CHAPTER 5
Project description
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5. Project description

This chapter provides a description of Brisbane Metro including key infrastructure, operations and construction.

5.1 Project overview

Brisbane Metro is located within the Brisbane LGA. It extends approximately 21 kilometres from Eight Mile Plains station in the south to RBWH station at Herston in the north, and to the UQ Lakes station at St Lucia. It comprises a range of elements that work together to respond to the project principles and address the identified problems outlined in Chapters 2 and 4. Key elements of Brisbane Metro are shown in Figure 5.1 and summarised in Table 5.1.

Figure 5.1: Key elements of Brisbane Metro

<table>
<thead>
<tr>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Network and services</td>
<td>A reliable, frequent trunk service along with attractive interchanges provides the catalyst for a revised network, increasing network efficiency and freeing space on the busway for higher occupancy metro vehicles.</td>
</tr>
</tbody>
</table>
| Metro lines                  |   • Metro 1 – Eight Mile Plains station to Roma Street station.  
    • Metro 2 – UQ Lakes station to RBWH station.  |
| Frequency of services        |   • Three minutes during peak periods.  
    • Metro service every 90 seconds between Mater Hill and Roma Street stations during peak periods.  
    • Five minute frequencies during week day inter-peak period.  
    • 10 minute frequencies during other off-peak times including weekends.  |
| Hours of operation           |   • 20 hours a day Monday to Friday, with services between 5am and midnight.  
    • All day Saturday and Sunday, with services between midnight Friday and midnight Sunday.  |
| Network integration strategy | Hybrid model, with Brisbane Metro performing a trunk role supported by numerous ‘feeder routes’, with a limited number of high performing services also operating directly to the CBD. Specifically: |
Description | Details
--- | ---
 | • routes 66, 111 and 160 superceded by Brisbane Metro
 | • connecting with local feeder routes at Brisbane Metro stations
 | • retention of frequent through running services (i.e. BUZ and CityGlider) on the busway
 | • introduction of new, and strengthening of existing, Glider network.

Key Brisbane Metro/rail interchanges | • Roma Street (all rail lines including proposed CRR project).
 | • South Brisbane/Cultural Centre (Beenleigh/Gold Coast, Cleveland lines).
 | • Buranda (Cleveland line).
 | • Boggo Road (Beenleigh/Gold Coast, Cleveland lines including proposed CRR project).

Key metro/bus interchanges | • RBWH
 | • Roma Street
 | • King George Square
 | • Cultural Centre
 | • Boggo Road
 | • Griffith University
 | • Upper Mt Gravatt (Garden City)
 | • Eight Mile Plains.

Operational policies | Policy and operational changes reduce vehicle dwell times, improve busway capacity and reduce travel time variability.

Ticketing | • Ticketing gates or platform card readers will be installed at Brisbane Metro stations.
 | • No on-board ticket purchases or validation will be available on metro or bus services (on metro alignment).

Boarding | All door alighting and boarding on metro services and other busway services at Brisbane Metro stations.

Vehicle | First vehicle into platform bays is first vehicle to leave the platform.

Vehicles | The metro vehicle carries more customers per driver and per litre of fuel, increasing efficiency. The vehicle also operates alongside 12.5 metre, 14.5 metre and 18 metre buses, maximising station performance in mixed fleet operations minimising need for new infrastructure.

Vehicle type | Metro vehicle approximately 24-25 metres long, 2.55 metres wide, 3.5 metres high. At least four double-leaf access doors.

Power supply | Council has assessed potential fuel source options. A number of options exist including:
 | • diesel fuel (assumed for the draft Design Report)
 | • hybrid diesel, a battery powered electric drive is constantly charged by an on-board diesel generator
 | • rapid charge fully-electric, an on-board battery fully powers the electric drive, with rapid charging being required at most stations
 | • longer range fully-electric, an on-board (larger) battery fully powers the electric drive, with charging being required after approximately 200 kilometres of travel
 | • gas powered.

Capacity | 150 customers.

Fleet size | 60 vehicles for initial operations.

Systems | Station, platform and on-board systems will better manage vehicle operations and improve passenger information. This will improve the customer experience by providing advance notification of stop location, reducing dwell times and improving busway capacity, reducing travel time variability and improving vehicle efficiency.

Station/platform systems | • Dynamic vehicle bay allocation system.
 | • Platform information displays advise customers on what services are arriving at each bay and arrival times.
 | • On-bus information displays to advise travel times to key stations.
 | • Platform and on-bus public address systems to assist customers.
<table>
<thead>
<tr>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>On-vehicle systems</strong></td>
<td>• Wi-Fi access.</td>
</tr>
<tr>
<td></td>
<td>• Real-time travel updates from current station to Eight Mile Plains, Buranda, King George Square, and RBWH stations.</td>
</tr>
<tr>
<td></td>
<td>• Public address/voice announcements that the next station will be reached in one minute.</td>
</tr>
<tr>
<td></td>
<td>• Real-time vehicle location to support dynamic vehicle bay allocations.</td>
</tr>
<tr>
<td><strong>Infrastructure</strong></td>
<td><strong>Targeted investment in new infrastructure, along with modifications to existing infrastructure, will help address critical inner city bottlenecks and increase the capacity of the busway.</strong></td>
</tr>
<tr>
<td><strong>Tunnels/portals</strong></td>
<td>• Tunnel from the existing South East Busway near South Brisbane railway station to the new underground Cultural Centre station, passing under the Queensland Rail railway corridor.</td>
</tr>
<tr>
<td></td>
<td>• Portal and transition structure along Melbourne Street from the new underground Cultural Centre station to Victoria Bridge.</td>
</tr>
<tr>
<td></td>
<td>• Cut-and-cover tunnel along Adelaide Street to connect to the existing Albert Street bus tunnel and King George Square station.</td>
</tr>
<tr>
<td><strong>Victoria Bridge</strong></td>
<td>• Victoria Bridge converted to a green bridge for metro and bus services, pedestrians and cyclists.</td>
</tr>
<tr>
<td></td>
<td>• Modification to pedestrian access on the downstream side of the bridge with an additional 1.2 metre width providing increased pedestrian capacity and enhanced connection to Reddacliff Place.</td>
</tr>
<tr>
<td><strong>North Quay</strong></td>
<td>• The intersection of North Quay and Adelaide Street closed to through traffic to allow for a dedicated corridor for Brisbane Metro and bus services between Adelaide Street and Victoria Bridge.</td>
</tr>
<tr>
<td></td>
<td>• The intersection of North Quay, William Street and Queens Wharf Road will be restricted to local traffic only.</td>
</tr>
<tr>
<td><strong>New stations</strong></td>
<td>New underground station at the Cultural Centre precinct.</td>
</tr>
<tr>
<td><strong>Existing station modifications</strong></td>
<td>Major station modifications (platforms extensions greater than 10 metres):</td>
</tr>
<tr>
<td></td>
<td>• Griffith University station</td>
</tr>
<tr>
<td></td>
<td>• Buranda station</td>
</tr>
<tr>
<td></td>
<td>• Roma Street station.</td>
</tr>
<tr>
<td></td>
<td>Minor modifications or upgrades at other busway stations.</td>
</tr>
<tr>
<td><strong>Turnarounds</strong></td>
<td>Brisbane Metro turnarounds at:</td>
</tr>
<tr>
<td></td>
<td>• Eight Mile Plains station</td>
</tr>
<tr>
<td></td>
<td>• UQ Lakes station</td>
</tr>
<tr>
<td></td>
<td>• Countess Street</td>
</tr>
<tr>
<td></td>
<td>• Ernie’s Roundabout at Herston.</td>
</tr>
<tr>
<td></td>
<td>Bus turnarounds at:</td>
</tr>
<tr>
<td></td>
<td>• Griffith University station</td>
</tr>
<tr>
<td></td>
<td>• Woolloongabba station.</td>
</tr>
<tr>
<td><strong>Layovers</strong></td>
<td>Layover facilities for metro vehicles at:</td>
</tr>
<tr>
<td></td>
<td>• Eight Mile Plains station</td>
</tr>
<tr>
<td></td>
<td>• UQ Lakes station</td>
</tr>
<tr>
<td></td>
<td>• Countess Street</td>
</tr>
<tr>
<td></td>
<td>• Ernie’s Roundabout.</td>
</tr>
<tr>
<td></td>
<td>Layover facilities for buses at Griffith University and Boggo Road station.</td>
</tr>
<tr>
<td><strong>Metro depot</strong></td>
<td>New metro depot to be constructed at School Road, Rochedale for stabling, refuelling and maintenance of metro vehicles.</td>
</tr>
</tbody>
</table>
5.2 Project operations

This section provides a summary of the proposed operation of Brisbane Metro, including the network and services, operational policies and metro vehicles.

Brisbane Metro will deliver a ‘turn-up-and-go’ mass transit system with metro services every three minutes in peak periods on both metro lines which equates to metro services every 90 seconds in the inner city. The system will have the capacity to carry up to 22,000 customers per hour per direction (metro services and buses) upon commencement of operations with increased capacity in the future.

