-trunk	0.56
EXIT-CF-383	Aqua/Swimming	Sommerville House Swimming Pool	Non-trunk	0.6
EXIT-CF-X22	General community space	General community leisure service	Trunk	0.09
EXIT-CF-X104	Community service / group space	Community group space	Trunk	1.8
EXIT-CF-X184	General community space	General community space	Trunk	0.05
Total				**6.45**

The total supply of land for community facilities (inclusive of those facilities within the local catchment) is summarised in Table 20.

Table 20 Supply of Land for Community Facilities

Community Facility Type	Supply (ha)
Community service/ group space	3.70
General community space	0.39
Visual arts or display space	0.13
Performing Arts	0.85
Library	0.31
Aqua / Swimming	1.71
Total	**7.09**

5.3.2.2 Future (without PDA)

There is no additional supply of park or land for community facilities planned in the LGIP or LTIP in the district catchment. The only additional park provision which had been provided for in the LGIP was the Carl Street urban commons which has now been delivered and recognised as part of existing supply.

The Woolloongabba CRR PDA is within the district catchment. As presented in Table 21, the draft Woolloongabba CRR PDA Development Scheme outlines a range of public realm, park and community facility outcomes which for the purpose of this assessment are assumed to be delivered.

Table 21 Proposed community infrastructure

Item	Approximate area (m2)	Category	Indicative delivery date
Woolloongabba Station Plaza	1,200	Embellished (trunk) urban commons	2025
Central Plaza	3,000	Embellished (trunk) urban commons	2025
Stadium Forecourt	7,100	Embellished (trunk) urban commons	2025
Principal Library and Community Hub	2,000	Trunk community facility opportunity	2025
Potential Offset Park	TBC	Trunk local recreational park	2025
Central Park	5,000	Trunk local recreation park	2026-2031
Outdoor sport and recreation space	TBC	Non-trunk recreational facility	2026-2031
Embellished public realm between Stage 3 buildings		Embellished (non-trunk) public realm	2026-2031
Corridor Park	900	Embellished (non-trunk) corridor park	2032-2041

These developments would result in the following additional provision by 2025:

- 1.13 ha of trunk urban commons
- 0.33 ha of trunk local recreation park
- Central public library (2,000m^2 of floorspace) providing flexible community space assumed to be part of the land for community facilities network

By 2031 it would result in additional provision of the following:

- 0.50 ha of trunk urban local recreation park to create a quality, landscaped town centre for the Precinct
- Outdoor sports and recreational facilities of approximately 800m^2.

5.3.2.3 Future (with PDA)

As outlined under the neighbourhood catchment analysis.

The public realm, park and community facility outcomes provided through the draft Woolloongabba CRR PDA Development Scheme are assumed to be delivered as outlined above.

5.3.2.4 Supply Summary

Parks supply within the district catchment is summarised in Figure 12.

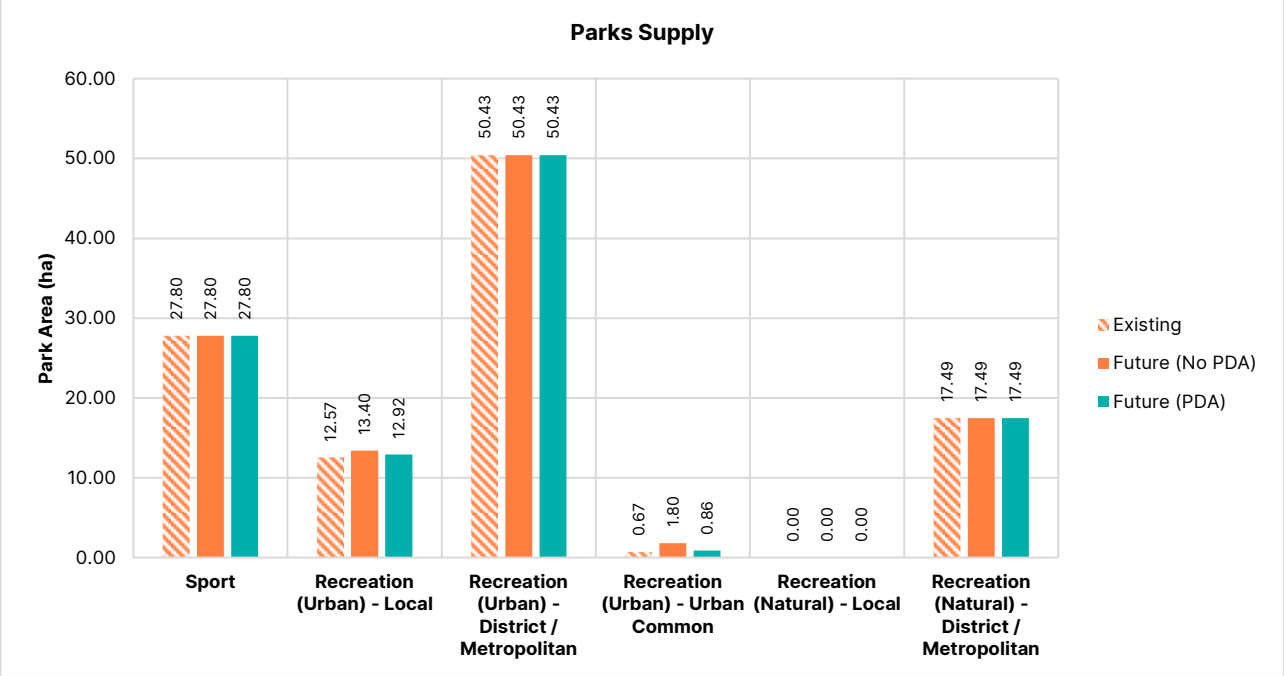


Figure 12 Parks Supply in District Catchment

5.3.3 Service Analysis

5.3.3.1 Parks Provision Rate Analysis

The results of the Parks Provision Rate Analysis for the District catchment are summarised in Table 22.

Table 22 Parks Provision Rate Analysis for District catchment

	Existing	Future (No PDA)	Future (PDA)	Change
Yields				
Population	35,498	50,930	51,089	159
Jobs	45,487	62,430	77,933	15,503
Sport				
Demand Driver	Population	Population	Population	
Demand (ha)	42.598	61.116	61.307	0.191
Supply (ha)	27.796	27.796	27.796	0.000
Supply Balance (ha)	-14.802	-33.320	-33.511	-0.191
Provision Rate (ha/1000p)	0.783	0.546	0.544	-0.002
% DSS Achieved (Population)	65%	45%	45%	0%
Provision Rate (ha/1000j)				
% DSS Achieved (Jobs)	N/A	N/A	N/A	
Supply Status	Under Supply	Under Supply	Under Supply	
Recreation (Urban) - Local				
Demand Driver	Population	Population	Population	
Demand (ha)	28.398	40.744	40.871	0.127
Supply (ha)	12.566	13.396	12.916	-0.480

	Existing	Future (No PDA)	Future (PDA)	Change
Supply Balance (ha)	-15.832	-27.348	-27.955	-0.607
Provision Rate (ha/1000p)	0.354	0.263	0.253	-0.010
% DSS Achieved (Population)	44%	33%	32%	-1%
Provision Rate (ha/1000j)				
% DSS Achieved (Jobs)	N/A	N/A	N/A	
Supply Status	Under Supply	Under Supply	Under Supply	
Recreation (Urban) - District / Metropolitan				
Demand Driver	Population	Population	Population	
Demand (ha)	28.398	40.744	40.871	0.127
Supply (ha)	50.433	50.433	50.433	0.000
Supply Balance (ha)	22.035	9.689	9.562	-0.127
Provision Rate (ha/1000p)	1.421	0.990	0.987	-0.003
% DSS Achieved (Population)	178%	124%	123%	-0.4%
Provision Rate (ha/1000j)				
% DSS Achieved (Jobs)	N/A	N/A	N/A	
Supply Status	Over Supply	Over Supply	Over Supply	
Recreation (Urban) - Urban Common				
Demand Driver	Jobs	Jobs	Jobs	
Demand (ha)	0.273	0.375	0.468	0.093
Supply (ha)	0.671	1.801	0.861	-0.940
Supply Balance (ha)	0.398	1.426	0.393	-1.033
Provision Rate (ha/1000p)				
% DSS Achieved (Population)	N/A	N/A	N/A	
Provision Rate (ha/1000j)	0.015	0.029	0.011	-0.018
% DSS Achieved (Jobs)	246%	480%	184%	-296%
Supply Status	Over Supply	Over Supply	Over Supply	
Recreation (Natural) - Local				
Demand Driver	Population	Population	Population	
Demand (ha)	21.299	30.558	30.653	0.095
Supply (ha)	0.000	0.000	0.000	0.000
Supply Balance (ha)	-21.299	-30.558	-30.653	-0.095
Provision Rate (ha/1000p)	0.000	0.000	0.000	0.000
% DSS Achieved (Population)	0%	0%	0%	
Provision Rate (ha/1000j)				
% DSS Achieved (Jobs)	N/A	N/A	N/A	
Supply Status	Under Supply	Under Supply	Under Supply	
Recreation (Natural) - District / Metropolitan				
Demand Driver	Population	Population	Population	
Demand (ha)	28.398	40.744	40.871	0.127
Supply (ha)	17.486	17.486	17.486	0.000

	Existing	Future (No PDA)	Future (PDA)	Change
Supply Balance (ha)	-10.912	-23.258	-23.385	-0.127
Provision Rate (ha/1000p)	0.493	0.343	0.342	-0.001
% DSS Achieved (Population)	62%	43%	43%	
Provision Rate (ha/1000j)				

5.3.3.2 Parks Accessibility Analysis

The results of the parks accessibility analysis for the Local catchment are shown in Table 23 and in Map 5 Existing and Future Parks Accessibility.

Table 23 Park Accessibility Analysis for local catchment

Trunk Type – Park Hierarchy	DSS (Max Distance to Park) (m)	DSS Achieved- without PDA	DSS Achieved- with PDA
Sport	3,000	Yes	Yes
Recreation (Urban) - Local	750	No	No
Recreation (Urban) - District / Metropolitan	3,000	Yes	Yes
Recreation (Urban) - Urban Common	750	Yes	Yes
Recreation (Natural) - Local	N/A	-	-
Recreation (Natural) - District / Metropolitan	N/A	-	-

5.3.3.3 Land for Community Facilities Supply / Demand Balance

Application of land provision standards and service population standards for the land for community facilities network is outlined in Table 24.

Table 24 Land for Community Facilities Supply & Demand Results for District catchment

Land for network type	Existing			Without PDA (2036)			With PDA (2036)		
	Demand (m2)	Supply (m2)	Difference (m2)	Demand (m2)	Supply (m2)	Difference (m2)	Demand (m2)	Supply (m2)	Difference (m2)
Community service/ leisure- Local	1.28	0.49	-0.79	1.83	0.49	-1.34	1.83	0.54	-1.29
Community service/ leisure- District	2.31	2.82	+0.51	4.75	2.82	-1.93	4.75	3.0	-1.75
Community service/ leisure- Principal	0.07	1.09	+1.02	0.14	1.09	+0.95	0.14	1.09	+0.95
Arts and culture- District	1.2	0.13	-1.07	2.59	0.13	-2.46	2.59	0.25	-2.34
Arts and culture- Principal	0.04	0.85	+0.81	0.09	0.85	+0.76	0.09	0.85	+0.76

Land for network type	Existing			Without PDA (2036)			With PDA (2036)		
	Demand (m2)	Supply (m2)	Difference (m2)	Demand (m2)	Supply (m2)	Difference (m2)	Demand (m2)	Supply (m2)	Difference (m2)
Sport and recreation- District	2.82	1.16	-1.66	4.05	1.16	-2.89	4.05	1.21	-2.84
Sport and recreation- Principal	0.02	0.55	0.53	0.40	0.55	+0.15	0.40	0.55	+0.15

Without the PDA, the greatest levels of undersupply are for the network types of arts and culture (district) and sport and recreation (district). Across all network types there is an undersupply of 6.76ha against the indicative DSS.

With the PDA, there is a slight oversupply of community service (principal), arts and culture (principal) and sport and recreation (principal). Across all network types the undersupply totals 6.36ha against the indicative DSS.

The accessibility standard for land for community facilities in the local catchment is 2km for residents. Under both the without and with PDA scenarios, these accessibility standards are met.

5.3.4 Key Findings

Key findings from the assessment of the district catchment are as follows:

- The rate of population growth is dictated by the availability of additional dwellings coming online. Relatively constrained population growth is predicted between 2021 and 2026, with population growth then accelerating between 2026 and 2031.
- Conversely, jobs growth without the CRR PDA is predicted to be relatively strong between 2026 and 2031, but then steadying to a total of 62,430 jobs by 2036.
- Under the with PDA scenario, the trend of slowing jobs growth from 2026 is reversed, with strong jobs growth stimulated resulting in a total of 77,300 jobs by 2036.
- Existing supply of parks across all BCC park types totals 123.11 ha. District/ metropolitan recreation park (urban and natural) accounts for 55% of total park provision. This is followed by sport park (23%), non-trunk/ unclassified park (12%) and local recreation park (10%).
- The total supply of land for community facilities is 7.09ha with community service/ group space contributing 52% of total land area followed by aqua/ swimming facilities (24%), performing arts (12%), general community space (6%), library facilities (4%) and visual arts space (2%).
- There is no additional supply of park or land for community facilities planned in the LGIP or LTIP.
- There are additional parks included in the Woolloongabba CRR PDA and these were included in the Future scenarios.
- Existing provision of local recreation park is 0.354ha/ 1,000p (44% of DSS). There is no provision of natural local recreation park in the catchment which further reduces the rate of provision. Without the PDA the rate of provision falls to 0.263ha/ 1,000p. With the PDA there is a slight increase in the rate of provision to 0.253ha/ 1,000p (32% of DSS).
- District and metropolitan (urban) park provision is 1.421ha/ 1,000p which is substantially higher than the DSS of 0.8ha/ 1,000p. With the PDA the rate of provision decreases to 0.987ha/ 1,000p which remains over the DSS rate of demand.
- The provision of urban common is 0.015ha/ 1,000j which represents 250% of the DSS demand. With the CRR PDA, this would fall to 0.011ha/ 1,000j which remains higher than the DSS demand.
- There is an area north of the CRR PDA which does not meet the accessibility standards for provision of local recreation park- refer to Map 05 'Accessibility Analysis. Accessibility standards for all park other types are met throughout the catchment.
- Without the CRR PDA, the greatest levels of undersupply are for the network types of arts and culture (district) and sport and recreation (district). Across all network types there is an undersupply of 6.76ha against the indicative DSS.
- With the CRR PDA, there is an oversupply of community service (principal), arts and culture (principal) and sport and recreation (principal). Across all network types the undersupply totals 6.36ha against the indicative DSS.

- The accessibility standard for land for community facilities in the local catchment is 2km for residents. Under both the without and with PDA scenarios, these accessibility standards are met.

6 Summary

6.1 Neighbourhood Catchment

The neighbourhood catchment is characterised by large scale medical and research facilities, as reflected by the lack of any permanent residents and large number of jobs. The residential population is not expected to grow significantly, with no residential development proposed as part of the Boggo Road CRR PDA other than the 82 dwellings and associated 159 residents approved as part of the Stockwell proposal.

Development of the CRR PDA will result in a substantial increase in the number of jobs supported within the neighbourhood catchment which would ultimately support 26,044 jobs in 2036.

The existing rate of supply of local recreation park is 0.029ha/ 1,000j (29% of DSS). Without the PDA, the rate reduces to 0.020ha/1,000j (20% of DSS. With the PDA, the rate of provision is 0.022ha/1,000j (22% of DSS).

There is no existing supply of urban common with in the catchment. In the PAH precinct (Precinct 3), there is a shortage of public realm and open space to support workers and users of the PAH. It is estimated that there are currently 7,341 jobs on in the of the PDA which will increase 26,044 jobs by 2036 based on the PDA Reference Scheme.

To meet the DSS for the current number of jobs there is a requirement for a minimum of 430m^2 of urban common space. To meet the DSS with the PDA, there is a minimum requirement of 1,560m^2 of urban common space. In order to cater for demand by health workers and users of hospital and health services in the eastern portion of the PDA, it is proposed that a minimum of 800m2 of accessible public plaza should be delivered through the PAH Masterplan.

Construction of the Boggo Road CRR TSD works has required the re-location of the existing Outlook Park. After analysing a range of options it is proposed that Outlook Park be permanently established, inclusive of play equipment and other embellishments, and of no less size, potentially within the Boggo Road Precinct, on either Lot 1 or lot 2 or on another suitable site within close proximity to the residential catchment north of the PDA.

Th existing Boggo Road Gaol Park presents an opportunity for the upgrade of embellishments to serve a trunk park function. It is well located, flat, readily accessible and already embellished to a reasonable standard. Whilst there is a heritage overlay across part of the site, there is an opportunity to advance upgrade and reclassification to provide an additional 3,503m^2 of trunk local recreation park.

There is further an opportunity to investigate development of small scale (non-trunk) open space as this also makes a significant contribution to achieving a high-quality public realm. This is particularly the case for major health institutions such as hospitals where patients, visitors and staff appreciate the opportunity to access green space and amenable public realm. There are small areas throughout the Boggo Road Precinct which may be integrated into the future PAH masterplan so as to provided valued additional open space.

The CRR PDA and associated Development Scheme provides an opportunity for collaboration between state government, local government, and community stakeholders to agree upon a preferred future use of the Boggo Road Gaol which balances heritage values with activation of the space for community purposes.

Based on the assessment of previously proposed plans for the facility, it could provide an overall addition of 4,000m^2 of community space for a variety of purposes including community meeting space, flexible indoor/ outdoor recreational space and an art and events venue for live music, theatre and entertainment. Such an outcome would bring the rate of provision of land for community facilities to above the indicative DSS.

6.2 Local Catchment

The local catchment area increasingly supports medium to high density housing and is predicted to continue to grow and change. The residential population is predicted to grow steadily to 9,462 by 2036, however the number of jobs is higher than residents which in 2036 would equate to 16,756 jobs. With the PDA the rate of jobs growth substantially increases to a total of 31,626 by 2036.

Existing supply of local recreation park totals 50,595m^2 with Fairfield Park (16,448m2) and Turley Street Park (19,210m^2) providing a major contribution to total supply. Dutton Park provides the total supply of district and metropolitan park (82,708m^2). The recently completed Carl Street urban commons provides 4,278m^2 of supply to the local catchment.

There is an absence of any form of park to the north of the CRR PDA and there is an accessibility gap with regard to the provision of local recreation park.

There is no additional supply of parks or land for community facilities proposed in the LGIP or LTIP.

The existing rate of provision of local recreation park is 0.685 ha/1,000p (85% of DSS). Without the CRR PDA, the 2036 rate of provision is 0.535 ha/1,000p (67% of DSS). With the CRR PDA there would be a slight increase in the rate of provision to 0.562 ha/1,000p (70% of DSS).

The existing rate of provision of district/ metropolitan recreation park is 1.12 ha/1,000p (140% of DSS). Without the CRR PDA this would falls to 0.874 ha/1000p (109% of DSS) and with the CRR PDA it falls to 0.860 ha/1000p (108% of DSS).

The existing provision of urban common is 0.037 ha/ 1,000j (611% of DSS). With the PDA, the rate of supply would ultimately fall to 0.019 ha/ 1,000j (319% of DSS).

Existing supply of land for community facilities totals 6,400m^2 across three sites. This rate of provision is slightly lower (197m^2) than the indicative DSS. Without the CRR PDA, the rate of supply of land for community facilities would reduce to be 4,781m^2 lower than the indicative DSS. With the CRR PDA, the rate of supply of land for community facilities would be 1,074m^2 lower than the indicative DSS. Within the local catchment there is a broad array of regional scale community infrastructure including hospitals, educational and research institutions. The strategic planning intent of Council and the Queensland Government is to leverage off such infrastructure provision to create a vibrant and dynamic 'Knowledge Corridor'. The Boggo Road CRR PDA complements this planning intent and provides a major catalyst for its realisation.

6.3 District Catchment

The district catchment includes a large part of the inner city south of Brisbane and contains a broad array of regional scale community infrastructure. The rate of population growth is dictated by the availability of additional dwellings and relatively constrained population growth is predicted between 2021 and 2026, before accelerating between 2026 and 2031.

Without the CRR PDA predicted jobs growth is constrained. However, with CRR PDA the trend of slowing jobs growth is reversed, with strong jobs growth resulting in a total of 77,933 jobs by 2036.

Existing supply of parks across all BCC park types totals 123.11 ha. District/ metropolitan recreation park (urban and natural) accounts for 55% of total park provision. This is followed by sport park (23%), non-trunk/ unclassified park (12%) and local recreation park (10%).

There is no additional supply of park or land for community facilities planned in the LGIP or LTIP.

There are additional parks included in the Woolloongabba CRR PDA and these were included in the Future scenarios.

Existing provision of local recreation park is 0.354ha/ 1,000p which equates to 44% of DSS demand. There is no provision of natural local recreation park in the catchment which further reduces the rate of provision. Without the CRR PDA the rate of provision falls to 0.247ha/ 1,000p. With the PDA there is a slight increase in the rate of provision to 0.254ha/ 1,000p which represents 32% of DSS demand.

There is an area north of the CRR PDA which does not meet the accessibility standards for provision of local recreation park. Accessibility standards for all park other types are met throughout the catchment.

District and metropolitan (urban) park provision is 1.421ha/ 1,000p which is substantially higher than the DSS of 0.8ha/ 1,000p. With the CRR PDA the rate of provision decreases to 0.987ha/ 1,000p which remains 123% over the DSS rate of demand.

The total supply of land for community facilities is 7.09ha with community service/ group space contributing 52% of total land area followed by aqua/ swimming facilities (24%), performing arts (12%), general community space (6%), library facilities (4%) and visual arts space (2%). The greatest levels of undersupply are for the network types of arts and culture (district) and sport and recreation (district). Across all network types there is an undersupply of 6.76ha against the indicative DSS.

Overall the development proposed by the Boggo Road CRR PDA has minimal effect on the rates of provision of parks and community infrastructure. The opportunity for the Boggo Road Station Precinct is to ensure high levels of accessibility and connectivity between the precinct and the community infrastructure provided in the broader district catchment.

