CHAPTER 6
Traffic and transport assessment
6. Traffic and transport assessment

This chapter assesses potential impacts on traffic and transport from Brisbane Metro’s construction and operation. In particular, it describes the existing and future transport network and conditions without Brisbane Metro and compares this to the forecast changes resulting from its construction and operation. These impacts and benefits are described along with proposed mitigation and management measures.

6.1 Assessment methodology

Construction and operation of Brisbane Metro will have both positive and negative impacts on traffic and transport networks at a regional or ‘citywide’ level, and corridor and inner city level. This assessment considers potential traffic and transport impacts and benefits of Brisbane Metro:

- across the Brisbane Statistical Division (refer to Figure 6.1)
- within the Brisbane Metro study area, which includes the Brisbane Metro alignment (as described in Chapter 1)
- within the ‘city core’, which includes the inner city areas of South Brisbane and the CBD and stations at Mater Hill, South Bank, Cultural Centre, South Brisbane, King George Square and Roma Street.

Figure 6.1: Brisbane Statistical Division
This assessment has been prepared in accordance with established and contemporary industry practice relating to the assessment of major public transport infrastructure projects. It involved:

- collation and review of available data on existing transport conditions and the effect of Brisbane Metro
- traffic and transport demand modelling and forecasting, including modelling undertaken specifically for this assessment and for the Brisbane Metro Business Case
- analysing existing and future transport conditions for the transport network, both with and without Brisbane Metro, using collated information along with validated and tested transport models
- assessing the differences between the derived forecast conditions for scenarios with and without Brisbane Metro to understand the effects on public transport, traffic, cyclists and pedestrians
- assessing the effects of Brisbane Metro on the transport system during construction
- identifying mitigation measures.

This analysis was informed by the following transport models.

- Brisbane Metro Transport Model, which is a strategic multi-modal transport that models (using Emme software) regional changes to patronage, mode share and overall network performance (public transport and traffic) to understand and identify strategic potential positive and negative impacts of Brisbane Metro.
- Mesoscopic traffic modelling (using SATURN software) and microsimulation traffic modelling (using Vissim software) of the inner city road network to assess the effects of traffic network changes (e.g. the closure of Victoria Bridge to general traffic and modifications to North Quay) on the city core.
- Microsimulation modelling (using Vissim software) of bus and traffic operational performance changes to the busway and selected interfacing road networks to understand and identify customer benefits of Brisbane Metro.
- Microsimulation modelling (using Legion software) of the detailed behaviour of pedestrian and customer movement at the key stations and precincts (e.g. Cultural Centre precinct, King George Square station and Roma Street station).

The transport modelling has been subject to a rigorous calibration and validation process, and reviewed and verified independent of the modelling team, to ensure the models are fit-for-purpose to test future year scenarios. The transport models have also been reviewed by key stakeholders and by an independent peer reviewer appointed by Council.

This assessment considers modelled changes associated with an indicative new supporting bus network. This ‘indicative bus network’ is preliminary only and has been developed for the purposes of assessing potential benefits and impacts of Brisbane Metro’s operation. Council will involve communities and key stakeholders in a staged review and planning of changes to the bus network required for the introduction of Brisbane Metro. This engagement activity will be undertaken in partnership with TransLink and Transport for Brisbane prior to the commencement of Brisbane Metro operations.

Since the release of the Brisbane Metro Business Case in May 2017, further project development, including the refinement of transport modelling and assessment outcomes, has been undertaken to inform the planning of Brisbane Metro and assessments for this draft Design Report.

Consistent with TMR standards and time horizons used to assess the impacts of other major inner city transport projects (e.g. the proposed CRR project), this assessment considers:

- the impact of Brisbane Metro during construction, based on a 2021 transport model year
- the impact of Brisbane Metro in the year of opening, being 2023 (represented by the 2021 transport model year)
- the impact of the project design 10 years after the year of opening, being 2032 (represented by a 2031 transport model year).
The public transport system carries a high proportion of its daily loads during the morning and evening peak periods (i.e. 7am-9am and 4pm-6pm), with about 50% of daily public transport trips occurring within these two-hour peak periods (i.e. four hours a day). The morning peak period is more concentrated than the afternoon peak period, with the afternoon peak period having a greater spread of departure times due to many educational departure trips (especially for schools) that occur prior to afternoon peak commuter trips. Therefore, this assessment generally reports on the morning peak period. Transport forecasts reported in this assessment generally relate to the morning peak hour (i.e. 7.30am-8.30am).

6.2 Existing environment

This section provides an overview of the existing traffic and transport environment at a regional level (Brisbane Statistical Division), study area and city core level.

6.2.1 Regional transport environment

Public transport demands

Transport modelling for Brisbane Metro indicates that in 2016, an average of 7.8 million person trips were made on an average weekday in the Brisbane Statistical Division (refer to Table 6.1). This included approximately 567,000 public transport trips, representing a mode share of 7.3%. Private vehicle use was the dominant method of travel with around 6.3 million trips (car driver and car passenger) representing around 81% of daily trips in the Brisbane Statistical Division.

Table 6.1: Modelled 2016 daily trips across the Brisbane Statistical Division region by mode

<table>
<thead>
<tr>
<th>Mode</th>
<th>Person trips</th>
<th>Mode share (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Car driver</td>
<td>4,588,000</td>
<td>59.1</td>
</tr>
<tr>
<td>Car passenger</td>
<td>1,712,000</td>
<td>22.0</td>
</tr>
<tr>
<td>Public transport</td>
<td>567,000</td>
<td>7.3</td>
</tr>
<tr>
<td>Walk and cycle</td>
<td>900,000</td>
<td>11.6</td>
</tr>
<tr>
<td>Total</td>
<td>7,767,000</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Bus users accounted for almost 370,000 weekday public transport trips, with rail users accounting for over 200,000 trips. Across the Brisbane Statistical Division, rail carries around 35% of total public transport users in the morning peak, with buses carrying the bulk of the remaining 65%. Ferry caters for only a small proportion of public transport trips (1.0%). Bus customers have an average trip length of 8.1 kilometres, less than half the average rail trip length of 17 kilometres. The average trip time for bus users (i.e. time spent on-board) is 18 minutes compared to just under 26 minutes for rail.

Bus network and services

The urban bus network complements the rail network by primarily focusing on a metropolitan distribution and connectivity function, which the rail network is generally not as well suited to providing. The bus network also provides connections in areas with poor access to rail services.

Within Brisbane, the commuter market is focused on travel to and from the CBD and inner city precincts in the morning and afternoon two-hour peak periods. Over 500 bus services per hour enter the CBD in the morning peak period. When coupled with general road network congestion, these concentrated demands place pressure on infrastructure, challenging the reliability of the bus network. The ‘all-day’ bus market is mainly associated with relatively short trips to the nearest major centre, such as the CBD (centre), Indooroopilly (west), Chermside (north), Carindale (east), and Garden City (south). As these centres are hubs for their respective sub-regions, a number of interchange opportunities already exist at these locations.

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1 Brisbane Metro Transport Model (2017)
Universities at St Lucia (UQ), Gardens Point (QUT), Kelvin Grove (QUT), Nathan and Mt Gravatt (Griffith University) and TAFE facilities are also major generators of bus trips throughout the day. Corridors to the south-east and inner-north of Brisbane are serviced by grade-separated busways that provide access to the CBD. The busway network carries around two-thirds of Brisbane’s buses into the CBD. It comprises:

- South East Busway, extending from the CBD to Eight Mile Plains
- Eastern Busway, extending from UQ to Langlands Park, Coorparoo
- Northern Busway, including the Inner Northern Busway, extending from the CBD to Kedron.

Transport for Brisbane operates the majority of bus services in Brisbane. Services from outer urban areas such as Logan and Redlands, are run by private operators under contract to TransLink. Transport for Brisbane operates a wide range of different bus services, reflecting the diverse role that buses play in the transport network. Service types include trunk line haul services to major commuting destinations (e.g. BUZ and City Express routes), inner city distributor services (e.g. CityGliders) and local services fulfilling a community service obligation of government.

**Rail network and services**

Queensland Rail’s Citytrain network is a passenger rail service that covers more than 800 kilometres of track in South East Queensland. Queensland Rail, under contract to TransLink, operates more than 900 services on the Citytrain network\(^2\) and provides around 70 services for the weekday morning peak hour to and through the CBD.

Passenger rail services in Brisbane are generally medium to long distance commuter services, with heavy use during the morning and evening peaks and moderate use during the daytime off-peak period. This is reflected in the current number of scheduled services in the weekday off-peak period which, at around 30 services per hour, is approximately 40% of peak frequencies. A range of network constraints limit the number of services that can reliably operate on the Citytrain network. These include the four-track arrangement through the inner city between Roma Street and Bowen Hills where 11 lines merge into two pairs of track through the CBD.

**Roads and traffic**

The Brisbane regional road network is characterised by a range of radial and orbital arterial and motorway routes including the:

- M1 (Gateway Motorway), a north-south bypass on the eastern edge of the Brisbane Metropolitan area
- M3/M7/A3 (Pacific Motorway/Clem Jones tunnel (Clem7)/Airport Link/Gympie Road), a key north-south route through inner Brisbane
- M3, including Captain Cook Bridge, Riverside Expressway, Hale Street and ICB, provides access from the motorway network to the CBD and the inner city and provides a toll free route for north-south trips.
- M5/ICB/Kingsford Smith Drive, an east-west route linking the western suburbs to the north-eastern suburbs and airport via inner north Brisbane
- M2/M6 route (Logan Motorway), an east-west bypass of Brisbane on the southern edge of the metropolitan area.

The M3 between Rochedale and the Brisbane River is within the study area.

Cars currently dominate the way people move around Brisbane, with more than 80% of all daily trips by private vehicle\(^3\). Current congestion in Brisbane’s transport network is highlighted in transport modelling plots of the volume over capacity ratio for the morning two-hour peak in 2016 (refer to Figure 6.2). Where demand is in excess of practical capacity, the ratio is greater than one. These congested corridors are indicated in red with the band width indicating the extent of congestion. It is evident from Figure 6.2 that Brisbane’s road network is operating at or close to practical capacity during peak periods on most of the key commuter arterials serving, and within, the city core, resulting in congestion for all road users including commercial vehicles and buses.

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\(^3\) DILGP (2017) ShapingSEQ: South East Queensland Regional Plan 2017, Queensland Government
Figure 6.2: Morning peak period road network volume to capacity ratios (2016)*

* Brisbane Metro Transport Model (2017)
6.2.2 Study area transport environment

This section describes the existing busway and key railway stations within the study area, including their facilities and services. It provides an overview of the existing patronage and facilities of each station with regard to access and parking including pedestrian and cycle facilities. The road and active transport network along with vehicular parking, loading and emergency vehicle routes and their operation for specific locations within the city core focused on the Cultural Centre precinct and Adelaide Street/North Quay are also reported.

Suburban bus services

Suburban bus services in the study area are generally trunk line haul services that operate on the busway. From each station customers can typically use an express or all stopping service as a single-seat journey to the CBD operating at a ‘turn-up-and-go’ frequency throughout the day with even greater frequency in the morning and afternoon peak periods.

Station activity

Table 6.2 shows busway and railway station customer boarding, alighting and transfer activities for stations within the study area (outside of the city core). Information on station activity within the city core is provided in section 6.2.3.

UQ Lakes, Griffith University and RBWH stations all experienced the heaviest customer activity during the morning peak period in 2016, while Herston, Greenslopes and Buranda (railway) stations had the lowest levels of station activity. Only a small number of bus to rail transfers (approximately 100 transfers) occurred in the morning peak hour at Buranda bus/rail interchange, however a relatively large volume of transfers (approximately 700 transfers) occurred from rail to bus at the Park Road/Boggo Road interchange. Bus to bus transfers are also prevalent at Griffith University station.

Table 6.2: 2016 morning peak hour busway and railway station customers

<table>
<thead>
<tr>
<th>Station</th>
<th>Initial boarding</th>
<th>Transfer boarding</th>
<th>Final alighting</th>
<th>Transfer alighting</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eight Mile Plains</td>
<td>500</td>
<td>200</td>
<td>100</td>
<td>200</td>
<td>1000</td>
</tr>
<tr>
<td>Upper Mt Gravatt</td>
<td>500</td>
<td>100</td>
<td>500</td>
<td>400</td>
<td>1400</td>
</tr>
<tr>
<td>Griffith University</td>
<td>400</td>
<td>400</td>
<td>500</td>
<td>400</td>
<td>1700</td>
</tr>
<tr>
<td>Holland Park West</td>
<td>400</td>
<td>0</td>
<td>100</td>
<td>0</td>
<td>500</td>
</tr>
<tr>
<td>Greenslopes</td>
<td>200</td>
<td>0</td>
<td>100</td>
<td>0</td>
<td>300</td>
</tr>
<tr>
<td>Buranda (busway)</td>
<td>300</td>
<td>300</td>
<td>300</td>
<td>300</td>
<td>1200</td>
</tr>
<tr>
<td>Buranda (railway)</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>-</td>
<td>300</td>
</tr>
<tr>
<td>PA Hospital</td>
<td>100</td>
<td>0</td>
<td>400</td>
<td>0</td>
<td>500</td>
</tr>
<tr>
<td>Boggo Road</td>
<td>100</td>
<td>600</td>
<td>100</td>
<td>100</td>
<td>900</td>
</tr>
<tr>
<td>Park Road (railway)</td>
<td>200</td>
<td>100</td>
<td>200</td>
<td>700</td>
<td>1200</td>
</tr>
<tr>
<td>UQ Lakes</td>
<td>500</td>
<td>0</td>
<td>2400</td>
<td>0</td>
<td>2900</td>
</tr>
<tr>
<td>Normanby</td>
<td>100</td>
<td>0</td>
<td>600</td>
<td>0</td>
<td>700</td>
</tr>
<tr>
<td>QUT Kelvin Grove</td>
<td>600</td>
<td>0</td>
<td>400</td>
<td>0</td>
<td>1000</td>
</tr>
<tr>
<td>Herston</td>
<td>0</td>
<td>0</td>
<td>200</td>
<td>0</td>
<td>200</td>
</tr>
<tr>
<td>RBWH</td>
<td>300</td>
<td>100</td>
<td>1500</td>
<td>100</td>
<td>1800</td>
</tr>
</tbody>
</table>

5 Brisbane Metro Transport Model (2017)
Station facilities

Table 6.3 provides an overview of the key features and existing facilities of the busway and railway stations within the study area (outside of the city core). Stations in the city core are described in section 6.2.3.

### Table 6.3: Existing station facilities

<table>
<thead>
<tr>
<th>Section of the alignment</th>
<th>Stations</th>
<th>Key station features and facilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rochedale to Upper Mt Gravatt</td>
<td>Eight Mile Plains and Upper Mt Gravatt stations</td>
<td>• Central busway carriageway with two side platforms, 55 metres in length.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Passenger set-down and pick-up point.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Park ‘n’ ride facilities:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Eight Mile Plains – two large car parks located on either side of Miles Platting Road and with a total capacity of 890 bays</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Upper Mt Gravatt – a capacity of 111 bays.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Pedestrian bridge with lifts and stairs to link platforms.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Bike and toilet facilities located within the car parks.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Stations are fully accessible.</td>
</tr>
<tr>
<td>Mt Gravatt to Greenslopes</td>
<td>Griffith University, Holland Park West and Greenslopes stations</td>
<td>• Central busway carriageway with two side platforms, 55 metres in length</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Passenger set-down and pick-up points:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Griffith University – adjacent to the station within the Griffith University Mt Gravatt campus</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Holland Park West – none</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Greenslopes – located on Barnsdale Place on the eastern side of the station.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Park ‘n’ ride facilities are not provided at these stations (the car park adjacent to Griffith University station is operated by the university and is not a park ‘n’ ride).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Pedestrian lifts and stairs provide access to platforms.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Bike storage facilities are within the station.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Station is fully accessible.</td>
</tr>
<tr>
<td>Woolloongabba to St Lucia</td>
<td>Buranda (busway)</td>
<td>• Buranda station is below street level.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Central busway carriageway with two side platforms, 55 metres in length.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Two pedestrian bridges at either end of the station provide access to, and between, the platforms.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Primary pedestrian bridge is accessed from O’Keefe Street via lift and stairs.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Secondary pedestrian bridge is located on the opposite side of the station and is accessed via stairs or ramp between Buranda station and Buranda railway station.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Passenger set-down and pick-up points, park ‘n’ ride facilities and bike storage facilities are not provided.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• A parking control area is located west of the station restricting parking to two hours on all roads (unless signed otherwise) 7am-7pm, Monday to Friday (excluding public holidays).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Veloway 1 (South East Freeway Bikeway) passes the station on O’Keefe Street.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Station is fully accessible.</td>
</tr>
<tr>
<td></td>
<td>Buranda (railway)</td>
<td>• Buranda railway station is located on the Cleveland line and is immediately adjacent to Buranda station.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• It has two platforms with access to and between platforms provided via an overbridge and stairs.</td>
</tr>
<tr>
<td>Section of the alignment</td>
<td>Stations</td>
<td>Key station features and facilities</td>
</tr>
<tr>
<td>--------------------------</td>
<td>----------</td>
<td>-----------------------------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Access is from both Arne Street to the north and Gillingham Street or Logan Road from the south.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• The station is not fully accessible with both inbound and outbound platforms accessed via steep ramps or stairs.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• A park ‘n’ ride facility with a capacity of 25 bays.</td>
</tr>
<tr>
<td>Woolloongabba</td>
<td></td>
<td>• Woolloongabba station is located on a spur off the main South East Busway.</td>
</tr>
<tr>
<td>(This station does not</td>
<td></td>
<td>• Central busway carriageway with two side platforms, 55 metres in length.</td>
</tr>
<tr>
<td>form part of the proposed Brisbane Metro network)</td>
<td></td>
<td>• Overbridge with lifts and stairs at either end provides access to and between platforms.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Primary pedestrian bridge is accessed from O’Keefe Street via lift and stairs.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Pedestrian access to the station is via footpaths and pedestrian crossings on Stanley Street from the south, Ipswich Road from the east and the Landcentre building from the north.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Bus turnaround is located at the eastern end of the station and bus layover facilities are at the western end of the station.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Passenger set-down and pick-up points, park ‘n’ ride facilities and bike storage facilities are not provided.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Station is fully accessible.</td>
</tr>
<tr>
<td>PA Hospital</td>
<td></td>
<td>• PA Hospital station is on the Eastern Busway.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• The station is located on an elevated structure adjacent to the hospital and includes a central busway carriageway with two side platforms, 75 metres in length.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• An overbridge with lifts and stairs at either end provides pedestrian access between platforms as well as direct access to the hospital and the access road beneath the busway.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Bus stops are located on the PA Hospital access road beneath the busway.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• A kiss ‘n’ ride passenger set-down and pick-up point is located on the PA Hospital access road beneath the busway.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• A multi-storey car park operated by the hospital is located between the station and PA Hospital.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• An elevated cycle way is located parallel to the Eastern Busway on the hospital side that provides direct cycle connection between Kent Street and O’Keefe Street without the need to cross Ipswich Road at-grade.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Station is fully accessible.</td>
</tr>
<tr>
<td>Boggo Road</td>
<td></td>
<td>• Boggo Road station is on the Eastern Busway and is located adjacent to Park Road railway station.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• An at-grade open air station with a central busway carriageway with two side platforms, 58 metres to 66 metres in length.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• An overbridge with lifts and stairs at either end provides pedestrian access between platforms and connects directly to the Park Road railway station pedestrian overbridge.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Pedestrian footpaths are provided to Annerley Road to the west and the Ecosciences Precinct to the south.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Pedestrian connectivity to the north and east is constrained by the presence of the busway and railway but can be accessed via Quarry Street.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• A second pedestrian overbridge is located 70 metres to the west and provides a connection across the railway between Merton Road and Boggo Road (adjacent to Dutton Park School).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• A passenger set-down and pick-up point is located on Boggo Road.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• There are a range of cycle routes to the west and south of the station.</td>
</tr>
</tbody>
</table>
### Section of the alignment

<table>
<thead>
<tr>
<th>Stations</th>
<th>Key station features and facilities</th>
</tr>
</thead>
</table>
| Park Road (railway) | - Park Road station is served by the Beenleigh, Gold Coast and Cleveland lines and is immediately adjacent to Boggo Road station.  
- A park ‘n’ ride facility with 28 car parking bays with vehicle access via off Quarry Street. |
| UQ Lakes | - UQ Lakes station is the western terminus of the Eastern Busway and it serves the UQ St Lucia campus.  
- An at-grade open air station comprising a central busway circulation roadway (turnaround facility) with two side platforms located on the outside of the terminus busway – one sawtooth platform with capacity for three buses and one straight platform.  
- Eleanor Schonell Bridge east of the station provides a bus, pedestrian and bicycle link across the Brisbane River, between the university campus and Dutton Park.  
- Pedestrian routes to the station within the university campus are available via footpaths, some of which are covered.  
- Bike facilities, car parking and taxi stands are located within the university but they are not associated with the bus station.  
- Station is fully accessible. |
| Kelvin Grove to Herston | - Central busway carriageway with two side platforms of varying length:  
  - Normanby – 55 metres  
  - QUT Kelvin Grove – 82 metres  
  - Herston – 77 metres  
  - RBWH – 55 metres.  
- Pedestrian overbridge with lifts and stairs provide a link to and between the platforms except at RBWH where the platforms are elevated with a concourse underneath accessed via lifts and stairs.  
- Bike storage, passenger set-down and pick-up points and park ‘n’ ride facilities are not provided (a cycle centre is located on the ground level of the RBWH station, which provides cycling and walking end-of-trip facilities).  
- Stations are fully accessible. |

### 6.2.3 City core transport environment

This section describes existing transport conditions in the city core, which includes South Brisbane and the CBD. In particular, it describes public transport infrastructure and services as well as traffic conditions, walking and cycling facilities. Information on current transport infrastructure challenges within the city core are presented in Chapter 2.