5.2.1 Network and services

Brisbane Metro services and frequencies

Brisbane Metro proposes two new high-capacity metro lines that share existing infrastructure with bus services, as shown in Figure 5.2. They include:

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

Metro 1 will provide a new trunk route from the southern suburbs to the inner city, servicing destinations such as Griffith University Mt Gravatt campus and Garden City Shopping Centre and providing opportunities to transfer to other metro, bus and rail services in the CBD. Metro 2 will provide a strong inner city distribution function along the knowledge and health corridor, anchored by major trip generators at RBWH in the north and UQ St Lucia in the south. It will also provide connectivity to destinations at South Brisbane, the CBD and inner-northern suburbs.

Brisbane Metro is proposed to operate:

- 20 hours a day Monday to Friday (with services between 5am and midnight)
- All day Saturday and Sunday (with services between midnight Friday and midnight Sunday).

Table 5.2 provides an overview of metro service frequencies during peak and off-peak periods for the year of opening and at 10 years following opening. In the year of opening, metro services will operate at three minute frequencies during peak periods. During day-time inter-peak, metro services will operate at about five minute frequencies.

Over the subsequent years of operations, metro frequencies in peak times will continue to increase in line with demand. Metro 1 frequencies are proposed to increase over 10 years, with services proposed to operate every two minutes during peak periods. The same frequency of services proposed from day one of operations will continue to operate during off-peak periods.

Table 5.2: Brisbane Metro service frequencies

<table>
<thead>
<tr>
<th>Period</th>
<th>Metro line</th>
<th>Year 1</th>
<th>Year 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weekday peak frequency</td>
<td>Metro 1</td>
<td>3 minutes</td>
<td>2 minutes</td>
</tr>
<tr>
<td></td>
<td>Metro 2</td>
<td>3 minutes</td>
<td>2 minutes</td>
</tr>
<tr>
<td>Weekday inter-peak</td>
<td>Metro 1 and Metro 2</td>
<td>5 minutes</td>
<td>5 minutes</td>
</tr>
<tr>
<td>Other times</td>
<td>Metro 1 and Metro 2</td>
<td>10 minutes*</td>
<td>10 minutes*</td>
</tr>
</tbody>
</table>

* Adjusted to match demand
Public transport network integration

Brisbane Metro will form part of the wider South East Queensland public transport network. The overarching vision for the integration of metro, bus and rail (existing and future) has been established in a number of plans and strategies including the Connecting Brisbane strategy released by the Queensland Government and Brisbane City Council in June 2017.
Brisbane’s proposed future core public transport network is shown in Figure 5.3. The network provides a clear inter-relationship between different transport modes and services, each servicing a range of destinations and connecting at key interchanges to allow customer transfer between services. For example, the proposed CRR project provides a new corridor for trunk passenger rail services, transporting passengers into the CBD from the north and south of Brisbane. Brisbane Metro also acts as a trunk passenger route for large areas of Brisbane not served by the rail network, as well as improving the distribution of passengers within the inner city including between the CBD and key trip generators on the busway.

Figure 5.3: Proposed future core public transport network for Brisbane

Brisbane Metro proposes a hybrid of the ‘direct service model’ (i.e. single seat) and ‘trunk and feeder model’ (i.e. local services feed into a trunk corridor). This provides a trunk service that operates as the primary service along the busway supported by numerous ‘feeder routes’, with a limited number of high performing services (e.g. BUZ and CityGlider services) also operating directly to the CBD (refer to Figure 5.4). The hybrid strategy allows simplification of the public transport network to create more legible high-capacity trunk service(s), and retention of selected key ‘through running’ bus routes along the trunk route.

\[1\] DILGP (2017), Connecting Brisbane
Proposed network changes resulting from the introduction of Brisbane Metro will generally include:

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

The introduction of Brisbane Metro is not proposed to affect bus services operated by private operators. Changes to other bus services will be planned with TransLink and Transport for Brisbane and consulted with the community prior to implementation as described in Chapter 3.

**Special events**

The Metro 1 and Metro 2 services present a range of opportunities to assist in the planning and management of major events including:

- events in the CBD and South Bank such as Riverfire and New Year’s Eve, parades/marches (e.g. Anzac Day, Labour Day), and major conferences, festivals and other celebrations
- events at the Exhibition Showgrounds (via RBWH station), such as the Royal Queensland Show (Ekka), Caravan and Camping Show, Oktoberfest and concerts.

Regular scheduled metro services could be increased in frequency if required (e.g. up to peak period frequencies), in order to assist in the event transport task. Brisbane Metro may also present opportunities to assist in transporting crowds to and from the Brisbane Cricket Ground (Gabba stadium) and allow Stadiums Queensland to consider an alternative event transport management plan using metro vehicles to provide shuttle services from Eight Mile Plains, Upper Mt Gravatt and RBWH stations.

**5.2.2 Operational policy improvements**

Brisbane Metro will change a number of current operational policies to improve capacity and reliability. Dwell times will be improved by allowing faster and more efficient customer boarding and alighting. These changes include:

- metro vehicles and buses will facilitate multi-door boarding and alighting for customers
- providing stand-alone card interface devices at existing busway stations to facilitate off-board ticketing
• providing ticketing gates at underground stations (i.e. Cultural Centre and King George Square stations)
• implementing first-in/first-out vehicle operations at all stations requiring all vehicles to follow the same dwell times, noting that King George Square station will operate on a first-in/first-out basis over two separate sections of each platform
• implementation of a new passenger information display system to support the real-time bus management system and inform customers of the stopping bay for approaching or departing metro vehicles and buses.

5.2.3 Metro vehicle

A new fleet of 60 high-capacity metro vehicles will be introduced on the day of opening for the Metro 1 and Metro 2 services to improve customer experience, comfort and busway capacity. Council is currently assessing a range of metro vehicles from suppliers in Australia and around the world to determine their suitability for Brisbane Metro. A ‘reference vehicle’ has been adopted for the purposes of this draft Design Report.

Each metro vehicle will be approximately 24-25 metres in length and provide capacity for up to 150 customers (depending on customer density). The metro vehicles are proposed to be bi-articulated (i.e. have two articulation or pivot points) to provide similar turning circles and swept path vehicle movements to existing buses. Other features of the metro vehicle include:

• low floor design to allow quicker boarding and alighting, and improved comfort
• four large (double) doors along the left-side of the vehicle to allow rapid boarding and departure
• four axles
• on-board features such as Wi-Fi access, passenger information systems to provide real-time travel updates, and public/voice announcements of the next station.

The metro vehicle will be able to operate on the existing busways without significant modification. The existing platform height will be maintained, with metro vehicles provided with doorway access ramps that will be motor powered or manually deployed by the driver as required.

Council has investigated potential options for the metro vehicle’s fuel source, including conventional and alternative fuels such as diesel, gas, fully-electric or hybrid options. For the purposes of this draft Design Report, it is assumed that the fuel type would be diesel.

It is anticipated that the total number of metro vehicles required for day one of operations would be 60 vehicles. This number has been determined based on the peak operating frequencies, the forecast (modelled) journey times for each metro service and other assumptions around the recovery layover time and the number of spare vehicles required for servicing and maintenance.

Key dimensions for the reference vehicle adopted for the draft Design Report are summarised in Table 5.3. An artist’s impression of a metro vehicle is shown in Figure 5.5.

Table 5.3: Brisbane Metro reference vehicle – assumed dimensions

<table>
<thead>
<tr>
<th>Item</th>
<th>Assumed dimension</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum vehicle length</td>
<td>24-25 metres</td>
</tr>
<tr>
<td>Maximum vehicle width</td>
<td>2.55 metres</td>
</tr>
<tr>
<td>Height of the vehicle</td>
<td>3.5 metres</td>
</tr>
<tr>
<td>Boarding height</td>
<td>0.33 metres (floor height at entry to vehicle)</td>
</tr>
<tr>
<td>Platform kerb height</td>
<td>0.15 metres minimum (to match existing)*</td>
</tr>
<tr>
<td>Minimum clearance height</td>
<td>Not less than 4.5 metres</td>
</tr>
<tr>
<td>Access doors</td>
<td>At least four access doors at front, centre and rear of the vehicle (left-hand side)</td>
</tr>
<tr>
<td>Item</td>
<td>Assumed dimension</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>Front and rear overhang</td>
<td>1.9 metres</td>
</tr>
<tr>
<td>Wheelbase</td>
<td>6.6 metres</td>
</tr>
</tbody>
</table>

* Assumes that Disability Discrimination Act 1992 (DDA) compliance issues are resolved within the vehicle using doorway access ramps.

Figure 5.5: Artist impression of a metro vehicle

5.2.4 System – platform management and information system

The platform management and information system will reduce dwell times at stations, improve busway capacity by increasing the number of people able to board buses per hour and provide an improved experience for customers. This is achieved by a combination of measures including the following.

- Advising passengers at station platforms in advance which platform bay/stop arriving metros and buses are going to stop at so customers can comfortably move to the correct bay/stop and are ready to board when their service arrives. This would minimise walk distance to the vehicle door and minimise anxiety that the passenger would miss their desired service.
- On-vehicle information system to advise customers when they are arriving at stations so they are ready to alight.
- Bus driver consoles to advise drivers in advance of each station the bay they are to stop at, simultaneously advising customers the stop their bus is to stop at.
- Tracking of vehicles by a combination of GPS, Bluetooth and potentially radio frequency identification devices so the system can determine the order of vehicles and allocate the station bay/stop accordingly.
- Bus/metro vehicle order remaining fixed approaching each station to provide sufficient time for the system to allocate a stop/bay and customers to move to the allocated stop/bay.