7 Recommended CRR PDA Outcomes

The development proposed by the Boggo Road CRR PDA would not have a substantial effect on the rates of provision of parks and land for community facilities. However, in order to realise the vision of the Boggo Road CRR PDA to create a vibrant, stimulating and amenable environment which supports the creation of Brisbane's 'Knowledge Corridor' it is recommended that the following investments in parks and community facilities be advanced within the CRR PDA:

- CRR TSD (Stage 1) to involve delivery of the Boggo Road CRR Station Plaza (BGO-PL-01) will provide 1,100m2 of embellished (trunk) urban commons/ public realm space. Stage 1 to also involve the provision of approximately 4,500m2 of (non-trunk) landscape amenity park (BGO-PP-01) adjacent to the eastern entry to the Central Bridge along with streetscape improvements on Peter Doherty Street, Joe Baker Street and Boggo Road
- Maintain the supply of local recreation park through the permanent establishment of Outlook Park (BGO-PP-02) inclusive of play equipment and other embellishments, and of no less size, within the Boggo Road Precinct, on either Lot 1 or lot 2, or on another suitable site within close proximity to the residential catchment north of the PDA.
- Upgrade of Boggo Road Gaol Park with an appropriate standard of embellishments (BGO-PP-03) so that it provides a trunk infrastructure standard of local recreation park. As an existing facility in a flat, and readily accessible location, Boggo Road Gaol Park presents an excellent opportunity to increase the supply of inner-city local recreation park. Whilst there is a heritage overlay across part of the site, there is an opportunity to advance upgrade and reclassification to provide an additional 3,503m2 of trunk local recreation park.
- To cater for demand by health workers and users of hospital and health services in the PAH precinct of the PDA, it is proposed that a minimum of 800m2 of accessible public plaza (BGO-PL-02) be delivered through the PAH Masterplan
- Work with BCC and the PAH to further investigate enhancement of public realm space and informal open space throughout the eastern portion of the CRR PDA (BGO-PR-01)
- BCC to investigate opportunities for local recreation park provision in the catchment to the north of the PDA
- Upgrade of pedestrian and cycle linkages throughout the CRR PDA to enable access to community facilities and services provided in the local and district catchments
- The CRR PDA and associated Development Scheme provides an opportunity for collaboration between state government along with local government and community stakeholders to agree upon a preferred future use of the Boggo Road Gaol which balances heritage values with activation of the space for community purposes.
- Based on the assessment of previously proposed plans for the facility, it could provide an overall addition of 4,000m2 of community space for a variety of purposes including community meeting space, flexible indoor/ outdoor recreational space and an art and events venue for live music, theatre and entertainment.

Attachment A Maps

Map 1 Existing and Developed Scenario

Boggo Road Cross River Rail Priority Development Area
Baseline Potential Development Scenario
Staging Plan - Reference Scheme

Legend

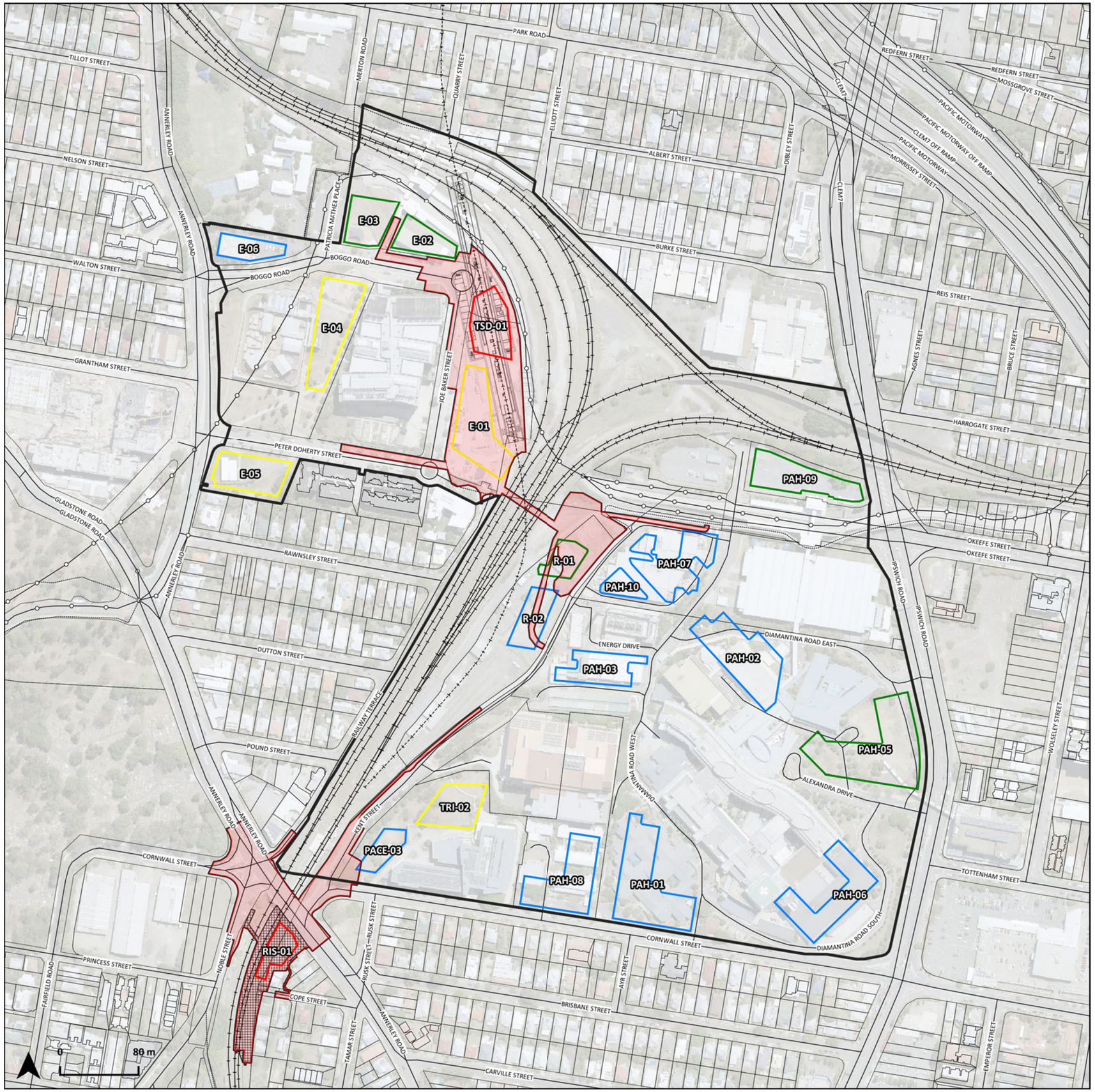
- Boggo Road CRR PDA Boundary
- CRR TSD and CRR RIS Delivery Area

PDA - Development Sites (by Stage & Year) (Indicative Only)
- Stage 1 (TSD & RIS) (2020 - 2025)
- Stage 2 (2025 - 2026)
- Stage 3 (2027 - 2031)
- Stage 4 (2032 - 2041)

Transport - Road, Transit
- Road
- Busways
- Tracks, Paths & Malls

Transport - Rail
- Operational
- Under Construction
- CRR TSD Boggo Road Station
- CRR RIS Dutton Park Station

Property - DCDB
- Base Parcels



NOTE:
Future PDA potential development opportunity sites and staging are conceptual and indicative only for infrastructure network analysis purposes.

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Data Sources
QLD Government 2021, Brisbane City Council 2021, Urban Utilities 2020

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Map 2 Parks & Land for Community Facilities in Neighbourhood Catchment

Boggo Road CRR PDA
Community Infrastructure
Map 02 | Neighbourhood Catchment

Legend

Community Infrastructure | Analysis Catchments

- Neighbourhood (PDA)
- Local (750m Service Area)
- District (2000m Service Area)
- Community Infrastructure | BCC Community Facilities

Community Infrastructure | Parks

- Recreation (Urban) - Local
- Recreation (Urban) - District / Metropolitan
- Non-Trunk / Unclassified
- Base | Locality Boundary
- Base | Existing Road
- Base | Base Lot Boundary

CROSSRIVERRAIL

Map 3 Parks & Land for Community Facilities in Local Catchment

Boggo Road CRR PDA
Community Infrastructure
Map 03 | Local Catchment

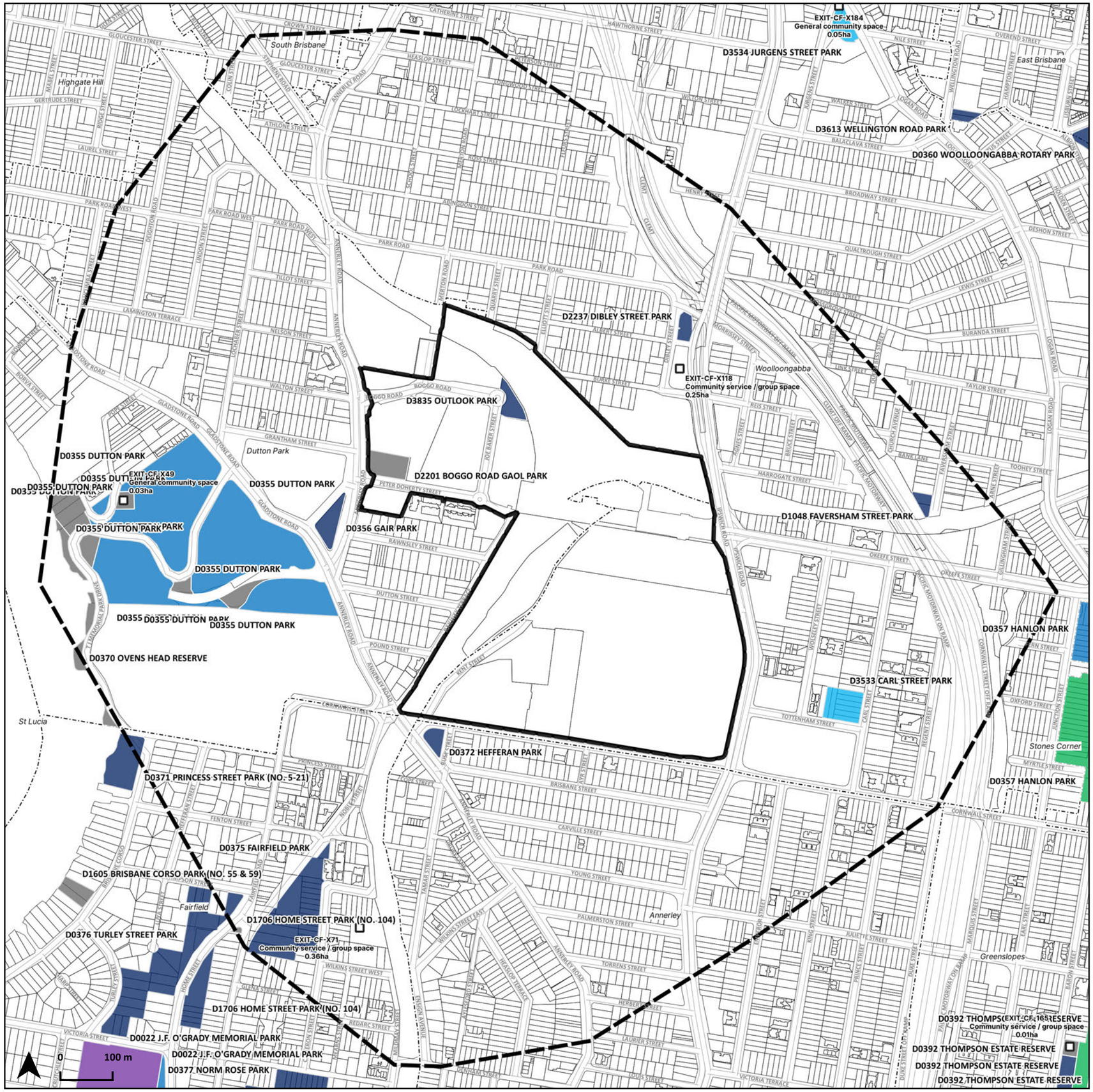
Legend

Community Infrastructure | Analysis Catchments

- Neighbourhood (PDA)
- Local (750m Service Area)
- District (2000m Service Area)
- Community Infrastructure | BCC Community Facilities

Community Infrastructure | Parks

- Sport
- Recreation (Urban) - Local
- Recreation (Urban) - District / Metropolitan
- Recreation (Urban) - Urban Common
- Recreation (Natural) - District / Metropolitan
- Non-Trunk / Unclassified
- Base | Locality Boundary
- Base | Existing Road
- Base | Base Lot Boundary



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Map 4 Parks & Land for Community Facilities in District Catchment

Boggo Road CRR PDA
Community Infrastructure
Map 04 | District Catchment

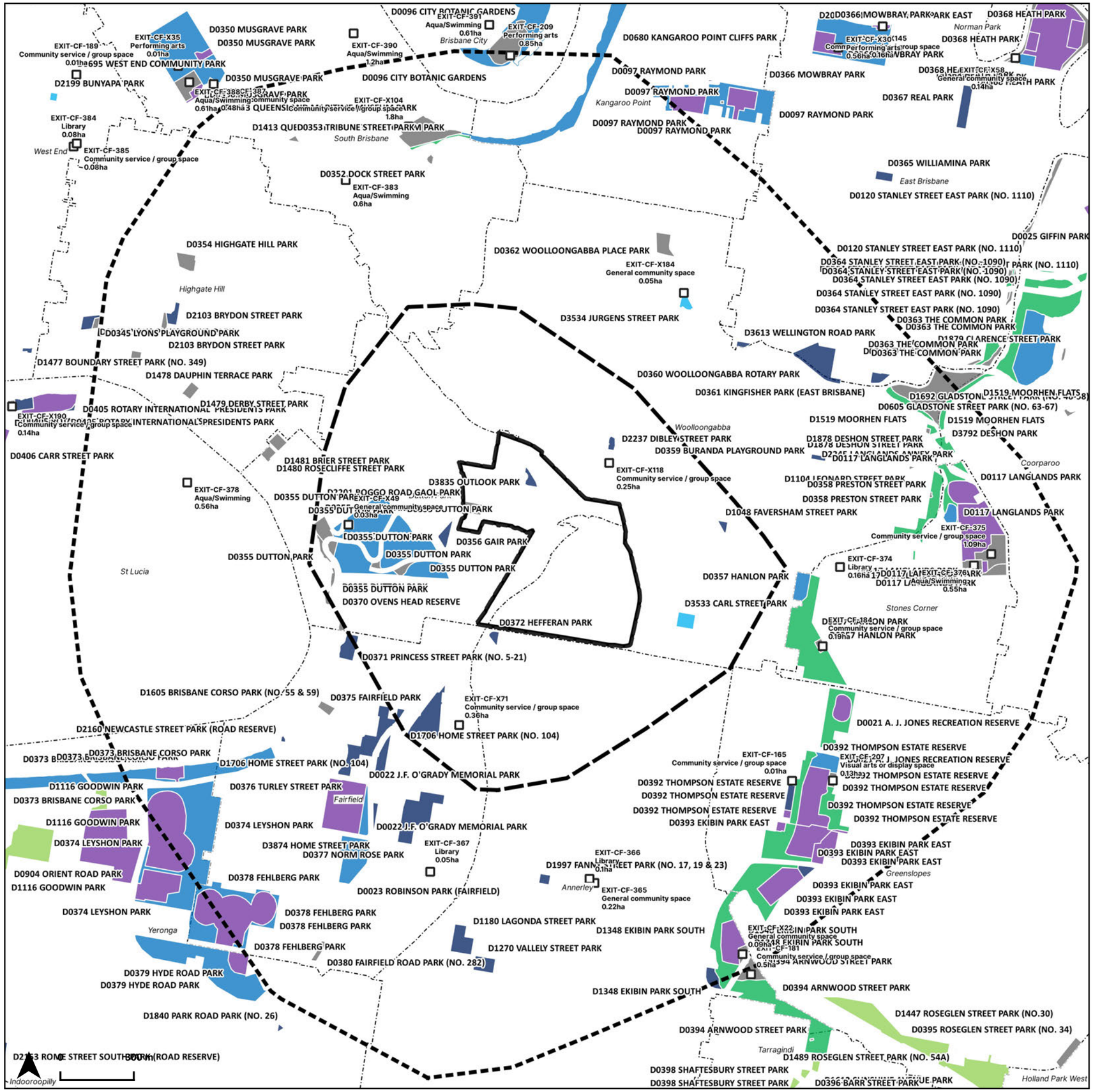
Legend

Community Infrastructure | Analysis Catchments

- Neighbourhood (PDA)
- Local (750m Service Area)
- District (2000m Service Area)
- Community Infrastructure | BCC Community Facilities

Community Infrastructure | Parks

- Sport
- Recreation (Urban) - Local
- Recreation (Urban) - District / Metropolitan
- Recreation (Urban) - Urban Common
- Recreation (Natural) - District / Metropolitan
- Recreation (Natural) - Local
- Non-Trunk / Unclassified
- Base | Locality Boundary



CROSSRIVERRAIL

Map 5 Existing and Future Parks Accessibility

Boggo Road CRR PDA
Community Infrastructure
Map 05 | Accessibility Analysis

Legend

Community Infrastructure | Analysis Catchments

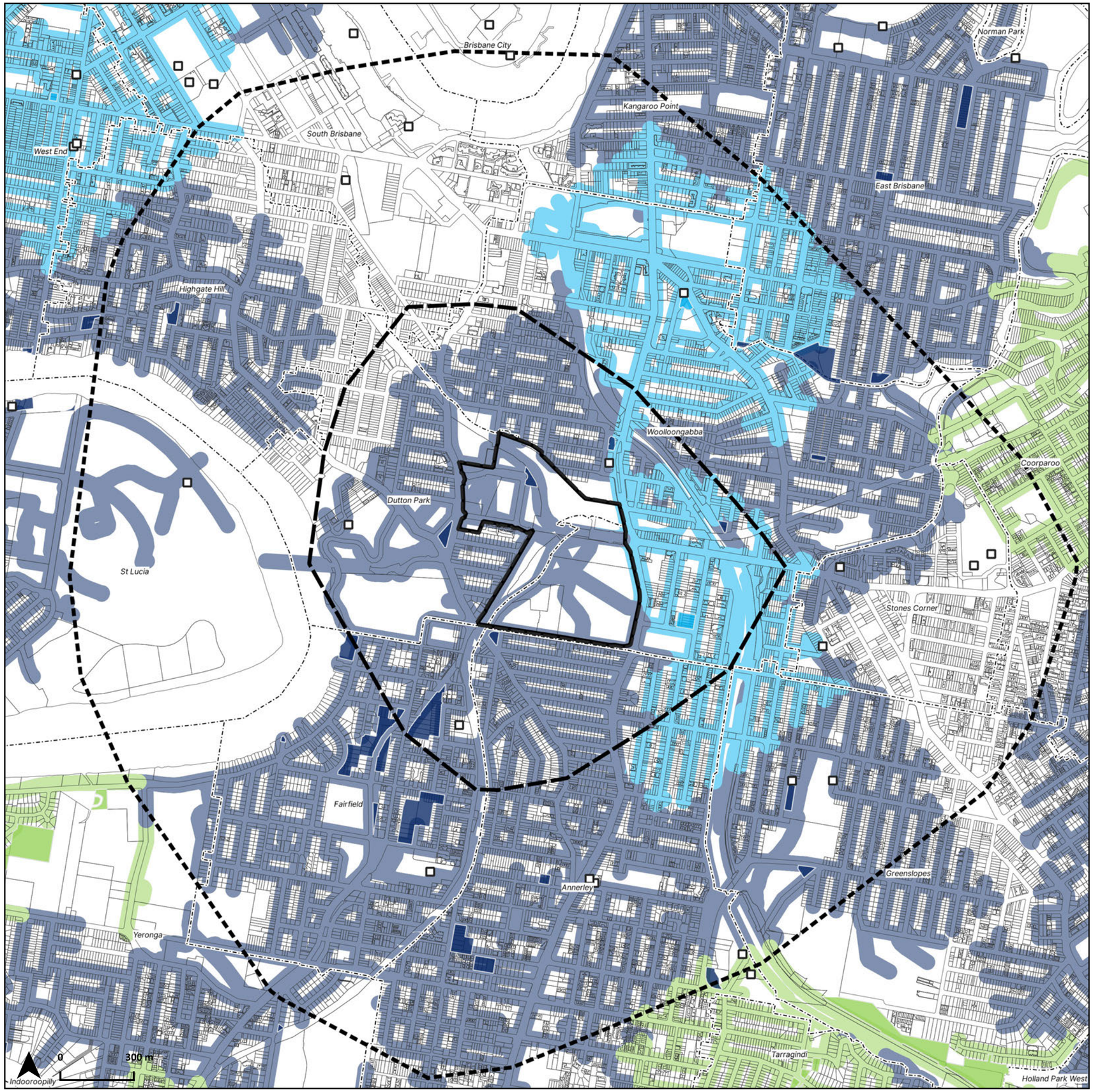
- Neighbourhood (PDA)
- Local (750m Service Area)
- District (2000m Service Area)
- Community Infrastructure | BCC Community Facilities

Community Infrastructure | Parks

- Recreation (Urban) - Local
- Recreation (Urban) - Urban Common
- Recreation (Natural) - Local
- Base | Locality Boundary
- Base | Base Lot Boundary

Community Infrastructure | 750m Service Areas for Local Parks

- Recreation (Natural) - Local
- Recreation (Urban) - Local
- Recreation (Urban) - Urban Common



CROSSRIVERRAIL

Map 6 Proposed Future Parks & Land for Community Facilities

Boggo Road Cross River Rail Priority Development Area
Future Infrastructure Network Plan
Parks & Community Infrastructure

Legend

- Boggo Road CRR PDA Boundary
- CRR TSD and CRR RIS Delivery Area

Infrastructure - Project Location

- Parks & Community Infrastructure
- Temporary Outlook Park

PDA - Development Sites (by Stage & Year) (Indicative Only)

- Stage 1 (TSD & RIS) (2020 - 2025)
- Stage 2 (2025 - 2026)
- Stage 3 (2027 - 2031)
- Stage 4 (2032 - 2041)

Infrastructure - Parks - Existing Parks (by Trunk Type)

- Recreation (urban) - District / Metropolitan
- Existing Park - embelishment enhancements
- Recreation (urban) - Local

Transport - Road, Transit

- Road
- Busways
- Tracks, Paths & Malls

Transport - Rail

- Operational
- Under Construction
- CRR TSD Boggo Road Station
- CRR RIS Dutton Park Station

Property - DCDB

- Base Lot
- Easements etc

Key	Project No	Description
1	BGO-PP-01	Potential New Urban Commons within PAH (Location Indicative)
2	BGO-CF-01	Potential repurposing of Boggo Road Gaol for community uses
3	BGO-PL-01	Boggo Road CRR Station Plaza (by CRR TSD)
4a	BGO-PP-02 (A)	Potential Outlook Park Opportunity Area (approx. 2100m² (26.6% land area) of 7876m² will be required for delivery) OR
4b	BGO-PP-02 (B)	Potential Outlook Park Opportunity Area (approx. 2100m² (18.3% land area) of 11460m² will be required for delivery)
5	BGO-PP-03	Existing Boggo Road Gaol Park, only future embellishments proposed
6	BGO-PP-04	Landscape Amenity Area (Non-Trunk) (by CRR TSD)

BGO-PP-02 (A) and BGO-PP-02 (B) represent indicative locations for one (1) replacement park to be provided. Section 2.6.1 Connectivity, access and public realm provision 10 of the draft proposed Boggo Road Development Scheme requires the first stage of development within the Outlook Park opportunity area to provide a new permanent Outlook Park.

DRAFT - Not government policy

NOTE:
Future PDA potential development opportunity sites and staging are conceptual and indicative only for infrastructure network analysis purposes.

