

# BRISBANE METRO

Draft Design Report  
Key Findings

APRIL 2018



*Dedicated to a better Brisbane*



## Have your say

A range of opportunities will be available to learn more about Brisbane Metro and provide feedback on the draft Design Report. This includes:

- reviewing the draft Design Report on Council's website: [brisbane.qld.gov.au](http://brisbane.qld.gov.au)
- attending community information sessions held at locations along the Brisbane Metro corridor
- contacting the Brisbane Metro project team on 1800 692 333 during business hours.

Feedback can be provided by making a submission:

- in writing to: Brisbane Metro, Brisbane City Council, GPO Box 1434, Brisbane QLD 4001
- by email to the Brisbane Metro project team at [metro@brisbane.qld.gov.au](mailto:metro@brisbane.qld.gov.au)
- through Council's website, [brisbane.qld.gov.au](http://brisbane.qld.gov.au).

**Feedback on the draft Design Report should be received by 25 May 2018.**



## A MESSAGE FROM THE LORD MAYOR

As Lord Mayor, I am committed to delivering world-class public transport for residents and visitors.

A key part of this is Brisbane Metro, Brisbane City Council's high-frequency, high-capacity public transport system.

With two metro routes operating every three minutes during peak periods, Brisbane Metro will deliver turn-up-and-go services across a 21 kilometre network, linking the suburbs with the inner city.

Following the release of the Brisbane Metro Business Case in 2017, I announced Council's commitment to fund two-thirds of the capital cost of Brisbane Metro.

I firmly believe that by repurposing parts of our existing world-class busway, Brisbane Metro represents the most cost-effective solution to help solve our inner city bus congestion issues.

Planning is also underway for the procurement phase, with the delivery strategy for the project released to industry in February. Subject to funding and approvals, formal procurement activities are expected to commence in mid-2018.

The release of the Brisbane Metro draft Design Report provides residents with another opportunity to help shape this vital project.

We are at an exciting stage in the development of Brisbane Metro and I look forward to delivering this important public transport project for Brisbane.

**Lord Mayor  
Councillor Graham Quirk**



## A MESSAGE FROM THE DEPUTY MAYOR

Brisbane Metro presents a once-in-a-generation opportunity to improve the way people travel to and within Brisbane.

By upgrading the existing busway network, fixing major bottlenecks and introducing new, high-capacity vehicles, Brisbane Metro provides a smart and cost-effective solution to Brisbane's bus congestion issues.

For customers, it means faster travel times, more reliable services and better connections to a range of destinations across the inner city and suburbs.

It will also support our city's liveability and economic prosperity into the future, helping to maintain Brisbane's status as a New World City and making public transport a more attractive option for both residents and visitors.

So far, stakeholder and community feedback has played a critical role in the evolution of Brisbane Metro.

I encourage you to have your say on the draft Design Report as we move toward fully realising the benefits of this city-changing project.

**Deputy Mayor  
Chairman, Public and Active Transport Committee  
Councillor Adrian Schrinner**



# Contents

<b>Foreword</b>	3	<b>7 Impact assessment</b>	47
<b>1 About Brisbane Metro</b>	7	Traffic and transport	48
<b>2 The journey so far</b>	13	Noise and vibration	50
Project background	13	Aboriginal and historic cultural heritage	50
About the draft Design Report	14	Land use, planning and urban amenity	51
Community and stakeholder engagement	15	Socio-economic assessment	52
<b>3 The need for Brisbane Metro</b>	17	Air quality	52
A growing city	17	Water resources	53
Bus network challenges	18	Soils, topography and land contamination	54
Planning for future growth	20	Flora and fauna	54
<b>4 Developing Brisbane Metro</b>	21	Cumulative impacts	55
Options assessment process	21	<b>8 Environmental management</b>	57
Identifying the solution	22	Environmental approvals	57
<b>5 The Brisbane Metro solution</b>	23	Environmental mitigation and management	57
New and upgraded infrastructure	24	<b>9 Summary of key findings</b>	59
A new fleet of high-capacity metro vehicles	33	Rochedale to Upper Mt Gravatt	59
New services and an improved network	34	Mt Gravatt to Greenslopes	60
Policy and operational improvements	37	Woolloongabba to St Lucia	61
New vehicle and passenger management systems	37	South Brisbane	62
<b>6 Constructing Brisbane Metro</b>	39	Brisbane CBD	64
Construction overview	39	Kelvin Grove to Herston	65
Station modifications	41	<b>10 Next steps</b>	67
Major construction works	42		
Commissioning and completion works	45		



*Artist's impression only*

# 1 About Brisbane Metro

Brisbane Metro is a high-frequency public transport system that will cut travel times, reduce inner city bus congestion and improve services to the suburbs.

It comprises a high-frequency metro network across 21 kilometres of existing busway that links Eight Mile Plains, Royal Brisbane and Women's Hospital (RBWH) and University of Queensland (UQ) Lakes busway stations and all busway stations in between.

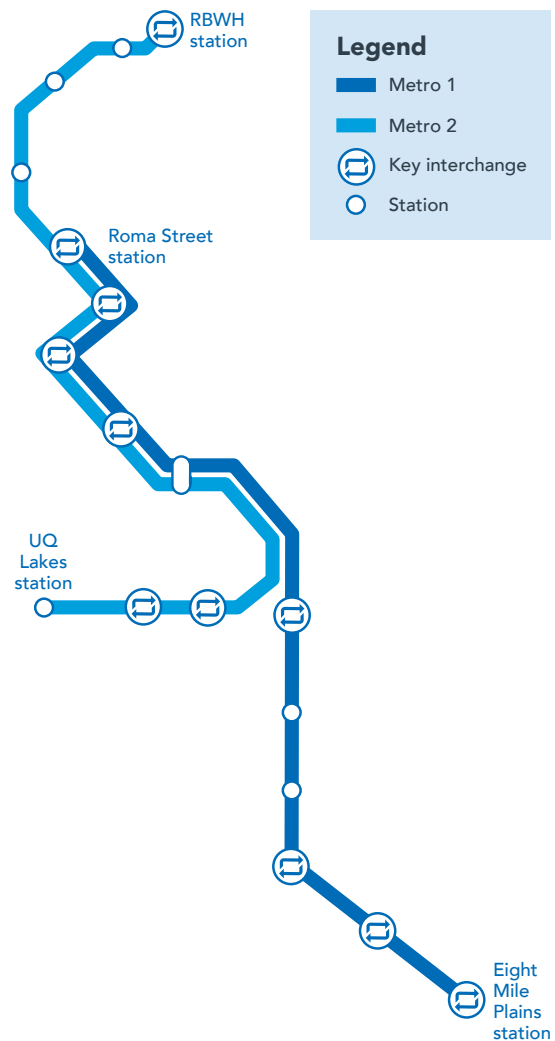
The project features two new high-capacity metro lines:

- **Metro 1** – Eight Mile Plains station to Roma Street station
- **Metro 2** – RBWH station to UQ Lakes station.

Brisbane Metro will be delivered through five key elements, including:

- new and modified infrastructure
- high-frequency turn-up-and-go metro services
- a new fleet of high-capacity metro vehicles
- policy and operational improvements
- new customer and vehicle management systems.

By combining these elements, Brisbane Metro delivers significantly greater benefits than any single solution to addressing Brisbane's bus capacity and congestion issues.



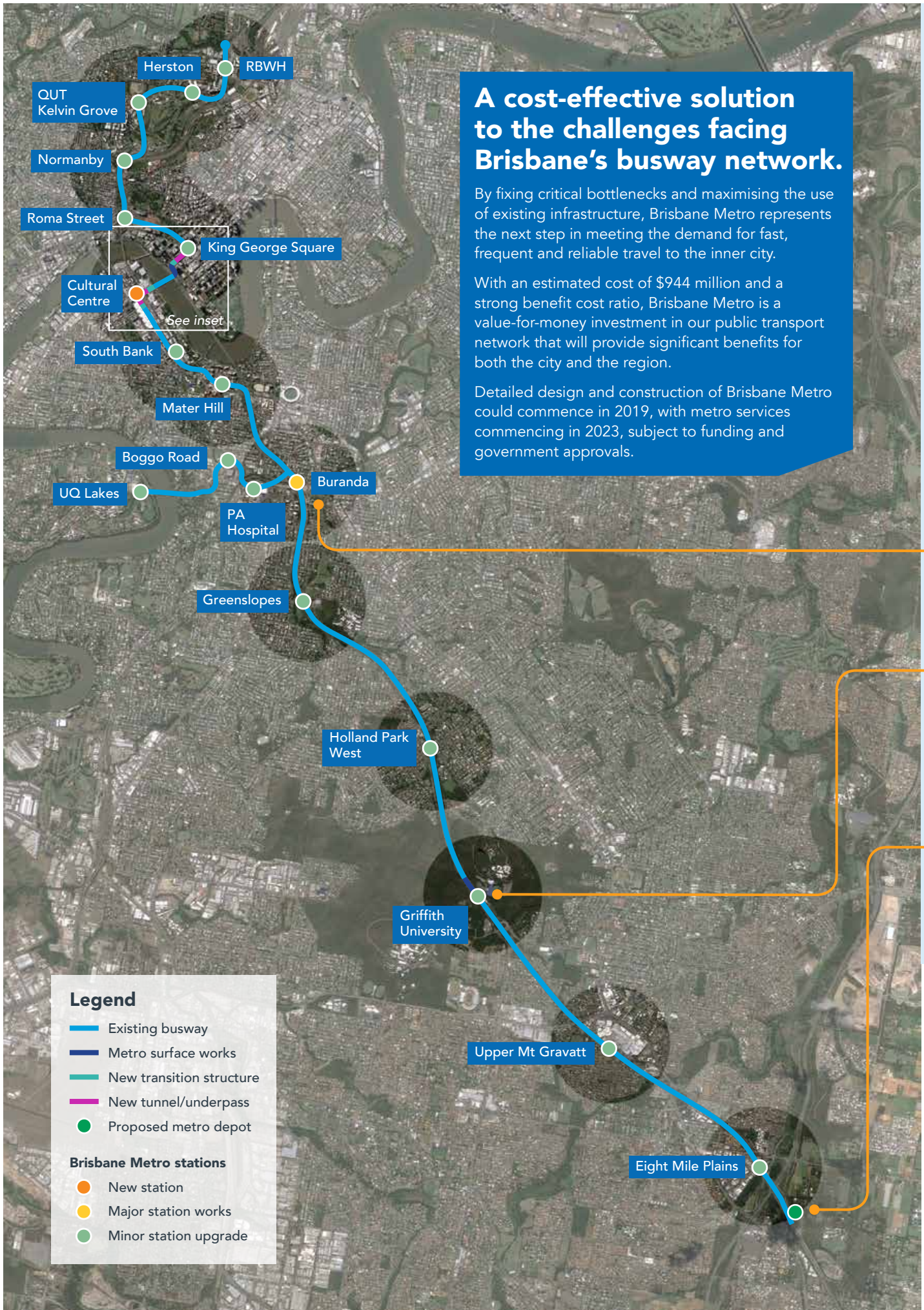
Two  
**new metro lines**  
connecting the  
inner city and  
suburbs



**18** stations  
and  
**11**  
interchanges



A fleet of  
**60**  
**high-capacity**  
metro vehicles



## A cost-effective solution to the challenges facing Brisbane's busway network.

By fixing critical bottlenecks and maximising the use of existing infrastructure, Brisbane Metro represents the next step in meeting the demand for fast, frequent and reliable travel to the inner city.

With an estimated cost of \$944 million and a strong benefit cost ratio, Brisbane Metro is a value-for-money investment in our public transport network that will provide significant benefits for both the city and the region.

Detailed design and construction of Brisbane Metro could commence in 2019, with metro services commencing in 2023, subject to funding and government approvals.

**Legend**

- Existing busway
- Metro surface works
- New transition structure
- New tunnel/underpass
- Proposed metro depot

**Brisbane Metro stations**

- New station
- Major station works
- Minor station upgrade

**Station upgrades and modifications**

Upgrades are required at 17 existing busway stations, including the installation of off-board ticketing equipment and new passenger information display systems.

Extensions to platforms will also be required at some stations to ensure effective operations from day one and into the future.

A new underground station at the **Cultural Centre** for metro and bus services will be constructed, along with new surface level bus stops on Melbourne Street.

A new tunnel under **Adelaide Street** will be constructed, providing a segregated connection for metro and bus services from North Quay to King George Square station.



Construction works are required to modify the station platforms and busway tunnel at **Buranda busway station**.

A new bus turnaround and layover facility will be constructed immediately north of **Griffith University station** for local bus services connecting to Brisbane Metro.

A **new depot** will be constructed at School Road, Rochedale along with a connection to the existing busway.

**Victoria Bridge** will be converted to a 'green bridge' for metro and bus services, pedestrians and cyclists.

**North Quay** will be closed to through traffic between Ann Street and William Street, with some local access retained.



Estimated total capital cost of **\$944 million**



Estimated major construction period of **2.5 years**



Metro services to commence **2023\***

*\*subject to government funding and approvals.*

## Addressing the challenges

Brisbane Metro will mean faster and more reliable journeys for customers across Brisbane's public transport network.

### Improved travel time and reliability



- Journeys on key links such as between King George Square and Buranda busway stations will be faster by 30% in the morning peak period and 50% in the afternoon peak period (on average) compared to without Brisbane Metro.
- Variability in travel time will be significantly reduced, creating a more reliable and attractive service.

### Improved accessibility



- An additional 40,000 people will be within a 30-minute trip by public transport to the CBD by 2031 (compared to without Brisbane Metro).
- An additional 135,000 people will be within a 30-minute trip by public transport to UQ St Lucia by 2031 (compared to without Brisbane Metro).

### Improved connectivity



- Greater multi-modal network connectivity through an increase in transfers to rail at Roma Street station and at Boggo Road station, where Brisbane Metro interchanges with the proposed Cross River Rail (CRR) project.
- An easier-to-use busway system, with improved interchanges between services and simplified bus network.

### Improved capacity



- Unlocks critical busway capacity constraints and improves effective capacity, allowing the busway system to serve more of the growth in inner city trips than without Brisbane Metro.
- Reduced reliance on congested alternative routes for buses such as Captain Cook Bridge.
- Reduced congestion on South East Busway at key locations.

Improved efficiency and amenity

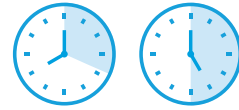


- More efficient operations of the public transport network, using fewer vehicles to meet customer demand and reducing the number of buses entering the CBD, resulting in lower costs per passenger.
- Improved amenity by removing 125 buses from CBD streets.
- Frees up buses to provide more services to the suburbs.

Increased mode share



- Supports increased travel demand and mode share, with increased public transport kilometres travelled, weekday public transport trips and daily public transport mode share.
- Supports future decreased private vehicle trips (compared to without Brisbane Metro).



Improves travel times by up to **30%** in the AM peak period and **50%** in the PM peak period



Boosts capacity of the busway to carry up to **22,000** people per hour



Improves amenity by removing **125** buses from the CBD



**Better connections** between key health, knowledge, education and entertainment hubs



## 2 The journey so far

Brisbane Metro has been developed in response to the congestion and capacity constraints on Brisbane's bus network. Increasingly, these impact on customer travel time and reliability, and detract from amenity in the CBD and inner city.

### Project background

Brisbane City Council announced Brisbane Metro in early 2016 as a way of addressing Brisbane's inner city bus network congestion issues by making better use of existing busway infrastructure.

The initial Brisbane Metro concept proposed converting a section of the existing busway in the inner city to a high-frequency dedicated metro corridor.

Following the announcement of the project, an options assessment process was undertaken, serving as the first stage of the project's feasibility assessment.

This process, underpinned by detailed analysis and investigation, and extensive stakeholder and community engagement, examined a broad range of options for the Brisbane Metro project.

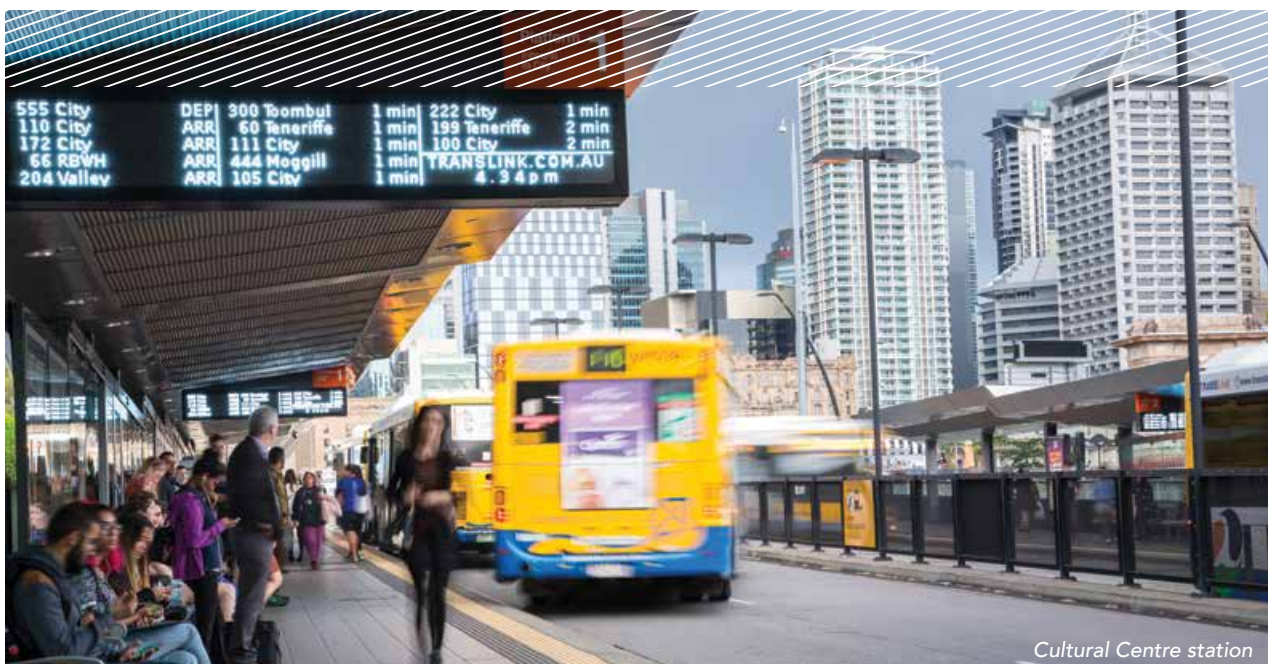
These options ranged from the better use of existing infrastructure to the construction of new infrastructure.

As a result, Council identified a solution that comprises a high-frequency metro network across 21 kilometres of existing busway that links Eight Mile Plains, RBWH, UQ Lakes and all busway stations in between.

A key driver for revising the announced project solution was the feedback provided from the community and stakeholders on the original proposal.

In 2017, Council released the Brisbane Metro Business Case, following a 12-month detailed assessment of the benefits, costs and impacts of delivering the project.

