Cross River Rail Environmental Impact Statement

Request for Project Change-14

Changes to the Project and changes to the imposed conditions

Volume 3 Technical Reports

Date: *April 2024*

Author: *Cross River Rail Delivery Authority*

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Contents

Introduction

These technical reports have been prepared for the Cross River Rail (CRR) Project to assess the environmental effects arising from the Proposed Changes in comparison to the Evaluated Project.

Volume 1 describes the Proposed Changes to the design and delivery of the Evaluated Project and provides a summary of the effects of the proposed change, with Volume 2 providing a set of drawings describing changes to the Project. In all instances, the Proposed Changes are generally in accordance with the evaluated plans and drawings set out in the Evaluated Project, within the level of assessed impacts and consistent with the CRR Project-wide Imposed Conditions.

An assessment of the main aspects and effects of proposed change are presented in this report and supported by Attachments A-E. A risk review was undertaken across all environmental aspects, and it was identified that as these works are within existing assessed footprints and disturbance areas, they are not creating any additional risk for other aspects (e.g. Non-Indigenous Heritage Management). Therefore, they can be managed in accordance with the existing Imposed Conditions.

Proposed Change

This RfPC requests that the Coordinator-General evaluate the following proposed changes.

- Proposed Change to the Project Works at Roma Street station that consists of:
    - Closing Herschel Street to vehicles between George and Roma Streets and increasing the area available to support the safe and efficient movement of pedestrians and active transport users.
    - Adjusting Roma Street/Herchel Street/George Street signalised intersections, footpaths, cycle infrastructure and urban design to accommodate the new pedestrian and traffic arrangements.
    - Adjusting road pavement treatments and signals on Makerston Street to add a right turn (east-bound) onto Roma Street, to compensate for the loss of the right turn facility from Herschel Street.
    - Removing the proposal to underground the Roma Street section of the INB from the scope of the Project, which also results in retaining the existing Parkland Boulevard / Roma Street intersection alignment.

No proposed changes to the Imposed Conditions are being requested as part of this RfPC, apart from a change to Imposed Condition 1 (General Conditions) to include reference to a revised set of project documentation incorporating the Proposed Change and removing redundant references to scope items that no longer form part of the Project.

Technical Assessments

Required technical assessments have been identified for RfPC-14 as provided in Table 1.

The project has completed assessments of proposed works and their potential impacts across applicable environmental aspects. The key aspects identified for assessment included traffic and transport, noise and vibration and air quality. A summary assessment of these potential impacts is presented within this report.

The purpose of the technical assessments is to review the proposed changes and identify if they were likely to result in any new or increased impacts compared to those previously evaluated for the Project. These assessments have confirmed that the effects of this change are no worse than what has been previously evaluated for the Project. In some cases, such as operational traffic impacts, marginal improvements are to be gained by implementing this change..

The existing Coordinator-General's Imposed Conditions and established Environmental Management Framework (EMF), as set out below, were found to be appropriate to manage the proposed changes associated with RfPC-14. Subsequently, apart from a change to Imposed Condition 1 (General Conditions), there are no other proposed changes to the Imposed Conditions being requested as part of this RfPC.

Table 1: Requirement for technical assessments

Aspect	Phase	Summary of Proposed Change	Consistent with current evaluated project	Key Applicable Imposed Condition	Outline Environmental Management Plan Commitment
Traffic and Transport	Construction	Works, equipment, method and type of construction activities consistent with the impacts that have been presented in RfPC-1, 3 and 4.	YES	Appendix 1, Part A, Condition 14.	Appendix H- Construction Traffic Management Plan, particularly Section 2.1, 3.1, 3.2, 3.3, 3.4, 4.1, 4.2 & 5.4.
Noise and Vibration			YES	Appendix 1, Part A, Condition 10, Table 1, 11, and 12.	Appendix Q- Noise and Vibration Management Plan, particularly Section 2.1, 3.1, 3.2, 3.3, 4,1, 4.2.1, 4.2.2, 4.2.12 & 5.4
Air Quality			YES	Appendix 1, Part A, Condition 13	Appendix E -Air Quality Management Plan, particularly Section 2.1, 3.1, 3.2, 3.3, 3.4, 4.1, 4.2 & 5.4.
Traffic and Transport	Operation	Development of Herschel Street Pocket Park with updated pedestrian connection solution. Removal of the proposed relocation of the Inner Northern Busway underground from the Project. Removal of proposed reconfiguration of the Parkland Boulevard/Roma Street intersection.	NO[1]	Schedule 1, Environmental Design Requirements Condition 1.	N/A
Pedestrian			NO[1]	Schedule 1, Environmental Design Requirements Condition 1.	

[1] These have not been assessed previously as part of the current Cross River Rail Project. However, they are consistent with the Roma Street Cross River Rail Priority Development Area scheme that came into effect on 30 July 2021

Five (5) technical reports have been prepared for the RfPC to assess whether there are any new or increased impacts arising from the Proposed Change in comparison to the Evaluated Project (**Attachments A-E**).

A summary of potential changed impacts and associated cross-references is detailed in Table 2.

These technical assessments have relied upon previous assessments presented as part of former RfPCs for the project and the 2011 EIS. When previous technical assessments have been relied upon, these have been referenced appropriately and justification has been provided in the report as to the suitability for use of the previous assessment.

Some of the technical assessments are reliant upon new assessments either qualitative or quantitative in nature (e.g., additional predictive modelling undertaken). Where required, new assessments were also undertaken.

Appropriate references and excerpts of the technical assessments have been included in these technical reports.

Table 2: Potential changed impacts and associated technical report cross-references

Proposed Changes to impacts / Technical Report	Change Aspects	Technical Report cross-reference
Project Traffic Impact Assessment **Attachment A Project Traffic Impact Assessment Report - Extract** This report covers detailed traffic and pedestrian modelling assessments for the operational phases of the Herschel Street Pocket Park and the removal from the Project scope of the previous proposal to relocate the Inner Northern Busway underground and the associated reconfiguration of the Parkland Boulevard/Roma Street intersection.	Evaluated project	Background
	Effect of the proposed change	Traffic Impact Assessment
	Mitigations proposed	N/A
Construction Traffic impact **Attachment B Technical Report: Construction Traffic and Transport** This report covers detailed traffic and pedestrian assessments for the construction phases of the Herschel Street Pocket Park and the removal from the Project scope of the previous proposal to relocate the Inner Northern Busway underground and the associated reconfiguration of the Parkland Boulevard/Roma Street intersection.	Evaluated project	CRR Project Approved Work and Impacts
	Effect of the proposed change	Material Changes to Impacts
	Mitigations proposed	Conclusions and Recommendations
Operations Traffic impact **Attachment C Operations Technical Report: Operations Traffic and Transport** This report covers detailed traffic and pedestrian assessments for the operational phases of the Herschel Street Pocket Park and the removal of relocating the Inner Northern Busway underground with the associated relocation of Parkland Boulevard.	Evaluated project	CRR Project Approved Work and Impacts
	Effect of the proposed change	Material Changes to Impacts
	Mitigations proposed	Conclusions and Recommendations
Noise and Vibration Impacts	Evaluated project	Introduction

Proposed Changes to impacts / Technical Report	Change Aspects	Technical Report cross-reference
Attachment D Technical Report: Noise and Vibration This report covers detailed assessment of noise impacts from traffic, construction works and operations associated with the new Herschel Street Pocket Park. Plus, the removal of relocating the Inner Northern Busway underground with the associated relocation of Parkland Boulevard.	Effect of the proposed change	Construction Impacts Operational Impact Outcomes Summary of Assessment of Changes
	Mitigations proposed	Outcomes
Air quality impact **Attachment E Technical Report: Air quality** This report covers detailed assessment of air quality impacts from construction works and operations associated with the new Herschel Street Pocket Park. Plus, the removal of relocating the Inner Northern Busway underground with the associated relocation of Parkland Boulevard.	Evaluated project	Introduction
	Effect of the proposed change	Potential Construction Impacts Potential Operational Impact Recommendations and Conclusion
	Mitigations proposed	Proposed Changes to the EMF

Cross River Rail Environmental Impact Statement – Volume 3 Attachment A

Request for Project Change-14

Changes to the Project and changes to the imposed conditions

Technical Report: Traffic Impact Assessment Summary

Date: April 2024

Author: Cross River Rail Delivery Authority

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Glossary of Terms and Acronyms

Terms	Description
AS	Australian Standard
AS/NZS	Australian/New Zealand Standard
CBD	Brisbane Central Business District
BCC	Brisbane City Council
BSTM	Brisbane Strategic Transport Model
CRR	Cross River Rail
CRRDA	Cross River Rail Delivery Authority
DOS	Degree of Saturation
DTMR	Department of Transport and Main Roads, Queensland
GEH	GEH Statistic is a calibration measure used in microsimulation modelling
hr	Hour
IFC	Issued for Construction
km	Kilometre
LATM	Local Area Traffic Management
LGIP	Local Government Infrastructure Plan
LOS	Level of Service
m	Metre
PDA	Priority Development Area
PSTR	Project Scope and Technical Requirements
RPEQ	Registered Professional Engineer, Queensland
R2	R-Square is a calibration measure used in microsimulation modelling
s	Second
SATURN	Mesoscopic traffic modelling software package developed and distributed by Atkins Limited (Version 11.4.07H)
SIDRA	Signalised & unsignalized Intersection Design and Research Aid, computer software program developed by Akcelik & Associates (Version 8.0.7.7948)

SCATS	Sydney Coordinated Adaptive Traffic System – traffic signal control system used in Brisbane
TAPS	Transport, Access, Parking and Servicing Planning Scheme Policy, BCC
TIA	Traffic Impact Assessment
TSD	The Tunnels, Stations and Development of CRR
VISSIM	Microsimulation traffic modelling software package developed and distributed by PTV Group (Version 8.0.7.7948)

Introduction

Background

Cross River Rail Project

Cross River Rail (CRR) is a 10.2km rail line between Dutton Park and Bowen Hills, which includes a 5.9km twin tunnel under the Brisbane River and Brisbane CBD. The project also includes construction of four new high-capacity underground stations at Boggo Road, Woolloongabba, Albert Street, Roma Street and redevelopment of the existing Dutton Park Station. The Tunnels, Station and Development (TSD) Package is delivering the underground section of the project. Figure 1 provides an overview of the wider CRR project.

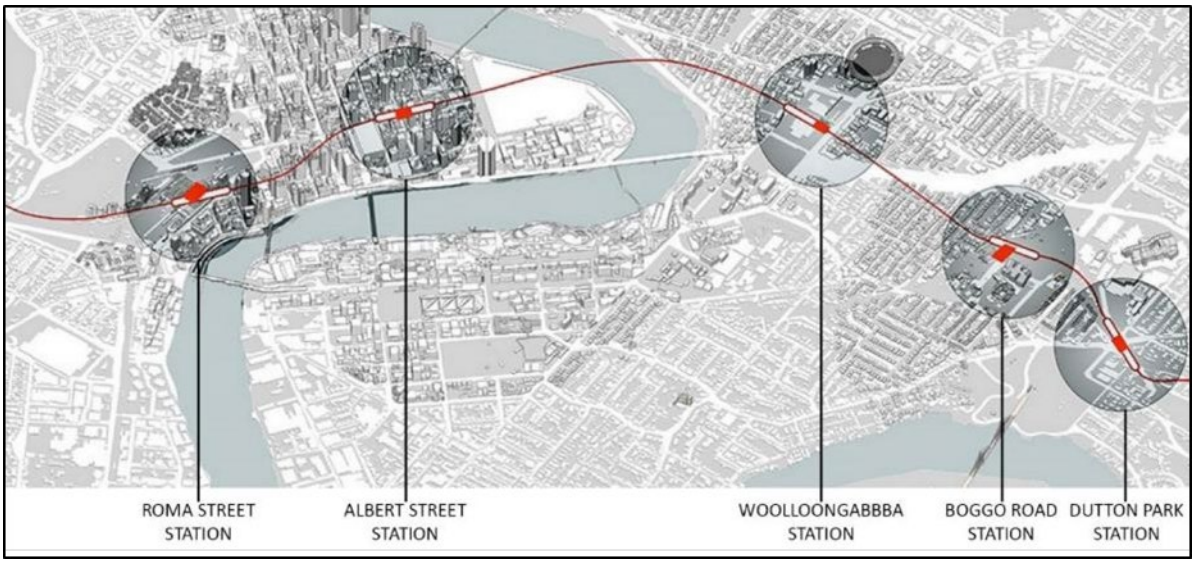


Figure 1 Cross River Rail – Project Overview

Roma Street Precincts

A new underground station is being delivered at Roma Street, on the site of the former Brisbane Transit Centre as shown in Figure 2. The station is located within the Roma Street CRR Priority Development Area (PDA), which was declared in December 2019 and shown in Figure 3.