#### Bus operations

The city core, and particularly the CBD, is the hub of Brisbane’s bus network and the principal destination for bus commuters. A wide range of bus service types converge on the city core including all stops inner suburban buses, limited stops buses from middle-outer suburban locations (including BUZ and CityGlider routes) and express-running, peak-only ‘Rocket’ services.
City core bus stops and stations used by customers are as follows.

- Mater Hill station – located on the South East Busway and serves the Mater health precinct and a number of schools and a residential catchment with entrances on Stanley Street and Water Street. Compared to other busway stations it has relatively short platforms at 44 metres in the inbound direction and 47 metres in the outbound direction.

- South Bank station – an elevated station on the South East Busway with 55 metre long platforms with access via stairs or lifts at the southern end of the platforms. The station serves a number of schools, TAFE South Bank campus and leisure and retail destinations in South Bank Parklands. The busway station is located adjacent to South Bank railway station with access between the two stations via Tribune Street.

- Cultural Centre station – primarily where South East Busway routes and South Brisbane/West End routes converge and the termination point for some northern services. It provides the widest range of access to bus services across Brisbane and supports significant bus-bus interchange. A much lower level of bus-rail interchange occurs with South Brisbane railway station.

- QSBS – located beneath Queen Street Mall and the Myer Centre, it principally provides for terminating services from the south and west. Buses that serve King George Square station typically pass through QSBS without stopping.

- Adelaide Street – provides an important two-way ‘east-west’ bus route to and through the CBD allowing for good CBD access as well as bus-bus interchange opportunities (including with King George Square station buses) and bus-rail interchange opportunities in the vicinity of Central station. Adelaide Street bus stops cater for Fortitude Valley and West End services, as well as a range of other services from across the network (north, south, east and west). Many of these services start or terminate in Adelaide Street.

- Elizabeth Street – principally provides a termination location for ‘Rocket’ services from the south and east as well as the all-day frequent 555 service to Loganholme.

- King George Square station – principally serviced by high-frequency, all-day BUZ routes providing city centre access as well as some bus-bus interchange.

- Roma Street station – bus platforms are fully integrated with the railway station allowing for bus-rail and bus-bus interchange within the same station facility.

- Bus stops are located on a range of other inner city streets including George Street, North Quay, and Edward, Queen, Ann, Creek and Alice Streets. In addition to regular services, the CBD street bus stops provide for NightLink, special events and free loop services.

Bus coverage within the city core is generally good, however there are parts of the CBD south of Elizabeth Street with infrequent and irregular services such as the government precinct, QUT Gardens Point campus and the Riverside and Eagle Street office precincts. During off-peak periods customers generally need to walk to other bus stations and stops to access a bus. The City Loop service provides a good level of service (e.g. every 10 minutes) Monday to Friday during work hours.

While many buses start or terminate their routes at the QSBS, Cultural Centre station or Roma Street station, there is little to no opportunity for layover within these stations. The closest layover areas that can be accessed from the busway are at Hope Street (South Brisbane), Countess Street (CBD) and Woolloongabba. These layover areas are often full in peak periods and prior to the afternoon peak period, requiring buses to circulate the city streets prior to entering into service. This adds to operating costs and increases congestion.

There is significant demand for bus travel to and from the city core in the peak periods. Total bus station and bus stop activity in the city core is higher than rail with over 37,000 boardings and alightings occurring in the morning peak hour\(^6\). However, unlike rail, this occurs across a greater number of stations and stops and a wider geographic area.

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\(^6\) Brisbane Metro Transport Model (2017)
Table 6.4 shows the current usage of major city core bus stations and total city core bus stop and station activity in the morning peak hour. More than half of the bus activity in the city core occurs at on-street bus stops in the morning peak hour. There is also significant activity at busway stations south of the river, with around 7800 customers boarding and alighting bus services at the Cultural Centre, South Bank or Mater Hill stations in the morning peak hour. Many of these customers, particularly from South Bank and Mater Hill stations, access the CBD via the Goodwill Bridge.

Table 6.4: 2016 morning peak hour bus patronage at selected inner city locations

<table>
<thead>
<tr>
<th>Busway station</th>
<th>Initial boarding</th>
<th>Transfer boarding</th>
<th>Final alighting</th>
<th>Transfer alighting</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roma Street</td>
<td>250</td>
<td>500</td>
<td>470</td>
<td>230</td>
<td>1500</td>
</tr>
<tr>
<td>QSBS</td>
<td>410</td>
<td>90</td>
<td>2100</td>
<td>80</td>
<td>2700</td>
</tr>
<tr>
<td>King George Square</td>
<td>2000</td>
<td>990</td>
<td>2100</td>
<td>310</td>
<td>5400</td>
</tr>
<tr>
<td>Cultural Centre</td>
<td>530</td>
<td>1000</td>
<td>800</td>
<td>900</td>
<td>3200</td>
</tr>
<tr>
<td>South Bank</td>
<td>520</td>
<td>50</td>
<td>2000</td>
<td>80</td>
<td>2700</td>
</tr>
<tr>
<td>Mater Hill</td>
<td>300</td>
<td>240</td>
<td>1100</td>
<td>240</td>
<td>1900</td>
</tr>
<tr>
<td>City core total bus</td>
<td>7500</td>
<td>3100</td>
<td>24,000</td>
<td>2500</td>
<td>37,000</td>
</tr>
</tbody>
</table>

The following infrastructure constraints on critical sections of the busway and road network in the city core limit capacity and therefore the throughput of bus services.

- All services from the south are required to cross the river to access the CBD with the majority of these services using Victoria Bridge and Captain Cook Bridge, both of which are congested in peak times.
- Bus movements on Victoria Bridge are constrained by the intersection capacity at each end of the bridge (with North Quay and Grey Street), the capacity of Cultural Centre station, and the intersection of Melbourne Street with the Melbourne Street busway portal.
- Bus movements on Captain Cook Bridge are constrained by interactions with general traffic, which regularly cause buses to block back onto the busway itself in the inbound direction in the morning peak period.
- Inner sections of the South East Busway are constrained by station capacity, which is limited by bus dwell times and stopping arrangements. Station capacity constraints are evident at Cultural Centre, Mater Hill and South Bank stations. This causes undesirable bus queuing on station approaches in the busway network and on Victoria Bridge as buses wait for platform space.
- Cultural Centre station, a key determinant of capacity across Victoria Bridge that has approximately 220 buses per hour in the peak direction, already operates over its theoretical capacity of 180 buses per hour per direction in peak periods, and has been since about 2008.
- Significant issues exist in terms of traffic congestion and footpath crowding on core CBD streets such as Adelaide and Elizabeth Streets, and platform capacity constraints are emerging also at Roma Street station.
- Inadequate space for bus depots and lack of inner city layover is resulting in inefficient operations, such as increased dead running. The whole system is operating at or close to capacity in some sectors which makes it vulnerable to delays.

Overall, the approach to the CBD from the south including river-crossing capacity are considered the most critical constraints to bus throughput. These constraints contribute to worsening travel times and increasingly variable journey times for customers. Further discussion on these constraints is provided in Chapter 2.

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7 Brisbane Metro Transport Model (2017)
8 TransLink (2016) Go card ticket data (2011 to 2016), provided September 2016
Rail operations

Five railway stations are located in the city core – South Bank, South Brisbane, Roma Street, Central and Fortitude Valley. Of these, Roma Street, South Brisbane and South Bank are located within the study area.

The CBD is served by Central and Roma Street railway stations, located on the northern side of the CBD. All 11 South East Queensland rail lines and around 70 rail services in the weekday morning peak hour serve these two stations. The southern areas of the CBD including the government precinct, QUT Gardens Point campus and Riverside and Eagle Street office precincts are more than a 15-minute walk from a railway station. This results in high volumes of pedestrians walking through the CBD from both Central and Roma Street railway stations as well as across the Brisbane River from South Bank and South Brisbane stations.

Table 6.5 shows the customer boarding, alighting and transfer activities at the five railway stations within the city core. These activities are recorded during a morning peak hour in 2016. Central station is dominant for alightings in the CBD in the morning peak hour, while Roma Street railway station experiences the most significant transfer activity of all five railway stations.

Table 6.5: 2016 morning peak hour rail station customers

<table>
<thead>
<tr>
<th>Railway station</th>
<th>Initial boarding</th>
<th>Transfer boarding</th>
<th>Final alighting</th>
<th>Transfer alighting</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>South Bank</td>
<td>300</td>
<td>100</td>
<td>2300</td>
<td>50</td>
<td>2800</td>
</tr>
<tr>
<td>South Brisbane</td>
<td>200</td>
<td>100</td>
<td>1200</td>
<td>200</td>
<td>1700</td>
</tr>
<tr>
<td>Roma Street</td>
<td>300</td>
<td>600</td>
<td>3000</td>
<td>800</td>
<td>4700</td>
</tr>
<tr>
<td>Central</td>
<td>1100</td>
<td>200</td>
<td>13,000</td>
<td>400</td>
<td>14,000</td>
</tr>
<tr>
<td>Fortitude Valley</td>
<td>400</td>
<td>400</td>
<td>2500</td>
<td>400</td>
<td>3700</td>
</tr>
<tr>
<td>City core total</td>
<td>2300</td>
<td>1400</td>
<td>22,000</td>
<td>1900</td>
<td>27,000</td>
</tr>
</tbody>
</table>

Key features and facilities of the three city core stations within the study area are outlined in Table 6.6.

Table 6.6: Existing features and facilities at city core railway stations within the study area

<table>
<thead>
<tr>
<th>Station</th>
<th>Key station features and facilities</th>
</tr>
</thead>
</table>
| South Bank railway station  | • South Bank railway station is located between Tribune Street, Vulture Street and Grey Street in South Brisbane. It is adjacent to South Bank busway station.  
  • Key features include:  
    • three entrances from Tribune Street, Vulture Street and a recently opened third entrance from Grey Street  
    • pedestrian footpaths on Vulture Street, Grey Street and Tribune Street have been widened as part of the adjacent South Point development to increase pedestrian accessibility  
    • lifts are provided to access the stations in addition to stairs and ramps.  
  • South Bank railway station provides access to South Bank Parklands, Little Stanley Street and the Grey Street precinct, and Goodwill Bridge, the Queensland Maritime Museum, TAFE South Bank and several major private and public schools (e.g. Brisbane State High School). |
| South Brisbane railway station | • South Brisbane railway station is located on Grey Street diagonally opposite the Cultural Centre station and the Queensland Cultural Centre.  
  • Key features include:  
    • entrance on Grey Street opposite QPAC  
    • lifts and stairs are provided to all platforms  
    • forecourt provides a buffer between the station entrance and the Grey Street footpath  
    • pedestrian crossing of Grey Street is facilitated by a median traffic island  
    • no passenger set-down and pick-up points or car parks are provided. |

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9 Brisbane Metro Transport Model (2017)
Station

<table>
<thead>
<tr>
<th>Key station features and facilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>a small number of car parking spaces for staff only are provided adjacent to the station</td>
</tr>
<tr>
<td>Grey Street has on-road cycle lanes where it passes the station and a CityCycle station is provided adjacent to the station.</td>
</tr>
<tr>
<td>South Brisbane railway station provides the most direct access to a wide range of employment, cultural and leisure destinations including the BCEC, Queensland Art Gallery, Gallery of Modern Art, State Library of Queensland, Queensland Museum and QPAC. It also serves a growing residential catchment.</td>
</tr>
<tr>
<td>Passengers access the station via Grey Street and a proportion utilise covered pedestrian links in QPAC to access Victoria Bridge and the CBD.</td>
</tr>
</tbody>
</table>

Roma Street railway station

<table>
<thead>
<tr>
<th>Roma Street railway station</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roma Street railway station is part of the Brisbane Transit Centre, a multi-modal transport hub comprising the Roma Street railway station (suburban and intercity services), Roma Street busway station and Roma Street intercity coach station, as well as a range of food, hotel, office and retail uses.</td>
</tr>
<tr>
<td>Roma Street railway station has an important interchange function with around 30% of boarding and alighting customers in the morning peak hour transferring between public transport service (bus or rail).</td>
</tr>
<tr>
<td>Key features of Roma Street railway station include:</td>
</tr>
<tr>
<td>six regularly in-service rail platforms that are used by all South East Queensland suburban rail services</td>
</tr>
<tr>
<td>two dual gauge platforms used for daily interstate train services to Sydney</td>
</tr>
<tr>
<td>long distance rail services to northern and western Queensland, typically from Platform 10</td>
</tr>
<tr>
<td>each platform is accessible by stairs, lifts and escalators from a central pedestrian subway.</td>
</tr>
</tbody>
</table>

Road network and access

City Plan classifies all roads as one of six categories – motorway, arterial route, suburban route, district access road, neighbourhood access road and local access road.

Victoria Bridge is a ‘district access’ road under Council’s road hierarchy for Brisbane. District access roads provide access to neighbourhood access roads and allow for the movement of people and goods within and through suburbs, and access to local streets. Victoria Bridge serves as a major river crossing for public transport, pedestrians and cyclists but its capacity to cater for general traffic is limited by constrained intersections at either end of the bridge and currently carries an average of 10,900 vehicles per weekday\(^\text{10}\).

William Jolly Bridge is classified as an ‘arterial route’. It has two traffic lanes in each direction and currently carries approximately 39,100 vehicles per weekday\(^\text{11}\). The daily traffic volume of William Jolly Bridge has reduced slightly since the opening of Go Between Bridge in 2010. The tolled Go Between Bridge is also an ‘arterial route’ with two traffic lanes in each direction carrying approximately 13,300 vehicles per weekday\(^\text{12}\).

Captain Cook Bridge is classified as a ‘motorway’ (M3) and connects the Pacific Motorway to the Riverside Expressway. It comprises four traffic lanes in each direction with a posted speed limit of 80 kilometres per hour and currently carries approximately 143,500 vehicles per weekday\(^\text{13}\). It serves as the main general and commercial traffic route from the city’s south into the CBD as well as for through trips for destinations west via Coronation Drive and north via Hale Street and the ICB.

Traffic conditions in the city core can generally be described as congested in the peak periods with many areas experiencing average travel speeds of 10 kilometres per hour or less across a peak hour. Notably congested routes in the morning peak period include the Elizabeth Street off-ramps to the CBD as well as Countess Street/Upper Roma Street and Grey Street approaching Victoria Bridge. In the afternoon peak period there is notable congestion around Petrie Terrace and Milton Road (both directions), Adelaide Street, George Street and Grey Street.

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\(^{10}\) TMR (2016) Screenline Traffic Count Database (AWDT) provided August 2016
\(^{11}\) TMR (2016)
\(^{12}\) TMR (2016)
\(^{13}\) TMR (2016)
Car parking, access and servicing

Within the city core, the Brisbane Central Traffic Area applies a two-hour parking limit, except as signed or where parking meters operate, and as permitted by the road rules. Short-term (i.e. up to and including three hours) on-street metered parking bays in the CBD (zone 1) are charged at up to $4.40 per hour during weekdays (7am-7pm). Where four hour or longer parking is available (e.g. in the city fringe/zone 2 area) a fee of $2.70 per hour applies, up to a maximum daily charge of $10 on weekdays ($6 on weekends). Parking restrictions apply 7am-6pm Monday to Friday, and 7am to midday Saturday.

Loading restrictions are ‘as signed’ throughout the Brisbane Central Traffic Area with both customer and commercial loading activities competing with other needs for limited amounts of kerb space.

In addition to on-street parking and loading, there are a number of commercial car parks near to each busway station in the city core (e.g. Mater Hill and South Bank stations). These typically provide parking opportunities for surrounding business, medical and educational institutions as well as entertainment areas. These car parks are not typically used by public transport customers due to their close proximity to the CBD and parking regime of these car parks is typically not attractive for CBD commuters. A more detailed analysis of parking and loading around the Cultural Centre precinct and Adelaide Street is provided in the following section.

Mater Hill

A number of commercial car parks are located near Mater Hill station, of which the main car parks are Mater Hill Car Park West, Hancock Street Car Parking and Swiss-Belhotel Car Park. These are predominantly used by staff, patients and visitors of the Mater Hospitals and Lady Cilento Hospital. These car parks generally operate 24 hours, seven days a week. There are no car parks in the area that are directly linked to the use of Mater Hill station.

South Bank

Multiple commercial car parks and on-street parking opportunities are available for public use in the vicinity of South Bank station. The closest commercial car parks are Southpoint car park and Vulture Street car park, which are generally open 24 hours, seven days a week. Directly surrounding the station, long-term parking is predominantly available for motorcycles in addition to some on-street car spaces. None of these are directly associated with South Bank station.

Cultural Centre precinct

There are three commercial car parks in the Queensland Cultural Centre. These have a total capacity of approximately 1000 bays, of which around 950 bays are available to the public. The car parks operate as a ‘pay-on-entry’ basis and charge $16 per entry/day, making it an affordable option for commuter parking. Dynamic message signs at the entrances to the car parks and at several locations on the surrounding road networks advertise the number of spaces available at each car park. The following provides an overview of each car park. Figure 6.3 shows the car parks and their key access routes.

- The QPAC car park provides around 400 publicly available spaces and 12 disability parking spaces. The car park is accessible via Melbourne Street and Stanley Street, or Stanley Place through the Cultural Centre tunnel. Vehicular entry from Melbourne Street to Stanley Street is via left and right turn movement in, although left-out access only is provided to Melbourne Street. Around 50% of vehicles access the QPAC car park from Stanley Place, while around 65% of vehicles exit via Stanley Place with the remainder using Stanley Street and Melbourne Street14.

- The Queensland Art Gallery and Queensland Museum car park provides around 400 publicly available spaces and 12 disability parking spaces. The primary entry/exit to the car park is within the Cultural Centre tunnel. The major access to this car park is via the intersection of Stanley Place/Grey Street/Peel Street. Access is also provided from Montague Road and Stanley Street. A secondary exit is provided directly to Grey Street. This has poor visibility of the Grey Street footpath and sight lines of traffic on Grey Street are also restricted.

14 Video survey conducted on 16 June 2017
The State Library of Queensland and Gallery of Modern Art car park provides around 100 publicly available spaces and four disability parking spaces. The car park is accessible via Stanley Place. The major access to this car park is via the intersection of Stanley Place/Grey Street/Peel Street but it is also accessible via Montague Road and the Cultural Centre tunnel.