**The Business Case confirmed Brisbane Metro is a cost-effective solution that unlocks the potential of the existing busway infrastructure and lays the foundation for future growth.**



Cultural Centre station

## About the draft Design Report

The draft Design Report is the next important milestone in the development of Brisbane Metro.

It provides a voluntary, non-statutory assessment of the concept design, the feasibility of the project, understanding of potential construction and operational impacts, approach to managing potential impacts, and required regulatory approvals. Council has previously prepared voluntary environmental assessments for major transport projects such as the Go Between Bridge and Eleanor Schonell Bridge.

The draft Design Report has been prepared with consideration of Council's Environmental Policy and Community Engagement Policy and relevant State legislation requirements. It is also consistent with voluntary environmental assessments prepared previously for public transport projects in South East Queensland.

The draft Design Report aims to provide sufficient information to allow the community and stakeholders to understand Brisbane Metro and its potential impacts.

Community and stakeholder engagement has supported the development of the draft Design Report by helping to identify and understand key stakeholder issues and plan appropriate mitigation measures.

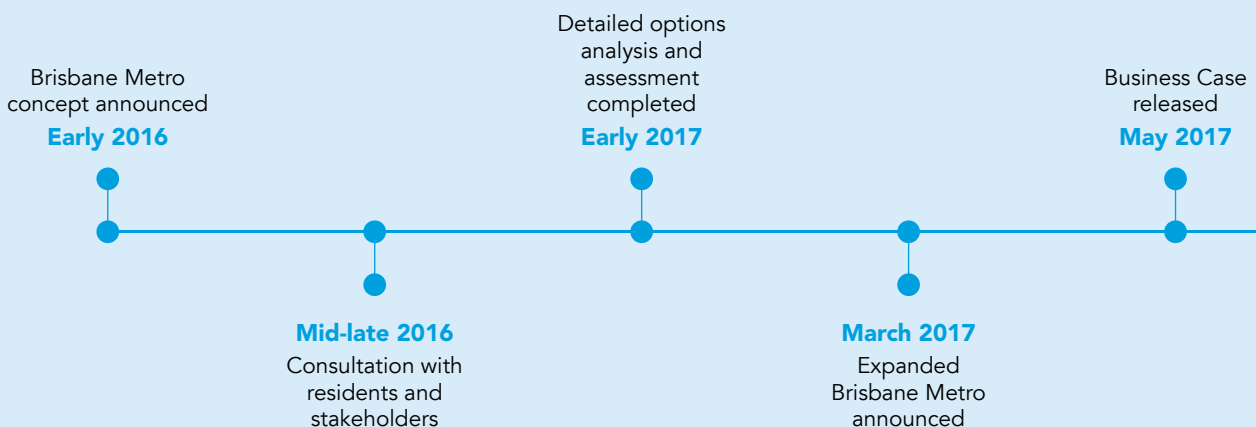


### Contents of the draft Design Report:

- **Key Findings (this document)** – provides a summary of the main outcomes of the draft Design Report particularly in regard to the identification of key issues and outcomes for Brisbane Metro.
- **Part A: Introduction** – provides information on Brisbane Metro's background and scope of the draft Design Report, project need, and community and stakeholder engagement activities and outcomes.
- **Part B: Concept Design** – describes the project options assessment and development, and provides an overview of Brisbane Metro's infrastructure, operation and construction.
- **Part C: Environmental Assessment and Management** – presents the findings of transport, environmental and social assessments of Brisbane Metro's construction and operation.
- **Part D: Concept Design Drawings** – these show the metro alignment, key infrastructure (e.g. stations and metro depot), construction worksite and laydown areas, and property impacts.

For further information, refer to Chapter 1: Introduction of the draft Design Report.

### Key milestones in the development of Brisbane Metro



## Community and stakeholder engagement

Engagement with the community and stakeholders has played an important role in helping to shape Brisbane Metro.

Three rounds of communication and engagement activities have been held between March 2016 and May 2017. Each round of engagement was based on specific project milestones, allowing for the outcomes of engagement to help inform future stages of project development.

Engagement activities included citywide newsletters, community information sessions, stakeholder reference group meetings and briefings with individual key stakeholders. A range of channels have been used to promote the engagement program, including media, advertising, social media and Council publications.

Feedback from engagement activities has indicated strong support for more frequent, reliable public transport in Brisbane, and high awareness and recognition of existing bus congestion issues in Brisbane's inner city, particularly around Cultural Centre station and the CBD.

As a result of specific feedback on the original Brisbane Metro concept received during Round 2 engagement, Council announced the revised Brisbane Metro solution in March 2017, which received strong support from the community and stakeholders.

Community and stakeholders were invited to provide detailed feedback on the revised project, which was used to help finalise the Business Case before its release on 30 May 2017.

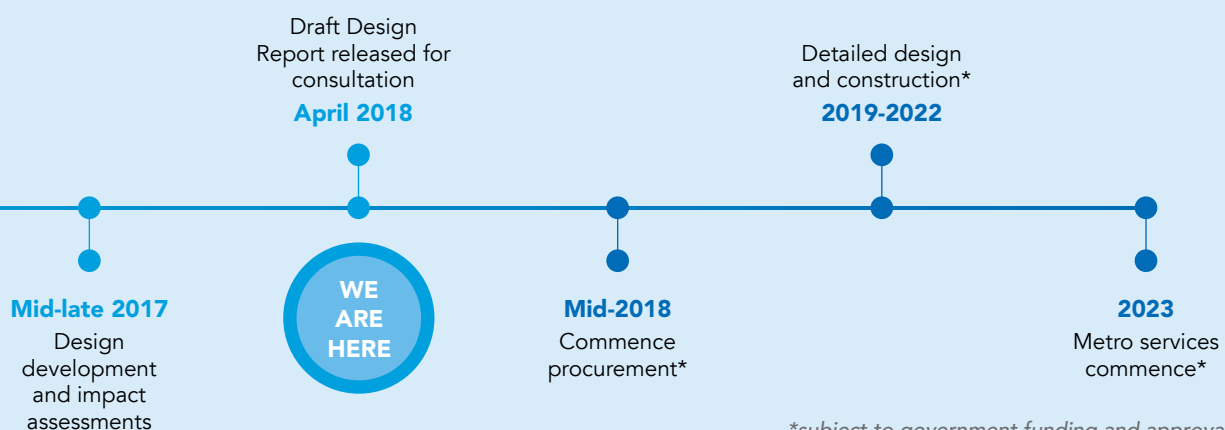
This feedback, as well as ongoing engagement with key government, corridor and technical stakeholders, has been critical in progressing planning for Brisbane Metro.

*For further information, refer to Chapter 3: Community and Stakeholder Engagement of the draft Design Report.*

Community and stakeholder engagement has supported the development of the draft Design Report by helping to identify and understand key stakeholder issues and plan appropriate mitigation measures.



Brisbane Metro community information session





# 3 The need for Brisbane Metro

Addressing Brisbane's inner city bus congestion and capacity issues is critical to supporting future jobs and population growth in the CBD and across the city.

## A growing city

Brisbane is an economic powerhouse for Queensland and is the State's gateway to the global economy. Over the next 25 years, Brisbane's population and economy will continue to grow. By 2041, the city is expected to be home to more than 1.4 million people, an increase of more than 27%.

Brisbane's economy is expected to provide 1.2 million jobs for the wider region, with growth in health, education, retail and tourism sectors generating increased travel demand into the city and surrounding precincts.

## The importance of inner Brisbane

Brisbane's city centre is the globally-facing commercial centre for South East Queensland. By 2041, Brisbane's city centre is expected to have expanded beyond its traditional peninsula location to become a network of inner city precincts.

Brisbane's CBD and inner city precincts are predicted to continue to be the driving force of the region's economy, supporting more than 630,000 jobs. Future population growth in Brisbane will be greatest in suburbs within five kilometres of the CBD, with approximately 475,000 residents living in the inner city by 2041.

The ability for workers, residents and visitors to move quickly and easily within and between these inner city precincts will be essential to the success of Brisbane's economy.

## Supporting regional jobs and economic growth

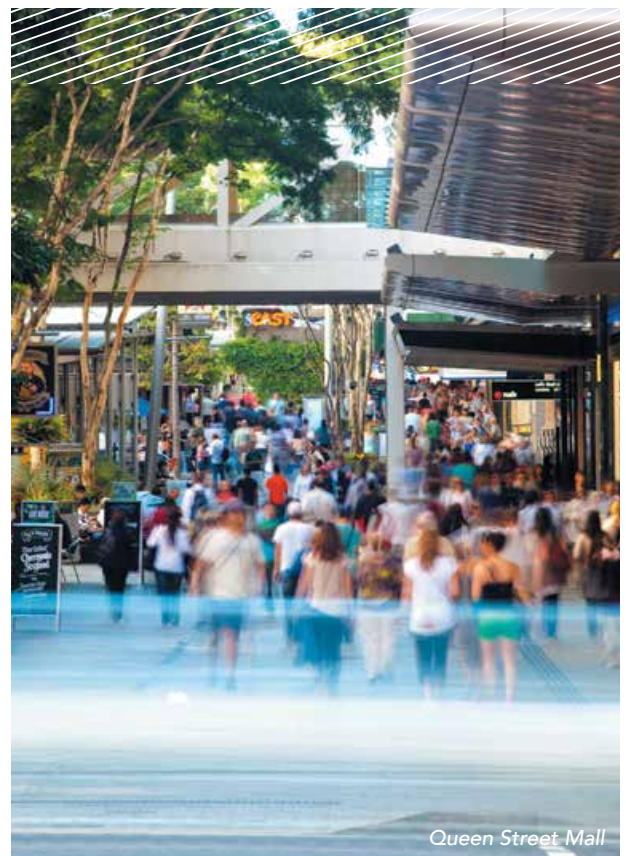
While employment growth is expected to remain strong within the CBD and surrounding inner city precincts, population growth in the wider South East Queensland region over the next 25 years is predicted to be greatest in the urban centres outside of Brisbane.

Employment growth in the CBD and inner city depends on residents from suburbs and centres across the region being able to get to workplaces in a reliable time, particularly during peak periods.

## Improving access and connectivity

Providing high-quality public transport services to the CBD from commuter catchments in areas outside of Brisbane, along with inner city distribution services, will be critical to supporting growth across the region.

Brisbane's transport network is now at a critical point in its evolution, as emerging issues challenge the region's growth aspirations. To address these issues, it is essential to promote public transport as the preferred mode for accessing the CBD and inner city, especially during peak periods.



Queen Street Mall

## Bus network challenges

Buses have a more significant role in Brisbane's public transport network than in other major cities. Buses move 24 million more passengers each year than the entire rail network in South East Queensland.

Critical parts of Brisbane's existing busway infrastructure have reached capacity and cannot accommodate significant growth without investment. The reliability and operational efficiency of the bus network is also degrading due to the constraints of the network, particularly within the CBD.

### Critical bottlenecks

The end of the South East Busway's segregated bus route is a short, yet extremely significant distance from the southernmost station on the Inner Northern Busway at King George Square, with the CBD and Victoria Bridge spanning the gap. Even with dedicated bus lanes linking the busways, buses must compete with other traffic at intersections, sit in queues and compete for road space with taxis, delivery vans and other vehicles.

The effects of bus constraints are evident and visible on key parts of the busway network, including intersection congestion at each end of the Victoria Bridge, particularly at the busway portal at the intersection of Melbourne Street in South Brisbane.

Capacity at Cultural Centre, South Bank, Mater Hill, and Buranda busway stations is also being reached during peak periods. As a result, bus services have been directed away from the busway corridor to Captain Cook Bridge in an attempt to improve journey times. However, heavy road congestion in peak periods is placing the performance of these services under pressure.

### Degrading travel times and reliability

Existing CBD and inner city bus congestion impacts on reliability of services and travel time performance. A comparison of current scheduled and actual travel times for journeys between Buranda and King George Square busway stations shows travel times can vary significantly. Bus network congestion is expected to increase with predicted population and employment growth, further impacting on travel times and reliability.

### Worsening amenity

A high volume of buses currently enter the inner city to meet customer demand, which has substantial amenity impacts at the Cultural Centre precinct, along Victoria Bridge and on CBD streets.

The movement of buses from the busway portal at the intersection of Melbourne Street to and from the Cultural Centre station severely constrains pedestrian movement in the precinct, and detracts from the important east-west pedestrian connection between the CBD and South Brisbane.

### Network and operational inefficiencies

Aspects of current network planning and operations also impact on the efficient running of the network. Low-frequency and low-patronage bus services using the constrained inner parts of the busway network in peak periods add to congestion and contribute to delays for all services.

Current boarding and ticketing practices on busway stations, such as single-door boarding and drivers being involved in fare collection and assisting passengers, impact on dwell times (i.e. bus stopping times at stations) and, ultimately, the operational efficiency and capacity of the busway network.

### Meeting future public transport demand

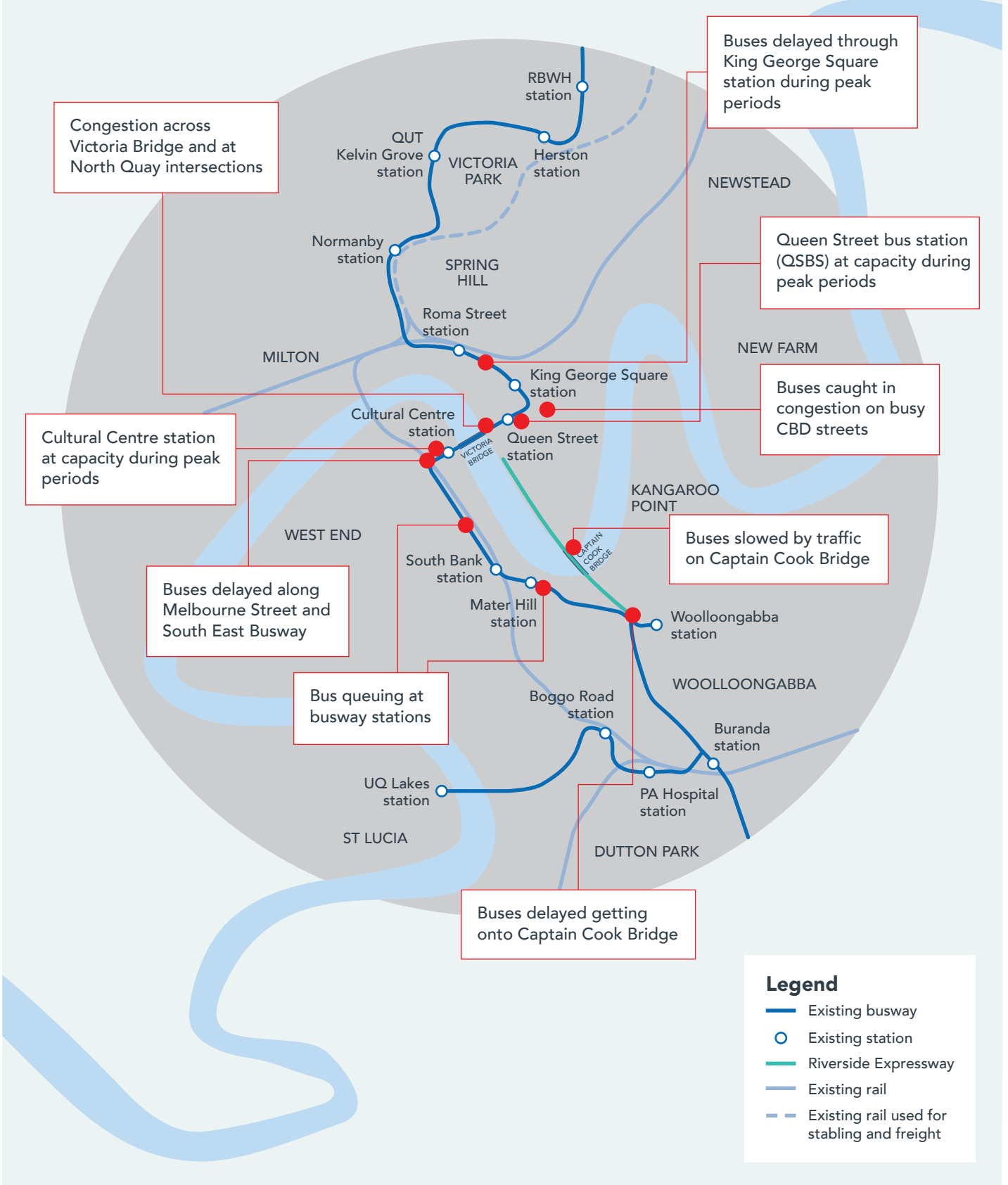
Due to the forecast population and employment growth, the demand for bus travel in the Brisbane region is anticipated to double from 2016 to 2041, growing to more than 730,000 bus passengers per day.

Providing capacity in and through the inner city bus network is critical to the effective operation of the wider bus network and the ability to cater for future growth in services.

Without investment in busway infrastructure, there will be insufficient capacity to meet the projected growth in population and employment.



# Inner city bus network constraints



## Planning for future growth


Supporting population and employment growth in Brisbane and the South East Queensland region through improved public transport is reflected in key plans and policies at all levels of government.

These include:

- **Australian Infrastructure Plan** – indicates that urban passenger transport networks should be upgraded so they meet future connectivity needs, are more integrated, have higher capacity and can meet the twin demands of population growth and rising expectations for service levels.
- **Smart Cities Plan** – prioritises infrastructure that improves accessibility, promotes agglomeration economies and enhances amenity, housing affordability and sustainability.
- **State Infrastructure Plan** – includes the provision of infrastructure that connects communities to markets and supports growth and productivity, prioritising investments that reform or make better use of existing infrastructure prior to consideration of significant new construction.
- **ShapingSEQ – South East Queensland Regional Plan 2017** – identifies Brisbane Metro as the number two transport infrastructure priority for the Brisbane region, helping to provide additional accessibility to, and circulation within, the inner city, particularly between the CBD, research and health institutions.
- **Brisbane City Centre Master Plan 2014** – proposes that public transport will be the best way to commute to the city centre and that investment will be made in high-capacity and high-frequency transit to accommodate strong city growth.
- **Draft Transport Plan for Brisbane – Strategic directions** – seeks to ensure Brisbane’s transport networks are planned to meet projected population and employment needs and provide travel-to-work options that meet commuters’ needs while allowing efficient network operation through increased use of public and active transport for commuter travel.

Brisbane Metro will support the objectives of these plans and policies by addressing critical capacity issues in the public transport network and improving accessibility within and between key employment nodes.

*For further information on the need for Brisbane Metro, refer to Chapter 2: Project Need of the draft Design Report.*



### Connecting Brisbane

The *Connecting Brisbane* strategy was jointly released by the Queensland Government and Brisbane City Council in June 2017.

