

MAY 2024

INTERIM INFRASTRUCTURE PLAN BACKGROUND REPORT

WOOLLOONGABBA PRIORITY DEVELOPMENT AREA



Economic Development Queensland

Creating and investing in sustainable places for Queensland to prosper



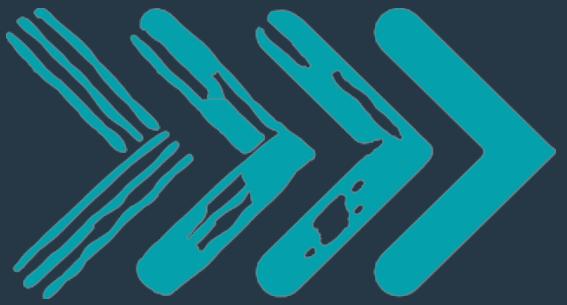
**Queensland
Government**



NOT GOVERNMENT POLICY – FOR INFORMATION ONLY

Conceptual only – not final

Image source: Cross River Rail Delivery Authority



COPYRIGHT

This publication is protected by the Copyright Act 1968.

CREATIVE COMMONS LICENCE

This work, except as identified below, is licensed by the Department of State Development and Infrastructure under a Creative Commons Attribution (CC BY) 4.0 Australia licence. To view a copy of this licence, visit: <http://creativecommons.org.au/> You are free to copy, communicate and adapt this publication, as long as you attribute it as follows:

© State of Queensland, The Department of State Development and Infrastructure, 2024.

Third party material that is not licensed under a Creative Commons licence is referenced within this document. All content not licensed under a Creative Commons licence is all rights reserved.

Please contact the Department of State Development and Infrastructure / the copyright owner if you wish to use this material.

TRANSLATING AND INTERPRETING SERVICE

The Queensland Government is committed to providing accessible services to Queenslanders of all cultural and linguistic backgrounds. If you have difficulty understanding this publication and need a translator, please call the Translating and Interpreting Service (TIS National) on 13 14 50 and ask them to contact the Department of State Development and Infrastructure on 07 3328 4811.

DISCLAIMER

While every care has been taken in preparing this publication, to the extent permitted by law, the State of Queensland accepts no responsibility and disclaims all liability (including without limitation, liability in negligence) for all expenses, losses (including direct and indirect loss), damages and costs incurred as a result of decisions or actions taken as a result of any data, information, statement or advice, expressed or implied, contained within. To the best of our knowledge, the content was correct at the time of publishing.

Any references to legislation are not an interpretation of the law. They are to be used as a guide only. The information in this publication is general and does not take into account individual circumstances or situations. Where appropriate, independent legal advice should be sought.

Copies of this publication are available on our website at www.edq.qld.gov.au and further copies are available upon request.

CONTACT US

Phone: +61 7 3328 4811 or 13 QGOV (13 74 68)

Email: edq@dsdilgp.qld.gov.au

Web: www.edq.qld.gov.au

Post: GPO Box 2202, Brisbane, Queensland 4001

Address: 1 William Street, Brisbane 4000

Image source: Queensland Government

Front cover image source: Cross River Rail Delivery Authority



CONTENTS

1	Background	5
1.1	Woolloongabba Priority Development Area (PDA)	5
1.2	Purpose of the Interim Infrastructure Planning Background Report	5
2	Baseline report summaries	7
2.1	Water supply	7
2.2	Sewerage	10
2.3	Stormwater	14
2.4	Transport	18
2.5	Social infrastructure	22
2.6	Electrical	41
2.7	Communications	44
2.8	Gas	46
3	Growth projections	47
3.1	Introduction	47
3.2	Growth projection years	47
3.3	Potential development capacity	47
3.4	Development constraints	47
3.5	Growth rates	47
3.6	Growth projections summary	48
4	Demand projections	49
5	Desired Standards of Service (DSS)	50
5.1	Water supply	50
5.2	Sewerage	50
5.3	Stormwater	50
5.4	Transport	50
5.5	Social infrastructure	50
6	Infrastructure planning	52
6.1	Purpose	52
6.2	Planning Horizon	52
6.3	Water Supply	52
6.4	Sewerage	55
6.5	Stormwater	57
6.6	Transport	73
6.7	Social infrastructure	78
7	Infrastructure summary and categories	83
7.1	Infrastructure categories	83
8	Interim infrastructure charges, funding and condition	89
Appendix A	PDA Boundary	90





Appendix B	Development Yields	91
Appendix C	Demand generation rates.....	94
Appendix D	Demand projections	95





1 Background

1.1 Woolloongabba Priority Development Area (PDA)

The Woolloongabba PDA was declared by a regulation on 22 September 2023 and the Woolloongabba PDA Interim Land Use Plan (ILUP) came into effect. It comprises an area of approximately 106 hectares and is identified in Appendix A. The Woolloongabba PDA is located approximately 1.5 kilometres south-east of Brisbane's CBD. The Woolloongabba PDA provides critical city-significant connections with other inner-city destinations including South Bank, Kangaroo Point and the Boggo Road Cross River Rail (CRR) PDA.

The Woolloongabba PDA spans the suburbs of Woolloongabba and parts of Kangaroo Point, East Brisbane, and South Brisbane. In part, this is due to the significant regional road corridors which traverse the Woolloongabba PDA, including the Pacific Motorway, Vulture and Stanley Streets, currently prioritising vehicular movement, limiting the amenity and comfort of active travel options.

The mix of uses will be aligned with the investment in infrastructure in the locality. Development will improve the visitor experience during events at the Gabba stadium and provide for easy community access to the Woolloongabba CRR and Woolloongabba Busway Stations. Access to the area by public transport, walking and cycling will be prioritised over private vehicles.

From the date of gazettal, the Development Scheme for the PDA will replace the Interim Land Use Plan (ILUP) which commenced upon declaration of the Woolloongabba PDA.

The proposed development scheme (known as 'The Woolloongabba Plan') consists of the following:

1. a land use plan that regulates development in the PDA
2. an infrastructure plan that describes infrastructure required to support achievement of the land use plan
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.

To accompany the proposed development scheme, the Woolloongabba PDA Development Charges and Offsets Plan (DCOP) is currently being prepared to provide 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 will provide EDQ with 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 Woolloongabba PDA to 2066. The DCOP will also set out matters relevant to calculating development charges, credits, offsets and refunds for the provision of trunk infrastructure.

1.2 Purpose of the Interim Infrastructure Planning Background Report

As with all PDAs, the funding and delivery of infrastructure will be critical to achieving the vision of the Gabba as a vibrant and destination and focal point for Brisbane's inner south as a place to live, work, play, learn, and stay. PDAs are therefore underpinned by Development Charges and Offsets Plans (DCOPs) which provide a comprehensive analysis of the trunk infrastructure network planning to service development assumptions and aspirations over time, relevant development charges, how these charges are calculated, levied and administered.

With the proposed development scheme for the Woolloongabba PDA now completed, a DCOP for the PDA is being prepared. The DCOP will be a policy document which is intended to provide guidance to the MEDQ on infrastructure matters for a development and states the following:

- the Development Charge for the provision of Trunk Infrastructure for the following networks:
 - Water supply
 - Sewerage





- Transport
- Parks and open space
- Community facilities
- the Trunk Infrastructure plans and schedules of works, and
- matters relevant to calculating a credit, offset or refund for the provision of Trunk Infrastructure.

Development Charges will contribute to funding the cost of Trunk Infrastructure that is proposed to service development within the PDA.

This Interim Infrastructure Planning Background Report (IIPBR) documents the analysis and preliminary findings and directions for each of the above networks, informing the preparation of the Proposed Development Scheme Infrastructure Plan, and framing the detailed analysis and planning to complete a final IPBR and DCOP for the Woolloongabba PDA. The initial findings within this report will form the basis for consultation with key stakeholders over the coming months to finalise planning assumptions and costs over the life of the PDA, and to deliver a charging and offsets framework to service the delivery of the PDA.

Planning has not currently progressed to determination of trunk/non-trunk infrastructure components. However, Section 5 of this report outlines the Desired Standards of Service (DSS) for infrastructure typically applied in this process. 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 Woolloongabba PDA and will be tested and further refined as part of the planning process ahead.

The Interim IPBR does not address financial sustainability, development charges, and the process of determining charges. These aspects will be addressed as part of the forthcoming Development Charges and Offset Plan (DCOP) that will undergo a separate public consultation process following finalisation of The Woolloongabba Plan.





2 Baseline report summaries

2.1 Water supply

2.1.1 Service providers

Urban Utilities (UU) is the service provider for water supply infrastructure in the Woolloongabba PDA. There are no Seqwater assets in the vicinity of the Woolloongabba PDA. Internal water services and reticulation (e.g., private internal water reticulation at the CRR development site and The Gabba) were not included in the scope for the baseline report.

2.1.2 Information sources

Information relating to the existing water infrastructure assets was obtained from UU.

2.1.3 Asset hierarchy

For the baseline reporting investigation, the following definitions applied:

- Trunk infrastructure:
 - Reservoirs, water pump stations, water boosters and water treatment plants
 - Water pressure mains defined as trunk in the UU GIS dataset, and significant appurtenances connected to these pipelines (typically >DN300, however this is dependent on the service area).
- Non-trunk infrastructure:
 - All other water supply infrastructure.

2.1.4 Existing infrastructure

Woolloongabba PDA is located entirely within the Tarragindi Water Supply Zone (TWSZ), refer Figure 1. Population changes are anticipated within the Woolloongabba PDA and the Kurilpa Sustainable Growth precinct (KSGP) located in the Highgate Hill Water Reservoir Zone (HWRZ) adjacent and, it is anticipated this will result in changes to the current zone boundaries, zone feed points and supply reservoir sources. Anticipated changes include a TWSZ two-way feed between the HWRZ and TWSZ in South Brisbane. So far, these possible changes have not been assessed.



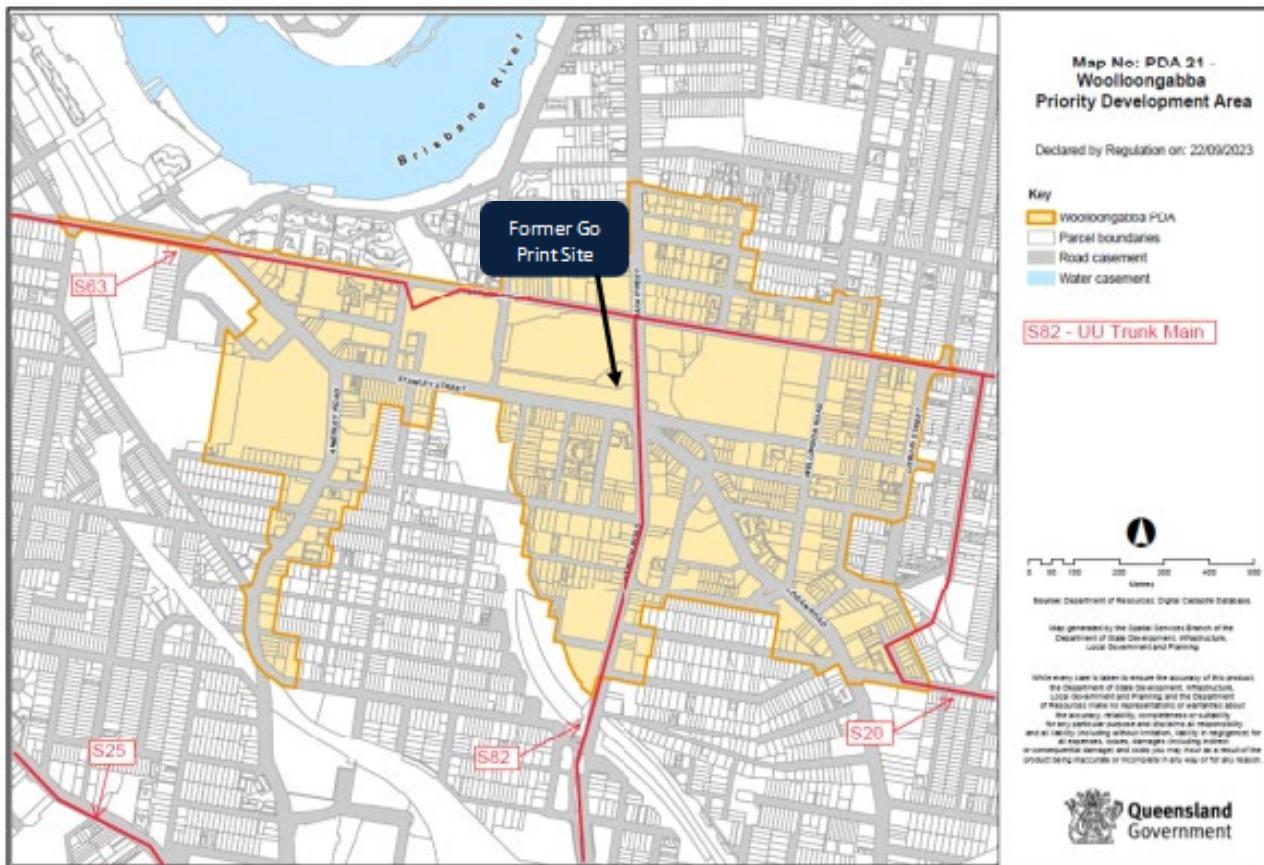


Figure 1: Woolloongabba PDA boundary with UU trunk mains overlaid in red

2.1.5 Reservoir storage

Tarragindi Reservoir currently has spare capacity (refer Table 1). The TWSZ supplies water to the Highgate Hill reservoir. Highgate Hill Reservoir has inadequate storage capacity to service its supply zone currently (refer Table 1). It is currently being supplemented with water from Green Hill Reservoir during periods of high demand.

Table 1: Reservoir storage capacity vs current demand

Reservoir	Highgate Hill	Tarragindi
Capacity (ML)	9	62
Planning Horizon	Required Capacity (ML)	
2021	15.5	47.4
2026	18	48.9

2.1.6 Trunk mains

Demand in the Woolloongabba PDA is supplied through Trunk Mains S25, S82, S20, and the local network. All three trunk mains are interconnected by S63 running east/west along Vulture Street connecting with them at their downstream ends. UU has advised based on preliminary forecasted Woolloongabba PDA population figures there will be negligible performance differences in the trunk main network compared to current planning population projections at year 2036.





It is noted there are sections of S25 and S82 that are experiencing head loss greater than the Southeast Queensland Water Supply and Sewerage Design and Construction Code (SEQCode) specified design limit of 3m/km for pipes equal to 200mm diameter or greater (refer Figure 2.) This was also confirmed by computer hydraulic modelling undertaken during the Boggo Road CRR PDA water investigations.

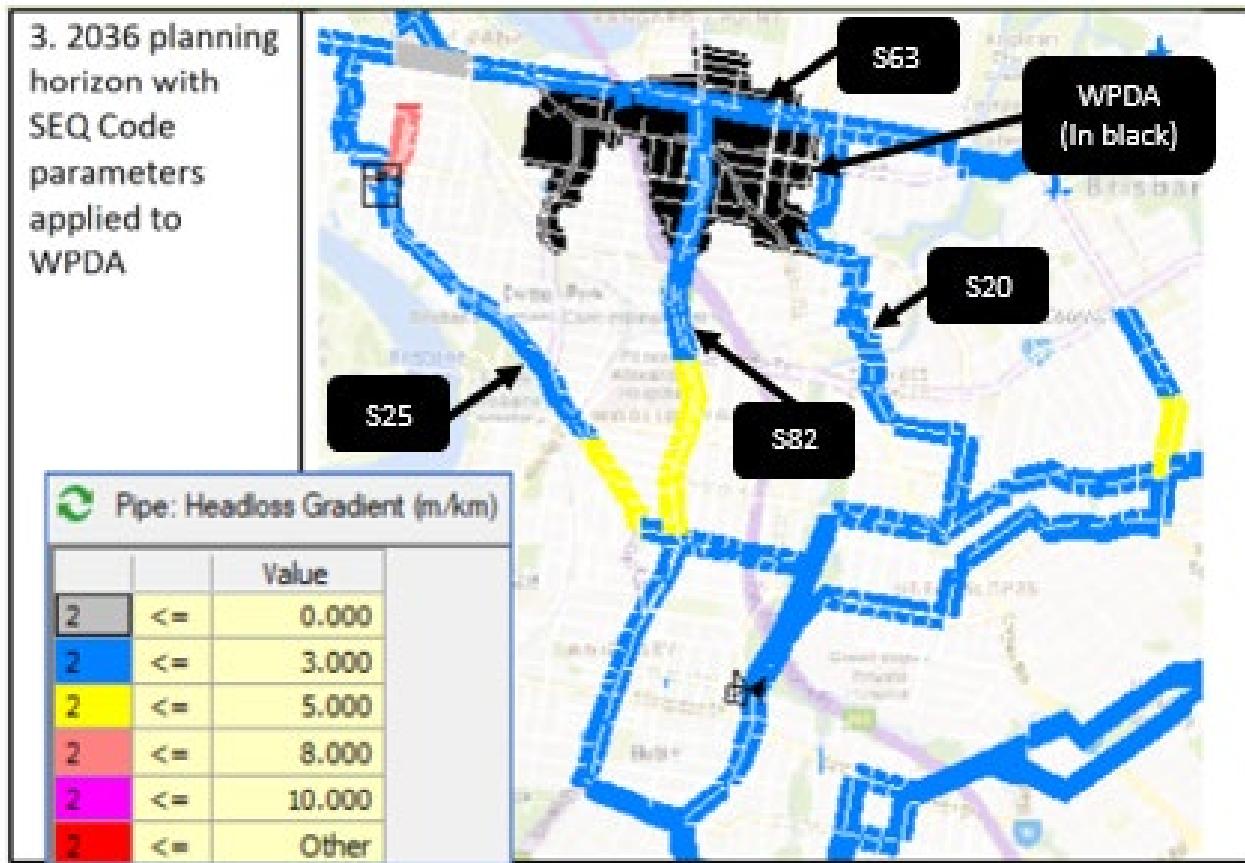


Figure 2: Trunk main head loss performance at year 2036 (>300mm mains shown)

The network is currently performing adequately within the Woolloongabba PDA. Previously supplied flow pressure data from UU pertaining to mains located immediately surrounding the former Go Print development site (refer Figure 1) indicate there was good pressure and high fire flows available in the immediate area. Additional demand may require upgrades to the local trunk and reticulation mains dependant on location, main size, and development density.

UU uses an Integrated Zone Planning (IZP) approach which is a circular, more holistic, and iterative method for evaluating water networks within their service territory. It primarily concentrates on the upcoming ten-year period, employing an adaptive planning approach for infrastructure needs that extend beyond this timeframe. Consequently, the enhancements outlined in Table 2 below are confined to the next decade only.





Table 2: Current Z1 Wellers Hill IZP Capital Plan 2023-2033

Capital Intervention	Description	Delivery Date
DM04 – DMA012-TAR-G/P Highgate Hill rezone	New zone feeds from TWSZ to HWSZ	FY2025
DM05 – DMA – TAR – G/P Norman Park	New zone feeds from Wellers Hill to TWSZ	FY2033
WTRG014 Montague Road Trunk main Augmentation – Stage 2	Refer Netserv	FY2027
FP – TRR – 0112 to FP – TRR – 0116	Refer Netserv	TBC (Cancelled)

2.1.7 Water main age

It has been identified that trunk mains S82 and S63 are more than 100 years old and are made of Cast Iron, however parts of S63 have been replaced over time. Also identified are areas of 80mm Cast Iron reticulation mains that are more than 100 years old. While past their design life, UU will generally only replace them when they become unserviceable due to repeated failure or capacity has been exceeded.

It is expected the trunk mains made of Cast Iron will be replaced by UU over time as main failures become frequent or demand requires upgrade of mains. Depending on location and Woolloongabba PDA demand impacts, parts of these future upgrades may need to be brought forward and facilitated by EDQ (they may be conditioned and delivered/built by developers).

With regards to the 80mm Cast Iron reticulation mains, they are generally limited in fire flow capacity. As higher density developments occur in the area, these mains will be upgraded to meet the minimum required design fire flow requirements for development. These main upgrades will be generally constructed and funded by developers at the time of development.

2.2 Sewerage

2.2.1 Service providers

UU is the service provider for water supply infrastructure in the Woolloongabba PDA. Internal sewerage services and reticulation of any development were not included in the scope of the baseline report.

2.2.2 Information sources

Information relating to the existing sewer infrastructure assets was obtained from a variety of UU sources.

2.2.3 Asset hierarchy

For the baseline reporting investigation, the following definitions applied:

- Trunk infrastructure:
 - Trunk diameter sewage gravity mains as defined in the UU GIS network dataset (typically greater than 300mm in diameter)
 - Sewage rising main
 - Sewage pump stations (SPS) and sewage treatment plans (STP).
- Non-trunk infrastructure:
 - All other sewage supply infrastructure.





2.2.4 Existing infrastructure

The Woolloongabba PDA is situated entirely within the S1 (Luggage Point) sewerage scheme. The Woolloongabba PDA area drains into two separate sewer catchments. The majority drains to the Luggage Point Recovery Resource Centre via New Farm Siphon, Caswell Street Pumping station, and Eagle Farm Pumping Station (SP010) (refer Figure 3) while the remaining section along the western boundary drains west via the Hockings Street Siphon, Grey Street Pumping Station, and Eagle Farm Pumping Station (SP010) to the Luggage Point Recovery Centre (refer Figure 4).

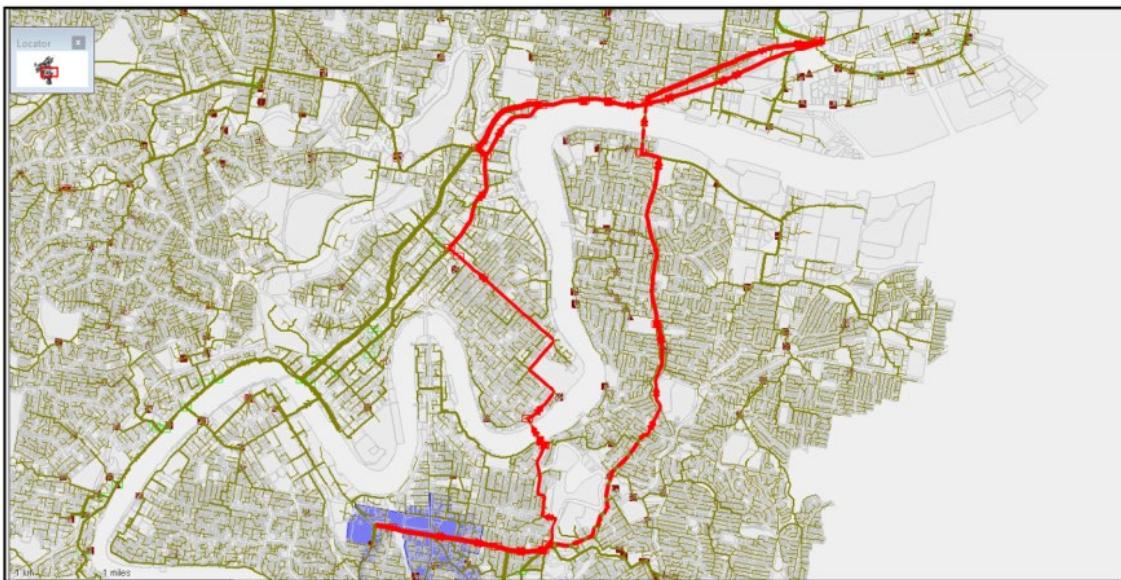


Figure 2: Woolloongabba PDA sewer drainage path (east) in red

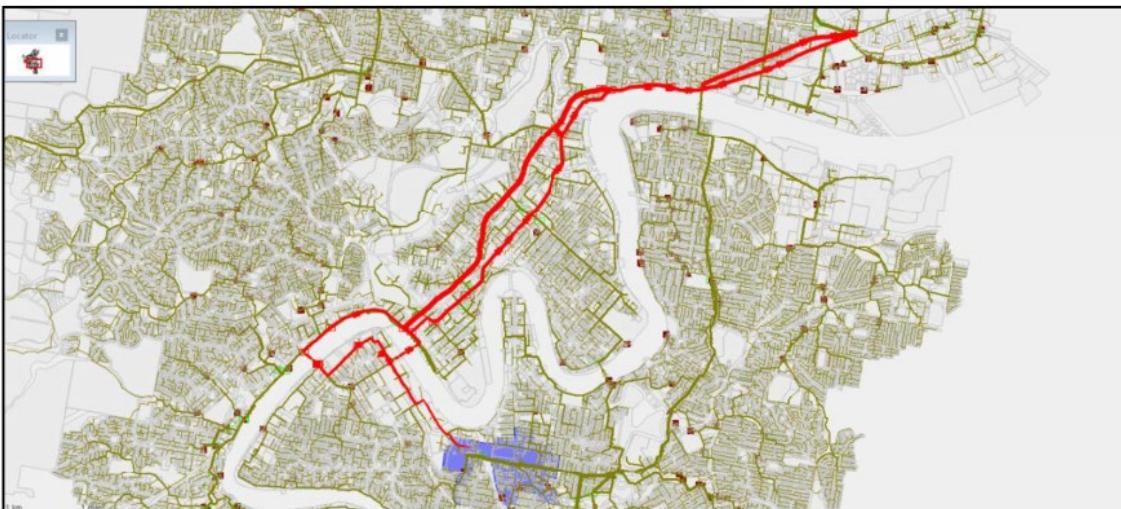


Figure 4: Woolloongabba PDA sewer drainage path (west) in red

Inside the Woolloongabba PDA there are no significant capacity limitations (refer Figure 5), and based on UU's 2016 population projection data, the current network has the capacity to accommodate the expected growth until 2031. There have however been wet weather sewage releases reported within and immediately downstream of the Woolloongabba PDA boundary. These releases caused by downstream surcharging in the network during wet weather events backing up into the sewers in the lower parts of the Woolloongabba PDA area.