The three Cultural Centre car parks often operate at capacity when major events or combinations of similarly-timed events are held around the Cultural Centre venues. Traffic congestion has been observed within the car parks, in the Cultural Centre tunnel, and between Stanley Place and its intersection with Peel and Grey Streets both prior to and after these events. Queues of traffic can back up from the intersection of Stanley Place and Peel and Grey Streets to the QPAC car park (around 400 metres) following events at the Cultural Centre, and traffic congestion related to an event can take over 15 minutes to clear.

Pedestrian access to these car parks is via internal stairs and elevators to the Cultural Centre venues. As users of these car parks could be accessing any of the Cultural Centre venues, pedestrian access across Melbourne Street is important. Access is provided via the Cultural Centre pedestrian tunnel and the Cultural Centre pedestrian bridge. Both of these routes provide weather protection.

QPAC also has an underground staff and VIP car park containing approximately 35 spaces. Entry is provided from Grey Street with exit to Stanley Street. The BCEC car park, which has around 1,500 spaces, and other commercial car parks, including at South Bank Parklands are also within walking distance of the station and parking costs are similar to the Cultural Centre car parks.

On-street parking controls directly around the Cultural Centre precinct consist of loading zones (commercial and passenger) and bus zones. In more distant areas, parking controls vary from long-term metered parking, to no standing or clearways along major roads. The Cultural Centre precinct is within the Brisbane Central Traffic Area. There are kerbside provisions and parking bays for people with disability located at various points in the Cultural Centre precinct (refer to Figure 6.4).

Arrangements for service vehicles associated with the various Cultural Centre venues are shown in Figure 6.4. Height restrictions of 2.3 metres are in place for the route between Stanley Place and the Cultural Centre tunnel. From Stanley Street, the Cultural Centre tunnel has a signed height restriction of 4.4 metres and vehicles of height between 2.3 metres and 4.4 metres are required to U-turn within the tunnel to exit via Stanley Street.

Adelaide Street and North Quay

There are multiple car parks and private access around Adelaide Street and North Quay, including four publicly-accessible car parks in the vicinity of King George Square. While most of these car parks have one vehicular access point to the street network, the King George Square car park can be accessed from both Roma Street and Adelaide Street. In addition to the four public car parks, 300 George Street and 266 George Street provide private car parking facilities. The development at 300 George Street, expected to open in early 2019, will have left-in/left-out access from North Quay (between Ann and Adelaide Streets) and Adelaide Street (between North Quay and George Street) while Brisbane Square at 266 George Street has left-in/left-out access from North Quay (between Queen Street and Adelaide Street).

Adelaide Street and surrounding areas fall within the Brisbane Central Traffic Area. There are no opportunities for on-street car parking on Adelaide Street with on-street controls dominated by bus and loading zones on each side of the street in addition to an area for police vehicle parking.

There is limited on-street parking availability for people with disabilities surrounding King George Square station. Due to the numerous on-road traffic controls and bus stops in the area, there are limited passenger loading zones that generally have a two-minute restriction.

Several on-street loading zones are available for service vehicles in areas surrounding King George Square station, predominantly along Adelaide Street and Ann Street. In addition, there are a number of driveways and laneways that provide essential vehicular access to properties on Adelaide Street between Albert Street and George Street.
Figure 6.3: Parking access – Queensland Cultural Centre

Cultural Precinct total car parking capacity of around 1,000 with around 50 not available to the public.
Figure 6.4: Queensland Cultural Centre car parking and kerbside provisions for people with disabilities, and service vehicle access
Roma Street

Roma Street station is served by good road access. As a major interchange station there is a range of access modes provided including taxi and private car. There are several taxi facilities provided at/around Roma Street station.

There is no dedicated park 'n' ride facility at Roma Street station however there is a large multi-storey public car park immediately adjacent to and integrated with the station with around 800 spaces. This is principally parking for tenants of the transit centre office buildings as well as offering paid parking for CBD commuters. Such parking is intended to cater for commuter driving trips rather than driving as part of a public transport journey and therefore is not considered a commuter park ‘n’ ride facility.

Emergency access in the city core

Council, in partnership with the Queensland Government, is currently delivering an Emergency Vehicle Priority system to provide emergency services vehicles with a passage of green lights on-route to an emergency. The Emergency Vehicle Priority rollout has so far connected more than 300 intersections across 13 road corridors in Brisbane over the past year. Emergency Vehicle Priority devices have been fitted to approximately 120 ambulances and 23 fire and rescue vehicles, accounting for more than half of the vehicle fleet.

The busway itself also provides a route for emergency services to use along with the city’s bus and transit lanes. The following summarises other accesses to and from major emergency facilities in the city core.

- Roma Street fire station and ambulance station are located on Upper Roma Street between Roma Street and Skew Street intersections on the western edge of the CBD. Both stations have an access onto Upper Roma Street providing direct access to the CBD via North Quay or Roma Street, and to areas south of the Brisbane River via William Jolly Bridge.

- The entrance to the Mater Hospital Brisbane emergency department is through Raymond Terrace. An ambulance only access is on Stanley Street, approximately 100 metres west of Raymond Terrace. Mater Private Hospital Brisbane has an emergency department that is accessed from Vulture Street. The emergency service routes are via Annerley Road and Stanley Street from the east and Vulture Street and Stanley Street from the west.

- Emergency services access to South Bank Parklands is in accordance with City Parkland Services Standard Operating Procedure. Access routes include Grey Street, Russell Street, Little Stanley Street, Cultural Centre tunnel and The Arbour. During event periods at the Cultural Forecourt, emergency access is in accordance with South Bank Corporation’s Standard Operating Procedure for events.

- Emergency access from the road network to the Cultural Centre precinct is via William Jolly Bridge to the west, Victoria Bridge to the east, Melbourne Street to the south and Grey Street from the east.

- Existing emergency access routes in the vicinity of Adelaide Street include Elizabeth Street and George Street and George Street and Ann Street. These routes are currently experiencing various degrees of congestion during the peak periods, however with the Emergency Vehicle Priority system in place, emergency services are able to respond to Adelaide Street in a reasonably timely manner.

Pedestrian and cycle facilities

This section provides a description of the pedestrian and cycle facilities and conditions in the immediate environs of busway stations and bus stops on Adelaide Street within the city core.

Mater Hill station

The main pedestrian access to Mater Hill station is from Stanley Street onto the inbound platform via a short run of stairs, ramp or lifts. The entrance is adjacent to a signal controlled pedestrian crossing of Stanley Street. An overpass provides access across to the outbound platform. There is also a second pedestrian access from Water Street that provides access to both platforms.
Stanley Street, where it passes adjacent to Mater Hill station, has on-road bicycle lanes in both directions. However, due to high traffic volumes, number of intersections, vehicular access points and kerbside parking and loading, Stanley Street is not an attractive road for cyclists. There are also currently no bicycle parking facilities provided at Mater Hill station.

The proposed ‘Woolloongabba Bikeway is due to become operational by early 2019. This consists of a 1.1 kilometre two-way segregated cycleway along Stanley Street between Ipswich Road, Woolloongabba, and Dock Street, South Brisbane. This new separated bikeway will pass the entrance of Mater Hill station and will provide a dedicated facility for cyclists to access Mater Hill station in the near future.

South Bank station

Access to the South Bank station platform is via lifts and stairs from Colchester and Tribute Streets. Pedestrian access is partly impeded by roadside crash barriers along Tribute Street, which separate access between South Bank railway station and South Bank busway station.

There are currently no dedicated cycle facilities to, or in the immediate vicinity of, South Bank station; however, bike racks and lockers are available upon request to TransLink.

Cultural Centre station

Footpaths are located along both sides of the road network surrounding the Cultural Centre station, however pedestrian access is complex. Due to the segregated nature of the busway and the need to minimise conflicts between buses, traffic, pedestrians and cyclists, some key pedestrian desire lines are not directly provided for and fencing is used to enforce safety of pedestrian paths. In particular, there is no pedestrian crossing on the northern side of the Melbourne Street and Grey Street intersection. The Cultural Centre pedestrian bridge provides a grade-separated pedestrian crossing of Melbourne Street that links surrounding footpaths to the busway station platforms and Cultural Centre venues on either side of the street. The bridge has lifts and stairs to both footpaths and both station platforms.

Pedestrian surveys\textsuperscript{15} were undertaken for this assessment within the Cultural Centre precinct, which identified a number of key intersections with high foot traffic. Over an 18-hour period during a typical weekday, 19,900 pedestrians crossed the intersection of Melbourne Street and Grey Street. The intersections along Grey Street at Russell Street, Little Stanley Street and Ernest Street also cater for significant pedestrian volumes.

Afternoon peak hour pedestrian activity in the Cultural Centre precinct is shown in Figure 6.5. This indicates that:

- pedestrian access to/from the north of the precinct (i.e. Victoria Bridge) is largely outbound from the CBD (60% of two-way trips), and of those outbound pedestrian volumes, 66% (1000 pedestrians) use the downstream side of Victoria Bridge
- a significant proportion of outbound pedestrians using the downstream side of Victoria Bridge (around 75%) divert from the Melbourne Street corridor and use the Cultural Forecourt to travel further south and east
- significant pedestrian activity occurs at the intersection of Grey Street and Melbourne Street with the busiest crossing being north-south across Grey Street on the western side of Melbourne Street.
- bus movement along Melbourne Street, particularly at the busway portal, significantly impact safe and efficient pedestrian movement. Measure to provide for pedestrian safety include barriers and signalised controlled pedestrian crossing that are not provided along all pedestrian desire lines
- bus and vehicle movement between Grey Street and Victoria Bridge, along the Melbourne Street axis, interrupts the continuity of the public realm and pedestrian movement from QPAC to the Art Gallery
- bus and vehicle movement at the Grey Street and Melbourne Street intersection interrupts legible and convenient pedestrian movement along the eastern side of Grey Street, including barriers to maintain pedestrian safety

\textsuperscript{15} Video survey conducted on 16 June 2017
- bus station platforms and associated lift, stair and ramp access impacts capacity of adjoining public realm for pedestrian and cycle circulation through the Cultural Centre precinct.

In the Cultural Centre precinct, bicycle access is available as on the riverside path, via the Victoria Bridge/Melbourne Street corridor, and along Grey Street. Bike lanes exist on Melbourne Street and parts of Grey Street. Cyclists have also been observed to use unmarked paths and footpaths in the precinct.

Figure 6.5: Cultural Centre precinct hourly pedestrian volumes (afternoon peak hour 4.45pm to 5.45pm)\(^{16}\)

Recent cycle surveys\(^{17}\) illustrate that cycle movements along Grey Street are the highest in the precinct, and are notably higher in the eastern direction. It is likely that many of these will be coming from Kurilpa Bridge. Between 170 and 290 cyclists travel south along Grey Street during a typical 18-hour weekday period while between 100 and 160 travel north. Melbourne Street also has approximately 140 travelling in either direction over an 18-hour period. Another notable location is near the State Library of Queensland with up to 220 cyclists travelling from Stanley Place into the Peel Street and Grey Street intersection (refer to Figure 6.6).

\(^{16}\) Video survey conducted on 16 June 2017
\(^{17}\) Video survey conducted on 16 June 2017
Victoria Bridge

Victoria Bridge is a key pedestrian connection linking the north and south banks of the Brisbane River. The bridge acts as a gateway to the CBD via Reddacliff Place on the north bank and the Cultural Centre precinct on the south bank. It presently supports buses, general traffic, pedestrians and cyclists. The bridge is also a popular location for visitors to take in views of the CBD, South Bank Parklands and the Brisbane River.

A 2.7-metre clear-width path on the downstream side of the bridge is provided for pedestrians only, while a 2.7-metre clear-width shared path (pedestrian and cycles) is provided on the upstream side of the bridge. On-road cycling is also permitted on the general carriageway with one-metre on-road cycle lanes located adjacent to local traffic lanes.

The existing pedestrian path on the downstream side of Victoria Bridge meets the Austroads minimum clear width requirement of 2.4 metres clear-width for high pedestrian volume paths (Austroads Part 6A, Section 5.1.2). The existing shared path on the upstream side of Victoria Bridge does not meet the Austroads minimum clear width requirements for either a cycle only path, shared path or separated two-way pedestrian and cycle path. Further, the one-metre on-road cycle lanes do not comply with the Austroads preferred minimum width of 1.5 metres or minimum acceptable width of 1.2 metres (Austroads, Cycling Aspects of Austroads Guides, Section 4.3.2).

While Victoria Bridge is classified as a ‘principal cycle route’ by TMR, it is classified as a ‘secondary cycle route’ by Council. This secondary classification reflects the current limitations of Victoria Bridge and the existence of new purpose-built active transport bridges at each end of the CBD (i.e. Kurilpa and Goodwill bridges). Nevertheless, Victoria Bridge is considered to represent a desire line for slower speed urban cycling while the alternative routes are likely to be more attractive for higher speed commuter and fitness related cyclists. This movement pattern is reinforced by the limited cycle connectivity at either end of Victoria Bridge including the pedestrian zones at Reddacliff Place and Queen Street Mall.

18 Video survey conducted on 16 June 2017
Existing pedestrian and cycle connectivity to and from the bridge can be summarised as follows.

- **At the northern end of Victoria Bridge.**
  - Pedestrians can cross North Quay into Reddcaiff Place via signalised crossings from both sides of the bridge. Pedestrian access to the North Quay ferry terminal is provided by a recently installed lift and stair/ramp on the downstream side of the bridge.
  - Cyclists in the upstream shared path can access the Bicentennial Bikeway via a steep ramp off North Quay or continue towards Adelaide Street and George Street. Cyclists in the on-road cycle lanes are only permitted to turn right towards William Street and Elizabeth Street (as per general traffic).

- **At the southern end of Victoria Bridge.**
  - Pedestrians and cyclists on the upstream shared path can pass along the edges of the existing Cultural Centre station between the QPAC and the Queensland Art Gallery. Pedestrians and cyclists can also access the South Bank Parklands boardwalk/promenade via a loop ramp.
  - Pedestrians (only) on the downstream footpath or cyclists (only) in the southbound cycle lane can access South Bank Parklands via Stanley Street.

The following summarises usage of Victoria Bridge by pedestrians and cyclists.

- **Victoria Bridge caters for approximately 800 cycle trips per weekday, which is less than Goodwill Bridge (3860 bicycle trips per weekday) and Kurilpa Bridge (1170 bicycle trips per weekday).**
- **Approximately 18,700 pedestrian trips per day use Victoria Bridge, which significantly exceeds the number of pedestrian trips combined for Goodwill Bridge (10,700 trips per day) and Kurilpa Bridge (2800 trips per day). Pedestrian activity on Victoria Bridge is at its busiest during the evening peak with around 2400 users per hour on a typical weekday. Approximately 60% of pedestrians in the afternoon peak hour use the downstream path.**

**Adelaide Street**

Adelaide Street is a north-south street with strong pedestrian usage. It provides access to King George Square station and caters for a large number of bus stops. Formal signalised pedestrian crossings are located at all cross streets including George, Albert and Edward Streets in the vicinity of King George Square. Due to frequent gaps in traffic flow and distance between crossings (greater than 200 metres) a large number of informal mid-block pedestrian crossing movements have been observed.

Pedestrian activity in Adelaide Street in the vicinity of King George Square station precinct is high. The pedestrian activity tends to accumulate around specific points (bus stops, pedestrian crossings and street corners) for short periods of time before dispersing, therefore the level of footpath congestion in Adelaide Street is considered relatively low with generally free-flowing pedestrian movement. In the afternoon peak hour, congestion occurs at a number of bus stop locations that conflicts with pedestrian movement. Pedestrian conflict also occurs on a regular basis at the intersection of Adelaide Street and Edward Street. Albert Street provides service vehicle access to Queen Street Mall that can create further congestion.

Adelaide Street is designated as a principal cycle route (TMR) and a primary cycle route (Council). There are currently limited formal cycle facilities on Adelaide Street itself and cyclists experience a high level of interaction between cars and bus services on the carriageway.

**Roma Street**

The main access routes to Roma Street station are along George Street or along and across Roma Street to the south-east. A secondary access routes provides a pedestrian connection via Platform 10 to Roma Street Parkland and Albert Street. To the south George Street links the station to major employment areas. Access to George Street is possible only by crossing Roma Street by an at-grade signalised crossing at Makerston Street, jaywalking ‘mid-block’, or by utilising the existing overbridge.
Roma Street is the main access route west of the station (including the areas around Petrie Terrace and Caxton Street) as well as land uses immediately east of the station including around King George Square. While lightly used in general, this route is heavily used during events at Suncorp Stadium. This route is relatively unattractive as it is flanked by car parks, busy roads and rail/busway bridges, with no shelter/shade and with narrow footways (less than two-metre effective width in sections).

6.3 Proposed operational impacts

This section describes forecast transport changes from Brisbane Metro in its opening year (represented by 2021 transport model year) compared to the situation without Brisbane Metro and operations 10 years after opening (represented by 2031 transport model year) with Brisbane Metro. The operational benefits and impacts are based on a proposed bus and Brisbane Metro network which is yet to be agreed with TransLink and customers.

Bus operations

Key features of the proposed bus network in the city core, with Brisbane Metro in operation include:

- a reduction in the number of local and connector type services from the south-east via the South East busway
- frequent West End route (BUZ, CityGlider) will continue to serve Cultural Centre station (using the Cultural Centre bus stops) and Adelaide Street
- frequent South East Busway (BUZ) services will still proceed to and terminate at QSBS
- frequent busway routes 61 (Maroon CityGlider) and 222 (BUZ) will continue to serve Cultural Centre, King George Square and Roma Street stations along with Metro 1 and Metro 2 services
- frequent (BUZ and CityGlider) services from the north-west will continue to serve Roma Street and King George Square stations
- all commencing services to the north and west will be removed from Cultural Centre station and Victoria Bridge and will instead terminate and commence in the southern/eastern CBD
- a range of peak-only 'Rocket' (express) services will continue to operate and predominantly serve the south-eastern part of the CBD to provide a more direct journey for this major employment precinct, in peak times.

These changes in bus operations will in some cases result in different travel patterns and levels of station activity at the city core stations. These changes and the related impacts on station operations are described in the following sections.

6.3.1 Regional transport changes

Busway travel times and reliability

Without Brisbane Metro, the bus network is expected to become increasingly congested during peak periods, due to increasing customer demand and additional services attempting to travel on constrained links and stations. This is expected to result in bus journey times, including dwell times at stations, becoming increasingly variable, leading to unreliable operations for some customers and operators. This means that during peak periods, some customers will increasingly be unable to rely on their bus service to arrive at their destination in a consistent timeframe, while bus operators will find it increasingly difficult to manage the variability of journey times.

Brisbane Metro will reduce average travel times and variability for modelled years compared to the scenario without Brisbane Metro. Specifically, Brisbane Metro is forecast to result in:

- substantial reductions in mean travel times in the peak direction (refer to Figure 6.7), e.g. the journey from King George Square station to Buranda station outbound in the afternoon peak hour is expected to be around 10 minutes faster with Brisbane Metro
significant improvements in the variability of journey times, e.g. in 2021 the arrival time at Buranda station from King George Square station via the busway in the afternoon peak hour is expected to reduce from between 13 minutes and 34 minutes (without Brisbane Metro) to between eight and 10 minutes (with Brisbane Metro) (refer to Figure 6.8).

Figure 6.7: Forecast change in mean peak hour travel time in 2021

Figure 6.8: Forecast change in variability of peak hour travel time in 2021

Arrival time at King George Square from Buranda—2021
Via Busway 7.30am-8.30am

Arrival time at Buranda from King George Square—2021
Via Busway 4.30pm-5.30pm

19 Brisbane Metro busway Vissim model 2017
20 Brisbane Metro busway Vissim model 2017
Overall, Brisbane Metro will significantly improve travel times on key sections of the busway compared to the scenario without Brisbane Metro. This principally results from reduced station delays, with significant reductions in queuing forecast on station approaches, and elimination of intersection delays at critical at-grade intersections. These travel time improvements will be further strengthened by significant reductions in travel time variability currently experienced, and which are forecast to worsen.

These benefits will be experienced by Brisbane Metro customers as well as customers of the wider public transport network, with modelled travel time and variability improvements also accruing to retained bus services on the same inner city sections of the busway.