The strategy outlines how Brisbane Metro and the proposed CRR project will work together to unlock existing capacity, overcome current constraints at the core of the transport network and deliver more frequent, integrated services on a turn-up-and-go high-frequency network supported by feeder services.

This will provide the transport capacity needed to support the growth of the economy and population, and connect people to where they want to go at the times they want to travel.

Upgrading the inner city core network will also enable the development of future citywide and region-wide public transport services and strategic infrastructure investments.

# 4 Developing Brisbane Metro

Brisbane Metro has been developed in line with a range of policies and frameworks for prioritising significant infrastructure projects.

Planning for Brisbane Metro has been informed by a number of previous studies and projects that have been initiated and investigated to address Brisbane’s bus constraints. Due to various factors, including affordability constraints and changes in government direction, many of these have not progressed past the feasibility stage.

## Options assessment process

The options assessment process for Brisbane Metro is based on the Queensland Government framework outlined in the *State Infrastructure Plan*, which is designed to assist in prioritising infrastructure investment decisions across government.

Identified options were sorted into four categories – reform, better use, improve existing and new – which aligns with Infrastructure Australia’s strategic options development process. This encourages the identification of options for reform and better use of assets through technologies and systems that drive efficiency of infrastructure and provide flexible, customer-focused solutions.

A value management framework was adopted to guide the identification and assessment of project options. Value management is a structured and analytical process that defines a project’s needs and its delivery strategy to achieve a ‘best value’ approach for decision-making.

Four key phases have formed the backbone of the value management framework for Brisbane Metro:

- **Goal definition and problem identification** – determine key outcomes, problems, constraints, opportunities and establish cause and effect relationships between the identified problems.
- **Stakeholder analysis** – identify and describe potential key stakeholders.
- **Options generation** – encourage creative thinking and engage project stakeholders to convert identified problems into innovative solutions.
- **Options assessment** – evaluate each generated solution to determine the most effective implementation strategy.

The value management framework was used to identify and assess possible options available for Brisbane Metro. The methodology process is summarised in the figure over the page and included the identification and shortlisting of options through workshops and multi-criteria analysis.

Increasing preference	Reform	<ul style="list-style-type: none"> <li>• Improve service performance through an amendment of existing institutions and laws</li> </ul>
	Better use	<ul style="list-style-type: none"> <li>• Improve service performance by influencing demand (i.e. by not building capacity)</li> </ul>
	Improve existing	<ul style="list-style-type: none"> <li>• Improve service performance through lower cost capital work to augment existing infrastructure</li> </ul>
	New	<ul style="list-style-type: none"> <li>• Construction of new infrastructure following elimination of less capital intensive options</li> </ul>

Queensland Government options assessment framework

## Identifying the solution

Throughout the project options assessment and development, Council has maintained a thorough comparison and review framework to ensure the best possible outcomes are achieved.

Key Council project objectives were identified early in the process and guided decision-making on possible options.

These objectives included:

- delivering high-frequency turn-up-and-go services
- increasing the capacity of the busway network
- reducing bus congestion on the busways in the CBD and inner city
- reducing the number of buses in the CBD
- improving travel times and reliability
- freeing up buses to allow for more services in the suburbs.

Options were assessed against a range of customer-focused criteria, and how they best performed against Council's objectives.

Understanding community and stakeholder views and finding a cost-effective solution to bus congestion issues have also been key objectives for Council.

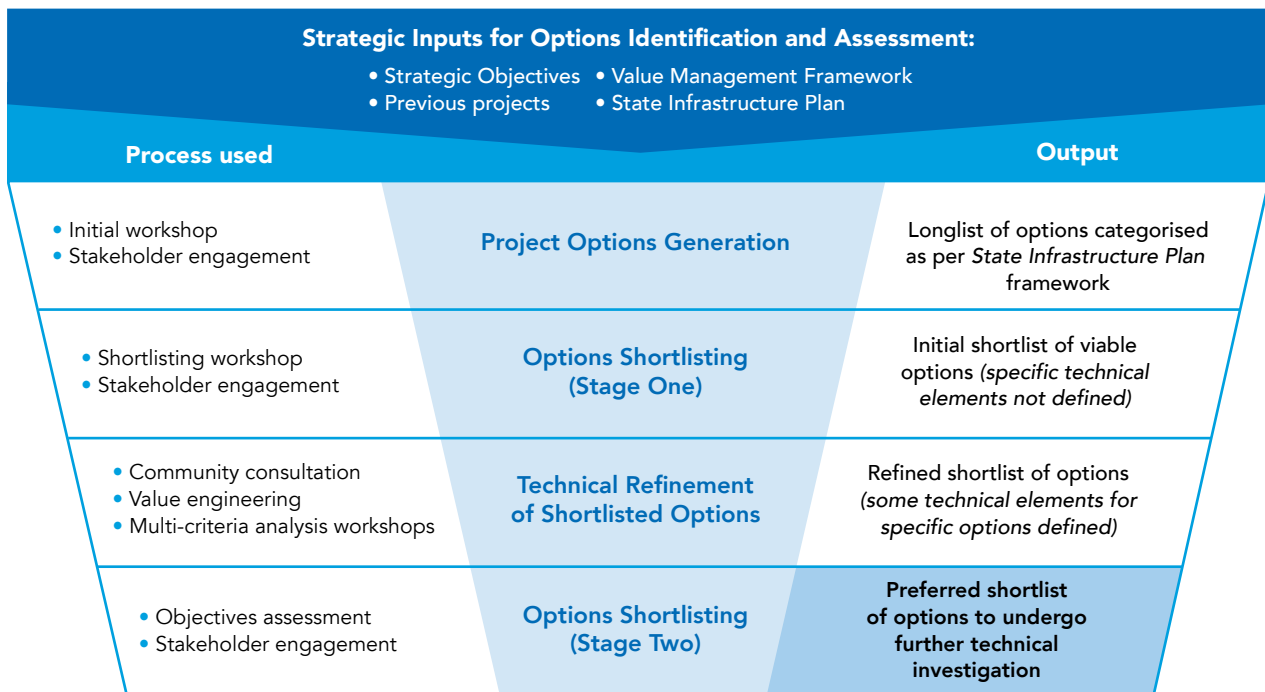
Based on the options assessment, Council announced the revised Brisbane Metro in March 2017. Council proceeded to the next stage of the project's feasibility assessment, with a Business Case on the revised Brisbane Metro released in May 2017.

Further development of the Brisbane Metro concept design has considered a range of different project element options. This process was influenced by the options process for the original Brisbane Metro concept, in particular the alignment and elements of the project in South Brisbane and the CBD.

Additional elements investigated for Brisbane Metro related to:

- infrastructure, including depot and station siting and design, layover and turnaround locations
- construction methodology at key locations
- metro vehicles, including fuel type.

*For further information on the development of Brisbane Metro, refer to Chapter 4: Project Options and Development of the draft Design Report.*



Options identification and shortlisting process

# 5 The Brisbane Metro solution

By combining targeted infrastructure investments with policy and operational measures and new technology, Brisbane Metro removes the key constraints on our existing busway infrastructure without the cost and community impacts of delivering a major new dedicated transport corridor.

To achieve this, Brisbane Metro will be delivered through five key elements as outlined in the figure below.

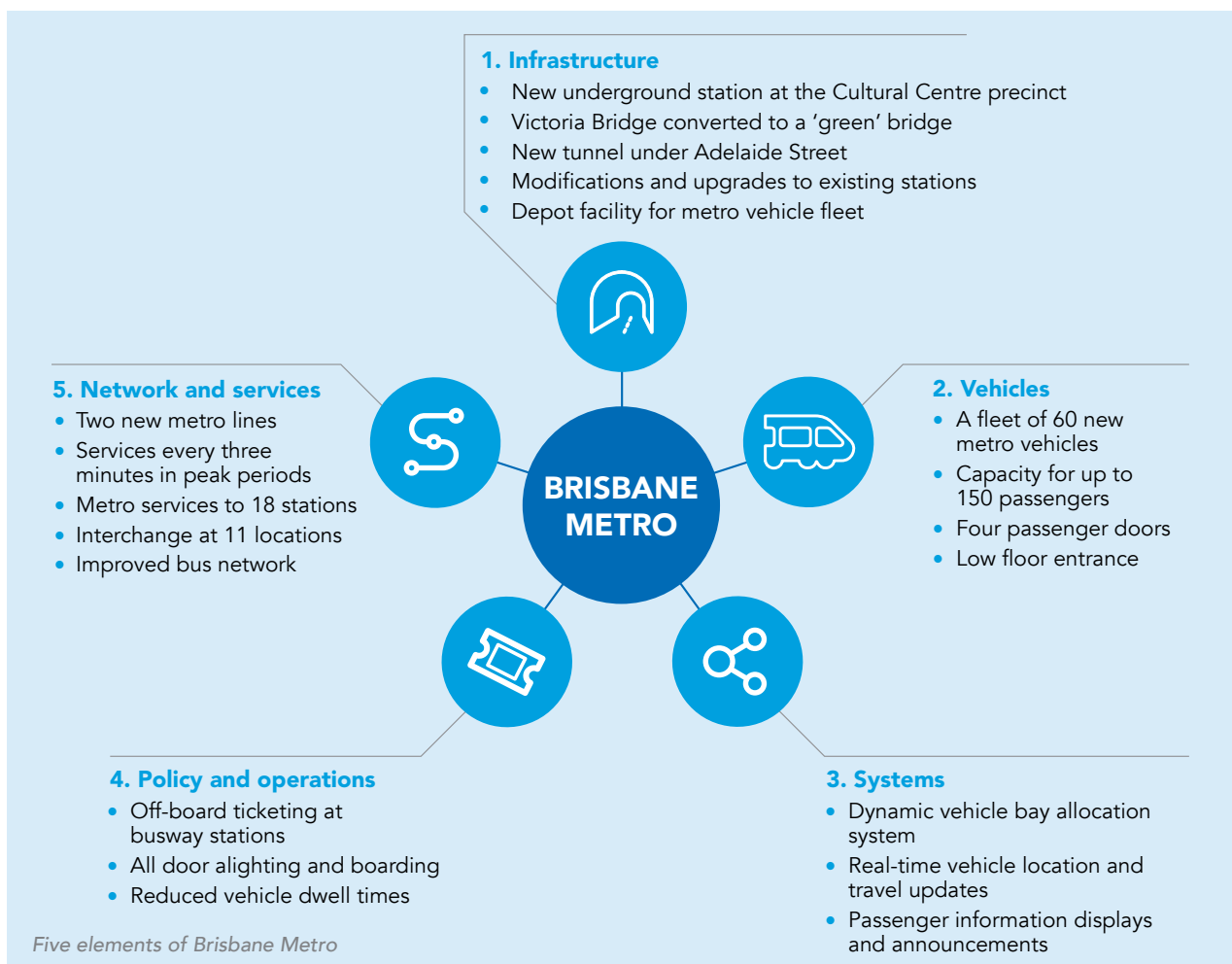
New and upgraded infrastructure elements of the Brisbane Metro solution described in this section include:

- a new Cultural Centre underground station
- traffic changes to Victoria Bridge and North Quay
- a new tunnel underneath Adelaide Street
- modifications and upgrades to existing busway stations
- layover and turnaround facilities for buses and metro vehicles.

This section also describes the key elements of Brisbane Metro's operations, which include:

- the new metro vehicle fleet and metro depot at Rochedale
- metro network operations
- changes to the bus network
- policy and operational changes
- vehicle and passenger management systems.

*For further information on the Brisbane Metro solution, refer to Chapter 5: Project Description of the draft Design Report.*





## New and upgraded infrastructure

For much of the alignment, Brisbane Metro uses the existing world-class busway. Targeted investment in new infrastructure, along with modifications to existing infrastructure, will help address critical inner city bottlenecks and increase the capacity of the busway.

### Local road and access changes

This includes the closure of Melbourne Street to general traffic between Hope Street and Victoria Bridge, and reduction of Grey Street to one lane in each direction. The intersection of Melbourne Street and Hope Street will be modified to allow left-in access to Hope Street only.

### New Melbourne Street bus stops

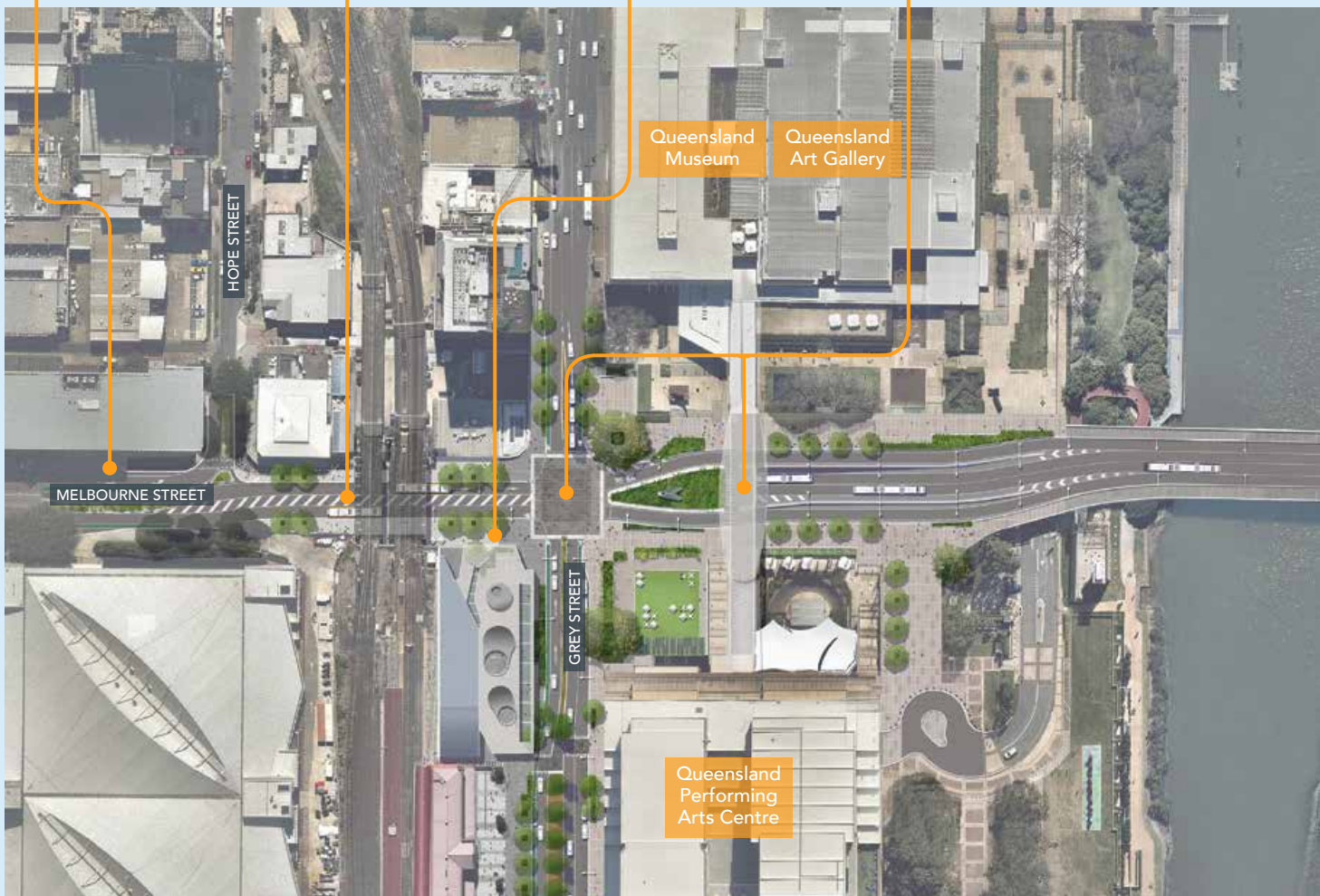
New bus stops, which replace the existing Cultural Centre station for bus services connecting to West End, the CBD and Fortitude Valley, will be installed on Melbourne Street under the existing rail bridge.

### New Cultural Centre underground station

A new underground station, which replaces the existing surface level Cultural Centre station for services connecting to the South East Busway and suburbs, will be constructed to accommodate metro and bus services.

### Improved pedestrian connectivity

This includes the upgrade of the Grey Street and Melbourne Street intersection to a scramble crossing, and a new surface level pedestrian crossing between QPAC and the Queensland Museum.



Artist's impression only. Subject to government funding and approvals.

The targeted improvements and modifications will unlock the potential of the existing busway infrastructure, while also enhancing public amenity and improving accessibility.

**Changes to Victoria Bridge**

The two centre lanes will be dedicated to Brisbane Metro and South East Busway services, with a lane on either side for other bus services.

The downstream footpath will be widened within the existing bridge width, providing increased capacity for pedestrians.

**Changes to North Quay**

The dedicated corridor for metro and bus services will be completed by closing the intersection of North Quay and Adelaide Street to through traffic

The intersection of North Quay, William Street and Queens Wharf Road will be restricted to local traffic only.

**New Adelaide Street tunnel**

A new tunnel connecting from North Quay to King George Square station will provide one lane for metro and bus services in each direction, with a tunnel portal and transition structure to be located between North Quay and George Street.



Artist's impression only. Subject to government funding and approvals.

## New Cultural Centre underground station

The Cultural Centre precinct will be serviced by a new state-of-the-art underground station for metro vehicles and buses.

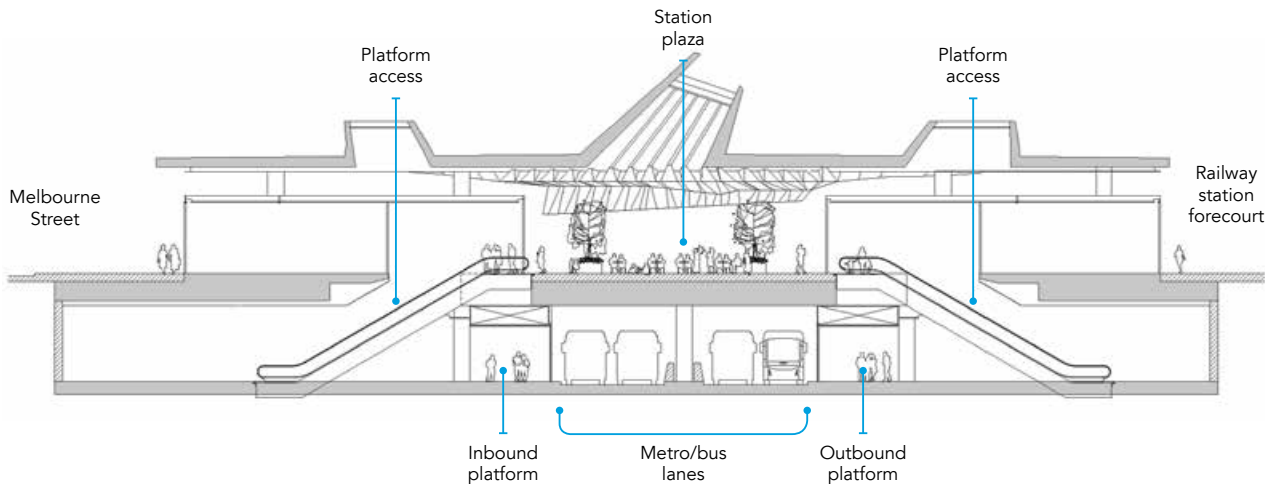
The new underground station is proposed to be located on a site at the intersection of Melbourne and Grey Streets, beneath the existing South Brisbane railway corridor, 125 Grey Street, and the Queensland Performing Arts Centre (QPAC) Green.