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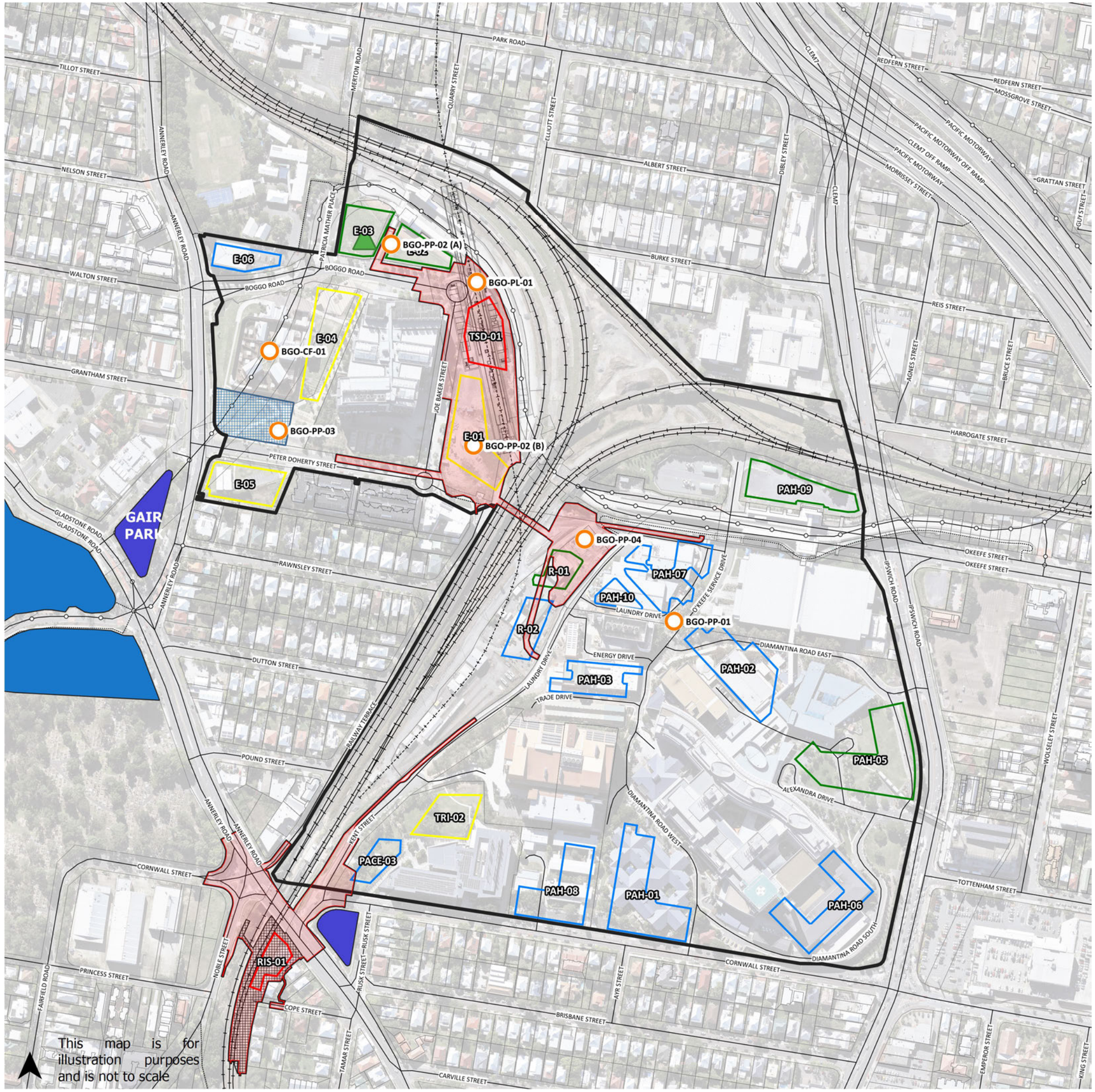


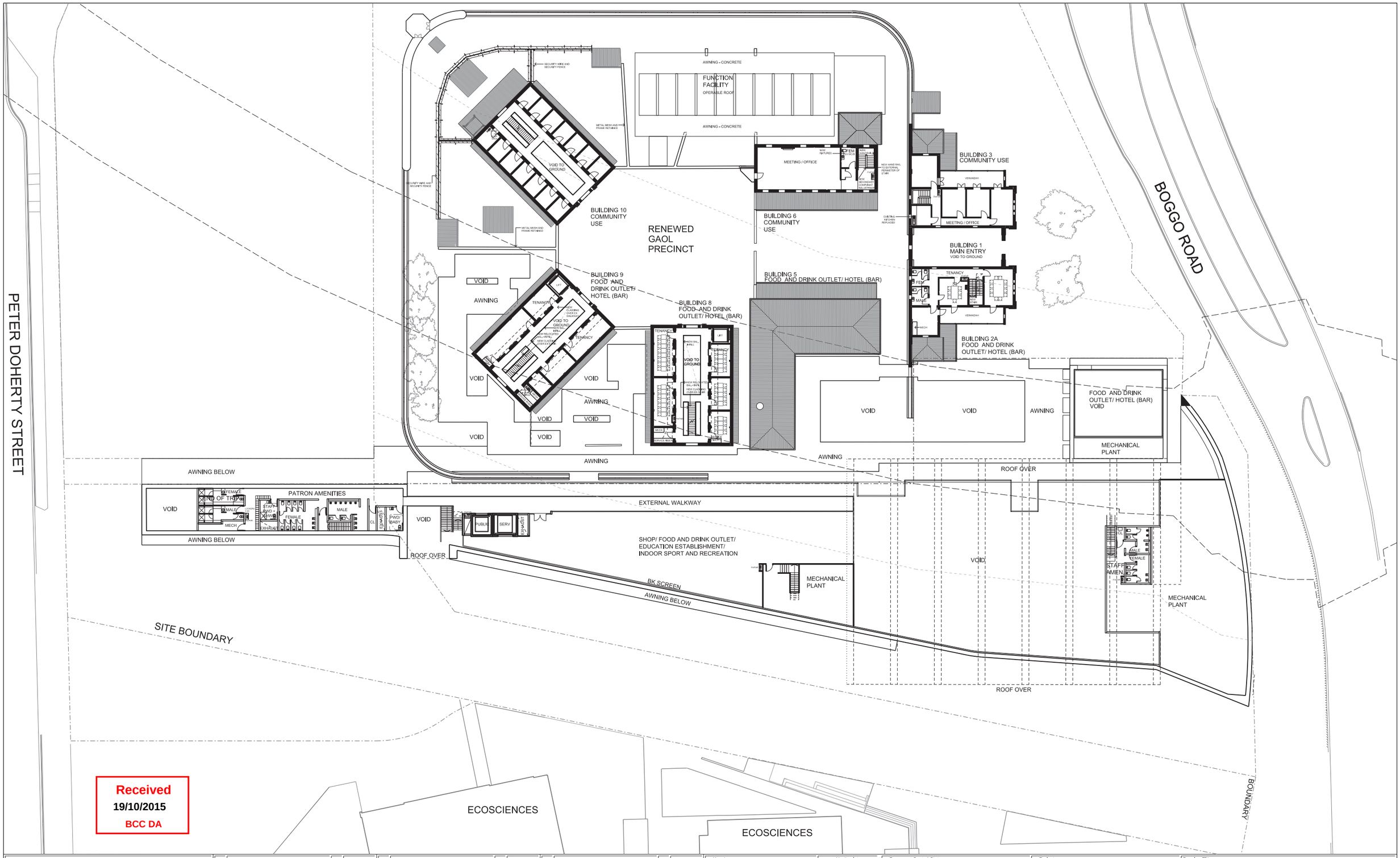
Attachment B Parks Data

PARK_NUMBER	Name	Area (m2)	Area (ha)	Catchments	BCC Demand Group
D2201	BOGGO ROAD GAOL PARK	3503.009521	0.35	District, Local, Neighbourhood	Non-Trunk / Unclassified
D3835	OUTLOOK PARK	2127.261719	0.213	District, Local, Neighbourhood	Recreation (Urban) - Local
D1706	HOME STREET PARK (NO. 104)	180.451416	0.018	District, Local	Non-Trunk / Unclassified
D0370	OVENS HEAD RESERVE	2721.585449	0.272	District, Local	Non-Trunk / Unclassified
D0355	DUTTON PARK	1558.273926	0.156	District, Local	Non-Trunk / Unclassified
D0355	DUTTON PARK	928.0361328	0.093	District, Local	Non-Trunk / Unclassified
D0355	DUTTON PARK	2037.725098	0.204	District, Local	Non-Trunk / Unclassified
D0355	DUTTON PARK	1072.465576	0.107	District, Local	Non-Trunk / Unclassified
D0355	DUTTON PARK	1622.046631	0.162	District, Local	Non-Trunk / Unclassified
D0355	DUTTON PARK	4594.603516	0.459	District, Local	Non-Trunk / Unclassified
D0355	DUTTON PARK	10297.28955	1.03	District, Local	Recreation (Urban) - District / Metropolitan
D0355	DUTTON PARK	28911.70581	2.891	District, Local	Recreation (Urban) - District / Metropolitan
D0355	DUTTON PARK	756.3256836	0.076	District, Local	Recreation (Urban) - District / Metropolitan
D0355	DUTTON PARK	15599.61108	1.56	District, Local	Recreation (Urban) - District / Metropolitan
D0355	DUTTON PARK	27144.06665	2.714	District, Local	Recreation (Urban) - District / Metropolitan
D2237	DIBLEY STREET PARK	1382.559326	0.138	District, Local	Recreation (Urban) - Local
D0376	TURLEY STREET PARK	19210.18726	1.921	District, Local	Recreation (Urban) - Local
D0356	GAIR PARK	2914.126465	0.291	District, Local	Recreation (Urban) - Local
D1048	FAVERSHAM STREET PARK	1099.495605	0.11	District, Local	Recreation (Urban) - Local
D0371	PRINCESS STREET PARK (NO. 5-21)	5904.925537	0.59	District, Local	Recreation (Urban) - Local
D0375	FAIRFIELD PARK	16448.74756	1.645	District, Local	Recreation (Urban) - Local
D0372	HEFFERAN PARK	1502.679688	0.15	District, Local	Recreation (Urban) - Local
D3533	CARL STREET PARK	4278.874023	0.428	District, Local	Recreation (Urban) - Urban Common
D0353	TRIBUNE STREET PARK	603.7341309	0.06	District	Non-Trunk / Unclassified
D0352	DOCK STREET PARK	732.4929199	0.073	District	Non-Trunk / Unclassified
D0362	WOOLLOONGABBA PLACE PARK	5048.768311	0.505	District	Non-Trunk / Unclassified
D1878	DESHON STREET PARK	362.034668	0.036	District	Non-Trunk / Unclassified
D1479	DERBY STREET PARK	2485.357178	0.249	District	Non-Trunk / Unclassified
D1478	DAUPHIN TERRACE PARK	2448.477783	0.245	District	Non-Trunk / Unclassified
D1519	MOORHEN FLATS	31419.48828	3.142	District	Non-Trunk / Unclassified
D1480	ROSECLIFFE STREET PARK	2069.020996	0.207	District	Non-Trunk / Unclassified
D1481	BRIER STREET PARK	2808.523193	0.281	District	Non-Trunk / Unclassified
D0117	LANGLANDS PARK	5324.792969	0.532	District	Non-Trunk / Unclassified
D0096	CITY BOTANIC GARDENS	16610.84058	1.661	District	Non-Trunk / Unclassified
D2103	BRYDON STREET PARK	1812.976807	0.181	District	Non-Trunk / Unclassified
D0117	LANGLANDS PARK	10889.77734	1.089	District	Non-Trunk / Unclassified
D0357	HANLON PARK	1582.724609	0.158	District	Non-Trunk / Unclassified
D0394	ARNWOOD STREET PARK	5720.725342	0.572	District	Non-Trunk / Unclassified
D0354	HIGHGATE HILL PARK	4566.596191	0.457	District	Non-Trunk / Unclassified
D0117	LANGLANDS PARK	3378.59375	0.338	District	Non-Trunk / Unclassified
D0392	THOMPSON ESTATE RESERVE	857.5219727	0.086	District	Non-Trunk / Unclassified
D0392	THOMPSON ESTATE RESERVE	1738.014404	0.174	District	Non-Trunk / Unclassified
D1348	EKIBIN PARK SOUTH	1869.953369	0.187	District	Non-Trunk / Unclassified
D0358	PRESTON STREET PARK	218.7138672	0.022	District	Non-Trunk / Unclassified
D1413	QUEENSLAND MARITIME MUSEUM PARK	16727.75977	1.673	District	Non-Trunk / Unclassified
D1104	LEONARD STREET PARK	215.2365723	0.022	District	Non-Trunk / Unclassified
D1605	BRISBANE CORSO PARK (NO. 55 & 59)	2127.556152	0.213	District	Non-Trunk / Unclassified
D0380	FAIRFIELD ROAD PARK (NO. 282)	1731.277344	0.173	District	Non-Trunk / Unclassified
D2244	GLADYS STREET PARK	381.4504395	0.038	District	Recreation (Natural) - District / Metropolitan
D3792	DESHON PARK	3247.128906	0.325	District	Recreation (Natural) - District / Metropolitan
D0392	THOMPSON ESTATE RESERVE	9326.640625	0.933	District	Recreation (Natural) - District / Metropolitan
D1413	QUEENSLAND MARITIME MUSEUM PARK	2233.052246	0.223	District	Recreation (Natural) - District / Metropolitan
D0117	LANGLANDS PARK	6141.456055	0.614	District	Recreation (Natural) - District / Metropolitan
D0393	EKIBIN PARK EAST	21198.19019	2.12	District	Recreation (Natural) - District / Metropolitan
D0358	PRESTON STREET PARK	13176.9248	1.318	District	Recreation (Natural) - District / Metropolitan
D1878	DESHON STREET PARK	1093.360352	0.109	District	Recreation (Natural) - District / Metropolitan
D2245	LANGLANDS ANNEX PARK	1329.305908	0.133	District	Recreation (Natural) - District / Metropolitan
D1519	MOORHEN FLATS	4701.703369	0.47	District	Recreation (Natural) - District / Metropolitan
D1519	MOORHEN FLATS	6092.59082	0.609	District	Recreation (Natural) - District / Metropolitan
D0393	EKIBIN PARK EAST	15827.93384	1.583	District	Recreation (Natural) - District / Metropolitan
D0392	THOMPSON ESTATE RESERVE	11054.05176	1.105	District	Recreation (Natural) - District / Metropolitan
D1348	EKIBIN PARK SOUTH	17727.68701	1.773	District	Recreation (Natural) - District / Metropolitan
D0357	HANLON PARK	44269.97266	4.427	District	Recreation (Natural) - District / Metropolitan
D0021	A. J. JONES RECREATION RESERVE	17055.05298	1.706	District	Recreation (Natural) - District / Metropolitan
D0022	J.F. O'GRADY MEMORIAL PARK	4778.789063	0.478	District	Recreation (Urban) - District / Metropolitan
D0680	KANGAROO POINT CLIFFS PARK	63289.48828	6.329	District	Recreation (Urban) - District / Metropolitan
D0392	THOMPSON ESTATE RESERVE	6830.77124	0.683	District	Recreation (Urban) - District / Metropolitan
D0378	FEHLBERG PARK	2962.247314	0.296	District	Recreation (Urban) - District / Metropolitan
D0378	FEHLBERG PARK	1798.625488	0.18	District	Recreation (Urban) - District / Metropolitan
D0378	FEHLBERG PARK	17808.08301	1.781	District	Recreation (Urban) - District / Metropolitan
D0374	LEYSHON PARK	64361.70557	6.436	District	Recreation (Urban) - District / Metropolitan
D0097	RAYMOND PARK	31691.70264	3.169	District	Recreation (Urban) - District / Metropolitan
D0096	CITY BOTANIC GARDENS	166936.335	16.694	District	Recreation (Urban) - District / Metropolitan
D0357	HANLON PARK	6166.737061	0.617	District	Recreation (Urban) - District / Metropolitan
D0373	BRISBANE CORSO PARK	13712.64502	1.371	District	Recreation (Urban) - District / Metropolitan
D0373	BRISBANE CORSO PARK	19834.47412	1.983	District	Recreation (Urban) - District / Metropolitan
D0117	LANGLANDS PARK	3381.54541	0.338	District	Recreation (Urban) - District / Metropolitan
D0023	ROBINSON PARK (FAIRFIELD)	18066.41187	1.807	District	Recreation (Urban) - District / Metropolitan
D3874	HOME STREET PARK	1476.672852	0.148	District	Recreation (Urban) - Local
D1706	HOME STREET PARK (NO. 104)	4778.544922	0.478	District	Recreation (Urban) - Local
D2103	BRYDON STREET PARK	2952.64209	0.295	District	Recreation (Urban) - Local
D1270	VALLELY STREET PARK	4980.33374	0.498	District	Recreation (Urban) - Local
D1180	LAGONDA STREET PARK	8153.648926	0.815	District	Recreation (Urban) - Local
D0393	EKIBIN PARK EAST	1965.876221	0.197	District	Recreation (Urban) - Local

PARK_NUMBER	Name	Area (m2)	Area (ha)	Catchments	BCC Demand Group
D0392	THOMPSON ESTATE RESERVE	3069.027832	0.307	District	Recreation (Urban) - Local
D1997	FANNY STREET PARK (NO. 17, 19 & 23)	1673.432129	0.167	District	Recreation (Urban) - Local
D0359	BURANDA PLAYGROUND PARK	1206.286621	0.121	District	Recreation (Urban) - Local
D0377	NORM ROSE PARK	20638.01831	2.064	District	Recreation (Urban) - Local
D3613	WELLINGTON ROAD PARK	1023.986572	0.102	District	Recreation (Urban) - Local
D0360	WOOLLOONGABBA ROTARY PARK	16448.50537	1.645	District	Recreation (Urban) - Local
D0361	KINGFISHER PARK (EAST BRISBANE)	2548.558594	0.255	District	Recreation (Urban) - Local
D2160	NEWCASTLE STREET PARK (ROAD RESERVE)	369.5026855	0.037	District	Recreation (Urban) - Local
D1348	EKIBIN PARK SOUTH	3787.886963	0.379	District	Recreation (Urban) - Local
D3534	JURGENS STREET PARK	2430.181641	0.243	District	Recreation (Urban) - Urban Common
D0022	J.F. O'GRADY MEMORIAL PARK	31954.41064	3.195	District	Sport
D0373	BRISBANE CORSO PARK	5736.611572	0.574	District	Sport
D0117	LANGLANDS PARK	9880.201904	0.988	District	Sport
D0374	LEYSHON PARK	50940.01343	5.094	District	Sport
D0378	FEHLBERG PARK	48958.79688	4.896	District	Sport
D0021	A. J. JONES RECREATION RESERVE	6660.711182	0.666	District	Sport
D0392	THOMPSON ESTATE RESERVE	957.8986816	0.096	District	Sport
D0392	THOMPSON ESTATE RESERVE	23307.63354	2.331	District	Sport
D0393	EKIBIN PARK EAST	15092.85913	1.509	District	Sport
D0393	EKIBIN PARK EAST	1337.789307	0.134	District	Sport
D0117	LANGLANDS PARK	1029.901611	0.103	District	Sport
D0117	LANGLANDS PARK	29110.95776	2.911	District	Sport
D0393	EKIBIN PARK EAST	16094.82251	1.609	District	Sport
D0393	EKIBIN PARK EAST	8876.210205	0.888	District	Sport
D1348	EKIBIN PARK SOUTH	12865.27075	1.287	District	Sport
D0379	HYDE ROAD PARK	6122.264893	0.612	District	Sport
D0097	RAYMOND PARK	9032.909424	0.903	District	Sport
Total			**123.109**		

LGIP_ID	PROJECT_TY	EDITORS_NO	IMP_Trunk	Catchments	Area (ha)
EXIT-CF-X71	Community service / group space	Community Service/Group Space	Trunk	District, Local	0.36
EXIT-CF-X49	General community space	General Community Space	Trunk	District, Local	0.03
EXIT-CF-X118	Community service / group space	Community Service/Group Space	Trunk	District, Local	0.25
EXIT-CF-165	Community service / group space	1. COMMUNITY SERVICE FACILITY,NORMAN CREEK CATCHMENT COORD COMMITTEE (N4C)	Trunk	District	0.01
EXIT-CF-184	Community service / group space	4. KINDERGARTEN / PRESCHOOL,STONES CORNER KINDERGARTEN & PRESCHOOL	Trunk	District	0.19
EXIT-CF-207	Visual arts or display space	1.DEDICATED ART & CRAFT CREATION/TEACHING SPACE,WOODTURNERS SOCIETY OF QUEENSLAND	Trunk	District	0.13
EXIT-CF-209	Performing arts	3.DEDICATED PERFORMANCE VENUE - OUTDOOR,RIVERSTAGE	Trunk	District	0.85
EXIT-CF-365	General community space	COMMUNITY HALL,ANNERLEY HALL	Trunk	District	0.22
EXIT-CF-366	Library	PUBLIC LIBRARY,ANNERLEY LIBRARY	Trunk	District	0.1
EXIT-CF-367	Library	PUBLIC LIBRARY,FAIRFIELD GARDENS LIBRARY	Trunk	District	0.05
EXIT-CF-374	Library	PUBLIC LIBRARY,STONES CORNER LIBRARY	Trunk	District	0.16
EXIT-CF-375	Community service / group space	COMMUNITY SERVICE FACILITY,EASTERN SUBURBS DISTRICT RUGBY LEAGUES CLUB	Trunk	District	1.09
EXIT-CF-376	Aqua/Swimming	PUBLIC LAP/RECREATION SWIMMING,LANGLANDS PARK SWIMMING POOL	Trunk	District	0.55
EXIT-CF-378	Aqua/Swimming	PUBLIC LAP/RECREATION SWIMMING,UQ DAVID THIELE POOL	Non Trunk	District	0.56
EXIT-CF-383	Aqua/Swimming	PUBLIC LAP/RECREATION SWIMMING,SOMERVILLE HOUSE POOL	Non Trunk	District	0.6
EXIT-CF-X22	General community space	COMMUNITY SERVICE/LEISURE,GENERAL COMMUNITY SERVICE	Trunk	District	0.09
EXIT-CF-X104	Community service / group space	Community Service/Group Space	Trunk	District	1.8
EXIT-CF-X184	General community space	General Community Space	Trunk	District	0.05

Attachment C Existing Development Plans



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Rev	Descriptlon	By	Date
01	FOR REVIEW	IR	08.02.13
02	COLOURED	IR	11.02.13
03	FOR REVIEW	IR	08.03.13
04	PRELIM ISSUE	IR	12.03.13
05	PRELIM ISSUE	IR	13.03.13
06	FOR REVIEW	TS	12.06.14
07	CLIENT ISSUE	JW	04.09.14
08	CLIENT ISSUE	JW	15.09.14

Rev	Descriptlon	By	Date
09	CONSULTANT MEETING	IR	07.01.15
10	CONSULTANT COORDINATION	IR	25.01.15
11	CONSULTANT COORDINATION UPDATE	IR	28.01.15
12	DHPW CONSENT ISSUE	IR	30.01.15
13	SERVICES BACKGROUND ISSUE	IR	23.03.15
14	DHPW CONSENT ISSUE	IR	13.04.15
15	DHPW CONSENT ISSUE	IR	16.04.15
16	DHPW CONSENT ISSUE	IR	01.05.15