5.3 Brisbane Metro infrastructure

Brisbane Metro reuses, repurposes and augments the existing busway wherever possible. New major infrastructure will be limited to the Cultural Centre precinct and North Quay/Adelaide Street to provide a complete grade separated or segregated alignment between the existing busways, and the metro depot at Rochedale. Other infrastructure includes station modifications, and new/modified layovers and bus turnarounds.

This section describes the new and modified infrastructure proposed for Brisbane Metro. An overview of the key infrastructure is shown in Figure 5.6 (refer to Part D: Concept Design Drawings for further details).
Figure 5.6A: Brisbane Metro overview

Key

New infrastructure
- Metro / bus on surface
- Metro / bus platform

Existing infrastructure
- Metro alignment

Stations
- Station modifications
Figure 5.6B: Brisbane Metro overview

Key

New infrastructure
- Blue: Metro / bus on surface
- Orange: Metro / bus platform

Existing infrastructure
- Blue: Metro alignment

Stations
- Green circle: Station modifications
- Black circle: Station upgrades

- Holland Park West station
- Mt Gravatt
- Griffith University station
- Nathan
- Robertson
- Macgregor
- Upper Mt Gravatt station
- Upper Mt Gravatt
- Mt Gravatt

Scale: 800m
Figure 5.6C: Brisbane Metro overview

Key

<table>
<thead>
<tr>
<th>New infrastructure</th>
<th>Stations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metro / bus platform</td>
<td>Station modifications</td>
</tr>
<tr>
<td>Existing infrastructure</td>
<td>Station upgrades</td>
</tr>
<tr>
<td>Metro alignment</td>
<td></td>
</tr>
</tbody>
</table>

Stations:
- Greenslopes station
- Tarragindi
- Annerley
- Coorparoo
- Holland Park West station
- Greenslopes
Figure 5.6D: Brisbane Metro overview

Key

**New infrastructure**
- Metro / bus on surface
- Transition structure
- Tunnel / underpass
- Metro / bus platform

**Existing infrastructure**
- Metro alignment

**Stations**
- New station
- Station modifications
- Station upgrades
Figure 5.6E: Brisbane Metro overview

Key

<table>
<thead>
<tr>
<th>New infrastructure</th>
<th>Stations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metro / bus on surface</td>
<td>New station</td>
</tr>
<tr>
<td>Transition structure</td>
<td>Station modifications</td>
</tr>
<tr>
<td>Tunnel / underpass</td>
<td>Station upgrades</td>
</tr>
<tr>
<td>Metro / bus platform</td>
<td></td>
</tr>
</tbody>
</table>

Existing infrastructure

Metro alignment

Metro stations:
- Cultural Centre station
- King George Square station
- Roma Street station
- QUT Kelvin Grove station
- Herston station
- RBWH station
- South Brisbane
- South Bank
- Kangaroo Point
- Petrie Terrace
- Normanby station
- Brisbane

Metro alignment path:
- Cultural Centre station
- King George Square station
- Roma Street station
- QUT Kelvin Grove station
- Herston station
- RBWH station
- South Brisbane
- South Bank
- Kangaroo Point
- Petrie Terrace
- Normanby station
- Brisbane
5.3.1 Cultural Centre precinct

The Cultural Centre precinct will be serviced by a new underground station for metro vehicles and buses operating on the Brisbane Metro alignment. The new station joins the South East Busway underground and connects to Victoria Bridge via a transition structure along Melbourne Street. Surface bus stops at Melbourne Street will also provide for services to West End, CBD and Fortitude Valley (e.g. CityGlider).

New underground Cultural Centre station

The new underground Cultural Centre station is to be located beneath the existing South Brisbane railway corridor, the property at 125 Grey Street, the intersection of Grey and Melbourne Streets, and the QPAC Green. An underpass of the railway corridor will connect the station to the existing South East Busway beside the BCEC. The new underground station is to connect to Victoria Bridge via a transition structure along Melbourne Street.

Key elements of the new underground Cultural Centre station are shown in Figure 5.7. Additional station drawings are also included in the concept design drawings for the draft Design Report (refer to Part D: Concept Design Drawings).

Figure 5.7: Cultural Centre station

The station will include stopping bays for inbound and outbound metro vehicles and buses, and central through running lanes in both directions. Side platforms are proposed to be approximately 100 metres long and up to 5.5 metres wide. The platforms will be approximately seven to eight metres below surface level. The platforms will be designed to cater for pedestrian flow during peak times. They will include full height platform screen doors providing customer comfort as well as management and separation from the metro vehicles and buses.

Customer access will be provided to each platform by escalators, stairs and a lift. The escalators allow bi-directional peak hour management. The two station entries are proposed to be located at 125 Grey Street, at
the corner of Grey Street and Melbourne Street. The station entries include surface level ticket gates to allow fare management. The station ground level concourse has a canopy structure extending the full width of the site, with provision for small retail tenancy spaces (refer to Figure 5.8).

Figure 5.8: Cultural Centre station – cross section

Essential station services and equipment, smoke extraction fans, and transformers are proposed to be located above the station and station canopy structure. The existing Melbourne Street busway portal to the South East Busway will be closed to buses. Fire and life safety measures will include smoke zones, emergency egress/evacuation facilities to meet Queensland Fire and Emergency Services (QFES) requirements, including necessary fire prevention and fire control systems. A smoke extraction outlet is proposed to be located above the station canopy to remove smoke in the event of a fire in the station. Emergency egress to the surface will be provided from each end of the station platforms to ensure the safety of customers in the event of an emergency. Flood protection measures will be incorporated into the design (e.g. transition structure, BCEC busway tunnel connection and station entries) to provide a 1-in-150 year (0.6%) annual exceedance probability (AEP) level of flood immunity to the underground station. Essential station services and equipment are proposed to be located above the station and would have a higher level of flood immunity.

The new Cultural Centre underground station will also incorporate a level of finish similar to existing busway stations (e.g. quality of tiling and glazing finishes) and a level of public realm that integrates the infrastructure to the local precinct. The station has been designed to support potential low rise development above it.

The location of the station requires surface works to be undertaken within the QPAC Green. Following the construction works, the QPAC Green will be reinstated. Council has commenced consultation with QPAC and Arts Queensland about Brisbane Metro and will continue to consult with these stakeholders about the reinstatement of QPAC Green following construction.

Other infrastructure elements required for the new underground station are described in Table 5.4.

Table 5.4: Infrastructure elements of the new underground Cultural Centre station

<table>
<thead>
<tr>
<th>Infrastructure element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BCEC busway tunnel</td>
<td>Brisbane Metro requires lowering of a section of existing pavement within the South East Busway BCEC tunnel and construction of an opening through a section of the existing bored pile wall that forms part of the busway tunnel. This section of tunnel supports the BCEC loading dock above. A waterproof barrier will be provided along the edge of the alignment facing Melbourne Street to prevent overland flow from the Melbourne Street busway portal entering the Brisbane Metro alignment.</td>
</tr>
<tr>
<td>Infrastructure element</td>
<td>Description</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Rail underpass</td>
<td>The southern end of the new underground station and connection to the existing BCEC busway tunnel will sit beneath the railway corridor, including the existing railway platforms and the four rail lines. An underpass structure will be required to support the existing rail lines and station platforms.</td>
</tr>
<tr>
<td>Melbourne Street transition</td>
<td>A transition structure will be required to connect the underground station to the surface at Victoria Bridge. The transition structure extends along Melbourne Street from the station portal, next to the existing Cultural Centre pedestrian bridge, to Victoria Bridge. The transition structure requires the closure of the existing Cultural Centre pedestrian tunnel between QPAC and the Queensland Museum. The transition structure also requires the reconstruction of a section of the Victoria Bridge backspan.</td>
</tr>
<tr>
<td>structure</td>
<td></td>
</tr>
</tbody>
</table>

**Melbourne Street bus stops**

Surface level bus stops will be established on either side of Melbourne Street for bus services connecting to West End, the CBD and Fortitude Valley. The new surface bus stops will be located beneath the existing rail overpass, between Grey and Hope Streets and integrated with the public realm.

As the number of buses on surface is significantly reduced, the bus stops will be shorter than the existing surface bus station platforms. The outbound stop will provide a direct connection to the entries for the new Cultural Centre underground station. Pedestrian connection between the inbound stop and the underground station will be provided via the upgraded Melbourne and Grey Street intersection.

The existing busway station at the Cultural Centre precinct will be removed. This includes the central lift and stairwell to the Cultural Centre pedestrian bridge. The outside lifts connecting to the pedestrian bridge are proposed to be relocated to within the QPAC and Queensland Museum sites allowing enhanced pedestrian access and public realm improvements to this section of Melbourne Street.

**Local road and access changes**

Grey Street will be reduced to one lane in each direction for a section near the station entries and through the Melbourne Street intersection. This is required to accommodate the entries to the underground station and pedestrian access. Passenger drop-off/pick-up for QPAC and access to the QPAC staff and VIP car park from Grey Street will be maintained along with the pedestrian crossing of Grey Street at the South Brisbane railway station. The intersection at Grey and Melbourne Streets will be upgraded to a scramble crossing to improve the capacity and convenience for pedestrians to cross this intersection. Public realm improvements will also be made to part of Grey Street to create a boulevard.