The station will be connected to the existing South East Busway beside the Brisbane Convention and Exhibition Centre (BCEC), and to Victoria Bridge along Melbourne Street.

Located in one of Brisbane's most important inner city precincts, the new station will provide customers with fast and easy access to destinations such as Queensland Cultural Centre, South Bank and South Brisbane.

### Station features

- Stopping bays for inbound and outbound metro vehicles and buses
- Central through running lanes in both directions and side platforms approximately 100 metres long and 5.5 metres wide, approximately seven to eight metres below ground
- Full-height platform screen doors for customer safety, management and amenity
- A level of finish similar to existing busway stations (e.g. quality of tiling and glazing finishes)
- Access to each platform via escalators, a stairway and lift
- Two station entries at the corner of Melbourne Street and Grey Street with surface-level ticket gates and a ground-level concourse with a canopy structure.



Cultural Centre station – cross section (indicative only)

## New Melbourne Street surface bus stops

Surface-level bus stops will be established on either side of Melbourne Street for bus services connecting to West End, the CBD and Fortitude Valley such as Council's Blue CityGlider service. The bus stops will be integrated with the surrounding public realm.

The new bus stops will be located underneath the existing rail overpass between Hope Street and Grey Street, with the outbound stop providing a direct connection to the entries for the new Cultural Centre underground station.

Pedestrian connection between the inbound stop and the underground station will be provided via the upgraded Melbourne Street and Grey Street intersection.

The existing busway station at the Cultural Centre precinct will be removed, including the central lift and stairwell to the Cultural Centre pedestrian bridge.

## Infrastructure elements of the new underground Cultural Centre station

### Melbourne Street transition structure

A transition structure will connect the underground station to the surface at Victoria Bridge. The transition structure will extend along Melbourne Street from the station portal, next to the existing Cultural Centre pedestrian bridge, to Victoria Bridge. This requires the removal of the existing Cultural Centre pedestrian tunnel connecting QPAC and the Queensland Museum. A pedestrian connection will be provided via a new surface crossing. The transition structure also requires the reconstruction of a section of the Victoria Bridge backspan.

### Under rail station structure

The southern end of the new underground station and connection to the existing BCEC busway tunnel will sit beneath the railway corridor, including the existing railway platforms and the four rail lines. An underpass structure will be required to support the existing rail lines and station platforms.

### Station entries

Two entries to the new underground station will be located at the corner of Grey and Melbourne Streets (125 Grey Street). These will be connected by a ground-level concourse, with a canopy structure.

### BCEC busway tunnel

Brisbane Metro requires lowering of a section of the South East Busway within the BCEC busway tunnel and construction of an opening through a section of the wall that forms part of the existing busway tunnel. This section of tunnel supports the BCEC loading dock above.

Artist's impression only. Subject to funding and government approvals.

## Local road and access changes

To accommodate the introduction of Brisbane Metro, a range of local road and access changes are proposed to be implemented in South Brisbane, including at the Cultural Centre precinct. Key changes include:

- the busway portal at the intersection of Melbourne Street closed to buses, allowing unimpeded pedestrian and bus movements along this section of Melbourne Street
- Melbourne Street closed to general traffic between Hope Street and the Victoria Bridge with the intersection of Melbourne and Hope Streets modified to allow left-in access to Hope Street only
- access for surface buses maintained between Grey and Merivale Streets
- the intersection at Grey and Melbourne Streets upgraded to a scramble crossing to improve the capacity and convenience for pedestrians to cross this intersection
- an additional surface level pedestrian crossing of Melbourne Street introduced at the existing Cultural Centre pedestrian bridge between QPAC and the Queensland Museum
- enhanced pedestrian and cycle access provided along Melbourne Street between Grey and Merivale Streets, including widened footpaths and public realm improvements
- Grey Street reduced to one lane in each direction near the new underground station and through the intersection of Melbourne and Grey Streets. Public realm improvements will also be made to parts of Grey Street.

Importantly, local vehicle access to QPAC will be maintained, including visitor drop-off/pick-up and access at Grey Street, and access to the loading dock on Grey Street opposite the South Brisbane railway station.

## Cultural Centre precinct access

Due to the removal of general vehicle traffic from Victoria Bridge, car parks within the Cultural Centre precinct will no longer be accessible via the existing Melbourne Street entry/exit at the Cultural Forecourt area adjacent to the Brisbane River.

Access to Cultural Centre precinct car parks will be maintained via the existing Peel Street/Stanley Place entry/exit and through the Cultural Centre tunnel under the Victoria Bridge.

Service and emergency vehicle access to the Cultural Forecourt and Stanley Place will be maintained via Russell Street. Smaller vehicle egress will be via the existing Cultural Centre tunnel, while larger vehicles egress will be managed via the outbound bus lane at Melbourne Street.

Emergency vehicles will continue to use the busway and bus lanes at Melbourne Street and Victoria Bridge, or Russell Street depending on their direction of approach to the Cultural Centre precinct.

To accommodate the new underground station infrastructure, the existing Cultural Centre pedestrian tunnel beneath Melbourne Street will be closed. Pedestrian movements will be via the existing pedestrian bridge, a new pedestrian crossing of Melbourne Street beneath the existing pedestrian bridge, and the proposed scramble crossing at the upgraded Melbourne and Grey Streets intersection. The lifts connecting the pedestrian bridge to the street level will also be relocated to within the Cultural Centre precinct, allowing increased public realm along Melbourne Street.

Council has commenced discussions with the Cultural Centre precinct stakeholders about the closure of the pedestrian tunnel and will continue to consult with these stakeholders through the design development.

## Delivering a world-class gateway to the Cultural Centre precinct

Brisbane Metro presents an opportunity to reimagine the Cultural Centre precinct as a highly connected place that celebrates Brisbane's culture, river's edge and subtropical lifestyle.

Additional improvements to the pedestrian environment and streetscape have the potential to establish a gateway to our world-class cultural and recreational precinct and provide better access to the city's arts venues.

Council is committed to working with stakeholders in the precinct, including QPAC, the Queensland Art Gallery, Queensland Museum, State Library of Queensland and South Bank Corporation, to help jointly realise this vision.



*Note: Artist's impression (above) is indicative of a concept design for a future vision of the Cultural Centre precinct subject to further engagement with stakeholders and approved funding.*



Artist's impression only

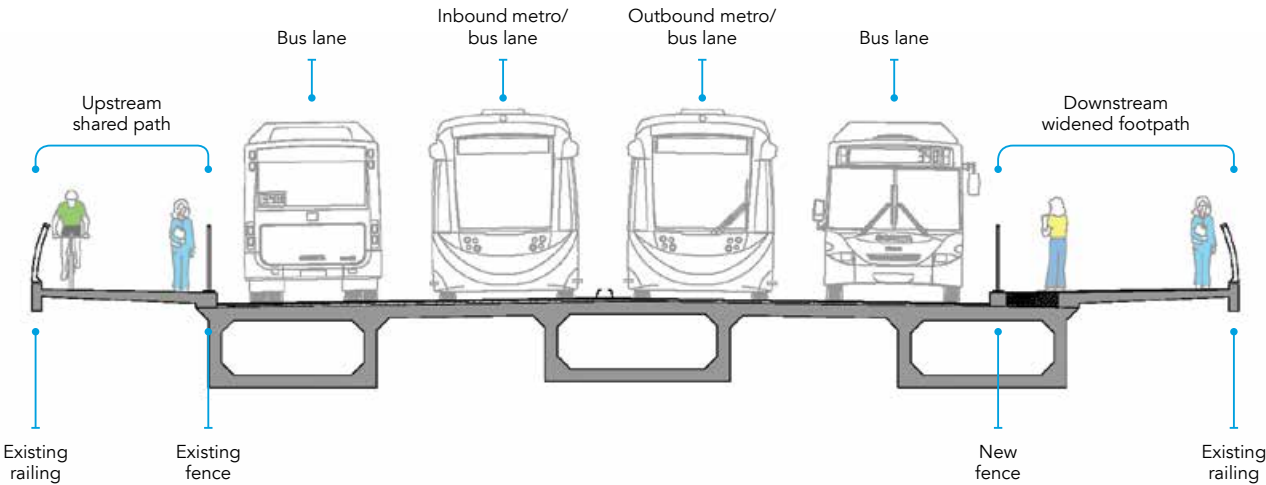
### Changes to Victoria Bridge

Victoria Bridge will be converted to a 'green bridge' for metro and bus services, pedestrians and cyclists. Removing general vehicle traffic will provide additional lanes for cross-river public transport, doubling the capacity of this important link.

The two middle lanes will be used for Brisbane Metro and South East Busway services, with a lane on either side for other buses connecting to West End and New Farm. Access for emergency vehicles will be maintained on all four lanes.

The existing on-road bike lanes will be reallocated, allowing the existing downstream footpath to be widened by 1.2 metres within the existing bridge width. This will further facilitate pedestrian movement and greater capacity across the bridge. Pedestrians will be encouraged through signage to travel on the downstream footpath.

As currently occurs, cyclists will be required to dismount at each end of the bridge on the downstream footpath or use the shared path on the bridge's upstream footpath.



Victoria Bridge – cross section (indicative only)

## Changes to North Quay

The dedicated corridor for metro and bus services will be completed by closing the intersection of North Quay and Adelaide Street to through traffic. The intersection of North Quay, Queen Street, William Street and Queens Wharf Road will be restricted to local traffic only.

### Pedestrian and cyclist connectivity

Reducing through traffic from this section of North Quay, along with public realm improvements, will enhance pedestrian connectivity from the downstream path on Victoria Bridge to Reddacliff Place and the CBD, with pedestrian access maintained across the North Quay and William Street intersection.

The existing at-grade access to Reddacliff Place for pedestrians and cyclists on the upstream footpath of Victoria Bridge will be maintained. The cycle ramp access to the Bicentennial Bikeway will be maintained to North Quay.

### Brisbane Metro and bus services

A section of North Quay from Victoria Bridge into the Adelaide Street tunnel will be modified, with two central lanes reserved for metro and some bus services and two outside lanes for New Farm/West End bus services.

Access to Queen Street bus station (QSBS) for inbound buses travelling across Victoria Bridge will be via the new Adelaide Street tunnel and existing Albert Street tunnel. Outbound buses from the QSBS to Victoria Bridge will continue to use the existing access.

The corner from Victoria Bridge to North Quay will be extended in the upstream direction, to provide a turning path for metro vehicles and buses from Victoria Bridge onto North Quay.

## New Adelaide Street tunnel

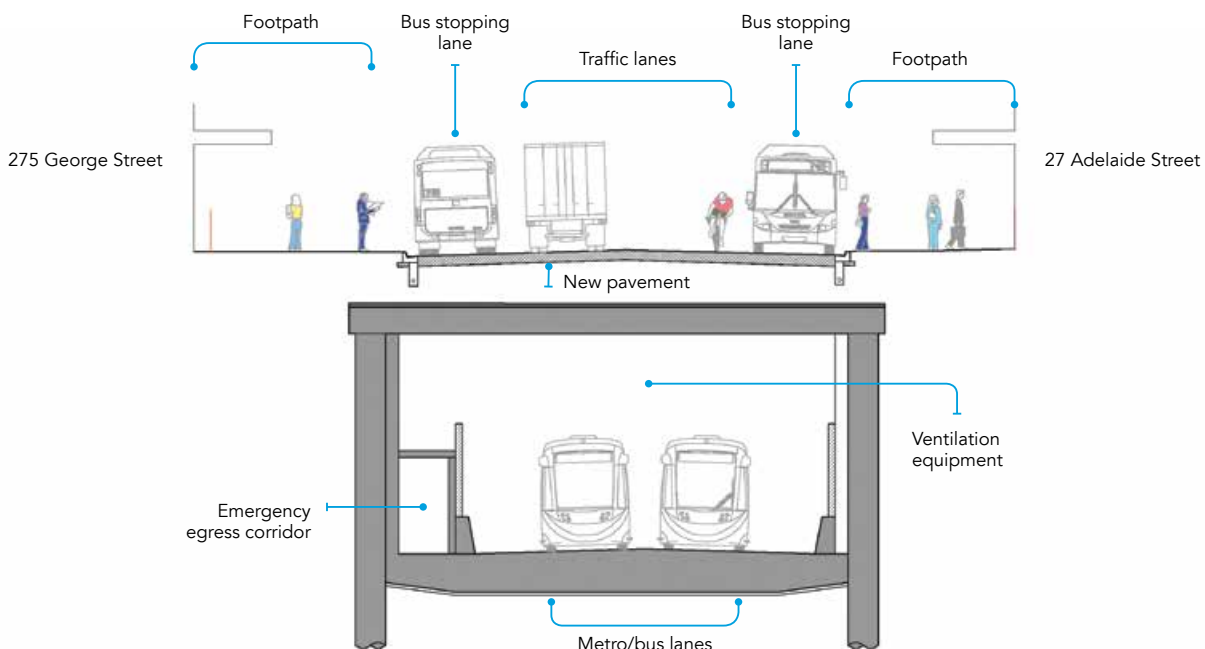
A new tunnel under Adelaide Street will connect from North Quay to King George Square station, completing the segregated corridor for metro and bus services. A tunnel portal and transition structure will be located at Adelaide Street, between North Quay and George Street.

The tunnel will provide one lane for metro vehicles and buses in each direction. It will be 13 metres wide, approximately 200 metres long and up to 11 metres deep where it connects to the existing Albert Street bus tunnel and King George Square station.

A connection will be provided to allow buses to access QSBS from the Adelaide Street tunnel.

Fire and life safety measures will be integrated into the tunnel design, including fans for smoke extraction, a fire isolation corridor and emergency exit paths and points.

Access for surface buses on Adelaide Street will be maintained, with buses travelling on either side of the tunnel portal between George Street and North Quay.



Adelaide Street tunnel – cross section (indicative only)

## Busway station modification and upgrades

Upgrades will be required at all existing busway stations to provide:

- new ticket readers or fare gates on the platforms to facilitate off-board ticketing, i.e. 'tagging on' and 'tagging off'
- new passenger information display systems to support the real-time bus management system and to inform customers of the stopping bay approaching metro vehicles and buses will depart from

- new Brisbane Metro branding (e.g. painting, signage).

Platform extensions will also be required at some stations to accommodate increased station activity. Existing entrances and exits to current stations will be maintained.

The table below includes a summary of the works proposed to be undertaken at each of the existing busway stations for Brisbane Metro.

Busway station	Summary of works
<b>Eight Mile Plains</b>	<ul style="list-style-type: none"> <li>■ Modification of existing platforms by approximately 9.25 metre extension at southern end</li> <li>■ Station upgrades (e.g. passenger information displays, off-board ticketing)</li> </ul>
<b>Upper Mt Gravatt</b>	<ul style="list-style-type: none"> <li>■ Modification to existing platforms by approximately 9.25 metre extension at southern end, including new stairs, partial demolition and reconstruction of existing retaining walls and footpath</li> <li>■ Station upgrades (e.g. passenger information displays, off-board ticketing)</li> </ul>
<b>Griffith University</b>	<ul style="list-style-type: none"> <li>■ Modification to existing platforms by approximately 29.25 metre extension at the northern end</li> <li>■ Station upgrades (e.g. passenger information displays, off-board ticketing)</li> </ul>
<b>Buranda</b>	<ul style="list-style-type: none"> <li>■ Modification to existing platforms by approximately 29.25 metre extension at southern end</li> <li>■ Station upgrades (e.g. passenger information displays, off-board ticketing)</li> </ul>
<b>UQ Lakes</b>	<ul style="list-style-type: none"> <li>■ Station upgrades (e.g. passenger information displays, off-board ticketing, pedestrian paths and median to allow metro vehicle turnaround)</li> </ul>
<b>Mater Hill</b>	<ul style="list-style-type: none"> <li>■ Modification of existing platforms with extensions at western end by approximately 6 metres (inbound platform) and 3 metres (outbound platform)</li> <li>■ Station upgrades (e.g. passenger information displays, off-board ticketing)</li> </ul>
<b>King George Square</b>	<ul style="list-style-type: none"> <li>■ Station modifications and upgrades (e.g. adjustments to passenger screen door locations, passenger information displays, and off-board ticketing)</li> </ul>
<b>Roma Street</b>	<ul style="list-style-type: none"> <li>■ Modification of existing outbound platform by approximately 13.5 metres at eastern end, requiring volumetric acquisition of part of Brisbane Transit Centre (west tower)</li> <li>■ Station upgrades (e.g. passenger information displays, off-board ticketing)</li> </ul>
<b>Other stations</b>	<ul style="list-style-type: none"> <li>■ Station upgrades (e.g. passenger information displays, off-board ticketing)</li> </ul>

## Layovers and turnaround facilities

To suit the operational requirements of the Brisbane Metro vehicles, existing bus turnarounds will be utilised at Eight Mile Plains, UQ Lakes, Cordelia Street and Ernie's Roundabout at Herston.

New layover areas and modification to existing layover areas will also be required for metro vehicles.

In other locations, new turnarounds and/or modification of layover areas are required for local bus services connecting to Brisbane Metro services.

Provisions for existing, modified and new turnarounds and layovers are outlined in the table opposite.

Location	Provisions
<b>Eight Mile Plains</b>	<ul style="list-style-type: none"> <li>■ Metro layover (four vehicles) and existing turnarounds</li> </ul>
<b>Griffith University</b>	<ul style="list-style-type: none"> <li>■ Bus layover (four vehicles) and turnaround</li> </ul>
<b>Countess Street</b>	<ul style="list-style-type: none"> <li>■ Metro layover (four vehicles) and existing turnarounds</li> </ul>
<b>Ernie's Roundabout</b>	<ul style="list-style-type: none"> <li>■ Metro layover (four vehicles) and existing turnaround</li> </ul>
<b>Boggo Road</b>	<ul style="list-style-type: none"> <li>■ Bus layover (one vehicle)</li> </ul>
<b>UQ Lakes</b>	<ul style="list-style-type: none"> <li>■ Metro layover (one vehicle) and existing turnaround</li> </ul>
<b>Woolloongabba</b>	<ul style="list-style-type: none"> <li>■ Bus turnaround</li> </ul>

## New Brisbane Metro depot

A depot facility for metro vehicles will be located at School Road, Rochedale, adjacent to the South East Busway.

The proposed depot site will be approximately 55,000 square metres and will require Council to acquire four private properties and a property currently owned by the Department of Transport and Main Roads.