Figure 2 Roma Street Station Precinct Map

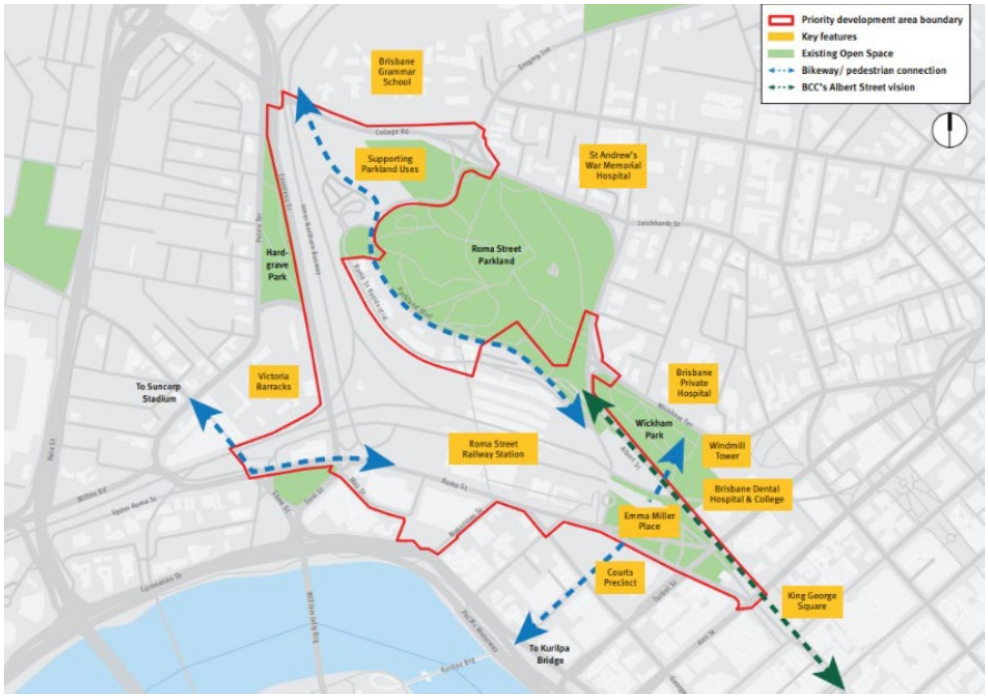


Figure 3 Roma Street Cross River Rail Priority Development Area – Key Features and Surrounds

The Roma Street Cross River Rail (CRR) Priority Development Area (PDA) was declared on 13 December 2019. The strategic vision for the CRR PDA identifies that the precinct will improve connections between the City Centre, Spring Hill, Petrie Terrace and Kurilpa Bridge through providing a transit rich environment, street activation, improved public spaces and permeable connections for active transport.

Construction for CRR is underway. Of note, the Brisbane Transit Centre has been vacant since late March 2019 with demolition of the building completed. There has also been disruption to pedestrian connections with the permanent closure of the Roma Street footbridge from mid-January 2020. Intermittent lane and footpath closures have also been in effect on Roma Street since mid-September 2019.

Primary access to the new Roma Street station precinct will be via the proposed Roma Street Plaza, directly adjoining the Roma Street road frontage. This Traffic Impact assessment has been prepared to assess the changes proposed in RfPC-14 and how they relate to transport infrastructure proximate to Roma Street station. This assessment considers several key elements including:

- closure of Herschel Street between George Street and Roma Street to vehicles
- the already completed removal of the existing pedestrian overpass above Roma Street, with pedestrian movements across Roma Street to be facilitated at-grade via the reconfigured intersection arrangements at the Roma Street / George Street intersection
- provision of a direct cycle connection between Herschel Street and Roma Street through the eastern portion of the closed section of Herschel Street, to provide a connection to Herschel Street to a new separated bi-directional on-road cycle path on the southern side of Roma Street
- the Makerston Street / Roma Street intersection will be reconfigured to permit all movements.
- loading zones and accessible parking bays to be provided along Roma Street.

Further detail on the proposed station design elements is provided in under the heading **Roma Street Station Precinct**.

Purpose of this Report

This report sets out an assessment of the expected transport impacts of the proposed changes for RfPC-14 at the Roma Street station precinct on the existing road network proximate to the station. This Traffic Impact Assessment (TIA) follows the guidance provided in Brisbane City Council's (BCC) Transport, Access, Parking and Servicing (TAPS) Policy. It details the outcomes of the traffic operational assessment which has been undertaken of the directly adjoining road network.

This TIA has included consideration of:

- existing traffic conditions surrounding the site.
- likely future traffic conditions, with consideration of background traffic growth and traffic redistribution effects following completion of the Roma Street station precinct.
- the traffic generating potential of the proposed station precinct.
- suitability of the proposed access arrangements at the interface with the BCC controlled road network.
- the resultant transport impact of the Roma Street station precinct on the surrounding road network.

This Traffic Impact Assessment assesses the impacts of the changes presented in RfPC-14 of the Proposed Change to the Project Works at Roma Street station consists of:

- Closing Herschel Street to vehicles between George and Roma Streets and increasing the area available to support the safe and efficient movement of pedestrians and active transport users.
- Adjusting Roma Street/Herchel Street/George Street signalised intersections, footpaths, cycle infrastructure and urban design to accommodate the new pedestrian and traffic arrangements.
- Adjusting road pavement treatments and signals on Makerston Street to add a right turn (east-bound) onto Roma Street, to compensate for the loss of the right turn facility from Herschel Street.

- Removing the proposal to underground the Roma Street section of the INB from the scope of the Project, which also results in retaining the existing Parkland Boulevard / Roma Street intersection alignment.

Consultation with Brisbane City Council

This TIA has been developed through ongoing consultation and collaboration with BCC, including various meetings to confirm inputs (e.g. model files and data) in the various traffic models used to present the analysis summarised in this report.

During these discussions, BCC articulated its expectations for the traffic modelling to be undertaken as part of the TIA, which included a combination of SATURN and VISSIM modelling for the Roma Street station precinct.

Further discussions on the proposed TIA assessment methodology were undertaken in 2020. The proposed methodology for the Roma Street Precinct was provided to BCC in October 2020 and summarised in Figure 4.

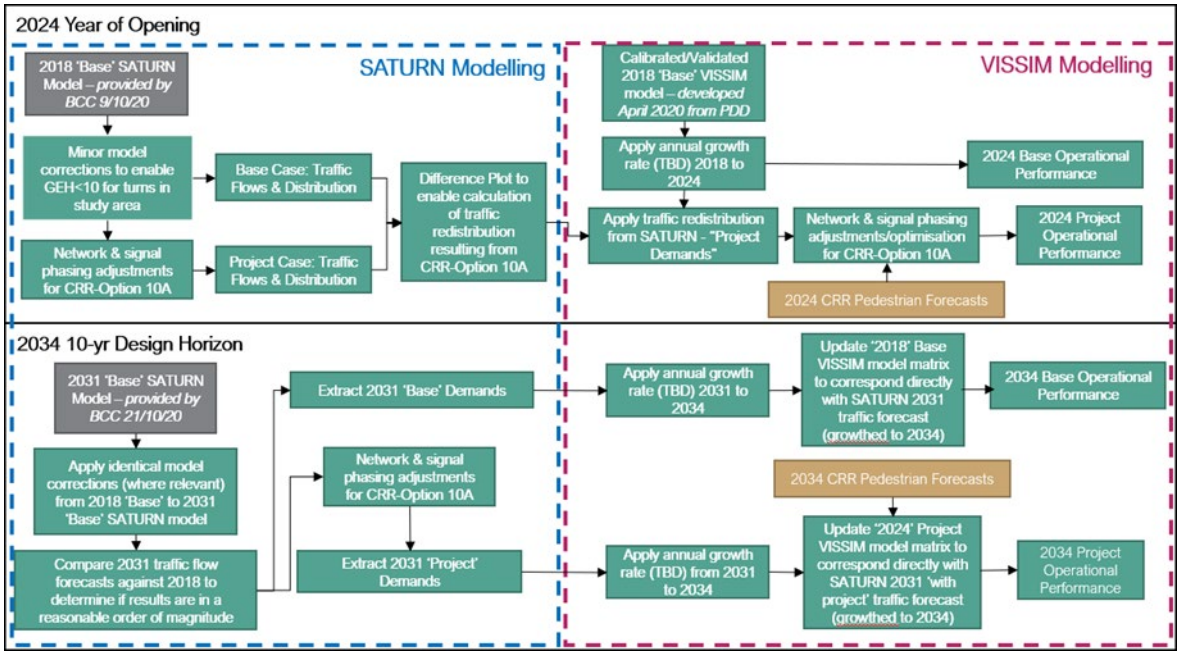


Figure 4 Roma Street Precinct – Proposed Traffic Impact Assessment Methodology

BCC provided its commentary on the proposed TIA assessment methodology (Figure 4) in November 2020, as follows:

- *We have a 2022 "project model" (later updated to 2023 project model) which includes all projects we foresee will be open or completed at that point in time in the CBD and fringe. It would be best to use for considering your 2024 Year of Opening scenario. It could be used for overlaying and isolating project case impacts on the base model.*
- *Whether you add two years of growth or not to achieve a 2024 scenario would not necessarily change the answer as vehicle trip growth is generally low and limited by road network capacity which is at its limit in the peak direction in peak hours.*

- *2024 VISSIM - the methodology appears to propose applying an annual trip growth. This is not consistent with the way that growth is derived in the SATURN network model (BCASM) which is informed by population and employment growth at a zonal level from the BSTM (Brisbane Strategic Transport Model) which is used for future trip forecasting. Growth in travel zones change at varying rates according to scope for changes in land-use and state population and employment forecasts.*

- *Similar comments apply to the 2034 scenario for applying growth and general network capacity. Applying a general linear growth to all zones is a different methodology for the reasons outlined in the previous dot point. It is suggested that 2031 is an adequate future year scenario to use for considering the development impacts. But if you are required to create a "2034" scenario, appropriate travel zone trip adjustments would need to be developed and applied to the 2031 trip matrix. Ideally this should be developed from the BSTM by interpolating 2031 and 2041 trip forecasts.*

Based on these comments, the TIA assessment methodology was revised as outlined in Figure 5.

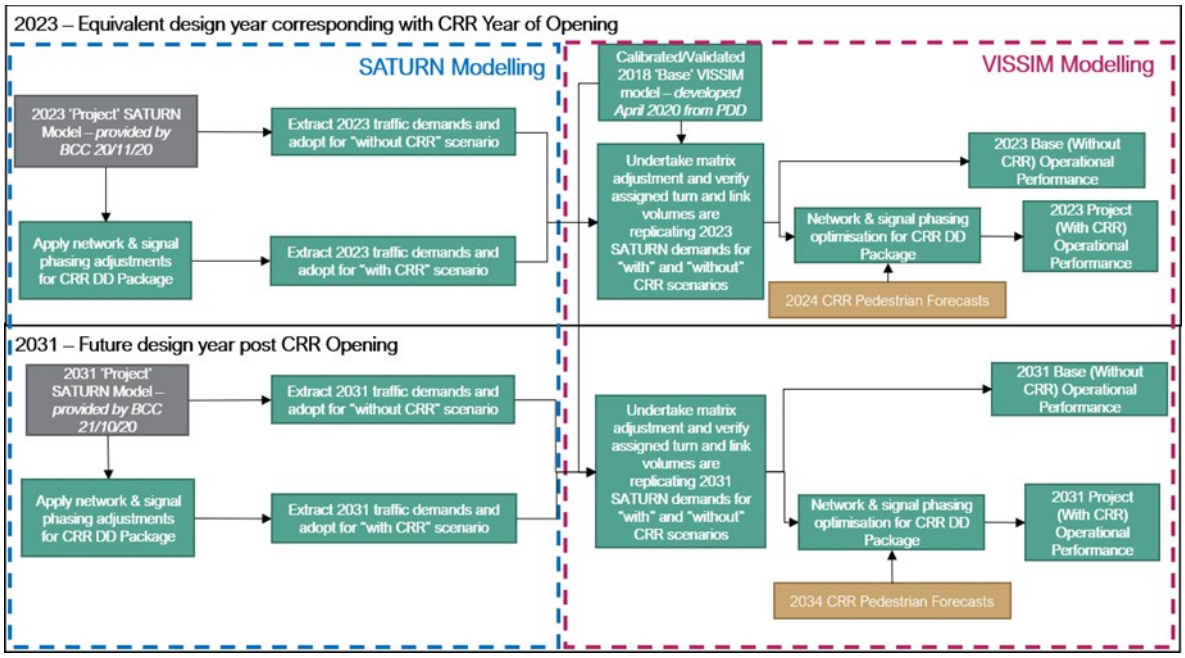


Figure 5 Roma Street Precinct – Adopted Traffic Impact Assessment Methodology.