**Accessibility**

Brisbane Metro will improve travel time on the busway leading to faster journeys and improved accessibility to jobs, education and other destinations. In 2031, around 40,000 additional people are expected to be within 30-minute public transport travel time of CBD (refer to Table 6.7). Further, an additional 135,000 people are expected to be within 30-minute public transport travel time of UQ with Brisbane Metro compared to without Brisbane Metro. Some of this large increase is due to a number of inner northern suburbs shifting from being a few minutes over 30-minute public transport travel time without Brisbane Metro to under 30 minutes with Brisbane Metro.

A greater number of customers within the inner 10 kilometres will also be able to access the CBD within 30 minutes in the morning peak period in 2031 with Brisbane Metro, compared to without Brisbane Metro (refer to Figure 6.9). With around 266,000 jobs, representing 15% of the Brisbane’s Statistical Division’s total employment, located within 800 metres of a metro station in 2031, Brisbane Metro will provide significantly improved access and public transport capacity to the city’s key employment hubs.

### Table 6.7: People within 30-minute travel time of destinations – 2031 morning peak period

<table>
<thead>
<tr>
<th>Destination</th>
<th>Number of people (morning peak period – 2031)</th>
<th>Without Brisbane Metro</th>
<th>With Brisbane Metro</th>
<th>Difference (number)</th>
<th>Difference (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roma Street</td>
<td>690,000</td>
<td>710,000</td>
<td>20,000</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>CBD (GPO)</td>
<td>635,000</td>
<td>675,000</td>
<td>40,000</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>South Brisbane</td>
<td>625,000</td>
<td>655,000</td>
<td>30,000</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Buranda</td>
<td>725,000</td>
<td>775,000</td>
<td>50,000</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Upper Mt Gravatt</td>
<td>585,000</td>
<td>620,000</td>
<td>35,000</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>University of Queensland</td>
<td>480,000</td>
<td>615,000</td>
<td>135,000</td>
<td>28</td>
<td></td>
</tr>
</tbody>
</table>

Note: 30-minute travel time is for in-vehicle public transport time

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21 Brisbane Metro Transport Model (2017)
Connectivity and integration

Brisbane Metro will improve connectivity through the creation of a more connected public transport network, introducing better transfer opportunities between metro, bus and rail. The significance of the integration of Brisbane Metro and the rail network is demonstrated in Figure 6.10. In particular, this shows how rail customers (shown in red) from the Ipswich/Springfield Line from the west and northern rail lines (both via Fortitude Valley station or the proposed CRR Exhibition station) will interchange at Roma Street station, to access destinations along the Brisbane Metro corridor.

Increased interchange between Metro 2 with the proposed CRR project and the Cleveland and Beenleigh lines at Boggo Road station will also be a key outcome, demonstrating the improved connectivity with the rail network to major destinations such as the UQ and the PA Hospital precinct. Figure 6.10 also shows the connectivity of Brisbane Metro with the bus network where it feeds into Brisbane Metro on the Inner Northern Busway, South East Busway and the Eastern Busway.

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22 Brisbane Metro Transport Model (2017)
Transport demand and mode share

Total trips across the Brisbane Statistical Division are forecast to increase from 7.8 million per day in 2016 to approximately 9.8 million trips per day in 2031. This represents growth of 27% or an average of 1.6% per annum.

Growth in public transport travel is forecast to outstrip growth in private car travel, due to forecast increases in road congestion coupled with higher costs of motoring (e.g. parking and tolls). Between 2016 and 2031, the public transport task is forecast to grow by an additional 460,000 trips to 1,029,000 trips per weekday, an increase of 81%. Growth in bus travel is forecast to be particularly strong to 2021, and is expected to continue to grow at a steady rate beyond this time (refer to Figure 6.11). Part of the forecast growth in rail beyond 2021 can be attributed to the future implementation of ETCS and the proposed CRR project.

23 Brisbane Metro Transport Model (2017)
Brisbane Metro will have beneficial impacts on travel demand across the whole Brisbane Statistical Division. Changes to weekday travel demand across the Brisbane Statistical Division resulting from Brisbane Metro, compared to without Brisbane Metro, include:

- an additional 23,000 public transport trips in 2031 expected to be made each weekday (+2.0%)
- by 2031 car driver and passenger trips are expected to reduce by 14,000 each weekday (-0.2%)
- a further increase in daily public transport mode share
- mode share change by 2031 due to Brisbane Metro is expected to increase passenger public transport kilometres by an additional 4.5% in 2021 and 3.6% in 2031.

Other forecast changes across the Brisbane Statistical Division for rail, bus and metro trip characteristics with and without Brisbane Metro are also summarised as follows.

- Strong growth in Brisbane Metro users/boardings is forecast, increasing from 95,000 in 2021 (the year of opening) to over 120,000 per day in 2031 (10 years after opening).
- An overall increase in total weekday public transport users/boardings is forecast to increase between 2016 and 2031 from 88% without Brisbane Metro to 102% with Brisbane Metro.
- When Brisbane Metro and buses are considered together, growth in morning peak hour users/boardings from 2016 to 2031 are forecast to be 88% compared to 57% without Brisbane Metro. On a weekday basis, user growth is forecast to be 81% for Brisbane Metro and bus combined compared to 58% without Brisbane Metro.
- The number of weekday rail users/boardings is forecast to increase from 203,500 in 2016 to 500,000 in 2031 with the implementation of ETCS and proposed CRR project, driven by strong demographic growth in greenfield development areas and regional travel which is not significantly impacted with Brisbane Metro.

This indicates that both rail and bus users/boardings will significantly increase in a complementary way, resulting in greater overall public transport mode share.

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Bus and metro operations and service kilometres

Brisbane Metro will include a range of bus network changes, resulting in more suburban buses interchanging outside of the inner city and connecting to metro, busway and railway stations. These will be supplemented with additional capacity on Brisbane Metro services, existing frequent bus routes (e.g. BUZ, CityGlider) and new frequent routes, increasing public transport capacity and choice of destinations in the inner city. This will allow reallocation of some kilometres saved through interchange to the suburban bus network providing higher service frequencies over a longer span of hours for key complementary corridors.

Network changes with Brisbane Metro, along with improved travel times and better scheduling reliability, will result in better bus fleet utilisation and lower cost per customer kilometre travelled.

Changes in private car travel

Road congestion is an important driver of future public transport mode share and demand. Forecast growth in traffic highway conditions without Brisbane Metro shows a significant worsening of road congestion during the peak period across most of the network, particularly to 2031.

The impact of this worsening traffic congestion, coupled with other costs of motoring (e.g. CBD parking and tolls) is expected to encourage a further shift to public transport modes. With Brisbane Metro, travel by car in the peak period is forecast to decrease with an overall increase in public transport mode share during the peak periods (as well as on a daily basis). This mode shift provides network-wide travel time saving benefits to all users of the surface road network with a large number of users experiencing small congestion improvements. There will also be some congestion relief due to removal of buses from constrained CBD streets.

Forecast private and commercial vehicle user benefits can be summarised as follows.

- Vehicle travel time savings: with Brisbane Metro, average vehicle travel times are forecast to be faster compared to the without Brisbane Metro case. Brisbane Metro provides forecast benefits compared to without Brisbane Metro, with most of the benefit experienced by motorists travelling in the same corridors as Brisbane Metro as this is where some motorists may change mode to travel by metro or bus.
- Vehicle operating cost savings: Brisbane Metro will enable higher average speeds due to less peak congestion in some corridors as a result of the diversion from car to public transport and a reduction in buses on CBD streets.
- Road crash cost savings: road crashes and their average costs vary by vehicle kilometres travelled and the type of road (motorway, arterial, local). Furthermore, the type of crash also varies by the speed of traffic and vehicle. The forecast reduction in vehicle kilometres travelled on the network when Brisbane Metro is in place, is expected to result in a reduction in road crashes.

Whilst the forecast travel time improvements are minor, the large number of vehicles benefiting from the improvement provides a substantial benefit to the community.

6.3.2 Changes to performance of stations in the study area

This section describes the changes and the related impacts and benefits of Brisbane Metro to stations within the study area. Transport changes within the city core area are discussed in section 6.3.3. A high-level description of Brisbane Metro and the bus network and services is provided in Chapter 5.

Brisbane Metro will provide high-frequency services at existing busway stations along the alignment. For some stations, this will include a service in the morning peak period every 20 to 30 seconds on average, while other stations will include a service about every minute on average. This increased frequency, the attractiveness of Brisbane Metro more generally, and related network changes are forecast to increase station activity (i.e. boardings and alightings) during the morning peak period across existing stations.

Customer crowding on platforms is expressed as a level of service (LOS) ranging from A (least crowded) to F (most crowded) (refer to Figure 6.12). A maximum density of customers on the platform equating to LOS B/C (i.e. 0.93 square metres per person) was adopted as the target for this assessment, based on international
planning guidelines. Assessments of customer crowding on platforms indicated that the forecast increases in station activity is expected to be accommodated by the existing platform widths and proposed extensions, with stations expected to achieve the targeted LOS within the existing platform widths.

Figure 6.12: Pedestrian level of service

A number of existing stations are expected to experience an increase in transfer activity, partly as a result of improved transfer opportunities for customers on other services to access Brisbane Metro destinations. These transfers will generally occur on the same platforms, allowing for simple and intuitive interchange between services, with minimal walking distance.

The following sections summarise the forecast changes in customer activity and potential impacts on customers at stations along the Brisbane Metro alignment (outside of the city core).

Rochedale to Upper Mt Gravatt

Brisbane Metro will have minimal changes to the bus network structure in this section of the alignment. In particular, current frequent routes direct to the CBD will be retained as they serve a large catchment to the south of the busway. A wide range of high performing peak express services (e.g. ‘Rocket’ services) will also be maintained, providing a direct connection to the office precinct in the eastern CBD.

Forecast changes in customer activity and the likely impacts on customers at stations in this section of the study area are described in Table 6.8, along with any other changes in access with Brisbane Metro.

Table 6.8: Changes in station activity and performance – Rochedale to Upper Mt Gravatt

<table>
<thead>
<tr>
<th>Station</th>
<th>Inbound services (morning peak hour)</th>
<th>Platform length</th>
<th>Bus and metro performance</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eight Mile Plains</td>
<td>120 (bus and metro)</td>
<td>Increase from 55 metres to 64.5 metres.</td>
<td>The station is expected to operate efficiently with minimal vehicle queues and delays on the station approach.</td>
<td>Boardings and alightings are forecast to more than double in the morning peak hour in 2021, compared to without Brisbane Metro. Transfers would account for over 70% of total forecast activity in the morning peak hour.</td>
</tr>
<tr>
<td>Upper Mt Gravatt</td>
<td>120 (bus and metro)</td>
<td>Increase from 55 metres to 64.5 metres.</td>
<td>Customers, particularly in the peak direction, are expected to experience significant reduction in average delays.</td>
<td>Boardings and alightings are forecast to increase by about 18% in the morning peak hour in 2021 (compared to without Brisbane Metro). Interchange activity is expected to remain at around 30% of total station activity.</td>
</tr>
</tbody>
</table>

Mt Gravatt to Greenslopes

Forecast changes in customer activity and the likely impacts on customers at stations between Mt Gravatt and Greenslopes are described in Table 6.9, along with any other changes in access.

Table 6.9: Changes in station activity and performance – Mt Gravatt to Greenslopes

<table>
<thead>
<tr>
<th>Station</th>
<th>Inbound services (morning peak hour)</th>
<th>Platform length</th>
<th>Bus and metro performance</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Griffith University</td>
<td>180</td>
<td>Increase from 55 metres to 84.5 metres.</td>
<td>Reduction in average delays are expected to be experienced by customers, particularly in the peak direction.</td>
<td>A forecast uplift in station activity of around 50% in the morning peak hour with total boardings/alighting at around 2800. Transfers are forecast to rise to around 1800 (with Brisbane Metro) and account for over 60% of total activity in the morning peak hour.</td>
</tr>
<tr>
<td>Holland Park West</td>
<td>60</td>
<td>No change from existing.</td>
<td>The station is expected to operate efficiently with negligible delays for vehicle approaching or travelling through the station.</td>
<td>A forecast uplift in total boarding/alighting activity from around 600 to 900 customer movements, in the morning peak hour in 2021. Transfer activity is currently negligible and not expected to change with Brisbane Metro.</td>
</tr>
<tr>
<td>Greenslopes</td>
<td>70</td>
<td>No change from existing.</td>
<td>The station is expected to operate efficiently with negligible delays for vehicles approaching or travelling through the station.</td>
<td>A forecast increase in boarding/alighting activity of about 50% in the morning peak hour in 2021 (i.e. from around 400 to 600 customer movements). Transfer activity at is currently negligible and not expected to change with Brisbane Metro.</td>
</tr>
</tbody>
</table>

Woolloongabba to St Lucia

Stations in this section of the Brisbane Metro alignment include Buranda, PA Hospital, Boggo Road, UQ Lakes and Woolloongabba stations. Forecast changes in customer activity and the likely impacts on customers at stations between Woolloongabba and St Lucia are described in Table 6.10, along with any other changes in access.

Table 6.10: Changes in station activity and performance – Woolloongabba to St Lucia

<table>
<thead>
<tr>
<th>Busway station</th>
<th>Inbound services (morning peak hour)</th>
<th>Platform length</th>
<th>Bus and metro performance</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buranda</td>
<td>160</td>
<td>Lengthened from 55 metres to 84.5 metres.</td>
<td>Average delays in the northbound direction during the morning peak, are expected to reduce significantly. An improvement is also forecast in the outbound direction in the afternoon peak resulting in a noticeable reduction in queues of buses approaching the station.</td>
<td>Forecast uplift in station activity of around 70% associated with transfers, which are forecast to more than double to 1500 boardings/alightings. This relates to proposed bus network changes, which will increase transfer opportunities at Buranda station from local and connector services. Transfer activity will occur on the same platform or between street level and busway platform level (via stairs or lift).</td>
</tr>
<tr>
<td>Busway station</td>
<td>Inbound services (morning peak hour)</td>
<td>Platform length</td>
<td>Bus and metro performance</td>
<td>Activity</td>
</tr>
<tr>
<td>----------------</td>
<td>--------------------------------------</td>
<td>----------------</td>
<td>--------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>PA Hospital</td>
<td>70 (inbound to UQ)</td>
<td>No change from existing.</td>
<td>The station is expected to operate with negligible delays for vehicles approaching or travelling through the station. Average delays experienced by customers on board services will reduce significantly in the morning peak in the westbound direction (towards UQ).</td>
<td>This station will be a terminus for local and connector services. Forecast uplift in activity of about 80% to 1100 customer movements. This growth will primarily occur from both increased walk and cycle based trips to/from surrounding precincts (+400) and transfers (+100). With Brisbane Metro, transfers are expected to account for less than 10% of total station activity in the morning peak hour.</td>
</tr>
<tr>
<td>Boggo Road</td>
<td>80 (inbound to UQ)</td>
<td>No change from existing.</td>
<td>The station is expected to operate efficiently with negligible delays for customers on board vehicles approaching and travelling through the station.</td>
<td>Forecast increase in activity of about 300% in the morning peak hour in 2021 (i.e. from around 1000 to 4200 boardings/alightings). The largest component of this change relates to transfers, which are forecast to increase to 3500 boardings/alightings with Brisbane Metro in the 2021 morning peak hour. Transfers are forecast to account for over 80% of total station activity in the morning peak hour, with Brisbane Metro.</td>
</tr>
<tr>
<td>UQ Lakes</td>
<td>60 (inbound to UQ)</td>
<td>No change from existing.</td>
<td>UQ Lakes will continue as a terminus station with three bus and two metro bays. The station is expected to operate efficiently with reduce delays experienced by customers on board vehicles approaching and departing the station.</td>
<td>Forecast 30% uplift in station activity, from 3500 to 4500 boardings/alightings. Transfer activity is expected to remain a negligible component of station activity with Brisbane Metro.</td>
</tr>
<tr>
<td>Woolloongabba</td>
<td>60</td>
<td>No change from existing.</td>
<td>Reduced bus volumes and station activity with Brisbane Metro is expected to result in minor improvements in busway performance.</td>
<td>Overall station activity in the morning peak hour in 2021 is forecast to reduce from around 1300 to about 800 boardings/alightings associated with indicative network changes with Brisbane Metro, resulting in reduced transfers.</td>
</tr>
</tbody>
</table>

**Kelvin Grove to Herston**

Stations within the section of the Brisbane Metro alignment include Normanby, QUT Kelvin Grove, Herston and RBWH stations. Forecast changes in customer activity and the likely impacts on customers at stations in this section of the alignment are described in Table 6.11, along with any other changes in access.
Table 6.11: Changes in station activity and performance – Kelvin Grove to Herston

<table>
<thead>
<tr>
<th>Station</th>
<th>Inbound services (morning peak hour)</th>
<th>Platform length</th>
<th>Bus and metro performance</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normanby</td>
<td>80</td>
<td>No change from existing.</td>
<td>The station is expected to operate efficiently with negligible delays for customers on board vehicles approaching and travelling through the station.</td>
<td>A forecast uplift of over 50% in station activity in the morning peak hour in 2021, from 900 to 1400 boardings/alightings. Growth is expected to come from initial boardings/final alightings with transfers continuing to be a negligible component of station activity.</td>
</tr>
<tr>
<td>QUT Kelvin Grove</td>
<td>50</td>
<td>No change from existing.</td>
<td>The station is expected to operate efficiently with negligible delays for customers on board vehicles approaching and travelling through the station.</td>
<td>A forecast uplift in station activity in the morning peak hour in 2021 of about 27% (i.e. from 1500 boardings/alightings to 1900). The majority of growth is expected to come from initial boardings and final alightings with transfers representing a minor component of station activity (around 10%).</td>
</tr>
<tr>
<td>Herston</td>
<td>50</td>
<td>No change from existing.</td>
<td>The station is expected to operate efficiently with negligible delays for customers on board vehicles approaching and travelling through the station.</td>
<td>Forecast station activity at Herston station is forecast to be similar in both the with and without Brisbane Metro scenarios, with around 300 boardings/alightings. Transfers are also expected to remain a small component of activity.</td>
</tr>
<tr>
<td>RBWH</td>
<td>80</td>
<td>No change from existing.</td>
<td>The station is expected to operate efficiently with negligible delays for customers on board vehicles approaching and travelling through the station.</td>
<td>A forecast increase in boardings/alightings by almost 90% from 2100 (without Brisbane Metro) to 3900 (with Brisbane Metro). Transfers are forecast to be a significantly higher proportion of station activity compared to without Brisbane Metro, increasing to 1200 boardings/alightings with Brisbane Metro, an increase of 1000 transfer movements. Customers transferring to a high-frequency metro or bus service to continue to the CBD, Fortitude Valley or South Brisbane will benefit from simple and easy, same platform transfers opportunities.</td>
</tr>
</tbody>
</table>

The assessment of stations in the study area (not including those in the city core) illustrates that demand for bus and metro services will generally increase at each station compared to without Brisbane Metro. The operation of services will generally be improved (as evidenced through shorter delays and queues at stations) and platform lengths are expected to adequately cater for the passenger demand.

6.3.3 City core transport changes

This section provides an overview of potential impacts and benefits within the city core from the operation of Brisbane Metro.

Travel demand and mode share

Brisbane Metro is forecast to have more public transport customer trips to the city core in the morning peak hour in 2031, compared to the scenario without Brisbane Metro. In particular, the increase in public transport mode share with Brisbane Metro is forecast to drive a six per cent increase in public transport customer trips to the city core in 2021. By 2031 (with Brisbane Metro) the overall increase in public transport customer trips into the city...
core are forecast to be 89% compared to 2016. Figure 6.13 illustrates the forecast public transport demand into the city core during the morning peak hour (7.30am-8.30am), including the annual growth rate.

The breakdown of trips into the city core is shown in Figure 6.13. This shows the current significance of rail and bus for travel in the morning peak hour. Rail mode share is forecast to grow to over 50% by 2031 driven by the implementation of ETCS, proposed CRR project and additional service growth across the entire rail network.

Figure 6.13: Morning peak hour trips into the city core by mode

Change in bus volumes

Brisbane Metro will reduce the volume of buses entering the city core in the morning peak hour (at the year of opening) compared to current day operations, with significant reduction in the number of buses accessing the CBD on the South East Busway and several CBD streets. In particular, approximately 90 fewer buses are expected to enter the city core at Woolloongabba from the South East Busway corridor in the morning peak hour in 2021, while round 35 fewer services will also enter the city from the north via RBWH compared to without Brisbane Metro.