Melbourne Street will be closed to general traffic between Hope Street and Victoria Bridge. Two surface bus lanes will be maintained along the section of Melbourne Street between Merivale Street and Grey Street, with the section between Merivale Street and Hope Street also having an eastbound lane for local traffic. The Melbourne Street busway portal will be closed to buses removing the intersection at Melbourne Street and allowing unimpeded pedestrian and vehicle movements in both directions along this section of Melbourne Street. The intersection of Melbourne and Hope Streets is proposed to be modified to allow left-in access only to Hope Street. Vehicle egress to Melbourne Street from the BCEC loading dock will be maintained.

As indicated in Table 5.4, the transition structure will require the closure of the existing Cultural Centre pedestrian tunnel. Pedestrian movements that use the pedestrian tunnel, will be accommodated via the existing Cultural Centre pedestrian bridge, a new surface level pedestrian crossing of Melbourne Street located under the pedestrian bridge and the proposed scramble crossing at the upgraded Melbourne and Grey Streets intersection. Council has commenced discussions with the Cultural Centre stakeholders, including Arts Queensland, QPAC, Queensland Museum, and Queensland Art Gallery about the closure of the Cultural Centre pedestrian tunnel and will continue to consult with these stakeholders through the design development.

Melbourne Street access to/from Stanley Street for general traffic will be removed with the closure of Melbourne Street to general traffic between Hope Street and Victoria Bridge. Access to the Cultural Centre car parks will be via the existing Peel Street/Stanley Place access through the Cultural Centre tunnel. A cul-de-sac facility is
proposed be provided to allow general traffic to turn around next to the QPAC forecourt area. Consultation with Cultural Centre stakeholders has commenced regarding this change.

Access for emergency vehicles to the Cultural Centre precinct will be maintained from the surface bus lanes at Melbourne Street. Service vehicle access to the Cultural Forecourt will be maintained from the existing Russell Street access. Egress for large service vehicles from the Cultural Forecourt will be maintained to the outbound bus lane at Melbourne Street. Egress for smaller service vehicles will be maintained via the Cultural Centre tunnel.

5.3.2 Victoria Bridge

Victoria Bridge will be closed to general traffic to provide two additional lanes for cross-river public transport. The two middle lanes will be used for metro vehicles and busway buses with a lane on either side for surface buses (e.g. CityGlider) (refer to Figure 5.9). Access for emergency vehicles will be maintained on all four lanes.

The existing roadway space will be reallocated and reduced, allowing the existing downstream footpath to be widened by at least 1.2 metres within the existing bridge width. This will facilitate pedestrian movement and greater capacity across the bridge. Pedestrians will be encouraged through signage to travel on the downstream footpath. As currently occurs, cyclists will be required to dismount at each end of the bridge on the downstream footpath or use the shared path on the bridge’s upstream footpath. Opportunities to provide wider paths on both sides of Victoria Bridge will be investigated during the detailed design phase.

The abutment corner of Victoria Bridge at North Quay will be extended and widened to provide an acceptable turning path for the metro and buses from Victoria Bridge onto North Quay.

Figure 5.9: Cross section of Victoria Bridge

5.3.3 North Quay/Adelaide Street

North Quay

North Quay will be widened between Victoria Bridge and the proposed Adelaide Street portal, with two central metro/bus lanes and outside lanes for surface buses. A shared pedestrian/cycle path will be maintained on the western side of North Quay. Changes will be made to the intersection of North Quay, Victoria Bridge and William Street.

Access to QSBS for buses travelling across Victoria Bridge will be via the new Adelaide Street tunnel and existing Albert Street bus tunnel. Access will be maintained for outbound buses from the QSBS to Victoria Bridge at North Quay. The intersection of North Quay and Adelaide Street will be closed to through traffic to allow for a dedicated corridor for Brisbane Metro. The intersection of North Quay, William Street and Queens Wharf Road would be restricted to local traffic only. Traffic access will be maintained to the development at 300 George Street and the car park at Brisbane Square.
Pedestrian access will be maintained across the North Quay and William Street intersection to Reddacliff Place and the CBD on the downstream footpath and upstream shared path of Victoria Bridge. The existing cycle ramp access to the Bicentennial bikeway is proposed to be relocated near the intersection of North Quay and Adelaide Street.

Key elements of works at North Quay are shown in Figure 5.10. Additional drawings are also included in the concept design drawings for the draft Design Report (refer to Part D: Concept Design Drawings).

**Figure 5.10: North Quay**

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**Adelaide Street**

A new tunnel under Adelaide Street will connect North Quay to the existing Albert Street bus tunnel near King George Square station, completing the grade separation and segregation of the busway corridor from general traffic. A tunnel portal and transition structure will be located at Adelaide Street, on the river side of George Street.

The tunnel will provide one lane in each direction for metro vehicles and buses (refer to Figure 5.11 and Figure 5.12). It is proposed to be about 13 metres wide, approximately 200 metres long and up to about 11 metres deep where it connects to the existing Albert Street bus tunnel and King George Square station. A ‘hook turn’ lane will be provided to allow inbound buses to access QSBS (i.e. buses would turn right from a left-hand lane).
Fire and life safety measures will be integrated into the design of the new Adelaide Street tunnel. These would include:

- fans in the Adelaide Street tunnel near the junction with the existing Albert Street bus tunnel
- fire isolated corridor along the tunnel for emergency egress of metro customers
- emergency egresses near the portal at George Street to North Quay and to King George Square.
Access for surface buses will be maintained along Adelaide Street. Surface buses will travel on the outside of the transition structure and tunnel portal to access George Street and North Quay.

5.3.4 Busway station modifications and upgrades

Platform extensions will be required to the existing Eight Mile Plains, Upper Mt Gravatt, Griffith University, Buranda, Mater Hill, and Roma Street stations, to accommodate increased station activity. Modifications will also be required to the platform screen door locations at King George Square station. Existing entrances and exits to current stations will be re-used. DDA compliant access and ramps will be provided as required, whilst maintaining the existing entrances.

All existing busway stations will also be upgraded to include:

- new ticket stand-alone card interface devices on the platforms to facilitate off-board ticketing, i.e. ‘tagging on’ and ‘tagging off’
- new passenger information displays to support the real-time bus management system and to inform customers of the stopping bay approaching metro vehicles and buses would depart from
- new Brisbane Metro branding (e.g. painting, signage).

Table 5.5 includes a summary of the works to be undertaken at each of the existing busway stations for Brisbane Metro. A detailed description of proposed works for the new underground Cultural Centre station is provided in section 5.3.1.

### Table 5.5: Station modifications

<table>
<thead>
<tr>
<th>Busway station</th>
<th>Summary of works</th>
</tr>
</thead>
</table>
| Eight Mile Plains                | • Modification of existing platforms by approximately 9.25 metre extension at southern end  
                                 | • Station upgrades (e.g. passenger information displays, off-board ticketing). |
| Upper Mt Gravatt                 | • Modification to existing platforms by approximately 9.25 metre extension at southern end,  
                                 | including new stairs, partial demolition and reconstruction of existing retaining walls and footpath.  
                                 | • Station upgrades (e.g. passenger information displays, off-board ticketing). |
| Griffith University              | • Modification to existing platforms by approximately 29.25 metre extension at the northern end  
                                 | • Station upgrades (e.g. passenger information displays, off-board ticketing). |
| Holland Park West and Greenslopes| • Station upgrades (e.g. passenger information displays, off-board ticketing). |
| Buranda                          | • Modification to existing platforms by approximately 29.25 metre extension at southern end  
                                 | • Station upgrades (e.g. passenger information displays, off-board ticketing) |
| PA Hospital                      | • Station upgrades (e.g. passenger information displays, off-board ticketing). |
| Boggo Road                       | • Station upgrades (e.g. passenger information displays, off-board ticketing). |
| UQ Lakes                         | • Station upgrades (e.g. passenger information displays, off-board ticketing).  
                                 | • Minor modification to pedestrian paths and median to allow metro vehicle turnaround. |
| Mater Hill                       | • Modification of existing platforms by approximately six metres inbound and three metres outbound at the western end.  
                                 | • Station upgrades (e.g. passenger information displays, off-board ticketing). |
| South Bank                       | • Station upgrades (e.g. passenger information displays, off-board ticketing). |
| King George Square               | • Minor station modifications including adjustments to platform screen door locations.  
                                 | • Station upgrades (e.g. passenger information displays, and off-board ticketing) |
| Roma Street                      | • Major modification of existing outbound platform by approximately 13.5 metres at the eastern end, requiring volumetric acquisition of Brisbane Transit Centre (west tower).  
                                 | • Station upgrades (e.g. passenger information displays, off-board ticketing). |
| Normanby to RBWH                 | • Station upgrades (e.g. passenger information displays, off-board ticketing). |
5.3.5 Layovers and turnaround facilities

Existing bus turnarounds will be utilised at Eight Mile Plains, UQ Lakes, Cordelia Street and Ernie’s Roundabout at Herston. New layovers will be added and minor modifications made to existing layover facilities to suit the operational requirements of the metro vehicles. In other locations, new turnarounds and/or modification of layovers will be required for interconnecting local bus services.