It is noted that a separate local validation exercise for the Roma Street precinct was undertaken on the BCC supplied 2018 SATURN models (provided October 2020) to confirm that the underlying SATURN models were operating within reasonable bounds when compared against available traffic count data.. The local validation exercise indicated the model was reasonably well calibrated in the area of interest, thereby indicating a good degree of confidence in the application of the SATURN models (as provided by BCC) within this TIA. See heading **Base (2018) SATURN Model Interrogation** for further detail and commentary on the local validation of the provided 2018 SATURN models. The methodology adopted and presented herein is consistent with discussions held with BCC and aligns with the requirements as generally set out within BCC's TAPS Policy.

Ongoing discussions with BCC for finalising the Herschel Street Pocket Park solution have been based upon these traffic assessments they have accepted.

References

In preparing this report, reference has been made to the following:

- an inspection of the site and its surrounds undertaken by project consultants in February 2020.
- Brisbane City Plan 2014.
- manual traffic counts collected (by others) during the Cross River Rail design and covering the Roma Street / George Street, Roma Street / Makerston Street, Roma Street / Coach Terminal Carpark Access, Roma Street / Parkland Boulevard and Roma Street / Herschel Street intersections in March 2018 and March 2018.
- SCATS intersection detector count and signal phasing timing data provided by BCC in January 2020 as referenced in the context of this report.
- traffic signal installation plans and associated signal phasing details provided by BCC in January 2020 as referenced in the context of this report.
- SATURN models provided by BCC in October and November 2020 for use by CRRDA.
- VISSIM models provided by BCC in January 2020 for use by CRRDA.
- NSW Roads and Maritime Services (RMS) Traffic Modelling Guidelines (February 2013)
- Issue for Construction (IFC) plans prepared by the Cross River Rail contractor, provided under heading **Roma Street Station Precinct.**
- other documents and data as referenced in this report.

Existing Conditions

Roma Street Station Precinct

The Roma Street station precinct is located directly adjacent to the existing Roma Street train station, at the former Brisbane Transit Centre, Brisbane City. It is located within the Roma Street CRR PDA.

The Roma Street station precinct and its surrounding environs is shown in Figure 6. Surrounding land uses predominately include office, retail, and high-density residential uses in an inner-city environment. Roma Street Parkland and Wickham Park are also located in proximity, to the north of the existing Roma Street train station.

Demolition of the Brisbane Transit Centre was completed in December 2020, following closure of business in late March 2019. Traffic flows proximate to the Roma Street station precinct have reduced following the closure of the Brisbane Transit Centre, with disruption to vehicle traffic and pedestrian infrastructure ongoing as described under heading **Roma Street Precincts**.

Figure 6 Roma Street Station Location

Existing Road Network

Key roads affected by the proposed modifications to the local road network as part of the RfPC-14 include Roma Street, Makerston Street, Herschel Street and George Street. The existing characteristics of these roads in the vicinity of the Roma Street station precinct are outlined in Table 1.

Table 1 Existing Road Network

Road Name	Roma Street	Makerston Street	Herschel Street	George Street
Jurisdiction	Council	Council	Council	Council
Class Type	Suburban	Neighbourhood	Neighbourhood	Suburban
Posted Speed Limit	40kph	40kph	40kph	40kph
Lane Formation	4-lane / divided / two-way	2-lane / undivided / two-way	4-lane / undivided / two-way	3-lane / one-way
Carriageway Width	20m	12m	12m	12m
Reserve Width	30m	24m	17.5m	25m
Kerbside Arrangements	Loading zones, bus stops and periodic parking in various locations			
Daily Volume [1]	18,500 vehicles per day	2,000 vehicles per day	6,500 vehicles per day	10,000 vehicles per day

[1] Based on detector counts obtained from Brisbane City Council in January 2020

Existing typical arrangements of these key roads proximate to the Roma Street station precinct are shown in Figure 2.2 to Figure 2.9.

Figure 2.2: Roma Street at Makerston Street (Facing West)

Figure 2.3: Roma Street at Makerston Street (Facing East)

Figure 2.4: Roma Street at George Street (Facing West)

Figure 2.5: Roma Street at George Street (Facing East)

Figure 2.6: Roma Street at Herschel Street (Facing West)

Figure 2.7: Roma Street at Herschel Street (Facing East)

Figure 2.8: Roma Street at Parkland Boulevard (Facing West)

Figure 2.9: Roma Street at Parkland Boulevard (Facing East)

Traffic Volumes

Appropriate road traffic volume has been collected and verified for the road networks considered in this TIA for RfPC-14, including raw SCATS data. This included appropriate validation against manual traffic counts. The data collected was from March 2018.

For input and calibration of the traffic modelling, peak hours traffic flows were determined. To do this the SCATS data was separated into 15-minute intervals for each detector. Peak hour traffic volumes for each Tuesday, Wednesday, and Thursday within the month of March 2018 were then extracted for each detector. Appropriate validation occurred to 'sanity check' the data and avoid any impact of undercounting, overcounting or alarming detectors.

Traffic flow diagrams showing the calculated 2018 base year traffic volumes are provided in Figure 7 and Figure 8.

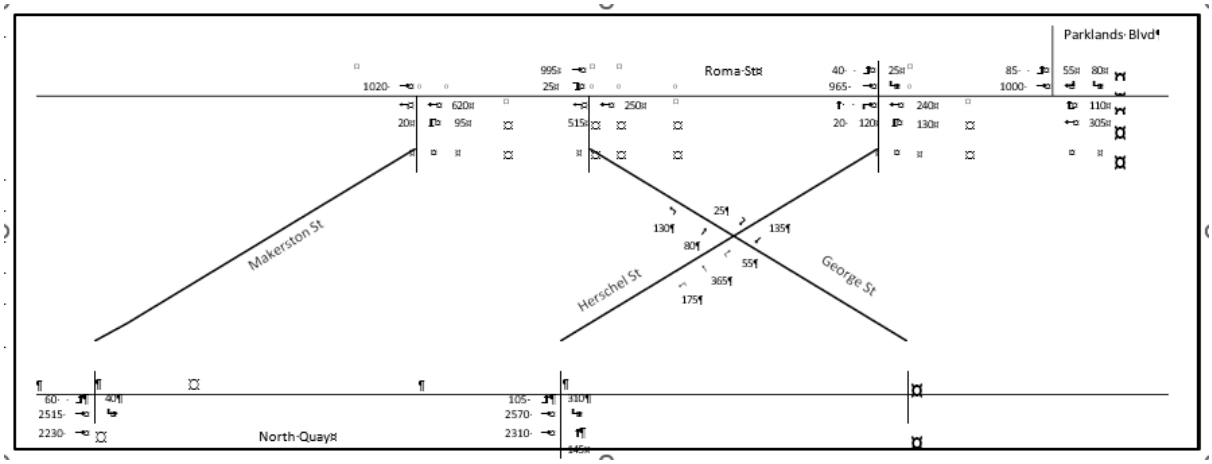


Figure 7 Roma Street Precinct 2018 Base Year Traffic Volumes – AM Peak

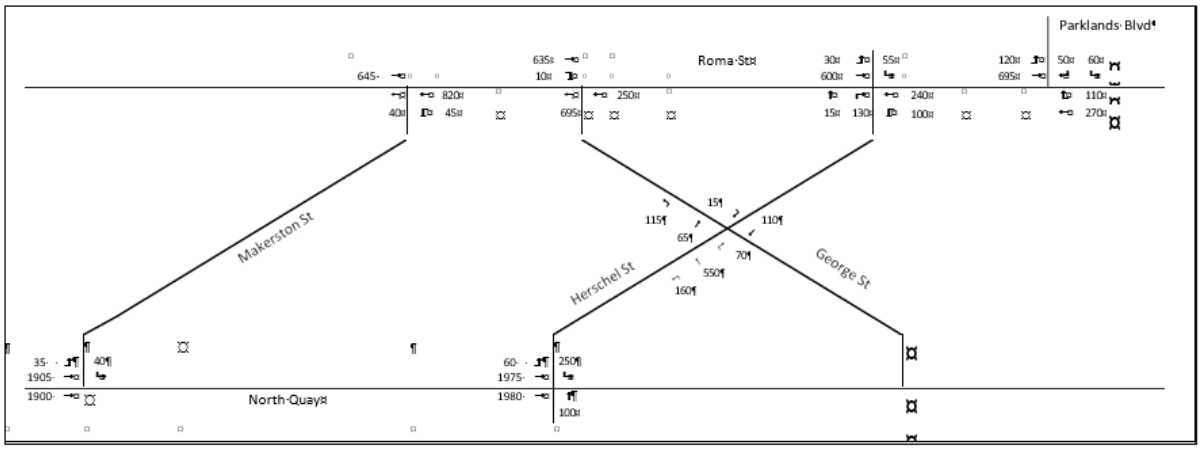


Figure 8 Roma Street Precinct 2018 Base Year Traffic Volumes – PM Peak

Integrated Transport Infrastructure

Public Transport

The Roma Street station precinct is currently well serviced by public transport (bus and rail). Bus stops are provided on Roma Street, George Street, Herschel Street and North Quay. The Roma Street Busway Station and Roma Street Train Station are also located in proximity, providing high frequency services to greater Brisbane. A summary of existing bus stops and rail services proximate to the Roma Street station precinct are provided in Table 2 and Table 3.