This will contribute to reduced bus-related congestion on specific routes entering the CBD, including Victoria Bridge and Captain Cook Bridge. This will also support improved CBD access and amenity. A reduction in buses in the city core will also have beneficial impacts on operational efficiency for the wider bus network through improved journey time reliability, resulting in better schedule adherence for operators and reduced requirements for additional bus fleet to serve an otherwise increasingly long and unreliable peak journey time.

Station activity and performance

This section presents an overview of changes to station activity and performance of the busway for stations in the city core. Figure 6.14 shows changes in the transport task at city core bus stations with and without Brisbane Metro. Significant increases in activity at Roma Street and King George Square stations are forecast with Brisbane Metro. At other stations, Brisbane Metro will result in a general increase for metro and bus customers that travel to the city core.

26 Brisbane Metro Transport Model (2017)
Forecast changes in customer activity and the likely impacts on customers at stations in this city core are described in Table 6.12 for South Brisbane and Table 6.13 for stations in the CBD. Further growth in jobs and population between 2021 and 2031 is also expected to see continued patronage growth at most busway stations (refer to Figure 6.15). Patronage at King George Square station is forecast to plateau, in part due to the introduction of the proposed CRR project between 2021 and 2031 as rail caters for a greater proportion of growth in the CBD transport task over this period.

Figure 6.14: Morning peak hour city core station customer activity (bus and metro) (2021)

Figure 6.15: 2021 and 2031 weekday city core station customer use (bus and metro)

27 Brisbane Metro Transport Model (2017)
28 Brisbane Metro Transport Model (2017)
Table 6.12: Changes in station activity and performance – South Brisbane

<table>
<thead>
<tr>
<th>Station</th>
<th>Description</th>
</tr>
</thead>
</table>
| Mater Hill                  | • In the year of opening over 110 inbound bus and metro services will serve the station in the morning peak, or a bus every 30 to 40 seconds on average. This includes the Metro 1, Metro 2 and frequent (BUZ and Glider) services.  
                               • Brisbane Metro is forecast to lead to station activity (boardings/alightings) increasing by almost 40% from 1900 without Brisbane Metro to 2600 boardings/alightings with Brisbane Metro. Transfers are forecast to remain a relatively minor component of station activity (i.e. around 20%) reflecting the unchanged function of the station as a destination for surrounding employment uses.  
                               • Microsimulation modelling shows that the station is expected to operate efficiently with Brisbane Metro, substantial improvements in average delays experienced by customers on board services heading northbound through Mater Hill station in the morning peak and southbound in the afternoon peak (e.g. delays are forecast to reduce by over 100 seconds northbound in the morning peak and over 30 seconds southbound in the afternoon peak). This is the result of minor station lengthening and a range of network changes and is reflected through a significant reduction in bus queues.  
                               • Assessment of customer crowding undertaken for this assessment shows that the existing 4.9 metre wide platforms, lengthened from 45 metres to 50 metres is expected to sufficiently accommodate the forecast changes in activity within a target pedestrian queueing LOS of B to C.                                                                                                                                                                                                                                                                                                                                                   |
| South Bank                  | • In the year of opening, over 110 inbound bus and metro services will serve South Bank station in the morning peak hour, equating to a service every 30 to 40 seconds on average. This includes the Metro 1 and Metro 2 services as well as frequent (BUZ and Glider) services.  
                               • Brisbane Metro is forecast to increase boardings/alightings at South Bank station from 2900 without Brisbane Metro to 4200 with Brisbane Metro (i.e. 45%). Transfers are expected to remain a negligible component of station activity.  
                               • Microsimulation modelling that at the opening of Brisbane Metro, the station is expected to operate efficiently with reduced delays and bus queues approaching the station in both directions during peak periods (e.g. delays reduce by almost 60 seconds northbound in the morning peak and by almost 30 seconds southbound in the afternoon peak). These are associated with a range of network changes and more efficient operations.  
                               • Assessment of customer crowding shows that the existing 4.9 metre wide platforms, are expected to be sufficient to accommodate the forecast changes in activity within a target pedestrian queueing LOS B to C.                                                                                                                                                                                                                                                                                                                                                                                                 |
| Cultural Centre (underground station and surface bus stops) | • With Brisbane Metro, the underground Cultural Centre station platform will serve frequent South East Busway services including Metro 1 and Metro 2, Maroon Glider and BUZ services. New surface level bus stops at Melbourne Street will serve West End to City and Fortitude Valley services.  
                               • In the year of opening, over 110 inbound services will serve the new underground station platform in the morning peak hour, equating to a bus or metro every 30 to 40 seconds on average, while around 30 inbound buses will serve the surface bus stops.  
                               • Total station activity in 2021 with Brisbane Metro (both underground station and surface bus stops) is forecast to increase slightly compared to without Brisbane Metro (+9%) from 3900 to 4300 boardings/alightings in the morning peak hour. This is despite a minor reduction (-8%) in transfers, from 1800 without Brisbane Metro to 1700 with Brisbane Metro due to wider network changes associated with the project.  
                               • The new underground Cultural Centre station will provide beneficial impacts for customer amenity and safety for the South East Busway through the provision of a modern station, with a climate controlled environment with platform screen doors.  
                               • The new surface bus stops will provide improved customer amenity for customers of West End to City and Fortitude Valley services, with significantly reduced levels of crowding and better integration of the bus stops within the public realm. Removal of bus platforms and shelters from the existing Cultural Centre station will provide additional public realm space in the heart of the Cultural Centre precinct.  
                               • Microsimulation modelling shows that with Brisbane Metro, average delays experienced by customers on services through the new underground Cultural Centre station are expected to improve in both directions during peak periods compared to without Brisbane Metro. The most significant changes are forecast to occur in the afternoon peak hour outbound, with delays reducing from over two minutes (without Brisbane Metro) to around 10 seconds on average (with Brisbane Metro). This is expected to result in a fundamental reduction in queues on the approach to the station, particularly in the afternoon peak outbound. Furthermore, no delays or queues have been forecast for buses entering and departing the surface bus stops. |
Assessment of potential customer crowding showed the proposed underground platform and bus stop widths are expected to be sufficient to accommodate the forecast changes in activity within a target pedestrian queueing LOS B/C. Analysis using a Legion pedestrian model also found that in the critical afternoon peak period in 2031, the underground platforms comfortably accommodate the forecast boardings/alightings, including waiting customers at an average density in the peak 15 minutes at LOS A (i.e. ‘free circulation’) (refer to Figure 6.16). The analysis also found that stairs and escalators accessing the underground station experience localised areas of LOS B/C, however overall the station is expected to operate within capacity. Pedestrian circulation in and around the surface stops is also good with no forecasts congestion or constraints.

Figure 6.16: Cultural Centre platform level pedestrian density – 2031 afternoon peak 15 minutes

<table>
<thead>
<tr>
<th>Station</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>King George Square</td>
<td>With Brisbane Metro, the existing 130-metre-long King George Square station platforms will be reconfigured into two independently operated zones (lead stops), including one for Brisbane Metro services and another for other bus services.</td>
</tr>
<tr>
<td></td>
<td>In the year of opening, over 100 services in the peak direction (40 metro and over 60 bus) will serve the station, representing a bus or metro every 30 to 40 seconds on average. This includes the Metro 1 and Metro 2 services, as well as the existing Maroon CityGlider and frequent (BUZ) services.</td>
</tr>
<tr>
<td></td>
<td>Brisbane Metro is forecast to increase station activity (boardings/alightings) by almost 120%, from 5700 to 12,400 boardings/alightings. By far the largest component of this increase is expected to be associated with transfers, which increase from 1500 to 5300 (+250%). Initial boardings and final alightings (to/from the surrounding precinct) are forecast to increase from 4200 to 7100 boardings/alightings (+70%).</td>
</tr>
</tbody>
</table>
|                  | Compared to without Brisbane Metro, in 2021, transfers are expected to account for over 40% of total (busway) station activity in the morning peak hour with Brisbane Metro, compared to around 25% without Brisbane Metro. This change reflects the more connected public transport network provided by Brisbane Metro and redistribution of some transfers currently occurring at Cultural Centre station to other stations (e.g. King George Square and Roma Street stations). For example, this will allow customers from the south-east who are travelling to the

![Diagram](https://via.placeholder.com/150)

Table 6.13: Changes in station activity and performance – CBD
The assessment of activity and performance for stations in the city core shows that passenger demand is expected to be more evenly spread compared to without Brisbane Metro, resulting in an improved customer experience. The assessment also showed that:

- there will be significant increases in passenger activity at Roma Street and King George Square stations
- pedestrian congestion associated with the existing Cultural Centre station will be relieved by the new underground station
- all city core stations will have an appropriate passenger LOS.
Rail operations

Brisbane Metro will support the rail network and its operations in the city core. Forecast rail patronage at city core stations was analysed for the morning peak hour in 2016, 2021 and 2031 with and without Brisbane Metro. This included the proposed CRR project stations at Albert Street and Roma Street in 2031. The analysis found that Brisbane Metro will generally result in a negligible change to rail patronage forecast, however some minor localised changes are expected to occur as customers redistribute between rail, bus and metro modes within the city core.

- Rail patronage will reduce by around 11% at South Brisbane railway station and 22% at South Bank railway station in the morning peak hour in 2021 for Brisbane Metro compared to without Brisbane Metro. This is a result of reduced travel times and high service frequencies at the Cultural Centre and South Bank stations, resulting in some rail customers finding it more beneficial to transfer to Brisbane Metro to access destinations near these stations.
Additional transfer activity will occur between modes at Roma Street station, due to improved interchange opportunities between metro, bus, rail (all lines including the proposed CRR project), resulting in a small change in total rail patronage at this station.

Road network and performance

Brisbane Metro will include a number of road network changes at South Brisbane, Victoria Bridge and North Quay/Adelaide Street. Proposed road changes at South Brisbane are shown in Figure 6.19 and include:

- reconfiguration of the Melbourne Street and Grey Street intersection to reduce intersection size and create a scramble crossing for pedestrians; provide one straight ahead lane in each direction on Grey Street; remove turns from Grey Street to Melbourne Street; remove the straight ahead movement along Melbourne Street to Victoria Bridge for general traffic
- removal of the bus contraflow arrangement on Melbourne Street between Merivale and Grey Streets including the bus cross-over movement at the intersection of Melbourne and Merivale Streets
- Melbourne Street will be for buses only between Grey and Hope Streets with one lane provided in each direction
- surface bus stops (inbound and outbound) will be located on Melbourne Street between Grey and Hope Streets with the removal of bus stops from the existing Cultural Centre station
- removal of signals at the Melbourne Street and Hope Street intersection and reconfiguration of the intersection to left-in only
- closure of the existing Melbourne Street busway portal
- closure of the Melbourne and Stanley Streets intersection to general traffic, with the exception of authorised service vehicles, and conversion of Stanley Street to a cul-de-sac.

Proposed changes to Victoria Bridge, and on the north side of the Brisbane River are shown in Figure 6.20. They include:

- removal of general traffic from Victoria Bridge, with the bridge dedicated to metro, buses, pedestrians and cyclists only
- amendments to the intersection of Victoria Bridge/QSBS portal/North Quay/Queens Wharf Road/William Street to support changes to Victoria Bridge, with buses no longer accessing QSBS from Victoria Bridge along with the provision of a pedestrian scramble crossing at the William Street/QSBS node
- closing the intersection of North Quay and Adelaide Street to through traffic to allow for a dedicated corridor for Brisbane Metro and bus services, with traffic accessing the development at 300 George Street via a left-turn into Adelaide Street
- restricting the intersection of North Quay, William Street and Queens Wharf Road to local traffic only, and maintaining access for traffic entering or exiting the Brisbane Square car park
- continuation of split phase arrangements at William Street and Elizabeth Street signals established as a temporary arrangement for Queen’s Wharf Brisbane, to allow buses to turn left from the Riverside Expressway northbound off-ramp to access QSBS.

The model also includes road network changes proposed by other projects, such as the closure of parts of Albert Street between Elizabeth Street and Mary Street from 2021 onwards to support construction of the proposed CRR project Albert Street station. It is assumed that William Street will be re-opened to two-way traffic by 2023.
Figure 6.19: Brisbane Metro – road network changes (south)
Figure 6.20: Brisbane Metro – road network changes (north)
The change in traffic patterns and transport conditions from the closure of Victoria Bridge along with other Brisbane Metro road changes and changes for the proposed CRR project and Queen’s Wharf Brisbane, were assessed using SATURN mesoscopic and Vissim microscopic traffic modelling software. Without Brisbane Metro, Victoria Bridge will serve mainly local trips between West End, South Brisbane and the CBD/Fortitude Valley, which is in line with its status as a ‘district’ access road, the fourth level in the road hierarchy. The following summarises the impacts and benefits of Brisbane Metro in relation to the road network in the city core.

- With Brisbane Metro and other proposed traffic changes, traffic from Victoria Bridge and North Quay will divert to alternative routes including William Jolly Bridge, Go Between Bridge and Captain Cook Bridge. William Jolly Bridge will cater for the largest share of diverted traffic, with Go Between Bridge also attracting some drivers. Minor changes only are forecast to traffic volumes on Captain Cook Bridge and Story Bridge.

- In South Brisbane, traffic volumes are forecast to increase on Peel Street and decrease on Grey Street, while north of the river, traffic volumes will increase on Roma Street in both peaks, while North Quay, William Street and Ann Street are reduced.

- Compared to the existing condition there will be a forecast an increase in average intersection delay at some intersections including Grey Street/Peel Street and Peel Street/Merivale Street, Roma Street/Countess Street and Upper Roma Street/Skew Street.

- With Victoria Bridge closed to general traffic, the eastern end of Melbourne Street will have a lower order function, carrying trips between South Bank and West End, as well as providing access to the B Cec and properties on Hope Street and Fish Lane. Closing this section of Melbourne Street to general traffic will result in a diversion of South Bank-West End trips to Montague Road, Glenelg Street and Russell Street, while local access traffic will use Cordelia and Merivale Streets instead of Grey Street. The volumes affected are expected to be low (50 to 70 vehicles per hour eastbound and 80 to 90 vehicles per hour westbound) and will be redistributed across multiple routes. Thus, other than the reduced delays at Grey and Melbourne Streets achieved by simplifying the intersection, no significant impact is forecast on the surrounding road network.

- The amendment of the intersection of Hope and Melbourne Streets to left-in only will require all traffic to exit Hope Street via Peel Street.

Minor intersection reconfiguration improvements are proposed to help address increased traffic volumes (associated with traffic diverted from Victoria Bridge to William Jolly Bridge) at Grey Street/Peel Street and Peel Street/Merivale Street, Roma Street/Countess Street and Upper Roma Street/Skew Street. The performance of intersections within the microsimulation model area has been assessed with the morning peak hour assessment shown in Figure 6.21 and the afternoon peak hour assessment illustrated in Figure 6.22.

The performance is measured as a shift in LOS which is a measure of average intersection delay.

- In the morning peak hour in 2021 (i.e. year of opening), there are forecast to be improvements to delay and level of service at a number of intersections or little change in performance compared to without Brisbane Metro. This is due to reduced traffic volumes associated with the closure of Victoria Bridge, Melbourne Street (between Grey Street and Hope Street) and a section of North Quay to general traffic (between Adelaide Street and Elizabeth Street).

- In the afternoon peak hour in 2021 (i.e. year of opening) some minor increases in delay (typically around 10 seconds) are forecast on Cordelia Street and Merivale Street but the intersections on this corridor are forecast to still generally operate at satisfactory LOS of C/D or better. An increase in delay at Roma Street and Countess Street will result in this experiencing LOS E (i.e. average delay less than 80 seconds). Further investigation of signal operational measures are recommended in this location to mitigate some of this additional delay.

With several minor intersection improvements around Peel Street and Upper Roma Street, the traffic changes proposed as part of Brisbane Metro are not forecast to result in an increase in average delay across the microsimulation model area. Relatively minor increases in delay at some intersections will effectively be offset by reduced delays at other intersections as traffic redistributes to other routes, times periods or modes.
Notes:
Graphic shows detailed model coverage area only (which excludes Captain Cook Bridge, Riverside Expressway and Coronation Drive).
Red dots indicate reduced LOS or increased delay, while green dots represent improved LOS or reduced delay through that intersection.
Letters indicate the forecast LOS and numbers indicate the change in delay. A = average delay less than 10 seconds, B = average delay less than 20 seconds, C = average delay less than 35 seconds, D = average delay less than 55 seconds, E = average delay less than 80 seconds, F = average delay greater than 80 seconds

Brisbane Metro Vissim traffic model
Brisbane Metro Vissim traffic model
Vehicle access and parking

Brisbane Metro maintains access to properties and off-street car parks near the alignment, for cars and service vehicles, however, changes will be required to access routes to some properties at the Cultural Centre precinct and Adelaide Street/North Quay.

Cultural Centre precinct

Key changes to vehicle routes within the Cultural Centre precinct include:

- closure of Victoria Bridge and the section of Melbourne Street between Grey Street and Victoria Bridge to general traffic
- closure of access between Stanley Street and Victoria Bridge/Melbourne Street and conversion of Stanley Street to a cul-de-sac
- closure of Melbourne Street between Grey and Hope Streets to general traffic
- traffic signals removed from the intersection of Melbourne and Hope Streets and traffic movements restricted to left-turn only from Melbourne Street to Hope Street requiring Hope Street to be signed at its intersection with Peel Street as a no through route, a cul-de-sac arrangement for cars will be provided and service vehicles (e.g. waste collection trucks) required to do a three point turn or exit via Fish Lane, noting that Fish Lane has a 4.4 metre height restriction towards Grey Street
- service vehicles will continue to exit the BCEC loading dock to Melbourne Street
- the access (entrance only) to the BCEC car park on Melbourne Street will be closed. Alternative and convenient access is available to this car park via Russell Street from both Grey Street and Merivale Street.

These changes will affect the way some vehicles access the Queensland Cultural Centre, including to the three car parks (i.e. QPAC, Queensland Art Gallery and Queensland Museum, and the State Library of Queensland and Gallery of Modern Art car parks) (refer to Figure 6.23). No access changes are required for vehicles accessing the Cultural Centre car parks via William Jolly Bridge or Go Between Bridge/Montague Road (i.e. those typically using Stanley Place). The closure of Victoria Bridge will mean vehicles accessing car parks from the intersection of Melbourne Street/Stanley Place are required to use an alternative route via Grey Street and Stanley Place.

The existing access to and from the QPAC staff and VIP car park will be maintained from Grey Street and Stanley Street respectively, however, vehicles exiting this car park will be required to leave the precinct via the Cultural Centre tunnel and Stanley Place.

The closure of Victoria Bridge to general traffic will also change vehicle access to the Cultural Centre precinct from the CBD.
Figure 6.23: Queensland Cultural Centre parking – change in access

- Qld. State Library Car park (approx. 100 bays)
- Cultural Precinct total car parking capacity of around 1,000
- Qld. Art Gallery and Museum Car Park (approx. 410 bays)
- QPAC Car Park (approx. 410 bays)
- QPAC staff and VIP parking exit
- QPAC staff and VIP parking entry
- Melbourne Street pedestrian tunnel removed
- Melbourne Street pedestrian access between QPAC and Qld Art Gallery and Museum
- Alternative pedestrian route between QPAC and Qld Art Gallery and Museum
- BCEC service vehicle exit remains open and car park entrance closed
- Stanley Street closed at Victoria Bridge entrance
- Stanley Street entry/exit from QPAC car park via Stanley Place and Cultural Centre tunnel only
- All Cultural Centre precinct car parks enter/exit via Stanley Place, Qld. Art Gallery and Museum car park can exit onto Grey Street
- Hope Street – no through route with vehicles to exit via Peel Street or Fish Lane
- Encourage greater use of Grey Street exit from Qld. Art Gallery and Museum Car Park
- Hope Street left in only from Melbourne Street

LEGEND

- Metro on Existing
- Metro on Surface
- Bridge Structure
- Transition Structure
- Tunnel/Underpass
- Metro/Bus Platform
- Surface Roadworks
- Cycle Lane
- Pedestrian Precinct
The removal of the Melbourne Street connection to Stanley Street will require all car park trips to use Stanley Place and the Cultural Centre tunnel. Potential impacts from this change such as increased queuing and delays at the intersections of Stanley Place/Cultural Centre tunnel and Stanley Place/Grey Street/Peel Street will be managed with a minor change to the Grey Street and Peel Street intersection to provide additional storage capacity for exiting vehicles. For events at the Cultural Centre, there is potential for some additional queuing and short-term delays if a large number of vehicles exit all three car parks in a short period of time. The implementation of management measures, in conjunction with Cultural Centre stakeholders will assist in managing potential impacts. This may include:

- increased use of the Queensland Art Gallery and Museum car park exit direct to Grey Street (in consultation and agreement with the car park operator).
- restricting the intersection of Melbourne Street and Hope Street to left-in only from Melbourne Street.