Direct access to the depot for metro vehicles will be from the adjacent South East Busway.

The metro depot will generally operate between 20-24 hours per day, seven days per week.

Council has commenced discussions with landowners about acquiring the properties required for the depot.

The depot will provide stabling for the initial fleet of 60 metro vehicles and have capacity to accommodate growth of the fleet in line with demand.

### Car parking

Provision for up to 149 car parking spaces for staff and visitors.

### Administration facility

Office space, vehicle dispatch and training rooms, and driver facilities, including end of trip, amenities and recreational facilities.

### Vehicle stabling

Stabling for up to approximately 95 metro vehicles, allowing capacity for future growth to 2041.

### Vehicle facilities

Fuelling, wash down and cleaning facility for metro vehicles and associated water and fuel storage and waste management.

### Maintenance garage

13-bay garage as well as provision for maintenance tools and equipment, storage of metro vehicle parts, garage management office space and amenities.

*Artist's impression only*



## A new fleet of high-capacity metro vehicles

As part of Brisbane Metro, a new fleet of 60 high-capacity metro vehicles will be introduced, each able to carry up to 150 customers.

Each metro vehicle will be approximately 24-25 metres in length and bi-articulated (i.e. have two articulation or pivot points) with potential for steerable axles to allow smaller turning circles.

The metro vehicle will be able to operate on the existing busway. The existing platform height will be maintained, with metro vehicles provided with doorway access ramps that are motor powered or manually deployed by the driver as required.

Council is assessing a range of metro vehicles from suppliers in Australia and internationally to determine their suitability for the project.

Council is also considering potential options for the metro vehicle's fuel source, including conventional and alternative fuels such as diesel, gas, fully-electric or hybrid options.

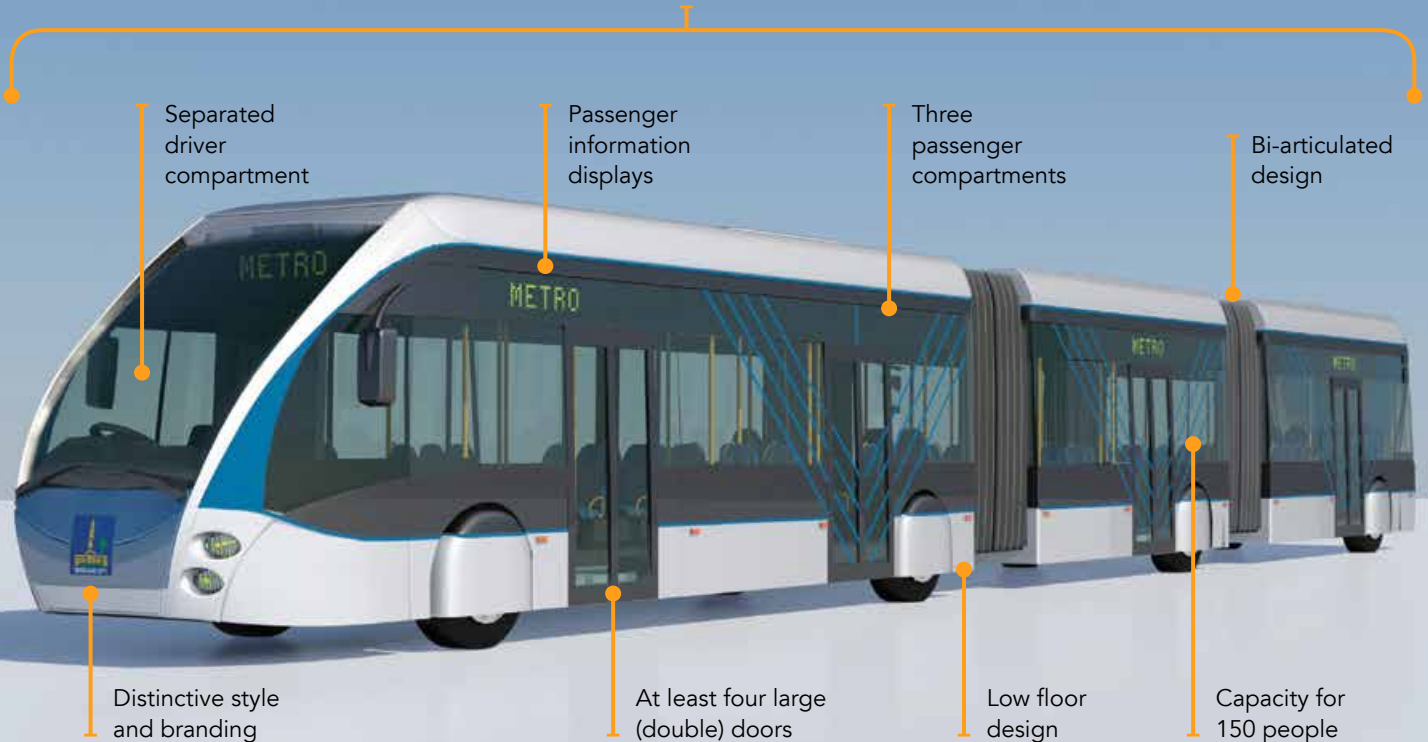
Key features of the metro vehicle will include:

- three passenger compartments
- low floor design to allow quicker boarding and alighting
- at least four large (double) doors to allow rapid boarding and departure
- on-board features such as Wi-Fi access, customer information systems to provide real-time travel updates, and public/voice announcements of the next station.

The metro fleet will expand over time to accommodate growth in services.

Artist's impression only

Approximately 24-25 m in length



## New services and an improved network

Brisbane Metro will introduce high-frequency, high-capacity metro standard services to the inner city and suburbs, along with changes to the bus network, providing customers with more choice and better connections across the public transport network.

Brisbane Metro proposes two new high-capacity metro lines:

- **Metro 1** – Eight Mile Plains station to Roma Street station via the South East Busway and Inner Northern Busway
- **Metro 2** – RBWH station to UQ Lakes station via the Inner Northern Busway, South East Busway and Eastern Busway.

Brisbane Metro will deliver a turn-up-and-go mass transit system with services every three minutes in peak periods on each metro line and up to every 90 seconds in the inner city, and with the capacity to carry up to 22,000 customers per hour per direction from day one of operations, with increased capacity in the future.



### Brisbane Metro operations

Brisbane Metro is proposed to operate:

- 5am to midnight, Monday to Thursday
- 5am Friday to midnight Sunday (i.e. all day Saturday and Sunday).

The table below provides an overview of the proposed metro service frequencies during peak and off-peak periods for the year of opening, and at 10 years following opening.

In the year of opening, metro services will operate at three-minute frequencies during peak periods. During daytime inter-peak, metro services will operate at about five-minute frequencies.

Over the subsequent years of operations, metro frequencies in peak periods will continue to increase in line with demand.







High-frequency services every **3MIN** in peak periods and every **5MIN** between peak periods

Period	Metro line	Year 1	Year 10
Weekday peak frequency	Metro 1	3 minutes	2 minutes
	Metro 2	3 minutes	3 minutes
Weekday inter-peak frequency	Metro 1 and Metro 2	5 minutes	5 minutes
Other off-peak times (including weekends)	Metro 1 and Metro 2	10 minutes	10 minutes

# Brisbane Metro network

## Legend

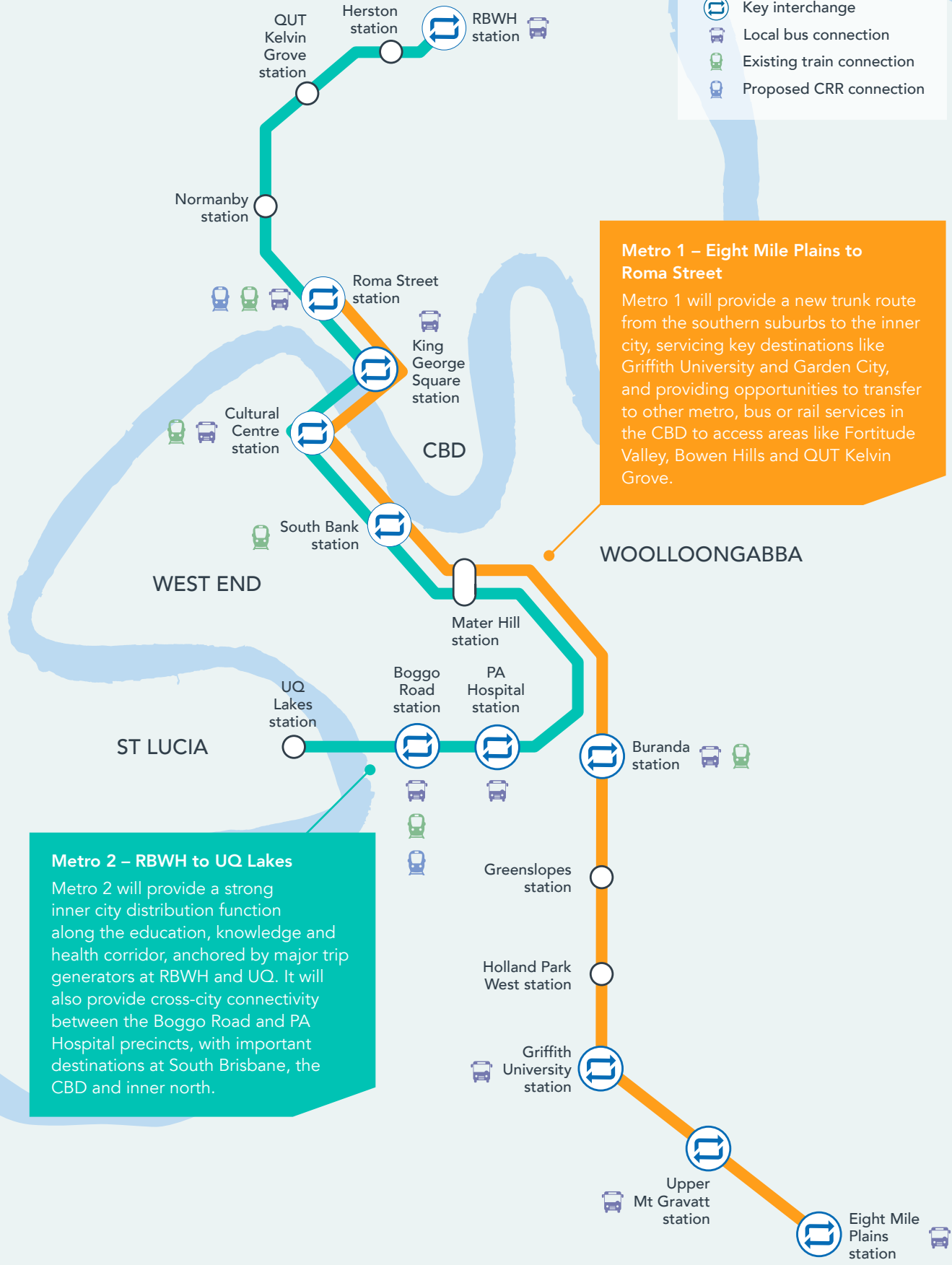
- Metro 1 line
- Metro 2 line
-  Key interchange
-  Local bus connection
-  Existing train connection
-  Proposed CRR connection

### Metro 1 – Eight Mile Plains to Roma Street

Metro 1 will provide a new trunk route from the southern suburbs to the inner city, servicing key destinations like Griffith University and Garden City, and providing opportunities to transfer to other metro, bus or rail services in the CBD to access areas like Fortitude Valley, Bowen Hills and QUT Kelvin Grove.

### Metro 2 – RBWH to UQ Lakes

Metro 2 will provide a strong inner city distribution function along the education, knowledge and health corridor, anchored by major trip generators at RBWH and UQ. It will also provide cross-city connectivity between the Boggo Road and PA Hospital precincts, with important destinations at South Brisbane, the CBD and inner north.



## Evolving the bus network

The introduction of Brisbane Metro provides an opportunity to evolve the bus network from a largely direct service (single seat) model to a hybrid network.

This will provide a trunk metro service that operates as the primary service along the busway and is supported by numerous 'feeder routes'.

Many current BUZ (high-frequency) and Rocket (peak-only express) services to the CBD will continue to operate, retaining a strong complementary network of suburbs-to-city services for existing bus customers.

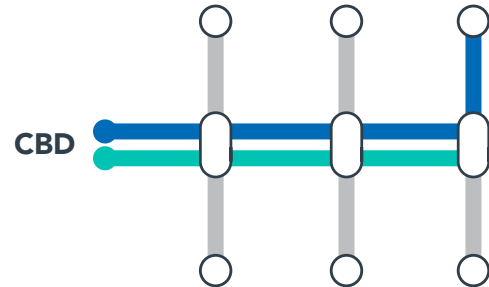
Other current lower patronage bus services will feed high-frequency trunk metro services on the busway.

Providing feeder services to Brisbane Metro stations will reduce duplication and provide a more efficient use of the existing bus fleet and infrastructure.


This will reduce bus congestion on the busway and in the CBD, helping to improve travel times and reliability.

At the same time, customers will benefit from an easier-to-use network and better, convenient connectivity to a wider range of growth destinations.

This will be supported by improvements to other high-frequency distribution services, such as Council's CityGlider network and the Inner City Loop.



### Legend

	Trunk route (Metro)		Major centre/interchange stops
	High-frequency route		Local stops
	Local feeder route		

### Hybrid model (trunk and feeder plus selected direct services)

## Bus network planning

Network changes resulting from the introduction of Brisbane Metro are not confirmed but are likely to include:

- Metro 1 supercedes bus route 111 (Eight Mile Plains to King George Square) and route 160 (Garden City to QSBS)
- Metro 2 supercedes bus route 66 (RBWH to UQ Lakes)
- high frequency services (e.g. BUZ, CityGlider and peak Rockets) continue to operate along parts of the busway
- BUZ and CityGlider services continue to use the inner (Mater Hill) South East Busway, and Rocket services use Captain Cook Bridge
- BUZ and Rocket services capped at the practical on-road capacity of 12 services per hour. Additional capacity provided by feeder services to Brisbane Metro or by articulated buses.

The introduction of Brisbane Metro is not proposed to affect bus services operated by private operators.

As part of future stages of project planning, Council will seek to involve residents and key stakeholders in a staged review and planning of changes to the bus network facilitated by the introduction of Brisbane Metro.

This engagement activity will be undertaken in partnership with TransLink and Transport for Brisbane and is expected to take place over a number of years, prior to Brisbane Metro operations commencing in 2023.



## Policy and operational improvements

Brisbane Metro will change a number of current operational policies to improve capacity and travel time reliability.

Dwell times will be improved by allowing faster and more efficient customer boarding and alighting.

These changes include:

- facilitating multi-door boarding and alighting for customers on metro vehicles and buses
- providing off-board ticketing at existing busway stations
- providing ticketing gates at underground stations (Cultural Centre and King George Square)
- implementing first in-first out vehicle operations at all stations requiring all vehicles to follow the same dwell times
- implementation of new passenger information display systems to support the platform management and information system and inform customers of the stopping bay for approaching or departing metro vehicles and buses.



Artist's impressions only

## New vehicle and passenger management systems

New vehicle and passenger management systems will help improve the efficiency and reliability of busway operations, and provide a better experience for customers.

Proposed system enhancements within the busway and on platforms include:

- dynamic vehicle bay allocation system, which directs drivers to a platform bay, improving efficiency of operations
- platform information displays to inform customers in advance where their service will arrive on the platform and the next three to five services arriving at each platform.

Proposed systems on board metro vehicles include:

- Wi-Fi connectivity, helping customers access real-time travel updates from their current station to their destination station
- next-stop voice announcements
- real-time vehicle location tracking to support dynamic vehicle bay allocations.



Artist's impression only

**Brisbane Metro will mean faster journeys, more reliable travel times and more buses for the suburbs.**



# 6 Constructing Brisbane Metro

Brisbane Metro will use the existing busway infrastructure for much of the alignment, minimising major construction works to a small number of locations.

## Construction overview

This section summarises the construction works proposed for Brisbane Metro. Main construction work sites will be at Rochedale, Griffith University station, Buranda busway station, Cultural Centre precinct, and North Quay/Adelaide Street in the CBD. Elsewhere, works will generally be minor in scale.

*For further detailed information on construction, refer to Chapter 5: Project Description of the draft Design Report.*

## Construction program

Construction of the main works for Brisbane Metro will generally occur over a period of approximately 2.5 years. Pre-construction works, including some service and utility relocations, will be undertaken prior to the main works.

An indicative construction program showing potential timeframes for each work site is outlined below.

Pre-construction works (or early works) will be undertaken in some locations such as the Cultural Centre precinct and Adelaide Street to allow major construction activities in these locations to be undertaken as efficiently as possible.

This includes relocation of some services and utilities (e.g. sewer pump stations, storm water pipes, and electrical and telecommunications cables), and upgrades to some intersections to help manage construction traffic impacts.

These works will be managed to minimise impacts on surrounding communities, but may require temporary changes to on-street parking, loading zones and bus stops. Some of these works will be undertaken by the relevant utilities providers and will be subject to separate development assessment processes in accordance with the requirements of *Brisbane City Plan 2014* and the *Planning Act 2016*.

Phase	2018	2019	2020	2021	2022	2023
<b>Pre-construction (or early works)</b>						
Identification/relocation of utilities and services	●		●			
<b>Design and construction</b>						
Detailed design		●	●			
Depot				●	●	
Griffith University station				●	●	
Buranda busway station				●	●	
Cultural Centre station			●	●	●	
Adelaide Street			●	●	●	
Minor station modifications				●	●	
<b>Demobilisation and commissioning</b>						
Commissioning					●	●
Demobilisation						●

Estimated construction timeframes (subject to funding and government approvals).

Construction activities involving station modifications, extensions to platforms or changes to layover/ turnaround areas are generally expected to take between two to six months at each station. Construction works for the new bus layover and turnaround facility at Griffith University station are expected to take approximately nine months.

Construction activities for the metro depot at Rochedale, Buranda busway station, Cultural Centre precinct and North Quay/Adelaide Street will occur over extended periods. This is mainly due to the scale of works required to construct new infrastructure or the need to stage construction activities to manage potential disruptions to transport networks and surrounding communities.

Works for the metro depot at Rochedale and works at Buranda busway station are both expected to take approximately two years. Construction of the new underground Cultural Centre station and Adelaide Street tunnel are expected to take approximately 2.5 years.

## Construction vehicles and haulage

Brisbane Metro construction will require the delivery of materials and removal of excavated material (spoil) by trucks. The main truck movements will be associated with construction of new, major infrastructure works (e.g. Griffith University station, Cultural Centre precinct and North Quay/Adelaide Street) or modification to Buranda busway station. The predicted number of haulage trips is relatively low compared to other transport infrastructure projects.

The number of spoil haulage vehicle trips will vary across the construction period at each work site. On average, it is expected to involve approximately eight to nine trucks per day at Griffith University and Buranda busway stations, approximately 23 trucks per day at the Cultural Centre precinct and North Quay/Adelaide Street, and up to approximately 30 trucks per day at Rochedale.