Table 2 Roma Street Precinct – Bus Stop Details

Bus Stop	Route Numbers	Frequency	Connected Suburbs
Herschel Street Stop 1 near North Quay	370, , 475, 476	Approximately 15 mins	City, Valley, RBWH, Windsor, Lutwyche, Kedron, Chermside, Toowong, Milton, Teneriffe Ferry, Bardon, Rainworth, Paddington

Bus Stop	Route Numbers	Frequency	Connected Suburbs
Herschel Street Stop 2 near North Quay	375, 379, 380 ,381	Approximately 10 mins	Bardon, Paddington, City, Valley, RBWH, Lutwyche, Stafford West, Grange Heights, Stafford, The Gap, Hillder Rd, Ashgrove, Red Hill, Payne Rd
George Street at Magistrates Courte	444	Approximately 15 mins	Queensland Cultural Centre, Chapel Hill, Kenmore, Moggill
North Quay Stop 106 near Herschel St	411, 415, 416, 417, 433, 445, 471,	Approximately 5 mins	Uni of Qld, St Lucia, Toowong, Auchenflower, Milton, City, Indooroopilly, West Taringa, Taringa, , ,Kenmore South, Fig Tree Pocket, Lone Pine, Mt Coot-tha, Birdwood Tce, Milton
Roma Street Stop 121 at Police HQ	61, 375, 379, 380, 381, N392	Approximately 5 mins	Bardon, Paddington, City, Valley, RBWH, Lutwyche, Stafford West, Grange Heights, Stafford, The Gap, Hillder Rd, Ashgrove, Red Hill, Payne Rd, Coorparoo, Stones Corner, Caxton St
Roma Street Stop 122 near Garrick St	470, 475, 476	Approximately 15 mins	City, Valley, RBWH, Windsor, Lutwyche, Kedron, Chermside, Toowong, Milton, Teneriffe Ferry, Bardon, Rainworth, Paddington
Roma Street Stop 124 at Roma Street Station	375, 379, 380 ,381, 470, 475, 476	Approximately 5 mins	Bardon, Paddington, City, Valley, RBWH, Lutwyche, Stafford West, Grange Heights, Stafford, The Gap, Hillder Rd, Ashgrove, Red Hill, Payne Rd, Windsor, Lutwyche, Kedron, Chermside, Toowong, Milton, Teneriffe Ferry, Bardon, Rainworth, Paddington
Roma Street Stop 125 At Transit Centre	350, 352, 412,	Approximately 10 mins	Aspley, Bridgemen Downs, Everton Park, Ashgrove, City, St Lucia, University of Queensland, Toowong, Milton,

Table 3 Roma Street Train Station – Service Details

Train Line	Frequency
Airport	Approximately 15 mins peak / 30 mins off-peak
Beenleigh	Approximately 15 mins peak / 30 mins off-peak

Train Line	Frequency
Caboolture	Approximately 15 mins peak / 30 mins off-peak
Cleveland	Approximately 15 mins peak / 30 mins off-peak
Doomben	Approximately 30 mins
Ferny Grove	Approximately 10 mins peak / 15 mins off-peak
Gold Coast	Approximately 15 mins peak / 30 mins off-peak
Ipswich	Approximately 15 mins peak / 60 mins off-peak
Redcliffe Peninsula	Approximately 15 mins peak / 30 mins off-peak
Shorncliffe	Approximately 15 mins peak / 30 mins off-peak
Springfield	Approximately 5 mins peak / 30 mins off-peak
Sunshine Coast	Approximately 15 mins peak / 30 mins off-peak

Pedestrian Infrastructure

The Roma Street station precinct is well serviced by existing pedestrian pathways and signalised intersection crossing treatments as is typical for a CBD environment. A map indicating the location of existing pedestrian infrastructure is provided in Figure 9.

It is noted that pedestrian movements across George Street at the Roma Street / George Street intersection is not permitted and currently managed by way of pedestrian barrier fencing along the south-western corner of George Street and Roma Street. This arrangement is retained in the detailed design for the project.

Cycle Infrastructure

The Roma Street station precinct is generally well serviced by dedicated cycling infrastructure, noting that there are some inconsistencies to the provision given the existing road network constraints. Several of the now obsolete CityCycle stations were also located within the vicinity of the precinct.

A map indicating the location of the dedicated cycling infrastructure and former CityCycle stations are provided in Figure 10.

Figure 9 Roma Street Station Precinct – Pedestrian Connectivity

Figure 10 Street Station Precinct – Dedicated Bicycle Connectivity

Roma Street Station Precinct

Overall layout

The detailed design plans for the changes proposed in RfPC-14 at the Roma Street station precinct is shown in Figure 11 to Figure 13. Commentary on the station design elements applicable to this TIA are provided under heading **Pedestrian Facilities** to heading **Car Parking**.

The proposed infrastructure is further assessed below. These new and updated infrastructure is not forecast to have any additional adverse impacts on other car parks, bus stops/bus bays, drop off facilities in the area, other than the described changes.

Pedestrian Facilities

The changes proposed in this RfPC will improve pedestrian amenity along Roma Street and its surrounds. Pedestrian crossing points across key roads within the Roma Street station precinct will be retained as per existing, though the previously demolished pedestrian overpass above Roma Street will now be replaced by an at-grade crossing at the reconfigured Roma Street / George Street intersection as proposed in this RfPC.

The closure of Herschel Street at its northern-most section will allow for improved urban design outcomes and will allow for a direct connection from Roma Street station to George Street with a wide crossing and large pedestrian standing area. Additionally, the signalised intersection at Makerston Street and Roma Street will provide for an all-pedestrian movement phase which allows for greater capacity to cater for increased pedestrian flows at this location. Pedestrian modelling has been undertaken and presented heading **Pedestrian Modelling Report Review** of Attachment B in this RfPC to ensure that the design accommodates an adequate level of service for key pedestrian desire lines as referenced in the project requirements.

The assessment of the adequacy of pedestrian pathways and associated infrastructure as required by the project requirements is addressed in a separate report and is outside of the scope of this TIA.

Cycle Facilities

The detailed design plans for the Roma Street station precinct retains cycle connectivity from Herschel Street to Roma Street through the eastern portion of the section of Herschel Street closed to vehicle traffic. A new direct cycle connection is provided to a separated bi-directional on-road cycle path on the southern side of Roma Street. The proposed arrangement is an improvement to existing cycle provision within the precinct. Additionally, bike boxes will be added to the modified intersections at Roma Street / Makerston Street, Roma Street / George Street and George Street / Herschel Street. Helping improve cycle safety at these intersections.

Drop-Off Facilities

The design plans for the Roma Street station includes drop-off facilities on the northern side of Roma Street on the eastbound carriageway, directly adjacent to Roma Street station. A number of drop-off uses are indicated and include space allocation for ‘car share’, ‘taxi’, ‘passenger loading’ and time-restricted ‘accessible parking’. Given that the Roma Street station precinct is located proximate to the Brisbane CBD these uses and associated time-restrictions are considered appropriate, and it is not anticipated that these drop-off facilities will generate a significant volume of traffic during the peak commuter peak periods. This was confirmed as an appropriate assumption by BCC in its correspondence in October 2021, as it was agreed that the Roma Street Station itself will not generate any significant car-based trips for passengers.

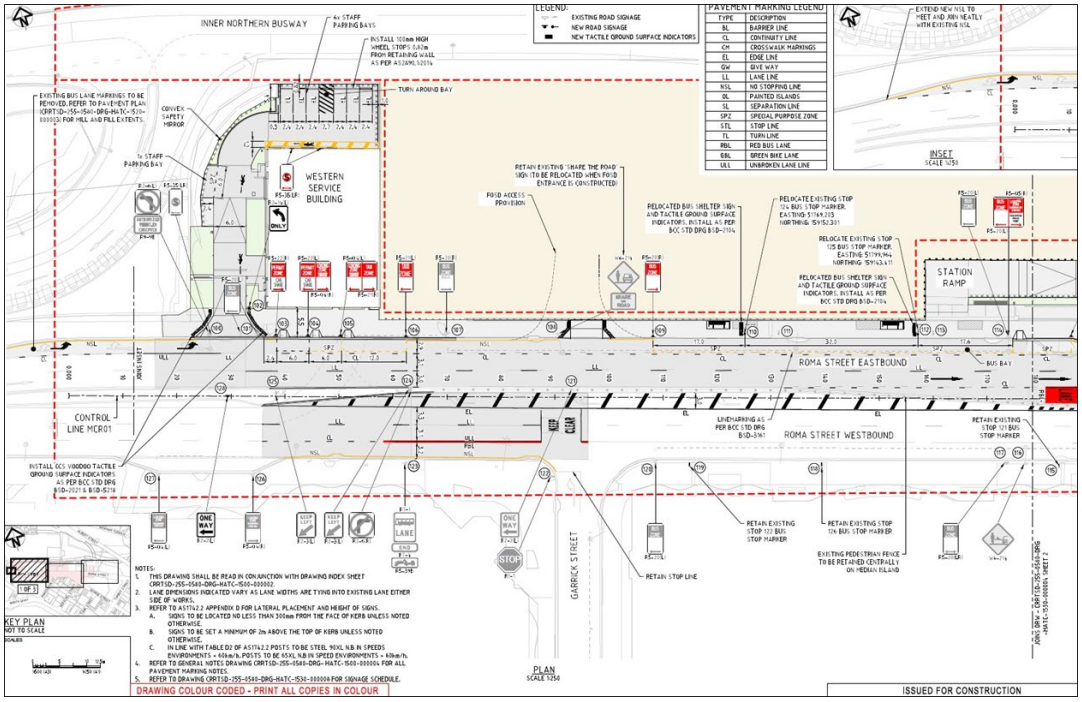


Figure 11 Draft Plan – Roma Street Station Precinct (Western Extent)

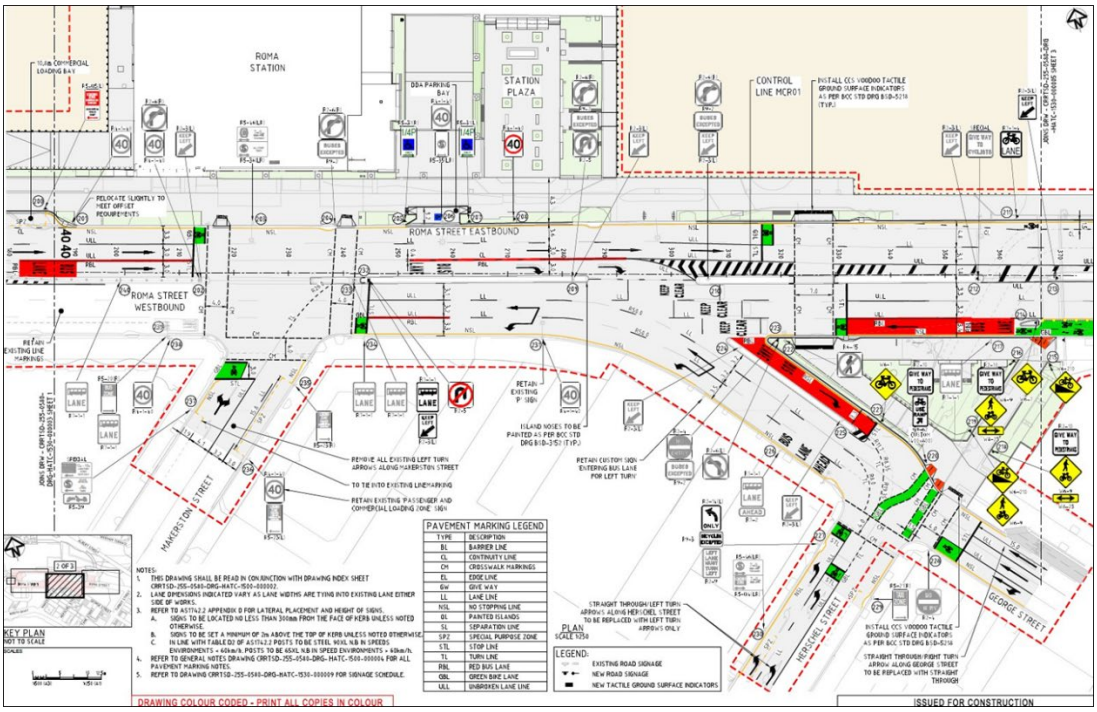


Figure 12 Draft Plan – Roma Street Station Precinct (Central Area)

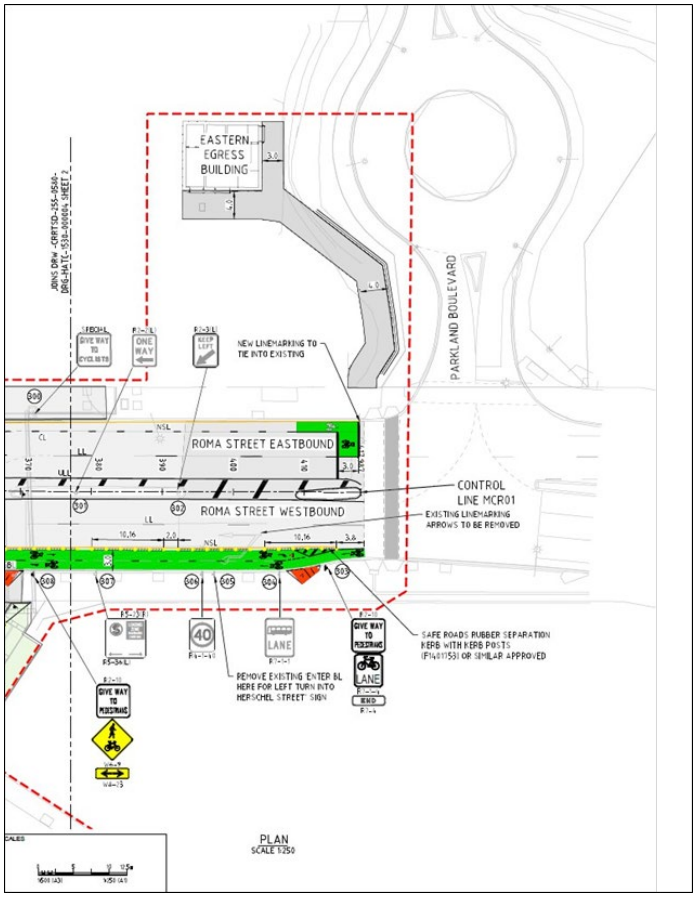


Figure 13 Draft Plan – Roma Street Station Precinct (Eastern Extent)

Commercial Vehicle Loading and Access

The Roma Street station precinct will provide for commercial vehicle loading bays along the northern side of Roma Street on the eastbound carriageway. Given the nature and location of these commercial vehicle loading bays, it is not expected that these facilities will generate a significant volume of traffic during the peak commuter peak periods.