Pedestrian access will be maintained to the Cultural Centre car parks via internal stairs and elevators to Cultural Centre venues, however Brisbane Metro will remove the Cultural Centre pedestrian tunnel connecting the Queensland Art Gallery car park and QPAC. Alternative access between these facilities will be provided via the modified surface pedestrian crossing at Melbourne and Grey Streets intersection, a new at-grade pedestrian crossing beneath the Cultural Centre pedestrian bridge, or existing pedestrian accesses at Stanley Place/Cultural Centre tunnel and the pedestrian bridge.

The implementation of mitigation measures in conjunction with Cultural Centre stakeholders to improve wayfinding within the precinct will assist in managing potential impacts associated with changed pedestrian access. These will include provision of signage and information to encourage pedestrians to cross via the proposed at-grade pedestrian crossing beneath the Cultural Centre pedestrian bridge, the proposed scramble crossing of Melbourne and Grey Streets or the Cultural Centre pedestrian bridge.

Brisbane Metro will maintain access to the Cultural Centre for loading and service vehicles, and persons with disability, although some changes may be required to current movements.

- Service vehicles under 2.3 metres in height will be directed to use the Cultural Centre tunnel and Stanley Place. This may result in a minor increase in journey time for service vehicles destined for the CBD or inner northern suburbs. Access to Melbourne Street (southbound) will be maintained for service vehicles over 2.3 metres in height via a proposed shared use part of Stanley Street and under a controlled traffic arrangement.
- Short-term passenger loading bays used by persons with disability will be maintained at Grey Street. Access for persons with disability will be maintained via Stanley Place and the Cultural Centre tunnel.
- The existing bus zones on Stanley Street, immediately adjacent to Melbourne Street/Victoria Bridge, will be replaced by a bus zone near the Museum.
- Other short-term on-street loading and servicing bays will be retained on Grey Street.

Adelaide Street/North Quay

Vehicle access to properties in the vicinity of Adelaide Street and North Quay will be largely similar from most directions and include changes due to the proposed CRR project and Queen's Wharf Brisbane projects. Access changes are shown in Figure 6.24.

The following summarises changes and potential impacts with Brisbane Metro in operation.

- The closure of Victoria Bridge to general traffic will require private vehicles, taxis and service vehicles to access properties in the CBD from South Brisbane via alternative routes such as William Jolly Bridge or Captain Cook Bridge. The effects of these changes are shown in Figure 6.21 and Figure 6.22.
- Vehicle access to Brisbane Square and the development at 300 George Street (currently under construction) will be provided by left-in/left-out configuration. Vehicles exiting from 300 George Street onto Adelaide Street will be required to use George Street to access onward destinations, rather than travelling straight ahead on Adelaide Street.
• Property access on Adelaide Street between George Street and King George Square will be maintained with some rerouting:
  - vehicles coming from North Quay will access this section of Adelaide Street via Turbot Street and Edward Street
  - vehicles coming from the south will continue to access this section of Adelaide Street via George Street.

• The removal of general though traffic from North Quay will mean that vehicles accessing local destinations in the southern CBD will be required to use the Riverside Expressway/Margaret Street, Riverside Expressway/Elizabeth Street, Turbot Street/Edward Street or Turbot Street/Wharf Street.

• Brisbane Metro is not expected to have any operational impacts on pedestrian routes to car parks in the vicinity of King George Square and Adelaide Street.

Figure 6.24: Adelaide Street parking – change in access

Emergency access

Access for emergency vehicles will be maintained along the Brisbane Metro alignment. Emergency vehicles will be permitted to use Brisbane Metro infrastructure, including the new underground Cultural Centre station, Adelaide Street tunnel, bus lanes and bus only lanes, allowing most current access routes to be maintained. At Adelaide Street/North Quay, emergency vehicles will be subject to some physical access restrictions from Brisbane Metro infrastructure, such as no longer being able to proceed south along North Quay across Adelaide Street. Within the Cultural Centre precinct, emergency access to and through the precinct will be maintained with emergency vehicles permitted to cross the pedestrian zone between Stanley Street and Melbourne Street/Victoria Bridge.
Pedestrian and cycle network

The walk distance to and from a bus stop or station to a customer’s ultimate destination is an important component of a public transport trip to the CBD. A forecast\(^{31}\) of average walk distance in the city core illustrates that Brisbane Metro will not increase the walk distance to bus stops or stations and will lead to a minor decrease.

Specific changes to walk and cycle networks around the Cultural Centre precinct and Adelaide Street/North Quay precinct are summarised in the following sections.

**Cultural Centre precinct and Victoria Bridge**

A number of changes to pedestrian and cycle networks are proposed as part of Brisbane Metro in the Cultural Centre precinct and Victoria Bridge (refer to Figure 6.25). Overall, these changes are expected to improve accessibility for pedestrians and cyclists to destinations, improve connectivity around the precinct and between major locations (e.g. CBD), and improve the safety of these modes, although some may have impacts that require mitigation measures.

Figure 6.25: Cultural Centre precinct – changes to the cycle and pedestrian network

The establishment of the new Cultural Centre underground station, will significantly reduce bus (and traffic) volumes through the Melbourne Street and Grey Street intersection. This will provide the opportunity to reconfigure this intersection to remove traffic lanes and the bus slip lane and create a new scramble (all movements) pedestrian crossing. A reduction in buses through this intersection will also allow surrounding footpaths to be widened.

Changes to Melbourne Street between Grey and Merivale Streets include relocating the surface bus stops to between Grey and Hope Streets, removing the Melbourne Street busway portal and restricting Melbourne Street to buses only between Grey and Hope Streets. These changes will improve the environment for pedestrians and cyclists as illustrated in Figure 6.25. Key improvements are:

- substantial reduction in traffic volume on Melbourne Street between Merivale Street and Victoria Bridge will create a more pleasant environment for pedestrians and cyclists

\(^{31}\) Brisbane Metro project model forecast of weighted average walk distance
- increased width of cycle lanes and reduced interaction of cyclists with general traffic
- wider footpaths with cyclists able to use the footpaths or the bus lane to access the intersection of Melbourne Street and Grey Street
- removal of pedestrian barriers
- removal of the Melbourne Street busway portal will provide a continuous pedestrian pathway on the eastern side of Melbourne Street between Grey Street and the existing BCEC service vehicle driveway, supporting improved access and connectivity for pedestrians in this area
- improved pedestrian crossing of Hope Street will be achieved through removal of the traffic signals so minimising the pedestrian wait time to cross Hope Street.

These changes will provide better access between the South Brisbane railway station, new underground Cultural Centre station and surface bus stops, and improve pedestrian access and amenity to, from and through the precinct for a large number of pedestrians.

A Legion pedestrian simulation analysis for the 2031 afternoon peak found that footways and crossings in the vicinity of the new underground Cultural Centre station will, in the busiest weekday peak period, operate at a very good level of service, generally LOS A/B with localised areas of LOS C/D (refer to Figure 6.26).

Figure 6.26: Cultural Centre precinct cumulative customer density 2031 afternoon peak 15 minutes

The relocation of the surface bus stops to between Grey Street and Hope Street are forecast to result in:
- pedestrian LOS A/B on the footpath adjacent to the Queensland Art Gallery and Museum on Melbourne Street between Grey Street and Victoria Bridge providing uncrowded conditions at this key part of the Cultural Centre precinct pedestrian network
- pedestrian LOS B/C on the footpath adjacent to QPAB on Melbourne Street between Grey Street and Victoria Bridge providing appropriate pedestrian flow conditions
- pedestrian LOS not worse than C at the surface bus stops on Melbourne Street between Grey Street and Hope Street.
Closure of the Stanley Street loop at its intersection with Melbourne Street will provide an uninterrupted downstream pedestrian pathway from Victoria Bridge to Grey Street. This will improve connectivity between Victoria Bridge (downstream footpath), Melbourne Street, the Cultural Forecourt and QPAC. Brisbane Metro will also include widening of the downstream path on Victoria Bridge from 2.7 metres to 3.9 metres. As indicated in section 6.2.3, pedestrian surveys show that a large number of pedestrians (around 1500 during the afternoon peak hour) use the downstream side of Victoria Bridge, with a significant proportion (i.e. 75%) of pedestrians using this side of Victoria Bridge to access the Cultural Forecourt and other destinations in South Bank Parklands. The improved connectivity provided by the closure of the Stanley Street loop will benefit the pedestrians that use this route to access the Cultural Centre precinct from Victoria Bridge.

Brisbane Metro will provide a continuous 1.5-metre minimum width on-road cycle lanes on Grey Street and Melbourne Street (south of Hope Street). On Melbourne Street, between Hope and Grey Streets, cyclists could either use the wide footpath (with cycle ramps provided for access) or the 4.2 metre wide bus lane. This will improve cycling conditions and safety within the precinct, allowing more separation from vehicles and better delineation of cycle lanes. Existing cycle lanes on Victoria Bridge and Melbourne Street (north of Grey Street) will be removed to accommodate lanes for Brisbane Metro/South East Busway services and surface buses, and increased pedestrian width on the downstream side of Victoria Bridge. Access will be maintained for cyclists across Victoria Bridge (upstream side) and through the Cultural Centre precinct, although changes may be required for some cyclists. This will impact around 300 daily cyclists that currently use the on-road cycle lanes on Victoria Bridge.

- Cyclists travelling inbound to the CBD via Victoria Bridge will be able to continue to travel via the shared path on the upstream side of Victoria Bridge. This shared path will remain unchanged at 2.7 metres wide.
- Cyclists travelling outbound from the CBD via the upstream shared path on Victoria Bridge will be able to cross diagonally from the north-west corner of Melbourne Street/Grey Street to the south-east corner in one movement (using the scramble crossing) to access the on street cycle lanes on Melbourne Street to travel towards West End.
- Cyclists requiring access to Elizabeth Street and the south-east parts of CBD across Victoria Bridge will be required to travel from the upstream shared path across North Quay towards Adelaide Street and then along Edward Street. Cyclist will be encouraged to make better use of the Kurilpa or Goodwill bridges (via the enhanced cycle lanes on Grey Street).

The closure of the Cultural Centre pedestrian tunnel between the Queensland Art Gallery, Queensland Museum and QPAC may impact access between the car park and QPAC for some users. The provision of the surface crossing of Melbourne Street beneath the Cultural Centre pedestrian bridge and the modification of the Melbourne Street and Grey Street intersection, including establishment of a scramble crossing, will mitigate impacts on general accessibility. In particular, this will provide direct, step-free access between the Queensland Art Gallery, Queensland Museum and QPAC in addition to linking the north-eastern side of the Cultural Centre precinct with the south-eastern side.

Adelaide Street/North Quay

Changes to pedestrian access in the Adelaide Street/North Quay precinct will mainly relate to changes to pedestrian and cycle access between Victoria Bridge and Reddacliff Place. These are shown in Figure 6.27. Potential impacts associated with the removal of on-road cycle lanes on Victoria Bridge were described in the previous section.

The pedestrian crossing from the upstream shared path on Victoria Bridge to/from Reddacliff Place will be maintained. To cater for pedestrian demand, an appropriate amount of space for pedestrians to wait between Victoria Bridge and the crossing will be provided. It is anticipated that the downstream pedestrian footpath of Victoria Bridge will continue to cater for around 60% of the pedestrian demand. To cater for this greater demand (compared to the upstream footpath) the downstream footpath will be widened within Victoria Bridge by 1.2 metres to 3.9 metres. The pedestrian crossing of William Street and Queens Wharf Road to Reddacliff Place will be shortened and converted to a scramble crossing to improve pedestrian access across Queens Wharf Road, William Street and the QSBS portal. This will provide better connectivity and access for pedestrians between the CBD and South Brisbane.
The existing 2.7 metre wide shared path on the upstream side of Victoria Bridge will be maintained and will so continue to not meet the Austroads minimum clear width requirements for either a cycle only path, shared path or separated two-way pedestrian and cycle path.

The introduction of Brisbane Metro will increase pedestrian activity into and out of the King George Square station entrances, principally along Adelaide Street. Legion pedestrian model outcomes of this analysis are presented in Figure 6.28. The analysis found that proposed relocation of bus stops in Adelaide Street (a separate initiative from Brisbane Metro) is forecast to create some localised crowding up to LOS D/E for customers waiting for a bus in the 2031 afternoon peak at the on-street bus stops in the vicinity of King George Square. However, customers accessing King George Square station are able to circulate along Adelaide Street on footpaths which are forecast to generally operate at LOS C/D or better.
Summary of operational impacts

The assessment has been informed by a structured process including strategic, mesoscopic and microsimulation modelling of transport conditions to help understand the implications of the Brisbane Metro transport interventions, compared to without Brisbane Metro. Across the Brisbane Statistical Division, the benefits of the operation of Brisbane Metro are related to:

- greater public transport demand and mode share – particularly for trips to the city core.
- improved capacity and crowding relief on the bus and Brisbane Metro network.
- Improved travel time and reliability.
- improved bus and Brisbane Metro operations.

The assessment of the study area illustrates that at all stations (except those in the city core) there will not be impacts related to transport operations in the vicinity of the station. Whilst demand for bus and metro services will generally increase at each station, the operation of services are generally forecast to improve (as evidenced through shorter delays and queues at stations) and platform lengths would adequately cater for the passenger demand. Table 6.14 provides a summary of impacts that are expected to occur in the city core.

Table 6.14: Summary of benefits and impacts in the city core

<table>
<thead>
<tr>
<th>Mode/topic</th>
<th>Benefits and impacts</th>
</tr>
</thead>
</table>
| Travel demand and mode share | - Between 2016 and 2031 the public transport network and services will need to accommodate a significant increase in forecast demand of 460,000 trips per weekday – an increase of 81%
- Brisbane Metro facilitates the bus/metro mode share of travel to the city core to be maintained at 26% into the future, by allowing these modes to serve 50% more trips to the city core by 2031. |
<table>
<thead>
<tr>
<th>Mode/topic</th>
<th>Benefits and impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bus operations in the city core</td>
<td>• Brisbane Metro will create a more legible and attractive public transport network for customers to the CBD – i.e. less routes operating through the busiest stations will also mean less people waiting on platforms making the station more comfortable and easy to use.</td>
</tr>
<tr>
<td>Bus volumes in the city core</td>
<td>• Brisbane Metro removes over 125 buses from CBD streets during the morning peak hour, reducing bus congestion on CBD streets.</td>
</tr>
</tbody>
</table>
| Performance of the busway in the city core          | • Brisbane Metro removes critical inner city busway bottlenecks of the Melbourne Street busway portal, Cultural Centre station, Victoria Bridge and North Quay, as well as platform capacity constraints at Buranda, Mater Hill, Griffith University and Eight Mile Plains stations.  
  • Brisbane Metro will allow the inner South East Busway to perform a higher order mass transit function and carry up to 70% of city-bound South East Busway passenger demand relieving Captain Cook Bridge and inner city streets. This allows Captain Cook Bridge to be used more selectively for peak-only ‘Rocket’ services where there is sufficient demand for a high performing direct peak-only service  
  • Brisbane Metro delivers strong travel time benefits to key travel generators in the city core |
| Station activity in the city core                   | • The passenger demand at stations in the city core will be more evenly spread compared to the without project case, resulting in an improved customer experience.  
  • Significant increase in passenger activity at Roma Street and King George Square stations  
  • Congestion at the Cultural Centre station will be relieved by the new Cultural Centre underground station and the location of the surface bus stops at Melbourne Street to between Grey Street and Hope Street.  
  • All city core stations will have an appropriate passenger LOS.                                                                                      |
| Rail operations in the city core                    | • Brisbane Metro does not alter the rail network, its operations or service frequency in the city core.  
  • Minimal forecast impact on rail patronage due to Brisbane Metro, including the proposed Cross River Rail Albert Street station.                                                                                       |
| Road network performance in the city core           | • With Brisbane Metro there are a number of road network changes proposed at South Brisbane, on Victoria Bridge and around North Quay and Adelaide Street. These changes are related to providing full separation of Brisbane Metro services from other road users, conversion of Victoria Bridge to a green bridge (that is for metro, buses, pedestrians and cyclists only) and Melbourne Street limited to buses only between Grey Street and Hope Street.  
  • Diversion of around 70% of Victoria Bridge trips to William Jolly Bridge.  
  • With several minor intersection improvements around Peel Street and Upper Roma Street already included in the ‘with Brisbane Metro’ scenario, the traffic changes proposed as part of Brisbane Metro are not forecast to result in an increase in average delay across the microsimulation model area. Relatively minor increases in delay at some intersections will effectively be offset by reduced delays at other intersections as traffic redistributes to other routes, times periods or modes. |
| Car parking in the city core                         | • Removal of a connection between the road network and the Cultural Centre car parks will increase delays and queues associated with these car parks.  
  • The Cultural Centre pedestrian tunnel, which provides a step-free and weather protected route between the QLD Art Gallery and Museum car park and QPAC will be removed by Brisbane Metro and replaced by a surface crossing.  
  • Access to car parking in the CBD will be appropriate but with some increase in trip length (due to change in route) to access/depart from car parks for some users.                                                                                                                   |
| Service vehicle access in the city core             | • Closure of Victoria Bridge and changes to North Quay/Adelaide Street will require a route change for cross river service vehicle trips that could increase trip times. 
  • Associated with the closure of Victoria Bridge to general traffic access between Victoria Bridge/Melbourne Street and Stanley Street will be closed with a cul-de-sac, with a turning head, constructed to terminate Stanley Street                                                                 |
<p>| Access for vehicles carrying people with disabilities| • Minimal (or no) change to location of on-street loading zones for people with disabilities.                                                                                                                          |
| Emergency access in the city core                   | • Emergency vehicle access unchanged with emergency vehicles continued to be permitted to use the busway.                                                                                                                                                                          |</p>
<table>
<thead>
<tr>
<th>Mode/topic</th>
<th>Benefits and impacts</th>
</tr>
</thead>
</table>
| Cycle and pedestrians in the city core | • Enhancements at the intersections of Grey Street/Melbourne Street and Victoria Bridge/William Street.  
• Provision of a surface pedestrian crossing of Melbourne Street beneath the Cultural Centre pedestrian bridge.  
• Removal of the existing Cultural Centre station will provide additional public realm space in the heart of the Cultural Centre precinct.  
• The new surface bus stops on Melbourne Street will provide improved customer amenity for customers of West End to City and Fortitude Valley services, with significantly reduced levels of crowding and better integration of the bus stops within the public realm.  
• Increased footpath width and environment for pedestrians and cyclists on Melbourne Street between Grey and Hope Streets.  
• Improved amenity on Adelaide Street due to reduction in buses.  
• On-road cyclists will be removed from Victoria Bridge and restricted to using the upstream shared path.  
• Pedestrian and cyclists will be maintained across North Quay on the upstream side of Victoria Bridge to access Reddacliff Place with the provision of a suitable sized area for pedestrians to wait between Victoria Bridge and the crossing. A scramble crossing will be provided on the downstream side.  
• The existing 2.7 metre wide shared path on the upstream side of Victoria Bridge will be maintained and will continue not to meet the Austroads minimum clear width requirements for either a cycle only path, shared path or separated two way pedestrian and cycle path. |

### 6.4 Construction impacts

Construction of Brisbane Metro will have no impact on much of the alignment and impacts on traffic and transport from the construction of Brisbane Metro will vary between construction worksites. Construction works at many locations will be relatively minor and are forecast to have a minimal impact on transport operations. In areas of major works, including the city core, potential impacts will be associated with temporary closure of traffic lanes, changes to turning movements at intersections and vehicle access to property, temporary alterations to bus operations, including bus stops and services, and changes to pedestrian and cycle networks. Beyond the construction worksites, temporary impacts may occur on some routes used by construction traffic.