Rev	Descriptlon	By	Date
17	DA ISSUE	IR	23.06.15

Keyplan

Northpoint: North

Document Control Status

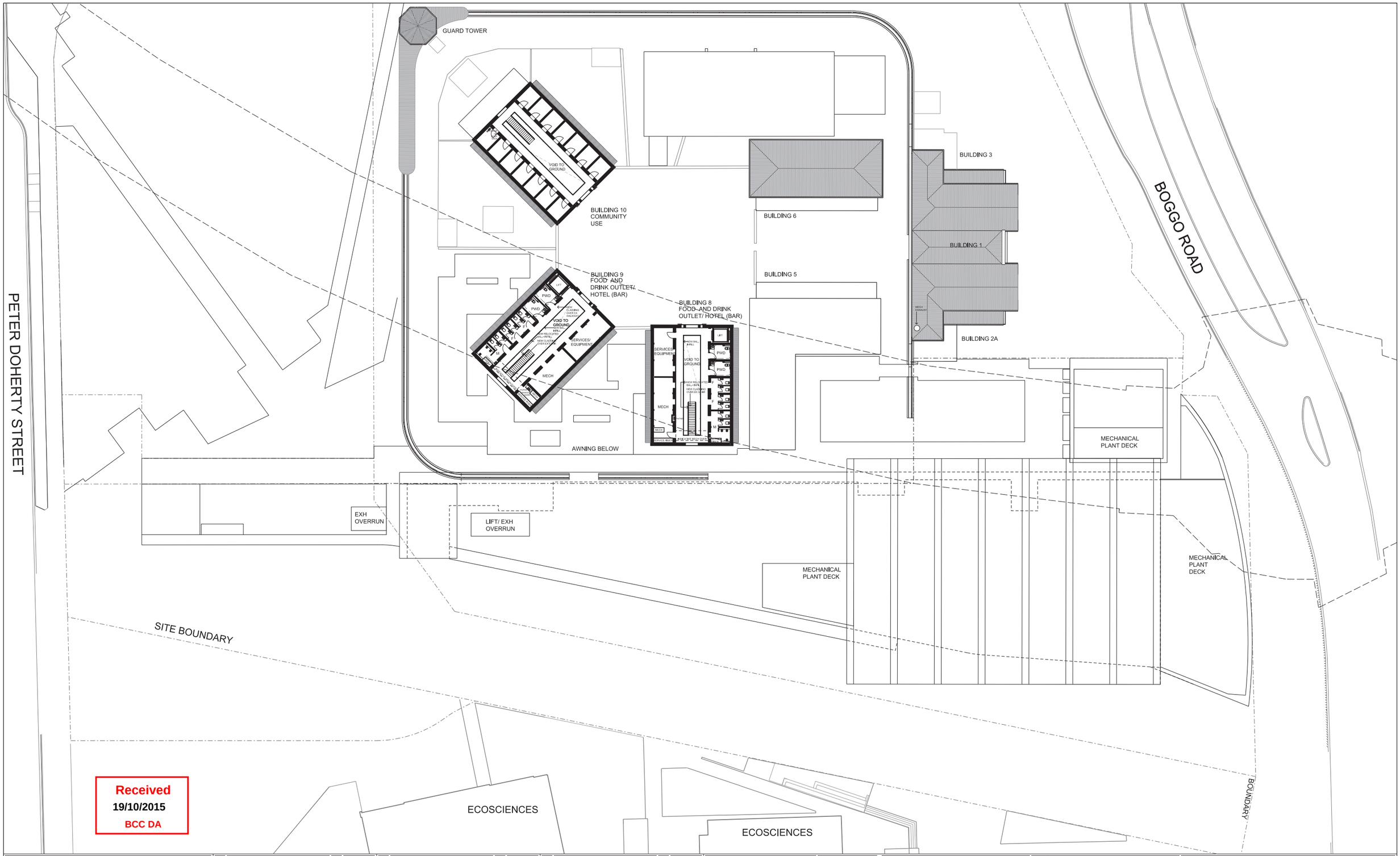
Orlginal Scale at A1:

Project: **BOGGO ROAD GAOL REDEVELOPMENT**

Client: CALILE MALOUF INVESTMENTS PTY LTD

Drawing Title: PLAN - PROPOSED LEVEL 1

Drawn: | Date: | Proj. Director: | Date:
Proj. Architect: | Date: | Co-ordinated: | Date:
Cad File: | Scale: 1:250 @ A1, 1:500 @ A3 | Project No: **120011**
Drawing Number: **AA-102** | Revision: **17**



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01	CLIENT ISSUE	JW	04.09.14
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09	DHPW CONSENT ISSUE	IR	13.04.15
10	DHPW CONSENT ISSUE	IR	16.04.15
11	DA ISSUE	IR	23.06.15

Keyplan

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Document Control Status

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Client: CALILE MALOUF INVESTMENTS PTY LTD

Drawing Title: PLAN - PROPOSED LEVEL 2

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Proj. Architect: | Date: | Co-ordinated: | Date:

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Drawing Number: **AA-103** | Revision: **11**

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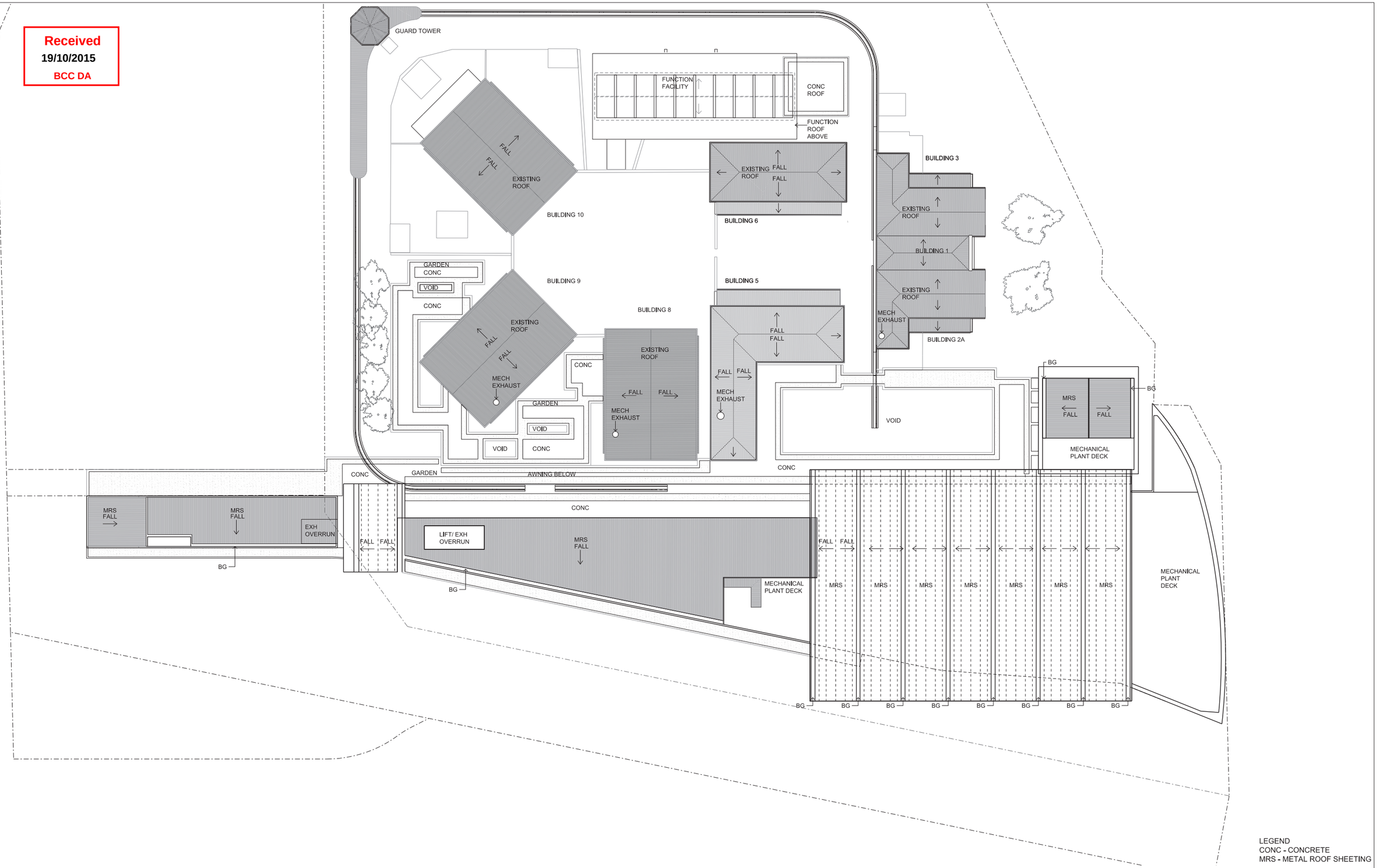

LEGEND
CONC - CONCRETE
MRS - METAL ROOF SHEETING

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02	CONSULTANT COORDINATION UPDATE	IR	28.01.15
03	DHPW CONSENT ISSUE	IR	30.01.15
04	SERVICES BACKGROUND ISSUE	IR	23.03.15
05	DHPW CONSENT ISSUE	IR	16.04.15
06	DA ISSUE	IR	23.06.15

Rev	Descriptlon	By	Date

Rev	Descriptlon	By	Date

Keyplan

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Project
BOGGO ROAD GAOL REDEVELOPMENT

Client
CALILE MALOUF INVESTMENTS PTY LTD

Drawing Title
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Proj. Architect:	Date:	Co-ordinated:	Date:
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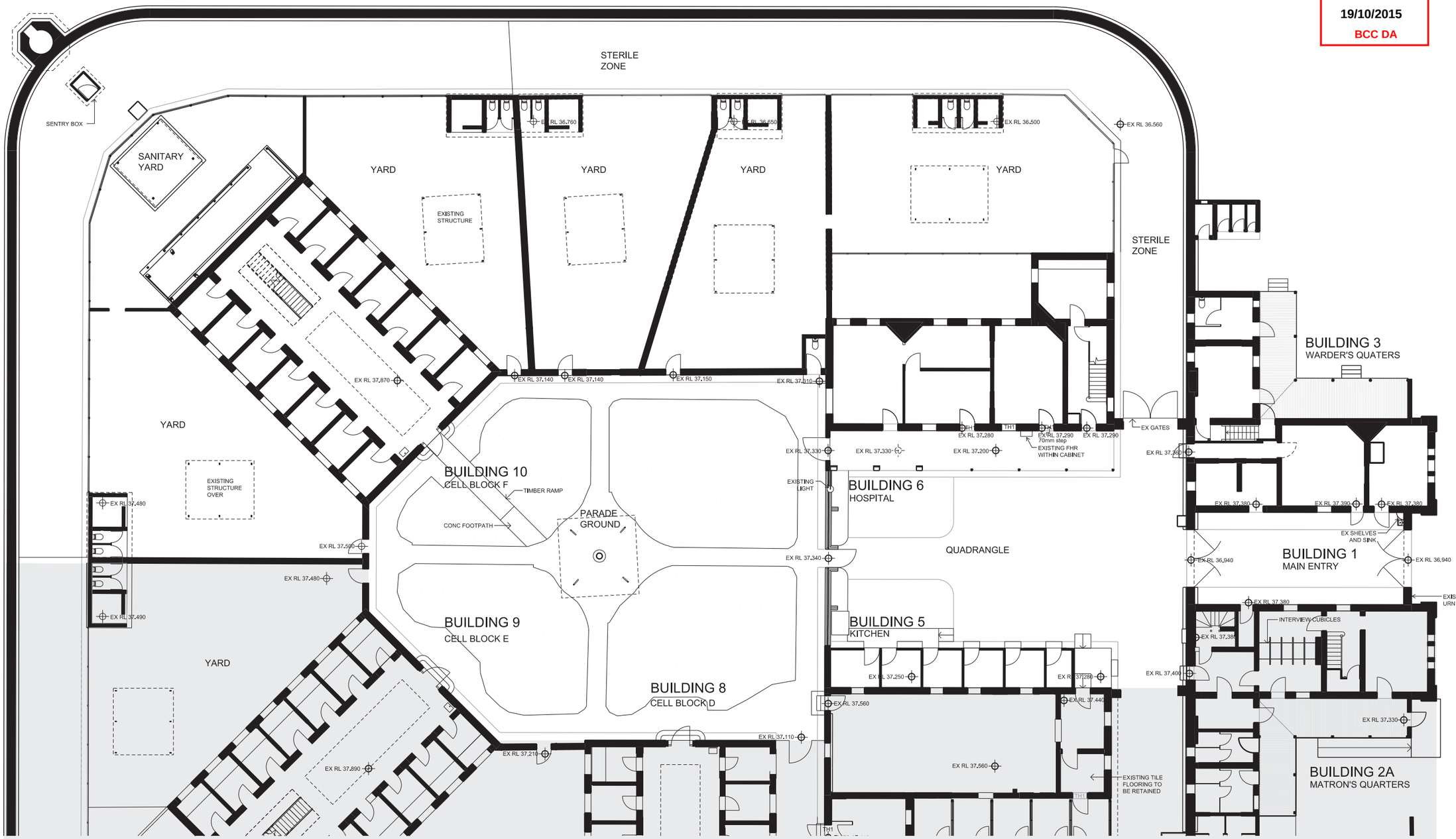

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02	CONSULTANT COORDINATION	IR	25.01.15
03	DHPW CONSENT ISSUE	IR	30.01.15
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07	DA ISSUE	IR	23.06.15

Keyplan

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Document Control Status

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BOGGO ROAD GAOL REDEVELOPMENT

Client

CALILE MALOUF INVESTMENTS PTY LTD

Drawing Title

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Proj. Architect: | Date: | Co-ordinated: | Date:

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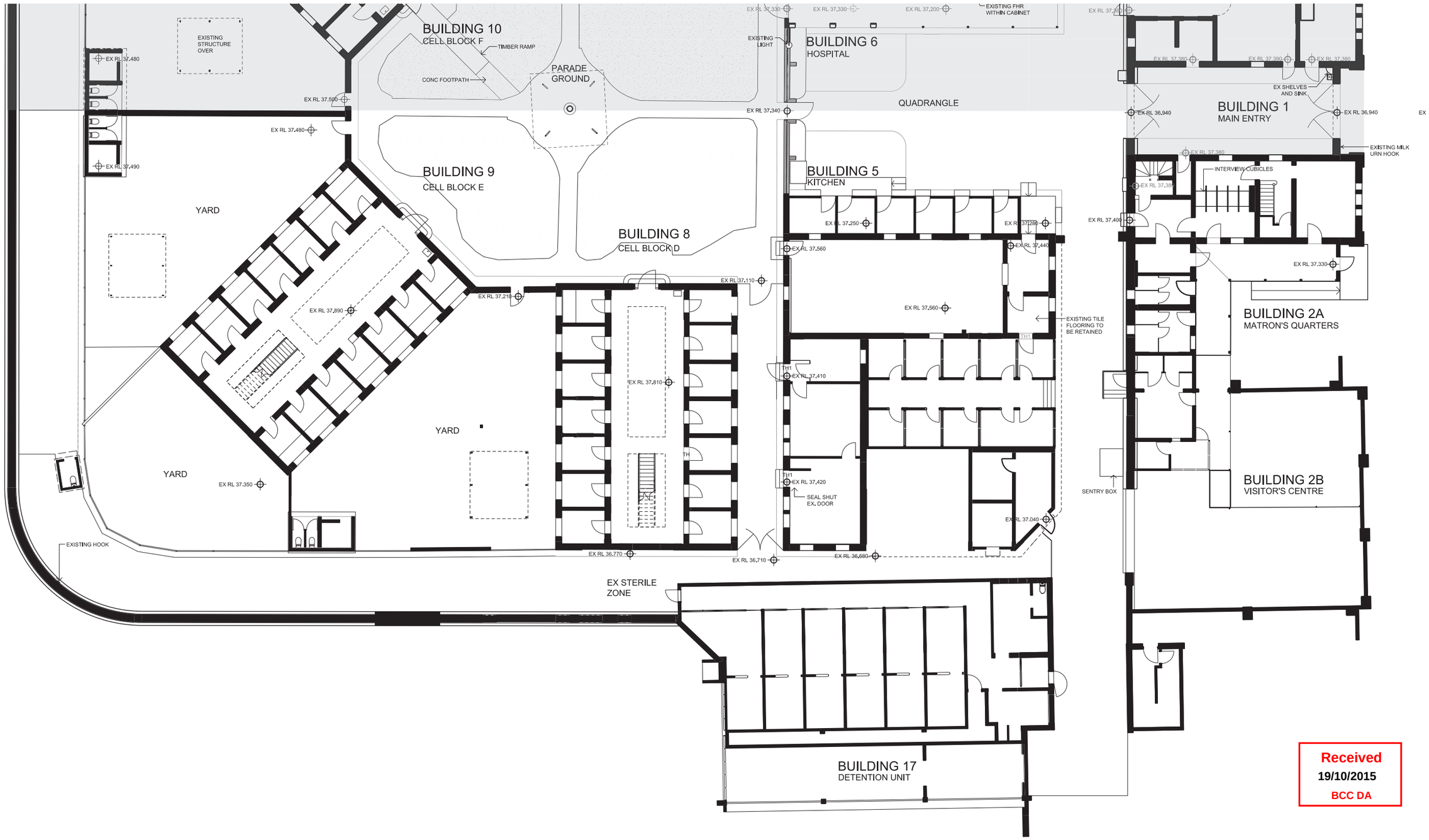

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02	CONSULTANT COORDINATION	IR	25.01.15
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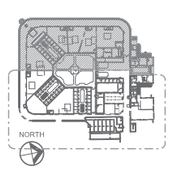
04	DHPW CONSENT ISSUE	IR	16.04.15
05	DA ISSUE	IR	23.06.15

Keyplan



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BOGGO ROAD GAOL REDEVELOPMENT

Client

CALILE MALOUF INVESTMENTS PTY LTD

Drawing Title

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Proj. Architect: | Date: | Co-ordinated: | Date:

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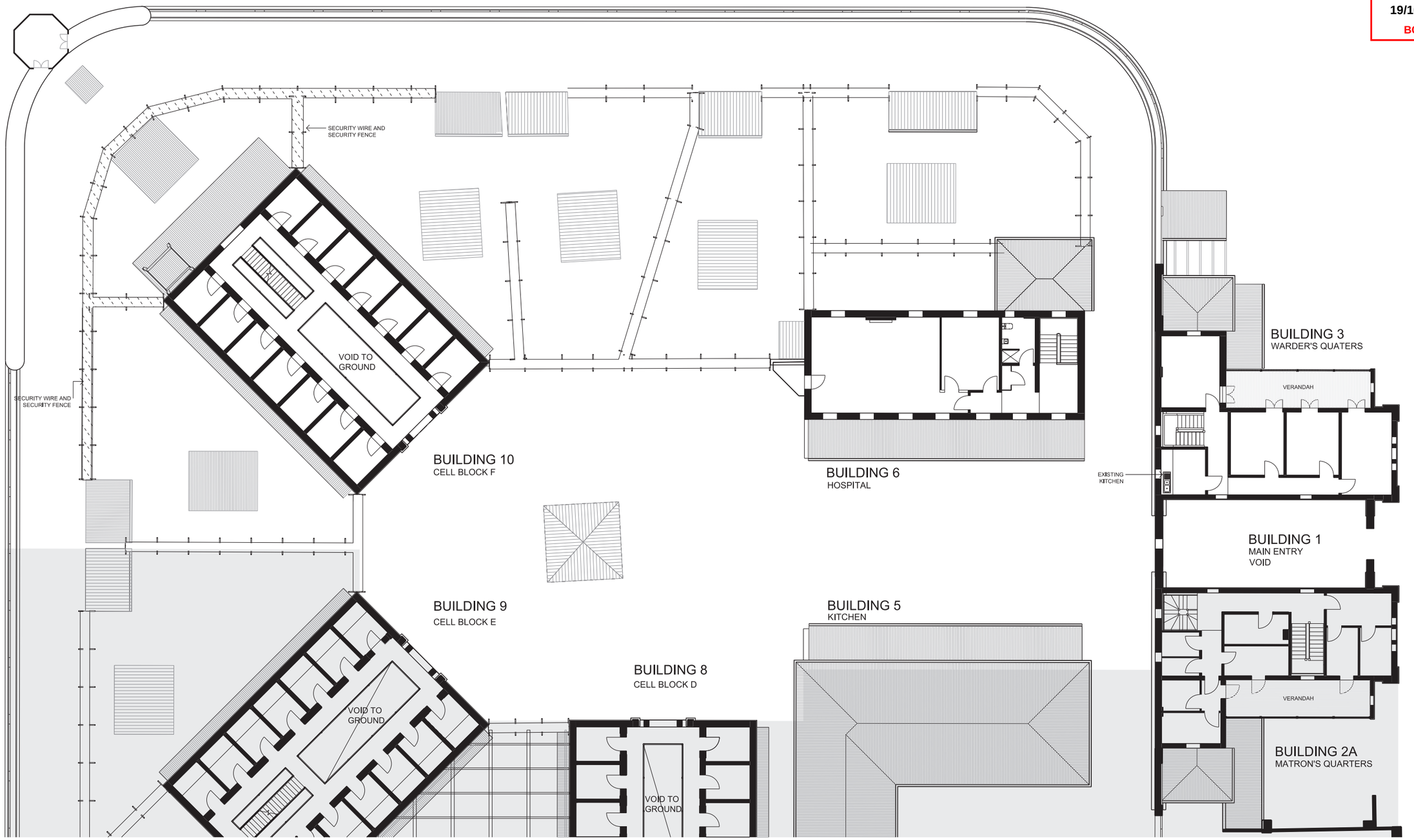
Drawing Number: **AA-151** | Revision: **05**



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03	DHPW CONSENT ISSUE	IR	30.01.15
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05	DHPW CONSENT ISSUE	IR	01.05.15
06	DA ISSUE	IR	23.06.15

Keyplan

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BOGGO ROAD GAOL REDEVELOPMENT