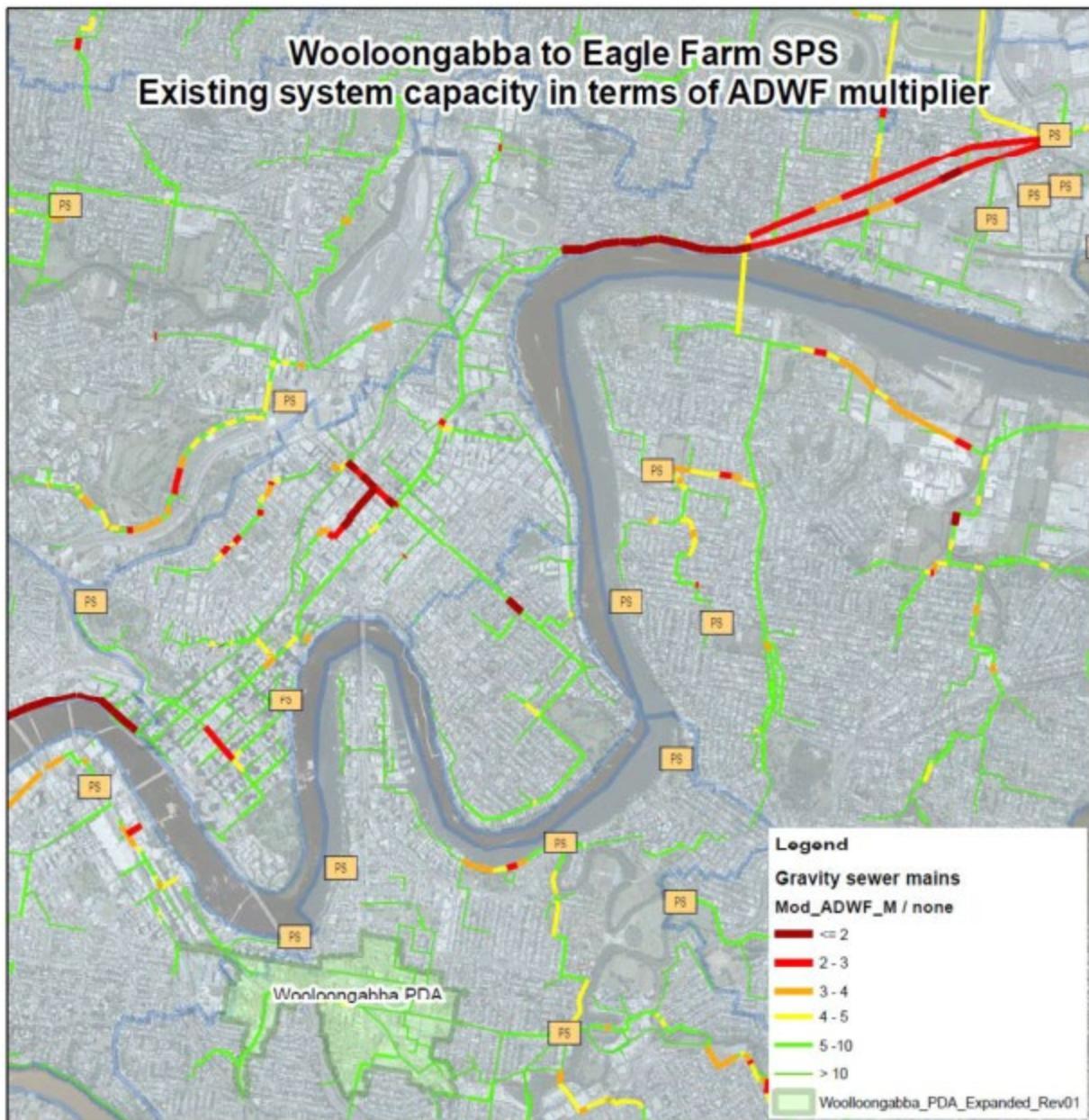


Figure 5: Woolloongabba to Eagle Farm SPS existing system capacity

Key capacity constraints identified downstream of the Woolloongabba PDA along its flow path to Luggage Point Recovery Centre include:

- Caswell Street SPS – Existing SPS is operating at about 825 L/s which is approximately 4.1xADWF
- DN600 Norman Creek gravity main from Caswell Street to new Farm siphon
- Kingsford Smith Drive single barrel DN1350 sewer from Cooksley Street to Hamilton siphon
- Norman Creek Interceptor sewer and Hamilton Siphon
- Twin Gravity sewer between Hamilton Siphon and Eagle Farm SPS
- Eagle Farm SPS
- Luggage Point Resource Recovery Centre.

Current planned augmentations over the next 10 years assessed excluding the impacts of the proposed Woolloongabba PDA and KSGP are detailed below in Table 3.



Table 3: Proposed augmentations 2022-2031

Project Reference	Project Name	Delivery Date
NCPC ICP S3	Caswell Street SP111 Upgrade – New rising main from Caswell Street PS to New Farm Siphon	2026
NCPC ICP S4	Lytton Road SPS extension	2025
STRG246	Grey Street Sewer Infrastructure Upgrade Phase 2	2024
NCPC ICP S6	Southside localised wet weather treatment facility and associated gravity sewer augmentation (location yet to be selected)	2031
KBBC ICP S3.2	Wet Weather Treatment at SP23 discharge facility	2028
KBBC ICP S6	Breakfast Creek Treatment Facility – Wet Weather Treatment Plant	2031
KBBC ICP Ex2.1	Breakfast Creek Treatment Facility – Small-scale WRP	2031
TTME014	TTME014 Luggage Point STP, Pinkenba ST018 Flare Upgrade	2024
TTMG025	TTMG025 Luggage Point STP Augmentation – Stage 2 (Bioreactor Works)	2035
TTMG031	TTMG031 Luggage Point STP Capacity Upgrade to 0.86M EP and 146.7 ML/d	2037
SPSG002	Eagle Farm SPS (SPS010) Pressure Surge Management Augmentation – System 1	2024

These augmentations are not expected to be required to be constructed by EDQ but rather works funded through collection of infrastructure charges collected by EDQ and UU from development within the catchment.





2.3 Stormwater

2.3.1 Service providers

BCC is the service provider that owns the stormwater infrastructure in the Woolloongabba PDA.

2.3.2 Information sources

Information relating to the existing stormwater infrastructure assets was obtained from a variety of data sets through BCC. This included GIS data, ASCON data, reference photography, ALS and LiDAR data, flood studies and tide tables.

2.3.3 Asset hierarchy

For the baseline reporting investigation, the following definitions applied:

- Trunk infrastructure was taken to comprise of – Natural waterways, overland flow paths, pipes greater than or equal to 900 mm in diameter, manholes and chambers on trunk mains
- Non-trunk infrastructure is taken to comprise of – all other stormwater supply infrastructure.

NOTE: QUDM defines trunk infrastructure as follows: “Trunk Infrastructure is addressed in Chapter 4 of the Planning Act and is development infrastructure identified in a local government infrastructure plan”. However, BCC does not have an exact definition in the LGIP for stormwater infrastructure. Therefore, the above definitions were developed based on the typical scale of LGIP infrastructure within the Woolloongabba PDA.

2.3.4 Existing infrastructure

A GIS model was developed from BCC's existing stormwater infrastructure GIS dataset. Only trunk stormwater infrastructure was included, as well as minor elements that related to the trunk infrastructure gully pits and connecting pipes at trapped sags along overland flow paths. The trunk stormwater infrastructure, as per the GIS model developed, is shown in Figure 6 below.

There is currently a level of uncertainty in the trunk stormwater infrastructure analysis, due to limitations in the BCC dataset. There are many invert levels, gully pits and gully pit connection pipes missing or erroneous trunk invert levels that resulted in unrealistic reverse grades or obverts above the ALS ground elevation. Furthermore, the BCC dataset may not include newly constructed stormwater infrastructure. As far as reasonably practical, the data was cleaned e.g. interpolated missing invert levels or adjusted gully pit locations based on aerial imagery.



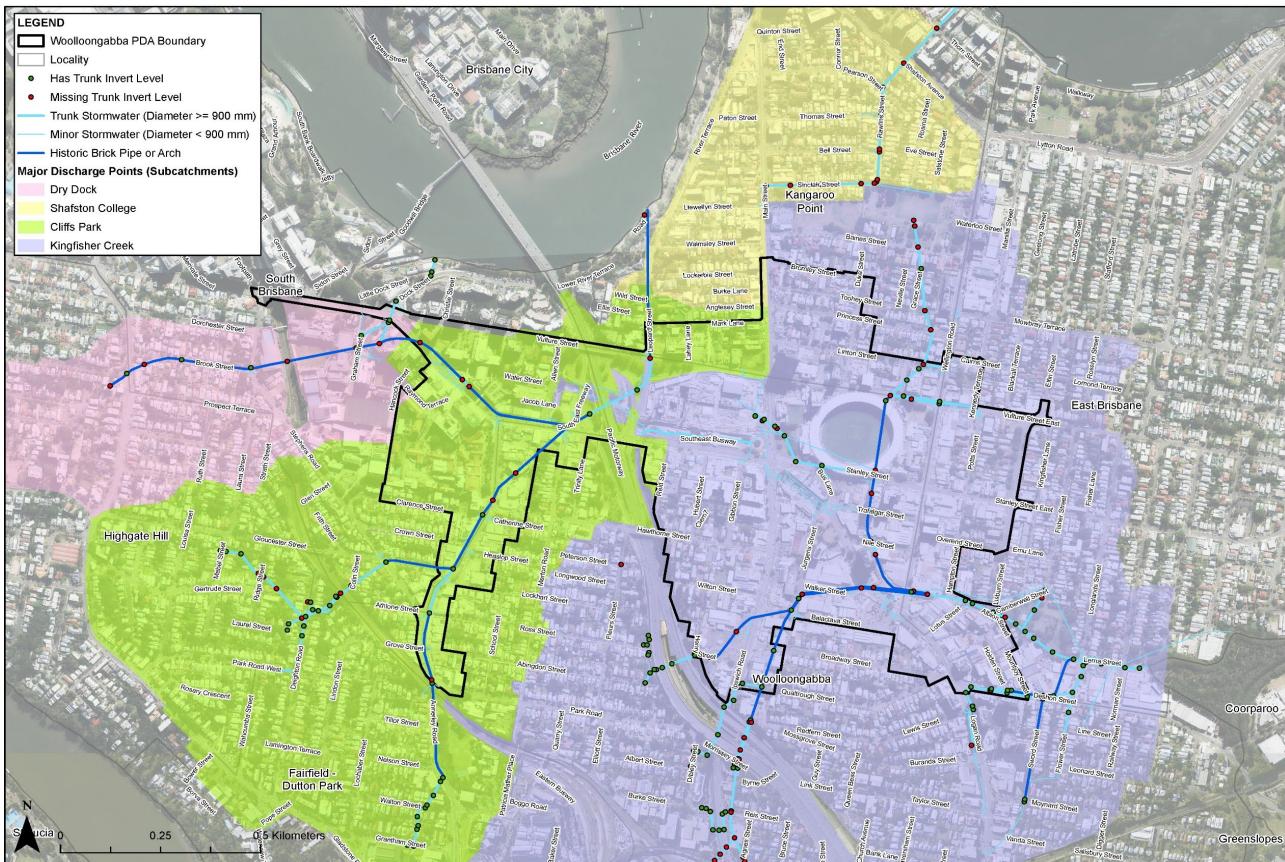


Figure 6: Woolloongabba PDA trunk stormwater infrastructure layout

In order to refine and further develop the stormwater analysis through the project it is recommended that:

- As constructed drawings be obtained for all complete or 'existing' LGIP infrastructure in the Woolloongabba PDA and for the stormwater infrastructure around the intersection of Logan Road and Trafalgar Street, where the two RCPs terminate without downstream connections
- Regarding the brick arches, confirm with BCC the 'diameter' and 'width' attributed in the GIS dataset represent and obtain any available survey of the brick arches
- Contact the Drainage Design team from the City Projects Office of BCC to get the list of upgraded relief drainage infrastructure, particularly the underground trunk drainage system.

2.3.5 Existing capacity

The existing stormwater infrastructure capacity was assessed using the 'overland flow' flood model of the Woolloongabba PDA developed by SMEC (2023). The flood model results show the minor drainage infrastructure does not meet the 10% AEP design flow serviceability standard, and as noted previously there are effectively no overland flow paths to meet the major drainage 2 % AEP design flow serviceability standard.

Additionally, a high-level assessment was undertaken using the rational method and uniform flow capacity estimates at key locations. The assessment indicates the minor drainage infrastructure can only convey 30 % to 60 % of the required 10 % AEP design flow, which roughly corresponds to 63 % AEP design flow capacity. This is consistent with the flood model results.

2.3.6 Future planned infrastructure

The reported under-capacity is consistent with prior investigations that informed the LTIP for the Woolloongabba and Kangaroo Point neighbourhoods. It therefore follows that most of the Woolloongabba PDA trunk stormwater lines are subject to relief drainage upgrades in the LTIP. However, the LTIP is only high-level and may not fully align with the immediate LGIP, which began in 2014 and will extend to 2026.



The LGIP shows substantial works have already been completed, not always in alignment with the LTIP, and there are still future infrastructure upgrades in the vicinity of Logan Road scheduled for completion by 2026. The LTIP, existing (constructed) LGIP and future (planned) LGIP stormwater GIS datasets are shown in Figure 7.

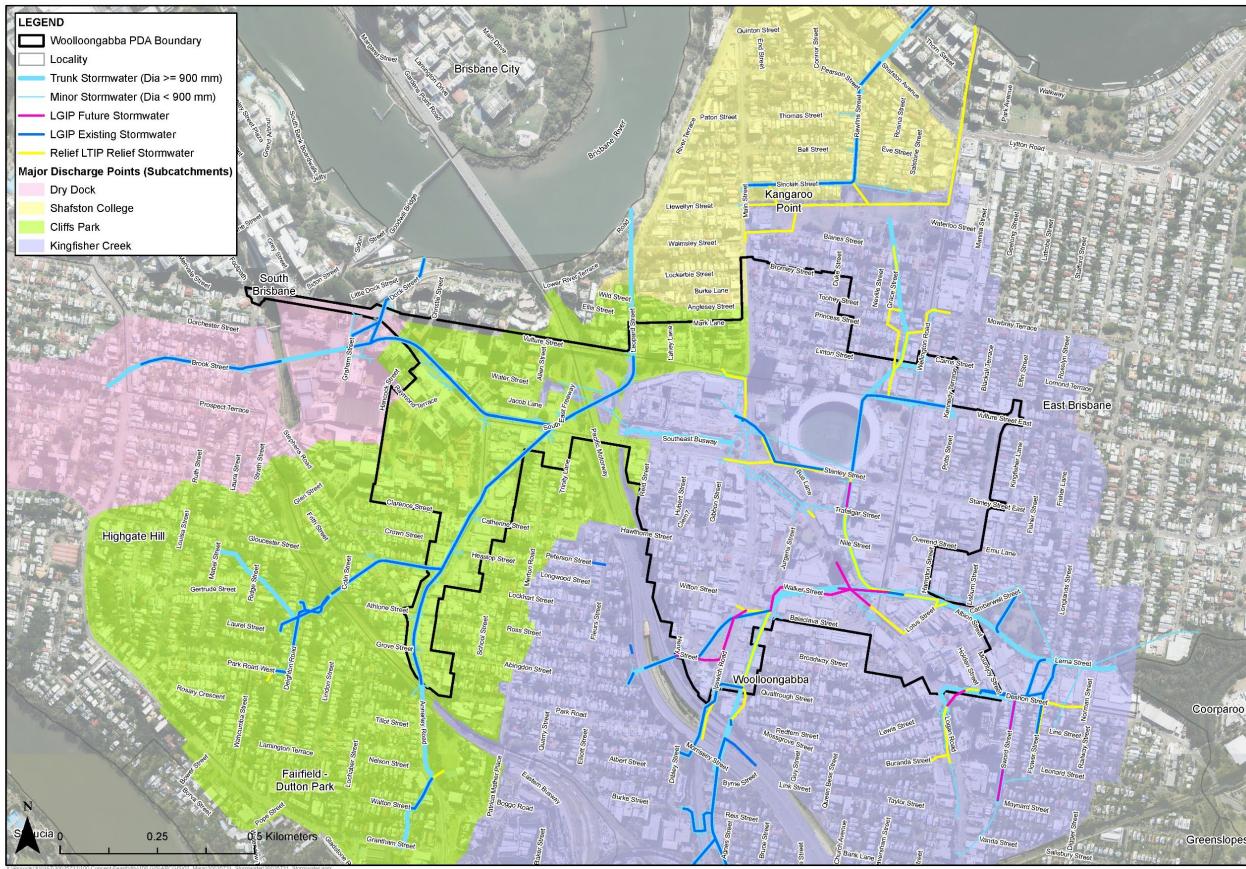


Figure 7: Woolloongabba PDA future stormwater infrastructure

2.3.7 Flood risk

Risk can be defined as the product of likelihood and consequence. For flood risk, the likelihood is defined by Annual Exceedance Probability (AEP) and the consequence is defined by either damage to property or loss of life. Typically, flood level is used to assess the risk of property damage and flood hazard is used to assess the risk to a person's safety. For broadscale planning, local governments will typically only provide information on the former. The two main types of flooding for this Woolloongabba PDA are overland flow and river/creek:

- Overland flow flooding occurs when the runoff from a locally intense, short duration rainfall event becomes concentrated in urbanised gullies in the upper reaches of a catchment
- River, creek flooding occurs when larger scale, longer duration rainfall events produce runoff in excess of the main channel capacity and the flow breaks out into the flood plain, inundating low lying areas.

The key sub-layers are the River, Creek and Storm Tide (Combined) Medium Risk (1.0% AEP), the River, Creek and Storm Tide (Combined) Low Risk (0.2% AEP) and the Overland Flow (Combined) as shown in Figure 8.



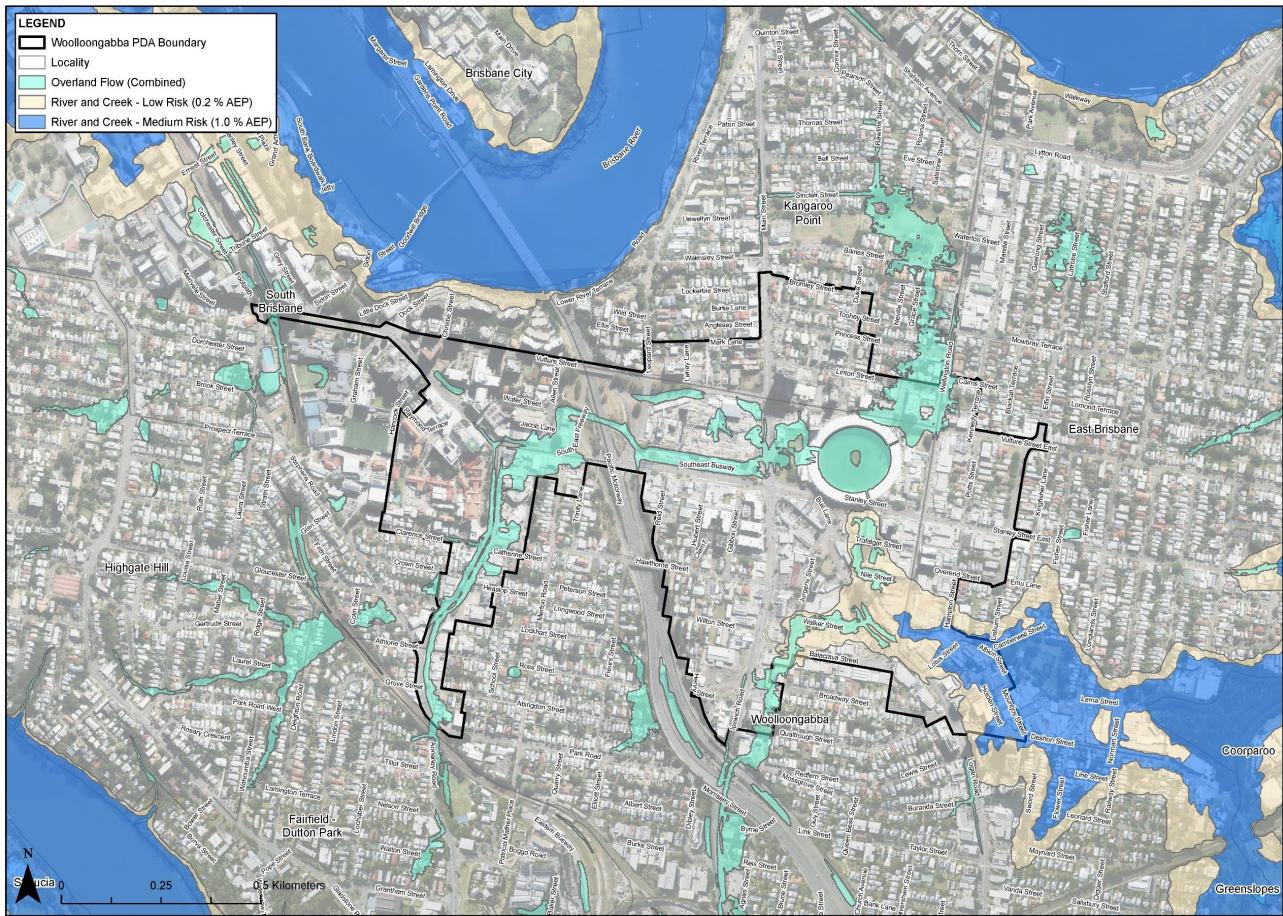


Figure 8: Flood risk





2.4 Transport

2.4.1 Service providers

The service providers and asset owners of the road networks in and around the Woolloongabba PDA are as follows:

- BCC – local streets
- QLD Department of Transport and Main Roads – Pacific Motorway
- Transurban – Clem7 tunnel.

2.4.2 Information sources

Information relating to the existing transport infrastructure assets was obtained from *Brisbane City Plan 2014*, BCC Strategies and other relevant documents, DTMR documents and the Translink website.

2.4.3 Asset hierarchy

The trunk roads are defined as per the road hierarchy overlay code in the *Brisbane City Plan 2014*

- Trunk infrastructure – motorways, aerial roads, suburban roads and district roads
- Non-trunk infrastructure – neighbourhood roads and local roads.

2.4.4 Existing infrastructure

The baseline transport infrastructure was reviewed based on the following elements:

- Road network and car parking
- Public transport
- Active transport.

BASELINE ROAD NETWORK AND PARKING SUMMARY

The Woolloongabba PDA supports several major trip generators for Brisbane including the Gabba and the Hospital and School precincts on the western edge, and from a review of the Southeast Queensland Strategic Transport Model (SEQ-STM) and Household Travel Surveys (HTS) reveals that more than 80 % of trips are going through the Woolloongabba PDA, and that more than 80% of trips are made by private vehicle. These observations reflect the road hierarchy of the Woolloongabba PDA, with key east-west arterials in Stanley Street and Vulture Street, key north-south arterials in Ipswich Road and Main Street as well as Pacific Motorway access points crossing the Woolloongabba PDA. Though access points to the Clem-7 Toll Tunnel are to the north and south of the Woolloongabba PDA, the tunnel runs below/through the Woolloongabba PDA, adding an additional north-south alternative to at-grade options.

The high movement function through the Woolloongabba PDA is reinforced by the traffic demand. As depicted in Figure 9, volume over capacity (v/c) for the Woolloongabba PDA is particularly critical in the PM, with the majority of arterials exceeding practical capacity (v/c = 0.9).

The impacts of peak period congestion are also evident in the Woolloongabba PDA's crash history. Of the 341 crashes over the last five years, more than 70 % are angle or rear end in nature, concentrated around the aforementioned arterials, which experience the most congestion.

In terms of carparking, there are ~560 formal parking bays and 72 commercial bays within the Woolloongabba PDA. Parking on major arterials such as Vulture Street are temporal with clearway functions during peak periods. Whilst there are numerous private carparks available for select land uses, these are dwarfed by the parking availability at the Mater Hospital precinct. Combining all private sources, it is estimated that the number of off-street parks approaches ~4,000.





Although there is a temporal parking zone in place surrounding the Gabba on event days that eliminates parking as an option, some event patrons will still use private vehicles for drop-offs as well as through ride shares noting that taxi use is anecdotally limited due to accessibility compared with ride share alternatives. Rideshare pick up/drop-off locations are set back from the stadium using neighbouring lower-order streets.

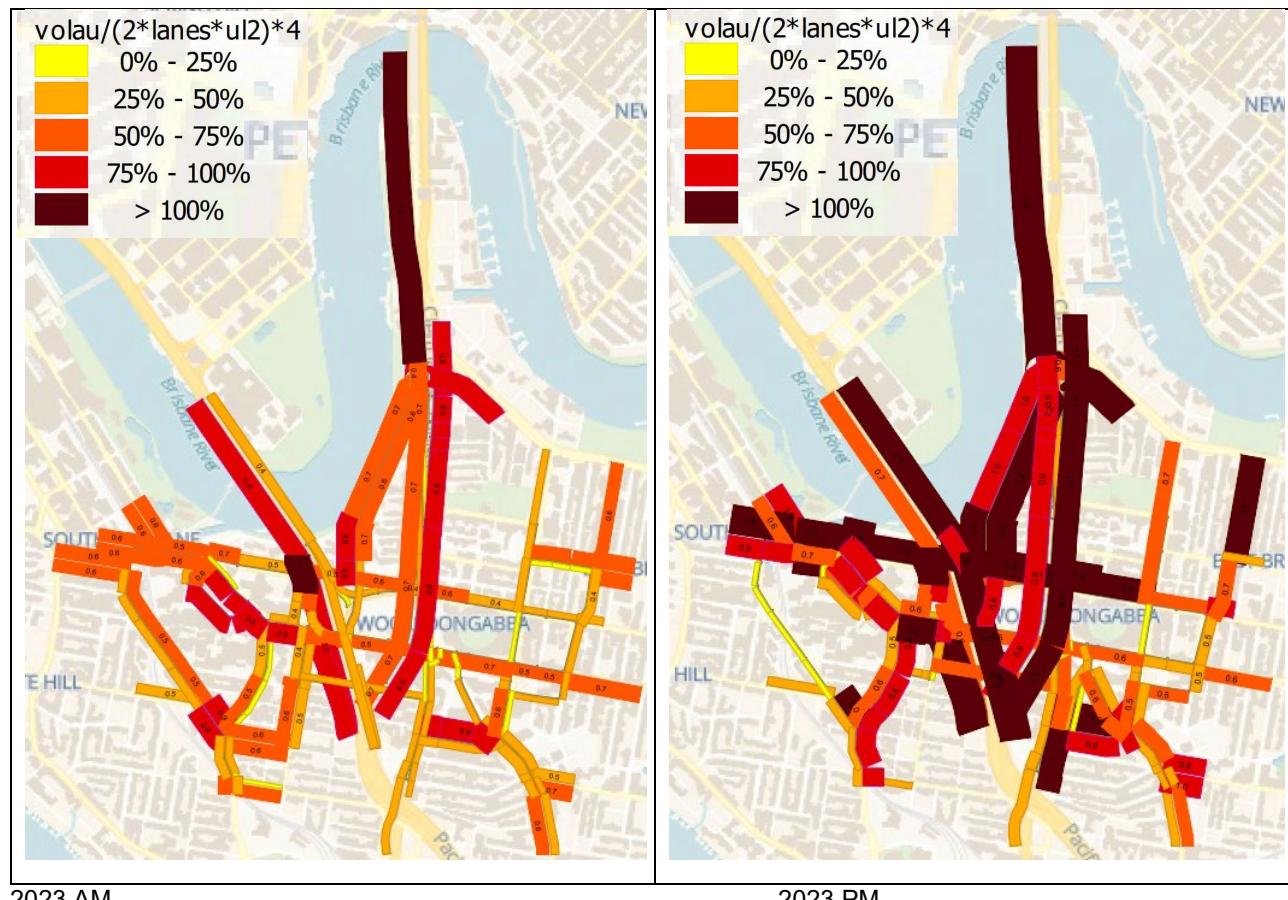


Figure 9: SEQ-STM V/C plots by peak period





The SEQ-STM has also been utilised to provide the total trip demands on the road network by the four trip sectors as shown in Table 3. The trips exclude active transport, and public transport on Busway and Queensland Rail lines.