Elsewhere, the number of trucks associated with the delivery of materials and removal of spoil is expected to be minor. Delivery of materials and removal of spoil (haulage) will be mainly by road.

The existing busway is also proposed to be used for the haulage of spoil and materials from some construction worksites (e.g. Griffith University station and Buranda busway station). This will generally occur when bus volumes on the busway are low (e.g. off-peak night-time period or weekends) to minimise disruption to bus services.

Haulage activities by road will avoid the morning and afternoon weekday peak periods to minimise impacts for road users and bus services.

## Hours of construction

Construction activities for Brisbane Metro will be undertaken both above and below ground.

Where possible, construction activities will be undertaken during daytime construction hours, being:

- Monday to Friday, 7am-6pm
- Saturday, 8am-5pm.

In order to minimise the duration of construction and potential impacts and disruptions on local communities and transport networks, some construction activities will be undertaken outside of daytime construction hours.

This includes evenings, nights and weekend work, along with some periods where works will be undertaken 24 hours per day.

These works will be managed in line with relevant noise criteria to minimise impacts on surrounding communities.



## Construction worksites and laydown areas

Major construction worksites will be required for the new underground Cultural Centre station and Adelaide Street tunnel, with smaller construction worksites required for the construction of turnaround facilities, layovers and station upgrades.

In addition, temporary construction laydown areas will be required to support construction activities. These will be used for site offices, and the storage of plant, equipment and materials. Potential construction laydown areas include:

- land within Griffith University Mt Gravatt campus, including a section of an existing car park and open space area
- a small area of land within Hanlon Park adjacent to O’Keefe Street and Junction Street, Greenslopes to support works for Buranda busway station
- vacant land at Stanley Street, adjacent to Ronald McDonald House, to support works for Mater Hill station
- open space at the corner of Grey Street and Peel Street, South Brisbane to support works for the Cultural Centre precinct
- land at Skew Street and North Quay within the CBD, to support works at Adelaide Street and North Quay.
- open space between the ICB and Gilchrist Avenue at Herston, formerly used for the Legacy Way construction worksite.

The need for additional laydown areas will be identified during future stages of project planning. Temporary laydown areas will be rehabilitated and reinstated following construction.

## Construction workforce

During construction, Brisbane Metro is expected to generate employment in construction, professional and administrative services, and technical and trade services such as plant and machinery, transport and skilled labour.



## Station modifications

Minor works will generally be associated with modification to existing busway stations and existing layover and turnaround areas.

Station modifications, including platform extensions, will generally be carried out within and around stations and platforms under normal busway and station operations.

Construction activities for the modification of existing layover and turnaround facilities will range from new line-marking to demolition and reconstruction of small areas of kerbing and/or pavement.

Measures will be implemented at worksites to manage safety for existing busway customers and minimise possible impacts on bus network operations.



## Major construction works

Major construction works will be required to deliver:

- the new metro depot at Rochedale
- a new bus turnaround and layover facility at Griffith University station
- a platform extension at Buranda busway station
- the new underground Cultural Centre station
- changes to North Quay and the new Adelaide Street tunnel.

Key phases of the construction works will generally involve:

- site establishment and preparation of worksites, including establishment of site accesses, safety and security fencing, site offices and general amenities, and hardstand areas, clearing of vegetation and demolition of structures and buildings, as required
- earthworks and/or excavation of underground structures
- building of new structures, including the underground station and tunnel
- fit-out of new infrastructure
- pavement works
- landscaping and public realm improvements.

This section provides an overview of the proposed construction methodology. The final methodology will be confirmed through the detailed design phase.

### Metro depot

Construction of the metro depot at Rochedale is expected to occur over a period of approximately two years. These works are proposed to be completed early in the construction program to provide storage for new metro vehicles as they are delivered.

The main construction activities are expected to include site clearing and demolition of existing structures, earthworks, building construction, and drainage and pavement construction.

Construction of a new access connection to the depot will be required from the existing South East Busway. This is likely to involve local widening of a section of busway for turn lanes and construction of a new culvert over the existing drainage channel.

Access for construction vehicles is proposed to be via School Road and the Gateway Motorway.



### Griffith University station layover and turnaround

Construction of the new bus turnaround and layover facility at Griffith University station is expected to be undertaken over approximately nine months.

The main construction activities for the new bus layover and turnaround facility involve clearing of existing vegetation within the construction footprint, excavation of the existing mound, and new pavement works.

Local widening of the existing busway north of the station is also required. This is likely to require demolition and reconstruction of a section of the existing barrier between the busway and motorway, and pavement works.

Access for haulage vehicles is proposed to be via the existing busway during off-peak periods to minimise the need for haulage vehicles to access internal roads within the Griffith University Mt Gravatt campus. This will be managed to maintain access for buses and minimise disruption on bus services.



## Buranda busway station

Extension of the platforms at the Buranda busway station will require the demolition and reconstruction of the O'Keefe Street busway underpass.

Construction of the underpass is expected to be staged over approximately two years. Traffic on O'Keefe Street is proposed to be reduced to two lanes westbound with eastbound traffic diverted to alternative routes as has been the case for previous major construction works in this location.

The main construction activities will generally involve piling of the underpass walls, demolition and removal of the existing roof deck and construction of a new, wider roof deck, and excavation of material from the busway and below the new roof deck for the widened underpass.

Temporary, short-term diversions of buses will be required for demolition and construction of the roof deck. These will be managed to minimise impacts on bus services.

Site works will require the removal of approximately 3500 cubic metres of spoil. Access for haulage vehicles is proposed to be from O'Keefe Street to Ipswich Road. Haulage vehicles will also be required to access the busway during excavation of the widened underpass. This access will be managed (e.g. via lane closures) to maintain access for buses.



Buranda busway station

## Cultural Centre precinct

Main construction works in the Cultural Centre precinct are expected to occur over approximately 2.5 years, with works undertaken concurrently over a number of work areas.

Works for each area will generally be completed over a number of stages to minimise impacts on transport networks and surrounding uses. Some pre-construction works such as service and utility relocation are proposed to be undertaken prior to the main construction works.

It is estimated that excavation works at the Cultural Centre precinct will require the removal of approximately 60,000 cubic metres of spoil. Access for haulage vehicles is proposed to mainly be via Melbourne Street to/from Merivale and Cordelia Streets.

### BCEC tunnel

The busway pavement of the existing South East Busway will need to be lowered within the BCEC tunnel to connect the existing busway to the new underground station.

Lowering of the busway pavement will be managed to maintain access for buses using the South East Busway.

The main construction activities required for this work include demolition of the existing pavement, and construction of a new concrete base slab and water tight retaining walls on either side of the busway.

### Underpass structure

An underpass of the existing railway corridor will be required to connect the existing South East Busway and new underground station. The underpass is proposed to be constructed by a 'jacked box' construction method from the side of the rail corridor.

The box jacking process for the underpass beneath the rail corridor is proposed to occur from the construction worksite at 125 Grey Street. An excavation box will be excavated to a depth of about nine metres and the underpass structure constructed within the excavation before pushing this beneath the railway corridor. During construction, temporary adjustments to the existing standard gauge rail track and the No.1 platform at South Brisbane station are likely to be required to maintain rail operations. These will be reinstated following the construction of the underpass.



125 Grey Street, South Brisbane



Cultural Centre precinct, South Brisbane

**Station box**

The station box is proposed to be constructed using a mix of top-down and bottom-up construction methods. Construction of the station box will be managed to maintain pedestrian and vehicle access on Grey Street and Melbourne Street.

The main construction activities will generally involve:

- construction of piles within the station and the external walls of the station box
- construction of the station roof
- excavation of material within the station box from beneath the station roof
- fit-out of the station
- construction of the surface-level concourse at the station entries.

Following construction of the station roof, excavation of the material within the station box is proposed to be carried out beneath the station’s roof slab from the construction worksite at 125 Grey Street and transition structure at Melbourne Street.

The location of the station requires works to be undertaken within the QPAC Green for a period of time. The main construction activities will require removal of the existing trees and landscaping. Works will be managed to minimise the duration of disruption and are expected to occur for a period of approximately nine months. Following construction, the QPAC Green will be reinstated in consultation with relevant stakeholders.

**Melbourne Street portal and transition structure**

The portal to the underground station and transition structure to Victoria Bridge is proposed to be constructed at the same time as the main station box.

Busway operations will be maintained at the Cultural Centre precinct during construction of the transition structure. This is expected to require relocation of the surface station platforms in the vicinity of the existing station.

**Surface works**

Surface works will involve construction of the station entry concourse and canopy structure, completion of the final road pavement, line marking, street furniture and signage works.



Melbourne Street and Grey Street

## North Quay/Adelaide Street

Construction works at North Quay/Adelaide Street are expected to generally be undertaken over a period of approximately 2.5 years and staged to allow access for buses to be maintained at Adelaide Street.

The Adelaide Street tunnel is proposed to be constructed as a cut-and-cover tunnel. Construction is proposed to be undertaken in two halves along the length of Adelaide Street, maintaining access for buses and local traffic.

The main construction activities will generally involve removal of existing street furniture, building awnings and trees. This would be followed by piling of the tunnel walls and construction of the tunnel roof.

Excavation of material within the tunnel is proposed to occur beneath the tunnel roof from the transition structure, allowing reinstatement of the surface above the tunnel and Adelaide Street to return to normal operations as soon as possible.

Construction of the Albert Street bus tunnel junction will require partial demolition of the southern tunnel wall beneath Adelaide Street as well as demolition of some existing internal columns.

Widening of North Quay is proposed, including a cantilever structure adjacent to the Riverside Expressway and relocation of the existing Bicentennial Bikeway connection to near the intersection of Adelaide Street.

It is estimated that excavation works for the Adelaide Street tunnel will require the removal of approximately 40,000 cubic metres of spoil.

Haulage access for construction of the tunnel roof is proposed to be via Edward and Adelaide Streets, with haulage access for tunnel excavation from North Quay (inbound) and George Street to the Riverside Expressway (outbound).



## Commissioning and completion works

Commissioning and completion works will involve inspecting and testing Brisbane Metro infrastructure and systems prior to operation. This will ensure they meet the required standards ready for Brisbane Metro operations and integrate with the existing busway. Commissioning works will be undertaken progressively throughout construction.

Station infrastructure and operating systems, including fire and life safety, ventilation, passenger information and control systems, and safety and security systems will be tested for reliability and function.

Infrastructure and operating systems within the new Adelaide Street tunnel will also be inspected and tested.

Driver training for the metro vehicles will be undertaken as part of the commissioning activities, due to the different nature of the vehicles and vehicle operations.



# 7 Impact assessment

By combining targeted investment in new infrastructure with upgrades to the existing busway, Brisbane Metro can be delivered with significantly fewer impacts than a major new dedicated transport corridor.

Through the preparation of the draft Design Report for Brisbane Metro, Council has undertaken an assessment of the potential benefits and impacts of the construction and operation of Brisbane Metro across the full range of environmental matters.

This section summarises the key findings of these assessments across the following areas:

- traffic and transport, including public transport, roads, pedestrian and cycle networks
- biophysical and natural values including soils, topography and geomorphology, surface water resources, groundwater, noise and vibration, air quality and flora and fauna
- planning, land use and socio-economic values such as impacts on local communities and businesses, Aboriginal and historical cultural heritage, and urban and visual amenity
- cumulative impacts.

Environmental approvals relevant to the construction and operation of Brisbane Metro are also identified along with measures to manage identified impacts and maximise benefits.

Through these assessments, Council has identified that, once operational, Brisbane Metro will have a range of long-term beneficial impacts. These include:

- more reliable, frequent and efficient public transport access and connections across Brisbane, providing benefits for residents, workers and visitors and supporting urban growth and development
- improved access to key centres, meeting places, employment, and health and education facilities, supporting enhanced social and economic outcomes for community members
- improved local amenity due to a reduction in bus numbers at surface level, and opportunities for enhanced streetscapes and public spaces, particularly at the Cultural Centre precinct and Melbourne Street.

Where Brisbane Metro uses existing busway infrastructure, Council has identified that most impacts from construction can be appropriately managed with standard mitigation measures in place.

Adverse environmental and social impacts will mainly occur during the construction phase. These impacts are expected to be temporary in nature, ranging from a few months to a few years, and will mainly be localised to those areas with the most intensive construction activity, such as Buranda busway station, Cultural Centre precinct and Adelaide Street/North Quay.

## Draft Design Report study area

The study area for the draft Design Report generally includes the Brisbane Metro alignment with a 250 metre buffer on either side. The study area commences at the proposed metro depot site at Rochedale, south of Eight Mile Plains station, and follows the existing South East Busway alignment to the Cultural Centre precinct at South Brisbane.

It then extends across Victoria Bridge to North Quay and along Adelaide Street to King George Square station, before following the Inner Northern Busway to the RBWH station and Ernie's Roundabout at Herston.

The study area also extends from UQ Lakes station via the Eastern Busway to the South East Busway north of Buranda station.

## Traffic and transport

The transport and traffic assessment considered the effects of Brisbane Metro's construction and operation on transport networks near the Brisbane Metro alignment and across the wider Brisbane area. Consistent with assessments for other major inner city transport projects such as the proposed CRR project, the assessment considered potential impacts of Brisbane Metro's operation at the year of opening and 10 years following opening.

### Existing context

In 2016, there were approximately 567,000 weekday public transport trips across Brisbane, of which approximately 50% occurred in the morning and afternoon peak periods. Buses are the dominant mode of public transport trips across Brisbane, catering for almost 65% of total daily public transport trips.

Buses play a diverse role in the transport network including trunk line haul services (e.g. BUZ and City Express routes) to major commuting destinations, inner city distributor services (e.g. CityGliders), and local services.

The rail network in Brisbane is constrained by a limited footprint; limited capacity in the inner city and across the Brisbane River; limited accessibility in the CBD; and reliability issues. Brisbane's road network is also operating at or close to practical capacity during peak periods on most key commuter arterials resulting in congestion for all road users, including bus services.

The centralised nature of employment in the CBD and inner city precincts concentrates trips on major corridors to the inner city, particularly in the morning and afternoon peak periods. In the morning peak period, over 500 bus services per hour enter the CBD. Combined with general road network congestion, this places pressure on infrastructure and challenges reliability of the bus network.

While employment growth is expected to remain strong within the CBD and inner city precincts, population growth in the wider region over the next 25 years will be greatest in the urban centres outside of Brisbane, further increasing demand for travel to the inner city.



### Impact assessment

This section summarises the key findings of the traffic and transport assessment for Brisbane Metro.

*For further information, refer to Chapter 6: Traffic and Transport of the draft Design Report.*

### Operation

Brisbane Metro will provide high-frequency metro and bus services at existing busway stations along the alignment. For some stations, this will include a metro or bus service in the morning peak period every 20 to 30 seconds on average, while other stations will include a service approximately every minute on average.

As part of delivering a more efficient network, changes to existing bus services will require some customers to transfer to metro or other high-frequency bus services. Changes to the overall busway system will be designed to make transfers at stations easier for customers, providing seamless, same platform transfers. Any impacts associated with customer transfer are expected to be minor and be offset by journey time and reliability improvements.

Provision of a segregated corridor for Brisbane Metro will require some changes to local access at South Brisbane and the CBD. This will require some motorists to use alternative routes. In particular, the removal of general traffic from Victoria Bridge and the closure of a section of North Quay to through traffic, will divert traffic to alternative routes. This is expected to result in some changes to traffic volumes on William Jolly Bridge, Go Between Bridge, Captain Cook Bridge and Story Bridge. Access for emergency vehicles will be maintained along the Brisbane Metro alignment, including through the new underground Cultural Centre station and Adelaide Street tunnel.

During operation, Brisbane Metro will support improvements in pedestrian and cycle access and connectivity, particularly at South Brisbane. This includes safer and easier access for pedestrians by removing existing pedestrian conflict points at Melbourne Street and providing a scramble crossing at the Melbourne Street and Grey Street intersection. A new surface level crossing between QPAC and the Queensland Museum will be provided to mitigate potential impacts associated with the closure of the Cultural Centre pedestrian underpass.

Continuous on-road cycle lanes on Grey Street and Melbourne Street (south of Grey Street) and reducing surface buses at Melbourne Street will make access for cyclists safer and easier. However, the removal of existing cycle lanes on Victoria Bridge and Melbourne Street (north of Grey Street) may require changes for some cyclists.

## Construction impacts

Traffic and transport impacts from Brisbane Metro's construction will vary between construction worksites along the alignment and will generally be localised to areas surrounding individual worksites. At many locations, construction works will be minor (e.g. installation of passenger information displays, signage, off-board ticketing facilities) and are expected to have minimal impact on transport operations. Any interfaces with bus services, road traffic, pedestrians and cyclists at these locations will be effectively managed with the implementation of standard traffic management measures and existing busway protocols.

In areas of more intensive construction works, potential traffic and transport impacts are likely to generally be associated with:

- temporary traffic lane closures and intersection changes near to construction works
- temporary changes to property access near to proposed works
- temporary alterations to bus operations, including bus stops and bus services
- changes to pedestrian and cycle networks near to construction works for safety.

The implementation of traffic management measures will assist in managing impacts on traffic and transport networks from construction activities and maintaining safety for road users near to construction works.

It is proposed that delivery of materials and removal of spoil will mainly be by road. The existing busway is proposed to be used for the haulage of spoil and materials from some construction worksites (e.g. Griffith University station and Buranda busway station). These activities will be managed to minimise disruptions to road networks and bus services, and maintain busway operations during peak periods.

In particular, haulage activities using the busway will generally occur when bus volumes on the busway are low (e.g. off-peak night-time period or weekends). Haulage activities by road are proposed to be limited during the morning and afternoon weekday peak periods to minimise impacts for road users.

## Managing traffic and transport impacts

An overarching traffic management plan will be developed and implemented to manage potential impacts of Brisbane Metro's construction on the transport network. This will be supported by construction traffic management plans for each worksite. Construction traffic management objectives are, where reasonable and practicable:

- maximise road safety related to construction activities
- minimise disruption to access for adjoining property including car parks
- avoid or mitigate impacts on the condition of transport infrastructure and operations
- minimise disruption to pedestrians and cyclists
- minimise changes to traffic operations and kerbside access
- minimise disruption to all public transport users including bus routes and stops
- ensure the CBD and urban road network can continue to function from a traffic perspective
- ensure any required works are compatible with existing infrastructure and future transport corridors
- transport excavated material via the arterial and motorway road network.

Performance criteria to achieve these principles will be included in the overarching traffic management plan and addressed in each construction traffic management plan. The plans will be prepared in consultation with key stakeholders, including transport operators, Queensland Government agencies, Cultural Centre precinct stakeholders, property owners, local residents and businesses.