Changes to transport networks during construction of Brisbane Metro are not expected to affect wider regional transport networks, with impacts generally localised to those areas surrounding individual construction worksites.

Traffic management measures will be implemented during construction, which will assist in managing potential impacts on traffic and transport networks. In particular, Construction Traffic Management Plans will be prepared for construction works. Further information on Construction Traffic Management Plans and proposed mitigation measures is provided in section 6.5.2.

#### 6.4.1 Study area construction impacts

**Rochedale to Upper Mt Gravatt**

Network changes and traffic generated by construction works associated with the minor modification of Eight Mile Plains and Upper Mt Gravatt stations, including platform extensions and installation of customer information displays and stand-alone card interface devices, will be minimal. Construction truck activity will be limited to a few vehicles a day on average. Any interfaces with bus services, pedestrians and cyclists will be appropriately managed with the implementation of traffic management measures in accordance with standard busway maintenance protocols.

Impacts on traffic and transport from the construction of the metro depot at School Road, Rochedale will mainly be associated with haulage vehicles (i.e. for transport of spoil and delivery of materials). A Construction Traffic Management Plan will be prepared for this construction worksite outlining measures to manage construction interfaces and impacts on transport networks, including any identified conflicts. Access to the construction worksite for the proposed depot will be from School Road. Site access will be managed to provide safe and
efficient vehicular access to the construction worksite. These measures will be outlined in the Construction Traffic Management Plan for this construction worksite and will include consideration of the need for deceleration lanes for construction vehicles approaching the construction worksite from School Road.

The proposed primary truck route for origins/destinations to the west and south will be School Road – Miles Platting Road – Gateway Motorway (M1) (refer to Figure 6.29). A secondary route is also identified for northern locations, and includes Miles Platting Road – Logan Road – Pacific Motorway (M3). Traffic using the road network in the vicinity of the construction worksite during off-peak periods is not expected to be significantly impacted by the addition of haulage vehicles for this construction worksite. The maximum percentage of trucks using School Road during construction will be around four per cent of existing traffic volumes during off-peak periods. Potential traffic impacts are considered minimal in terms of road capacity and pavement impacts, given the construction traffic is less than five per cent of the base traffic on all affected roads.

Potential construction impacts on bus services, including those on the South East Busway, pedestrians, cyclists and general traffic will generally be low, and will be effectively managed with the implementation of standard traffic management measures. These will be described in the Construction Traffic Management Plan and will include measures to maintain traffic safety in the vicinity of the Priestdale Road and School Road intersection associated with Rochedale State High School, such as reduced speed limits (from current 60 kilometres per hour limit), additional signage and restricting truck movements near the intersection of Priestdale Road and School Road during school pick-up/drop-off times. Construction of the metro depot is not expected to impact on emergency service vehicle routes.

Mt Gravatt to Greenslopes

Construction activities associated with minor modification of Holland Park West and Greenslopes stations (e.g. customer information displays and stand-alone card interface devices) are not expected to result in detrimental impacts on the surrounding transport networks. Any interfaces with bus services, pedestrians and cyclists will be appropriately managed with the implementation of traffic management measures.

Impacts from construction activities at Griffith University station will mainly be associated with the haulage of spoil and delivery of materials. The primary truck route for haulage vehicles is proposed to be via the South East Busway to the Pacific Motorway. This will occur when there are no buses operating on the busway or when bus volumes on the busway are low (e.g. off-peak night-time period or weekends) to minimise disruption to bus services. Bus access to the busway will be maintained during peak periods. Use of the busway will minimise traffic impacts on Griffith University Mt Gravatt campus and surrounding residential communities.

The primary truck routes for the Griffith University station construction worksite are shown in Figure 6.30 and include:

- Pacific Motorway (M3) – Logan Road – Klumpp Road – South East Busway (inbound to the construction worksite from the south)
- South East Busway – Klumpp Road – Logan Road – Pacific Motorway (M3) (outbound from the construction worksite to the south)

Secondary routes to access northern origins/destinations are also identified via the Pacific Motorway (M3).

An assessment of truck volumes around Griffith University station indicates that minimal impacts are expected on the road network due to the addition of haulage vehicles. Haulage vehicles are forecast to comprise less than two per cent of existing off-peak traffic along Klumpp Road. Undertaking the main haulage activities at night, via the busway, will further minimise impacts relating to traffic generation.

About 40 parking spaces within Griffith University Mt Gravatt campus will be temporarily impacted by the proposed construction worksite. These are currently used as permit parking by Griffith University and are located within a car park area with a total of around 200 parking spaces. Review of aerial photography from 2009 to 2017 shows that the car park occupancy is typically less than 50%. As such, temporary impacts from the use of these parking spaces is expected to be minor. Consultation will be undertaken with Griffith University to ensure any potential impacts on the wider car park from the temporary use for construction are minimised.
Figure 6.29: Metro depot worksite - truck routes

- **Secondary northern route via Pacific Motorway (M3)**
- **Primary southern or western route via Gateway Motorway (M2)**
- **Metro depot worksite**
- **Eight Mile Plains station**

**Key**

- **Worksite**
- **Truck route**
  - In (primary)
  - In (secondary)
  - Out (primary)
  - Out (secondary)
Figure 6.30: Griffith University and Upper Mt Gravatt station worksites - truck routes

Key
- Worksite

Truck route
- In (primary)
- In (secondary)
- Out (primary)
- Out (secondary)

Access to/from worksite via South East Busway from Klumpp Road

Primary southern or western route via Pacific Motorway (M3)

Access to M3 via Logan Road

Secondary northern route via Pacific Motorway (M3)

Griffith University station

Upper Mt Gravatt station
Potential construction impacts on bus services, including those on the South East Busway, pedestrians, cyclists and general traffic are expected to be low or negligible. Any interfaces with bus services, pedestrians and cyclists will be effectively managed with the implementation of standard traffic management measures. These will be described in the Construction Traffic Management Plan for the Griffith University station construction worksite.

The widening of the busway that is required to facilitate the turnaround at Griffith University will be located next to the M3. Temporary traffic control measures will be required on the M3 so that the work area is shielded.

**Woolloongabba to St Lucia**

Network changes and traffic generated by construction activities associated with minor modification of PA Hospital, Boggo Road and UQ Lakes stations (e.g. passenger information displays, stand-alone card interface devices and changes to turnaround and layover areas) will be minimal. Construction truck activity will be limited to, on average, a few vehicles a day. Any interfaces with bus services, pedestrians and cyclists will be appropriately managed with the implementation of traffic management measures in accordance with standard busway maintenance protocols.

Construction of the platform extensions at Buranda station will include the widening of the O'Keefe Street road bridge that passes over the existing busway. Potential traffic and transport impacts of these works will mainly be associated with temporary changes to bus, road, pedestrian and cycle networks as well as haulage of materials and spoil.

**Buranda traffic and bus impacts**

Demolition and reconstruction of the O'Keefe Street road bridge will require partial closure of O'Keefe Street to two lanes for approximately 18 months. Consistent with previous projects in this area, it is proposed that traffic lanes are provided in the westbound direction only as this leads to the PA Hospital. Eastbound traffic will be required to use alternative routes such as Logan Road and Cornwall Street. O'Keefe Street is classified as an arterial road in Council’s road hierarchy and provides a connection between Ipswich Road and the Clem7 motorway in the west to Logan Road and Old Cleveland Road in the east.

Approximately 600 eastbound vehicles in the morning peak hour and 1000 in the afternoon peak hour will be diverted from O'Keefe Street. During the morning peak, it is forecast that approximately 70% of this traffic is forecast to divert to Logan Road, 25% to Cornwall Street and the remaining 5.0% via the Pacific Motorway southbound. During the afternoon peak, approximately 80% of the affected traffic will divert to Logan Road, 10% to Cornwall Street and 5.0% via the Pacific Motorway southbound. The diversion of this traffic will add pressure to some intersections, notably:

- Junction Street/O'Keefe Street
- Cornwall Street and its intersections with Duke Street and the Pacific Motorway northbound on ramp
- Marquis Street and the Pacific Motorway southbound off ramp and Junction Street/Earl Street.

The Construction Traffic Management Plan for works at Buranda station will include measures to provide the satisfactory operation of these intersection (e.g. revised signal timings or minor line marking changes).

The partial closure of O'Keefe Street will also require the temporary diversion of an eastbound bus route. Alternative options for the diversion of this bus route will be determined in consultation with relevant stakeholders (e.g. TransLink and Transport for Brisbane) to minimise potential impacts on bus users. Bus access will generally be maintained on the busway and to Buranda station during construction. In particular, the busway will remain fully operational during peak periods. However, temporary changes will be required for safety, during demolition and reconstruction of the O'Keefe Street road bridge and excavation of the busway tunnel. This will include managed lane closures and temporary full closures. Any temporary full closures will occur when there are no buses operating on the busway or when bus volumes are low (e.g. off-peak night-time period or weekends) to minimise disruption to bus services.
Buses will continue to operate on the South East Busway but will be diverted around Buranda station onto O’Keefe Street via the Eastern Busway and South East Busway access points on O’Keefe Street as shown on Figure 6.31. During the closure periods, temporary bus stops will be provided on O’Keefe Street and temporary traffic control measures will be implemented to reduce the westbound lanes on O’Keefe Street to one lane for westbound buses and general traffic, allowing eastbound bus movements to use the second westbound lane. A travel time assessment indicates that impacts of this diversion are expected to be minor, with approximately two minutes added to an average off peak bus journey.

**Buranda truck routes**

Truck routes proposed for the Buranda construction worksite are shown in Figure 6.32. The route to the south utilities the Pacific Motorway. The primary truck routes to access origins and destinations to the west are:

- Ipswich Motorway – Ipswich Road – O’Keefe Street (inbound to the construction worksite)
- O’Keefe Street – Ipswich Road – Ipswich Motorway (M7) (outbound from the construction worksite).

A construction laydown area is proposed to be located on the corner of O’Keefe Street and Junction Street. This will be accessed from O’Keefe Street to avoid residential uses at Junction Street. Trucks will turn right out of the layover site onto Junction Street and left into O’Keefe Street. Site access will be managed with the implementation of standard traffic management measures to maintain safety for local road users. These measures will be outlined in the Construction Traffic Management Plan. An assessment of traffic volumes on surrounding streets indicates that minimal disruptions are expected to the road network around the Buranda station construction laydown and worksite from haulage vehicles, with construction trucks making up less than two per cent of total traffic volumes in day time off-peak periods.

The busway will also be used to remove some spoil from the busway at Buranda station. Access for trucks to the South East Busway will be via the access point on O’Keefe Street (refer to Figure 6.33). Haulage activities will occur when there are no buses operating on the busway or when bus volumes are low (e.g. off-peak night-time periods and weekends) to minimise disruption to bus services. It is estimated that around two trucks per hour will make this movement during off-peak periods.

**Buranda – other impacts**

During construction, access to the V1 Cycleway connection on and across O’Keefe Street and the southern shared use path to the existing pedestrian and cycle crossing west of Carl Street, will be maintained. Pedestrian access will also be maintained to Buranda busway and railway stations from O’Keefe Street. Reconfiguration of O’Keefe Street during construction will require the temporary closure of the northern footpath between the busway access, east of Buranda station and the pedestrian and cycle crossing west of Carl Street. Potential impacts of this change will be managed through a temporary pedestrian crossing at the eastern end of the construction worksite during temporary closure periods of some of the northern footpath.

As indicated previously, the westbound direction is proposed to be retained as it leads to the PA Hospital. This will maintain access for emergency vehicles towards the PA Hospital during construction. Emergency vehicles heading eastbound on O’Keefe Street will be required to use alternative access arrangements. Early and ongoing consultation with emergency service providers will be undertaken during the development of the Construction Traffic Management Plan for the Buranda station construction worksite to minimise potential impacts on emergency vehicle access. Potential impacts will also be managed through early and ongoing engagement with emergency services providers about temporary access changes during construction.

**Kelvin Grove to Herston**

Construction activities associated with the minor modification of stations in this section of the study area (e.g. installation of passenger information displays and stand-alone card interface devices) and modification to Ernie’s Roundabout are not expected to result in detrimental impacts on the surrounding transport networks. Any interfaces with bus services, pedestrians and cyclists will be appropriately managed with the implementation of standard traffic management measures. These measures will be detailed in the relevant Construction Traffic Management Plans for these construction worksites.
Figure 6.31: Buranda busway station worksite – bus diversion routes for night-time and weekend busway closure

Key

- Worksite
- Bus route
  - Northbound
  - Southbound

Notes:
- Bus diversion route for night time and weekend closure of the busway
- Left and right turns from O'Keefe Street to busway under traffic management
- Provide temporary bus stops on O'Keefe Street
- Buses to operate eastbound on O'Keefe Street under traffic management
Figure 6.32: Buranda busway station worksite – truck routes

Key
- Purple: Worksite
- Yellow: Site laydown

Truck route
- Solid blue: In (primary)
- Dashed blue: In (secondary)
- Solid orange: Out (primary)
- Dotted orange: Out (secondary)

Primary western route via Ipswich Road (A7) and Ipswich Motorway (M7/M2)

Secondary northern route via Clem7 (M7)

No right turn from Junction Road

Primary southern route via Pacific Motorway (M3)
Figure 6.33: Truck route to access Buranda busway station worksite

Trucks would only access the busway when bus volumes are low or buses are not operational in the busway.

Key

- Worksite

Truck route

- In
- Out

Truck route from worksite to access Ipswich Road (A7)

Truck route to construction worksite

Trucks reverse to worksite
6.4.2 City core construction impacts

Construction works associated with the minor modification of Mater Hill and South Bank stations, including platform extensions and installation of customer information displays and stand-alone card interface devices, are not expected to result in detrimental impacts on the surrounding transport networks. Modifications to pedestrian access ramps at Mater Hill will be carried out such that appropriate access for people with disabilities to the platforms will always be provided.

Construction works to support platform changes at King George Square station, including reconfiguration of platform screen doors, and Roma Street station are also not expected to result in detrimental impacts on surrounding transport networks. Any interfaces with bus services, pedestrians and cyclists from these works will be appropriately managed with the implementation of standard traffic management measures. These will be detailed on the relevant Construction Traffic Management Plans for these construction worksites.

Major construction worksites will be required to support construction works at the Cultural Centre precinct and Adelaide Street/North Quay. These works will occur over extended periods (i.e. around 2.5 years). Potential traffic and transport impacts of these works will generally be associated with changes to traffic access, temporary alterations to bus operations, haulage traffic, and temporary changes to pedestrian and cycle networks. Potential impacts from these construction worksites are described in the following sections.

Cultural Centre precinct construction worksite

Cultural Centre precinct road and property access impacts

A number of permanent road network changes will be implemented at the commencement of construction, including closure of Melbourne Street between Hope Street and Victoria Bridge to general traffic, and closure of Victoria Bridge to general traffic. In addition, temporary road network changes will be required at South Brisbane to support construction activities within the Cultural Centre precinct. These include:

- Grey Street will be reduced to one through traffic lane in each direction between Russell Street and Fish Lane with turning movements into Melbourne Street removed for the extent of the main construction works.
- the right turn pocket from Grey Street to South Brisbane railway station will be removed to provide uninterrupted through traffic movement during construction
- minor road modifications at the Hope Street/Melbourne Street intersection to change Hope Street to left-in/right-out only for the extent of the main construction works.

Permanent changes to car park access within the Cultural Centre and service access to the Cultural Forecourt will also be implemented at the commencement of construction. Potential impacts of these changes are described in section 6.3.3.

Access for emergency vehicles to the Cultural Centre precinct will be maintained during construction. Where temporary changes to existing access routes are required, alternative access routes will be determined in consultation with emergency services providers. Early and ongoing consultation with emergency service providers will be undertaken during the development of the Construction Traffic Management Plan for the Cultural Centre precinct construction worksite to minimise potential impacts on emergency vehicle access. Potential impacts will also be managed through early and ongoing engagement with emergency services providers about temporary access changes during construction.

Access will be maintained during construction in the vicinity of construction worksites. This includes access to all Cultural Centre venues and facilities, BCEC and local properties.

Cultural Centre precinct truck routes

Construction vehicles will generally approach and depart the construction worksite in the Cultural Centre precinct from Melbourne Street (refer to Figure 6.34). Haulage access will be required to Victoria Bridge for a period of approximately four months, to provide for the removal of spoil from the transition structure. Melbourne Street caters for the vast majority of haulage vehicle movements with efficient access to the arterial roads of:
- Merivale Street for onward travel to the south and east
- Cordelia Street for destinations to the north and west.

Traffic management measures will be implemented to facilitate access of trucks to/from the construction worksites. These measures will be detailed on the Construction Traffic Management Plan for the Cultural Centre precinct. This will include restricting haulage and delivery vehicle operations during the morning and afternoon commuter peak periods, to minimise potential impacts on the wider road network.

Construction vehicle volumes for the removal of spoil and delivery of materials to the construction worksite within the Cultural Centre precinct will add only a small number of additional vehicles to the road network. On the short section of Melbourne Street that trucks share the road with general traffic, construction trucks will make up around six per cent of off-peak traffic. On other parts of the proposed haulage routes, construction trucks will make up less than five per cent of off-peak traffic, and a maximum of three per cent of the average daily traffic volume of existing general traffic. This is considered to be low, and below the threshold at which the construction vehicle activity will likely require further mitigation.

The management and impact of construction vehicles on the transport network is considered to be similar to other large construction activities in the city core.

Cultural Centre precinct bus operational impacts

Bus access will be maintained through the Cultural Centre precinct during construction, including to the South East Busway, however temporary changes will be required to facilitate works in this location.

During construction, the removal of the existing Cultural Centre station and construction of the new underground station and transition structure will require the use of alternative surface bus stops at the Cultural Centre precinct on Melbourne Street between Grey Street and Victoria Bridge. This will be required for a significant part of the main construction works. Four bays in a lead stop arrangement (nose to tail) over a length of 57 metres will be provided in both directions. The dimensions of the bus stops will provide for safe customer access, egress, waiting and circulation at a pedestrian LOS D or better. Measures to reduce dwell time of buses (e.g. real time passenger information displays and pre-paid ticket arrangements) will be provided to maintain a reasonable throughput of services.

Staging of construction works at the Cultural Centre precinct will require the location of surface bus stops to be altered during the course of the construction phase. (They will remain in the vicinity of the Cultural Centre pedestrian bridge and when possible the existing bus platforms will be utilised.) Management measures will be implemented to minimise potential impacts of these changes of bus customers. These will be detailed in a Construction Traffic Management Plan for the Cultural Centre precinct and will include such things as early notification of bus customers and signage.

Construction of the connection between the existing BCEC busway tunnel and new underground station will require management of bus operations within a section of the South East Busway tunnel (south of the Melbourne Street portal). In particular, a section of the busway will be reduced to one lane operation. This will occur for approximately 18 months over the whole construction period, during which time a shuttle flow arrangement is proposed to facilitate two-way bus movements along the single lane. Reduced speed limits (e.g. 20 kilometres per hour) will also be implemented for safety. Traffic signals will be required to manage the shuttle flow in coordination with the intersections of the busway with Melbourne Street and Melbourne Street and Grey Street.
Figure 6.34: Cultural Centre worksite – truck routes to the west and south

Key
- Worksite
- Site laydown

Truck route
- In (primary)
- In (secondary)
- Out (primary)
- Out (secondary)

- Secondary northern route via Inner City Bypass (M3)
- Primary southern or western route via Ipswich Road (A7)
- Route follows Ipswich Road (A7) and onto Ipswich Motorway (M7)
The modified surface bus stops and shuttle flow operations within the BCEC tunnel will reduce the capacity of
the busway through the Cultural Centre precinct. Diversions away from the busway at the Cultural Centre
station will be required for about 60 buses per hour, out of around 220 buses per hour, in the peak direction to
provide a similar number of buses as currently pass through the Mater Hill station. These diversions will be
required to relieve pressure on busway operations and to maintain appropriate and reliable travel for bus
customers. Potential routes that may be diverted include those that commence or terminate at the Cultural
Centre station from the north and west and some services from the South East Busway that do not access
QSBS.