Table 3: SEQ-STM trip

Trip sectors	AM Peak		PM Peak		Weekday	
	Total	Share (%)	Total	Share (%)	Total	Share (%)
Internal to internal	228	0.3%	391	0.4%	1,818	0.5%
Internal to External	4,009	6.0%	9,383	10.2%	33,026	8.5%
External to Internal	6,935	10.3%	5,995	6.5%	33,012	8.5%
External to External	55,954	83.4%	76,006	82.8%	321,258	82.6%
TOTAL	67,127	100.0%	91,776	100.0%	389,114	100.0%

Table 3 shows that over 82% of trips are vehicles travelling through the Woolloongabba PDA in both peaks and throughout the day. Whilst a significant amount is on the Pacific Motorway, a large proportion is on the local road network and thus to accommodate the planned uplift within the Woolloongabba PDA, considerable increased in mode share to AT and PT needs to be improved across Brisbane (possible Southeast Queensland).

Any future upgrades should be focused on new and improved connections for pedestrians and cyclists within and surrounding the Woolloongabba PDA to reduce vehicle trips to/from and within the Woolloongabba PDA.

PUBLIC TRANSPORT

Public transport through the Woolloongabba PDA is currently limited to buses, operated by Translink with on-street assets owned by BCC. Woolloongabba is also a gateway to the Southeast Busway (Translink Asset), with many on-street services from Logan Road, Ipswich Road and Stanley Street feeding in and out of the busway via Woolloongabba Station. Mater Hill Station is also within the Woolloongabba PDA, catering for services from the southern end of the busway and The University of Queensland as well.

In terms of on-street services, stops near the eastern end of Stanley Street and Logan Road govern the patronage as shown below in Figure 10. This is likely due to a combination of residential catchments, and transfers between services on and off the busway.



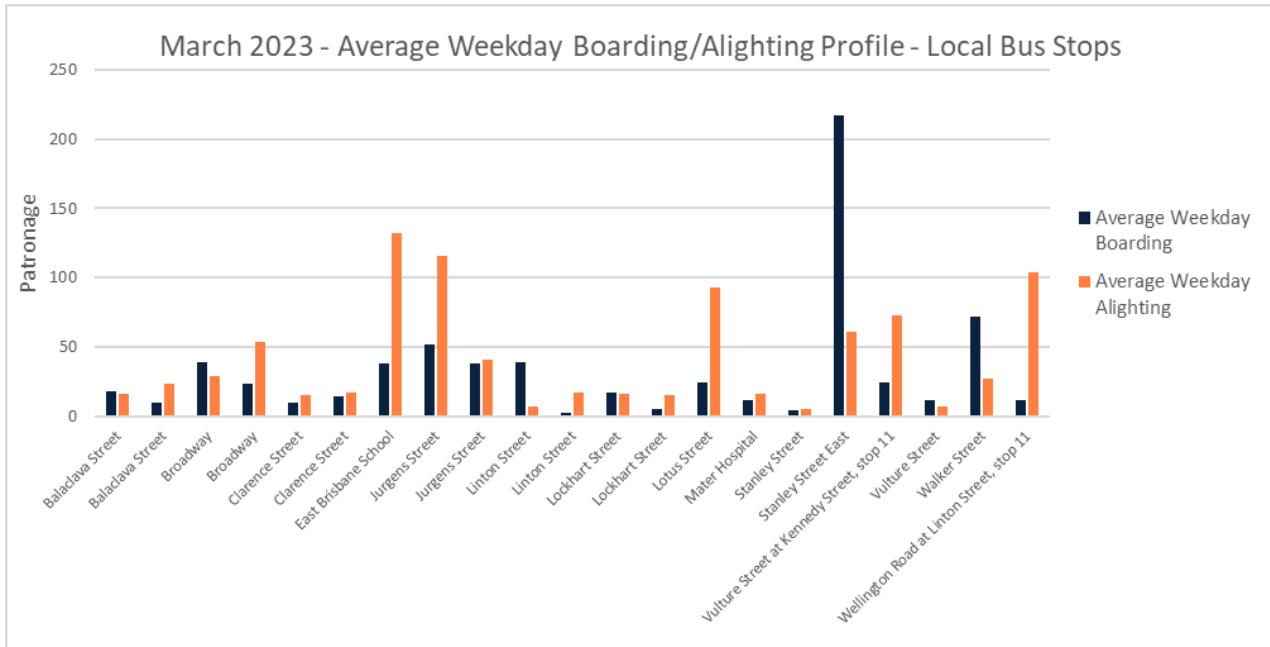


Figure 10: Average weekday origin / destination profile – local bus stops

Due to the limited public transport options on event days, additional shuttle services between key suburban activity centres, such as Carindale Shopping Centre, Brisbane CBD and Chermside, are run typically from two hours before and one hour after events to manage demand. Public transport is free to ticket baring patrons across the entire public transport network including shuttle services.

A key limitation of the current system is that there are no dedicated shuttle areas within the Gabba, such as what is available at Lang Park (Suncorp Stadium). This means that surrounding local streets, namely, Stanley Street and Logan Road, must be partially closed to hold buses and manage boardings/alightings on event days. This also means that event patrons must cross Stanley Street (a key east-west arterial) to reach the temporary shuttle station, creating further traffic network impacts, and requiring Police control to manage the flow of patrons.

ACTIVE TRANSPORT

The Woolloongabba PDA features a strategic location that has the potential to support a wide range of cyclists from commuters to recreational users. However, it currently faces substantial limitations regarding cycle infrastructure, which includes both on-road and off-road facilities.

Regarding at-grade cycle facilities, the Woolloongabba bikeway has greatly improved connectivity to the west of the Woolloongabba PDA between Woolloongabba, South Bank and Annerley via the Health and School Precinct. However, as illustrated in Figure 11 there is a clear lack of separated facilities (on-road or off-road) heading east from the Gabba, as well as directly north-south without using Veloway 1 (V1). This results in commuter cyclists using local streets and recreational cyclists using footpaths, neither of which foster active transport to, from or through the Woolloongabba PDA.

Furthermore, the limit on infrastructure is also visible on the uptake in e-scooters/e-bikes and associated share services (Beam and Neuron) which seem less common compared to inner-city and riverfront areas of Brisbane.

The V1 is a state cycling asset, providing a direct north-south connection between South Bank and Eight Mile Plains. Though this asset is strictly for cycling, pedestrians often use the asset around the Woolloongabba PDA as a safer alternative to roadside pathways, inadvertently creating a conflict that poses a clear safety risk to both user groups. Access to the V1 and connectivity beyond the V1 is resulting in low utilisation of this beneficial asset.



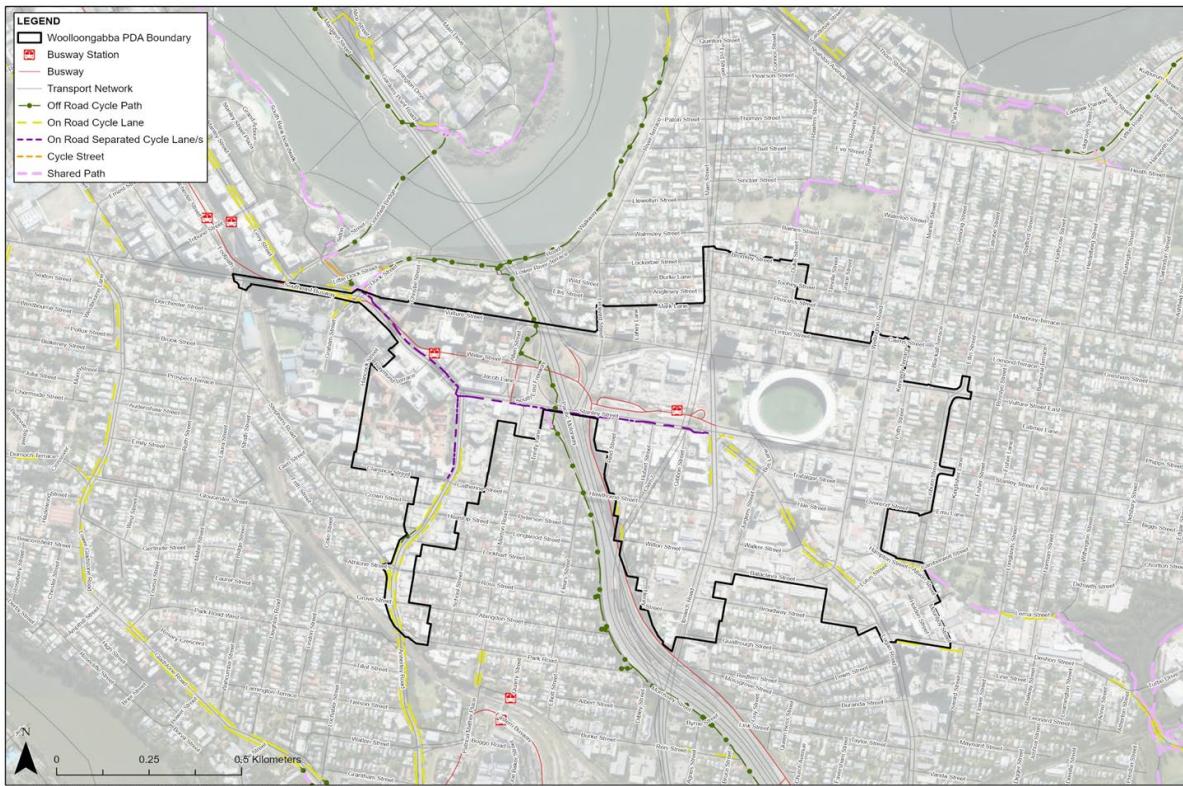


Figure 11: Existing cycle infrastructure

The Woolloongabba PDA 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. Several intersections do not provide pedestrian crossings on all legs, and several have free left turn lanes with only small islands for pedestrians to stop and wait.

However, under event conditions, the footpath network is insufficient for the management of crowds. Resulting in temporary fencing, partial road closures and Police control of adjacent intersections. Likely a part of the Gabba's broader traffic management strategy. Seemingly due to the cost and labour intensity required to mobilise and demobilise these temporary measures, they've become permanent fixtures in the area, which is an undesirable outcome for neighbourhood liveability and traffic management.

2.5 Social infrastructure

Baseline social infrastructure was reviewed based on the following reference documents:

- The terminology and provision for social infrastructure as outlined in the SEQ Regional Plan 2017 (ShapingSEQ)
- The Public Parks Network (trunk and non-trunk) as planned and provided for through BCC planning instruments such as the *Brisbane City Plan 2014*, LGIP and LTIP
- The Land for Community Facilities Network as provided through BCC planning instruments
- Community facilities PDA Guideline no.11 May 2015 (EDQ).

2.5.1 Social infrastructure catchment areas

Different forms of social infrastructure have different catchment areas according to the type of facility and the community it is designed to service. Additional factors such as accessibility via different forms of transportation further influence patterns of community infrastructure provision and use.





The Woolloongabba PDA covers portions of the following suburbs of Woolloongabba, Kangaroo Point, East Brisbane, and South Brisbane. These suburbs have been subsequently adopted as the local social catchment area.

A key feature of the area surrounding the Woolloongabba PDA is the proximity to key regional and district scale social infrastructure including major health precincts (Mater and Princess Alex Hospitals) and recreational areas (South Bank Parklands, Kangaroo Point Cliffs, and the Norman Creek corridor). Such facilities are integral to the assessment of social infrastructure provision, and therefore a broader district social catchment area was adopted. So as not to diminish the accuracy of data explaining socio-economic characteristics, the district level study area has been further defined into categories of primary and secondary.

The local and district (primary) social catchments are those suburbs (also aligning with Statistical Area Level 2 (SA2)) boundaries as defined by the Australian Bureau of Statistics (ABS) which are entirely or predominantly within a 3km travel distance of the Woolloongabba PDA. As presented in Figure 12 this comprises the following suburbs:

Woolloongabba	Highgate Hill
Kangaroo Point	West End
East Brisbane	Norman Park
South Brisbane	Coorparoo
Annerley	Greenslopes
Fairfield-Dutton Park	

The district (secondary) social catchment comprises those SA2 areas (i.e. suburbs) which are partially or entirely within a 3-5km travel distance from the Woolloongabba PDA. This comprises the suburbs of:

Balmoral	Paddington-Milton
Bulimba	Auchenflower
Kelvin Grove-Herston	Toowong
Red Hill	Taringa
Indooroopilly	Tarragindi
Mooreeba	Holland Park / Holland Park West
Yeronga	Camp Hill
St Lucia	Morningside – Seven Hills
Norman Park	Hawthorne

Whilst the secondary catchment suburbs were nominated in the baseline report, the time to collate and analyse the data for the nominated suburbs was not feasible for the timing of delivery of the report.



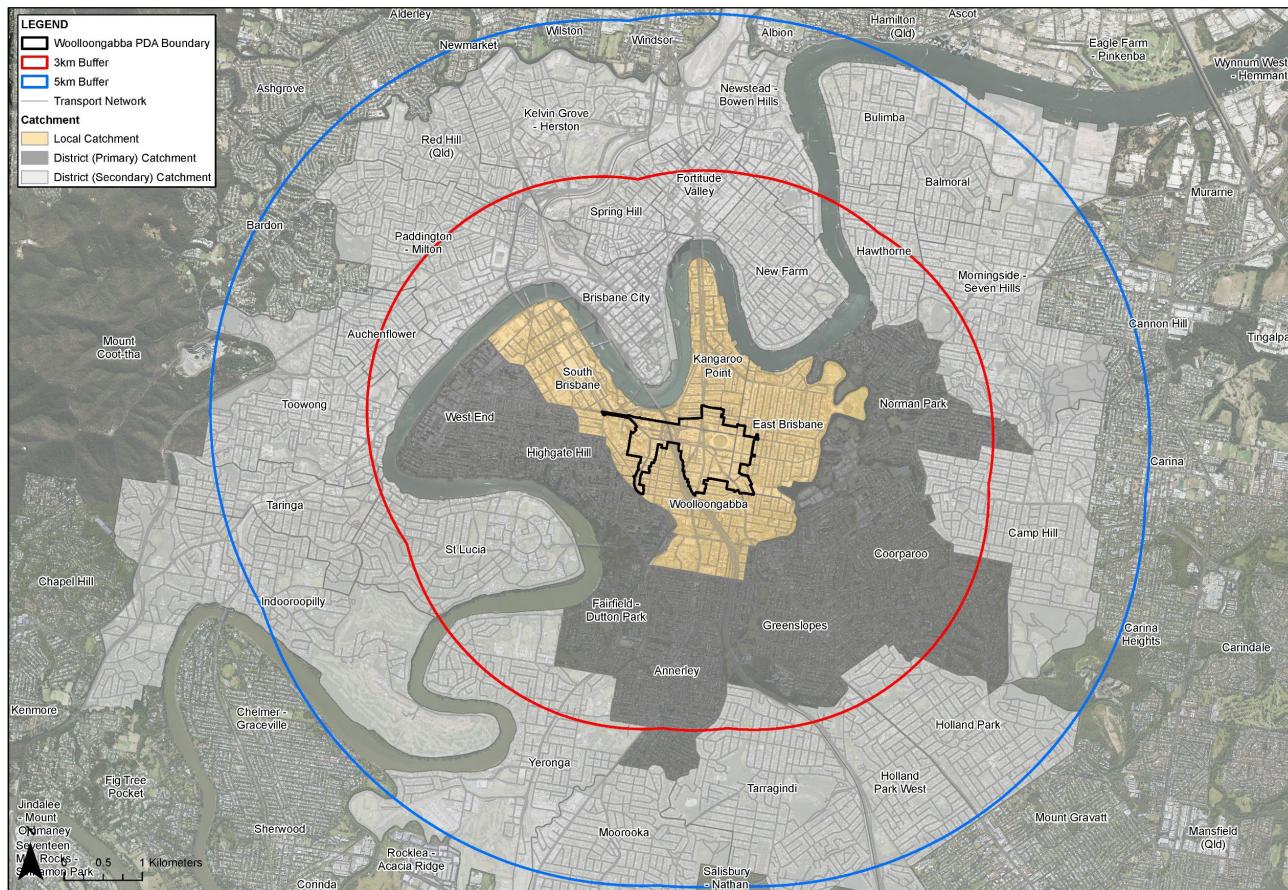


Figure 12: Local and district social catchment areas

2.5.2 Existing social infrastructure and assessment

PUBLIC PARKS NETWORK, BCC

For the purposes of assessing social infrastructure provision, the BCC key park classifications and catchment areas are as follows:

- Recreation (Urban) and Recreation (Natural) – Local: provides an outdoor setting for recreation and social activities, is usually available for public use and has a desired accessibility standard for up to 750m walking distance in the Local Recreation Need Area.
- Recreation (Urban) and Recreation (Natural) – District/Metro: includes recreational and natural parks, corridor parks, botanic gardens and arboreta and parks which provide a setting for community facilities and services – has a desired accessibility standard of 3km in the Local Recreation Need Area.
- Sport – Local/District/Metro: provides an outdoor setting for formal, structured sport activities, including training, skills development and competition - has a desired accessibility standard of 3km in the Local Recreation Need Area.

The BCC park classifications were collated and summarised as follows:





Table 4: Summary of BCC park provisions

Park Type	DSS	Current Population	Current Provision	Undersupply
Local Recreational Parks	1.4 hectares per 1,000 people	28,410 persons	11 Trunk Parks Total of 6.9453 ha provided 0.2445ha per 1,000 persons	32.8287ha
District /Metro Parks	1.6 ha per 1,000 persons	117,749 persons	49 Trunk Parks Total of 76.2439ha provided. 0.6475ha per 1,000 persons	112.1545ha
Sports Parks	1.2ha per 1,000 persons	117,749 persons	33 Trunk Parks Total of 49.324ha provided 0.4189ha per 1,000 persons	91.9748ha
Urban Common	Up to 1 per District Centre	117,749 persons	3 Trunk Urban Commons Total of 0.3604ha provided	N/A

Note: As residential derived demand for parks is greater, this has been applied rather than jobs derived demand. South Bank Parklands was not included as current provision of District Parks as South Bank administratively is classified separately. However, it is a key park space within the district (primary) catchment area. If it were included, this would add an additional 33.9378ha of currently provided parks which would raise the total to 110.1817ha. This equates to the current rate of provision of District Parks in the district (primary) catchment being 0.9357ha per 1,000 persons.



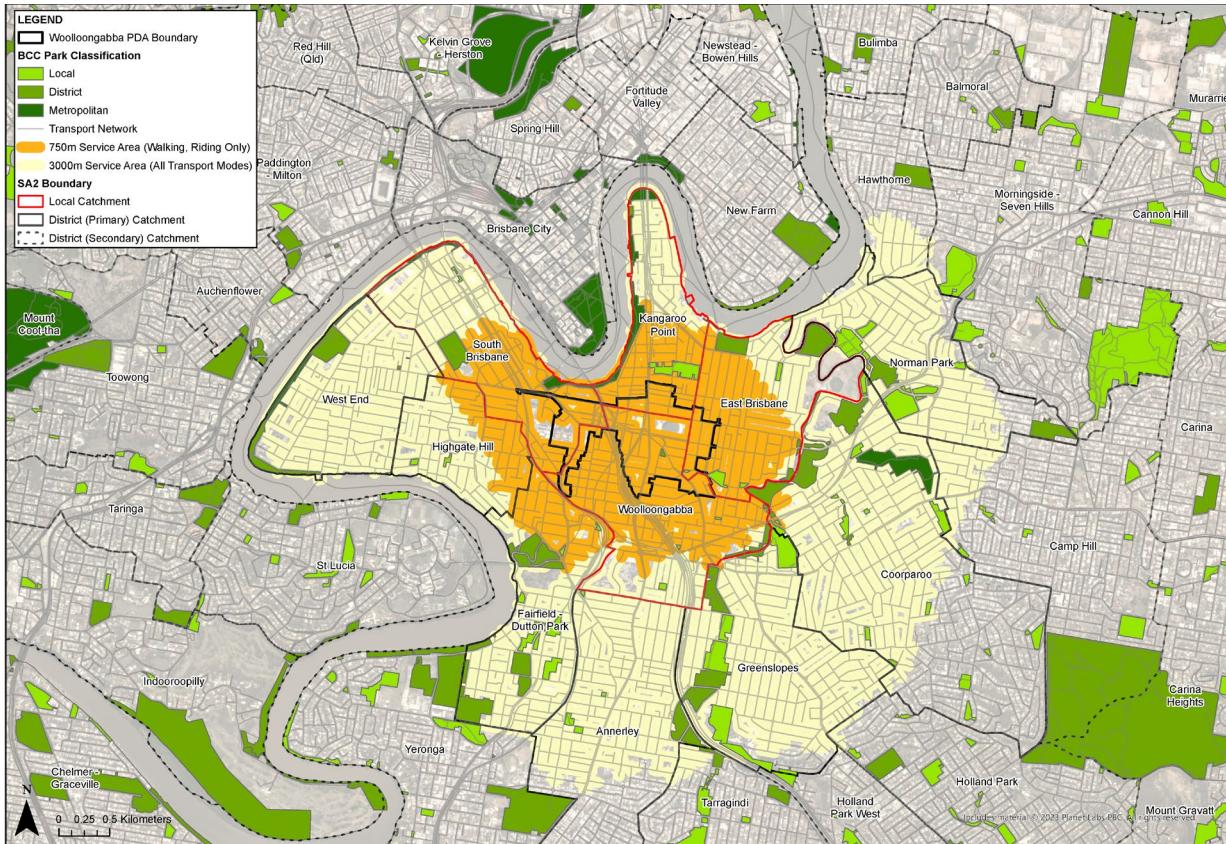


Figure 13: BCC park classification provisions

LAND FOR COMMUNITY FACILITIES, BCC

Through the Land for Community Facilities Network, BCC acquires and maintains land for community facilities as part of a wider network of providers. The types of community facilities planned for under the Land for Community Facilities Network include:

- Community space
- Community service/group space (facilities that support the operation of not-for-profit community groups, their activities and services)
- Visual arts space
- Performance space
- Indoor sport and recreation facilities
- Public libraries
- Public aquatic facilities/swimming pools.

Table 5 and Table 6 list the existing provision of community facilities in the local and district (primary) catchment areas as per the LGIP.

Table 5: Current rate of provision within the local catchment area

LGIP ID	Existing Infrastructure	Suburb	Site Area (ha)
EXIT-CF-X145	Eastern Suburbs Football Club	East Brisbane	6.8501
EXIT-CF-X58	Graham Fowles Boatshed	East Brisbane	1.6696
EXIT-CF-264	Kangaroo Point Rovers Football Club	Kangaroo Point	2.5987





LGIP ID	Existing Infrastructure	Suburb	Site Area (ha)
EXIT-CF-X185	Micro Art School	South Brisbane	0.0208
EXIT-CF-X35	South Brisbane Federal Band Inc.	South Brisbane	4.4659
EXIT-CF-388	Musgrave Park Swimming Pool	South Brisbane	0.9042
EXIT-CF-383	Somerville House Pool	South Brisbane	0.6139
EXIT-CF-390	Boat Pool Streets Beach and Aquativity	South Brisbane	11.0690
EXIT-CF-387	Jagera Community Hall	South Brisbane	0.9058
EXIT-CF-X184	Woolloongabba Substation (Community Space)	Woolloongabba	0.0469
EXIT-CF-136	Aboriginal & Torres Strait Islander Community Health Service Brisbane	Woolloongabba	0.2119
EXIT-CF-X118	MDA Brisbane Multi-cultural Centre	Woolloongabba	0.2501
TOTAL			29.6069

The provision standard DSS of land for as per 2022 population and 2020 jobs data for the local catchment area is 10.03 ha. The current total of local land for community facilities is 29.6069 ha. Therefore, there is currently an indicative oversupply of 19.5769 ha.



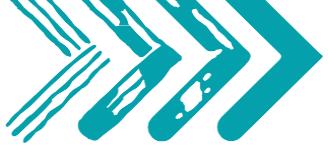


Table 6: Current rate of provision within the district (primary) catchment area

LGIP ID	Existing Infrastructure	Suburb	Site Area (ha)
EXIT-CF-365	Annerley Hall	Annerley	0.2193
EXIT-CF-X22	Annerley Community Hall	Annerley	2.1435
EXIT-CF-366	Annerley Library	Annerley	0.2193
EXIT-CF-318	Ekibin Park South - Sports Field	Annerley	4.3784
EXIT-CF-364	Southside Community Child Care Association	Annerley	0.4977
EXIT-CF-181			
EXIT-CF-271	Metro Districts Netball Association	Coorparoo	5.7602
EXIT-CF-233	Brisbane Lions Australian Football Club	Coorparoo	3.2639
EXIT-CF-X197	The Creche And Kindergarten Association Ltd. - Coorparoo	Coorparoo	NA
EXIT-CF-X144	Coorparoo Guides	Coorparoo	NA
EXIT-CF-X95	Wynola Girl Guides	Coorparoo	1.0150
EXIT-CF-X163	Whites Hill Scout Den	Coorparoo	1.7792
EXIT-CF-163	National Servicemens Assn Of Aust (Queensland) Inc	Coorparoo	1.7792
EXIT-CF-164			
EXIT-CF-371			
EXIT-CF-375	Eastern Suburbs District Rugby Leagues Club	Greenslopes	5.4615
EXIT-CF-376	Langlands Park Swimming Pool	Greenslopes	NA
EXIT-CF-165	Norman Creek Catchment Coord Committee (N4C)	Greenslopes	5.3442
EXIT-CF-166			
EXIT-CF-369			
EXIT-CF-373	Stones Corner Kindergarten & Preschool	Greenslopes	0.1744
EXIT-CF-184			
EXIT-CF-207	Woodturners Society of Queensland	Greenslopes	5.3442
EXIT-CF-368			
EXIT-CF-374	Stones Corner Library	Greenslopes	0.1622
EXIT-CF-367	Fairfield Gardens Library	Fairfield	3.6569
EXIT-CF-296	Jf O'grady Memorial Park Skatepark	Fairfield	3.6733
EXIT-CF-258	Brisbane Rugby League Referees Association	Fairfield	3.6733
EXIT-CF-X71	Link Vision	Fairfield	0.3611
EXIT-CF-405	Metro Arts	Norman Park	0.0425
EXIT-CF-384	West End Library	West End	0.0796





LGIP ID	Existing Infrastructure	Suburb	Site Area (ha)
EXIT-CF-189	Uniting Church in Australia Qld Synod	West End	0.0225
EXIT-CF-319	Gps Old Boys Rowing Club	West End	0.5073
EXIT-CF-239	Souths Logan Rugby League Club	West End	6.4374
TOTAL			56.0771

The indicative provision of land for as per 2021 population and 2020 jobs data for the district (primary) catchment area is 18.03ha. The current total of district land for community facilities is 29.6069 ha Therefore, there is a current indicative oversupply of 38.0471ha.