Client

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Drawing Title

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Proj. Architect: | Date: | Co-ordinated: | Date:
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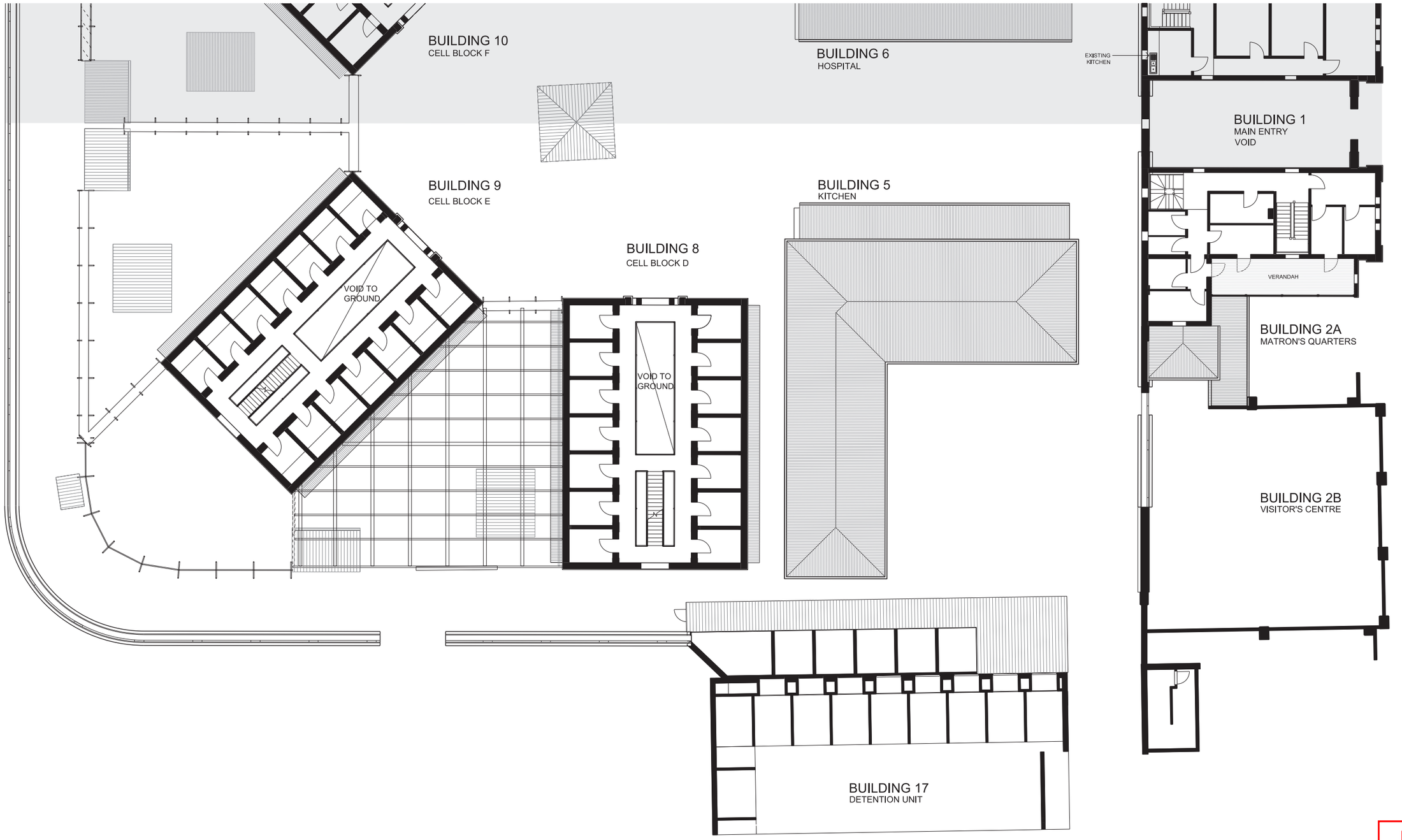

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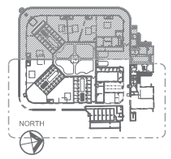

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Project: **BOGGO ROAD GAOL REDEVELOPMENT**

Client: CALILE MALOUF INVESTMENTS PTY LTD

Drawing Title: **EXISTING GAOL - LEVEL 1 EAST**

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Proj. Architect:	Date:	Co-ordinated:	Date:
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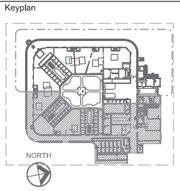

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Original Scale at A1:

Project

BOGGO ROAD GAOL REDEVELOPMENT

Client

CALILE MALOUF INVESTMENTS PTY LTD

Drawing Title

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Drawn:	Date:	Proj. Director:	Date:
Proj. Architect:	Date:	Co-ordinated:	Date:

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Project No: **120011**

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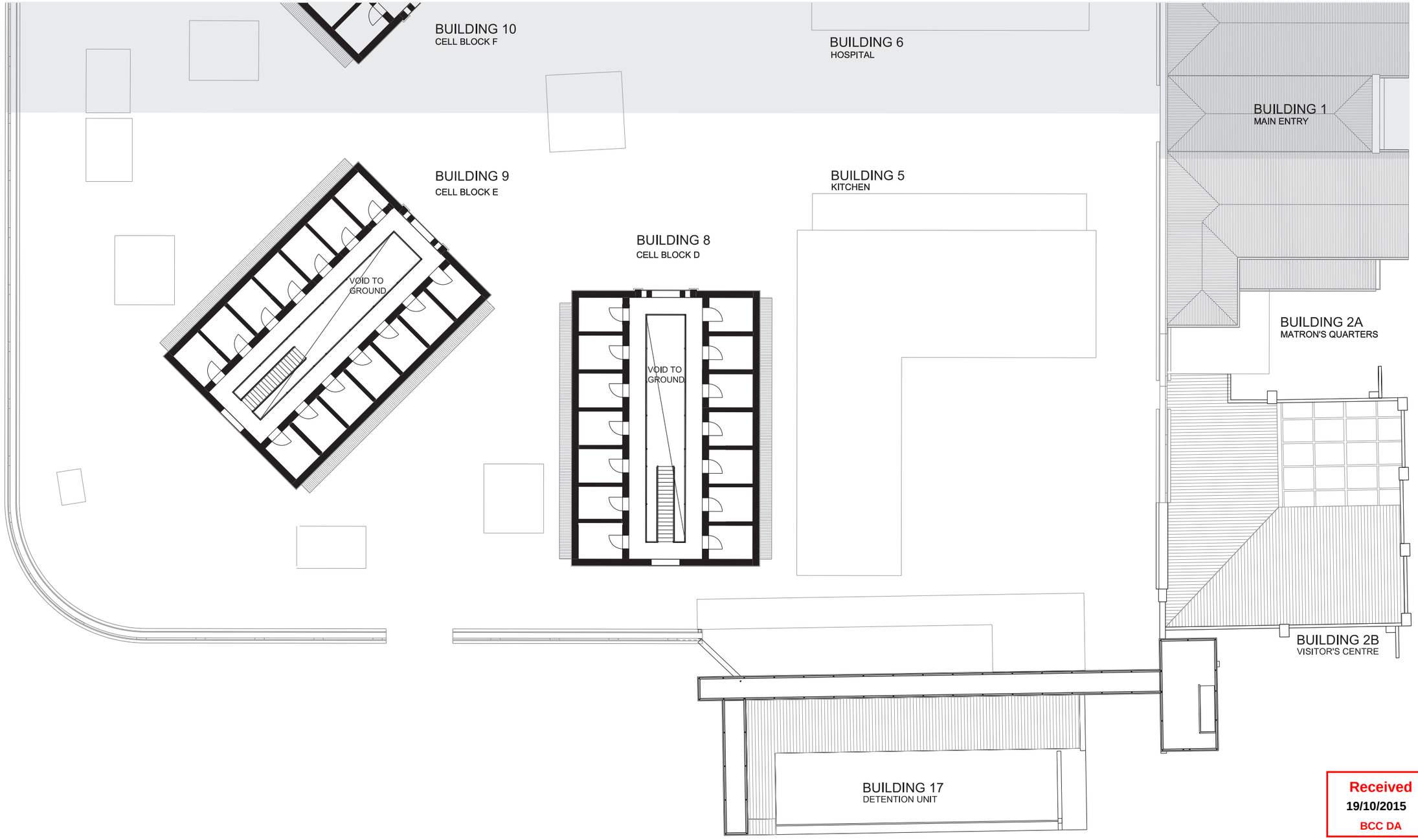
Revision: **05**



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02	CONSULTANT COORDINATION	IR	25.01.15
03	DHPW CONSENT ISSUE	IR	30.01.15
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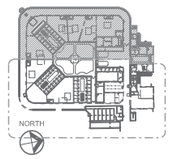

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Project: **BOGGO ROAD GAOL REDEVELOPMENT**

Client: CALILE MALOUF INVESTMENTS PTY LTD

Drawing Title: **EXISTING GAOL - LEVEL 2 EAST**

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Proj. Architect: | Date: | Co-ordinated: | Date:
Cad File: | Scale: 1:125 @ A1, 1:250 @ A3 | Project No: **120011**
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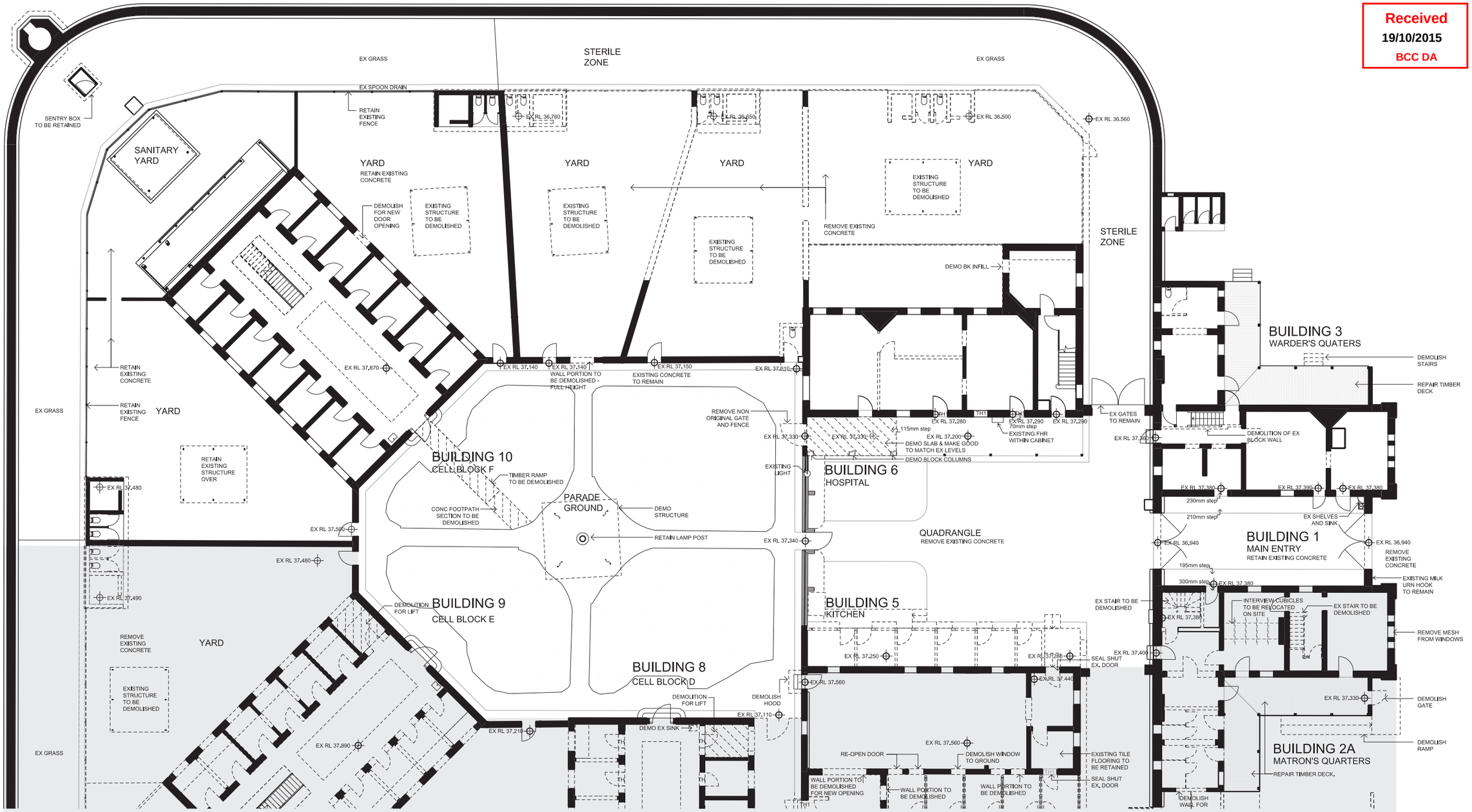

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Keyplan

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Document Control Status

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Project

BOGGO ROAD GAOL REDEVELOPMENT

Client

CALILE MALOUF INVESTMENTS PTY LTD

Drawing Title

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Proj. Architect:	Date:	Co-ordinated:	Date:
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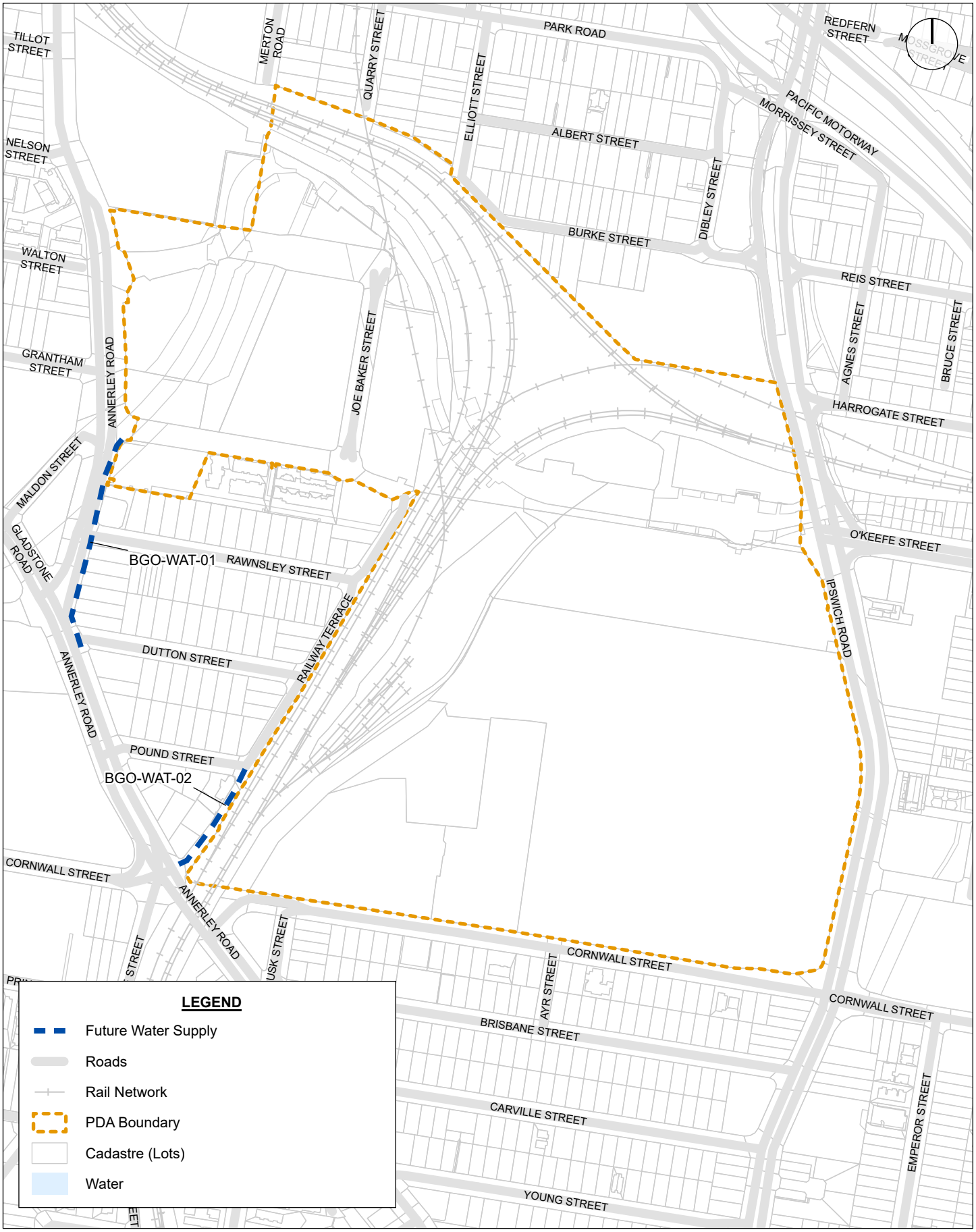
Drawing Number: AA-160			Revision: 07

Appendix F Future Trunk Infrastructure Plans



This map is for illustration purposes and is not to scale

Map 01 - Water Supply

Future DCOP Trunk Infrastucture Plan

Draft - Not government policy

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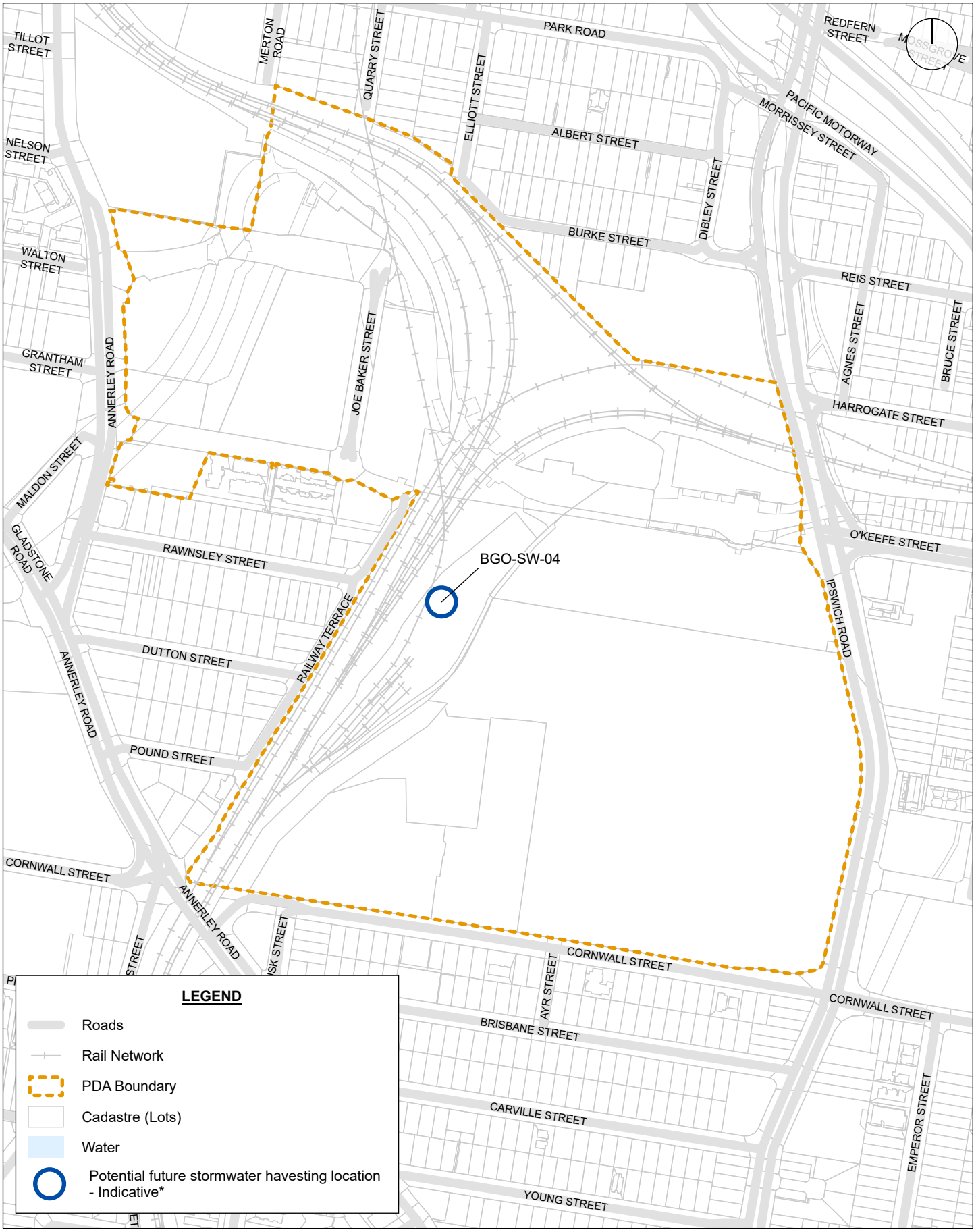

This map is for illustration purposes and is not to scale

Map 02 - Stormwater

Future DCOP Trunk Infrastucture Plan

*Note: BGO-SW-04 represent indicative location for one (1) stormwater harvesting device to be provided.

Draft - Not government policy

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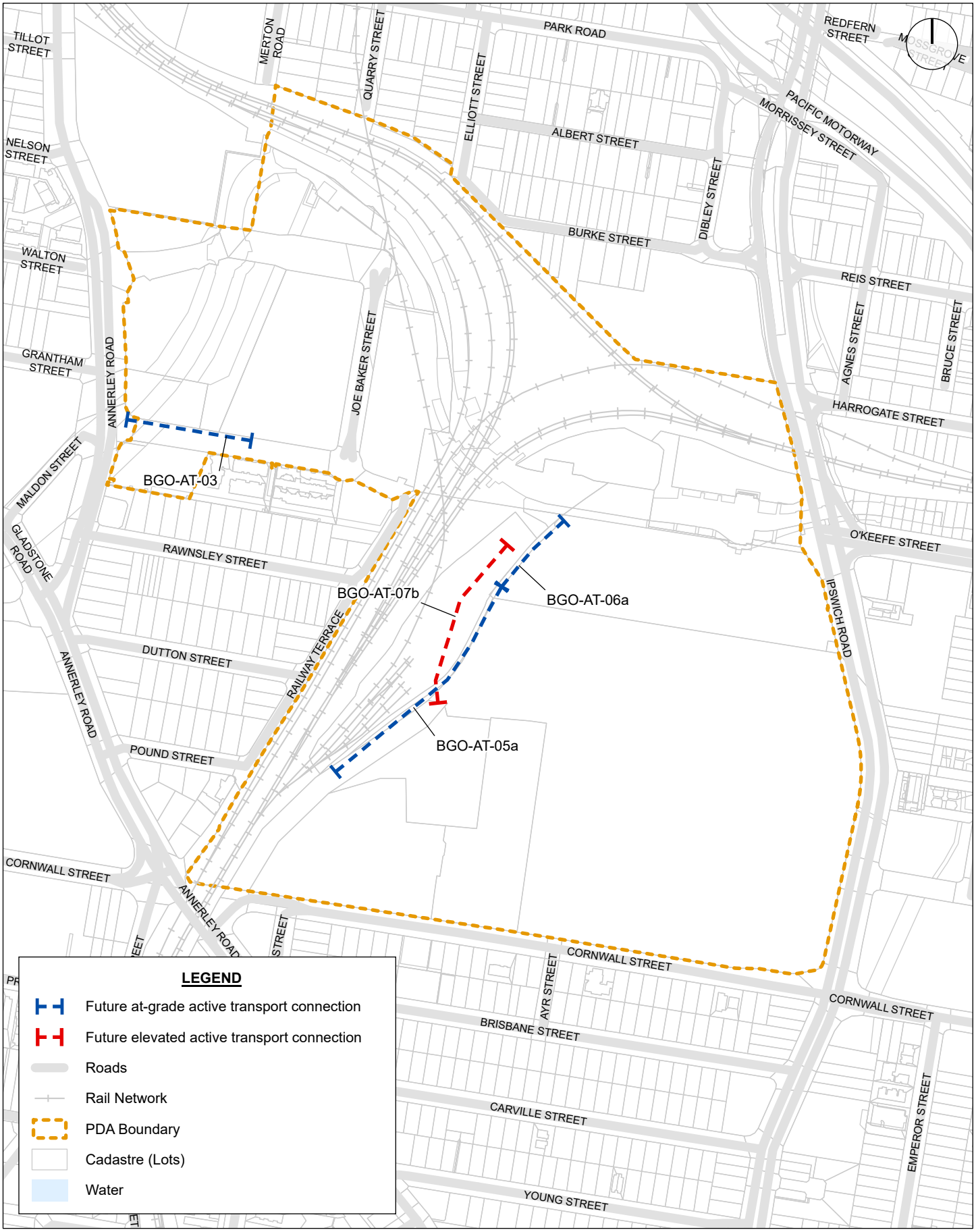