Provisions for existing, modified and new turnarounds and layovers will include:

- Eight Mile Plains station – metro layover (four vehicles) and existing turnarounds
- Griffith University station – bus layover (four vehicles) and bus turnaround
- Countess Street – metro layover (four vehicles) and existing turnarounds
- Ernie’s Roundabout – metro layover (four vehicles) and existing turnaround
- Boggo Road station – bus layover (one vehicle)
- UQ Lakes station – metro layover (one vehicle) and existing turnaround
- Woolloongabba station – bus turnaround.

The new bus turnaround and layover facility at Griffith University station is shown in Figure 5.13. Additional information is also included in the concept design drawings for the draft Design Report (refer to Part D: Concept Design Drawings).

Figure 5.13: Griffith University bus turnaround

5.3.6 Metro depot

A new depot facility for metro vehicles will be located at School Road, Rochedale, adjacent to the South East Busway. The proposed site will have a total area of approximately 55,000 square metres. Direct access to the metro depot will be provided from the South East Busway. The existing busway will be modified to include widening for slip and turn lanes. The South East Busway access connection will require a new culvert or bridge.
crossing of the drainage channel adjacent to the existing busway. The location of the South East Busway connection will be determined in consultation with TMR. The depot includes:

- stabling for up to approximately 95 metro vehicles, allowing capacity for future growth to 2041
- an administration facility containing metro fleet operational office space, vehicle dispatch and training rooms, driver facilities including kitchen, lunchrooms, lockers, sleeping rooms, and end of trip facilities including bike storage area, amenities and recreational facilities
- a 13-bay maintenance garage for first line maintenance (minor mechanical, electrical, interior/bodywork, tyre change/fitting and underbody wash) and second line heavy maintenance (major body repair, repainting and engine works), as well as provision for maintenance tools and equipment, storage of metro vehicle parts, garage management office space and amenities, fire services, fuel and waste storage/management
- a fuelling, wash down and cleaning facility for metro vehicles and associated water and fuel storage and waste management
- provision for up to 149 car parking spaces to cover the long-term requirements for metro drivers, garage and depot staff plus visitors
- site landscaping, drainage and bio-retention basin infrastructure.

The proposed depot layout is shown in Figure 5.14. Additional detail is also included in the concept design drawings for the draft Design Report (refer to Part D: Concept Design Drawings).

**Figure 5.14: Proposed metro depot layout**

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**Depot operations**

The metro depot will generally operate between 20-24 hours per day, although the maintenance garage is proposed to operate from 5am-7pm weekdays and 5am-4pm Saturday. After hours operations may be required to meet demand. Internal vehicle cleaning will occur prior to each metro vehicle’s entry to service. Fuelling and external cleaning of vehicles will generally occur between 7pm-3am.
5.3.7 Busway pavement

Brisbane Metro will reuse the existing busway pavements, without requiring modifications. The current traffic volumes using the busways to date are less than the original design intent and therefore the Brisbane Metro is expected to be able to operate on the existing pavements without requiring major maintenance before the end of the original pavement design life of 30 years.

5.3.8 Utilities

A range of existing services and utilities will be affected by new infrastructure.

The new underground Cultural Centre station will impact existing major utilities located within Melbourne and Grey Streets. Structures for the new underground Cultural Centre station located beneath the intersection of Melbourne Street and Grey Street will require utilities to be diverted around the new underground Cultural Centre station.

Subject to agreement with utility owners, it is proposed to divert utilities around the transition structure at Melbourne Street. These utilities include 110 kV electrical cables, 11 kV and low voltage electrical line, a proposed 1950-millimetre stormwater pipe, sewer gravity and rising mains, gas mains, and telecommunication cables.

An existing sewer pump station is located on the property at 125 Grey Street. The pump station is proposed to be decommissioned by Queensland Urban Utilities and a new pump station commissioned in a new location prior to the construction of the new underground Cultural Centre station. The new location of the sewer pump station is being investigated by Queensland Urban Utilities and would be subject to a separate development assessment process in accordance with the requirements of City Plan and the Planning Act 2016.

The new Adelaide Street tunnel will impact existing utilities installed within the road reserve and verges of Adelaide Street between North Quay and King George Square. The majority of utilities running longitudinally down and across Adelaide Street would require relocation to allow construction of the tunnel. Utilities located within existing verges will be retained where practical.

5.4 Brisbane Metro construction

Reusing the busway infrastructure for much of Brisbane Metro will limit major construction works to a small number of locations – metro depot (Rochedale), Griffith University station, Buranda station, Cultural Centre precinct and North Quay/Adelaide Street. Elsewhere, works are generally smaller in scale and similar to minor upgrades to, or maintenance of, the existing busway or an existing road.

5.4.1 Construction program

The main construction works for Brisbane Metro are expected to be staged over a period of about 2.5 years. Pre-construction works including some service and utility relocations will be undertaken prior to the main construction works to allow major construction activities to be undertaken as efficiently as possible.

An indicative program for the main construction works showing potential timeframes for each worksite is shown in Figure 5.15. This includes detailed design, construction, demobilisation (e.g. rehabilitation of areas affected by construction activities, removal of site offices, construction plant and equipment) and commissioning.

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

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

Temporary construction laydown areas will also be required to support construction activities and will be used for site offices, and the storage of plant, equipment and materials. Proposed construction laydown areas include:

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

The need for additional laydown areas will be identified through the detailed design phase.

5.4.3 Hours of construction

Construction of Brisbane Metro will require construction activities to be undertaken above ground and below ground.
Consistent with other Council major transport projects, where possible construction activities will generally be undertaken:

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

In order to minimise the duration of construction and potential impacts and disruptions on local communities and transport networks, some construction works will be undertaken outside of these main construction hours, including evenings, nights and weekends. This includes some activities that will be undertaken 24 hours per day. These works will be managed in line with relevant noise criteria to minimise impacts on surrounding communities.

Table 5.6 provides an overview of proposed construction hours for each worksite.

<table>
<thead>
<tr>
<th>Worksite</th>
<th>Main construction hours</th>
<th>Comment</th>
</tr>
</thead>
</table>
| Minor works (e.g. station upgrades minor busway station modifications and layovers/turnarounds) | • Monday to Friday, 7am-6pm  
• Saturday, 8am-5pm | • Activities requiring access to the busway (e.g. removal of demolition waste and supply of construction materials) will occur during off-peak night-time periods or weekends. |
| Metro depot | • Monday to Friday, 7am-6pm  
• Saturday, 8am-5pm | | |
| Griffith University bus turnaround and layover facility | • Monday to Friday, 7am-6pm  
• Saturday, 8am-5pm  
Haulage of excavated material or deliveries the busway:  
• Monday to Friday, 9pm-5am  
• 10pm Friday to 5am Monday (i.e. 24 hours Saturday and Sunday). | • Activities associated with haulage of excavated material or deliveries by the busway will occur during off-peak night-time periods or weekends. |
| Buranda station | • Monday to Friday, 7am-6pm  
• Saturday, 8am-5pm  
Works directly above the operating busway or within the busway:  
• Monday to Friday, 9pm-5am  
• 10pm Friday to 5am Monday (i.e. 24 hours Saturday and Sunday). | • Works above the operating busway would only occur when there is no use of the busway (e.g. off-peak night-time periods or weekends)  
• Works within the busway, works will only occur when there is low or no use of the busway (e.g. off-peak night periods or weekends).  
• Construction hours will consider potential noise impacts to adjoining sensitive receptors. |
| Cultural Centre precinct | • Monday to Friday, 7am-10pm  
• Saturday, 8am-5pm  
Underground works (i.e. underground excavation and station fit-out):  
• 24 hours | • Construction hours will consider potential for noise impacts during performances at QPAC.  
• Night-time and weekend works will be required for above ground works, works associated with the construction of the underpass of the railway corridor (e.g. ‘jacked box’ construction), and works within the railway corridor.  
• Construction hours will consider potential impacts on major community events within the Cultural Centre precinct and South Bank. |
| North Quay/Adelaide Street | • Monday to Friday, 7am-10pm  
• Saturday, 8am-5pm | • Works within the busway (e.g. for the Albert Street bus tunnel junction) will only occur when there is low or no use of the busway (e.g. off-peak night-time periods or weekends). |
**5.4.4 Construction vehicles and haulage**

Brisbane Metro construction will require the delivery of materials and removal of excavated material (spoil) by trucks. The main truck movements will be associated with construction of the metro depot, Griffith University bus turnaround and layover facility, modification of Buranda station, new underground Cultural Centre station, and North Quay/Adelaide Street. Elsewhere, the number of trucks associated with the delivery of materials and removal of spoil are expected to be minor.

Table 5.7 and Table 5.8 provide a summary of the estimated truck movements associated with the delivery of materials (e.g. light vehicles, body trucks, concrete trucks, crane trucks) and removal of spoil (e.g. body trucks) for the major construction worksites. The duration of the major haulage activities is also shown.