BCC LAND ZONED FOR COMMUNITY FACILITIES

Schools, universities, colleges, private companies, and not-for-profit organisations are all direct providers of different types of community facility infrastructure. In the Brisbane City Plan 2014, land zoned for community facilities includes the categories of:

- CF1 Community facilities Major health Care
- CF2 Community facilities Major sports venue
- CF3 Community facilities Cemetery
- CF4 Community facilities Community purposes
- CF5 Community facilities Education purposes
- CF6 Community facilities Emergency services
- CF7 Community facilities Health care purposes

Additional zonings relevant to community infrastructure include:

- MU1 & 3 Mixed use (Inner city and Corridor)
- NC Neighbourhood centre
- DC1 (District centre (District)
- SC1, 2 & 6 Specialised centre (Major education and research facility, Entertainment/conference centre and Marina).

A breakdown of land currently zoned for community facilities in the local and district (primary) catchment areas is provided in the following Table 7, Table 8 and Figure 14.

Table 7: Land currently zoned for community facilities within the local catchment area

Local catchment area					
Zoning	Woolloongabba (ha)	Kangaroo Point (ha)	South Brisbane (ha)	East Brisbane (ha)	Total (ha)
Community Facilities					
CF1 - Major health care	14.19	1.86	11.57	-	27.62
CF2 - Major sports venue	4.39	-	-	-	4.39
CF4 - Community purpose	1.93	2.35	0.46	0.22	4.96
CF5 - Education purpose	9.80	0.80	18.31	17.47	46.39
CF6 - Emergency services	0.13	-	-	-	0.13
SUBTOTAL	30.44	5.01	30.34	17.70	83.49





Local catchment area					
Zoning	Woolloonga bba (ha)	Kangaroo Point (ha)	South Brisbane (ha)	East Brisbane (ha)	Total (ha)
District Centre					
DC1 - District	1.47	0.69	1.56	-	3.72
DC2 - Corridor	7.24	-	-	-	7.24
Mixed Use					
MU1 - Inner city	18.94	12.17	36.71	8.21	76.03
MU3 - Corridor	7.38	-	0.61	-	7.98
Neighbourhood					
NC - Neighbourhood centre	-	-	0.21	1.85	2.06
Specialised Centre					
SC2 - Specialised centre (Entertainment and conference centre)	-	-	6.81	-	6.81
SC6 - Specialised centre (Marina)	-	2.32	-	-	2.32
Other					
Southbank Corporation Area, refer to Part 10	-	-	40.72	-	40.72
Queensland Children's Hospital State Development Area, refer to Part 10	-	-	15.65	-	15.65
TOTAL	65.46	20.19	132.62	27.76	246.03



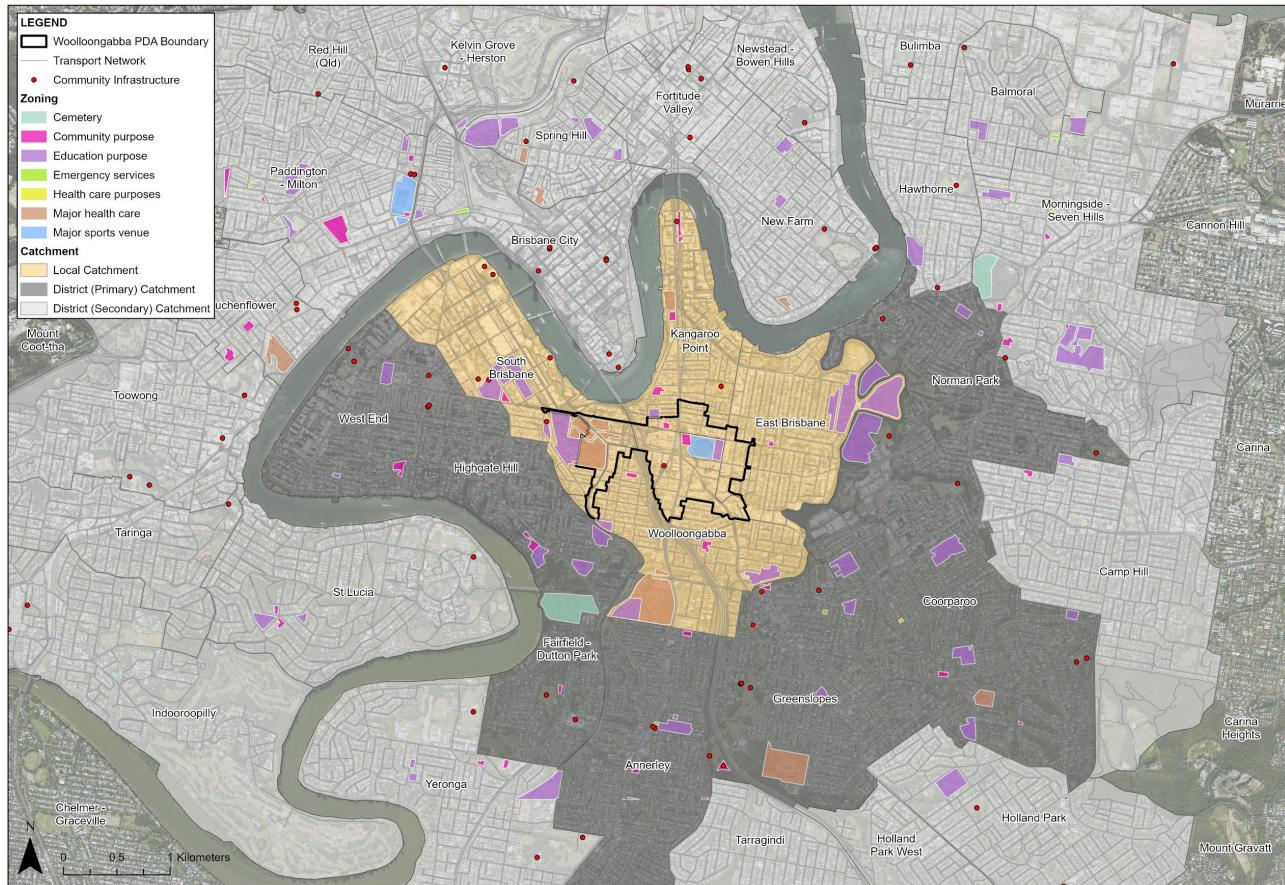


Figure 14: BCC Land for Community Facilities provision in the local and district (primary) catchment areas





Table 8: Land currently zoned for community facilities within the district (primary) catchment area

Zoning	Annerley (ha)	Coorparoo (ha)	Fairfield - Dutton Park (ha)	Greenslopes (ha)	Highgate Hill (ha)	West End (ha)	Norman Park (ha)	Total (ha)
CF1 - Major health care	-	2.37	-	11.08	-	-	-	13.46
CF3 - Cemetery	-	-	10.87	-	-	-	-	10.87
CF4 - Community purpose	1.74	0.64	0.87	0.69	0.21	0.92	-	5.08
CF5 - Education purpose	6.60	25.79	5.86	1.14	-	2.27	4.91	46.56
CF6 - Emergency services	-	-	-	0.16	-	-	0.04	0.20
CF7 - Health care purposes	-	0.12	-	-	-	-	-	0.12
CF6 - Emergency services	0.12	-	-	-	-	-	-	0.12
SUB TOTAL	8.46	28.93	17.61	13.07	0.21	3.19	4.95	76.42
District Centre								
DC1 - District	5.47	0.85	4.75	-	-	9.67	-	20.74
DC2 - Corridor	-	7.15	-	9.47	-	-	-	16.62
Mixed Use								
MU1 - Inner city	-	-	-	-	-	7.60	-	7.60
MU3 - Corridor	-	4.64	3.98	9.12	-	5.75	-	23.50
Neighbourhood								
NC - Neighbourhood centre	1.37	1.52	0.55	0.65	0.44	0.88	0.42	5.83
Specialised Centre								
SC1 - Specialised centre (Major education and research facility)	-	-	2.78	-	-	-	-	2.78
TOTAL	15.30	43.08	29.66	32.32	0.66	27.10	5.37	153.49





ANALYSIS OF CURRENT ZONING PROVISIONS

Analysis of current zoning provisions in the local catchment area highlighted that Woolloongabba had the highest community facility zoning with 30.44ha. South Brisbane (18.31ha) and East Brisbane (17.47ha) are the highest zoned for education purposes whereas Kangaroo Point only had 0.8ha. Woolloongabba has the highest for major health care, although South Brisbane includes the Queensland Children's Hospital SDA and the recent Mater Hill MID. The Gabba is the only major sports venue in the local catchment and is 4.39ha. Kangaroo Point contained the highest community purpose zoned land with 2.35ha and the only marina 2.32ha. South Brisbane had the only entertainment and conference centre zoning at 6.81ha. There was a total of 0.13ha zoned as Emergency Services across the local catchment. Overall, South Brisbane contained the highest coverage of community facility and other zonings which contribute to community facilities in the local catchment with 132.62ha.

Analysis of current zoning provisions in the district catchment area highlighted that Fairfield-Dutton Park was the only area to have cemetery zoning 10.87ha. Fairfield-Dutton Park were the only areas to have Major Education and Research Facility zoning 2.78ha. Greenslopes had the highest for major health care 11.08ha. Coorparoo had the highest education purpose zoning of 25.79ha. There was a total of 0.2ha zoned as Emergency Services across the district (primary) catchment. Overall, Coorparoo contained the highest coverage of community facility and other zonings which contribute to community facilities in the local catchment with 43.08ha.

SOCIAL INFRASTRUCTURE, EDQ PDA GUIDELINES

EDQ Community Facilities PDA Guideline No.11 (2015) (PDA Guideline) outlines the standards for the planning and provision of community facilities in Priority Development Areas (PDAs) in Queensland. The EDQ Guideline is to be read in conjunction with the broader suite of PDA Guidelines, and importantly in the context of local and State government social and infrastructure guidelines. The EDQ guidelines take a more granular, facility-based approach to allocating community facilities provision, reflecting EDQ's role in delivering major greenfield communities, and defined urban infill areas. Therefore, an initial assessment has been undertaken against the EDQ guideline, to identify any known gaps in the desired network of community infrastructure that should be specifically addressed through the planning process.

Existing social infrastructure was assessed against rates of provision as outlined in the guideline through the comparison of estimated site size.



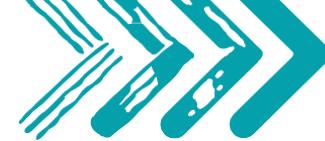


Table 9: Current rate of provision of facilities and services within the local and district (primary) catchment areas

Facility or Service	Hierarchy of Provision Planning Considerations	Number of Facilities (Population Triggers)	Indicative Site/Facility Area	Number of Facilities/ Total Site Area (ha)	Rating
Local Catchment – 41,514 persons / District (Primary) Catchment – 117,749 persons					
Aged Care/ Respite	Local	1:7,000 – 10,000	Site: 1,500 – 2,000m ² GFA: 500m ²	Local - 3 facilities 0.7586ha	Over
	District/ LGA/ Regional	1:20,000 – 100,000	Site: 3,000 – 5,000m ²	District - 5 facilities 1.5798ha	Adequate
Ambulance	District - depends on a range of factors including current and projected population, planned future development, hazard and risk assessment, road network, incident profile for area.	1:25,000 Consider response time profile, case load/day, proximity to existing ambulance stations and other health services	Site: 3,000m ²	In local catchment but District Facility - 1 facility 0.3509ha	Under
Art Gallery	Regional	1: 30,000 – 150,000	GFA: 400 – 1,500m ² Site 1,000 – 5,000m ²	Local - 3 facility 0.0948ha	Over
Cemetery/ Crematorium	Local Council/ private	1:50,000 – 200,000	1,500m ² per 1,000 people	District - 1 facility 10.8744ha	Adequate
Child Care	Predominately private	Variable	Variable	Local - 11 facilities 1.2929ha	*Potential under supply
				District - 17 facilities 4.6097ha	*Potential under supply
Community Centres/ Civic Centres	Neighbourhood (Council/private)	1:2,000 - 3,000	GFA: 200 - 300m ² Site: 500 - 750m ²	Local - 1 facility (2,558.34)	Adequate
	Community meeting room/ neighbourhood house			District - 2 facilities (1,545.64)	Under
	Local (Council/private/ community/state)	1:6,000 - 10,000	GFA: 600 - 800m ² (hall - 400m ²)	Local - 8 facilities 3.2350ha	Under





Facility or Service	Hierarchy of Provision Planning Considerations	Number of Facilities (Population Triggers)	Indicative Site/Facility Area	Number of Facilities/ Total Site Area (ha)	Rating
	Community centre/multi-purpose hall		Site: 5,000m2 (hall - 2,000m2)	District - 18 facilities 18.0254ha	Over
	District centre (State/ council) Multi-purpose community centre and/or neighbourhood centre	1:20,000 - 50,000	GFA: 1,000m2 Site: 10,000m2	As per above	
	Major Centre (Council) Civic Centre	1: 30,000 – 120,000	GFA: 2,000 – 5,000m2 Site: 15,000m2	As per above	
Community Health Precincts, Hubs, Centres and Services	Community health centre	1:20,000 - 30,000	GFA: 2,000 - 4,000m2 Site: up to 1.6ha	Local - 11 facilities 2.2399ha District - 9 facilities 1.0982ha	Under
	Community care hub	1:30,000 - 100,000	GFA: 4,000 - 8,000m2 Site: 1.6 - 3.2ha	As per above	
	Community care precinct	1:100,000 - 300,000	GFA: 8,000-10,000m2 Site: 3.2 - 4ha including parking	As per above	
Correctional Services	Regional	Imprisonment rate is 177 persons per 100,000	Prison site: approximately 600ha Offices: rented space 200-350m2 for area office	In local catchment but regional level facility - 1 facility 0.0260ha	N/A
Courthouses	Expand existing facilities- centralisation policy			Local/District - 0	N/A- Regional Level Facility
Exhibition/ Convention Centre		1:50,000 – 200,000	Area depends on number of floors, parking, capacity required for performances	Local -1 2.4414ha	Adequate





Facility or Service	Hierarchy of Provision Planning Considerations	Number of Facilities (Population Triggers)	Indicative Site/Facility Area	Number of Facilities/ Total Site Area (ha)	Rating
Fire and Rescue	Depends on response time and incident history proximity to existing facilities and population forecasts	Over 25,000 people	Site: 3,000-4,000m2 (auxiliary station) 3,000- 6,000m2 (permanent station) 10,000- 20,000m2 (permanent with specialist facilities)	District – 1 facility 0.111ha	Under
Hospital Public	Based on local planning and needs analysis	Likely to serve a catchment of over 100,000 people	10-15ha depending on level of service	In local catchment but district facility - 3 facilities 17.7404ha	Adequate
Kindergartens		1: 7,500-10,000	1,500-2,000m2	Local - 3 facilities 0.4009ha	Adequate
				District - 8 facilities 3.1316ha	Under
Libraries	Branch library	1: 15,000- 30,000	Minimum 150m2	Local	Under
				District - 4 facilities 4.118ha	Adequate
	Central library	1: 30,000- 150,000	37-49m2 per 1,000 people	District – 1 facility 0.8834ha	Under
Museum		1: 30,000- 120,000		In local catchment but district facility - 1 facility 3.3675ha	Adequate
Out-of-School-Hours-Care		Part of primary schools	15.25m2 per child indoor and outdoor	Local – 2 facilities 0.6923ha	Potential under supply*
				District - 3 facilities 5.5683ha	Potential under supply*





Facility or Service	Hierarchy of Provision Planning Considerations	Number of Facilities (Population Triggers)	Indicative Site/Facility Area	Number of Facilities/ Total Site Area (ha)	Rating
Performing Arts Spaces		30,000 – 50,000	Site: 3,000m ² minimum	Local/District – 2 facilities 8.7167ha	Over
Police	Main road location	1:20,000 – 30,000	Police Station Site: 4,000 – 5000m ² GFA varies according to local needs- shopfronts, rented space, stations	Local - 2 facilities	Adequate
	Security important			District - 4 facilities	Adequate
	Best location in town centre/ shopping centre				
Postal Services	Post box	1:300 Depends on volumes of mail compared to population and existing outlets	Business delivery centres: 2,800-4,000m ² Retail outlets: GFA 150-300m ²	Local - 4 facilities 0.1771ha	Under
	Centres			District - 11 facilities 11.149ha	Over
Primary Schools-State		1: 3,000 dwellings	6.5-7ha GFA: 5,500m ² for 625 P-7 Students	Local - 2 facilities 1.4371ha	Under
				District - 6 facilities 11.551ha	Under
Religious facilities	Variations depend on type of organisation			Local - 23 facilities 4.3202ha	N/A
				District - 17 facilities 5.4804ha	N/A
Secondary Schools – State		1:8,000 dwellings	12ha GFA: 16,870m ² for 1,500 students	Local - 1 facility 3.2769ha	Under
				District - 2 facilities 6.0882ha	Under





Facility or Service	Hierarchy of Provision Planning Considerations	Number of Facilities (Population Triggers)	Indicative Site/Facility Area	Number of Facilities/ Total Site Area (ha)	Rating
Secondary Schools- Non-State		1: 17,000 dwellings	8ha for 900 students	Local - 1 facilities 24.524ha	Adequate
				District - 4 facilities 20.2101ha	Under
Sporting Facilities (including swimming, aquatic and/or indoor sports facilities)	District	1:>30,000	1.8ha	Local - 9 facilities 33.8900ha	Over
				District - 14 facilities 35.9995ha	Over
TAFE College	District	1: over 50,000	3-12ha depending on training type Classroom 2m2 per student Automotive training 18m2 per student	In local catchment but district facility – 1 4.2618ha	Under
	Regional/Local Government/ Area- wide	1: over 150,000			
University		Over 250,000 people	Varies - main campuses, satellite campus, partnerships.	In local catchment but district facility - 1 facility 1.0073ha	Under
Youth Centre/ Service	Local	1:10,000 – 20,000	Min: 200m2 GFA (house)	Local - 3 facilities 0.5042ha	Over
	District	1:20,000 – 50,000	Min GFA 600 - 1,000m2 Site: 5,000 - 10,000m2 for open space or adjoin local open space	District - 1 facilities 0.0448ha	Under





Facility or Service	Hierarchy of Provision Planning Considerations	Number of Facilities (Population Triggers)	Indicative Site/Facility Area	Number of Facilities/ Total Site Area (ha)	Rating
Busway/ Train Station				Local - 10 facilities 10.5044ha	N/A
				District - 3 facilities 4.3882ha	

In preparing this report, reasonable efforts have been made to ensure the accuracy and completeness of the services and areas above. Users of this document should, however, note that information may have changed since publication or there may be services and areas that have not been included.





A summary of the existing provision of social infrastructure in the local (41,514 persons) and district (primary) (117,749 persons) catchment areas inclusive of site areas indicates that there are undersupplies for the following facilities or services:

- Ambulance
- Child care
- Community Centres/Civic Centres
- Community Health Precincts, Hubs, Centres and Services
- Fire and Rescue
- Kindergartens
- Libraries
- Out-of-School-Hours-Care
- Postal Services – local facilities only
- Primary Schools – State & non-state
- Secondary Schools – State & non-state
- TAFE College
- University
- Youth Centre/Service – district facility only.

In summary, the comparative analysis of community infrastructure reflects an oversupply of land available under the BCC Land Zoned for Community Facilities, but a shortfall in specific facilities as defined under the EDQ Guidelines. The process of consultation with key stakeholders to be undertaken over the coming months will further define the specific requirements for facility delivery over time, and also assess the role of facilities in the wider external catchment to adequately support Woolloongabba's development, and to define the level of intervention available through both the Woolloongabba PDA development scheme and DCOP. It is anticipated that the land use planning contemplated under the proposed development scheme supports the delivery of the full range of facilities required. It is noted that specific site requirements under the DCOP will be limited to 'trunk' level services.

2.5.3 Planned network growth

LOCAL GOVERNMENT INFRASTRUCTURE PLAN (LGIP)

According to the LGIP Part 4 and Schedule 3 of the City Plan, there is currently 13.6ha of embellishment – upgrade, 1.8ha of establishment - new and 1.81ha for land acquisition and embellishment, totalling 17.21ha planned either within or surrounding the Woolloongabba PDA.

According to the LGIP Part 4 and Schedule 3 of the City Plan, there are limited community facility upgrades or embellishments planned either within or surrounding the Woolloongabba PDA





2.6 Electrical

2.6.1 Service providers

The following service providers own and operate electricity infrastructure within and surrounding the Woolloongabba PDA:

- Powerlink: State Government Owned Corporation which owns, operates, and maintains the high voltage electricity transmission network
- Energex: State Government Owned Corporation that owns, operates, and maintains the electricity distribution network in South-East Queensland
- Princess Alexandra Hospital: State Owned Hospital that owns, operates, and maintains an internal electricity distribution system and has spare generating capacity that at times is used by Energex to supplement transient loads for venues within the Woolloongabba PDA.

2.6.2 Information sources

Information relating to the existing power infrastructure assets was obtained from a variety of sources. This included Energex reports/maps/data, as-constructed data and BYDA reports.

Consultation is ongoing with Energex to understand key infrastructure, capacity and current configuration and planned upgrades or issues impacting on the existing network.

2.6.3 Asset hierarchy

For the baseline reporting investigation, the following definitions applied:

- Trunk infrastructure:
 - Substations
 - High Voltage (HV) power cables/conduit banks
 - Pits associated with HV cables
 - Critical communications links between nodes
- Non-trunk infrastructure:
 - Low Voltage (LV) power cables/conduit banks.

2.6.4 Existing infrastructure

The following summary has been developed after reference to BYDA plans from each of the service providers and an assessment of Energex provided network data along with the Energex DAPR (Distribution Annual Planning Report).

The electrical network within the Woolloongabba PDA is predominantly serviced by the Energex Substation (WRD) on the corner of Vulture Street and Wellington Road. (WRD) provides supply to over 90% of the PDA aided by a minor contribution from several surrounding substations.

A network of cables and conduits at 4 differing voltages are present in the (WRD) system. The main incoming voltage is 110kV with 33kV also being present in the incoming supply system. The outgoing or distribution voltages are 11kV and LV. In that section of the PDA centred around the Woolloongabba Sports complex along with the Cross River Rail Station and Mater Hospital the electrical cables are installed underground. However, within a few hundred metres in all directions the Energex system changes to Overhead poles and Wires.

In the central area the conduits are a combination of asbestos, concrete and plastic making adjacent excavation generally difficult, and requiring precise location and development of suitable excavation processes to match individual site needs.

Looking at future capacity, there are two apparent influences that will impact the use of electrical power within the Woolloongabba PDA. There is a growing shift away from fossil fuels with the first impact being electric transport, the second is household use for cooking and private electrical generation. These changes will see an increase in





the amount of electrical energy being consumed. While the uptake of private solar and battery storage is increasing, the cost of these systems and therefore the low numbers installed, mean that the impact of solar systems is likely to be relatively minor. However, the growing trend to electric transport has already seen load growth and as shown in our sample calculation that is likely to increase by a factor of 30 times by 2066.

As well as load increase the electrical system will be required to undergo a change from overhead to underground at least in the distribution voltages. It is suggested that, as a minimum, conduit will be needed within the Energex alignment which may be encroached with competing services. Where multiple new buildings or high rises are planned new network will need to be installed within the footway corridor which in some sections of the Woolloongabba PDA are very narrow. A complete redevelopment may be required in many areas.

Whilst there appears to be spare capacity within the (WRD) substation there will be an increase from the Cross River Rail facility surface development. In addition, the area modelling also predicts a population increase. The anticipated load increases will exceed the existing infrastructure capacity. Due to this increase new electrical capacity will be required to supplement (WRD) and the process of land acquisition or planning for an internal substation will be needed.

The Existing and Projected loads are presented in the Table 10.

The existing loads have been calculated where possible using the published Energex loads data, After Diversity Maximum Demand (ADMD). Where the data available was only produced in metres squared, there is a method prescribed in AS/NZS 3000 which calculates based upon area. However, this calculation has been shown to produce figures which are high by a factor of approximately 3.

Therefore, to produce figures which are closer to that usually projected by Energex, these calculations have been reduced by a factor of 3.





Table 10: Existing and projected electrical loads for the Woolloongabba PDA

Development	Units	AS 3000 Loads	2023 Quantity	2023 Load kVA	2066 Quantity	2066 Load kVA	Required Carparks 2023	Car Park Impact 2023 kVA	Required Car parks 2066	Potential Car Park Impact 2066 kVA
Homes	EA	4	115	460	94	376	115	120.75	94	526
Units		3	2,292	6876	14,077	42,231	1,833.6	1,925.28	11,262	63,065
Rooming Accommodation		3	35	105	0	0	17.5	0	0	0
Residential Care		3	152	456	275	825	76	0	138	206
Short Term Accommodation		3	392	1176	2,522	7,566	0	0	0	0
Commercial		60/m ²	2,400	48	1,600	32	0	0	8	1
Retail	m ²	60/m ²	40,000	800	105,000	2,100	0	0	8	1
Food and Drink		60/m ²	7,036	141	82,000	1,640	0	0	820	123
Hotel		60/m ²	9,400	188	2,800	56	0	0	1,400	210
Service Stations		30/m ²	1,400	14	110	1.1	0	0	0	0
Office		60/m ²	99,000	1980	310,000	3,200	0	0	1,550	233
Light Industry		20/m ²	34,994	233	19,177	128	0	0	96	14
Car Park		20/m ²	43,300	289	10,250	68	0	0	366	2,563
Total loads without new technology				12,766		61,223	Car park impact	2046	Car park impact	66,942





2.7 Communications

2.7.1 Service providers

There are a significant number of communications service providers in the Woolloongabba PDA, both underground and wireless. The BYDA reports show the following service providers have significant underground infrastructure that may be impacted:

- Telstra, Optus, Primus Telecom Pty Ltd, NBN Co., Powertel, Nextgen and BCC.

Network performance test data from the Australian Communications and Media Authority (ACMA) shows the following wireless telecommunications services providers have infrastructure in the area that may be impacted by the Woolloongabba PDA development:

- Telstra, Optus and Vodafone.