## Noise and vibration

### Existing values

The Brisbane Metro alignment is located next to the Pacific Motorway and within inner city suburbs. Existing noise levels within the study area are generally high and typical of many urban areas.

During the day, evening and early night-time periods, existing noise levels are largely dominated by noise from road and/or rail. During the late night-time/early morning period, noise levels are dominated by other sources such as mechanical plant and people noise.

A range of receivers sensitive to noise and/or vibration are located near the alignment. This includes residential, commercial and retail uses, education and health facilities, cultural facilities and heritage places.

### Impact assessment and management

Construction noise and vibration impacts associated with modifications of most existing stations, layovers and turnaround facilities are expected to be minimal, and managed with the implementation of standard management measures (e.g. notification of near neighbours, scheduling of any noisy works during daytime hours where possible).

In areas of more intensive construction, such as Buranda busway station, the Cultural Centre precinct and North Quay/Adelaide Street, noise and vibration impacts are predicted from some construction activities for sensitive receptors near to work sites, and will require the implementation of specific mitigation measures.

In particular, specific measures will be required to manage noise and vibration impacts for nearby residential receivers from works undertaken at night; vibration impacts on heritage buildings such as South Brisbane railway station, former Queensland National Bank (Ng House) and City Hall; and noise and vibration impacts from some construction activities (e.g. piling and rock breaking) within the QPAC Green and adjoining areas for surrounding sensitive uses.

During operation of Brisbane Metro, changes to noise levels depend on the noise characteristics of the selected metro vehicle. For those sections of Brisbane Metro near the Pacific Motorway, the contribution of the metro and busway operations to overall noise levels is expected to be negligible. This is due to the significantly higher volumes of general vehicle traffic on the Pacific Motorway.

*For further information, refer to Chapter 10: Noise and Vibration of the draft Design Report.*



## Aboriginal and historic cultural heritage

### Existing values

The study area contains a number of places and areas important to Aboriginal groups, including at Toohey Forest Park, Woolloongabba, Dutton Park, the CBD, Roma Street, and Victoria Park. Historic heritage places of national, state and local importance are also located near the Brisbane Metro alignment and proposed construction laydown areas. In particular, a number of heritage places at South Brisbane and in the CBD are located immediately adjacent to new infrastructure or require works within their boundaries. Several areas of historical archaeological potential protected under the *Queensland Heritage Act 1992* are also located near proposed works.

### Impact assessment and management

Brisbane Metro is not expected to impact on known Aboriginal or historic heritage places where it uses existing busway infrastructure.

In areas where construction activities occur, Aboriginal cultural heritage values may be affected if works impact on any sub-surface material dating to the Aboriginal settlement of Brisbane. Potential changes to landscape, views and/or land use associated with new infrastructure may also impact intangible cultural heritage values. Potential risk of impact on Aboriginal cultural heritage values are generally expected to be low, apart from works associated with the metro depot, bus turnaround facility at Griffith University and Adelaide Street tunnel. Consultation will be undertaken with the Turrbal People and Jagera People #2 as the Aboriginal parties for the study area to confirm the findings of the assessment.

Potential impacts on historic heritage values may be associated with the siting or construction of new infrastructure. In particular, works at South Brisbane and the CBD will directly impact places listed on the Queensland heritage register. This includes South Brisbane Railway station, Queensland Cultural Centre and Early Streets of Brisbane. Impacts on the First Brisbane Burial Ground may also occur from the proposed establishment of a construction laydown area at Skew Street in the CBD. Works on or near to these places that affect their heritage values may require approval under the *Planning Act 2016*.

Other potential impacts on historic heritage values associated with construction dust; physical contact by construction equipment; settlement and construction vibration; and changes to views from the introduction of new infrastructure are expected to be appropriately managed through the careful design of above ground infrastructure and the implementation of environmental management measures during construction.

*For further information, refer to following chapters of the draft Design Report:*

■ [Chapter 15: Aboriginal Heritage](#)

■ [Chapter 16: Historic Heritage.](#)

## Land use, planning and urban amenity

### Existing values

The study area comprises a broad mix of land uses. This includes residential uses at varying densities; major commercial and employment uses; community uses such as education, cultural, leisure, health and medical uses; open space and conservation uses; and transport infrastructure. Some areas are also identified as emerging communities for future urban development. Land tenure across the study area comprises predominantly freehold land. This includes freehold properties held by Council and Queensland Government departments.

Along with the Pacific Motorway and other road and rail corridors, the existing busway, including stations, are the dominant elements of the visual and urban environment at many locations within the study area.

### Impact assessment and management

Property impacts will be minimised through the reuse of existing busway infrastructure and the location of new works within the existing busway corridor or road reserves. Permanent property impacts will mainly involve five properties required for the metro depot at Rochedale; small areas of land adjacent to the existing busway at Griffith University Mt Gravatt, Garden City Shopping Centre and Mater Medical Centre; and a property at 125 Grey Street, South Brisbane required for the new underground Cultural Centre station.

Construction of Brisbane Metro will require the temporary use of land for construction worksites and laydown areas. Use of this land will be temporarily disrupted during construction. Land not required for permanent infrastructure will be rehabilitated and reinstated following construction, with no long-term land use impacts expected.

Temporary changes in amenity at land uses near to construction works will generally be managed through the use of appropriate environmental management measures. This includes site-specific measures developed in consultation with owners of sensitive land uses such as health and medical facilities, educational uses, and Cultural Centre precinct facilities.



Operation of Brisbane Metro will support Council and the Queensland Government's strategic planning objectives for Brisbane by addressing capacity issues in the public transport network and improving accessibility within, and between, key employment nodes. This will also support development of an urban form consistent with the strategic land use outcomes of *ShapingSEQ* and City Plan.

Permanent land use change will generally be limited to the metro depot at Rochedale, a small area of land at Griffith University Mt Gravatt, and 125 Grey Street, South Brisbane. Impacts associated with these changes are expected to be minor given the relatively small areas of land affected and the availability of land supporting similar land uses in the study area.

Brisbane Metro is expected to improve the visual and urban amenity of local areas, particularly at the Cultural Centre precinct by:

- removing general traffic and reducing surface buses from a section of Melbourne Street and Victoria Bridge
- removing the existing Cultural Centre bus station, and removing the central lift and relocating the other lifts at the Cultural Centre pedestrian bridge
- removing existing pedestrian conflict points, fencing and pedestrian barriers at Melbourne Street.

This will enhance pedestrian amenity and allow improvements to the public realm in this location, providing beneficial impacts for the Cultural Centre precinct and reinforcing the precinct's importance as a world-class cultural and entertainment destination.

The introduction of Brisbane Metro is not expected to change existing visual or urban amenity where it uses existing infrastructure.

*For further information, refer to following chapters of the draft Design Report:*

■ [Chapter 13: Land Use and Planning](#)

■ [Chapter 17: Urban and Visual Amenity.](#)

## Socio-economic assessment

### Existing values

An estimated 154,188 people lived near the Brisbane Metro alignment as at June 2016, with this predicted to increase to 221,774 people by mid-2036. In addition, an estimated 243,737 people worked in areas near the Brisbane Metro alignment in 2016, of which approximately 50% worked in the CBD. Other key employment areas included South Brisbane, Kelvin Grove-Herston and Woolloongabba.

Communities near Brisbane Metro are generally characterised by:

- relatively young and highly mobile populations, particularly within inner city areas
- culturally diverse populations, with high proportions of people born overseas and who speak a language other than English at home
- relatively low proportions of owner occupiers and high proportions of rental households compared to Queensland and the wider Brisbane area
- high proportions of residents and workers who use public transport for travel to work.

### Impact assessment and management

Brisbane Metro will provide more reliable, frequent and efficient public transport access and connections for communities across Brisbane to employment, services and facilities. This is expected to support beneficial impacts relating to community well-being, community cohesion and improved economic opportunities for communities across Brisbane. Brisbane Metro will also support enhanced amenity at locations such as the Cultural Centre precinct, by removing general traffic and reducing surface buses from a section of Melbourne Street, and removing existing pedestrian conflict points. Local access changes within the inner city will require some road users to use alternative routes.

During construction, beneficial impacts will generally be associated with construction-related employment and increased demand for goods and services to support construction activities (e.g. manufacturing, construction, trade, transport and financial and business services).

Potential adverse socio-economic impacts are expected to be temporary in nature and be localised to those areas with the most intensive construction activity. This includes the Cultural Centre precinct, Adelaide Street, Buranda busway station, Griffith University Mt Gravatt campus and the proposed metro depot at Rochedale. These will generally relate to disruptions to local access and changes in local amenity and are expected to be managed with the implementation of appropriate environmental and traffic management measures.

*For further information, refer to Chapter 14: Socio-economic Assessment of the draft Design Report.*



## Air quality

### Existing values

A variety of uses sensitive to air quality impacts are located near the Brisbane Metro alignment. This includes residential uses, educational, health and medical facilities, and recreational and community uses. Existing air quality at many of these receivers is influenced by traffic on adjacent transport corridors. Monitoring data for the study area indicates that local background concentrations of most air pollutants are below the relevant assessment criteria, with levels of particulates occasionally exceeding or approaching the relevant assessment criteria.

### Impact assessment and management

Minor improvements in air quality are predicted in the longer term as a result of improved vehicle operational efficiencies. Reconfiguration of traffic flows for Brisbane Metro is likely to result in reductions in bus emissions in some areas of the CBD.

During construction, potential air quality risks will mainly relate to major construction works such as Buranda busway station, Cultural Centre precinct and North Quay/Adelaide Street.

Potential impacts will mainly be associated with dust deposition. This is expected to be managed through standard mitigation measures such as watering of demolition activities, wheel wash/rumble bars at construction exits, and management of excavation areas.

Potential construction air quality impacts on human health and ecological receptors (e.g. sensitive habitats and plant communities) are expected to generally be negligible to low. Other air quality issues (e.g. odour, emissions from plant and equipment) are expected to be effectively managed with standard management measures.

*For further information, refer to Chapter 11: Air Quality of the draft Design Report.*

# Water resources

## Existing values

The majority of the study area is located within the catchment of the Lower Brisbane River. In the south, the study area is located within the Bulimba and Norman Creek sub-catchments, while in the north the study area lies within the Enoggera Creek/Breakfast Creek sub-catchment. Areas within the study area are currently subject to flood risk from the Brisbane River, creeks, storm surge and overland flow. This includes sections of the existing busway alignment.

Areas of potential groundwater interest include those areas where below-ground excavation is required (Cultural Centre precinct and the CBD). It is possible that the alluvium within the Cultural Centre precinct extends to a significant depth, with the possibility of sand and gravel horizons in the lower parts of the sequence.

Groundwater levels may be in the order of one to two metres Australian Height Datum and are likely to show tidal variation. Along Adelaide Street, a significant thickness of alluvium is likely. The Neranleigh-Fernvale beds, which underlie the alluvium in the CBD, are considered unlikely to yield significant volumes of groundwater.

## Impact assessment and management

During operation, potential risks relating to surface water are expected to be similar to those for the current busway operations and will be managed through existing drainage infrastructure, the incorporation of appropriate drainage into the design of new infrastructure, and the implementation of current operational management procedures and policies.

Flood impacts and immunity of the existing busway were addressed in the design of the existing infrastructure. New and modified infrastructure for Brisbane Metro is being designed to achieve relevant flood immunity and to minimise flood impacts.

Existing flood risks at Eight Mile Plains and Ernie's Roundabout at Herston will be managed consistent with current operational procedures. Potential changes to overland flows at South Brisbane resulting from changes to the existing busway will be addressed through the detailed design phase.

The design of the new underground Cultural Centre station and Adelaide Street tunnel will incorporate groundwater control measures to manage potential impacts associated with groundwater ingress.



Potential flood impacts for operation of Brisbane Metro will generally relate to possible minor, localised changes to overland flows at South Brisbane from the changed arrangements at the Melbourne Street busway portal and creek and riverine flood immunity of Ernie's Roundabout at Herston. The proposed closure of the Melbourne Street busway portal is expected to significantly improve the flood immunity of the busway.

During construction, potential impacts on surface water quality are expected to be effectively managed with the implementation of appropriate environmental management measures relating to erosion and sediment control.

Construction worksites and laydown areas are generally located outside of flood zones or overland flow paths, apart from the construction laydown area at Hanlon Park and construction worksites within the Cultural Centre precinct. Measures will be implemented in these locations to minimise potential flood impacts.

Excavation works for the new underground Cultural Centre station and Adelaide Street tunnel will incorporate appropriate construction techniques to control or limit the inflow of groundwater, minimising the potential for off-site groundwater drawdown and the migration of potentially contaminated groundwater.

Appropriate protocols will also be implemented for the control and containment of fuel and chemicals to minimise the potential for contamination of the local groundwater environment.

*For further information, refer to following chapters of the draft Design Report:*

- [Chapter 8: Surface Water and Flooding](#)
- [Chapter 9: Groundwater.](#)

## Soils, topography and land contamination

### Existing values

Soils in the study area have a medium to high propensity for erosion. There is also potential for acid sulfate soils to be present in parts of the study area, with the highest risk in areas adjacent to the Brisbane River and Enoggera Creek/Breakfast Creek.

A number of potentially contaminated sites are located along the Brisbane Metro alignment associated with current or historic land use activities. This includes land near to excavation works at Buranda, South Brisbane and Adelaide Street.

### Impact assessment and management

During operation, potential impacts relating to soils are expected to be similar to those for the current busway operations. These will be managed through the implementation of current operational management procedures and policies, and the design of new or modified infrastructure.

During construction, Brisbane Metro is not expected to impact soils and topography where it uses existing infrastructure. Elsewhere, potential impacts will generally be associated with possible erosion and sedimentation due to soil disturbance, and disturbance of potential acid sulfate soils. This is expected to be appropriately managed with the implementation of standard mitigation measures.

Potential impacts associated with the disturbance of contaminated land will mainly be associated with works at Buranda busway station, Cultural Centre precinct and Adelaide Street, due to the extent of excavation required.

Management measures, such as controls for material haulage and monitoring, will be required to minimise the risk to workers and the environment. Potential contamination of land resulting from spills and leaks is expected to be effectively managed through the implementation of processes and procedures, and design of infrastructure and construction works. Other impacts associated with contaminated land are also expected to be managed through the design of underground structures.

*For further information, refer to Chapter 7: Soils, Topography and Contaminated Land of the draft Design Report.*



## Flora and fauna

### Existing values

Brisbane Metro is mainly located within a highly developed and disturbed urban environment. Key natural features of the study area include Toohey Forest Park and the riparian areas of the Brisbane River, Bulimba Creek and Norman Creek.

Elsewhere, native vegetation cover has generally been removed, with remaining patches confined to eucalypt woodland north of Griffith University station and mangroves along the Brisbane River and Breakfast Creek. Remnant trees may also be present in urban parklands and some private properties, including the proposed metro depot site at Rochedale.

Amenity plantings are located near to proposed works, including at Eight Mile Plains, Griffith University and Buranda busway stations, the Cultural Centre precinct and Adelaide Street. Vegetation protected by the *Natural Assets Local Law 2003* is also identified at various locations.

Three threatened bird species have the potential to utilise and/or overfly the study area, although limited habitat is present within the study area for these species.



## Impact assessment

Potential risks for flora and fauna during operation are expected to be similar to those for the current busway operations and are not expected to increase with Brisbane Metro.

During construction, flora and fauna impacts will mainly be associated with areas of major construction works. In particular, construction at Griffith University station will require clearing of a small area (up to 0.5 hectares) of remnant native vegetation.

Clearing of a small number of trees will also be required for construction of the metro depot at Rochedale. These areas of native vegetation are in highly disturbed areas and do not represent significant habitat for wildlife.

Measures will be implemented during construction to manage potential impacts on threatened flora and fauna species or communities.

Construction of the new underground Cultural Centre station and the Adelaide Street tunnel will require clearing of amenity plantings, including mature trees within the QPAC Green with heritage or high amenity value.

Clearing of small areas of immature amenity plantings will also be required at some other locations. Following construction, replacement landscaping and plantings will be provided to minimise potential amenity impacts.

*For further information, refer to Chapter 12: Flora and Fauna of the draft Design Report.*

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## Cumulative impacts

Construction and operation of Brisbane Metro will interact with other developments in the study area, including Queen's Wharf Brisbane, Herston Quarter and the proposed CRR project.

Potential cumulative impacts with other projects will mainly relate to construction traffic, local access changes and public transport changes. Ongoing engagement with relevant stakeholders of other projects in the study area will assist with the management of potential cumulative impacts.

In the longer term, Brisbane Metro will interchange with the proposed CRR project at Boggo Road station and Roma Street station, providing beneficial impacts for public transport access. Brisbane Metro also supports planned developments within the study area and sustainable growth.

During construction, cumulative interactions between different environmental aspects of Brisbane Metro are likely to mainly arise from combinations of noise, dust, visual intrusion, traffic, parking and access issues, although these are expected to be effectively managed with the implementation of coordinated environmental management measures.

*For further information, refer to Chapter 20: Cumulative Impacts of the draft Design Report.*



Brisbane CBD and South Bank





# 8 Environmental management

The construction and operation of Brisbane Metro will include management of various environmental elements in order to satisfy legislative requirements and minimise impacts. This includes a range of environmental approvals and permits, and development of a construction environmental management plan (CEMP).

## Environmental approvals

A range of environmental approvals may be required under Queensland and Australian Government legislation for the construction and operation of Brisbane Metro. These generally relate to works on or near to a Queensland heritage place, clearing of native vegetation, and works involving waterways.

Approvals are also required from the Queensland Government to use and construct Brisbane Metro within a busway, railway or state-controlled road corridor.

Permits are also required under Council's local laws relating to the clearing of Council protected vegetation.

*For further information, refer to Chapter 22: Environmental Approvals of the draft Design Report.*

## Environmental mitigation and management

The environmental impacts of Brisbane Metro will be managed in line with Queensland and Australian government legislation, in addition to Council strategies, policies and guidelines, through an environmental management framework.

A CEMP will be developed to provide the framework for managing and controlling environmental aspects of Brisbane Metro through the pre-construction, construction and commissioning phases. It will outline the system and procedures required to minimise environmental impacts and fulfil legislative requirements.

Strategies defined in the CEMP will be developed with consideration of the mitigation measures presented in the draft Design Report and outcomes of stakeholder and community consultation. In particular, the CEMP will include:

- the management structure, roles and responsibilities for the management of environment impacts of Brisbane Metro's construction
- the environmental management objectives that are important to the environmental performance of Brisbane Metro's construction
- specific management measures and controls to avoid or minimise negative environmental impacts
- statutory framework and specific mechanisms for compliance with applicable policies, approvals, licences, permits, consultation agreements and legislation
- an environmental monitoring and reporting, auditing and review process to confirm the adequacy and effectiveness of management measures and controls and incorporate any changes to environmental management procedures and practices
- a process for identifying and implementing corrective actions to rectify non-conformances
- procedures for community and stakeholder engagement during construction, including implementation of a complaints and enquiries procedure.