**Table 5.7: Delivery vehicle trip generation (one way movements)**

<table>
<thead>
<tr>
<th>Construction worksite</th>
<th>Approximate duration</th>
<th>Total delivery vehicles</th>
<th>Average rate (vehicle/day)</th>
<th>Peak rate (vehicle/day)</th>
<th>Peak rate (vehicle/hour)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metro depot</td>
<td>22 months</td>
<td>9700</td>
<td>15</td>
<td>50</td>
<td>5</td>
</tr>
<tr>
<td>Griffith University station bus turnaround and layover facility</td>
<td>9 months</td>
<td>1800</td>
<td>10</td>
<td>30</td>
<td>3</td>
</tr>
<tr>
<td>Buranda station</td>
<td>24 months</td>
<td>10,100</td>
<td>20</td>
<td>60</td>
<td>6</td>
</tr>
<tr>
<td>Cultural Centre precinct</td>
<td>29 months</td>
<td>43,700</td>
<td>71</td>
<td>150</td>
<td>15</td>
</tr>
<tr>
<td>North Quay/Adelaide Street</td>
<td>30 months</td>
<td>32,600</td>
<td>51</td>
<td>105</td>
<td>11</td>
</tr>
</tbody>
</table>

**Table 5.8: Spoil truck trip generation (one way movements)**

<table>
<thead>
<tr>
<th>Construction worksite</th>
<th>Approximate duration</th>
<th>Total truck numbers</th>
<th>Average rate (trucks/day)</th>
<th>Peak rate (trucks/day)</th>
<th>Peak rate (trucks/hour)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metro depot</td>
<td>4 months</td>
<td>3,200</td>
<td>31</td>
<td>80</td>
<td>8</td>
</tr>
<tr>
<td>Griffith University station bus turnaround and layover facility</td>
<td>3 months</td>
<td>600</td>
<td>9</td>
<td>60</td>
<td>6</td>
</tr>
<tr>
<td>Buranda station</td>
<td>3 months</td>
<td>500</td>
<td>8</td>
<td>30</td>
<td>3</td>
</tr>
<tr>
<td>Cultural Centre precinct</td>
<td>26 months</td>
<td>13,300</td>
<td>23</td>
<td>120</td>
<td>12</td>
</tr>
<tr>
<td>North Quay/Adelaide Street</td>
<td>21 months</td>
<td>10,400</td>
<td>22</td>
<td>60</td>
<td>6</td>
</tr>
</tbody>
</table>

Delivery of materials and removal of spoil will be via road. The existing busway is proposed to also be used for the removal of spoil from some construction worksites (e.g. Griffith University station and Buranda station). This will generally occur when bus volumes on the busway are low (e.g. off-peak night-time period or weekends) to avoid disruption to bus services. Haulage activities on road are proposed to avoid the morning and afternoon weekday peak periods to minimise impacts for road users and bus services.

The proposed delivery and spoil haulage hours for each construction worksite are provided in Table 5.9.
Table 5.9: Spoil haulage and delivery hours

<table>
<thead>
<tr>
<th>Construction worksite</th>
<th>Possible hours of haulage operation*</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metro depot</td>
<td>Hours for haulage of materials and spoil:</td>
<td>• Trucks movements on roads would be avoided during commuter peak periods.</td>
</tr>
<tr>
<td></td>
<td>• Monday to Friday, 9am-4pm</td>
<td>• Trucks movements on Priestdale Road would be avoided during school drop-off/pick-up times (i.e. 7.30am-9am and 2.30pm-4pm).</td>
</tr>
<tr>
<td></td>
<td>• Saturday, 8am-5pm.</td>
<td></td>
</tr>
<tr>
<td>Griffith University station bus turnaround</td>
<td>Hours for haulage of materials and spoil via the busway:</td>
<td>• Truck movements should avoid travelling through the Griffith University Mt Gravatt campus and residential areas.</td>
</tr>
<tr>
<td>and layover facility</td>
<td>• Monday to Friday, 9pm-5am</td>
<td>• Truck movement to be via the South East Busway to Klump Road/Pacific Motorway interchange to access the Pacific Motorway.</td>
</tr>
<tr>
<td></td>
<td>• 10pm Friday to 5am Monday (i.e. 24 hours Saturday and Sunday).</td>
<td>• Hours for haulage access via the busway will be limited to times when buses are not operating on the busway or when the volume</td>
</tr>
<tr>
<td></td>
<td></td>
<td>of buses is low (i.e. off-peak night-time periods and weekends).</td>
</tr>
<tr>
<td></td>
<td>Hours for haulage of materials by road should not occur during Monday to Friday:</td>
<td>• Truck movement to be via the South East Busway to Klump Road/Pacific Motorway interchange to access the Pacific Motorway.</td>
</tr>
<tr>
<td></td>
<td>• 7am-9am</td>
<td>• Hours for haulage access via the busway will be limited to times when buses are not operating on the busway or when the volume</td>
</tr>
<tr>
<td></td>
<td>• 4pm-6pm.</td>
<td>of buses is low (i.e. off-peak night-time periods and weekends).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Truck movements on road would be avoided during commuter peak periods.</td>
</tr>
<tr>
<td>Buranda station</td>
<td>Hours for haulage of materials and spoil via the busway:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Monday to Friday, 9pm-5am</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• 10pm Friday to 5am Monday (i.e. 24 hours Saturday and Sunday).</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hours for haulage of materials and spoil by road should not occur during Monday to Friday:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• 7am-9am</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• 4pm-6pm.</td>
<td></td>
</tr>
<tr>
<td>Cultural Centre precinct</td>
<td>24 hours, apart from Monday to Friday:</td>
<td>• Truck movements on road would be avoided during commuter peak periods.</td>
</tr>
<tr>
<td></td>
<td>• 7am-9am</td>
<td>• Truck movements on road will consider the timing of major events at Southbank Parkland and the Cultural Centre precinct (e.g.</td>
</tr>
<tr>
<td></td>
<td>• 4pm-6pm.</td>
<td>Riverfire, New Years Eve, etc).</td>
</tr>
<tr>
<td>North Quay/Adelaide Street</td>
<td>24 hours, apart from Monday to Friday:</td>
<td>• Truck movements on road would be avoided during commuter peak periods.</td>
</tr>
<tr>
<td></td>
<td>• 7am-9am</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• 4pm-6pm.</td>
<td></td>
</tr>
</tbody>
</table>

* Haulage hours would also subject to any restrictions on construction work hours (refer to Table 5.6)

5.4.5 Construction workforce

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

5.4.6 Pre-construction works

Pre-construction works (or early works) will be undertaken in some locations such as the Cultural Centre precinct and Adelaide Street to allow major construction activities in these locations to be undertaken as efficiently as possible. This includes relocation of some services and utilities (for example, sewer pump station, storm water pipes, and electrical and telecommunications cables) and upgrades to some intersections to help manage construction traffic impacts.
These works will be managed to minimise impacts on surrounding communities, but may require temporary changes to on-street parking and loading zones, and bus stops. Some of these works will be undertaken by the relevant utilities providers and be subject to separate planning and development assessment processes in accordance with the requirements of City Plan and the Planning Act 2016.

5.4.7 Minor works

Minor works will generally be associated with modifications and upgrades to existing busway stations and existing layover and turnaround areas. These works are expected to be undertaken over a period of a few months.

Stations

As indicated in section 5.3.4, modifications, including platform extensions, will be required to some existing busway stations, while all existing busway stations will also be upgraded (e.g. with new signage, off-board ticketing facilities, passenger information displays). These works will generally be carried out within and around stations and platforms under normal busway and station operations. Work requiring use of elevated work platforms, such as installation of larger signage and painting of lift/stairwells, will be undertaken out of network operational hours for safety and to minimise disruption.

Demolition works, and construction of the platform extensions, are expected to require access from the busway for removal of waste material and for supply of construction materials. Construction access via the busway will be restricted to off-peak night-time periods or weekends to minimise disruption to bus network services. Measures will be implemented at worksites to manage safety for existing busway customers and minimise any potential impacts on bus network operations.

Table 5.10 provides a summary of construction activities required for the station modification works. Details of construction activities required at Buranda station is provided in section 5.4.10, while section 5.4.11 includes details on the construction of the new bus turnaround and layover facility at Griffith University station.

Table 5.10: Station modifications works

<table>
<thead>
<tr>
<th>Busway station</th>
<th>Summary of construction works</th>
</tr>
</thead>
</table>
| Eight Mile Plains    | Barriers will be established at the ends of the platforms where extension works are required to provide safe working zones. This includes temporary traffic protection barriers to the adjoining busway. Construction works are generally proposed to include:  
- demolishing the existing busway kerbs and drainage channels, vegetation clearing and partial demolition of the existing concrete stairway and precast panel retaining walls  
- forming and casting the new extended reinforced concrete platform sections and installing the extended stairway access  
- erecting the steelwork framing for the platform canopy extensions, and installation of rear glazing panels and sheeted roof panelling to match and join into the existing platform canopies.  
A construction period of approximately five months is expected to be required to complete the station modifications. |
| Upper Mt Gravatt     | Demolition and reconstruction of small sections of the existing bus station shell are potentially required to make space for the platform extensions. The main construction works are generally proposed to include:  
- modifying the existing retaining walls, including installation of new bored piles behind existing walls excavation of material, and potential installation of permanent wall anchors, prior to the demolition of existing wall sections  
- casting of new foundation pads for the new access stairways at the southern end of the station platforms and erection of steel support columns before the prefabricated stairway sections are lifted into place via mobile crane  
- erecting the steelwork framing for the platform canopy extensions, and installation of rear glazing panels and sheeted roof panelling to match and join into the existing platform canopies.  
A construction period of approximately six months is expected to be required to complete the station modifications. |
Table 5.11: Layover and turnaround works