Car Parking

The plans for the Roma Street station precinct do not provide for public car parking, as is appropriate given its location proximate to the Brisbane CBD. However, 6 spaces for the dedicated use of station staff and its operators are proposed, with vehicle access to be provided at the signalised intersection to the former Roma Street Coach Terminal. As part of CRR, the existing signals will be removed, with access to the proposed carpark provided by way of a left-in / left out priority-controlled intersection.

Proposed External Road Network Changes

As referenced under heading **Roma Street Precincts**, several modifications to the external road network are proposed in this RfPC in the vicinity of the Roma Street station precinct. The proposed road network modifications and intersection treatments are described under heading **Roma Street / George Street Intersection** to **Roma Street / Makerston Street Intersection**.

Roma Street / George Street Intersection

The proposed intersection is shown in Figure 14 and Figure 15. It incorporates the following:

- a new at-grade pedestrian crossing will be provided across Roma Street to the east of George Street
- a new cycle connection will be provided from Herschel Street to Roma Street
- Roma Street will retain its 2-lane throughput capacity in the eastbound direction, and 3 lane throughput capacity in the westbound direction at the George Street intersection
- the George Street approach will retain its 3-lane throughput capacity to Roma Street in the westbound direction
- dedicated bus lanes will be retained as per the current arrangement
- the existing intersection arrangement at George Street and Roma Street will be retained, with vehicle flows at this location controlled by the adjacent signalised intersections at George Street / Herschel Street and the new Roma Street / Pedestrian crossing, consistent with the current traffic arrangement.

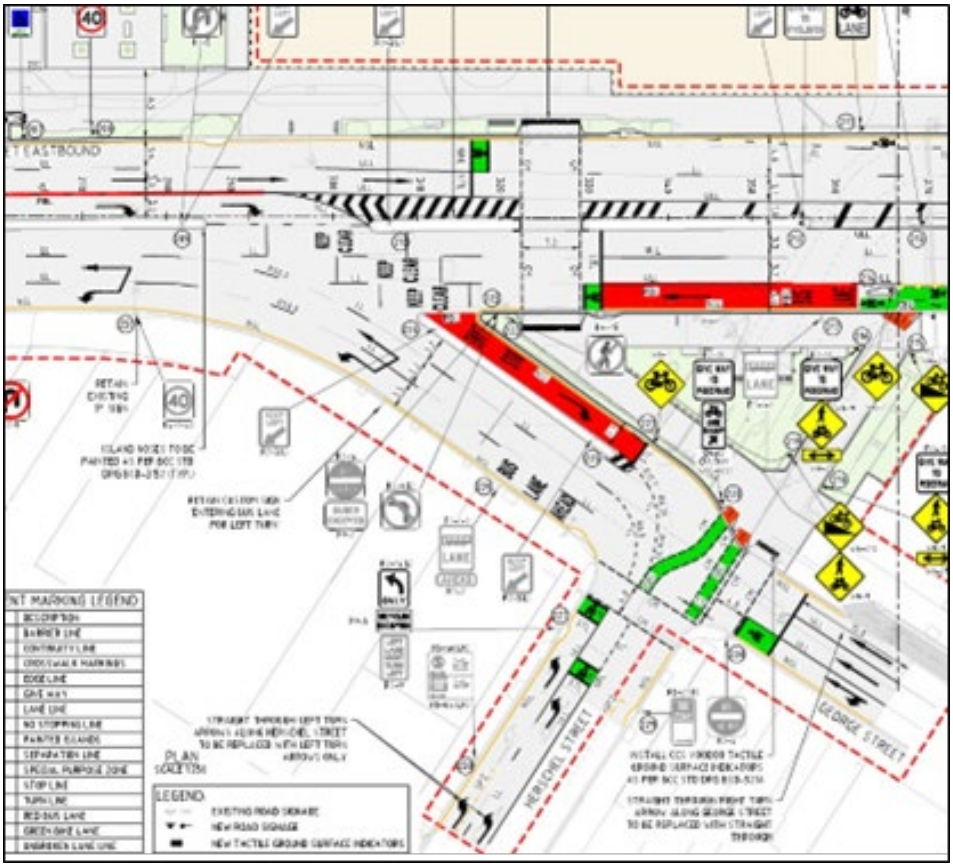


Figure 14 Draft Roma Street / George Street Intersection

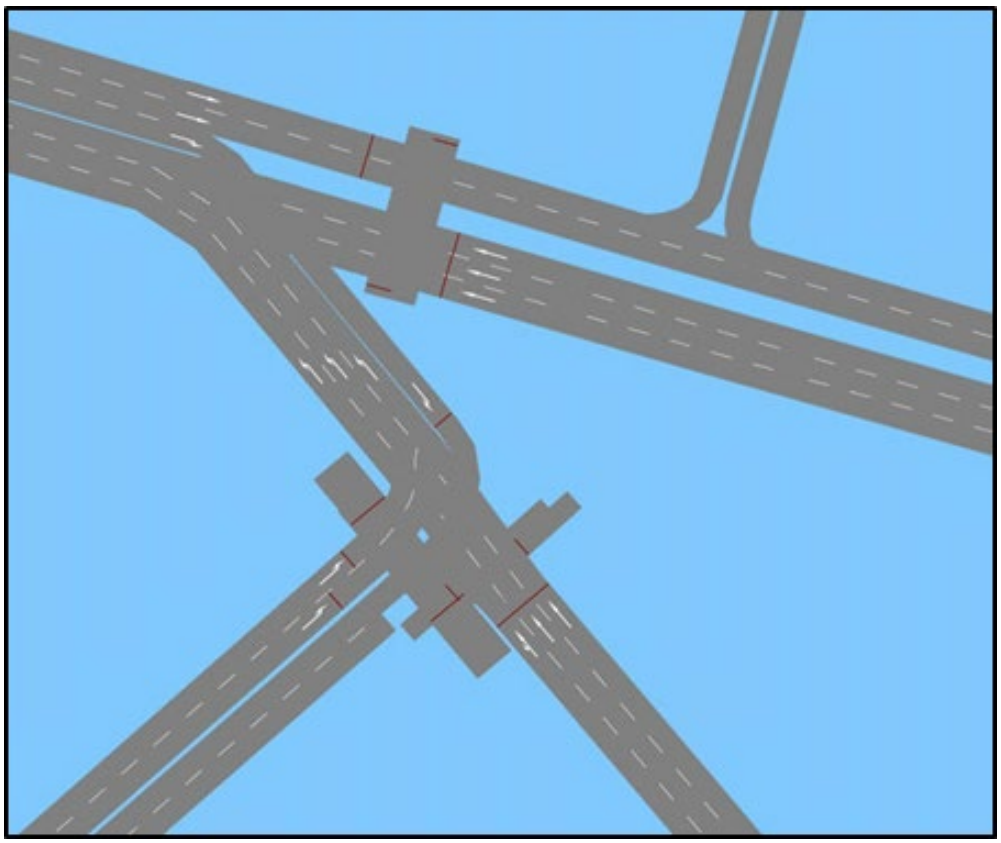


Figure 15 Roma Street / George Street (VISSIM)

George Street / Herschel Street Intersection

The proposed intersection is also shown in Figure 14 and Figure 15. It incorporates the following:

- closure of Herschel Street to the north of George Street
- the existing right turn from George Street into Herschel Street will be removed
- George Street will retain its one-way northbound vehicle movement, with 3 lane throughput capacity at Herschel Street
- the Herschel Street approach will be reconfigured to allow a dual left turn movement into George Street
- partial pedestrian protection is retained for the Herschel Street pedestrian crossing.

This intersection is proposed to operate in coordination with the Roma Street / George Street intersection per the existing arrangement, as outlined under the heading **Roma Street / Makerston Street Intersection**.

Roma Street / Makerston Street Intersection

The proposed intersection is shown in Figure 16 and Figure 17. It incorporates the following:

- Roma Street will retain its 3-lane throughput capacity in the eastbound direction, and 3-lane throughput capacity (inclusive of the existing bus lane) in the westbound direction at the George Street intersection
- the Makerston Street approach is proposed to be reconfigured to allow both left and right turning movements into Roma Street.

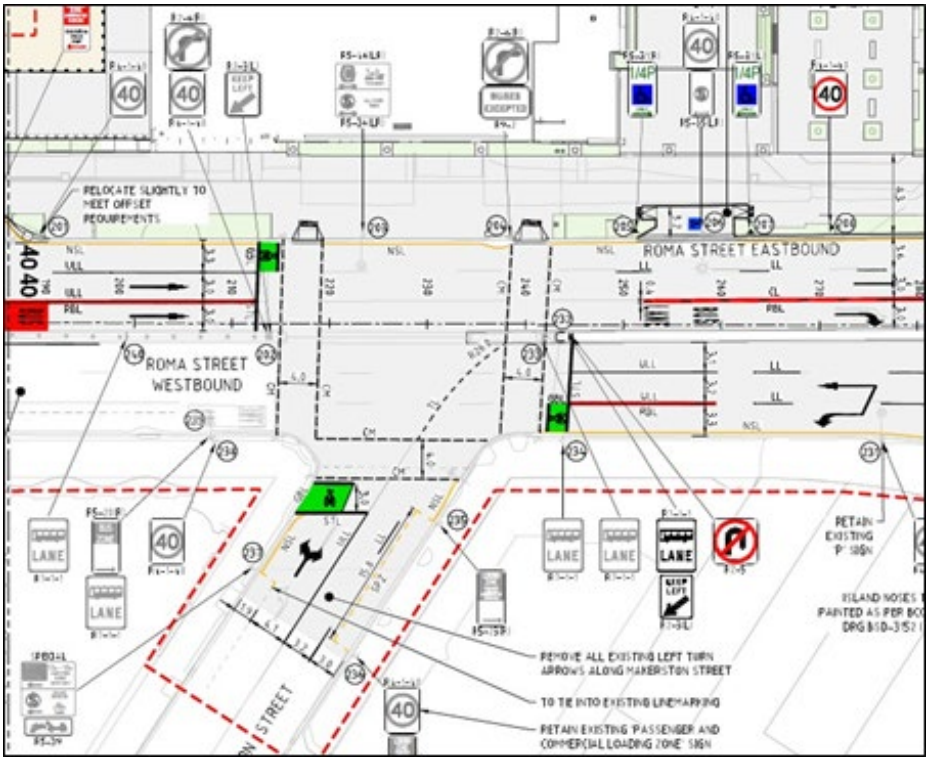


Figure 16 Roma Street / Makerston Street

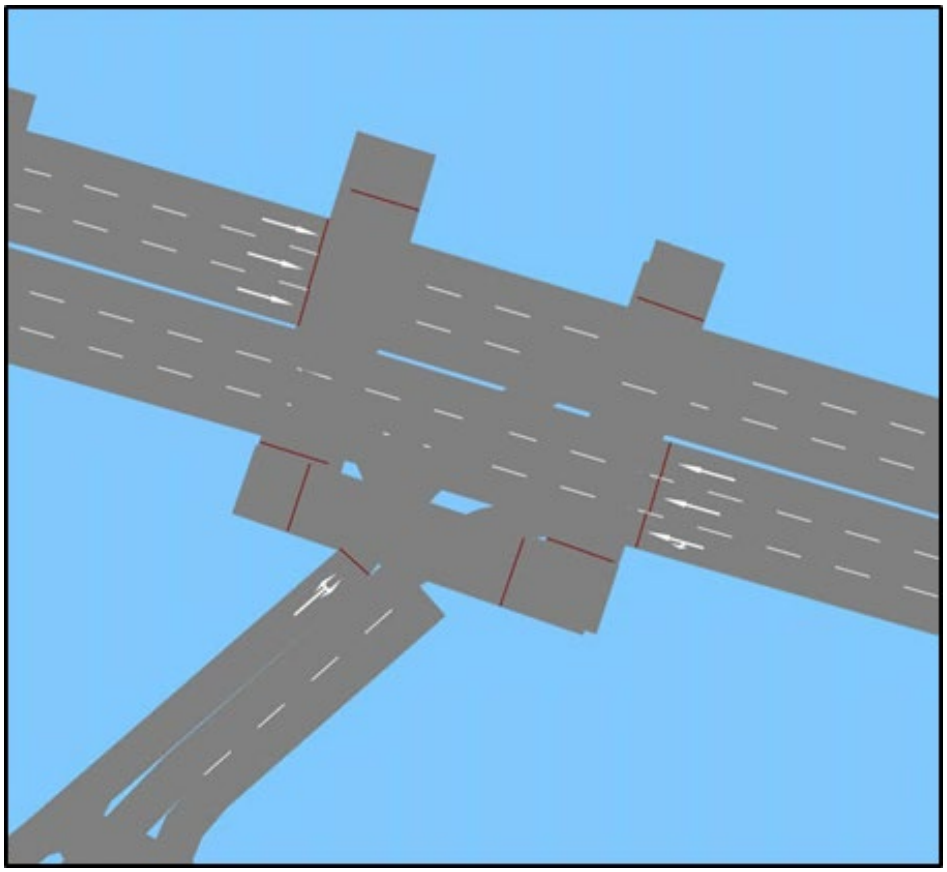


Figure 17 Roma Street / Makerston Street (VISSIM)