The CEMP will be supported by a number of sub-plans that relate to specific environmental issues or particular construction activities.

During operation, environmental management for Brisbane Metro will generally be in accordance with the existing environmental processes and procedures for the busway and Council bus depots. Updates to some existing processes and procedures may be required to incorporate additional requirements relating to the new metro vehicles and infrastructure.

A communication and engagement process will be implemented prior to the commencement of Brisbane Metro services and associated changes to the bus network in 2023.

Key issues to be addressed will include the timing of commencement of services, information on using and accessing Brisbane Metro services, and updates to signage, website and passenger information channels. Information on changes to local traffic access will also be required.



During operation, ongoing communication and complaints management for the metro operations will be in accordance with existing customer feedback processes.

*For further information, refer to Chapter 23: Environmental Mitigation and Management of the draft Design Report.*



Herston station

# 9 Summary of key findings

This section provides a summary of the benefits and impacts associated with the construction and operation of Brisbane Metro across the study area, based on the assessments undertaken for the draft Design Report.

## Rochedale to Upper Mt Gravatt

<b>School Road, Rochedale</b>	<ul style="list-style-type: none"> <li>New metro fleet depot and connection to South East Busway</li> </ul>	
<b>Eight Mile Plains station</b>	<ul style="list-style-type: none"> <li>Platform extensions and station upgrades (e.g. passenger information displays, off-board ticketing)</li> </ul>	
<b>Upper Mt Gravatt station</b>	<ul style="list-style-type: none"> <li>Platform extensions and station upgrades (e.g. passenger information displays, off-board ticketing)</li> </ul>	

Brisbane Metro will support improved access for communities and to key destinations in this section of the alignment, including Garden City Shopping Centre and Brisbane Technology Park.

In the year of opening, Eight Mile Plains and Upper Mt Gravatt stations will be served by a metro or bus service every 30 seconds on average in the morning peak period.

Works in this section will include the establishment of a new depot for the metro vehicle fleet at Rochedale and modifications to busway stations at Eight Mile Plains and Upper Mt Gravatt.






Eight Mile Plains station

### Potential impacts and management

- During construction, safe and efficient traffic access near to proposed works will be maintained through management of construction traffic. This includes measures to maintain traffic safety on Priestdale Road and School Road, particularly near Rochedale State High School.
- Potential temporary impacts on bus services, pedestrians, cyclists and general traffic associated with the depot construction and station modifications are expected to be low, and will be effectively managed with standard traffic management measures.
- Establishment of the depot will require clearing of some vegetation, including a small number of native tree species. Potential temporary construction impacts such as noise and dust at sensitive receivers near to the metro depot and existing stations will be managed through environmental management measures.
- Potential impacts associated with the operation of the metro depot, such as noise, light spill, and visual amenity, are expected to be appropriately managed through the depot design and layout.

# Mt Gravatt to Greenslopes

<b>Griffith University station</b>	<ul style="list-style-type: none"> <li>■ New bus turnaround and layover facility</li> <li>■ Platform extensions and station upgrades (e.g. passenger information displays, off-board ticketing)</li> </ul>	 Griffith University 🚗
<b>Holland Park West station</b>	<ul style="list-style-type: none"> <li>■ Station upgrades (e.g. passenger information displays, off-board ticketing)</li> </ul>	 Holland Park West
<b>Greenslopes station</b>	<ul style="list-style-type: none"> <li>■ Station upgrades (e.g. passenger information displays, off-board ticketing)</li> </ul>	 Greenslopes

At the year of opening, a metro or bus every 20 seconds on average will serve Griffith University station in the morning peak period, while Holland Park West and Greenslopes stations will be served by a metro or bus approximately every minute on average.

Operation of Brisbane Metro will also significantly reduce average delays experienced by busway customers, particularly at Griffith University station.

Works in this section of the alignment will involve the modification of existing stations and establishment of a new bus turnaround and layover facility at Griffith University station.



Griffith University station

## Potential impacts and management

■ During construction, parts of the South East Busway will be used for the haulage of spoil, helping to minimise impacts on the university and surrounding communities. This will be managed to maintain busway operations during peak periods and minimise disruptions to bus services. Potential construction impacts on other transport uses (e.g. pedestrians, cyclists, traffic) from these works are expected to be low or negligible.

■ The new bus turnaround and layover facility will require clearing of some remnant vegetation within the busway corridor and adjacent university campus. The vegetation in this area has been modified by past clearing and high levels of disturbance. No impacts on listed flora and fauna species or threatened ecosystems are expected with the implementation of management measures.

■ Standard mitigation measures are expected to manage potential environmental impacts associated with construction works at Griffith University and other existing stations. Temporary use of car parking and a small area of land at Griffith University Mt Gravatt campus are required for a proposed construction laydown site. This is not expected to impact on the operation of the university.



Griffith University Mt Gravatt campus

# Woolloongabba to St Lucia

<b>Buranda busway station</b>	<ul style="list-style-type: none"> <li>Platform extensions and widening of busway tunnel</li> <li>Station upgrades (e.g. passenger information displays, off-board ticketing)</li> </ul>	
<b>PA Hospital station</b>	<ul style="list-style-type: none"> <li>Station upgrades (e.g. passenger information displays, off-board ticketing)</li> </ul>	
<b>Boggo Road station</b>	<ul style="list-style-type: none"> <li>Station upgrades (e.g. passenger information displays, off-board ticketing)</li> </ul>	
<b>UQ Lakes station</b>	<ul style="list-style-type: none"> <li>Station upgrades and modifications (e.g. passenger information displays, off-board ticketing, pedestrian paths and median to allow metro vehicle turnaround)</li> </ul>	

Brisbane Metro will support improved access to key destinations such as UQ St Lucia campus and the PA Hospital.

At the year of opening, Buranda busway station will be served by a metro or bus every 20-30 seconds on average in the morning peak period, while PA Hospital, Boggo Road and UQ Lakes stations will be served by a metro or bus approximately every minute on average.

Works in this section of the alignment include modification to existing stations, including platform extensions at Buranda busway station.

At most stations, impacts of construction are expected to be minor and appropriately managed with the implementation of standard management measures.



## Buranda busway station – potential impacts and management

- During construction, the temporary diversion of eastbound traffic on O’Keefe Street will require measures (e.g. revised signal timings and minor line marking changes) to be implemented at some intersections on surrounding roads. This will help maintain a satisfactory level of operation.
- Temporary changes to the busway (e.g. managed lane closures or short-term diversions) will be required for some construction activities. These activities will be managed to minimise disruption to bus services.
- Access for pedestrians and cyclists will be maintained during construction, including to Buranda busway and railway stations, although temporary changes may be required to ensure safety. Potential disruption from construction vehicles is expected to be minor and will be managed to maintain safety for road users.
- Some works (e.g. night-time excavation, piling, and concrete sawing) will require specific mitigation measures to be implemented to manage temporary noise and/or vibration impacts for nearby residential uses.
- Management measures will be required for the proposed temporary laydown area at Hanlon Park to minimise potential impacts on Norman Creek and possible flood impacts for surrounding properties.



## South Brisbane

<b>Mater Hill station</b>	<ul style="list-style-type: none"> <li>Platform extensions and station upgrades (e.g. passenger information displays, off-board ticketing)</li> </ul>	
<b>South Bank station</b>	<ul style="list-style-type: none"> <li>Station upgrades (e.g. passenger information displays, off-board ticketing)</li> </ul>	
<b>Cultural Centre station</b>	<ul style="list-style-type: none"> <li>New state-of-the-art underground station for metro and bus services</li> </ul>	
<b>Melbourne Street</b>	<ul style="list-style-type: none"> <li>New surface bus stops</li> <li>Enhanced public realm and pedestrian connectivity</li> </ul>	

Brisbane Metro will improve public transport access to employment and health, education, recreation and leisure facilities at South Brisbane and surrounding suburbs.

At the year of opening a metro or bus will serve Mater Hill, South Bank, South Brisbane and Cultural Centre stations every 30-40 seconds on average in the morning peak period. Additional buses will also serve surface bus stops along Melbourne Street.

Brisbane Metro will involve the construction of a new underground Cultural Centre station and surface bus stops at Melbourne Street, and minor modifications to other existing busway stations.

Construction impacts such as noise, vibration and dust associated with the modification of existing stations at Mater Hill and South Bank are expected to be appropriately managed with the implementation of standard management measures.



## Cultural Centre precinct – potential impacts and management

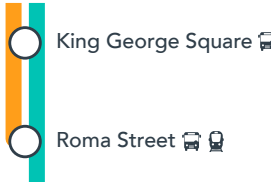
### Construction

- Pre-construction works, including relocation of some services and utilities, will be managed to minimise impacts on surrounding communities, but may require temporary changes to on-street parking, loading zones and bus stops.
- Construction of the new underground station will impact use of the QPAC Green at the corner of Melbourne and Grey Streets and require removal of existing trees and landscaping. Following construction, the QPAC Green will be reinstated and ongoing impacts are not expected.
- Traffic and transport impacts associated with construction vehicles are expected to be managed through the implementation of standard traffic management measures. Bus access will be maintained through the Cultural Centre precinct during construction.
- Temporary changes will be required during construction, including changes to bus stop locations, management of bus operations, and temporary diversions of some services. These changes will be managed to maintain appropriate and reliable travel for bus customers.
- Pedestrian and cycle access will be maintained near construction worksites, including to venues within the Cultural Centre precinct, however temporary changes will be required (e.g. closure or narrowing of some footpaths). Measures will be implemented to maintain safety for pedestrians and cyclists and minimise disruptions during construction.
- With the implementation of management measures, airborne noise from construction activities is not expected to impact on internal performance spaces within QPAC.
- Groundborne noise and vibration impacts on the use of internal performance spaces will be managed (e.g. by restricting high-impact noisy works during performance times). Other measures will also be required to minimise noise and vibration impacts for some nearby residents, businesses and visitors to the Cultural Centre precinct.
- Potential vibration impacts on nearby heritage buildings are expected to be appropriately managed through ongoing monitoring and building surveys prior to construction.
- Other potential environmental impacts such as air quality, contaminated land, soils, water quality and flooding, are expected to be managed with the implementation of standard management measures.

### Operations

- Brisbane Metro will improve amenity for users of the Cultural Centre precinct by reducing the number of buses at surface level and removing general traffic on Melbourne Street between Grey Street and Victoria Bridge.
- Pedestrian connectivity and safety will be improved by the closure of the existing Melbourne Street busway portal and intersection of Stanley Street and Melbourne Street.
- During operation, changes to road networks in South Brisbane are expected to reduce traffic volumes on some sections of Grey Street, and increase volumes on Peel Street, South Brisbane.
- Vehicle access to the Cultural Centre precinct will be maintained, however the closure of Victoria Bridge and a section of Melbourne Street to general traffic will change access for some users. Any potential impacts are expected to be managed through measures such as minor modifications to some intersections, changes to traffic signals or new and modified signage.
- The visual connection between Cultural Centre facilities across Melbourne Street will be improved by removing the existing surface busway station and central platform lift, impacting positively on heritage values. The relocation of the existing lifts from the pedestrian footpath will also allow increased public realm for pedestrian circulation. Careful design of above ground infrastructure will also assist in conserving and enhancing the heritage values of heritage places in this area.
- The removal of the existing Cultural Centre pedestrian tunnel will change access for some visitors to the Cultural Centre. However, an upgrade of the Melbourne Street/Grey Street intersection, including a 'scramble' crossing for pedestrians, and provision of a surface-level pedestrian crossing between QPAC and the Queensland Museum, will enhance general accessibility in the Cultural Centre precinct and maintain access between Cultural Centre facilities.

# Brisbane CBD

<b>North Quay/ Adelaide Street</b>	<ul style="list-style-type: none"> <li>■ New tunnel underneath Adelaide Street connecting North Quay to King George Square station</li> <li>■ Modifications to a section of North Quay</li> </ul>	 <p>The diagram shows a vertical alignment with two stations: King George Square (top) and Roma Street (bottom). A vertical bar with orange and teal segments represents the alignment. Bus and train icons are shown next to each station name.</p>
<b>King George Square station</b>	<ul style="list-style-type: none"> <li>■ Station modifications and upgrades (including adjustments to passenger screen door locations and some platform edge columns, passenger information displays, and off-board ticketing)</li> </ul>	
<b>Roma Street station</b>	<ul style="list-style-type: none"> <li>■ Platform extensions and station upgrades (e.g. passenger information displays, off-board ticketing)</li> </ul>	

Brisbane Metro will support improved access to key employment, education, retail and leisure destinations in the CBD. At the year of opening, King George Square station and Roma Street busway station will be served by a metro or bus approximately every 30-40 seconds on average in the morning peak period.

During operation, the removal of over 125 buses from CBD streets in the morning peak period will help to ease bus congestion and improve amenity in some locations. Changes to the road network north of the river are expected to reduce traffic volumes on North Quay, William Street and Ann Street, although traffic increases are likely at Roma Street.

Works in this section of the alignment involve construction of a new tunnel under Adelaide Street connecting North Quay to King George Square station, and modification of existing stations.

Construction impacts associated with the modification of existing stations are expected to be appropriately managed with the implementation of standard management measures, including measures to maintain bus access.

## North Quay/Adelaide Street – potential impacts and management

### Construction

- Pre-construction works, including relocation of some services and utilities, will be managed to minimise impacts on surrounding communities, but may require temporary changes to on-street parking, loading zones and bus stops.
- During construction, Adelaide Street will be reduced to one traffic lane in each direction and North Quay will have restrictions for general vehicle traffic, bus services, pedestrians and cyclists.
- Bus access will be maintained at Adelaide Street and North Quay, although some changes to bus services and stops will be required such as temporary removal of bus stops between George Street and Albert Street.
- Potential impacts associated with haulage of materials and spoil for the construction of the tunnel at Adelaide Street are expected to be minor and manageable with the implementation of standard management measures.
- Construction of the tunnel requires the clearing of existing street trees along Adelaide Street and the temporary removal of awnings along a section of Adelaide Street. New landscaping will be implemented along Adelaide Street, following construction.

- Noise, vibration and dust from some construction activities has the potential to impact on the amenity of some uses near to construction works and will require specific management measures to minimise disruptions for nearby businesses and residents. Environmental impacts such as contaminated land, soils, water quality and flooding, are expected to be appropriately managed with the implementation of standard management measures.

### Operations

- Reconfiguration of traffic flows for Brisbane Metro is likely to result in reductions in bus emissions in some areas of the CBD, resulting in local amenity improvements.
- Pedestrian access and connectivity from the CBD to the downstream path on Victoria Bridge will be improved through modifying the pedestrian crossing at William Street and Queen’s Wharf Road, and widening the downstream path on Victoria Bridge.
- The existing at-grade access to Reddacliff Place for pedestrians and cyclists on the upstream footpath of Victoria Bridge will be maintained.

## Kelvin Grove to Herston

<b>Normanby station</b>	<ul style="list-style-type: none"> <li>Station upgrades (e.g. passenger information displays, off-board ticketing)</li> </ul>	
<b>QUT Kelvin Grove station</b>	<ul style="list-style-type: none"> <li>Station upgrades (e.g. passenger information displays, off-board ticketing)</li> </ul>	
<b>Herston station</b>	<ul style="list-style-type: none"> <li>Station upgrades (e.g. passenger information displays, off-board ticketing)</li> </ul>	
<b>RBWH station</b>	<ul style="list-style-type: none"> <li>Station upgrades (e.g. passenger information displays, off-board ticketing)</li> </ul>	
<b>Ernie's Roundabout</b>	<ul style="list-style-type: none"> <li>Layover for metro vehicles</li> </ul>	

Brisbane Metro will support improved access to key destinations such as education, research and health facilities in this part of the alignment.

At the year of opening, Normanby and RBWH stations will be served by a metro or bus every 40-50 seconds on average in the morning peak period, while QUT Kelvin Grove and Herston stations will be served by a metro or bus almost every minute on average.

Works in this section of the alignment include upgrades to existing stations and existing layover and turnaround facilities.

Potential impacts from construction activities in this section are expected to be minor and appropriately managed with the implementation of standard management measures.



RBWH station



## 10 Next steps

Brisbane Metro presents a once-in-a-generation opportunity to improve the way people travel to and within Brisbane, providing more reliable, frequent and efficient public transport for residents and visitors.

Through the draft Design Report, Council has identified that where Brisbane Metro utilises existing busway infrastructure, the impacts from construction are expected to be minor. Where major construction works are required, impacts will generally be temporary in nature, ranging from a few months to a few years, and are considered to be outweighed by the long-term transport, social and economic benefits of the project.

Council is committed to working closely with the Queensland and Australian Governments, and other important stakeholders, to progress detailed planning for Brisbane Metro. This includes confirming funding arrangements, detailed approvals and agreements with key stakeholders in relation to construction and operations.

Following feedback from the community and stakeholders, the draft Design Report will be finalised. In addition, Council has commenced preliminary site investigations, including geotechnical investigations and survey of the key work sites, as well as planning for early works such as service relocations.

The next stage of planning also includes readiness-for-market activities, including the preparation of procurement documentation. As part of this, Council will develop detailed technical specifications for all aspects of Brisbane Metro's construction, design and operations.

Detailed design and construction of Brisbane Metro could commence in 2019, with metro services commencing in 2023, subject to funding and government approvals.

Council will continue to keep the community informed about Brisbane Metro, and provide opportunities for residents and stakeholders to have their say during future stages of the project.

Future stages in the development of Brisbane Metro are outlined in the table below.

Phase	Timing	Key activities
Draft Design Report	Mid-2017 to mid-2018	<ul style="list-style-type: none"> <li>Refinement of the Concept Design</li> <li>Further environmental and social assessments</li> <li>Targeted stakeholder engagement</li> <li>Release for consultation with stakeholders and the community</li> </ul>
Approvals and procurement planning*	Late 2017 to mid-2018	<ul style="list-style-type: none"> <li>Secure project funding</li> <li>Finalisation of key government approvals</li> <li>Preparation of contract documentation and tender development</li> </ul>
Pre-construction works*	Mid-2018 to mid-2020	<ul style="list-style-type: none"> <li>Relocation of some services and utilities</li> <li>Upgrades of some intersections</li> </ul>
Procurement*	Mid-2018 to late 2019	<ul style="list-style-type: none"> <li>Expressions of interest and request for tenders</li> <li>Selection of preferred tenderers</li> </ul>
Detailed design and construction*	2019 to 2022	<ul style="list-style-type: none"> <li>Complete detailed design and construction methodology</li> <li>Staged construction</li> <li>Ongoing community and stakeholder engagement</li> </ul>
Project completion*	2023	<ul style="list-style-type: none"> <li>Operational testing and commissioning</li> <li>Commencement of metro services</li> </ul>

*\*subject to government approvals.*



Service	Destination	Due
Metro 2	CBD+UQ	Arriving
Metro 2	CBD+UQ	3 Mins




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