<table>
<thead>
<tr>
<th>Location</th>
<th>Summary of construction works</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eight Mile Plains</td>
<td>Additional layover bays will be formed by widening sections of the existing busway pavement and kerbing at either end of the station platform. These works are expected to be completed within approximately 2-3 months.</td>
</tr>
<tr>
<td>Boggo Road station</td>
<td>Construction of a new bus layover bay at the western end of the inbound platform will involve:</td>
</tr>
<tr>
<td></td>
<td>• demolishing a section of existing edge barrier and local surface trimming</td>
</tr>
<tr>
<td></td>
<td>• constructing a section of extended busway pavement with new edge barrier and line-marking. Works are expected to be completed within approximately two months.</td>
</tr>
</tbody>
</table>
Summary of construction works

<table>
<thead>
<tr>
<th>Location</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>UQ Lakes station</td>
<td>Modification of the existing layover and turnaround will involve:</td>
</tr>
<tr>
<td></td>
<td>• minor reconstruction of the busway kerbing and pedestrian ramp</td>
</tr>
<tr>
<td></td>
<td>• line-marking works.</td>
</tr>
<tr>
<td></td>
<td>Works are expected to be completed within approximately two months.</td>
</tr>
<tr>
<td>Woolloongabba</td>
<td>Minor works only are proposed to be required, comprising line-marking changes to the existing layover facility. Works are expected to be completed within approximately 2-3 months.</td>
</tr>
<tr>
<td>Countess Street</td>
<td>Minor works only are proposed to be required, comprising line-marking changes to the existing layover facility. Works are expected to be completed within approximately one month.</td>
</tr>
<tr>
<td>Ernie’s Roundabout</td>
<td>Minor works only are proposed to be required, comprising line-marking changes to the existing layover facility. Works are expected to be completed within approximately one month.</td>
</tr>
</tbody>
</table>

### 5.4.8 Cultural Centre precinct

This section provides an overview of the proposed construction methodology for the new underground Cultural Centre station and other works within the Cultural Centre precinct. The final methodology will be confirmed through the detailed design phase.

The main construction works at the Cultural Centre precinct are expected to occur over about 2.5 years, with works undertaken concurrently over a number of work areas. These include:

- BCEC tunnel
- underpass of the existing railway corridor
- new underground Cultural Centre station box
- Melbourne Street portal and transition structure
- surface works, including the new Melbourne Street bus stops.

Works within each area are proposed to be completed over a number of stages to minimise impacts on pedestrians and visitors, transport networks and surrounding communities. As indicated in section 5.4.1, some pre-construction works such as service and utility relocations will be undertaken prior to the main construction works to allow major construction activities to be undertaken as efficiently as possible.

**Brisbane Convention and Exhibition Centre tunnel**

The busway pavement of the existing South East Busway will need to be lowered within the BCEC tunnel to connect the existing busway to the new underground station. Lowering of the busway pavement is proposed to be constructed in halves along the affected length of the existing busway tunnel to maintain access for buses using the South East Busway.

The main construction activities for this work involves demolishing and removing the existing busway wall linings, edge barriers and pavement to allow a new reinforced concrete base slab and integral water tight retaining walls to be constructed to each side of the busway. Measures will be adopted to resist uplift forces from buoyancy effects.

Traffic barriers and protection screens will be installed around construction works. Shuttle flow arrangements are proposed to be implemented for busway traffic between Russell Street and the Melbourne Street busway portal to facilitate two-way bus movements along the single lane. This is expected to occur for up to about 18 months of the two year construction period.
Following completion of the busway works the Melbourne Street busway portal will be closed to buses, with metro vehicles and buses diverted through the new underground station.

Works for the BCEC tunnel are expected to occur over approximately two years. These works will require coordination with construction activities for the underpass of the railway corridor and completion of finishing works for the new underground Cultural Centre station.

**Rail underpass**

An underpass of the existing railway corridor will be required to connect the South East Busway and new underground station. The underpass is proposed to be constructed by a ‘jacked box’ construction method from the side of the rail corridor. This involves pushing the underpass structure beneath the existing railway corridor using hydraulic jacks. Excavation beneath the railway corridor would occur progressively during installation of the jacked box. This construction methodology would allow the railway lines to continue operating above the construction works, helping to reduce potential disruption to rail services.

A construction work area is proposed to be established adjacent to the BCEC loading dock for construction works associated with the loading dock support and receive of the jacked box. This would involve moving (or ‘slewing’) the existing standard guage track through the South Brisbane railway station closer to the existing third track and some rail enabling works, such as adjustments to rail signalling and replacement of a turnout. These works are proposed to be undertaken during Queensland Rail shut-down periods (i.e. nights and weekends) and allow rail services to continue operating on the standard guage track during construction of the underpass structure. The standard guage will be reinstated to its current location following construction of the station works. The three narrow guage rail tracks (i.e. passenger rail) will also continue to operate for the duration of construction. Settlement monitoring will be installed on the rail tracks during construction to protect rail operations.

A section of the No 1 platform north-west of the station building will be demolished, along with a section of the adjacent concrete retaining wall at 125 Grey Street. A temporary steel platform is proposed to be installed to maintain passenger access to the platform during construction. The affected sections of platform and retaining wall are to be reinstated following construction of the underpass.

The box jacking process for the underpass beneath the rail embankment is proposed to occur from the construction worksite at 125 Grey Street. A box is to be excavated to a depth of about nine metres. The underpass structure is proposed to be constructed within the excavation. A jacking base slab is proposed to be constructed prior to construcing the jacked box underpass. The underpass will be pushed under the rail embankment and excavation under the rail corridor occurring progressively during the box jacking process from the construction worksite at 125 Grey Street.

Construction works for the underpass of the railway corridor are expected to occur over approximately 2.5 years.

**New underground Cultural Centre station box**

The main station box is proposed to be constructed using a mix of top-down and bottom-up construction methods. Construction of the station box is expected to be staged to allow pedestrian and vehicle access on Grey and Melbourne Streets to be maintained.

The sections of the main station box outside of the construction worksite at 125 Grey Street is proposed to be constructed with bored piles installed for the internal station support piles. The external walls of the station box are proposed to be constructed using diaghragm wall or comparable construction techniques. The station’s concrete roof slab would be cast on excavated ground following completion of the internal piles and external walls. Following construction of the station roof, excavation of the material within the station box is proposed to be carried out beneath the station’s roof slab from the construction worksite at 125 Grey Street and transition structure at Melbourne Street.
Station lifts, escalators, stairs and other station fixtures and services will be installed as part of the station fitout following excavation and construction of the station box. Construction of the surface level station entry concourse and roof canopy is proposed to be completed in parallel with the station fitout.

The location of the underground station will require surface works to be undertaken within QPAC Green. Following construction, QPAC Green will be reinstated in consultation with relevant stakeholders.

A construction period of around 2.5 years is expected to be required to complete construction of the new underground Cultural Centre station, with surface works within QPAC Green expected to occur for a period of about nine months.

**Melbourne Street portal and transition structure**

The portal to the underground station and transition structure along Melbourne Street is proposed to be constructed at the same time as the main station box. The main construction works are associated with the construction of the transition structure walls and excavation of materials.

In deeper sections of the transition structure, the walls of the transition structure are proposed to be constructed with diaphragm walls or comparable construction techniques. These are to be installed from the existing Melbourne Street surface. The shallower section of the transition structure are proposed to be excavated from surface level. Excavation of the material between the walls is expected to be undertaken from the Victoria Bridge end of the transition structure. A concrete base slab for the transition structure is be cast prior to the completion of finishing works. Temporary props are proposed to be used to stabilise the walls of the transition structure prior the installation of the base slab. Construction of the transition structure is expected to require the partial demolition and reconstruction of the backspan to Victoria Bridge.

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

A construction period of approximately two years is expected to be required to complete construction works for the Melbourne Street portal and transition structure.

**Surface works**

Some surface works will be carried out in conjunction within the various work stages, however final surface works will be completed towards the end of the Cultural Centre precinct works. This includes construction of the new Melbourne Street bus stops, station entry concourse and final road pavement, including line marking, road furniture and signage.

**Worksites**

Figure 5.16 shows the main area of construction works within the Cultural Centre precinct. All areas will share construction worksites and potential construction laydown areas. Further detail on the construction worksites is included in the concept design drawings for the draft Design Report (refer to Part D: Concept Design Drawings).

**Volume of excavated material**

It is expected that approximately 60,000 cubic metres of spoil (approximately 3000 ‘truck and dog’ movements) will be excavated and removed from construction works at the Cultural Centre precinct and around 20,000 cubic metres of concrete will be required for construction of the new station, underpass, transition and associated infrastructure.
Figure 5.16: Cultural Centre precinct worksites
Haulage routes

Most of the excavated spoil from the station and underpass of the railway corridor will be removed via Melbourne Street (towards Merivale Street) and major arterials to either Ipswich Road or Centenary Highway.

Excavated spoil from the transition structure along Melbourne Street is expected to require removal via Victoria Bridge. This is due to restrictions on turning trucks within the transition structure. The majority of construction equipment and material supply is proposed to be transported to site via Melbourne Street from Cordelia and Merivale Streets. Some oversize construction equipment (e.g. large boom cranes) and large precast construction material will need to be transported via William Jolly Bridge and Grey Street due to height and geometric restrictions on Melbourne Street.