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Map 03 - Transport (Active)

Future DCOP Trunk Infrastucture Plan

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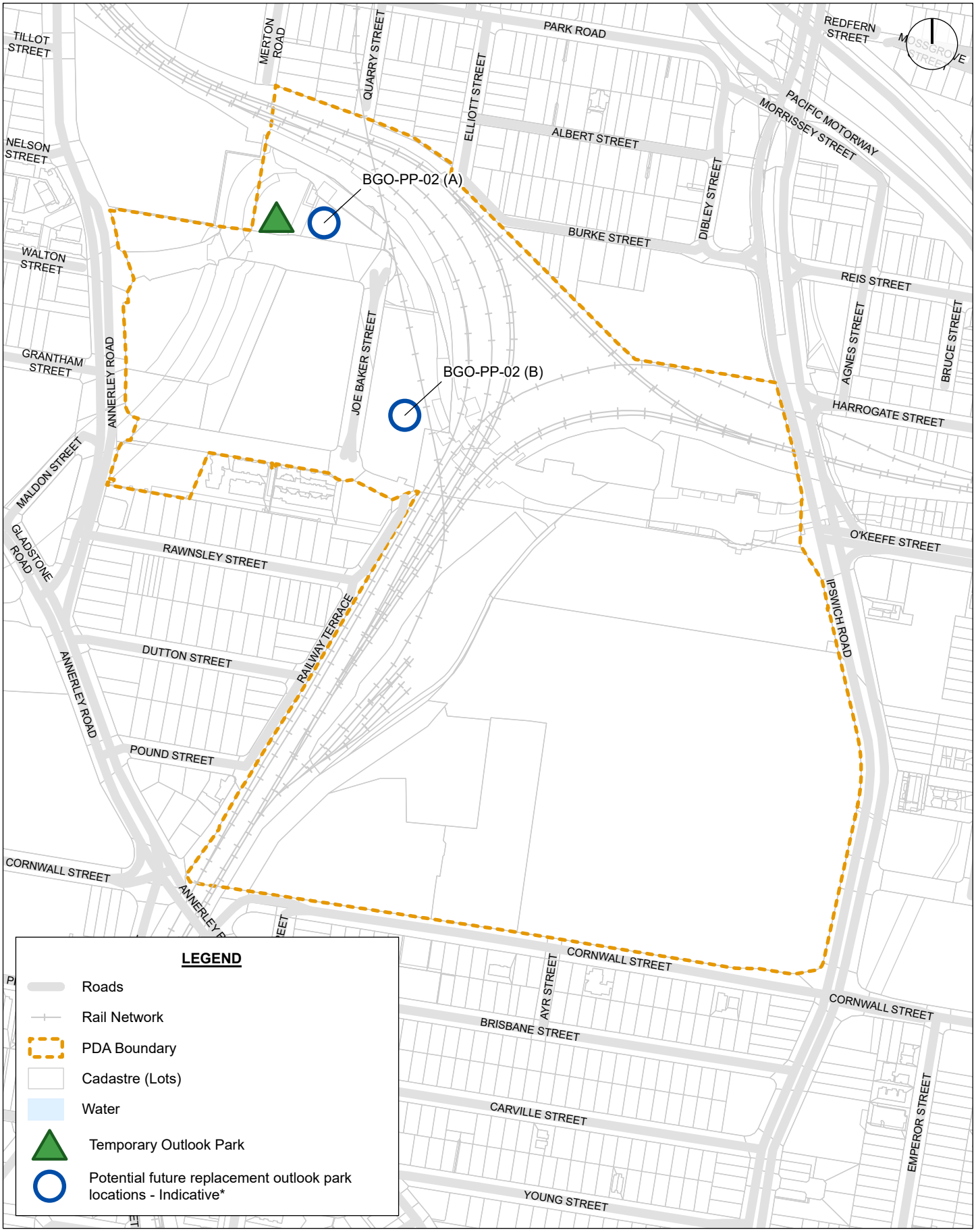

This map is for illustration purposes and is not to scale

Map 04 - Parks and Community Facilities

Future DCOP Trunk Infrastucture Plan

*Note: BGO-PP-02 (A) and BGO-PP-02 (B) represent indicative locations for one (1) replacement park to be provided. Section 2.6.1 Connectivity, access and public realm provision 10 of the draft proposed Boggo Road Development Scheme requires the first stage of development within the Outlook Park opportunity area to provide a new permanent Outlook Park.

Draft - Not government policy

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Appendix G Future Trunk Infrastructure Costs

Detailed Infrastructure Schedule of Works – DCOP Trunk Infrastructure

Table 1: Schedule of future trunk infrastructure works – Water Supply

DCOP ID	Map no.	Infrastructure type	Infrastructure description	Pipe diameter (mm)	Pipe length (m)	Estimated timing	Land cost	Works base cost	Works on-costs	Works contingency	Total works cost	Trunk establishment cost	Internal / External	Priority Infrastructure/ potential external contributions	PDA proposed contribution (trunk)	Non-PDA proposed contribution (trunk)
BGO-WAT-01	2	Water Main	Annerley Rd Water Main Upgrade - 215m of DN250mm Water Main replacing existing DN150mm Water Main	215	250	2026-2031	$0	$704,593	$407,539	$194,028	$1,306,160	$1,306,160	External	Yes	TBC	TBC
BGO-WAT-02	2	Water Main	Railway Tce Water Main Upgrade - 112m of DN180mm Water Main replacing existing 100mm Water Main	112	180	2026-2031	$0	$276,910	$160,672	$76,258	$513,840	$513,840	Internal	Yes	TBC	TBC

Notes:

1 – All costs are expressed in current cost terms as at the base date (FY 2021/22).

Table 2: Schedule of future trunk infrastructure works – Wastewater

No infrastructure identified.

Table 3: Schedule of future trunk infrastructure works – Stormwater

DCOP ID	Map no.[1]	Infrastructure type	Infrastructure description	Pipe diameter (mm)	Pipe length (m)	Estimated timing	Land cost	Works base cost	Works on-costs	Works contingency	Total works cost	Trunk establishment cost	Internal / External	Priority Infrastructure/ potential external contributions	PDA proposed contribution (trunk)	Non-PDA proposed contribution (trunk)
BGO-SW-04	N/A	Stormwater Harvesting	Stormwater harvesting and water balancing with wider catchment benefits	N/A	N/A	2032-2041	$0	$1,000,000	$170,000	$175,500	$ 1,345,500	$ 1,345,500	Internal	No	TBC	TBC

Notes:

1 – Location of proposed stormwater harvesting solution yet to be determined

2 – TBC – To be confirmed

3 – All costs are expressed in current cost terms as at the base date (FY 2021/22).

Table 4: Schedule of future trunk infrastructure works – Active Transport

DCOP ID	Map no.	Infrastructure type	Infrastructure description	Length (m) Qty (ea)	Width (m)	Area (m^2)	Estimated timing	Land cost	Works base cost	Works on-costs	Works contingency	Total works cost	Trunk establishment cost	Internal / External	Priority Infrastructure/ potential external contributions	PDA proposed contribution (trunk)	Non-PDA proposed contribution (trunk)
Active Transport																	
BGO-AT-03	3	Separated Path	Peter Doherty Street separated path	110	6.5	N/A	2020-2025	$0	$162,175	$27,570	$28,462	$218,206	$218,206	Internal	Yes	TBC	TBC
BGO-AT-06a	3	Separated Path	Kent Street interim separated path improvements	100	5.5	N/A	2027-2031	$0	$133,500	$22,695	$23,429	$179,624	$179,624	Internal	No	TBC	TBC

DCOP ID	Map no.	Infrastructure type	Infrastructure description	Length (m) Qty (ea)	Width (m)	Area (m^2)	Estimated timing	Land cost	Works base cost	Works on-costs	Works contingency	Total works cost	Trunk establishment cost	Internal / External	Priority Infrastructure/ potential external contributions	PDA proposed contribution (trunk)	Non-PDA proposed contribution (trunk)
Active Transport																	
BGO-AT-05a	3	Separated Path	Kent Street interim separated path improvements (Cycle Street)	410	3.3	N/A	2027-2031	$0	$82,000	$13,940	$14,391	$110,331	$110,331	Internal	No	TBC	TBC
BGO-AT-07b	3	Elevated Pedestrian Connection	Elevated pedestrian connection over Kent Street (extended option)	110	3	N/A	2027-2031	$0	$3,485,000	$592,450	$611,618	$4,689,067	$4,689,067	Internal	No	TBC	TBC

Notes:

1 – TBC – To be confirmed

2 – All costs are expressed in current cost terms as at the base date (FY 2021/22).

Table 5: Schedule of future trunk infrastructure works - Parks and community facilities

DCOP ID	Map no.	Infrastructure type	Infrastructure description	Area (m2)	Estimated timing	Land cost	Works base cost	Works on-costs	Works contingency	Total works cost	Trunk establishment cost	Internal / External	Priority Infrastructure/ potential external contributions	PDA proposed contribution (trunk)	Non-PDA proposed contribution (trunk)
Open Space															
BGO-PP-02 (A) / BGO-PP-02 (B)	4	Local Recreation Park	Embellishment of Outlook Park	TBD	2025-2026	$0	$747,000	$126,990	$218,497	$1,092,487	$1,092,487	Internal	No	TBC	TBC

Notes:

1 – TBC – To be confirmed

2 – All costs are expressed in current cost terms as at the base date (FY 2021/22).

Table 6: Schedule of future trunk infrastructure works - Priority Infrastructure / External Contributions*

Infrastructure type	Infrastructure description	Trunk establishment cost / contribution[1]
External Contributions	Contributions towards external infrastructure to be provided by other Infrastructure Authorities	TBC
Water	Annerley Rd Water Main Upgrade - 215m of DN250mm water main replacing existing DN150mm water main	TBC
Water	Railway Tce Water Main Upgrade - 112m of DN180mm water main replacing DN100mm water main	TBC
Transport (Active)	Peter Doherty Street separated path	TBC

Notes:

1 – *Priority Infrastructure / external contributions are as referred to in the Roma Street CRR PDA Development Charges and Offset Plan (DCOP)

2 – The Trunk establishment cost is the sum of the following: construction cost, construction on costs and construction contingency

2 – TBC – To be confirmed

3 – All costs are expressed in current cost terms as at the base date (FY 2021/22).

Appendix H Future Infrastructure Network Plans

Boggo Road Cross River Rail Priority Development Area
Future Infrastructure Network Plan
Active Transport - Stage 1 (2020 - 2025) (Indicative)

Legend

- Boggo Road CRR PDA Boundary
- CRR TSD and CRR RIS Delivery Area

Active Transport Projects (Stage 1)

- Vertical Transport Upgrade (Stage 1)
- Active Transport Link (Stage 1)
- Active Transport Link (TSD)

PDA - Development Sites (by Stage & Year) (Indicative Only)

- Stage 1 (TSD & RIS) (2020 - 2025)
- Stage 2 (2025 - 2026)
- Stage 3 (2027 - 2031)
- Stage 4 (2032 - 2041)
- Existing Buildings

Transport - Road, Transit

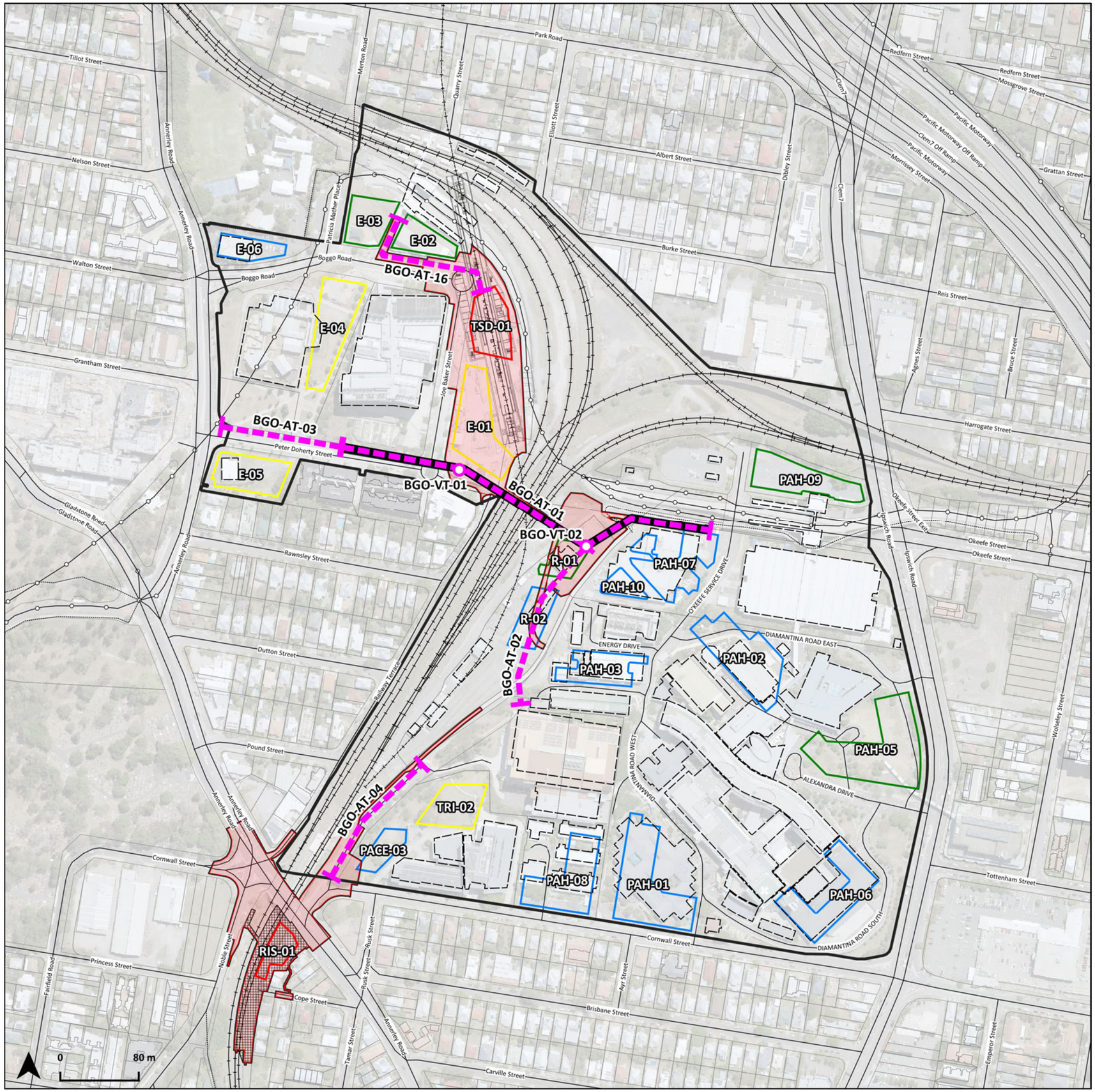
- Road
- Busways
- Tracks, Paths & Malls

Existing Rail

- Operational
- CRR Alignment
- CRR TSD Boggo Road Station
- CRR RIS Dutton Park Station

Property - DCDB

- Base Lot



NOTE:
Future PDA potential development opportunity sites and staging are conceptual and indicative only for infrastructure network analysis purposes.

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CROSSRIVERRAIL

Boggo Road Cross River Rail Priority Development Area
Future Infrastructure Network Plan
Active Transport - Stage 2 (2025 - 2026) (Indicative)

Legend

- Boggo Road CRR PDA Boundary
- CRR TSD and CRR RIS Delivery Area

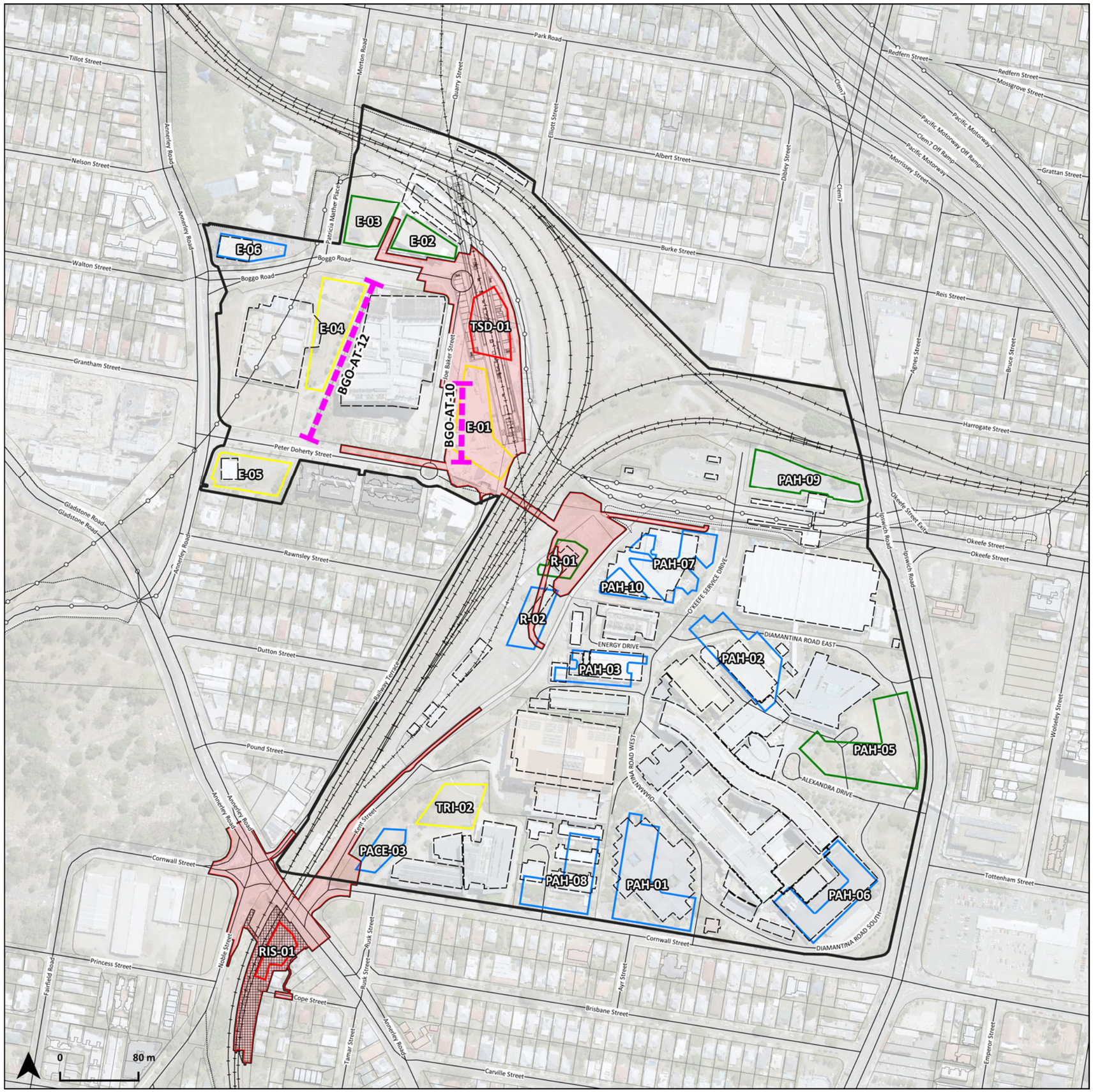
Active Transport Projects (Stage 2)
- Active Transport Link (Stage 2)

PDA - Development Sites (by Stage & Year) (Indicative Only)
- Stage 1 (TSD & RIS) (2020 - 2025)
- Stage 2 (2025 - 2026)
- Stage 3 (2027 - 2031)
- Stage 4 (2032 - 2041)
- Existing Buildings

Transport - Road, Transit
- Road
- Busways
- Tracks, Paths & Malls

Existing Rail
- Operational
- CRR Alignment
- CRR TSD Boggo Road Station
- CRR RIS Dutton Park Station

Property - DCDB
- Base Lot



NOTE:
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CROSSRIVERRAIL

Boggo Road Cross River Rail Priority Development Area
Future Infrastructure Network Plan
Active Transport - Stage 3 (2027 - 2031) (Indicative)

Legend

- Boggo Road CRR PDA Boundary
- CRR TSD and CRR RIS Delivery Area

Active Transport Projects (Stage 3)

- Vertical Transport Upgrade (Stage 3)
- Active Transport Link (Stage 3)

PDA - Development Sites (by Stage & Year) (Indicative Only)

- Stage 1 (TSD & RIS) (2020 - 2025)
- Stage 2 (2025 - 2026)
- Stage 3 (2027 - 2031)
- Stage 4 (2032 - 2041)
- Existing Buildings

Transport - Road, Transit

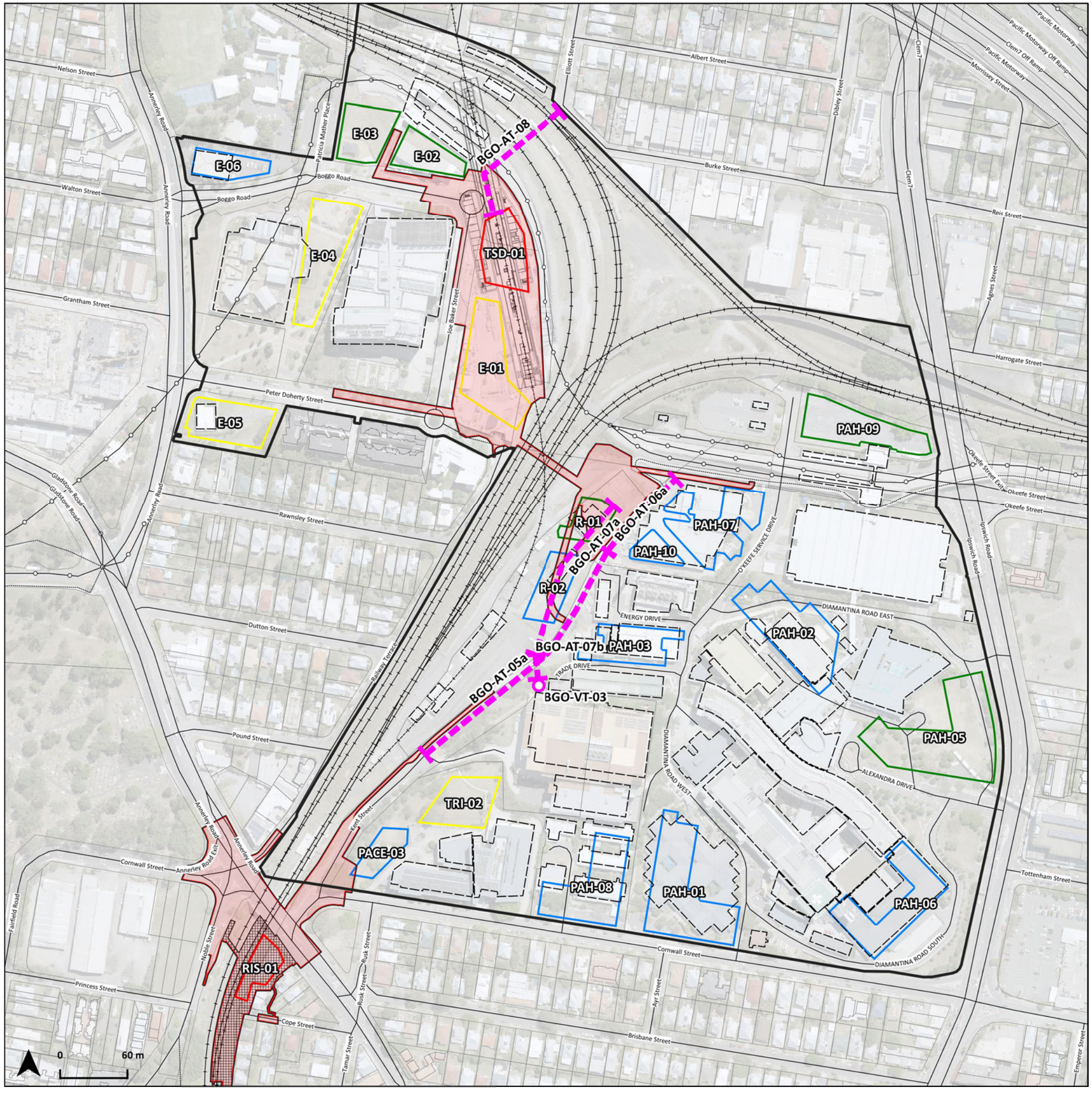
- Road
- Busways
- Tracks, Paths & Malls