- All services from the north and west will terminate and commence from other locations in the city core and
  Hope Street will not be used by these services to access Melbourne Street.
- Customers requiring access from the services from the north and west to the Cultural Centre station will
  transfer at locations such as Roma Street station, Adelaide Street or King George Square station.
- Some services from the South East Busway will be diverted via alternate routes, such as Captain Cook
  Bridge. Customers accessing Mater Hill, South Bank or Cultural Centre stations could transfer to
  alternative services at other busway stations (e.g. Woolloongabba, Buranda or Griffith University stations).

Suitable bus operation plans will be developed by Transport for Brisbane and TransLink32 prior to the
commencement of construction works. These will provide for as many buses as practical to continue to operate
through the South East Busway and Cultural Centre station.

Assessment of the impact of these changes and proposed management measures (e.g. shuttle flow operations,
reduced length at the Cultural Centre station, prepaid ticketing and platform management33 at surface bus stops
and the proposed diversion peak direction buses) was conducted using Vissim microsimulation model. This
assessment found that compared to the 2016 existing situation additional delays are expected to be, on
average, one minute or less and average bus queue lengths across Victoria Bridge approaching Cultural Centre
station will be similar in the both the morning and afternoon peak hour.

A detailed customer information campaign will be implemented to inform bus customers of temporary changes
to bus stops and services during the construction phase. This will assist in minimising confusion and disruption
to bus customers.

Cultural Centre precinct railway corridor impacts

Construction for the underpass of the South Brisbane railway corridor will be undertaken adjacent to live railway
tracks. This will require a significant amount of work to be carried out under normal Queensland Rail night-time
and weekend rail possessions and isolations of adjacent rail track(s).

Measures will be implemented during rail possessions to minimise potential impacts associated with temporary
disruptions to passenger rail and freight services. These will include rail replacement bus services for rail
customers and/or reduced service frequencies at off-peak times and implementation of real-time and advanced
travel information to notify rail customers of service changes (e.g. TransLink website or broadcast/noticeboards
at the station). Potential mitigation measures will be developed in conjunction with Queensland Rail to maintain
rail operations as far as practicable and minimise impacts on rail services. These will be detailed in the
Construction Traffic Management Plan for the Cultural Centre precinct.

Cultural Centre precinct pedestrian and cycle impacts

Access for pedestrians and cyclists will be maintained through and within the Cultural Centre precinct during
construction. This includes access to Cultural Centre venues such as QPAC, Queensland Museum, Art Gallery,
South Bank Parklands, and South Brisbane railway station.

A number of permanent changes to pedestrian and cycle access will be implemented at the commencement of
construction, including closure of the Cultural Centre pedestrian tunnel and removal of on-road cycle lanes from

32 Note that private operators use the South East Busway at South Brisbane and Cultural Centre station
33 25 second mean dwell times and 60% variability.
Victoria Bridge. In addition, temporary changes will be required near to construction worksites for safety. These include:

- potential closure and/or narrowing of some footpaths near to or through construction worksites
- changes to the availability and location of pedestrian crossings including at the intersection of Melbourne Street/Grey Street.

These changes will potentially impact the attractiveness, accessibility and connectivity for pedestrians and cyclists as well as increase travel time and inconvenience. Potential impacts associated with the closure of the Cultural Centre pedestrian tunnel are described in detail in section 6.3.3.

Traffic management measures will be implemented to minimise potential impacts and maintain safety for pedestrians and cyclists and ensure pedestrians can logically access destinations within or walk through the Cultural Centre precinct. These will be detailed in the Construction Traffic Management Plan for the Cultural Centre precinct and will include:

- ensuring both the downstream footpath and the upstream shared path on Victoria Bridge remain open and accessible from both sides of the Brisbane River
- maintaining pedestrian access for the duration of construction, to the Cultural Centre station from both sides of Melbourne Street
- maintaining pedestrians access for the duration of construction to the Cultural Centre pedestrian bridge from both sides of Melbourne Street
- providing an at-grade pedestrian crossing of Melbourne Street between the Cultural Centre pedestrian bridge and the intersection of Grey Street/Melbourne Street (this could be on the river side of the intersection)
- maintaining a pedestrian crossing of Grey Street for the duration of construction in the vicinity of QPAC and the South Brisbane railway station
- when possible providing a footpath on the western side of Grey Street between South Brisbane railway station and Melbourne Street
- ensuring a pedestrian path is available on the western side of Melbourne Street, between Grey and Merivale Streets and on Grey Street between Melbourne Street and the pedestrian crossing in the vicinity of QPAC and the South Brisbane railway station
- ensuring pedestrian access is maintained to Cultural Centre facilities and venues
- temporary footpaths should be a minimum width of 2.5 metres.

Additional mitigation measures will include advanced communication and signage of alternative routes (e.g. pedestrian crossings from a narrowed footpath to a wider footpath), management/marshalling of pedestrian flows, barriers and hoardings around construction worksites for safety, and traffic control measures to prevent conflict between pedestrians and construction vehicles.

**Adelaide Street/North Quay construction worksite**

**Adelaide Street/North Quay traffic and property access impacts**

A number of permanent road network changes will be implemented at the commencement of construction, including closure of Victoria Bridge to general traffic, removal of the south-east bound (straight ahead) movement along North Quay at Adelaide Street (including for buses) and closure of North Quay to general traffic. In addition, temporary road network changes will be required to support construction activities within at Adelaide Street/North Quay. These include:

- temporary changes to reduce Adelaide Street to one traffic lane in each direction between George Street and Albert Street
- temporary removal of on-street loading and parking along Adelaide Street, between George Street and Albert Street
changes to Adelaide Street between North Quay and George Street, providing one lane in each direction for bus access, property access and local traffic access only.

Access will be maintained to provide properties and car parks for the duration of construction, however temporary changes may be required to some property access in Adelaide Street between North Quay and Albert Street (i.e. limit to left-in/left-out access only). This will include access to the commercial/service vehicle zone between Brisbane City Hall and 48 Adelaide Street (Telstra Building) and for the development at 300 George Street (expected to be completed prior to construction of Brisbane Metro). Traffic management measures will be implemented to ensure traffic movement in/out the property safely and efficiently. These will be detailed in the Construction Traffic Management Plan for North Quay/Adelaide Street and will include measures such as temporary car park entry/exit arrangements, line marking and signage.

CBD truck routes

Proposed haulage vehicle access routes for the North Quay/Adelaide Street construction worksite will seek to access the Riverside Expressway as efficiently as possible. Construction haulage and delivery operations will be restricted during peak traffic hours (7am-9am and 4pm-6pm Monday to Friday), to minimise potential impacts on the wider road network.

The proposed truck route to service this construction worksite will be from North Quay (west) – Adelaide Street – George Street – Ann Street – Riverside Expressway (refer to Figure 6.35). An analysis of construction trucks generated by at the North Quay construction worksite found construction trucks operating on North Quay will comprise seven per cent of the total traffic volume for about two months. As such, potential impacts will generally be minimal and are considered manageable. Site access will be managed to provide safe and efficient vehicular access to the construction worksite. In particular, trucks will enter/exit the construction worksite under traffic control as some reversing and U-turn manoeuvres will be required to access the ramp to the portal.

Construction haulage vehicle access to the Adelaide Street construction worksite (i.e. between George Street and Albert Street) will be via a loop route as shown in Figure 6.36. The maximum number of trucks using this route are forecast to be about 100 delivery trucks and 60 spoil truck per day for a duration of around two months. These limited time periods and truck volumes are expected to create a minor impact on the road network around the Adelaide Street/North Quay construction worksite. This amount of activity is comparable to other major construction sites in the CBD.

CBD bus operational impacts

Bus access will be maintained at Adelaide Street and North Quay for the duration of construction, however temporary changes will be required to facilitate construction works in this location.

As indicated previously, Adelaide Street and North Quay will be reduced to one lane in each direction. This will require the management of bus operations, including:

- temporary relocation of some bus stops along Adelaide Street between George Street and Albert Street
- removal of bus stops along North Quay between Ann Street and Adelaide Street.

These measures will change routes that currently commence at these locations, however, the prioritisation of bus access are expected to result in minimal increases in average travel times in the vicinity of the construction worksites.

Suitable bus operation plans will be developed by Transport for Brisbane and TransLink prior to the commencement of construction works. These will provide for as many buses as practical to continue to operate along North Quay and Adelaide Street as far as practical, albeit with changes to where they stop, terminate, layover, turnaround and recommence.

34 Note that private operators use the South East Busway at South Brisbane and Cultural Centre station
Safe and convenient interchange opportunities between Adelaide Street buses and King George Square station will be maintained during construction, with preference given to the location of bus stops used by key routes including the Blue CityGlider (route 60), BUZ and the City Loop routes.

A detailed customer information campaign will be implemented to inform bus customers of temporary changes to bus stops and services during the construction phase. This will assist in minimising confusion and disruption to bus customers.

The bus travel times assessment using the Vissim microsimulation model forecast that appropriate operation compared to 2021 without Brisbane Metro:

- minimal change in average travel time in the morning peak hour for an inbound trip from the CBD end of Victoria Bridge to the intersection of Edward Street/Adelaide Street
- minor improvement in average travel time in the afternoon peak hour for an outbound trip from the intersection of Edward Street/Adelaide Street to the CBD end of Victoria Bridge.

These modelled travel time outcomes result from the reduction in general traffic within the vicinity of the construction worksite, modifications (less conflicting movements) to Victoria Bridge/North Quay, North Quay/Adelaide Street and Adelaide Street/George Street intersections, removing bus stops along Adelaide Street between Albert Street and North Quay and rerouting of some buses from Adelaide Street.

**CBD pedestrian and cycle impacts**

Access for pedestrians and cyclists will be maintained within the vicinity of works at Adelaide Street/North Quay during construction.

A number of permanent changes to pedestrian and cycle access will be implemented at the commencement of construction, including removal of the pedestrian crossing across Adelaide Street at the North Quay/Adelaide Street intersection. In addition, temporary changes will be required near to construction worksites for safety. These include:

- temporary removal of the footpath on the river side of North Quay between Adelaide Street and Victoria Bridge for some of the main construction works
- reductions in footpath width on Adelaide Street and no Adelaide Street mid-block crossings between Albert Street and North Quay
- temporary closure of the pedestrian/cycle ramp to the Bicentennial Bikeway along the river for approximately six months. Cyclists will be redirected to the Turbot Street ramp. The impact of this temporary change is relatively minor as it will require cyclists to ride north or south along George Street instead of directly onto or off Adelaide Street, if their destination is within this area.

The northern (upstream) shared pedestrian/cycle crossing across North Quay between Victoria Bridge and Reddacliff Place will remain open with connectivity provided from Reddacliff Place during construction works.

**Overall city core traffic impacts**

The combined traffic impacts of the construction worksites at the Cultural Centre precinct and Adelaide Street/North Quay were assessed in the project Vissim microsimulation model which indicated that without operational mitigation measures there will be impacts. To mitigate these construction impacts the operational measures should be implemented as part of the preconstruction works (or early works) proposed to be undertaken prior to the main construction works. The impact of construction activity on traffic will be managed through the implementation of the Construction Traffic Management Plans.
Figure 6.35: Adelaide Street / North Quay worksite – truck routes

- Truck exit worksite to Riverside Expressway via Ann Street
- Four lanes remain on George Street west of Adelaide Street
- Traffic management to control trucks entering/exiting worksite

Key
- Worksite

Truck route
- In
- Out
Figure 6.36: Truck routes to Adelaide Street worksite

- **Key**
  - Worksite
  - Site laydown
  - Truck route
  - In
  - Out

- **Stations**
  - Station modifications
  - Station upgrades

- **Entry route:** Turbot Street - Edward Street - Adelaide Street
- **Exit route:** Adelaide Street - George Street - Ann Street - Riverside Expressway

- **Adelaide Street worksite**
- **Traffic management to control trucks entering/exiting worksite**
- **Trucks to operate one-way towards George Street.**
6.5 Mitigation and management

This section summarises the mitigation and management measures proposed to address the identified transport impacts of Brisbane Metro including its construction and ongoing operational impacts.

6.5.1 Project development measures

Impacts to transport operations (including cycle and pedestrians) from the closure of Victoria Bridge to general traffic and its immediate connections to South Brisbane (Grey Street) and the CBD (North Quay) will be mitigated through measures identified in the development of Brisbane Metro and included in the concept design. The pedestrian and cycle measures include:

- widening of the downstream footpath of Victoria Bridge
- widening of footpaths on both sides of Melbourne Street between Grey Street and Victoria Bridge
- providing a surface pedestrian crossing of Melbourne Street beneath the Cultural Centre pedestrian bridge
- a scramble crossing at the intersection of Melbourne Street/Grey Street
- widened pedestrian footpaths and cycle facilities on Melbourne Street between Grey Street and Merivale Street
- improved and widened pedestrian footpath on North Quay between Adelaide Street and the upstream footpath of Victoria Bridge
- improved pedestrian crossing, including a scramble crossing, from the downstream footpath on Victoria Bridge to Reddacliff Place
- maintaining the existing pedestrian crossing from the upstream shared path on Victoria Bridge to Reddacliff Place
- improved cycle lanes on Grey Street to enhance access to Kurilpa and Goodwill bridges
- improved pedestrian connection from Victoria Bridge across Stanley Street to Melbourne Street
- wayfinding signage to assist users in selecting the appropriate side of Victoria Bridge.

For vehicle impacts relating to the closure of Victoria Bridge to general traffic, the following measures will be provided as part of Brisbane Metro:

- modify the Grey Street/Peel Street/Stanley Place intersection to increase capacity from Stanley Place
- modify the Countess Street and Roma Street intersection
- promote greater use of the Queensland Art Gallery/Queensland Museum car park exit to Grey Street and improved signage to the Cultural Centre precinct car parks developed in consultation with Cultural Centre precinct stakeholders
- retain appropriate egress for service vehicles from QPAC onto Melbourne Street and Grey Street
- relocate passenger drop-off and pick-up from coaches to Grey Street to the vicinity of the Queensland Museum
- provide passenger loading zones on Grey Street, which could be used by people with disabilities.

Council will continue to liaise with the CRR Delivery Authority regarding measures to improve stair/escalator capacity at the Roma Street outbound (northbound) busway platform and increase the length of the outbound (northbound) busway platform.

Whilst the analysis in this chapter concludes that impacts to customers are generally minor and most likely offset by journey time improvements on the busway itself, a more detailed network design and engagement process will be undertaken with the community and TransLink to obtain community feedback and ensure all stakeholder travel patterns are understood and addressed.
6.5.2 Construction mitigation measures

The principal means of mitigating construction impacts will be through more detailed planning which will occur through the development of a Framework Transport Management Plan followed by detailed Construction Traffic Management Plans.

A Framework Transport Management Plan is a high level overarching document and will be developed first, outlining the principles of construction traffic management and detailed consultation, approvals processes and monitoring. It is envisaged that the Framework Transport Management Plan will be approved by TMR (Metropolitan Region) and Council as appropriate, in consultation with the Queensland Police Service and other emergency services.

The construction traffic arrangements of Brisbane Metro as outlined in the Framework Transport Management Plan will be designed to achieve minimum possible disruption to public transport users, traffic, pedestrians and cyclists. The construction traffic management objectives are, to the extent reasonable and practicable, to:

- 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 most excavated material from locations that are close to the arterial and motorway road network.

Performance criteria proposed to achieve these principles, are to be included in the Framework Transport Management Plan and addressed in each Construction Traffic Management Plan. Following the approval of the Framework Traffic Management Plan, a Construction Traffic Management Plan will be developed for each construction worksite, including construction laydown areas, outlining more detailed information of specific traffic management techniques. Each Construction Traffic Management Plan should outline strategies to minimise any likely impact from construction activity at each construction worksite. The Construction Traffic Management Plans should consider the convenience and safety of all road users, including public transport, pedestrians and cyclists. Access to properties should be maintained at all times wherever possible.

Each Construction Traffic Management Plan will include a detailed description and plans for:

- staging and timing of works on the busway and busway stations
- staging and timing of works on roads
- pedestrian and cycle routes
- access to public transport stops
- signage and delineation around construction worksites and construction areas, including any diversion routes
- other measures to help ensure safety and manage the change in traffic flows (for example, traffic controllers, traffic signal operational changes, dynamic advance warning using variable message signage and real-time monitoring of traffic conditions using closed circuit television (CCTV))
- identification of any alternative routes with sufficient capacity to temporarily accommodate additional traffic, with measures to encourage drivers to use these routes.
- monitoring of traffic flows against any modelled traffic volumes.
The following outlines specific mitigation measures to be included in each Construction Traffic Management Plan.

- Liaison with affected stakeholders as part of the development of Construction Traffic Management Plans, including Griffith University, QPAC, Arts Queensland, South Bank Corporation and TMR.
- Special events that are held in the city core.
- Restricting truck (spoil and delivery) movements on the road network during commuter peak periods (i.e. 7am-9am and 4pm-6pm Monday to Friday). Further restrictions should apply to the Eight Mile Plains (metro depot) construction worksite to restrict truck movements at Priestdale Road during the afternoon school peak period (i.e. 2.30pm-4pm school days).
- Works to be completed from the busway should be carried out when bus volumes are low or when there are no buses operating on the busway. This will be between 9pm and 5am Monday to Friday, and during weekends from 10pm Friday to 5am Monday. Such works will have appropriate traffic control measures such as lane closures and will be coordinated with bus operators and TransLink.
- Deliveries and removal of spoil and materials via the busway will generally be carried out when there are low volumes or no buses operating on the busway, being 9pm and 5am Monday to Friday, and during weekends from 10pm Friday to 5am Monday. The operation of delivery and spoil vehicles on the busway will have appropriate traffic control measures and will be coordinated with bus operators and TransLink.
- At the Buranda construction worksite, buses will be required to be diverted from the busway over several weekends and at night (i.e. after 9pm). In consultation and agreement with TransLink and the bus operator, buses will be diverted via the Eastern Busway and South East Busway access points on O’Keefe Street with temporary bus stops provided on O’Keefe Street.
- Work areas associated with busway platform extensions and other minor station works should be segregated to prevent customers from accessing work areas and should be such that busway station operations continue relatively unhindered (i.e. no amendments to bus services and provision of appropriate customer access to platforms) whilst subjected to necessary safety measures (e.g. reduction in vehicle speed at construction worksites and provision of safety barriers and signage).
- At the Cultural Centre precinct construction worksite, a range of minimum requirements will be stipulated so that pedestrians can safely and logically access all destinations in the Cultural Centre precinct and be able to walk through the precinct. The following minimum requirements should be included in the Construction Traffic Management Plan:
  - both the downstream footpath and the upstream shared path on Victoria Bridge remain open and accessible from both sides of the Brisbane River
  - pedestrians are able to access the Cultural Centre station from both sides of Melbourne Street
  - pedestrians are able to access the Cultural Centre pedestrian bridge from both sides of Melbourne Street
  - an at-grade pedestrian crossing is available between the Cultural Centre pedestrian bridge and the intersection of Grey Street and Melbourne Street (this could be on the river side of the intersection)
  - a pedestrian crossing of Grey Street is provided to enable connectivity between QPAC and the South Brisbane railway station
  - pedestrian access across Melbourne Street will be provided at the intersection of Grey and Melbourne Streets
  - a pedestrian path is available on the north-west side of Melbourne Street between Grey and Merivale Streets
  - a pedestrian path is available on Grey Street between Melbourne Street and a pedestrian crossing between QPAC and the South Brisbane railway station
  - pedestrians are able to access the Cultural Centre venues
  - disabled drop off and taxi drop off.
Suitable bus operation plans will be developed by Transport for Brisbane and TransLink prior to the commencement of construction works. These will provide for as many buses as practical to continue to operate through the South East Busway, Cultural Centre station, along North Quay and Adelaide Street as far as practicable.

The combined traffic impacts of the construction worksites at the Cultural Centre precinct and Adelaide Street/North Quay will impact on the performance of the road network in the city core. To mitigate these construction impacts the operational measures (minor intersection reconfiguration improvements at Grey Street/Peel Street and Peel Street/Merivale Street, Roma Street/Countess Street and Upper Roma Street/Skew Street intersections) should be implemented as part of the preconstruction works (or early works).