Base (2018) SATURN Model Interrogation

Local Area Validation

A local area validation exercise was undertaken for the Roma Street precinct on the BCC supplied SATURN models to confirm that the underlying SATURN models were operating within reasonable bounds when compared against available traffic data. The local area validation confirms whether the base SATURN models are adequately replicating traffic flows in the precinct and indicates how well the model is calibrated in the area of interest. It is noted that the manual traffic count data obtained during March 2018 were used as the basis for the local area validation.

The NSW RMS Traffic Modelling Guidelines are used by many State and Local Government authorities within Australia. This comprehensive guideline provides a streamlined approach to the development and use of transport models using a variety software platforms. Though there is no specific guidance for calibration targets of mesoscopic models (i.e. SATURN), the calibration targets for microsimulation can be used to provide direction. These, as per the NSW RMS Traffic Modelling Guidelines, have been used to specify the target calibration criteria.

This approach was proposed to BCC in the methodology flow chart discussed under heading **Consultation with Brisbane City Council** and shown in Figure 4 with the proposed targets have adopted for use in this assessment.

Calibration Statistics with No Network Adjustment

Turn volumes were extracted from the provided 2018 SATURN models to determine the level of fit without any localised network adjustments.

The calibration target was achieved for the PM peak, however some adjustments were required to be considered in the AM Peak. These are discussed under heading **Calibration Statistics with Network Adjustments**.

The calibration checks for the 2018 SATURN models indicates a reasonable level of fit in the area of interest, satisfying the NSW RMS Traffic Modelling Guidelines. However, there were a number of key turns within the precinct that were out of acceptable bounds. Subsequently further checks were undertaken to confirm that the provided SATURN models was suitable to be used to inform the future traffic demands as outlined in subsequent sections of this TIA.

Calibration Statistics with Network Adjustments

A review of the provided 2018 SATURN models was undertaken to determine the accuracy and validity of the model parameters in the area of interest. Minor network and signal phasing adjustments were made to better replicate existing network conditions, and included:

- the addition of a left turn lane from George Street into Roma Street during the AM Peak (refer Figure 18 & Figure 19)
- signal phase timing adjustments to provide improved traffic flow and capacity where warranted by the manual turn count data, and where GEH was calculated to be greater than 10.

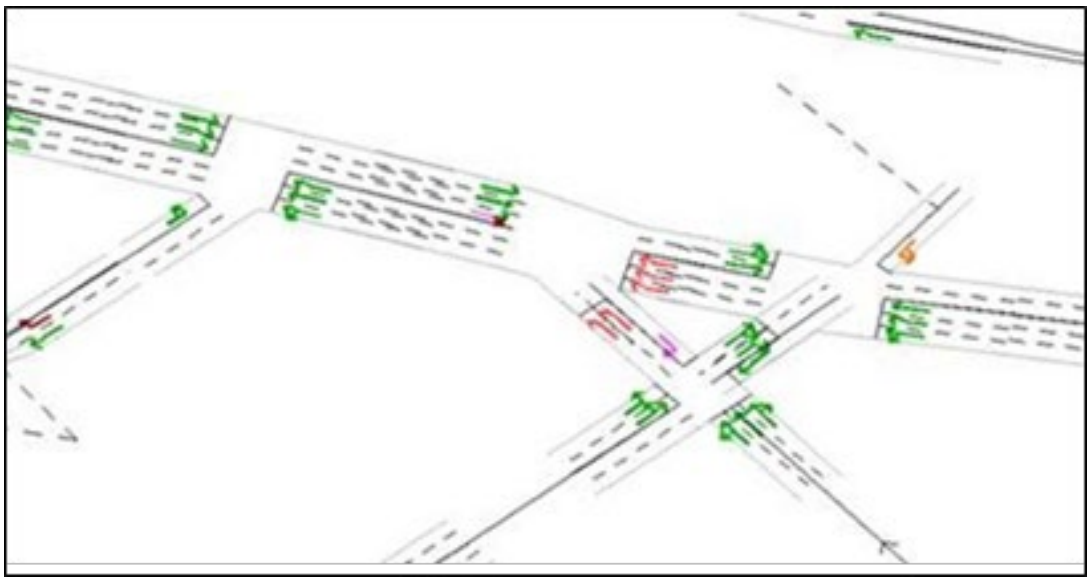


Figure 18 AM Peak (No Adjustment)

Figure 19 PM Peak (With Adjustment)

Following the model adjustments, turn volumes were extracted from the adjusted 2018 SATURN models and confirmed the resultant level of fit was appropriate. Based on the outcomes of the local area validation, it is considered that the underlying SATURN model is reasonably well calibrated in the area of interest, thereby indicating a good degree of confidence in the application of the SATURN models (as provided by BCC) within this TIA.

Base Year Operational Assessment

Modelling Methodology

Modelled Network

Operational performance of the base year road network was determined using VISSIM. The model coverage is shown in Figure 20.

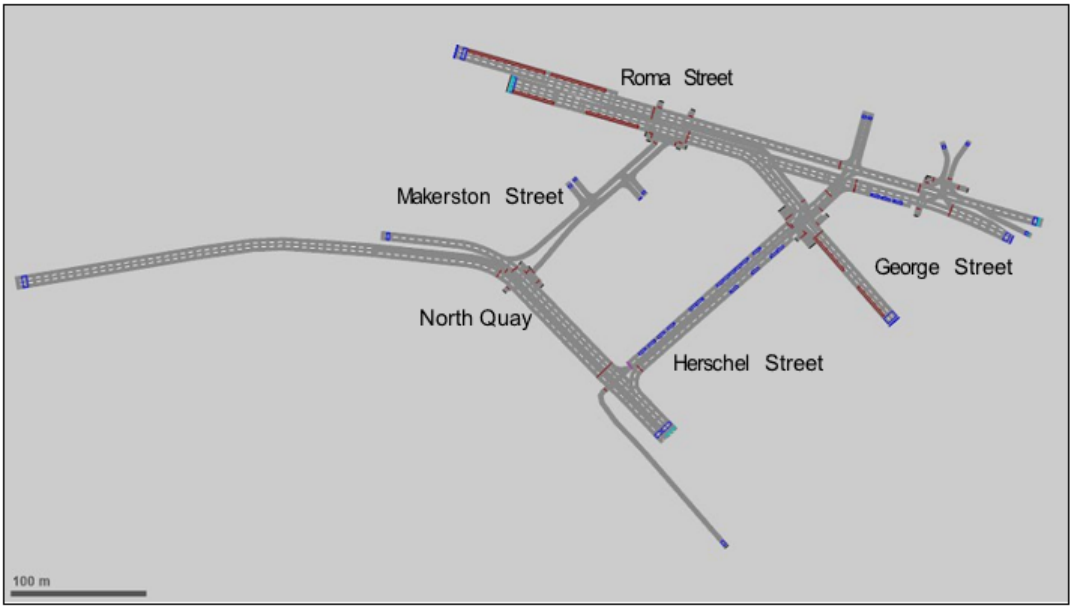


Figure 20 VISSIM Network Layout

Base Year Demand Development

To inform the traffic modelling, BCC has supplied CRRDA with the appropriate VISSIM model files.

Due to the level of documentation that BCC was able to provide supporting the VISSIM model provided Cross River Rail had a consultant undertake a review of the provided model data and complete required modifications to the VISSIM models as appropriate to the scope of this TIA.

A sub-network cut of the BCC provided VISSIM models was undertaken so that traffic demands, route choice and calibration were relevant to the area of interest as it relates to the Roma Street station precinct. The 2018 base year demands were determined through the following process:

- static routes were created from the original dynamic assignment provided within the supplied VISSIM models.
- the demand matrix and subsequent origins and destinations were determined for the subnetwork based on these static routes, which produced a starting point for the base demands.
- redistribution of traffic was undertaken where necessary to extend the model extents to include the Herschel Street / North Quay / Riverside expressway intersection.
- traffic entering the model on Herschel Street was assigned to appropriate new entry points for the extended study area (i.e. North Quay and the Riverside Expressway Exit onto Herschel Street).
- spot checks were undertaken to correct anomalies based on the traffic counts described under heading **Traffic Volumes**. For example, Parklands Boulevard entries for the AM Peak were much higher in the model than observed in the counts.
- manual adjustments were made for those vehicles that would enter the model subnetwork twice. For example, vehicles entering from the Transit Centre Car Park, which must turn left and exit the network to re-enter at another zone for its destination inside the subnetwork.

- the total demands were then adjusted using the VISSIM Matrix Correction tool and then split back into light vehicles (LV) and heavy vehicles (HV) matrices.
- the HV matrices were split for each individual origin-destination (O-D) in proportion to the original matrix HV proportion for that same O-D pair.
- to improve calibration, a single manual adjustment was made post matrix correction, which involved moving 60 vehicles from George St: West (entry) to North Quay. This was done to better match the count from North Quay onto Herschel Street and considers a worst-case scenario for assessment of queuing impacts on Herschel Street.

Signal Operations

The signal operations inherent within the VISSIM models has been retained for the base case operational assessment. The existing phasing sequence for the key intersections of Roma Street / Makerston Street and Roma Street / George Street / Herschel Street are illustrated in Figure 21 and Figure 22.

As the BCC VISSIM model did not include the intersection of North Quay / Herschel Street / Riverside Expressway, reference was made to the SCATS data which were provided by Council. Similar to the methodology adopted for the assessment of the other CRR stations, the information provided in the files were analysed to determine network specific operational indicators such as average phase times during the calculated peak periods and the traffic signal coordination offsets and offset phases. These were imported and visually inspected within the VISSIM model for the intersection of North Quay / Herschel Street / Riverside Expressway.