Existing Rail

- Operational
- CRR Alignment
- CRR TSD Boggo Road Station
- CRR RIS Dutton Park Station

Property - DCDB

- Base Lot



NOTE:
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Data Sources
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CROSSRIVERRAIL

Boggo Road Cross River Rail Priority Development Area
Future Infrastructure Network Plan
Active Transport - Stage 4 (2032 - 2041 / Ultimate) (Indicative)

Legend

- Boggo Road CRR PDA Boundary
- CRR TSD and CRR RIS Delivery Area

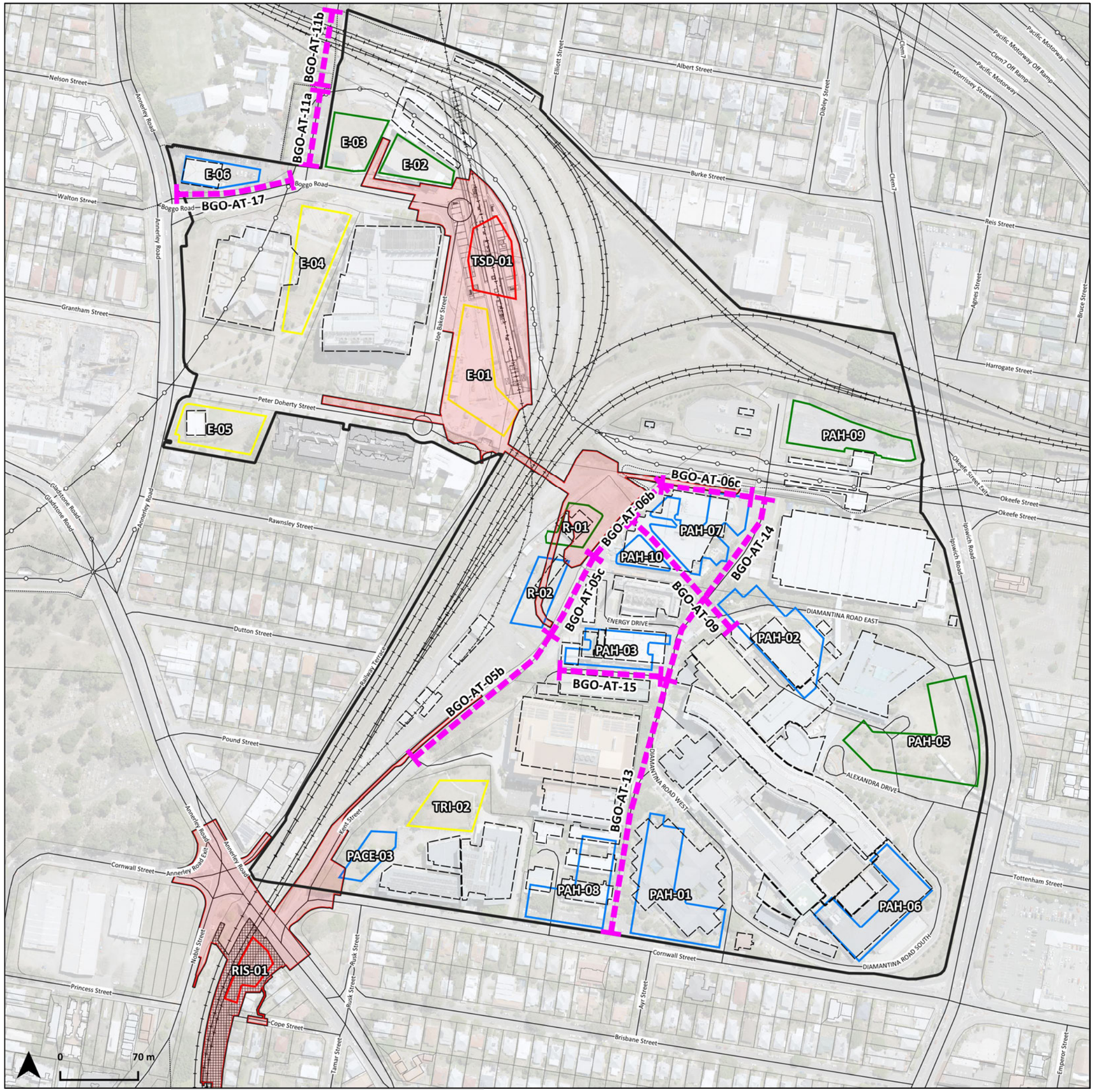
Active Transport Projects (Stage 4)
- Active Transport Link (Stage 4)

PDA - Development Sites (by Stage & Year) (Indicative Only)
- Stage 1 (TSD & RIS) (2020 - 2025)
- Stage 2 (2025 - 2026)
- Stage 3 (2027 - 2031)
- Stage 4 (2032 - 2041)
- Existing Buildings

Transport - Road, Transit
- Road
- Busways
- Tracks, Paths & Malls

Existing Rail
- Operational
- CRR Alignment
- CRR TSD Boggo Road Station
- CRR RIS Dutton Park Station

Property - DCDB
- Base Lot



NOTE:
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Data Sources
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CROSSRIVERRAIL

Boggo Road Cross River Rail Priority Development Area
Future Infrastructure Network Plan
Roads and Public Transport - Stage 1 (2025) (Indicative)

Legend

- Boggo Road CRR PDA Boundary
- CRR TSD and CRR RIS Delivery Area

Road Projects (Stage 1)

- Road Intersection Upgrade (Stage 1)
- Road Corridor (Stage 1)

PDA - Development Sites (by Stage & Year) (Indicative Only)

- Stage 1 (TSD & RIS) (2020 - 2025)
- Stage 2 (2025 - 2026)
- Stage 3 (2027 - 2031)
- Stage 4 (2032 - 2041)
- Existing Buildings

Transport - Road, Transit

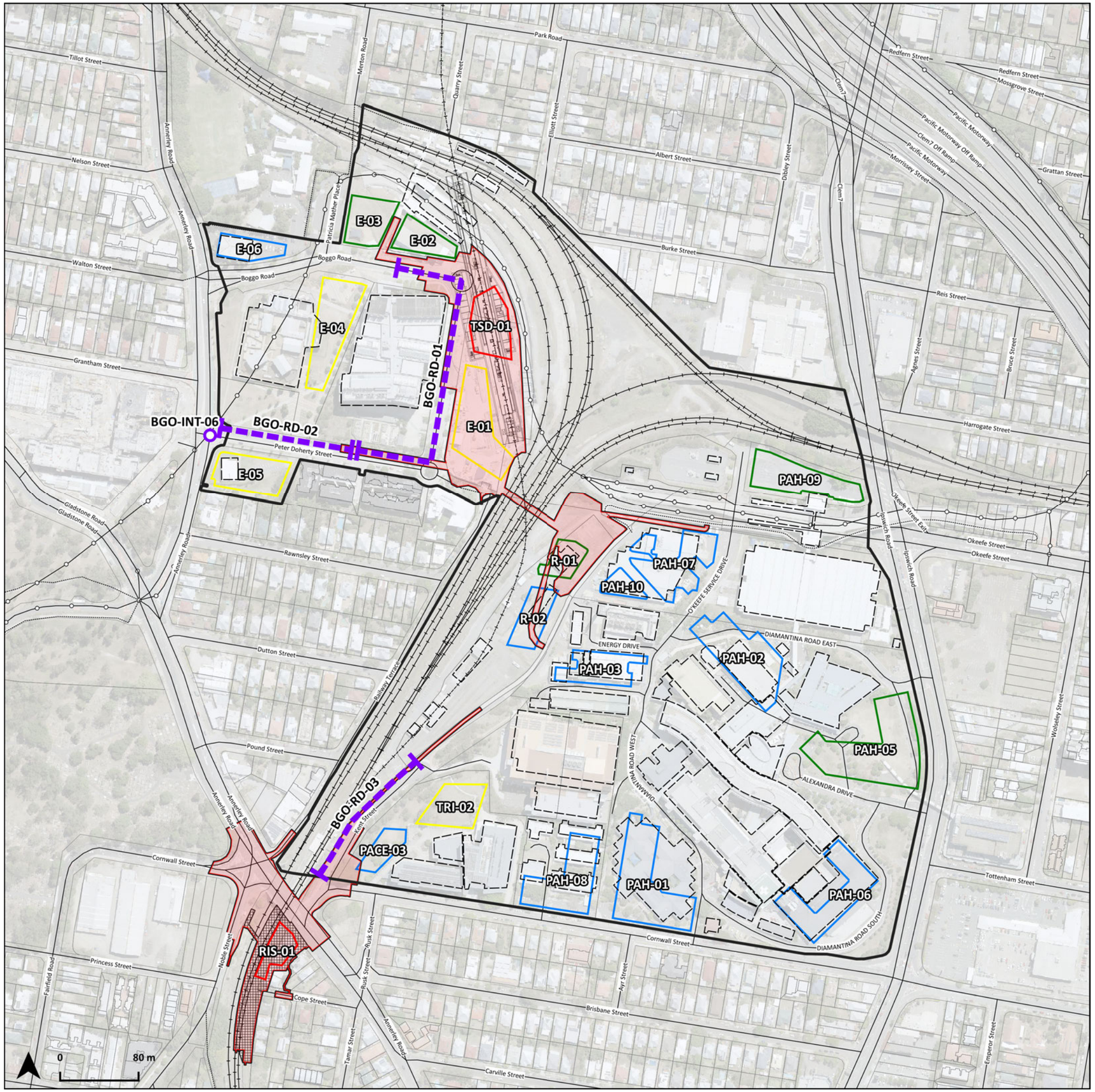
- Road
- Busways
- Tracks, Paths & Malls

Existing Rail

- Operational
- CRR Alignment
- CRR TSD Boggo Road Station
- CRR RIS Dutton Park Station

Property - DCDB

- Base Lot



NOTE:
Future PDA potential development opportunity sites and staging are conceptual and indicative only for infrastructure network analysis purposes.

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Data Sources
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CROSSRIVERRAIL

Boggo Road Cross River Rail Priority Development Area
Future Infrastructure Network Plan
Roads and Public Transport - Stage 2 (2025 - 2026) (Indicative)

Legend

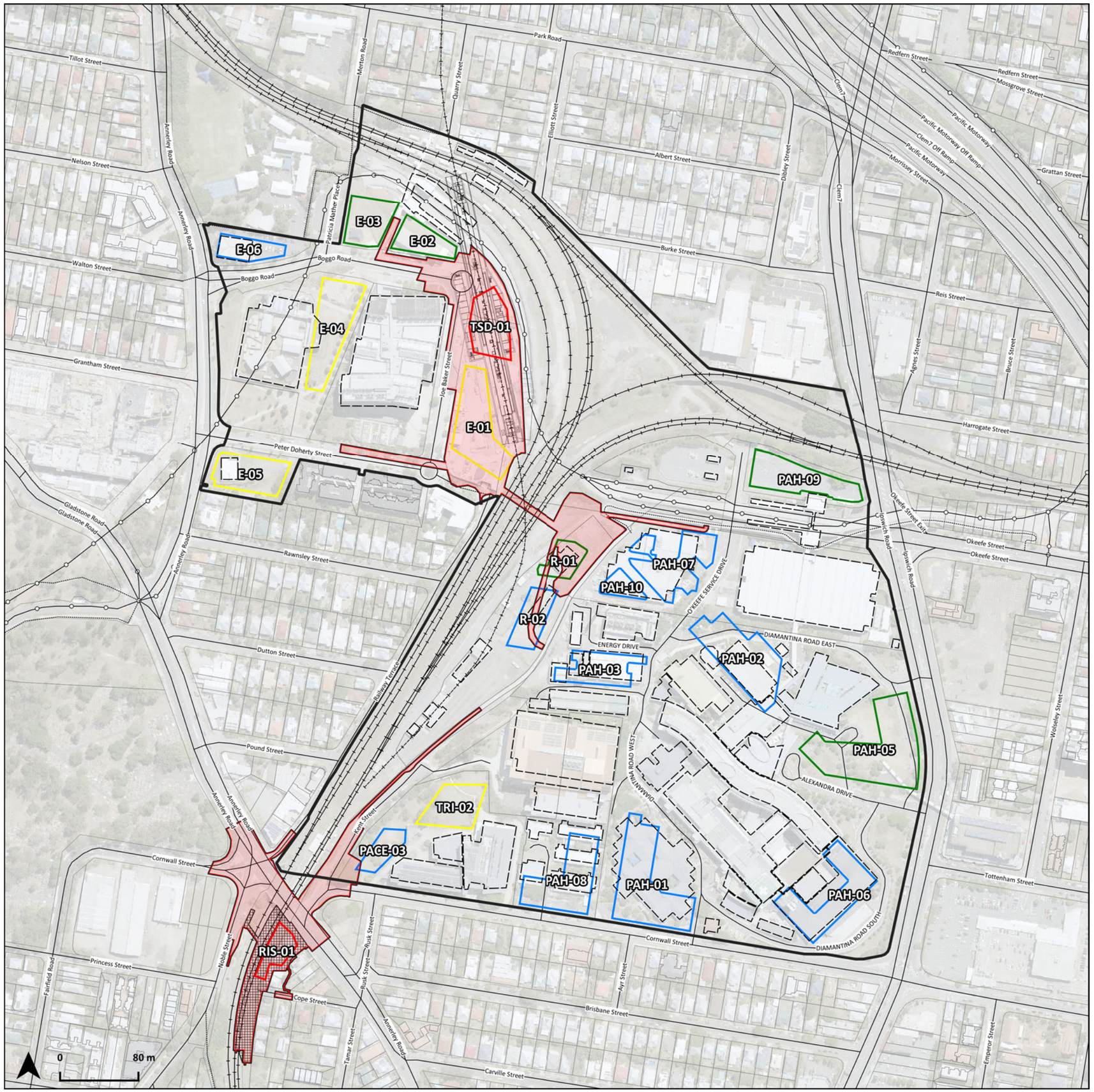
- Boggo Road CRR PDA Boundary
- CRR TSD and CRR RIS Delivery Area

PDA - Development Sites (by Stage & Year) (Indicative Only)
- Stage 1 (TSD & RIS) (2020 - 2025)
- Stage 2 (2025 - 2026)
- Stage 3 (2027 - 2031)
- Stage 4 (2032 - 2041)
- Existing Buildings

Transport - Road, Transit
- Road
- Busways
- Tracks, Paths & Malls

Existing Rail
- Operational
- CRR Alignment
- CRR TSD Boggo Road Station
- CRR RIS Dutton Park Station

Property - DCDB
- Base Lot



NOTE:
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Data Sources
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CROSSRIVERRAIL

Boggo Road Cross River Rail Priority Development Area
Future Infrastructure Network Plan
Roads and Public Transport - Stage 3 (2027 - 2031) (Indicative)

Legend

- Boggo Road CRR PDA Boundary
- CRR TSD and CRR RIS Delivery Area

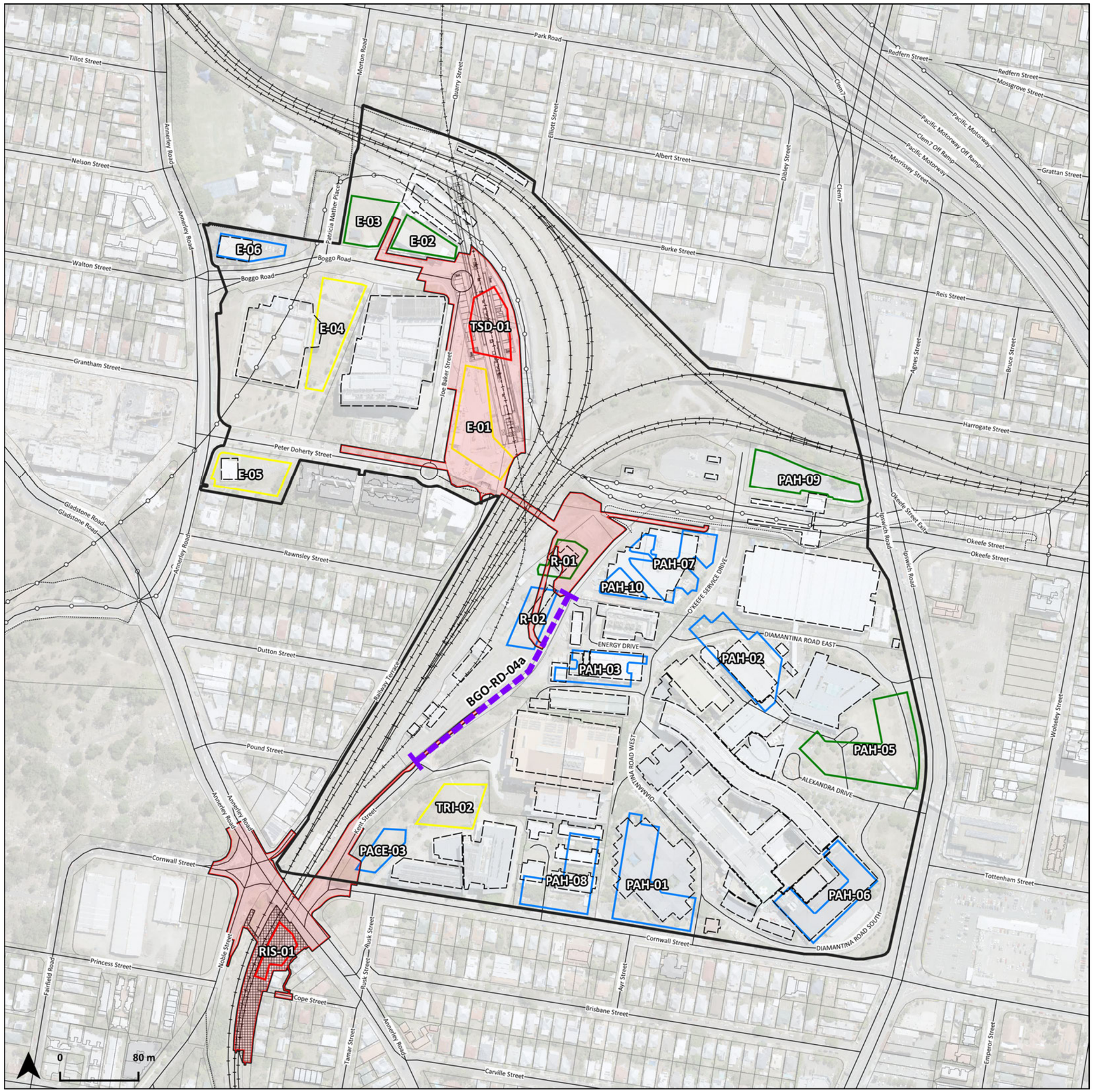
Road Projects (Stage 3)
- Road Corridor (Stage 3)

PDA - Development Sites (by Stage & Year) (Indicative Only)
- Stage 1 (TSD & RIS) (2020 - 2025)
- Stage 2 (2025 - 2026)
- Stage 3 (2027 - 2031)
- Stage 4 (2032 - 2041)
- Existing Buildings

Transport - Road, Transit
- Road
- Busways
- Tracks, Paths & Malls

Existing Rail
- Operational
- CRR Alignment
- CRR TSD Boggo Road Station
- CRR RIS Dutton Park Station

Property - DCDB
- Base Lot



NOTE:
Future PDA potential development opportunity sites and staging are conceptual and indicative only for infrastructure network analysis purposes.

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CROSSRIVERRAIL

Boggo Road Cross River Rail Priority Development Area
Future Infrastructure Network Plan
Roads and Public Transport - Stage 4 (2032 - 2041 / Ultimate) (Indicative)

Legend

- Boggo Road CRR PDA Boundary
- CRR TSD and CRR RIS Delivery Area

Road Projects (Stage 4)

- Road Intersection Upgrade (Stage 4)
- Road Corridor (Stage 4)

PDA - Development Sites (by Stage & Year) (Indicative Only)

- Stage 1 (TSD & RIS) (2020 - 2025)
- Stage 2 (2025 - 2026)
- Stage 3 (2027 - 2031)
- Stage 4 (2032 - 2041)
- Existing Buildings

Transport - Road, Transit

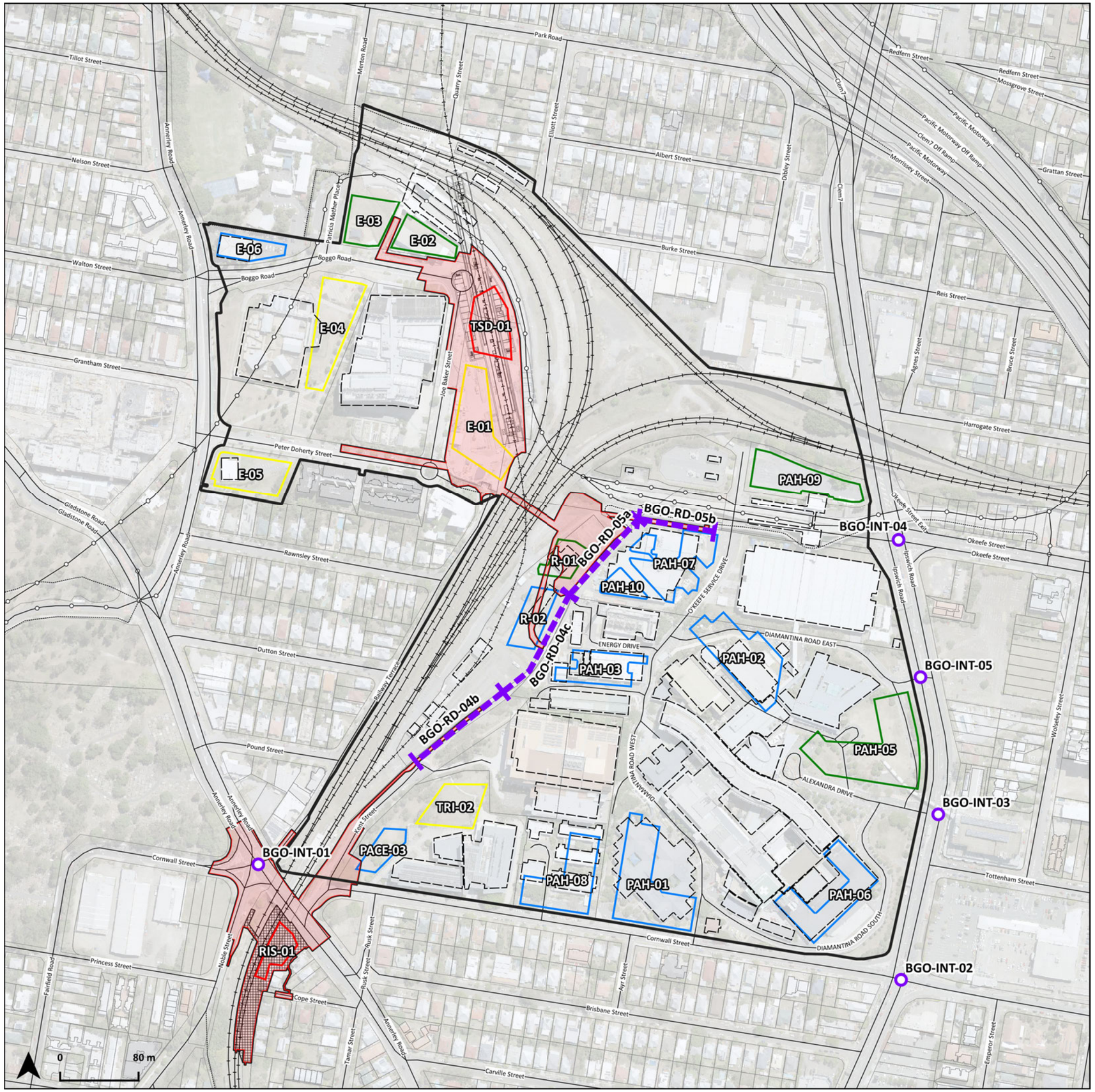
- Road
- Busways
- Tracks, Paths & Malls

Existing Rail

- Operational
- CRR Alignment
- CRR TSD Boggo Road Station
- CRR RIS Dutton Park Station

Property - DCDB

- Base Lot



NOTE:
Future PDA potential development opportunity sites and staging are conceptual and indicative only for infrastructure network analysis purposes.