2.7.2 Information sources

Information relating to the existing infrastructure assets was obtained from BYDA reports from service providers and Australian Communications and Media Authority Map of Mobile / Radio Service Nodes.

Further consultation is required with NBN Co. and Telstra to understand key infrastructure, capacity and current configuration and planned upgrades or issues impacting on the existing network. Most other telco cables also share Telstra conduits.

2.7.3 Asset hierarchy

Most cables running through the Woolloongabba PDA are trunk fibre cables and identified, by their owners, as critical infrastructure.

2.7.4 Existing infrastructure

The following summary has been developed after reference to DYBG plans from each of the service providers and an assessment of Australian Communications and Media Authority Map of Mobile / Radio Service Nodes.

The communications network within the Woolloongabba PDA is predominated by the Telstra exchange building on corner of Main/Linton & Stanley Streets. A nest of 28 conduits run along the south side of Vulture Street, within the footway corridor, from this location. Other conduits, of varying configurations, are similarly installed along all other roads within the Woolloongabba PDA. Both Optus and Telstra have aerial hybrid fibre assets along many of the residential streets within the area. Pits and manholes, for each service provider, are located regularly along the conduit routes to facilitate cable connections and links to adjacent properties.

Although a Telstra asset, the above conduit installations are utilised by all comms carriers (e.g. nbn Co, Optus, etc) to reticulate their cables. The majority of cables are noted as fibre optic and considered to be key infrastructure.

The conduits are a combination of asbestos, concrete and plastic making adjacent excavation generally difficult, and requiring precise location and development of suitable excavation processes to match individual site needs.

The Telstra exchange is a key component of Queensland's communications capability, being a pivotal link between the state and our southern population. The exchange also provides direct line-of-sight wireless connections to many locations.

Whilst there appears to a large degree of capacity within the existing infrastructure, each building (old or new) needs to select their own preferred network provider, so cable and/or conduit extensions to individual network operator's existing infrastructure is highly likely. It is suggested that, as a minimum, a dedicated conduit be provided to each new building communications room. Where multiple new buildings are planned along routes currently showing limited conduit capacity, additional new network will most likely need to be accommodated within





the footway corridor. Changing technologies, network provider choices, and existing cable capacities make it impossible to determine where additional cable might be required, particularly well beyond any new building area.

The wireless network is also demand driven, with each service provider determining their own infrastructure growth and antenna location, but it is suggested that building planners give consideration of antenna mounting needs.

Significant liaison with each communication provider, particularly Telstra and nbn Co, should be expected with the changes envisaged as part of this Woolloongabba PDA. Construction timeframes need to make allowance for these individual additional discussions and resultant works.





2.8 Gas

2.8.1 Service providers

APA Group own and operate Gas infrastructure in and around the Woolloongabba PDA:

2.8.2 Information sources

Information relating to the existing gas infrastructure assets was obtained from BYDA report and APA GIS data. At the time of this report, APA was yet to provide any guidance on existing plans or capacity in the area.

2.8.3 Asset hierarchy

For the baseline reporting investigation, the following definitions apply:

- Trunk infrastructure:
 - High-pressure gas mains and some large diameter medium pressure mains
 - Fittings attach to high-pressure gas mains
 - Facilities
- Non-trunk infrastructure:
 - All other gas supply infrastructure.

2.8.4 Existing infrastructure

There are numerous high-pressure mains within the Woolloongabba PDA and the BYDA reports also shows abandoned gas mains, notably on the southern side of Vulture Street and two mains on the southern/central side of Main Street, refer Figure 15 below.

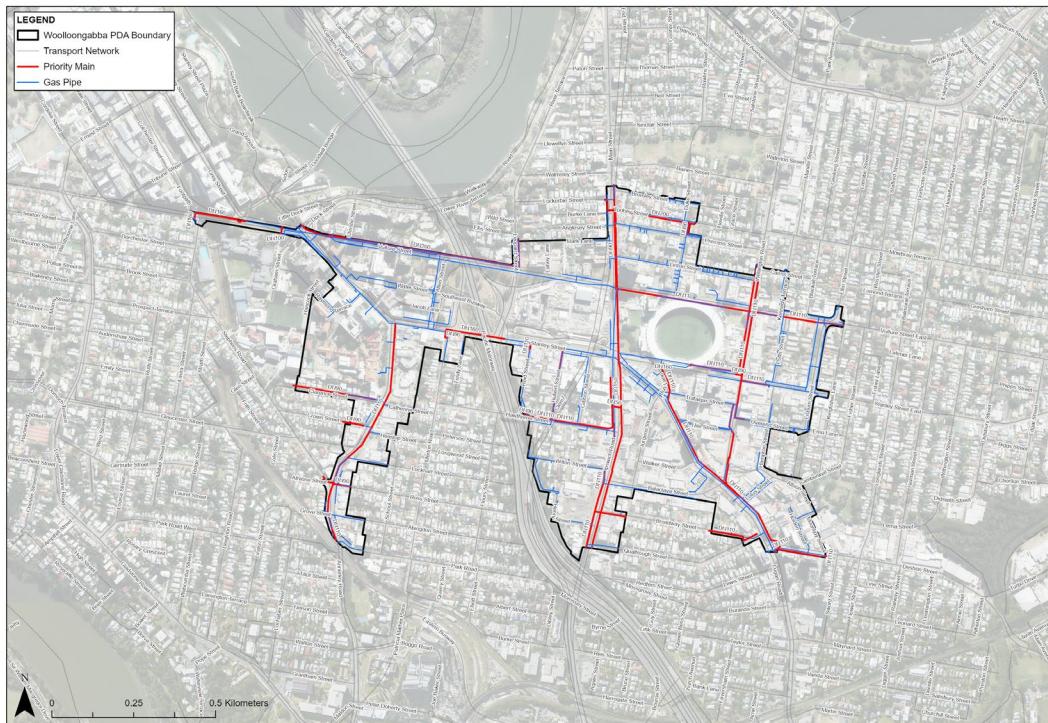


Figure 15: Priority main and gas pipe locations in the Woolloongabba PDA





3 Growth projections

3.1 Introduction

The rate of growth projected for the Woolloongabba PDA is based on 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.

3.2 Growth projection years

The Woolloongabba PDA growth projection years are:

- 2023 – the base year
- 2026 – projection year
- 2031 – projection year
- 2036 – projection year
- 2041 – projection year
- 2046 – projection year
- 2066 – final projection year.

3.3 Potential development capacity

EDQ commissioned the development of an Urban Growth Model (UGM) to inform infrastructure planning. The ultimate potential development capacity in the Woolloongabba PDA was determined the following factors:

- Size of the land parcel
- Developable area of the parcel
- Minimum area of developable land required for development to occur
- Existing land use and future land use of the parcel
- Buffer allowances to be applied within large parcel for uses such as internal roads, landscaping car parks, common area, etc.

3.4 Development constraints

The projected growth for the Woolloongabba PDA has been calculated taking into consideration known development constraints which may limit the potential yield of land. EDQ's UGM development constraints were derived from information contained in the BCC planning scheme overlays and State Government data including but not limited to flooding, steep slope, vegetation and waterway corridors. Two constraint impact levels were adopted being moderate development constraint – 40% yield reduction and absolute development constraint – 100% yield reduction.

3.5 Growth rates

The assumed rate of growth for residential and non-residential development in the Woolloongabba PDA was determined based on EDQ's UGM having regard to the anticipated timing of government land becoming available for development, the anticipated staging of future development, market analysis and industry engagement.





3.6 Growth projections summary

The Woolloongabba PDA is forecast to experience notable growth in population, employment and residential dwellings from the base year (2023) to the final projected development year (2066). Table 11 and Table 12 identify the source information, and revised projections of population, employment, and dwellings for the area which will inform the DCOP planning assumptions.

Table 11: Future residential dwellings and non-residential floor space projections for the Woolloongabba PDA – Identified within EDQ'S UGM

	2023 DCOP Base Date	2026 Projection year	2031 Projection year	2036 Projection year	2041 Projection year	2046 Projection year	2066 Final
Residential dwellings	2,988	TBA	TBA	TBA	TBA	TBA	17,178
Non-residential floor space (m² GFA)	489,333	TBA	TBA	TBA	TBA	TBA	1,068,367

Table 12: Future population and employment (job) projections for the Woolloongabba PDA – Identified within EDQ'S UGM

	2023 DCOP Base Date	2026 Projection year	2031 Projection year	2036 Projection year	2041 Projection year	2046 Projection year	2066 Final
Population	4,279	TBA	TBA	TBA	TBA	TBA	24,063
Employment (jobs)	12,759	TBA	TBA	TBA	TBA	TBA	36,844





4 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 Woolloongabba 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.





5 Desired Standards of Service (DSS)

Below are the DSS adopted for each infrastructure network. The DSS referenced outlines the standards to which infrastructure should be planned, designed and delivered within the Woolloongabba PDA.

5.1 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 Southeast 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.

5.2 Sewerage

The DSS for the wastewater network is consistent with:

- The design standards for the wastewater network stated in the Southeast 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.

5.3 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.

5.4 Transport

The DSS 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 will be planned to be assessed to 2066 planning horizon
 - Active transport routes must always be publicly accessible, or a suitable alternative route must be provided during the operation of events.

EDQ have adopted BCC's DSS, as per the Brisbane City Plan 2014 Local Government Infrastructure Plan (LGIP) for all transport networks.

The latest DSS can be accessed on the BCC website.

5.5 Social infrastructure

The DSS for the parks and community facilities network is consistent with the BCC LGIP and supporting policy and EDQ Guidelines, 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.





6 Infrastructure planning

6.1 Purpose

As described in section 5.0 of the proposed development scheme, the purpose of the infrastructure plan is to ensure that the Woolloongabba PDA vision is achieved through:

- Integrating infrastructure planning with land use planning identified in the development scheme
- Identifying the trunk infrastructure requirements which may be delivered to address impacts relating to a development proposal or relevant infrastructure provider such as State Government, BCC and/or UU
- Providing a basis for imposing conditions on Woolloongabba PDA development approvals in relation to trunk infrastructure
- Responding to the increased demand on the relevant infrastructure networks.

This interim IPBR should be read in conjunction with the draft development scheme infrastructure plan (Section 5.0) and the DCOP once it has been finalised. Section 5.2 of the development scheme identifies the various infrastructure networks and Section 5.3 describes three Woolloongabba PDA infrastructure categories: trunk, non-trunk and other which inform future funding arrangements.

6.2 Planning Horizon

The infrastructure plans for Woolloongabba PDA have a planning horizon of 2066. The horizon was chosen to align with the anticipated staging of future development and the realisation of ultimate development in the Woolloongabba PDA. The Woolloongabba PDA is assumed to be mostly developed by 2066 however development will continue to occur after this time.

6.3 Water Supply

6.3.1 Reservoir storage

Tarragindi Reservoir has adequate storage capacity up to the UU ultimate planning horizon (Refer Table 3). Its spare capacity at this time however will be limited. Highgate Hill Reservoir has inadequate capacity to service its supply zone both currently and at ultimate (Refer Table 13). It is currently being supplemented with water from Green Hill Reservoir during periods of high demand. Green Hill Reservoir may have available ongoing storage capacity to support Highgate Hill reservoir up till ultimate but needs consultation with Seqwater to confirm future proposed population demands are acceptable to continue current arrangements.



Table 13: Ultimate required reservoir storage volumes (ML)

Reservoir	Highgate Hill	Tarragindi
Capacity (ML)	9	62
Planning Horizon	Required Capacity (ML)	
2021	23.3	51.8
2026	26.1	53.9
Ultimate	29.2	59.4

6.3.2 Trunk mains

Demand requirements for the Woolloongabba PDA is supplied through Trunk Mains S25, S82, S20, and the local network. All three trunk mains are interconnected by S63 running east/west along Vulture Street at their downstream ends. Any increase in demand to the Woolloongabba PDA will be evenly proportioned across the three trunk mains. UU has advised based on preliminary forecasted Woolloongabba PDA population figures there will be negligible differences in performance of the trunk main network compared to current 2016 planning projections at year 2036.

Previously noted sections of S25 and S82 that were already experiencing head loss greater than the SEQCode specified design limit of 3m/km now have short sections with increased head loss up to 10m/km at ultimate peak hour (refer Figure 16).

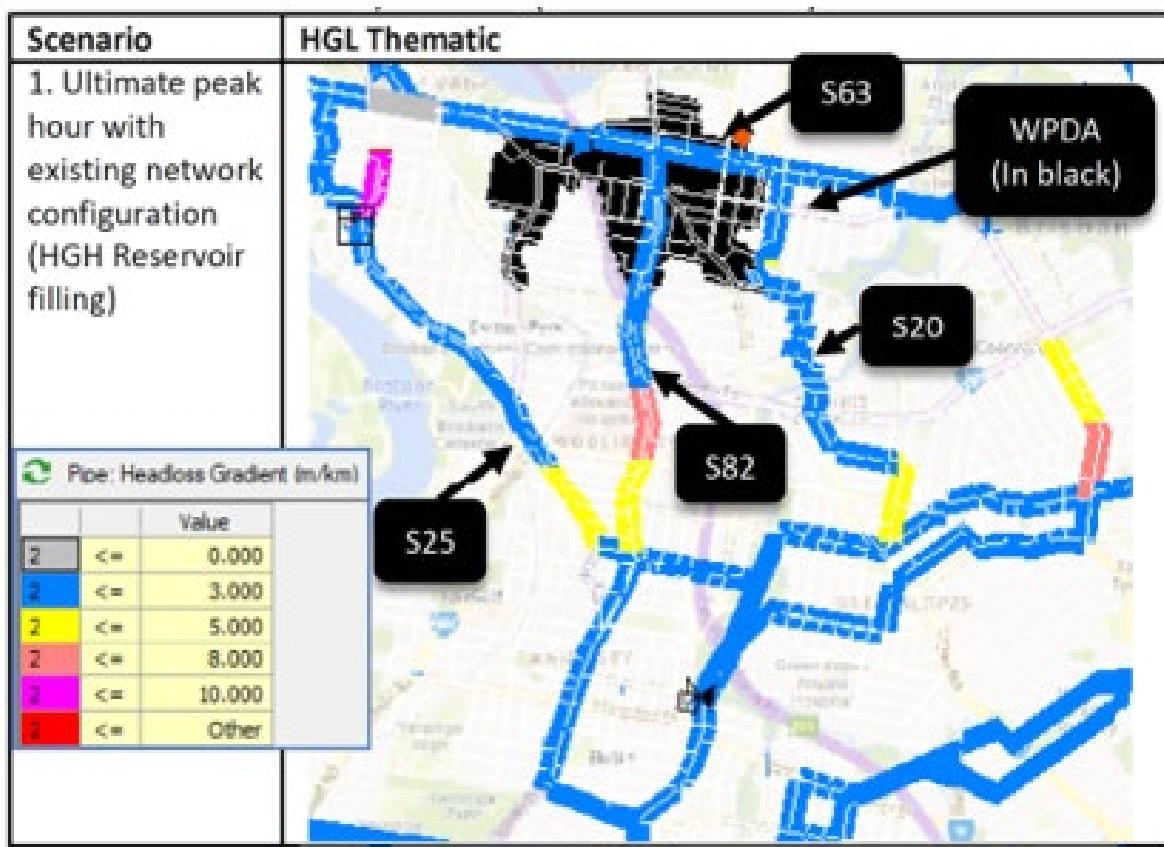


Figure 16: Trunk main head loss performance at ultimate (>300mm mains shown)

These head losses do not take into consideration potential population increases associated with the KSGP which will require additional demand sourced via the trunk mains supporting the Woolloongabba PDA. Higher head losses are expected possibly requiring augmentation or upsizing of the affected trunk main.

UU are currently assessing potential changes to population within the KSGP. This, with supplied Woolloongabba PDA population data will be used to assess trunk main capacity deficiencies and any required upgrades to ensure supply can be maintained to both Woolloongabba PDA and KSGP till ultimate.

6.3.3 Standards of service

It has been identified, from 2036 onwards, standards of service in respect to minimum pressure for properties at the high points in Leura Street and Ruth Street, Highgate Hill will start failing. This will occur during peak hour periods when Highgate Hill Reservoir is also filling. Initially in year 2036, three properties will be affected. By UU ultimate there will be at least 16 properties affected (refer Figure 17). This reduction of pressure is due to increased demand in the network and in part due to increased head loss in the Tarragindi trunk supply mains.

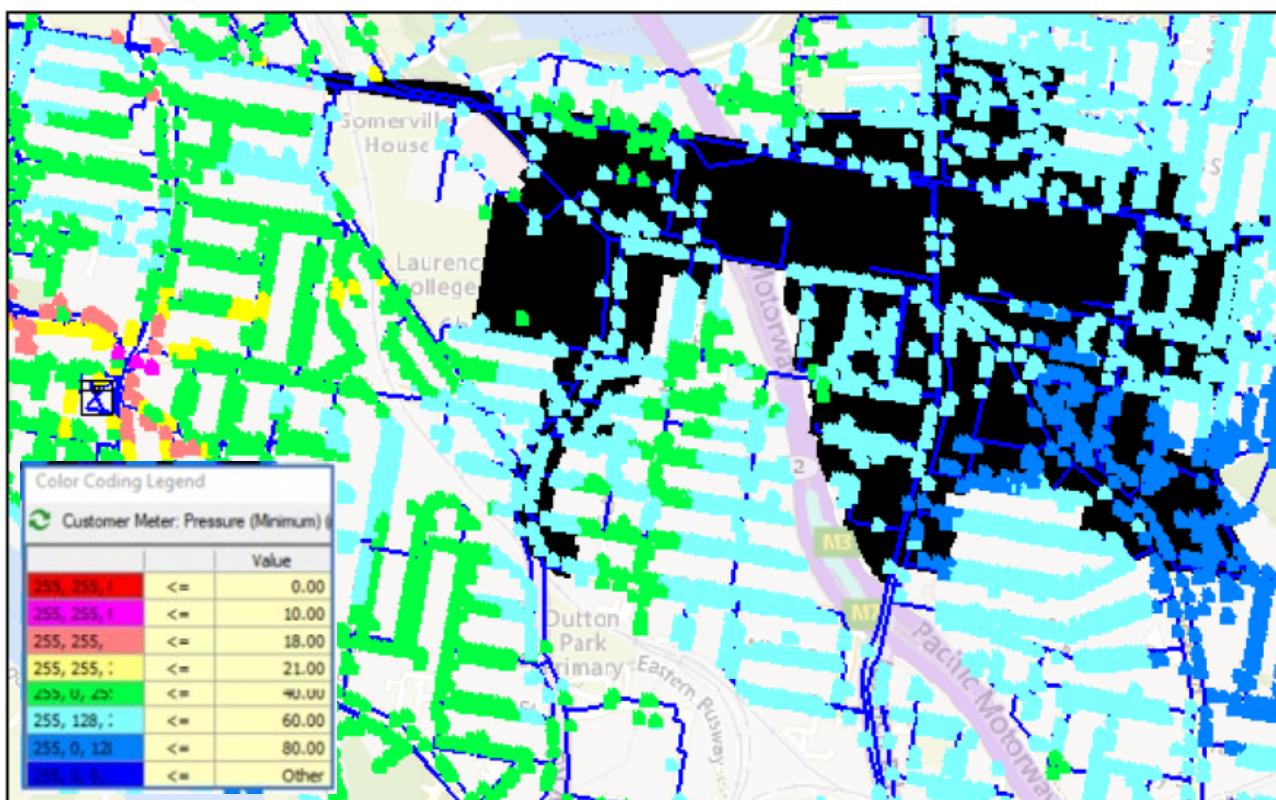


Figure 17: Tarragindi pressure performance – ultimate planning horizon, existing network configuration

UU does not currently have a proposed project or action in its ten-year capital investment plan to address these future performance deficiencies as they are to yet occur. They will be monitored and addressed in future iterations of the Integrated Zone Plan.

Current planned UU augmentations only cover the next 10 years for the water pipe network. Refer to Table 2 and Table 3, in Section 2 for current identified works and timing.

Future trunk infrastructure will be determined following UU water and sewerage impact assessment based on supplied EDQ's UGM from now up till UU's ultimate. It is noted there are multiple 80mm water reticulation mains in the Woolloongabba PDA. These will likely need to be upgraded as development proceeds to enable the development to meet higher required SEQCode design standards for in street firefighting flow requirements and generally increased peak hour flow demands.



6.4 Sewerage

Inside the Woolloongabba PDA there are no significant capacity limitations up until year 2031 based on UU's 2016 population projection data. There have been wet weather sewage releases reported within and immediately downstream of the Woolloongabba PDA. These caused by downstream surcharging in the network during wet weather backing up into the sewers in the lower parts of the Woolloongabba PDA.

Key capacity constraints downstream of the Woolloongabba PDA along its flow path include:

- Caswell Street SPS – Existing SPS is operating at about 825 L/s which is approximately 4.1xADWF
- DN600 Norman Creek gravity main from Caswell Street to new Farm siphon
- Kingsford Smith Drive single barrel DN1350 sewer from Cooksley Street to Hamilton siphon
- Norman Creek Interceptor sewer and Hamilton Siphon
- Twin Gravity sewer between Hamilton Siphon and Eagle Farm SPS
- Eagle Farm SPS
- Luggage Point Resource Recovery Centre.

Current planned UU augmentations only cover the next 10 years for the sewer pipe network and the treatment plant until year 2037. Refer to Table 3, in Section 2 for current identified works and timing.

Depending on development density and location, additional sewer upgrades maybe required following further assessment. Future trunk infrastructure will be determined following UU water and sewerage impact assessment undertaken as part of the next phase draft Woolloongabba PDA infrastructure background report. Assessment will be based on EDQ's UGM from now up till 2066.

6.4.1 Summary

In summary, for water there is adequate capacity in the network within the Woolloongabba PDA until around year 2036 based on current UU 2016 planning projections. Capacity issues identified in the TWSZ and HWRZ include:

- Highgate Hill Reservoir currently does not have adequate storage capacity based on SEQCode requirements to service the Highgate Hill Water Supply Zone
- Trunk Mains S25 and S82 upstream of the Woolloongabba PDA has section of mains that currently exceed SEQCode maximum design head loss requirements, and within the Woolloongabba PDA there are pipes that are past their service life with an age of 100yrs.

It is expected the aged trunk and reticulation mains will be replaced over time by either UU through their burst main replacement program, capital works upgrades or development.

Highgate Hill Reservoir storage capacity is currently offset by supply from the Green Hill Reservoir during high demand periods. Population is planned to increase due to the KSGP and the Woolloongabba PDA. UU is examining these proposed population density increases and anticipating the trunk mains supporting the Woolloongabba PDA will be also required to supply the KSGP. This will lead to higher head losses experienced in the trunk mains.

An increase in trunk main head loss will mean lower HGLs in the network will be experienced during peak demands. This has been identified to occur in the Highgate Hill area serviced by the TWSZ around year 2036. UU have provided details of planned upgrades over the next 10 years. None are located within the Woolloongabba PDA.

It is noted there are multiple 80mm water reticulation mains in the Woolloongabba PDA. These will likely need to be upgraded as development proceeds to enable the development to meet higher required SEQCode design standards for in street firefighting flow requirements and generally increased peak hour flow demands.

Currently population demands for the Woolloongabba PDA and KSGP have not been finalised. Required upgrades will likely change following undertaking of water supply hydraulic impact assessment incorporating finalised Woolloongabba PDA and KSGP population growth projections. Trunk infrastructure upgrades to service the Woolloongabba PDA and their required timing will be determined when UU undertakes an impact assessment of the Woolloongabba PDA proposed population growth projections on the existing water network.





For sewerage, inside the Woolloongabba PDA, there are no significant capacity limitations however it does experience wet weather sewage releases caused by downstream wet weather capacity issues. Based on UU's 2016 population projection data, the current network has the capacity to accommodate the expected population growth until 2031.

Downstream of the Woolloongabba PDA, key infrastructure that limits ultimate capacity to service the Woolloongabba PDA and other upstream development include Caswell Street SPS, the DN600 Norman Creek gravity sewer main from Caswell Street to New Farm siphon, the Norman Creek interceptor sewer and Hamilton siphon, and Kingsford Smith Drive single barrel DN1350 sewer from Cooksley Street to Hamilton siphon.

Required trunk sewer upgrades of the sewer network will be determined once an impact assessment of the Woolloongabba PDA population growth projections on the existing sewer network is undertaken by UU on behalf of EDQ in preparation of the final Woolloongabba PDA infrastructure plan background report.



6.5 Stormwater

The Woolloongabba PDA is prone to flooding from three main sources, namely the Brisbane River flood, the Norman Creek flood, and overland flooding (refer Figure 18). The first two sources primarily affect the south-eastern region of the Woolloongabba PDA. However, these extents (primarily the Brisbane River) progress north to Stanley Street in the 2100 future time horizon. Focussing on the stormwater infrastructure network, the key risk of overland flooding increase is due to existing trunk stormwater infrastructure being insufficient for the 10% AEP event, made worse by climate change.

SMEC was engaged by the EDQ Infrastructure Planning team to identify the potential stormwater infrastructure upgrades required to improve overland flooding in the Woolloongabba PDA under future development horizons.

SMEC conducted a review of the current overland flooding condition and identified three areas where improving existing infrastructure could reduce flood risks.