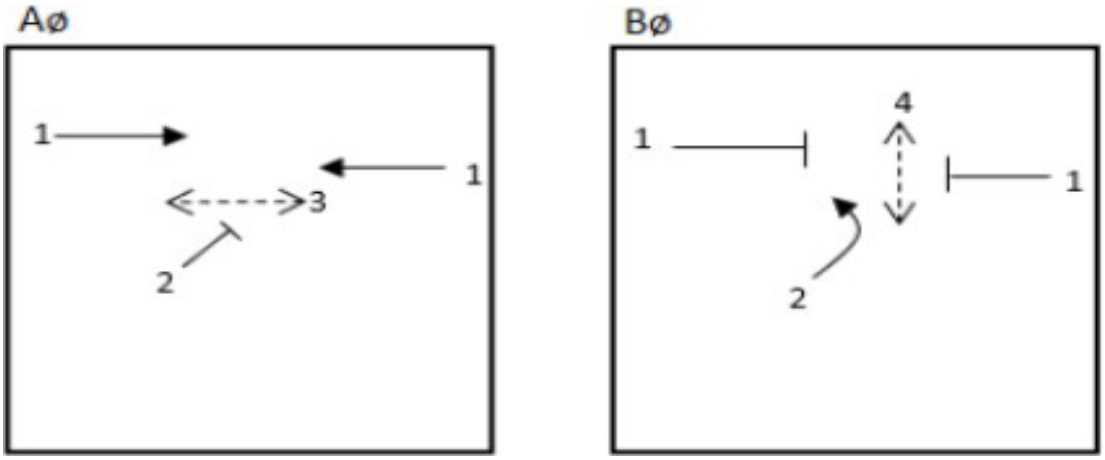


Figure 21 Phasing Sequence – Roma Street / Makerston Street (Existing)

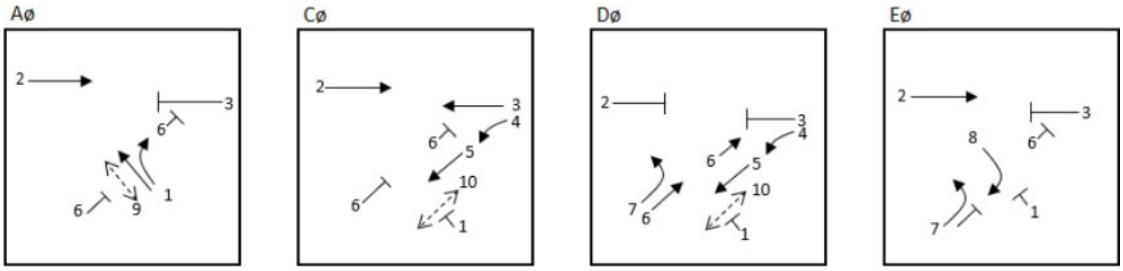


Figure 22 Phasing Sequence - Roma Street / George Street / Herschel Street (Existing)

Base Year Model Calibration

The NSW RMS Traffic Modelling Guidelines are used by many State and Local Government authorities within Australia. This comprehensive guideline provides a streamlined approach to the development and use of transport models using a variety of software platforms and was adopted for this TIA.

The calibration targets for microsimulation are set out in Chapter 11 of the guideline. It was agreed with BCC that VISSIM model calibration would be undertaken on the basis of turn volumes. For turn volumes, a model is generally considered calibrated if it achieves the nominated targets set.

It was confirmed that the models adequately replicate the base traffic conditions, achieving the required targets as described in the RMS Traffic Modelling Guidelines.

Base Case Operational Performance

The operational indicators of the intersections located proximate to the Roma Street station precinct for the 2018 base year, without the changes proposed in this RfPC are presented in Table 4. BCC identifies a target Level of Service (LOS) C for off-peak and peak conditions, except where roads are highly constrained as identified in its online mapping tool - *Transport Network Desired Standards of Service – Mode Share Targets (Map C3)*. The Roma Street station precinct falls within the “highly constrained” area and therefore some relaxation to the LOS target applies.

Notwithstanding, the results indicate that all intersections assessed within the VISSIM model are currently operating with adequate LOS, with all intersections operating with a minimum LOS C (total intersection) during AM and PM peak conditions. Whilst some individual movements fall below the target LOS criteria, these movements generally service lower order traffic movements and are considered acceptable on the balance of total traffic flows.

Heatmaps illustrating average speed by lane are presented in Figure 24 and Figure 25. The heatmaps illustrate that the Roma Street precinct generally operates under relatively free flow traffic conditions in the morning and afternoon peak. Road segments showing lower average speeds are the eastern Roma Street approach to the George Street intersection. Whilst there is some evidence of queuing on this approach, the effects are minor and do not extend beyond adjacent intersections.

It is noted that lower average speeds are also reported on Herschel Street on approach to the George Street intersection in the afternoon peak. This is a result of the availability of on-street parking on this road segment during this time. This does not occur in the morning peak, as Herschel Street is subject to parking restrictions (no standing) from 7am-9am.

Table 4 Base Year Operational Performance

Intersection	Approach/Movement		2018Base Case (AM Peak)			2018Base Case (PM Peak)		
			Demand (vph)	LOS	Avg Delay (sec)	Demand (vph)	LOS	Avg Delay (sec)
Roma Street/ Makerston Street	Roma Street (West)	T	1,020	**B**	11	650	A	**10**
		R	N/A	**N/A**	N/A	N/A	N/A	**N/A**
	Roma Stree t(East)	L	95	**D**	52	65	D	**53**
		T	595	**A**	10	805	A	**9**
	Makerston Street (South)	L	40	**D**	36	35	D	**41**
		R	N/A	**N/A**	N/A	N/A	N/A	**N/A**
	Total Intersection		1,750	**B**	13	1,555	B	**12**
Roma Street/ Herschel Street	Roma Street (West)	L	25	**A**	2	0	A	**0**
		T	995	**A**	3	650	A	**3**
	Roma Street (East)	L	135	**D**	51	90	C	**27**
		T	200	**D**	54	220	D	**46**
	Herschel Street (South)	T	15	**C**	33	10	D	**46**

Intersection	Approach/Movement		2018Base Case (AM Peak)			2018Base Case (PM Peak)		
			Demand (vph)	LOS	Avg Delay (sec)	Demand (vph)	LOS	Avg Delay (sec)
		R	140	C	23	150	C	**25**
	Total Intersection		1,510	B	16	1,120	B	**17**
George Street/ Herschel Street	Herschel Street (Southwest)	L	110	C	28	85	C	**29**
		T	110	D	42	90	D	**43**
	George Street (Southeast)	L	175	C	32	195	C	**34**
		T	375	B	19	565	B	**20**
		R	45	C	24	70	C	**27**
	Total Intersection		815	C	26	1,005	C	**26**
	North Quay (West) (Northern approach)	L	65	A	6	95	A	**4**
		T	1,825	A	9	1,465	A	**6**
	North Quay (West) (Centre approach)	T	760	A	9	485	A	**5**

Intersection	Approach/Movement		2018Base Case (AM Peak)			2018Base Case (PM Peak)		
			Demand (vph)	LOS	Avg Delay (sec)	Demand (vph)	LOS	Avg Delay (sec)
North Quay /Makerston Street	North Quay (West) (Southern approach)	T	2,280	**B**	14	1,925	A	**8**
	Makerston Street (North)	R	65	**E**	58	60	E	**57**
	Total Intersection		4,995	**B**	12	4,030	A	**8**
North Quay/ Herschel Street	North Quay (West) (Northern approach)	L	80	**A**	6	65	A	**5**
		T	2,590	**A**	6	1945	A	**5**
	North Quay (West) (Southern approach)	T	2,300	**A**	6	1925	A	**6**
	Herschel St (North)	L	330	**D**	50	295	D	**51**
	Riverside Expressway (South)	T	140	**D**	50	110	D	**52**
	Total Intersection		**5,440**	**A**	**10**	**4,340**	**A**	**10**

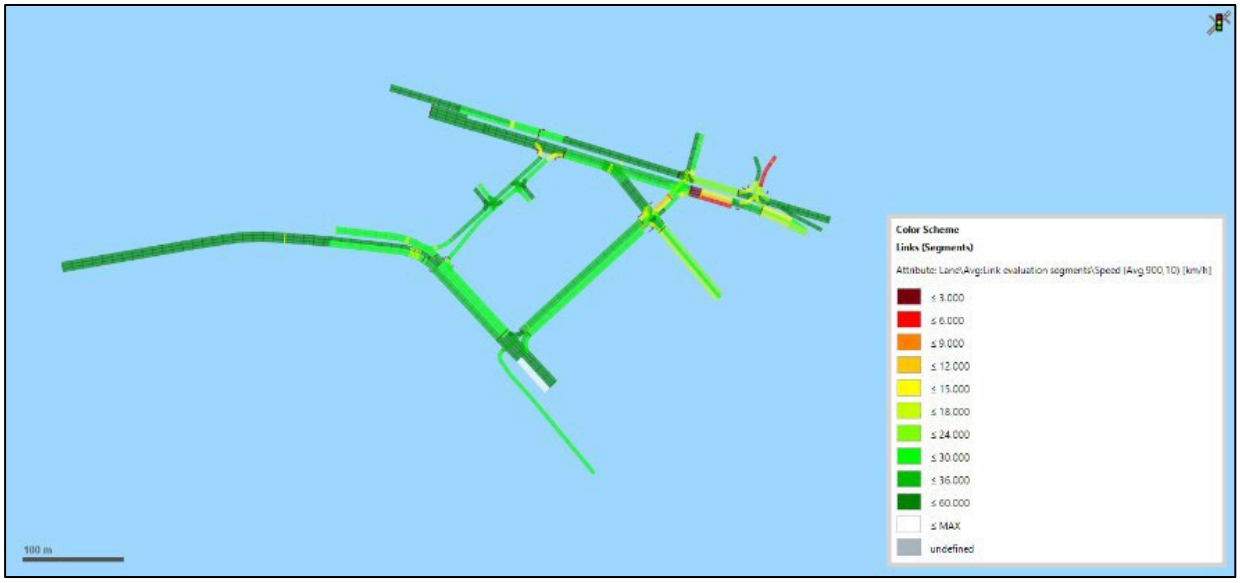


Figure 23 Base Year Average Speed – AM Peak

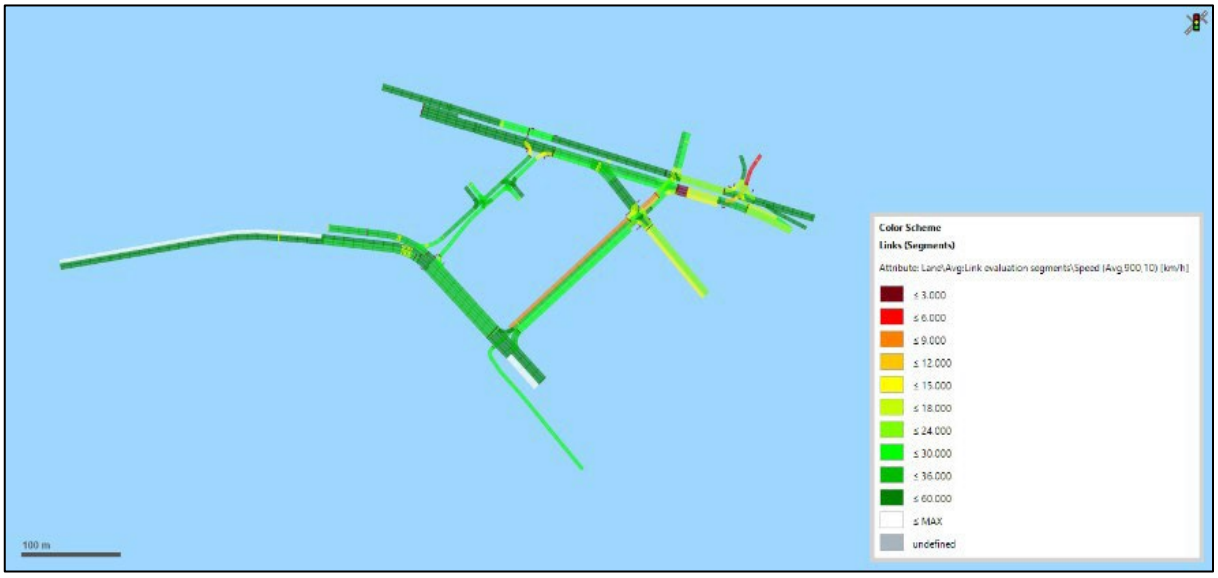


Figure 24 Base Year Average Speed – PM Peak

Future Year Traffic Forecast

Selected Design Horizons

The year of opening for CRR is currently forecast to be 2026, at the time of the initial development of this report it was forecast for 2024.

In accordance with the TIA assessment procedures specified in the BCC TAPS Policy, assessment horizons should correlate with the anticipated year of opening and a 10-year design horizon, post development opening. Based on these guidelines, the applicable design horizons for the TIA are 2024 and 2034. It has however been discussed and confirmed with BCC with current experienced traffic volumes in a post-covid environment that these assessments are appropriate for 2026 and 2036.