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Data Sources
QLD Government 2021, Brisbane City Council 2021, Urban Utilities 2020

CROSSRIVERRAIL

Boggo Road Cross River Rail Priority Development Area
Future Infrastructure Network Plan
Wastewater Infrastructure

Legend

- Boggo Road CRR PDA Boundary
- CRR TSD and CRR RIS Delivery Area

Wastewater Projects

Wastewater Projects (All Stages)
- Wastewater Project Alignment

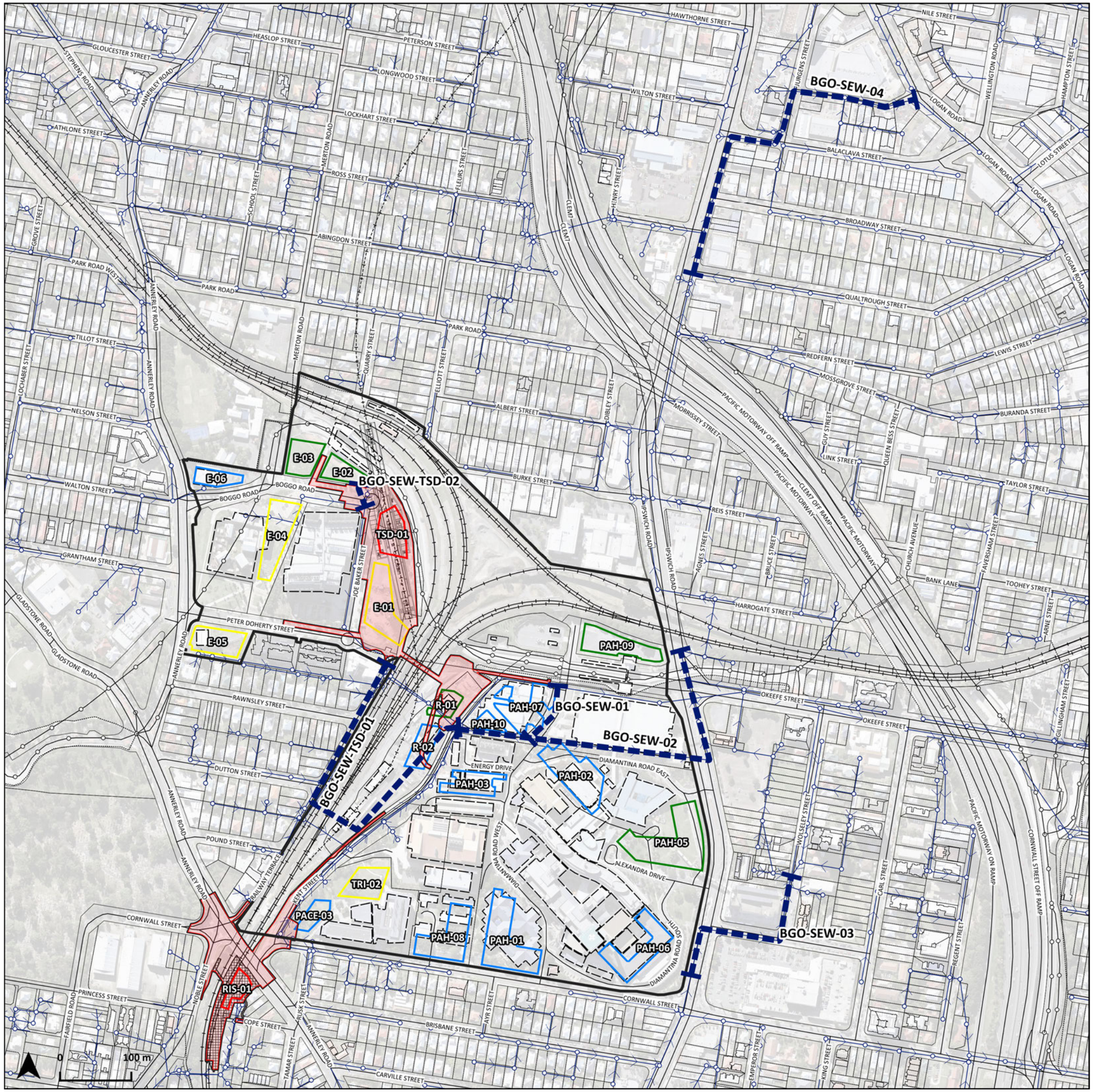
PDA - Development Sites (by Stage & Year) (Indicative Only)
- Stage 1 (TSD & RIS) (2020 - 2025)
- Stage 2 (2025 - 2026)
- Stage 3 (2027 - 2031)
- Stage 4 (2032 - 2041)
- Buildings | Existing Buildings

Wastewater
- Wastewater | Existing Manhole (Urban Utilities)
- Wastewater | Existing Gravity Main (Urban Utilities)

Transport - Road, Transit
- Road
- Busways
- Tracks, Paths & Malls

Transport - Rail
- Operational
- Under Construction
- CRR TSD Boggo Road Station
- CRR RIS Dutton Park Station

Property - DCDB
- Base Parcels



NOTE:
Future PDA potential development opportunity sites and staging are conceptual and indicative only for infrastructure network analysis purposes.

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Data Sources
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CROSSRIVERRAIL

Boggo Road Cross River Rail Priority Development Area
Future Infrastructure Network Plan
Water Supply Infrastructure

Legend

- Boggo Road CRR PDA Boundary
- CRR TSD and CRR RIS Delivery Area

Water Projects

Water Projects (All Stages)
- Water Project Alignment

Water Supply | Existing Node (Urban Utilities)
- Meter
- Valve
- Hydrant
- Water Supply | Existing Pressure Main (Urban Utilities)

PDA - Development Sites (by Stage & Year) (Indicative Only)
- Stage 1 (TSD & RIS) (2020 - 2025)
- Stage 2 (2025 - 2026)
- Stage 3 (2027 - 2031)
- Stage 4 (2032 - 2041)
- Existing Buildings

Transport - Road, Transit
- Road
- Busways
- Tracks, Paths & Malls

Transport - Rail
- Operational
- Under Construction
- CRR TSD Boggo Road Station
- CRR RIS Dutton Park Station

Property - DCDB
- Base Parcels

NOTE:
Future PDA potential development opportunity sites and staging are conceptual and indicative only for infrastructure network analysis purposes.

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Data Sources
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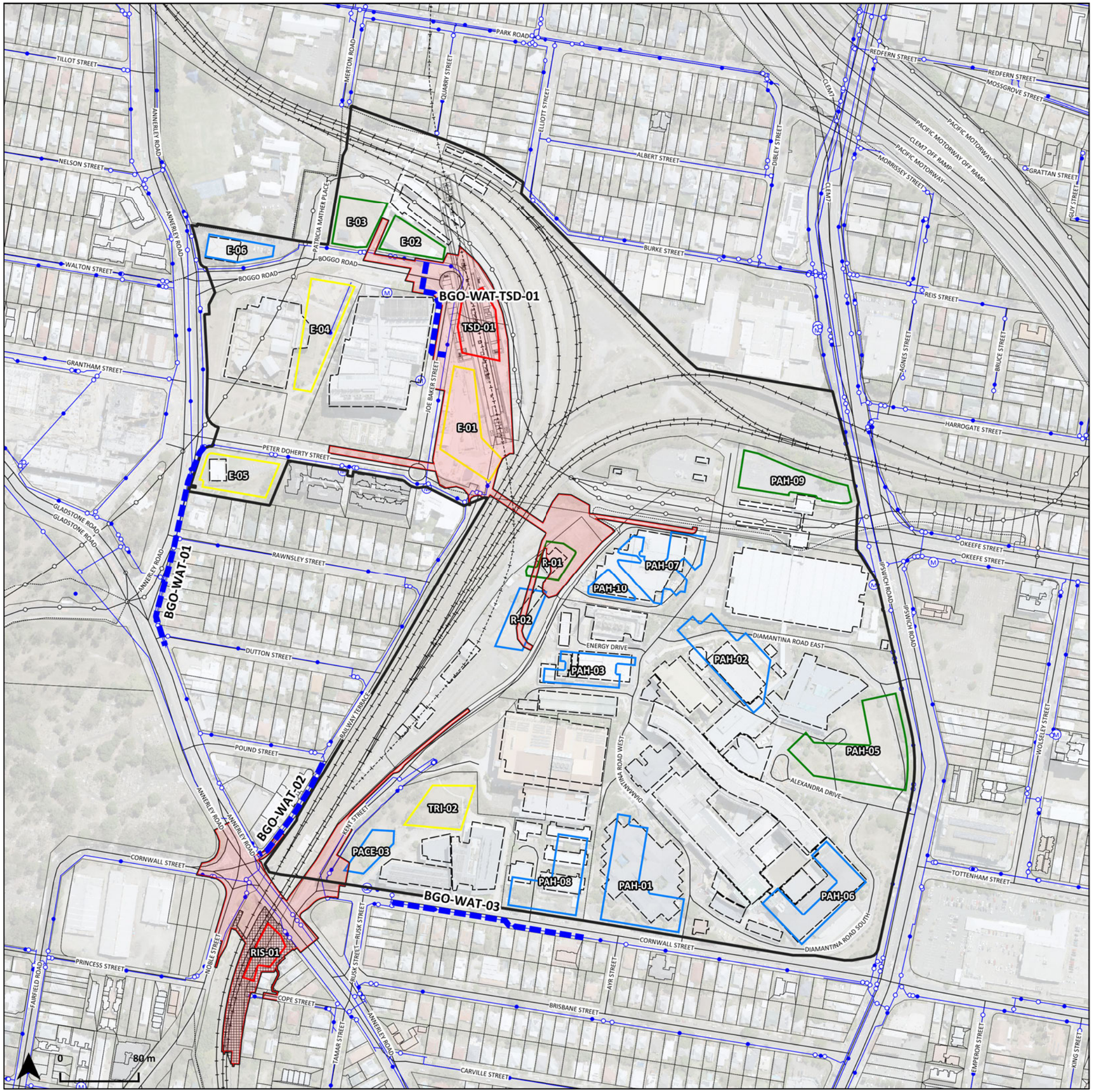

Boggo Road Cross River Rail Priority Development Area
Future Infrastructure Network Plan
Parks & Community Infrastructure

Legend

- Boggo Road CRR PDA Boundary
- CRR TSD and CRR RIS Delivery Area

Infrastructure - Project Location

- Parks & Community Infrastructure
- Temporary Outlook Park

PDA - Development Sites (by Stage & Year) (Indicative Only)

- Stage 1 (TSD & RIS) (2020 - 2025)
- Stage 2 (2025 - 2026)
- Stage 3 (2027 - 2031)
- Stage 4 (2032 - 2041)

Infrastructure - Parks - Existing Parks (by Trunk Type)

- Recreation (urban) - District / Metropolitan
- Existing Park - embelishment enhancements
- Recreation (urban) - Local

Transport - Road, Transit

- Road
- Busways
- Tracks, Paths & Malls

Transport - Rail

- Operational
- Under Construction
- CRR TSD Boggo Road Station
- CRR RIS Dutton Park Station

Property - DCDB

- Base Lot
- Easements etc

Key	Project No	Description
1	BGO-PP-01	Potential New Urban Commons within PAH (Location Indicative)
2	BGO-CF-01	Potential repurposing of Boggo Road Gaol for community uses
3	BGO-PL-01	Boggo Road CRR Station Plaza (by CRR TSD)
4a	BGO-PP-02 (A)	Potential Outlook Park Opportunity Area (approx. 2100m² (26.6% land area) of 7876m² will be required for delivery) OR
4b	BGO-PP-02 (B)	Potential Outlook Park Opportunity Area (approx. 2100m² (18.3% land area) of 11460m² will be required for delivery)
5	BGO-PP-03	Existing Boggo Road Gaol Park, only future embellishments proposed
6	BGO-PP-04	Landscape Amenity Area (Non-Trunk) (by CRR TSD)

BGO-PP-02 (A) and BGO-PP-02 (B) represent indicative locations for one (1) replacement park to be provided. Section 2.6.1 Connectivity, access and public realm provision 10 of the draft proposed Boggo Road Development Scheme requires the first stage of development within the Outlook Park opportunity area to provide a new permanent Outlook Park.

DRAFT - Not government policy

NOTE:
Future PDA potential development opportunity sites and staging are conceptual and indicative only for infrastructure network analysis purposes.

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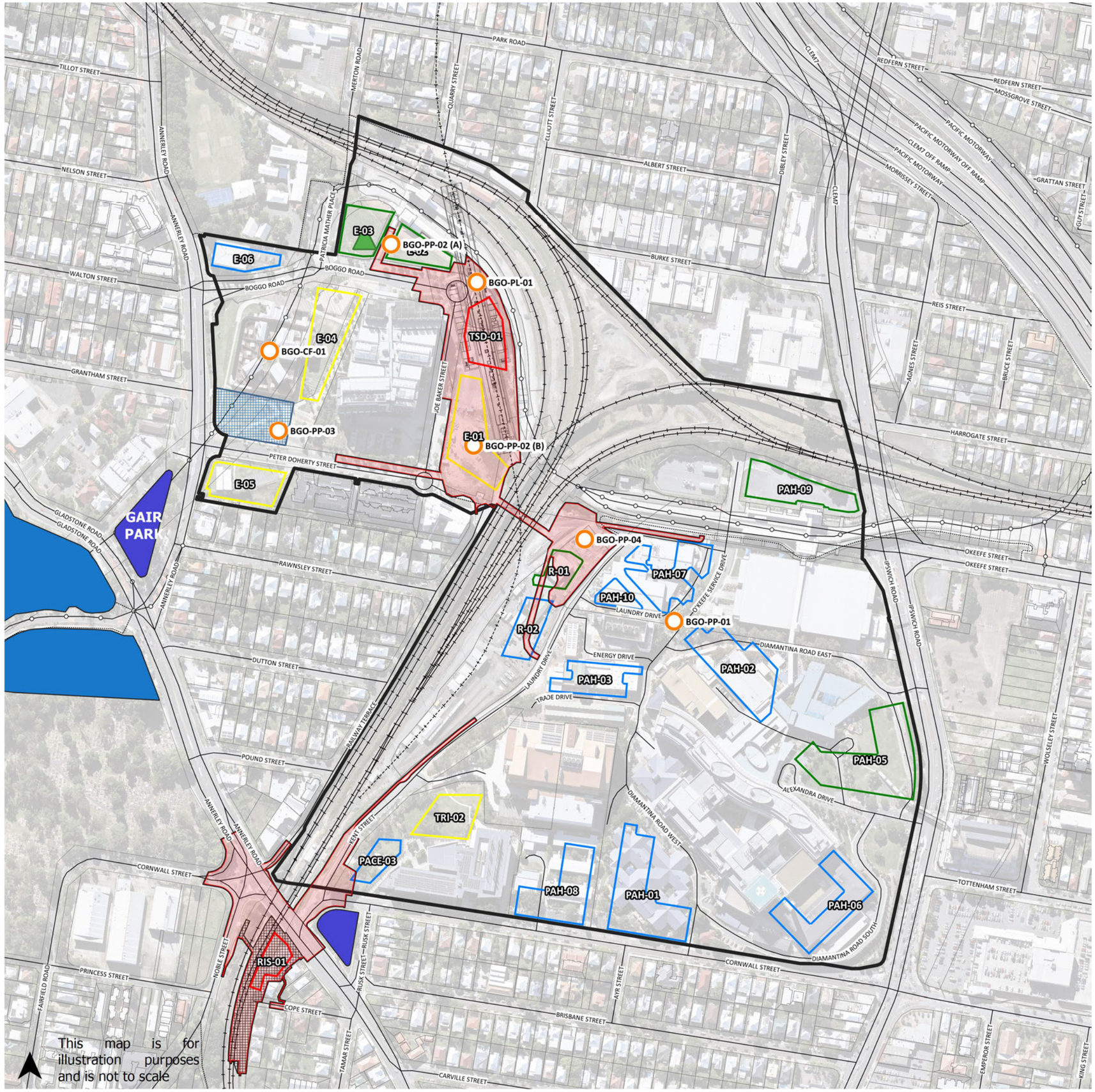


Boggo Road Cross River Rail Priority Development Area
Future Infrastructure Network Plan
Stormwater Infrastructure

Legend

- Boggo Road CRR PDA Boundary
- CRR TSD and CRR RIS Delivery Area

PDA - Development Sites (by Stage & Year) (Indicative Only)
- Stage 1 (TSD & RIS) (2020 - 2025)
- Stage 2 (2025 - 2026)
- Stage 3 (2027 - 2031)
- Stage 4 (2032 - 2041)
- Existing Buildings

Stormwater Projects

Stormwater Projects (All Stages)
- Stormwater Project Alignment

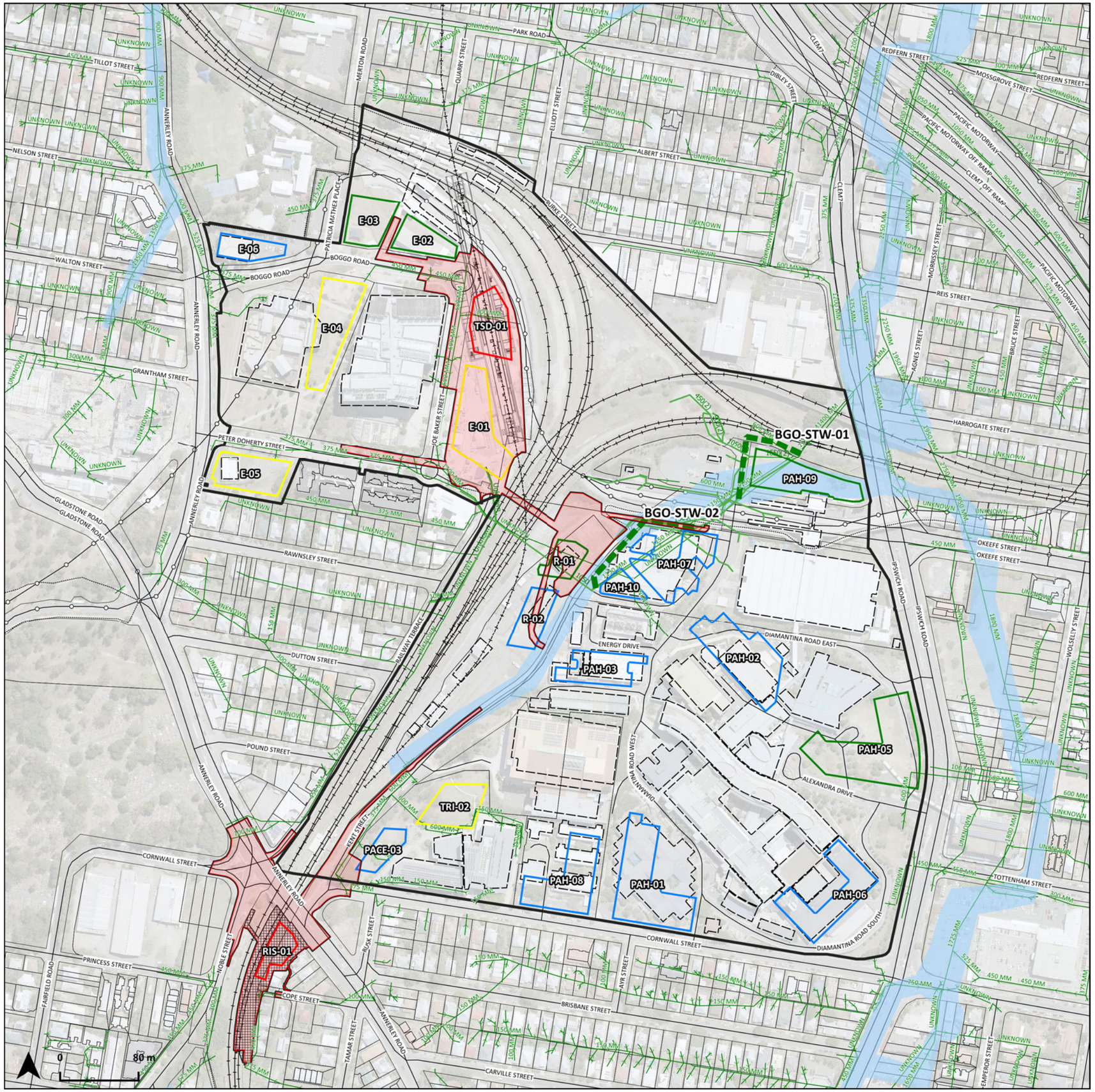
Known Stormwater Layout - Pipes
- Drainage
- Open Channel
- Pump Station

Flood Overlays
- overlays BCC flood plan overland flow
- Stormwater | Existing Pipe (BCC)

Transport - Road, Transit
- Road
- Busways
- Tracks, Paths & Malls

Transport - Rail
- Operational
- Under Construction
- CRR Alignment
- CRR TSD Boggo Road Station
- CRR RIS Dutton Park Station

Property - DCDB
- Base Parcels



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