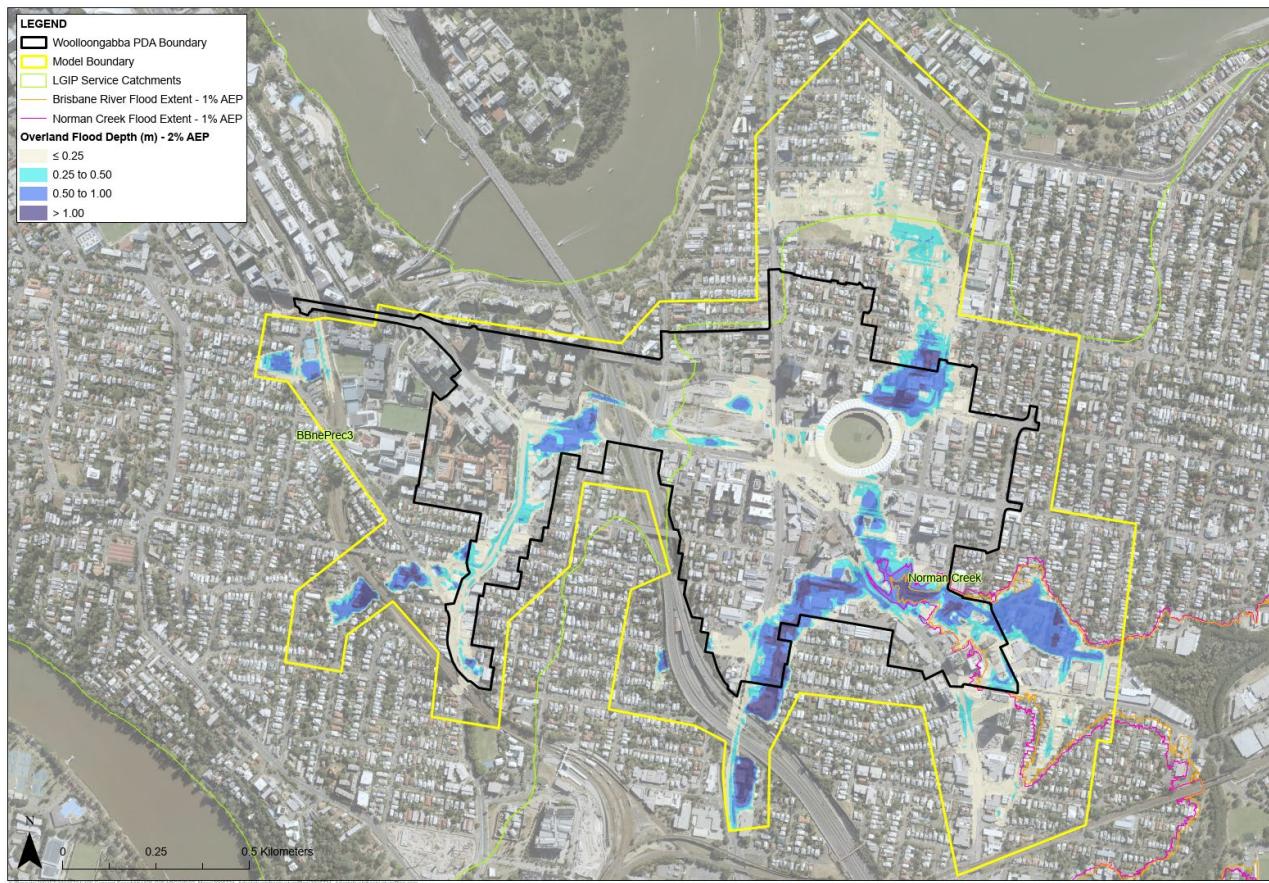


Figure 17: Flood Sources in the Woolloongabba PDA, 2020 (Current)



6.5.1 Objectives

The Woolloongabba PDA Baseline Infrastructure Report (Chorley, Litherland, Morrow, Pollard, & Springall, 2023) identifies that the current overland flooding indicates that the existing trunk infrastructure does not have sufficient capacity to convey the 10% AEP event. Overland flooding in this area will be further exacerbated because of climate change (represented as increased rainfall and mean sea level rise). Accordingly, infrastructure upgrades are required.

The objective of this study is to review the current overland flooding to identify areas where improving existing infrastructure would reduce flood risks. Overland flooding for current unmitigated conditions was modelled. Three areas were identified for potential improvements to trunk stormwater infrastructure, and three potential Mitigation Solutions were identified in consultation with the EDQ infrastructure team to improve flooding within the WPDA and reduce flood risks consequently. The approaches identified are interim at this point and represent the basis on which additional scenario testing and modelling will be undertaken.

6.5.2 Scope

The scope was as follows:

- Identification of areas impacted by overland flooding under the current time horizon (2020) and development assumptions in the future 2050 and 2100 time horizons. These scenarios are referred to as the Base Case (unmitigated) in this report.
- Proposing three Mitigation Solutions to improve the trunk stormwater infrastructure network.
- Undertaking a high-level assessment of these Mitigation Solutions and potential flooding improvements
- Providing recommendations on the further required assessment and staging of Mitigation Solutions based on hydraulic assessment, constructability, cost, and overall benefit to the area.
- Providing recommendations on further scenario modelling which apply different combination of proposed Mitigation Solutions (Called Mitigation Scenarios).

6.5.3 Methodology

The below methodology was applied to identify Mitigation Solutions. The following steps were undertaken:

- The current flooding conditions within the WPDA were analysed to identify impacted areas where infrastructure upgrades will improve flood conditions. The SMEC Base Case Flood Model (Chorley, Jonah, 2023) was used. The model was updated further as detailed in this report.
- Six Mitigation Solutions were proposed to the EDQ, and three Mitigation Solutions were shortlisted for further assessment and modelling.
- The selected three Mitigation Solutions were explored and altered in the modelling phase where needed.
- The outcomes of each Mitigation Solution were reported and discussed.
- Recommendations regarding staging, constructability, cost, etc. were prepared for each Mitigation Solution.





6.5.4 Related documents

A summary of the related documents and their specific relevance to this report is described in Table 14.

Table 14: Reference documentation

Document Name	Description	Relevance
Woolloongabba PDA Baseline Report	The stormwater section of the report provides an in-depth description of existing infrastructure and supply as well as the flood risk	Observations of existing infrastructure, uncertainties identified and recommendations to improve knowledge of missing data Existing stormwater capacity at key locations Future (planned) LGIP and LTIP stormwater network plans Flood risk relevant to the Woolloongabba PDA
Base Case Flood Modelling Memorandum	Provides a detailed description of the development of the base case overland flood model	Development of the base case hydraulic model Climate change definitions Limitations of the hydraulic model
Kingfisher Creek Relief Drainage Investigation Report	Suburb wide relief drainage investigation which appears to have informed the LTIP.	DRAINS model of the proposed relief drainage for the localised 50 year ARI design storm burst. Specific location of upgrades, upgrade details and reasoning for certain upgrades

6.5.5 Base case (unmitigated) flood condition

The SMEC Base Case Flood Model (Chorley, Jonah, 2023) was used and updated as part of this study. The following sections summarise assumption and scenarios used in this study.

SCENARIOS

A summary of the different scenarios modelled for the 10% and 2% AEP events are described in Table 15.

Table 15: Modelled scenarios

Scenario	Time horizon		
	2020 (Current)	2050	2100
Base Case (unmitigated)	Base Case 2020	Base Case 2050	Base Case 2100
Mitigation Solution 1	Mitigation Solution 1 2020	Mitigation Solution 1 2050	Mitigation Solution 1 2100
Mitigation Solution 2	Mitigation Solution 2 2020	Mitigation Solution 2 2050	Mitigation Solution 2 2100
Mitigation Solution 3	Mitigation Solution 3 2020	Mitigation Solution 3 2050	Mitigation Solution 3 2100

CLIMATE CHANGE

Three different climate scenarios were investigated for the 10% and 2% AEP flood events. These are the RCP 4.5 for 2020 (current) and RCP 8.5 for time horizons 2050 and 2100. Rainfall intensity and mean sea level rise have been increased in accordance with best practice guidelines from Australian Rainfall and Runoff (Babister, et al., 2019) and from Guidelines to the Effects of Climate Change in Coastal and Ocean Engineering (Harper, 2017)



respectively. The applied changes are summarised in Table 16. For more details, refer to the Base Case Flood Modelling Memorandum (Chorley, Jonah, 2023).

Table 16: Future climate increase in rainfall intensity and mean sea level rise

Type	Time horizon		
	RCP 4.5 - 2020 (Current)	RCP 8.5 - 2050	RCP 8.5 - 2100
Rainfall Intensity	0.0%	9.0%	20%
Mean Sea Level Rise	0.0m	0.4m	0.8m

LAND USE

The Woolloongabba PDA is situated within two stormwater network service catchments. These are the 'BBnePrec3' and 'Norman Creek' respectively, as seen in Figure 18. The existing and projected demand (impervious hectares) for these catchments are detailed in Table 17. Table SC3.1.6 from the City Plan (BCC, 2023) gives the existing and projected demand for each service catchment. Using the total service catchment area, the fraction impervious (%) is calculated. This was used to approximate the corresponding fraction impervious of each service catchment within the Woolloongabba PDA.

It is evident that the estimated fraction impervious for the Woolloongabba PDA is expected to marginally change in the ultimate development case. As such, the land use within the Woolloongabba PDA is not expected to change drastically from its current state so it wasn't included in the future scenarios.

Table 17: Existing and projected demand for the stormwater network

Service catchment	Existing and projected demand							
	Woolloongabba area (ha)	Total area (ha)	2021			Ultimate development		
			Fraction impervious (%)	Woolloongabba Impervious area (ha)	Total Impervious area (ha)	Fraction impervious (%)	Woolloongabba Impervious area (ha)	Total Impervious area (ha)
BBnePrec3	33.0	1204	56	18.5	676	69	22.8	829
Norman Creek	73.5	2990	53	39.0	1580	65	47.8	1949
Total	106.5	4194		57.5	2256		70.6	2778

MODEL UPDATES

The model adopted for this investigation is the SMEC Base Case Flood Model. Please refer to the Base Case Flood Modelling Memorandum for details regarding the model development. As part of this study, several updates were made to the Base Case Model which will be herein named the 'Unmitigated Model'. Those updates are listed below:

- Onsite retention through underground busway updated to RCBCs 3m wide by 1.7m high following confirmation on the 16/03/2023.

- Future LGIP infrastructure was incorporated into the Base Case (unmitigated) scenario based on the assumption that all future LGIP will be implemented by 2026.
- Locations in the 1d pipe network that exhibit pipe cover issues were addressed.
- Locations in the 1d pipe network where the downstream invert level was higher than the upstream invert level were revised.

2020 TIME HORIZON (CURRENT)

The modelling results for the Base Case (unmitigated 2020 time horizon) showed larger flood depths in the eastern region of the Woolloongabba PDA, north and south of the Gabba Stadium, with shallower depths seen through Annerley Road in the western portion. These three areas were identified as the main areas of interest (refer to Figure 17).

2050 TIME HORIZON

Under the 2050 time horizon, most of the flood extent remains the same as was established under the current time horizon (2020) with small increase in flood extent. Increased flood depths are observed mostly through Ipswich Road through to Logan Road which follows downstream to Norman Creek (Figure 18). Additionally, larger increases (>50 mm) are seen north of the Gabba from Vulture Street to Princess Street as well as in the western portion of the Woolloongabba PDA across Stanley Street which progresses to the busway. The most notable increase in flood extent, occurs downstream of the Woolloongabba Rotary Park adjacent to Deshon Street. In addition to this, the Gabba Stadium experiences an increase in flood extent towards the centre of the field.

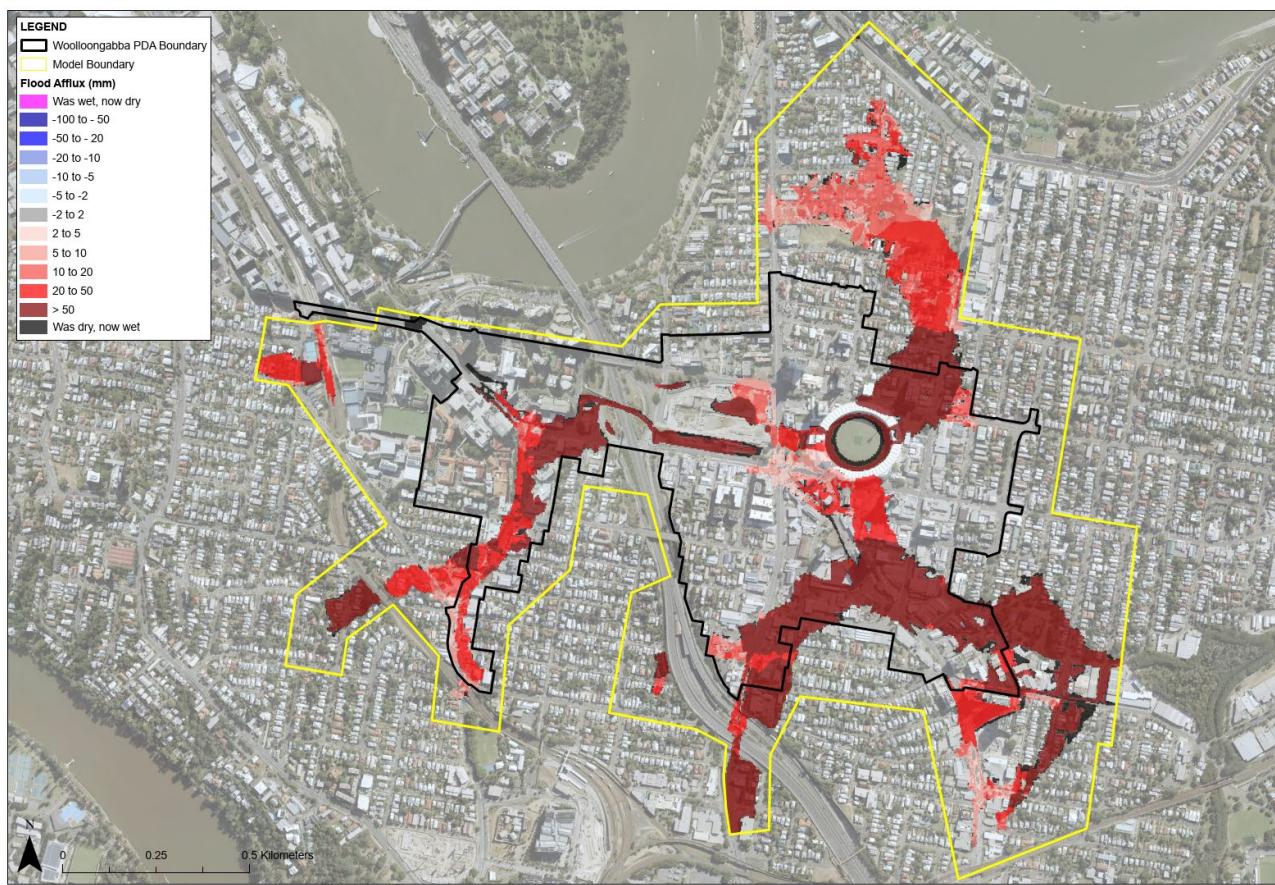


Figure 18: Change in flood depth and extent between the base case (unmitigated) 2020 and base case (unmitigated) 2050 scenarios for the 2% AEP

2100 TIME HORIZON

Under the 2100 time horizon, similar characteristics are observed as those shown in the 2050 horizon. Larger increases in depth now extend south of the Gabba from Stanley Street through to Logan Road and are much more

prominent down Annerley Road in the western side of the PDA (Figure 19 areas that became wet in the 2050 time horizon have worsened in extent by the 2100 time horizon.

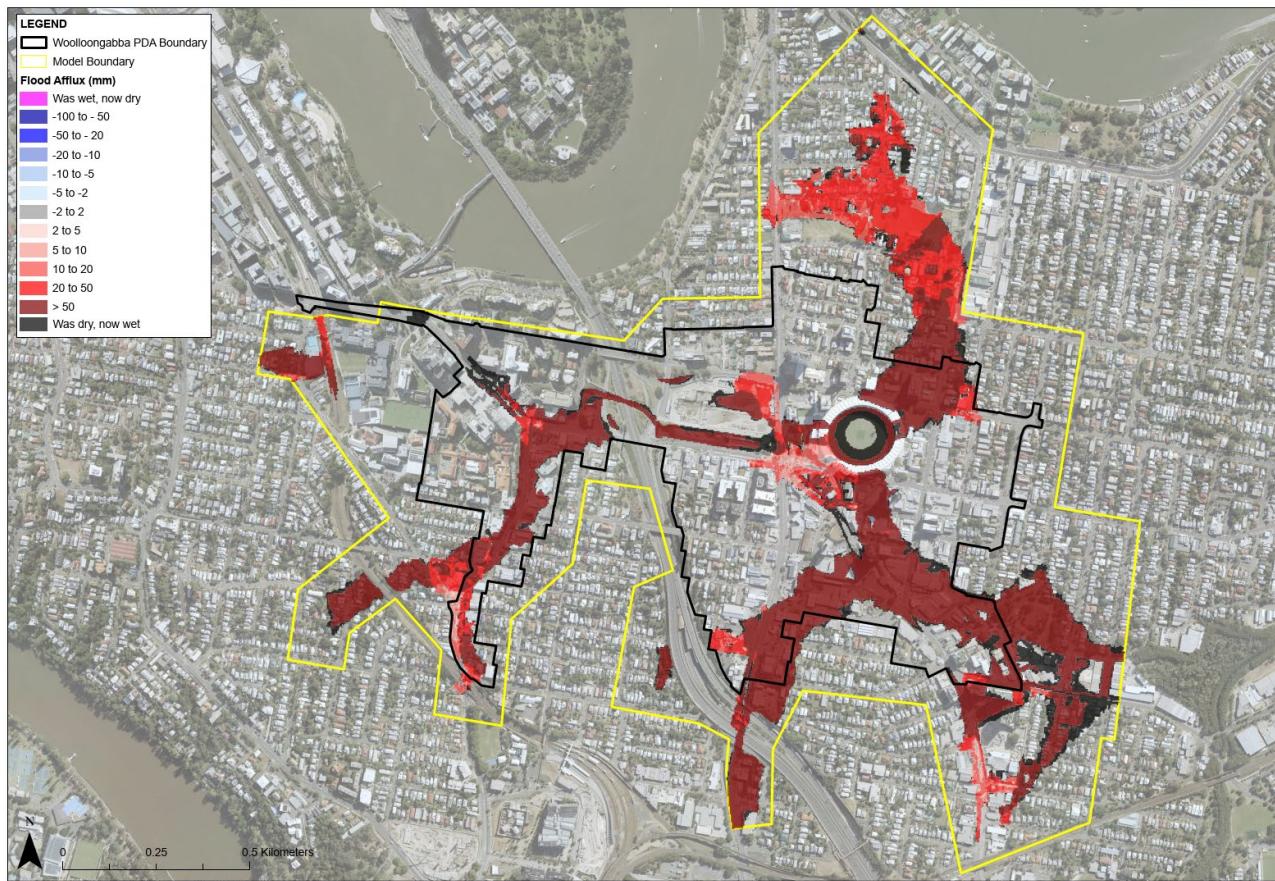


Figure 19: Change in flood depth and extent between the base case (unmitigated) 2020 and base case (unmitigated) 2050 scenarios for the 2% AEP

6.5.6 Mitigation solutions

An Optioneering workshop was held with EDQ Infrastructure Planning team on 5th March 2024. Six Mitigation Solutions were proposed to the EDQ infrastructure planning team with the goal of choosing three to further assess and model. A Mitigation Solution for each area of concerns (refer to Table 18) was identified to further investigate and understand the potential improve in overland flooding. Overland flooding was modelled for current (2020) and future scenarios (2050 and 2100 time horizons).

Please note that the current assessment is at a high level, further modelling and investigations are required to confirm the potential improvements. Additionally, in this stage, each Mitigation Solution was modelled in isolation, but in the next stage, a combination of these Mitigation Solutions must be investigated. The requirement for any network upgrades will need to be considered in a catchment-wide context, and appropriately apportioned.

MITIGATION SOLUTION 1

Mitigation Solution 1 is aimed at reducing flooding in the south and southeast of the WPDA, downstream of the Gabba Stadium. Existing pipe network is at capacity causing large overland flow extent from Redfern St to Balaclava St, extending through to Woolloongabba Rotary Park.

This Mitigation Solution includes an upgrade to the network starting along Ipswich Road into Qualtrough Street, then through to Balaclava Street; a relief pipe from Logan Road to Lotus Street, and upgrading the downstream network from Hampton Street to Norman Creek discharge including an additional 3 x 2.1 m RCBC cell to increase the downstream capacity (Figure 20).

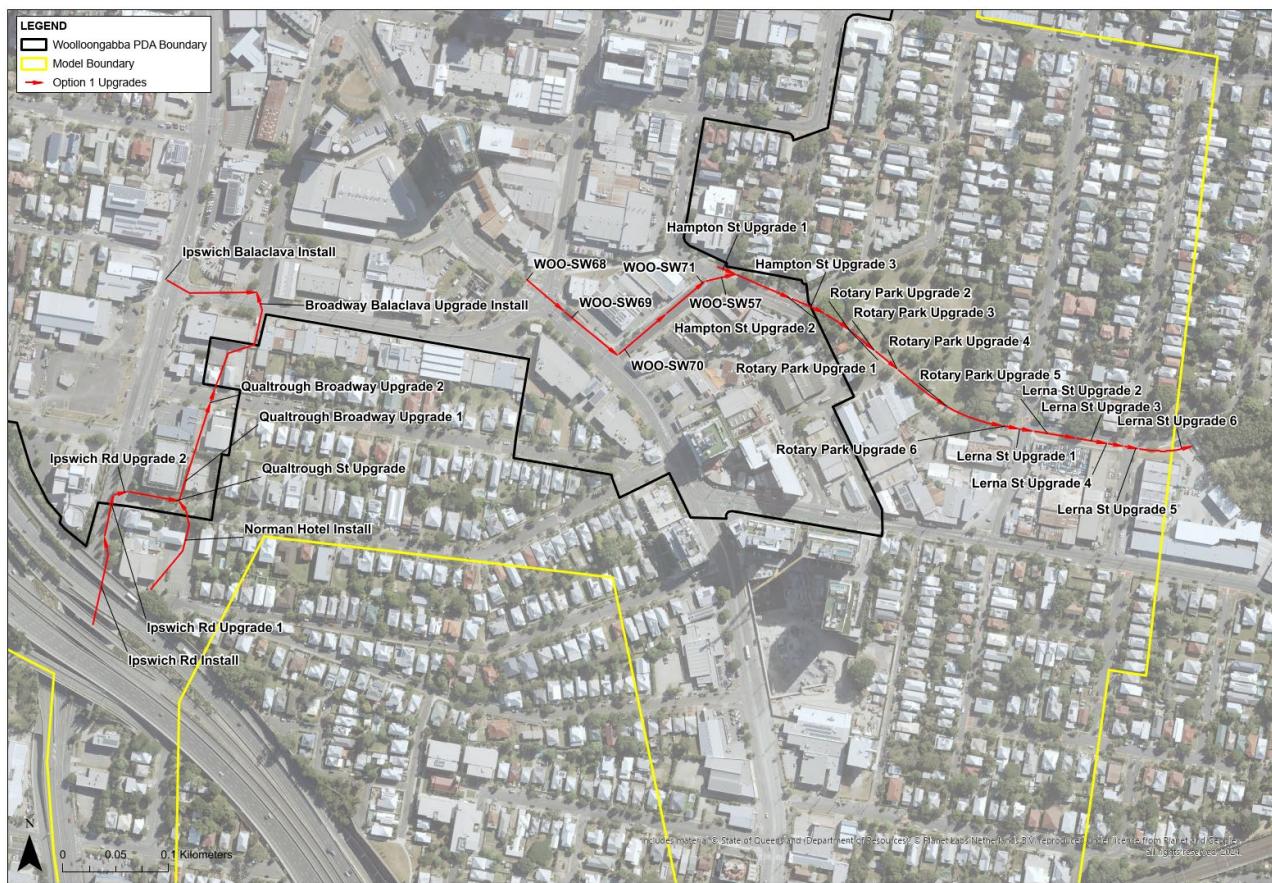


Figure 20: Mitigation solution 1 – proposed upgrades

MITIGATION SOLUTION 2

Mitigation Solution 2 is aimed at improving flooding north of the Gabba Stadium. The solution included upgrades from Baines Street to Vulture Street (LTIP) through the existing network, with an on-site detention under the Gabba Stadium.

This solution includes adding a pipe from Baines Street to Wellington Road then connecting in with the existing network, upgrading the remaining pipes down Wellington Road, and installing a pipe that connects to Vulture Street. The solution also includes an underground OSD tank (~46,000 m³, 13,815 m² x 3.3m depth) under the Gabba stadium with a uni-directional inlet pipe from Vulture Street and a two-way outlet pipe connecting to the existing network on Stanley Street (Figure 21).



Figure 21: Mitigation solution 2 – proposed upgrades

MITIGATION SOLUTION 3

Mitigation Solution 3 is aimed at addressing issues on the west side of the WPDA. The solution involves upgrading the pipe network along Annerley Road, installing a connecting pipe to Stanley Street, and upgrading the pipe network along Stanley Street (Figure 22).

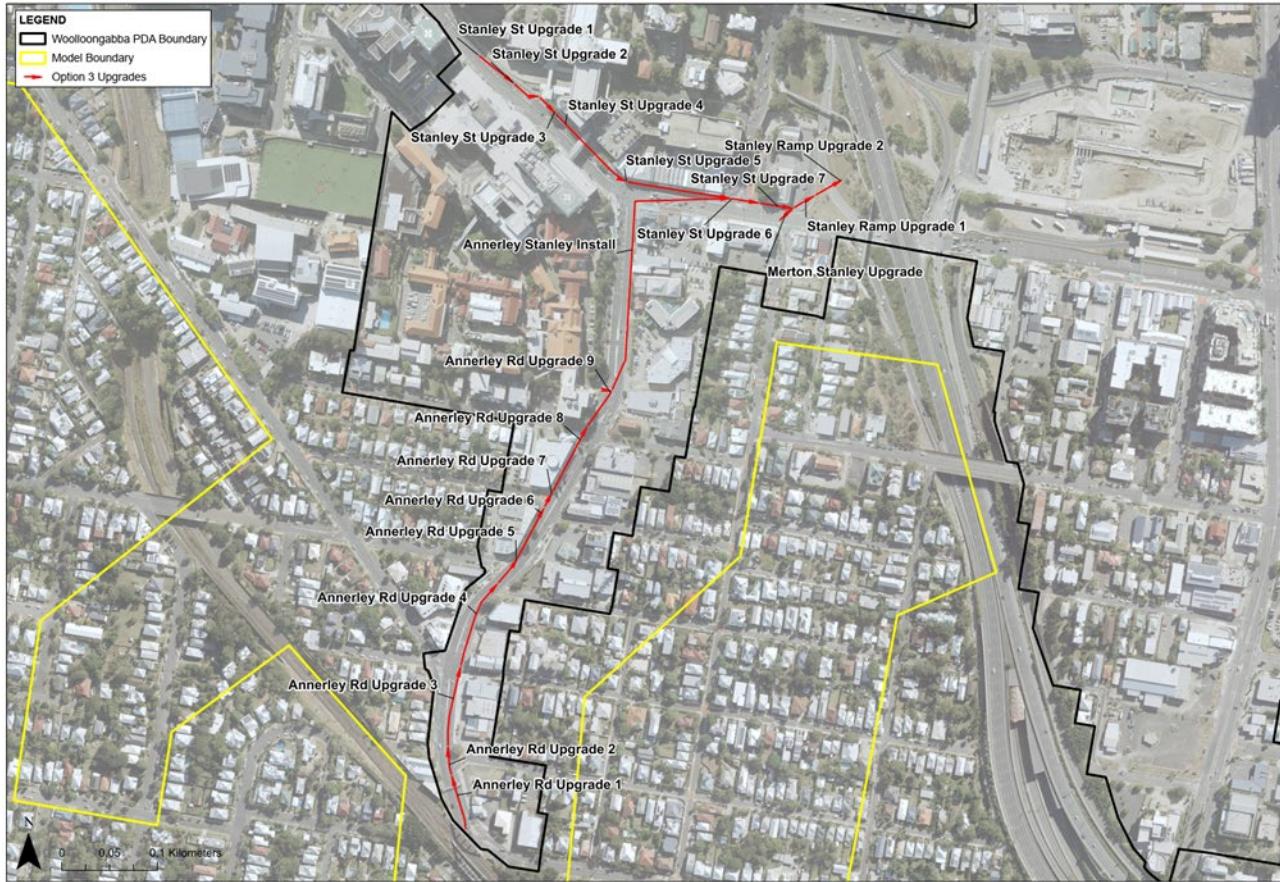


Figure 22: Mitigation solution 3 – proposed upgrades

6.5.7 Results

Note that the current assessment is at a high level, further modelling and investigations are required to confirm the potential improvements. Additionally, in this stage, each Mitigation Solution was modelled in isolation, but in the next stage, a combination of these Mitigation Solutions must be investigated. It is possible that all three mitigation solutions or a combination of them are required for the ultimate scenario, and staging and sequencing of delivery.