Construction and demolition waste and excavated spoil will be tested, treated, transported and disposed of in accordance with legislative requirements.

5.4.9 North Quay/Adelaide Street

This section provides an overview of the proposed construction methodology for works at North Quay and Adelaide Street, including the tunnel under Adelaide Street. The final methodology will be confirmed through the detailed design phase.

Construction works at North Quay and Adelaide Street are proposed to be undertaken in stages to maintain access for two bus lanes between Victoria Bridge and King George Square/Albert Street (one inbound and one outbound) and vehicle and pedestrian access to Brisbane Square, 300 George Street, and Adelaide Street businesses. Bus stops on Adelaide Street between North Quay and Albert Street are expected to be temporarily relocated during the construction of the bored piles and tunnel roof slab.

The tunnel under Adelaide Street is proposed to extend across the full-width of Adelaide Street. This is proposed to be constructed by top-down, cut-and-cover construction in two halves along the length of Adelaide Street. The following summarises the main construction activities required for each half of the tunnel construction.

The tunnel walls are proposed to be constructed with bored piles from the street/footpath surface. This will require the relocation and protection of some utilities, clearing of street trees, and temporary removal of street furniture and building awnings between George Street and King George Square/Albert Street. Construction of bored piles will also require footpath widths to be temporarily reduced near to construction activities. The street surface is proposed to be excavated following construction of the bored piles and prior to casting part of the tunnel roof structure. The tunnel roof structure is proposed to be completed in the second half of the tunnel construction, spanning the full width of the tunnel. Surface works including footpath reinstatement, roadway drainage and pavement works will be carried out to allow bus access to be maintained adjacent to work zones.

Following completion of the tunnel roof and the transition structure, the tunnel is proposed to be excavated from the entry portal on the river side of George Street. The busway pavement and drainage, emergency egress tunnel, barriers, services and tunnel linings are proposed to be progressively installed as the excavation progresses towards the junction with the Albert Street bus tunnel.

Construction of the junction with the Albert Street bus tunnel is proposed to be conducted in a number of stages. Construction of the tunnel junction is expected to require partial demolition of the southern tunnel wall beneath Adelaide Street as well as demolition of some existing internal station columns. New beams and column structures will be constructed. Excavation of Adelaide Street will be required to provide construction access for the tunnel break-in. This may require temporary closure of the access to King George Square station adjacent to City Hall. Other accesses to King George Square station at Adelaide Street and Ann Street will remain open.

The final fitout of the tunnel lighting, smoke extraction and fire systems will be installed and commissioned following completion of the tunnel junction.
Widening of North Quay requires the construction of a piled cantilevered deck structure over the embankment adjacent to the Riverside Expressway. The Bicentennial bikeway connection ramp is proposed to be relocated to the embankment along North Quay near the intersection of Adelaide Street.

**Period of works**

A construction period of around 2.5 years is expected to be required. Surface works for the Adelaide Street cut-and-cover tunnel are expected to take approximately 18 months (i.e. nine months for each half). Adelaide Street is expected to be reinstated about 18 months after commencement of the main construction works, with the excavation works continuing from beneath the roof. Construction of the Albert Street bus tunnel junction is expected to take approximately 12-18 months to complete.

**Worksites**

The construction worksite and proposed construction laydown areas are shown in Figure 5.17.

**Volume of materials**

It is expected that construction of the Adelaide Street tunnel will require the excavation of approximately 40,000 cubic metres of material (approximately 6000 body truck movements).

Approximately 14,000 cubic metres of concrete supply (approximately 240 trucks) will be required for the tunnel construction. Precast panels linings and miscellaneous deliveries will also be required.

**Haulage routes**

Construction vehicle access for the construction of the cut-and-cover sections of the tunnel under Adelaide Street is proposed to be via Edward Street and Adelaide Street, with egress to George Street and the Riverside Expressway. Removal of excavated spoil and concrete supply for excavation and construction below the tunnel roof is proposed to be via the Adelaide Street transition structure. Construction vehicles are to access via North Quay with vehicles exiting the construction worksite undertaking a U-turn at North Quay and egressing via Adelaide Street, George Street and the Riverside Expressway.
Figure 5.17: Adelaide Street worksites
5.4.10 Buranda station

Extension of the existing Buranda station platforms will require the demolition, reconstruction and widening of the existing O'Keefe Street busway underpass. This section provides an overview of the proposed construction methodology for works at Buranda. The final methodology will be confirmed through the detailed design phase.

Traffic lanes and pedestrian access along O'Keefe Street and to/from Buranda station are proposed to be temporarily relocated during construction of surface works to enable works zones to be established.

Road traffic on O'Keefe Street is proposed to be restricted to two lanes westbound during reconstruction of the underpass with eastbound traffic diverted to Cornwall Street. Pedestrian access to the busway station (and Buranda railway station) will be maintained from O'Keefe Street on the western end of the plaza area, while pedestrian access on the eastern side of the plaza will be through the adjacent Buranda Village.

The reconstruction of the underpass is proposed to be undertaken in stages across O'Keefe Street to maintain traffic and pedestrian access. The following summarises the main construction activities required for each stages of the underpass reconstruction.

New bored piled walls are to be constructed either side of the existing underpass. These are proposed to be constructed from the surface level of the bus station public plaza and O'Keefe Street. The surface is to be excavated to enable the forming and casting of new reinforced concrete pilecap beams above the new piled walls. The existing underpass deck slab is proposed to be cut into sections and removed for disposal off site. The existing underpass pilecap beams are proposed to be demolished progressively to enable installation of the new deck girders. New deck beams are to be supported on the new pilecap beams and piled walls and the reinforced concrete deck topping slab and relieving slabs cast.

Works at busway level will be required to widen and realign the busway, and construct the platform extensions. This will involve excavation of material between the existing and new piled walls, cutting and removing the old piled walls, and reconstruction of the busway drainage and pavement surface.

Construction works will require temporary closures of a single busway lane during night works and some full closures of the busway through Buranda station over weekend periods. During full closures of the busway, buses using the South East Busway will be diverted around Buranda station via the O'Keefe Street busway access points either side of the busway station. The westbound lanes on O'Keefe Street are proposed to be reduced to one lane to allow eastbound bus movements.

Period of works

A construction period of approximately 18-24 months is expected to be required for the modification of Buranda station. This includes:

- approximately 18 months for the demolition and reconstruction of the busway underpass
- approximately 10 months for reconstruction works at the busway level
- six months for station fitout and general enhancement works.

Worksites

The construction worksite and proposed construction laydown areas are shown in Figure 5.18.

Volumes of material

Modification of Buranda station will require the removal of around 3500 cubic metres of spoil (approximately 500 body truck movements) and approximately 600 square metres of concrete of concrete supply (approximately 100 concrete trucks).
Figure 5.18: Buranda station worksites
Haulage routes

For surface works, access to/from the construction worksite will be via O'Keefe Street. The removal of spoil and delivery of materials for works at the busway level would be via the busway access at PA Hospital station, exiting from the busway to O'Keefe Street.

5.4.11 Griffith University station layover and turnaround

Construction work for the new bus turnaround and layover facility at Griffith University station involves the construction of pavement works between the busway and the adjacent Griffith University car park. Land clearing and excavation will require the use of earthwork machinery with removal of spoil material.

Local widening of the busway towards the adjacent Pacific Motorway is required to construct a right-hand turning slot into the turnaround and layover facility. This is expected to require demolition and reconstruction of a section of the existing separation barrier between the busway and motorway, and realignment pavement works on the busway.

Around 2100 cubic metres of spoil will be removed from site (approximately 300 truck movements).

Haulage routes

Excavated spoil material is proposed to be stockpiled and transported off site south along the busway to the Kessels Road busway access. The haulage of spoil material on the busway will occur under managed one lane shuttle flow lane closure arrangements on the busway during off-peak night-time periods and weekends.

Period of works

A total construction period of around nine months is expected to be needed to complete the new bus layover and turnaround facility.

5.4.12 Metro depot

Construction of the metro depot will involve site clearing, earthworks platform preparation, drainage and pavement construction, and lighting and landscaping works. It is expected that the low rise building facilities will be constructed with reinforced concrete ground slab foundations, steel framing and precast panelling/glazing, plus steel roof sheeting.

Access to the adjoining busway will require widening of a section of busway for a turning lane and construction of a bridge or culvert structure with pavement works over the drainage channel which runs adjacent to the busway. Erosion protection works will also be required on the upstream and downstream channel sides of the access connection road.

About 1600 truck movements will be required for the depot construction.

Haulage routes

Access for construction equipment and materials would be via School Road and the Gateway Motorway.

Period of works

A total construction period of approximately 21 months is expected to be needed to complete the metro depot with works scheduled early in the program to provide a storage location for the new metro vehicles as they are progressively delivered.
5.5 Brisbane Metro commissioning and completion works

Commissioning and completion works will involve inspecting and testing Brisbane Metro infrastructure and operating systems prior to operation to ensure they meet the required standards for Brisbane Metro operations. This includes inspections and testing of new and modified infrastructure, and integration with the existing busway. Commissioning works will be undertaken progressively throughout construction.

Station infrastructure and operating systems, including fire and life safety, ventilation, passenger information and control systems and safety and security systems will be tested for reliability and function. Infrastructure and operating systems within the new Adelaide Street tunnel will also be inspected and tested.

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