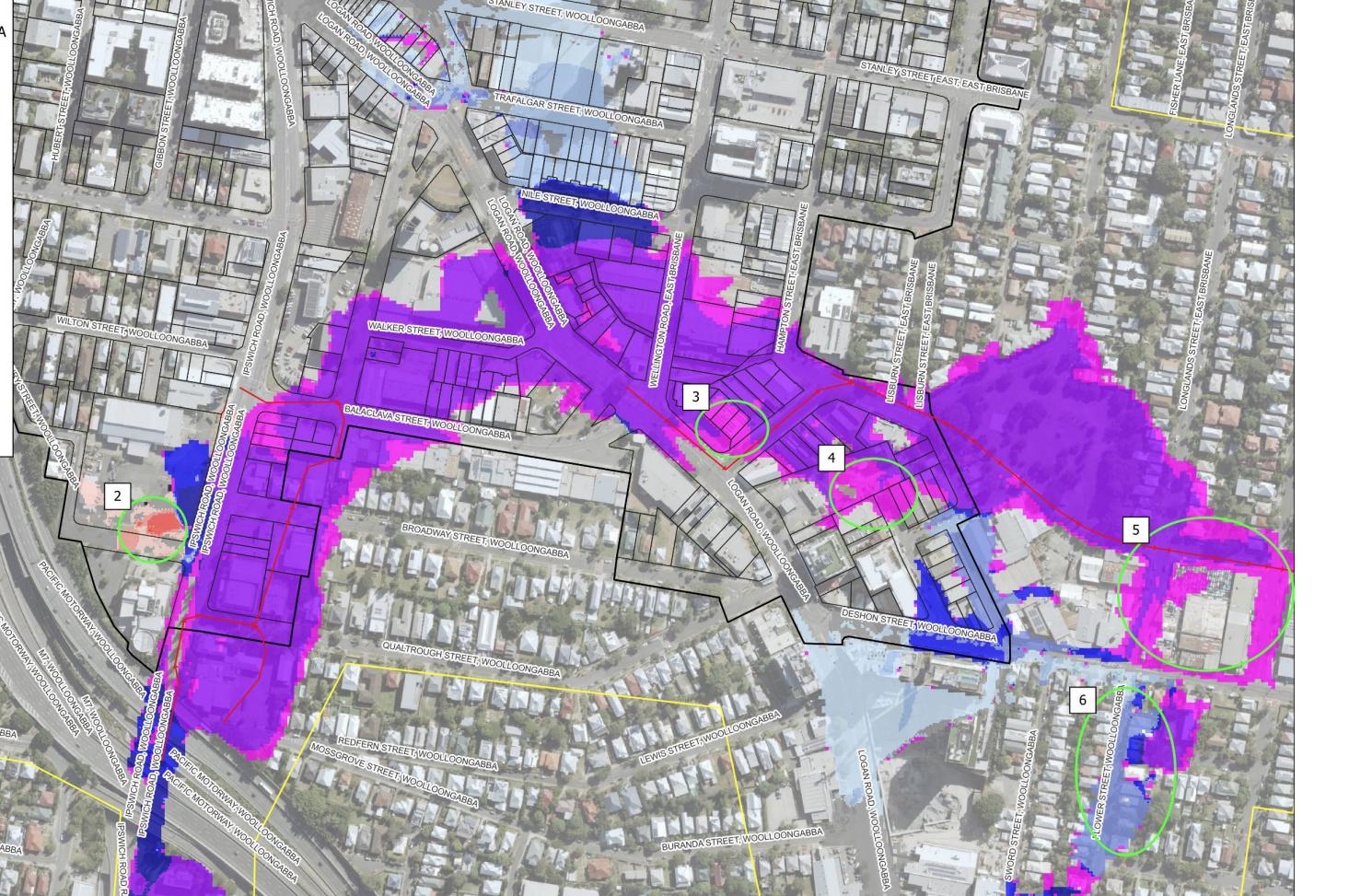
Table 18 summarises the proposed Mitigation Solutions and potential impacts and challenges.



Table 18: Summary of proposed mitigation solutions, potential impacts and challenges

Mitigation solution	Summary of potential impacts	Constructability/reliability	Cost
<p>Mitigation Solution 1 is aimed at reducing flooding in the south and southeast of the Woolloongabba PDA, downstream of the Gabba Stadium. Existing pipe network is at capacity causing large overland flow extent from Redfern St to Balaclava St, extending through to Woolloongabba Rotary Park.</p> <p>This Mitigation Solution includes an upgrade to the network starting along Ipswich Road into Qualtrough Street, then through to Balaclava Street; a relief pipe from Logan Road to Lotus Street, and upgrading the downstream network from Hampton Street to Norman Creek discharge including an additional 3 x 2.1 m RCBC cell to increase the downstream capacity (Figure 20).</p>	<p>The results indicate that the flood extent may decrease downstream of Woolloongabba Rotary Park. In the Base Case (unmitigated) scenario, a more extensive area downstream of the park is expected to be flooded in the 2050 and 2100 time horizons. Therefore, the results of Mitigation Solution 1 suggest better improvement in the future time horizons compared to the unmitigated scenario.</p> <p>A decrease in flood depths in some areas and a decline in hazard categories can be expected in both the 10% and 2% AEP events. However, a small area of increased flood levels was observed over commercial lots on Jurgen Street and within the carpark at the junction of Ipswich Road and Henry Street, but no significant change in the flood hazard category is expected.</p> <p>The observed impact should be confirmed and resolved in the next stages of the project using updated model and different solutions combinations scenarios.</p>	<ul style="list-style-type: none">-Taking advantage of public lands (roads and parks)-The majority of the extent covers industrial lots; with some residential dwellings.-May have difficulty accessing some of the drainage network that run directly through several industrial lots as well as some residential houses.	High



Mitigation solution	Summary of potential impacts	Constructability/reliability	Cost
Mitigation solution 1 potential flood improvements – change in flood depth and extent – 2% AEP 2020 time horizon			
 <p>LEGEND</p> <ul style="list-style-type: none"> Woolloongabba PDA Model Boundary Cadastral → Option 1 Upgrades Flood Afflux (mm) Was wet, now dry <= -100 -100 to -50 -50 to -20 -20 to -10 -10 to -5 -5 to -2 -2 to 2 2 to 5 5 to 10 10 to 20 20 to 50 > 50 Was dry, now wet <p>0.1 Kilometers</p>			





Mitigation solution	Summary of potential impacts	Constructability/reliability	Cost
<p>Mitigation Solution 2 is aimed at improving flooding north of the Gabba Stadium. The solution included upgrades from Baines Street to Vulture Street (LTIP) through the existing network, with an on-site detention under the Gabba Stadium.</p> <p>This solution includes adding a pipe from Baines Street to Wellington Road then connecting in with the existing network, upgrading the remaining pipes down Wellington Road, and installing a pipe that connects to Vulture Street. The solution also includes an underground OSD tank (~46,000 m³, 13,815 m² x 3.3m depth) under the Gabba stadium with a uni-directional inlet pipe from Vulture Street and a two-way outlet pipe connecting to the existing network on Stanley Street (Figure 21).</p>	<p>According to initial flood modelling results, an improvement in flood conditions can be expected in the targeted area and further downstream. In all time horizons, some areas between Trafalgar Street and Nile Street may become flood-free for the 2020 time horizon. However, in the 2050 and 2100 time horizons, this area is expected to become inundated for both the Base Case and Mitigation Solution 2 scenarios. Mitigation Solution 2 may provide a flood depth reduction in some area for the 2050 and 2100 time horizons.</p> <p>Across all time horizons and design events, no positive afflux is expected to occur as a result of Mitigation Solution.</p> <p>The observed impact should be confirmed and resolved in the next stages of the project using updated model and different solutions combinations scenarios.</p>	The biggest challenge for this Mitigation Solution is the installation of the underground OSD tank within the Gabba stadium.	High





Mitigation solution	Summary of potential impacts	Constructability/reliability	Cost
Mitigation solution 2 potential flood improvements – change in flood depth and extent – 2% AEP 2020 time horizon			
LEGEND <ul style="list-style-type: none"> Woolloongabba PDA Model Boundary Cadastre Option 1 Upgrades <p>Flood Afflux (mm)</p> <ul style="list-style-type: none"> Was wet, now dry <= -100 -100 to -50 -50 to -20 -20 to -10 -10 to -5 -5 to -2 -2 to 2 2 to 5 5 to 10 10 to 20 20 to 50 > 50 Was dry, now wet 			





Mitigation solution	Summary of potential impacts	Constructability/reliability	Cost
Mitigation Solution 3 is aimed at addressing issues on the west side of the WPDA. The solution involves upgrading the pipe network along Annerley Road, installing a connecting pipe to Stanley Street, and upgrading the pipe network along Stanley Street (Figure 22).	<p>The model results indicate that some areas along Annerley Road may become dry as a result of this solution. This is particularly prominent during the 10% AEP event where overland flooding mostly occurs within the road reserve, across all three time horizons. A few locations have shown a positive afflux due to the implementation of this mitigation solution.</p> <p>The observed impact should be confirmed and resolved in the next stages of the project using updated model and different solutions combinations scenarios.</p>	Annerley Rd is highly trafficable during the day and provides several connection routes to different areas in Woolloongabba.	Medium to High





Mitigation solution	Summary of potential impacts	Constructability/reliability	Cost
Mitigation solution 3 potential flood improvements – change in flood depth and extent – 2% AEP 2020 time horizon			
<p>LEGEND</p> <ul style="list-style-type: none"> Woolloongabba PDA Model Boundary Cadastre Option 3 Upgrades <p>Flood Afflux (mm)</p> <ul style="list-style-type: none"> Was wet, now dry <= -100 -100 to -50 -50 to -20 -20 to -10 -10 to -5 -5 to -2 -2 to 2 2 to 5 5 to 10 10 to 20 20 to 50 > 50 Was dry, now wet <p>Mitigation Zones</p> <ul style="list-style-type: none"> 1: Vulture Street, Woolloongabba 2: Raymond Terrace, South Brisbane 3: Annerley Road, South Brisbane 4: Pacific Motorway, Woolloongabba 5: Vulture Street, Woolloongabba 6: Annerley Road, Woolloongabba 7: Gloucester Street, South Brisbane 8: Delight Road, Union Park 9: Abingdon Street, Woolloongabba <p>0 0.1 0.2 Kilometers</p>			





6.5.8 Conclusion and recommendations

In summary, three areas within the Woolloongabba PDA were identified as areas where upgrading trunk stormwater infrastructure may provide flood improvements. Several mitigation solutions were reviewed through a high-level desktop assessment. Three Mitigation Solutions were then shortlisted in a workshop with EDQ. The SMEC overland flood model (2023) was used to assess the potential impact of these three Mitigation Solutions. It should be noted that each Mitigation Solution focuses on a specific area and all three Mitigation Solutions or combination of them may be needed to improve flood conditions within the Woolloongabba PDA in the ultimate scenario, subject to further analysis.

Based on initial investigations, it appears that each mitigation solution may offer flood benefits in the vicinity of the proposed upgrades. However, it is important to note that due to land use, constructability, and hydraulic constraints, it is not feasible to fully eliminate flood risks in this area.

The current assessment is at a high level, and further modelling and investigations are required to confirm the potential improvements. Additionally, in this stage, each Mitigation Solution was modelled in isolation, but in the next stage, a combination of these Mitigation Solutions must be investigated. This will include engagement with key stakeholders including particularly BCC.

In the next phase of the project:

- Once the staging of Mitigation Solutions is better understood, with regards to constructability priority, the following Mitigation Scenarios should be modelled before implementing them within the new Development Scheme:
 - A combination of Mitigation Solution 1 and 2
 - A combination of Mitigation Solution 2 and 3
 - A combination of all three Mitigation Solutions
- Obtain as-constructed drawings or surveys for existing pit and pipe networks as the model is largely based on assumptions.
- Liaise with BCC to discuss if any upgrades have been missed or if any will not be going ahead.
- Liaise with the Gabba Stadium authority to align Mitigation Solution 2 construction with future construction programs in this area.
- Additional modelling can be undertaken for Mitigation Solution 1 to understand whether providing a few underground OSD tanks under the carparks/open spaces upstream can be used instead of upgrading the upstream pipe system. This will reduce the cost and risks due to the elimination of the need for micro-tunnelling under private properties.
- Obtain the latest layout and levels of the Cross River Rail station (the area impacted by the Mitigation Solution 3).
- Following the above recommendations, update the model to address small areas that experience increases in flood depth as a result of the proposed Mitigation Solutions.
- Undertake constructability review of the Mitigation Solutions to see if they are viable or unfeasible. Stakeholder consultation is also required.
- The draft new Developments Scheme suggest 1% AEP as the flood planning event. The updated model should be run for 1% AEP.
- The draft new Development Scheme suggests both Climate Change scenarios of RCP 4.5 and 8.8. The updated SMEC model should be run climate change scenario RCP 4.5.





6.6 Transport

The Woolloongabba PDA is located in one of Brisbane's most significant precincts with a major sports stadium, several hospitals and schools, and reinforcing it as a key transport hub for inner Brisbane. Future land uses will generate some traffic demand, however, given the Woolloongabba PDA is within the City Frame and has access to excellent Public Transport (PT) and Active Transport (AT) infrastructure, it is expected with the proposed upgrades that a large proportion of the travel demand will be satisfied by non-private vehicle mode share and a greater reliance on active and public transport. Further, the future re-development will be replacing some previous land uses where the traffic generated will be offset against the new developments.

6.6.1 Future transport demands

Table 19 provides a summary comparison of key demographics at 2046 between the SEQ-STM and EDQ's UGM which shows very similar order of magnitudes and the SEQ-STM slightly higher thus more conservative for this assessment.

Table 19: SEQ-STM demographics Vs EDQ's UGM

	SEQ-STM			EDQ'S UGM (to be confirmed)			SEQ-STM minus EDQ'S UGM
	2023 Total	2046 Total	Increase	2023 Total	2046 Total	Increase	Total (%)
Population	10,945	23,628	12,683	5,299	21,040	15,741	2,588 (11.0)
Occupied dwelling	5,790	12,596	6,806	2,988	11,631	8,643	965 (7.7)
Employment (Jobs)	21,068	28,654	7,586	12,759	27,364	14,605	1,290 (4.5)
Enrolment	4,245	4,630	385	TBA	TBA	TBA	TBA

As the SEQ-STM and any other State and Local government demographic datasets do not go out to 2066, the draft transport review is only to 2046.

The 2046 SEQ-STM future year with committed and funded projects (Scenario 1) has also been utilised to provide the v/c plots as illustrated in Figure 23 and total trip demands on the road network by the four trip sectors as provided in Figure 15. The trips exclude active transport, and public transport on Busway and Queensland Rail lines.

Table 20 provides the delta between the 2046 to the 2023 demands which shows approximately a 17% increase in demands in both the AM and PM peaks.

Figure 23 shows congestion on the wider network including additional local roads including Stephens Road, Hawthorne Street likely to due to rat running.



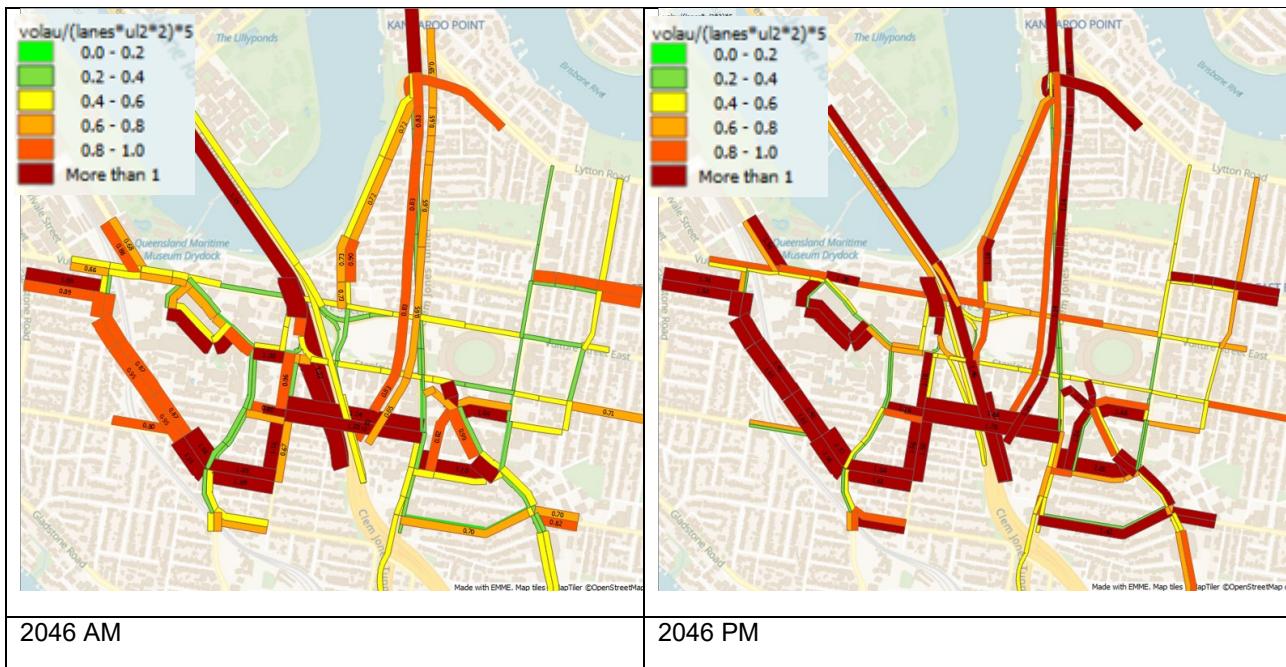


Figure 23: SEQ-STM V/C plots by peak period

Table 20: SEQ-STM trip - 2046

Trip sectors	AM peak		PM peak		Weekday	
	Total	Share (%)	Total	Share (%)	Total	Share (%)
Internal to internal	467	0.6%	830	0.8%	3,959	0.8%
Internal to External	6,440	8.2%	12,701	11.8%	48,742	10.1%
External to Internal	9,069	11.5%	9,649	9.0%	48,710	10.1%
External to External	62,682	79.7%	84,082	78.4%	381,086	79.0%
TOTAL	78,658	100.0%	107,262	100.0%	482,498	100.0%





Table 21: SEQ-STM trip – 2046 increases compared to 2023

Trip sectors	AM peak		PM peak		Weekday	
	Total	Share (%)	Total	Share (%)	Total	Share (%)
Internal to internal	239	104.8%	439	112.3%	2,141	117.8%
Internal to External	2,431	60.6%	3,318	35.4%	15,716	47.6%
External to Internal	2,134	30.8%	3,654	61.0%	15,698	47.6%
External to External	6,728	12.0%	8,076	10.6%	59,828	18.6%
TOTAL	11,531	17.2%	15,486	16.9%	93,384	24.0%

FUTURE UPGRADES

Table 30 lists the range of preliminary road and transport works currently identified as required to service future development. The upgrades are largely focused to improve current gaps and deficiencies to promote and increase active transport trips and assist public transport services.

Re-development will create active street frontages, a range of safe and inviting public spaces for pedestrians and cyclists by strengthening permeable connections to Main Street, Ipswich Road, Leopard Street, Vulture Street, Stanley Street and Logan Road.

Trunk infrastructure is represented by roads and intersections of higher-order road hierarchies, including Motorway, Arterial, Suburban, and 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 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 Woolloongabba 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.

6.6.2 Car and bicycle parking rates

Further, to encourage active and public transport reduced car parking rates beyond that of the City Core (City Plan 2014) car parking rates as follows are proposed as outlined in Table 22. Consideration may be required for further reductions with modelling of the ultimate 2066 projections.





Table 22: Car parking rates

Use	Car parking rate
Uses other than Multiple dwelling, Dwelling, Rooming accommodation, Short-term accommodation	Maximum 1 space per 300m ² GFA
Multiple dwelling, Dwelling Note: Where car share spaces are provided, they will not be included in the maximum car parking calculation for the use.	Maximum 0.5 space per 1 bedroom dwelling Maximum 1 space per 2 bedroom dwelling Maximum 1.5 spaces per 3 bedroom dwelling Maximum 2 space per 4 and above bedroom dwelling Maximum 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
Short-term / Rooming accommodation	Maximum 0.25 spaces per room or unit
Hospital	Car parking rates to be determined by a car parking management plan submitted at the time of a Development Application

Table 23 outlines bicycle parking rates and end of trip facilities requirements to be implemented to underpin encouragement and promotion of active transport.

Table 23: Bicycle parking rates and end of trip facilities

Use	Bicycle Parking rate	End of Trip Facilities Requirements
Uses other than Multiple dwelling, Dwelling, Rooming accommodation, Short-term accommodation	1 bicycle parking space per 200m ² of gross floor area which is situated close to building entrance in a location that is obvious from the street frontage and has a high level of casual surveillance	Minimum 1 shower cubicle with provisions for both females and males Minimum 2 lockers per 1 bicycle space
Multiple dwelling, Dwelling Note: Where car share spaces are provided, they will not be included in the maximum car parking calculation for the use.	1 lockable and covered bicycle parking space, per bedroom – in an easily accessible location with a garage or separate facility 1 visitor bicycle parking space per 2 units or part thereof	Nil
Short-term / Rooming accommodation	1 lockable and covered bicycle parking space, per bedroom – in an easily accessible location with a garage or separate facility 1 visitor bicycle parking space per 4 units or part thereof	Nil
Hospital	Rates to be determined by a workplace travel management plan submitted at the time of a Development Application	





6.6.3 Other transport strategies, policies and innovations

Whilst reduced car parking rates and increased bicycle parking and end of trip facilities, wide strategies, policies and new technologies/innovation will need to be considered for the future design horizons in particular the ultimate 2066 design horizon for a sustainable transport system.

This should include:

- Mobility as a Service (MaaS)
- Digitalisation and seamless journeys
- Ride-sharing integration
- Autonomous vehicles
- Road pricing or congestion charging
- Car free city business districts – permanent or set day/s.





6.7 Social infrastructure

There are considerable constraints associated with the provision of park space in high density urban areas. The current provision of park land within a walkable and local catchment of the Woolloongabba PDA relative to the desired rate of provision represents a significant undersupply. The current rate of provision of district, metropolitan and sports park is similarly constrained and against the rate of provision for the catchment there is an undersupply of local recreational parks.

Development of the Woolloongabba PDA would transform the area into a central, highly accessible community focal point. As such there is an opportunity to provide innovative forms of community infrastructure which not only meet key local needs but further supports the establishment of the Woolloongabba PDA as a vital inner city community hub.

As part of the Woolloongabba PDA planning and development there is an opportunity to explore options for the integration of needed community infrastructure, employing innovative delivery mechanisms to realise social and commercial objectives. As the planning and provision of community infrastructure is undertaken across all layers of government and involving the private sector, a collaborative approach is essential. In particular, close collaboration between BCC and EDQ is central to achieving optimal community infrastructure outcomes for the Woolloongabba PDA.

The Woolloongabba PDA is anchored by the Gabba stadium and includes a broad offering of sporting, hospitality, retail, and entertainment industries. Parts of the Woolloongabba PDA, in particular key corridors such as Stanley Street, Ipswich Road, Logan Road, and Main Street, are shifting to modern, mixed-use urban neighbourhoods, characterised by high rise apartments and street-level retail spaces, balanced with heritage and commercial character buildings. Outside of key corridors, the Woolloongabba PDA also includes several residential pockets of traditional building character.





6.7.1 Future Social Infrastructure Planning

Social 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 *Brisbane 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.

From the established baseline for existing social infrastructure within defined catchments, refer Chapter 2, a further assessment will be undertaken utilising the predicted population and job growth in EDQ's UGM and Woolloongabba PDA Infrastructure Additional Planning Assumptions Rev A 300124 (January 2023) Bull + Bear Economics. To complete the assessment the following methodology will be applied:

- Definition of catchment areas (neighbourhood, local and district) and associated baseline characteristics;
- Assessment of existing and future provision of Local recreation, District and Sports park, along with defined 'Urban commons' against DSS as per BCC's City Plan 2014 (LGIP Extrinsic Materials- 2021).
- Assessment of existing and future provision of land for community facilities against DSS as per 2014 BCC City Plan (LGIP Extrinsic Materials- 2021). 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.
- Assessment of community infrastructure provision as per Economic Development Queensland (EDQ) PDA Guideline No.11 2015 – Community Facilities.

Should future trunk infrastructure outcomes be identified, these will be recommended in the future social infrastructure assessment and inform the Woolloongabba PDA Development Charges & Offsets Plan (DCOP).

The following tables summarise the predicted population and job growth in the defined catchment areas of Woolloongabba PDA, local and district catchments for ultimate social infrastructure planning:

WOOLLOONGABBA PDA – POPULATION AND GROWTH

The following figures have been derived from EDQ's UGM and Woolloongabba PDA Infrastructure Additional Planning Assumptions Rev A 300124 (January 2024), Bull+Bear Economics to predict population and jobs growth at an Australian Bureau of Statistics (ABS) Statistical Area 2 level which aligns with suburb boundaries. A significant increase in population is predicted in the Woolloongabba PDA, with a 462% increase in the population between 2023 and 2066. A breakdown of population and jobs growth is provided in Table 24.

Table 24: Summary of predicted population and job growth for the Woolloongabba PDA – Identified within EDQ'S UGM

	2023 DCOP Base Date	2026 Projection year	2031 Projection year	2036 Projection year	2041 Projection year	2046 Projection year	2066 Final
Resident population	4,279	TBA	TBA	TBA	TBA	TBA	24,063
Jobs (Retail, commercial, industrial only)	12,759	TBA	TBA	TBA	TBA	TBA	36,844





LOCAL CATCHMENT – POPULATION AND GROWTH

A large increase in population is predicted in the local catchment area, particularly in South Brisbane, with a 171% increase in the population between 2023 and 2066, similarly within Woolloongabba with a 133% increase. Overall, across the catchment area, a 145% increase in the population is predicted between 2023 and 2066. A breakdown of population and jobs growth is provided in Table 25 and Table 26.

Table 25: Summary of predicted population growth for the local catchment – Identified within EDQ'S UGM

Suburb	2023 DCOP Base Date	2026 Projection year	2031 Projection year	2036 Projection year	2041 Projection year	2046 Projection year	2066 Final
East Brisbane	6,451	TBA	TBA	TBA	TBA	TBA	8,936
Kangaroo Point	10,662	TBA	TBA	TBA	TBA	TBA	16,244
South Brisbane	16,330	TBA	TBA	TBA	TBA	TBA	44,389
Woolloongabba	9,963	TBA	TBA	TBA	TBA	TBA	36,943

Table 26: Summary of predicted job growth for the local catchment – Identified within EDQ'S UGM

Suburb	2023 DCOP Base Date	2026 Projection year	2031 Projection year	2036 Projection year	2041 Projection year	2046 Projection year	2066 Final
East Brisbane	6,451	TBA	TBA	TBA	TBA	TBA	8,936
Kangaroo Point	10,662	TBA	TBA	TBA	TBA	TBA	16,244
South Brisbane	16,330	TBA	TBA	TBA	TBA	TBA	44,389
Woolloongabba	9,963	TBA	TBA	TBA	TBA	TBA	36,943

DISTRICT CATCHMENT – POPULATION AND GROWTH

Predicted growth in the district catchment is not as pronounced as that in the local catchment and is primarily driven by growth in South Brisbane and Woolloongabba. Across the catchment area, a 100% increase in the population is predicated between 2023 and 2066 in Table 27 and Table 28.

Table 27: Summary of predicted population growth for the district catchment – Identified within EDQ'S UGM

Suburb	2023 DCOP Base Date	2026 Projection year	2031 Projection year	2036 Projection year	2041 Projection year	2046 Projection year	2066 Final
East Brisbane	6,451	TBA	TBA	TBA	TBA	TBA	8,936
Kangaroo Point	10,662	TBA	TBA	TBA	TBA	TBA	16,244
South Brisbane	16,330	TBA	TBA	TBA	TBA	TBA	44,389
Woolloongabba	9,963	TBA	TBA	TBA	TBA	TBA	36,943





Suburb	2023 DCOP Base Date	2026 Projection year	2031 Projection year	2036 Projection year	2041 Projection year	2046 Projection year	2066 Final
Annerley	12,565	TBA	TBA	TBA	TBA	TBA	16,858
Fairfield-Dutton Park	5,231	TBA	TBA	TBA	TBA	TBA	6,436
Highgate Hill	6,716	TBA	TBA	TBA	TBA	TBA	9,463
West End	17,001	TBA	TBA	TBA	TBA	TBA	39,596
Norman Park	6,957	TBA	TBA	TBA	TBA	TBA	8,423
Coorparoo	18,165	TBA	TBA	TBA	TBA	TBA	30,288
Greenslopes	11,245	TBA	TBA	TBA	TBA	TBA	26,035

Table 28: Summary of predicted job growth for the district catchment – Identified within EDQ'S UGM

Suburb	2023 DCOP Base Date	2026 Projection year	2031 Projection year	2036 Projection year	2041 Projection year	2046 Projection year	2066 Final
East Brisbane	6,451	TBA	TBA	TBA	TBA	TBA	8,936
Kangaroo Point	10,662	TBA	TBA	TBA	TBA	TBA	16,244
South Brisbane	16,330	TBA	TBA	TBA	TBA	TBA	44,389
Woolloongabba	9,963	TBA	TBA	TBA	TBA	TBA	36,943
Annerley	3,027	TBA	TBA	TBA	TBA	TBA	4,134
Fairfield-Dutton Park	2,686	TBA	TBA	TBA	TBA	TBA	5,399
Highgate Hill	794	TBA	TBA	TBA	TBA	TBA	837
West End	9,000	TBA	TBA	TBA	TBA	TBA	11,928
Norman Park	1,174	TBA	TBA	TBA	TBA	TBA	1,227
Coorparoo	7,156	TBA	TBA	TBA	TBA	TBA	11,268
Greenslopes	7,836	TBA	TBA	TBA	TBA	TBA	12,891

The Woolloongabba PDA will be a renewed focal point for Brisbane's inner south, that will go through a period of transformative change which is predicted to further accelerate over the next thirty to forty years with significant population and job growth. Furthermore, the local and district catchments will also experience transformative change that will see the needs for social infrastructure to be adequately planned to meet the needs of a changing community. Whilst the future social infrastructure assessment for all catchments is yet to be completed, the proposed development scheme does nominate that within the Woolloongabba PDA and between the Woolloongabba CRR Station and the Gabba stadium, there will be an open and inviting public realm constructed, including a new Central Park, providing a strong connection to Country, uplift in amenity, and provision of inclusive, quality spaces for community enjoyment and civic engagement. The wider PDA will encourage diverse





living options, supported by complimentary non-residential land uses to commensurate with community need. In addition to the Central Park, refer to Section 7 for further provisions of proposed open space within the Woolloongabba PDA.





7 Infrastructure summary and categories

Having regard to the analysis of each network undertaken to date based on the ultimate development aspirations in the proposed development scheme, the following Table 29 consolidates the range of works currently identified as potentially required to service future development. No determination has been made at this stage regarding whether projects comprise trunk works or otherwise, and no prioritisation or sequencing has been applied to project delivery. Further detailed analysis, scenario testing, sequencing and costing will be undertaken in consultation with key stakeholders to fully define the Schedule of Works (SoW) for the Woolloongabba PDA, and this table will ultimately identify a categorised schedule of key projects and funding requirements.

Infrastructure identified will be funded from a combination of development charges (for trunk infrastructure identified in the DCOP), developers and other revenue sources yet to be determined. The delivery and cost of trunk infrastructure to service the Woolloongabba PDA will be the responsibility of State Government, BCC, UU or by developers and yet to be determined. State expenditure on infrastructure will be subject to consideration through normal state budgetary processes and will be part of an approved state agency capital works program. The provision of infrastructure by state and other providers is not determined by the PDA declaration and follows separate planning processes governed by other legislation.

For reference, the categorisation of infrastructure is described below to inform ongoing consideration of the findings to date, and finalisation of a SoW for the DCOP.

7.1 Infrastructure categories

The infrastructure planned to be delivered within the Woolloongabba PDA will fall into one of the following categories:

1. trunk infrastructure
2. non-trunk infrastructure, or
3. other infrastructure.

7.1.1 Trunk infrastructure

Trunk infrastructure is the higher order shared infrastructure that is planned to service the wider catchments in or external to the Woolloongabba PDA, rather than individual development sites. Trunk infrastructure may be delivered by the relevant infrastructure provider, such as State Government, BCC, UU, or by developers if required by a condition of a PDA development approval. Trunk infrastructure will be wholly or partially funded by development charges.

7.1.2 Non-trunk infrastructure

Non-trunk infrastructure is the lower order infrastructure which generally services a single development site, is internal to a development site, or connects the development site to trunk infrastructure and protects or maintains the safety or efficiency of the infrastructure network of which the non-trunk infrastructure is a component. Non-trunk infrastructure will be provided by the applicant, in accordance with the relevant responsible entity's requirements and as specified in a condition of a PDA development approval. Non-trunk infrastructure will not be eligible for an infrastructure charges offset.

7.1.3 Other infrastructure

Other infrastructure includes BCC and UU infrastructure not funded from infrastructure charges and infrastructure which is not part of BCC's or UU infrastructure networks. Other infrastructure may include necessary development infrastructure or provision for upgrades to the electricity, gas, telecommunications or state transport networks.

Other infrastructure may be delivered by State Government, other infrastructure providers or by developers who may be required to deliver or preserve the ability to provide this infrastructure by a condition of a PDA development approval.





Table 29: Infrastructure summary and catalogue

Infrastructure IDS	Infrastructure Works	Type of Works	Infrastructure Details
All items contained in this table are subject to investigation / detailed review as part of the preparation of the Development Charges and Offsets Plan (DCOP).			
Water/Sewerage			
WAT	Water	Install/Upgrade	As required to service the PDA and may include augmentation and / or new items and network innovations
SEW	Sewer	Install/upgrade	
Stormwater			
STW	Stormwater	Install/Upgrade	Pipe – Relief for Woolloongabba as per BCC LGIP Flood mitigation, which may include stormwater harvesting and total water cycle management plan opportunities Development site detention, and Internal network relief
STW	Stormwater	N/A	Protection of existing mains
Transport			
I02a	Transport	Upgrade	Stanley/Main/Ipswich intersection with improved pedestrian crossings and stand up left turn lanes by removing slip islands. Removes left turn from Stanley Street also on existing service road.
I02b	Transport	Upgrade	Upgrade Stanley/Main/Ipswich intersection with improved pedestrian crossings with Busway Access removal
I03	Transport	Upgrade	Upgrade Vulture/Main intersection with pedestrian and cyclist crossings on southern (new) and western (upgrade)
I07	Transport	Upgrade	Upgrade of Stanley/Leopard/Pacific Motorway to include right turn into Leopard Street from Stanley Street
I08	Transport	Upgrade	Upgrade of Vulture/Leopard intersection to include crossings for cyclists on north and west legs
I09	Transport	Upgrade	Close entry across two-way cycle track from Stanley Street to Gibbon Street
I10	Transport	Upgrade	Close exit across two-way cycle track from Hubert Street to Stanley Street
I11	Transport	Upgrade	Close entry across two-way cycle track from Stanley Street to Reid Street





Infrastructure IDS	Infrastructure Works	Type of Works	Infrastructure Details
I12	Transport	Upgrade	Close entry across two-way cycle track from Stanley Street to Merton Road
I13	Transport	Upgrade	Close driveway crossover across two-way cycle track on Stanley Street between Merton Road and Annerley Road
I14	Transport	Install	Add left turn movement from Stanley Street to Wellington Road
I15	Transport	Upgrade	Ipswich/Hawthorne intersection to include cyclist crossings on north and east legs. Investigate new pedestrian and cyclists crossing on south leg.
I16	Transport	Upgrade	Close north-west leg of Logan Road and expand realign Balaclava Street approach
I17	Transport	Install	New intersection provisions at Logan Road end to manage AT conflict
I18	Transport	Upgrade	Close Jurgens Street approach to general vehicles, and investigate re-routing of buses to support the creation of new open space
I19	Transport	Upgrade	Close Logan Road East bound approach to general vehicles and to be investigated
I20	Transport	Install	Construct new mid-block pedestrian and cyclist crossing
I22	Transport	Upgrade	Upgrade the Stanley Street / Annerley Road intersection
I23	Transport	Upgrade	Close exit from Trinity Lane to Stanley Street
I24	Transport	Upgrade	Signalise Wellington/Overend intersection as part of RD04 upgrade
RD01a	Transport	Upgrade	Extend through lane from Vulture/Main to proposed access point to Subarea 1b
RD01b	Transport	Upgrade	Extend right turn lane from Vulture/Main to proposed access point to Subarea 1b
RD01c	Transport	Install	Construct median to separate Vulture Street and Motorway Offramp traffic up to Vulture/Main Intersection
RD02	Transport	Install	Construct right in lane to access point from Stanley Street to Subarea 1b
RD03	Transport	Upgrade	Convert Stanley Street service road between Gibbon Street and Reid Street to a shared zone
RD04	Transport	Upgrade	Convert Wellington Road between Stanley Street and Trafalgar Street to two way or bus lane southbound
RD05	Transport	Upgrade	Road widening and turn lane reallocation for Main Street (S) approach of intersection with Vulture Street (TBC)





Infrastructure IDS	Infrastructure Works	Type of Works	Infrastructure Details
RD06	Transport	Install	Connect Trinity Lane to Merton Street
RD07	Transport	Upgrade	Remove one lane on Stanley Street east of Main Street for continuation of separated two-way cycle track to meet PNCP
RD08	Transport	Upgrade	Remove eastbound lane on Stanley Street between Main Street and Wellington Road with removal of Busway Access to Main Street.
RD09	Transport	Upgrade	Convert southbound to two-way with indented parking. Close northbound and convert as per Parks, Plazas and Public Realm
RD10	Transport	Upgrade	Convert Jurgens Street between Stanley Street and Logan Road to shared zone with local and bus access only
AT03	Transport	Install	Vulture/Leopard to CRR Station Pathway
AT04	Transport	Install	Station to Stadium overpass/es (AT01) to CRR Station Pathway
AT05	Transport	Install	Ipswich/Main/Stanley to CRR Station Pathway
AT06b	Transport	Upgrade	Ipswich Road PCNP Upgrade – Henry Street to Stanley Street
AT06c	Transport	Upgrade	Main Street PCNP Upgrade – Stanley Street to Vulture Street
AT07	Transport	Upgrade	Leopard Street two-way cycle track – Vulture Street to Kangaroo Point Cliffs
AT08	Transport	Upgrade	Streetscape improvements along Duke Street from Vulture Street to Raymond Park
AT10	Transport	Install	Investigate extending the Stanley Street separated two-way cycle track from Main Street to Lisburn Street
AT11	Transport	Install	On-road cycle lane (eastbound) on Vulture Street from Stephens Road to Lisburn Street
AT12	Transport	Install	Upgrade of Leopard Street footpath between Stanley Street and Vulture Street to PCNP standards
AT13	Transport	Upgrade	Logan Road/Jurgens Street PCNP - Stanley Street to Balaclava Street
AT14	Transport	Upgrade	Connect Logan Road to Norman Creek Bikeway
PT01	Transport	Install	Accommodate public transport stops on Balaclava Street
PT02	Transport	Install	Consolidate bus stops from Logan Road and Jurgens Street to between Logan Road and Balaclava Street





Infrastructure IDS	Infrastructure Works	Type of Works	Infrastructure Details
PT03	Transport	Install	Former Fiveways Bus Stop reinstated
PT04	Transport	Install	New Southbound Bus Stop to pair with PT03
PT05	Transport	Upgrade	Upgrade stop 3092 near Gibbon Street to support transfers to bus and railway stations
Public Realm			
OS1	Open space – other	Install	Applicants / developers to provide open space amounting to 50% of Sub-area 1b – Cross River Rail, bounded by Main, Leopard, Stanley and Vulture Streets.
O1	Open Space	Upgrade	Woolloongabba Place Park Review embellishment opportunities to support use during and outside of event times. Increase extent of tree planting.
O3	Open Space	Install	New Park – Jurgen Street, between Stanley Street and Trafalgar Street
O4	Open Space	Install	New Park – Logan Road, between Nile Street and Trafalgar Street/ Jurgen Street (part of the Creek to Cliffs Green Corridor)
O5	Open Space	Install	New Park – Logan Road, between Nile Street and Balaclava Street (part of the Creek to Cliffs Green Corridor)
O6	Open Space	Install	New Park – Balaclava Street (part of the Creek to Cliffs Green Corridor)
O7	Open Space	Upgrade	Watt Park (part of the Creek to Cliffs Green Corridor)
O8	Open Space	Install	New Park – Potts Street, between Stanley Street and Vulture Street
O9	Open Space	Install	New Park – Duke Street, between Bromley Street and Toohey Street
O10	Open Space	Upgrade	Allen Street verge and potential open space Provide active transport connections from the southern part of Water Street to the northern part of the street. Review opportunities for open space in conjunction with active transport access improvements.





Infrastructure IDS	Infrastructure Works	Type of Works	Infrastructure Details
-	Public realm and streetscapes	Upgrade	Various streetscape and public realm upgrades as per the Woolloongabba Plan.
-	Privately owned, publicly accessible open space (POPAOS)	Developer works	Various POPAOS as per the Woolloongabba Plan.





8 Interim infrastructure charges, funding and condition

Infrastructure charges will be based on the Infrastructure Funding Framework (IFF) in force at the time the PDA development application is approved unless:

- a DCOP is approved for the PDA, or
- an infrastructure agreement is entered into between the applicant and the MEDQ, or its delegate.

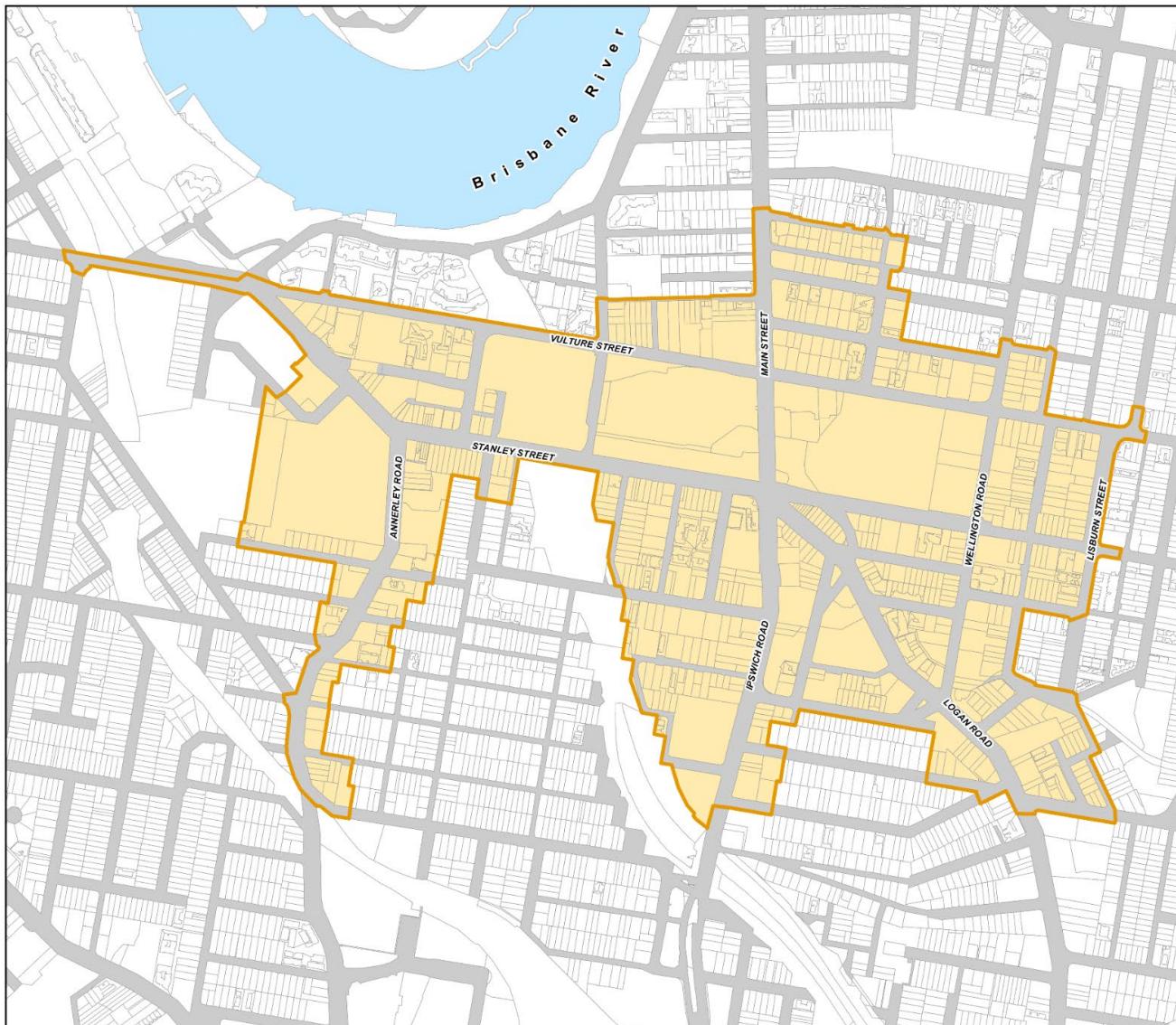
The requirement to pay infrastructure charges or to deliver trunk infrastructure identified in a DCOP, will be through a condition of a PDA development approval. Infrastructure may be required to be delivered in accordance with a detailed Infrastructure Master Plan (IMP) that is prepared to support a PDA development application or required by condition.

Applicable trunk infrastructure delivered as part of the development may be offset against the applicable infrastructure charges in accordance with a DCOP or the applicable policy in force at the time of the PDA development approval.





Appendix A PDA Boundary

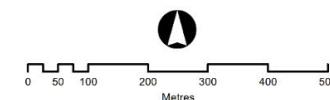


**Map No: PDA 21 -
Woolloongabba
Priority Development Area**

Declared by Regulation on: 22/09/2023

Key

- Woolloongabba PDA
- Parcel boundaries
- Road casement
- Water casement



Source: Department of Resources: Digital Cadastre Database.

Map generated by the Spatial Services Branch of the
Department of State Development, Infrastructure,
Local Government and Planning

While every care is taken to ensure the accuracy of this product,
the Department of State Development, Infrastructure,
Local Government and Planning and the Department
of Resources make no representations or warranties about
the 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 direct, indirect
or consequential damage) and costs you may incur as a result of the
product being inaccurate or incomplete in any way or for any reason.



**Queensland
Government**





Appendix B Development Yields

Table 30: Existing and proposed development yields: residential for the Woolloongabba PDA – Identified within EDQ'S UGM

Development Type	Development Type Sub Category	2023 DCOP Base Date	2026 Projection year	2031 Projection year	2036 Projection year	2041 Projection year	2046 Projection year	2066 Final
Residential	R1 Dwelling House	115	TBA	TBA	TBA	TBA	TBA	94
	R2 Dwelling Unit	2,992	TBA	TBA	TBA	TBA	TBA	14,077
	R3 Room Accommodation	35	TBA	TBA	TBA	TBA	TBA	0
	R4 Residential Care Facility	152	TBA	TBA	TBA	TBA	TBA	275
Entertainment and tourism	E3 Short term accommodation	392	TBA	TBA	TBA	TBA	TBA	2,522
	E3 Resort Complex	0	TBA	TBA	TBA	TBA	TBA	210
TOTAL		2,986	TBA	TBA	TBA	TBA	TBA	17,178

Table 31: Existing and proposed development yields: non-residential (GFAm²) for the Woolloongabba PDA – Identified within EDQ'S UGM

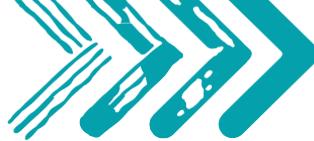
Development Type	Development Type Sub Category	2023 DCOP Base Date	2026 Projection year	2031 Projection year	2036 Projection year	2041 Projection year	2046 Projection year	2066 Final
Business Retail	B1 Club (food and drink)	2,100	TBA	TBA	TBA	TBA	TBA	2,100
	B1 Food and drink	0	TBA	TBA	TBA	TBA	TBA	68,340
	B1 Food and drink outlet	7,036	TBA	TBA	TBA	TBA	TBA	13,613





Development Type	Development Type Sub Category	2023 DCOP Base Date	2026 Projection year	2031 Projection year	2036 Projection year	2041 Projection year	2046 Projection year	2066 Final
	B1 Hotel	9,334	TBA	TBA	TBA	TBA	TBA	2,754
	B2 Retail	0	TBA	TBA	TBA	TBA	TBA	72,187
	B2 Shopping centre	6,272	TBA	TBA	TBA	TBA	TBA	5,910
	B2 Shop	32,689	TBA	TBA	TBA	TBA	TBA	27,522
	B3 Hardware and trade	100	TBA	TBA	TBA	TBA	TBA	0
	B3 Service station	1,406	TBA	TBA	TBA	TBA	TBA	110
	B3 Showroom	2,395	TBA	TBA	TBA	TBA	TBA	1,663
Commercial	C1 Office	99,039	TBA	TBA	TBA	TBA	TBA	310,378
Educational establishment	D1 Child care centre	5,073	TBA	TBA	TBA	TBA	TBA	5,200
	D2 Educational establishment	3,930	TBA	TBA	TBA	TBA	TBA	3,930
Entertainment and tourism	E1 Theatre	1,600	TBA	TBA	TBA	TBA	TBA	1,600
Industry	I1 Low impact industry	34,994	TBA	TBA	TBA	TBA	TBA	19,177
	I1 Research and technology	6021	TBA	TBA	TBA	TBA	TBA	0
	I5 Warehouse	24,213	TBA	TBA	TBA	TBA	TBA	15,427
Community service facility	S1 Indoor sport and recreation	241	TBA	TBA	TBA	TBA	TBA	0
	S1 Major sport recreation	48,608	TBA	TBA	TBA	TBA	TBA	48,608
	S1 Outdoor sport and recreation	382	TBA	TBA	TBA	TBA	TBA	382





Development Type	Development Type Sub Category	2023 DCOP Base Date	2026 Projection year	2031 Projection year	2036 Projection year	2041 Projection year	2046 Projection year	2066 Final
	S2 Club (social)	2,954	TBA	TBA	TBA	TBA	TBA	2,954
	S2 Community use	1,436	TBA	TBA	TBA	TBA	TBA	14,764
	S2 Place of worship	6,976	TBA	TBA	TBA	TBA	TBA	2,017
	S3 Health care services	26,129	TBA	TBA	TBA	TBA	TBA	129,223
	S3 Hospital	107,385	TBA	TBA	TBA	TBA	TBA	295,057
Transport infrastructure	T1 Transport terminal	50	TBA	TBA	TBA	TBA	TBA	350
	T3 Multistorey car park	43,300	TBA	TBA	TBA	TBA	TBA	10,000
	T3 Parking station	252	TBA	TBA	TBA	TBA	TBA	252
Total		473,915	TBA	TBA	TBA	TBA	TBA	1,053,518





Appendix C Demand generation rates

Table 32: Demand generation rates for the Woolloongabba PDA

Development Category	Infrastructure				
	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
Entertainment (Hotel) (per suite)	0.006	0.006	0.9	0.4	0.00102
Hotel (per suite)	1.75	1.75	0.9	0.4	1.78
Low Impact Industry (per m² GFA)	0.0048	0.0048	0.9	0.5	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
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

Table 33: Demand projections for the Woolloongabba PDA

Infrastructure	Existing and Projected Demand						
	2023 DCOP Base Date	2026 Projection year	2031 Projection year	2036 Projection year	2041 Projection year	2046 Projection year	2066 Final
Water Supply Network (EP)	7874	TBA	TBA	TBA	TBA	TBA	37,305
Wastewater Network (EP)	7874	TBA	TBA	TBA	TBA	TBA	37,305
Stormwater Network	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Transport Network (Trips)	TBA	TBA	TBA	TBA	TBA	TBA	TBA
Community Facility Network (EP)	TBA	TBA	TBA	TBA	TBA	TBA	TBA





CONTACT US

Phone: +61 7 3328 4811 or 13 QGOV (13 74 68)
Email: edq@dsdilgp.qld.gov.au
Web: www.edq.qld.gov.au
Post: GPO Box 2202, Brisbane, Queensland 4001
Address: 1 William Street, Brisbane 4000

Economic Development Queensland

Creating and investing in sustainable places for Queensland to prosper



Queensland
Government