Following advice provided by BCC, it was suggested that the TIA should correspond with the most relevant model years available in SATURN. Future year SATURN models were provided for 2023 and 2031, and therefore forecast background traffic demands used within this TIA correspond with traffic flows extracted from SATURN for these forecast years. Please refer to heading **Consultation with Brisbane City Council** for further detail and rationale. These are however representative of 2026 and 2036 levels.

Based on BCC's advice and direction, the selected design horizons applicable to this TIA are:

- 2023 (equivalent design year corresponding to the 2026 anticipated year of opening for CRR)
- 2031 (future design year post CRR opening equivalent to 2036 levels).

Future Road Network Planning

A review of BCC's Local Government Infrastructure Plan (LGIP) for this area indicates that there are no planned upgrades for roads in the immediate proximity of the Roma Street station precinct.

No amendments have therefore been made to the future year road network, without CRR.

Background Traffic Growth

To inform the future year traffic modelling, BCC has supplied CRRDA with SATURN the required model files.

Per the TIA assessment methodology outlined under heading **Consultation with Brisbane City Council** and summarised in Figure 5, forecast traffic demands for these model years are as per BCC traffic planning for this area of Brisbane CBD. These were used to inform the revised future year demand matrices adopted for the VISSIM modelling component.

SATURN derived traffic flows which are expressed in Passenger Car Equivalents (PCU) were converted to light and heavy vehicle splits using vehicle class breakdowns inferred by the manual traffic count data.

Roma Street Station Traffic Generation

Vehicle Traffic Generation

Given the nature of the proposed development and its location within the Brisbane CBD, it is not expected that significant vehicle traffic will be directly generated by the Roma Street station precinct. Rather, it is expected that generated traffic will predominantly comprise solely of pedestrian movements and walk-up demand.

Pedestrian Traffic Generation

Forecast traffic flows for pedestrian movements have been provided generated by other assessments. They are summarized in Figure 26 to Figure 29. These forecast pedestrian flows have been included in the operational assessment described under heading **Traffic Impact Assessment**.

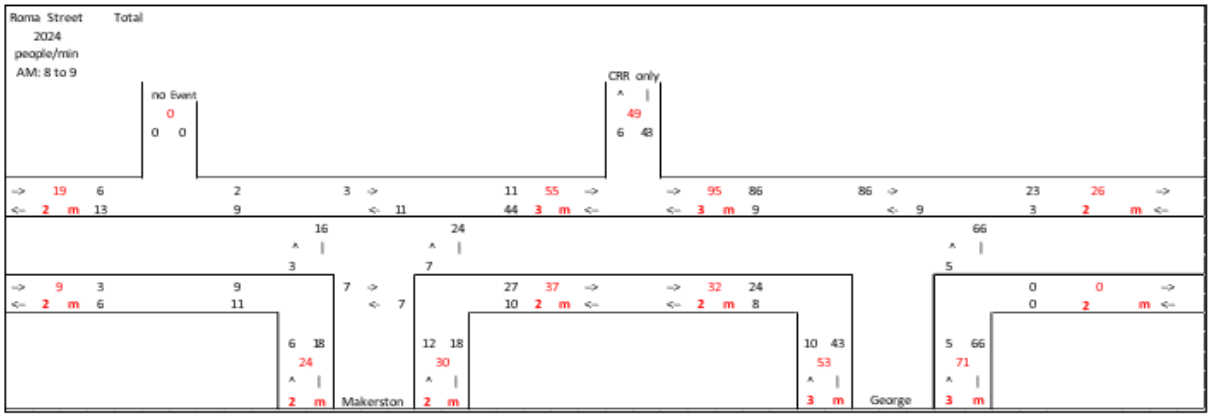


Figure 25 Forecast Pedestrian Flows – 2024 AM Peak Hour

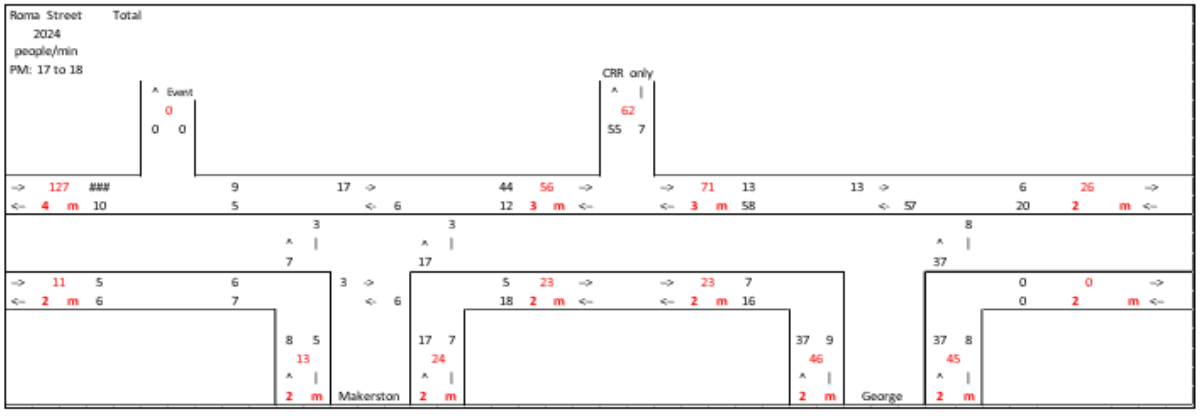


Figure 26 Forecast Pedestrian Flows – 2024 PM Peak Hour

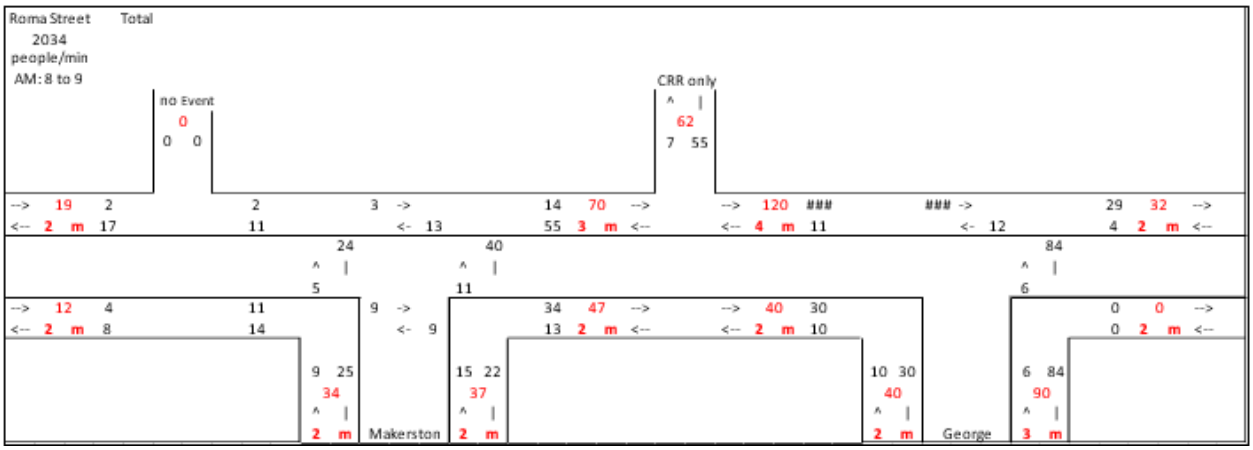


Figure 27 Forecast Pedestrian Flows – 2034 AM Peak Hour

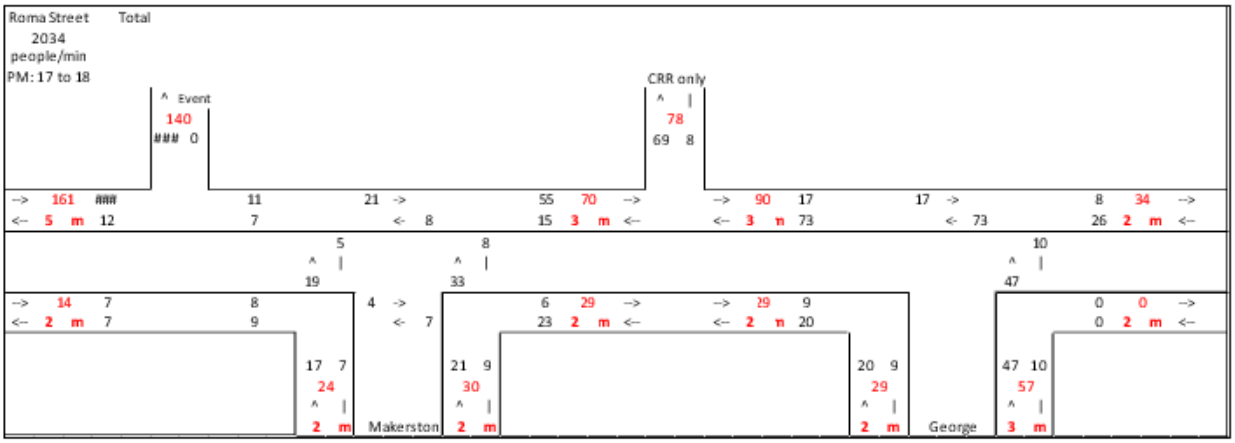


Figure 28 Forecast Pedestrian Flows – 2034 PM Peak Hour

Traffic Redistribution Changes with Cross River Rail

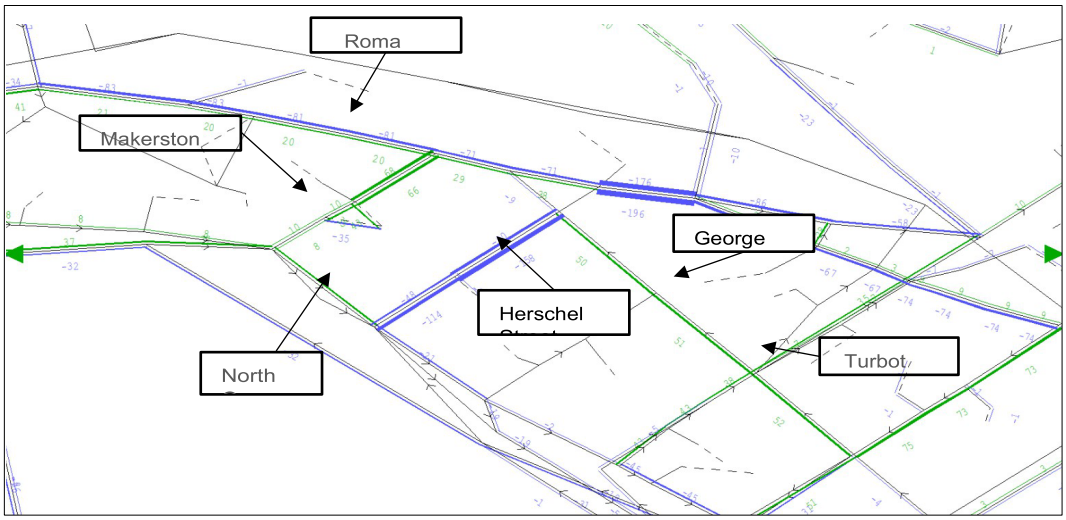
As discussed, under heading **Background Traffic Growth**, BCC has supplied SATURN model files to assist in the development of future year traffic flows. To verify the extent of traffic redistribution resulting from the changes proposed in this RfPC to the local road network changes. The provided 2023 and 2031 SATURN models were modified to reflect the Roma Street station design proposed in this RfPC as described under heading **Roma Street Station Precinct**.

A difference plot illustrating 2023 and 2031 modelled network flows, comparing SATURN outputs 'with' and 'without' this change is provided in Figure 30 to Figure 33. These difference plots suggest that traffic is likely to be reduced along Herschel Street as a result of the revised road network configuration and distributed to alternative paths along Makerston Street, George Street, Turbot Street and Ann Street.

It is noted that the SATURN modelling also suggests that AM Peak eastbound traffic originating from the north will be diverted from Roma Street to alternative paths such as Wickham Terrace. This is due to increased travel delays along Roma Street which are the result of the introduced at-grade pedestrian crossing at the intersection of George Street and Roma Street and the 'all-pedestrian movement phase' at the Makerston Street / Roma Street intersection. It is not considered likely that this would occur in practice, and accordingly, the eastbound traffic movement along Roma Street has

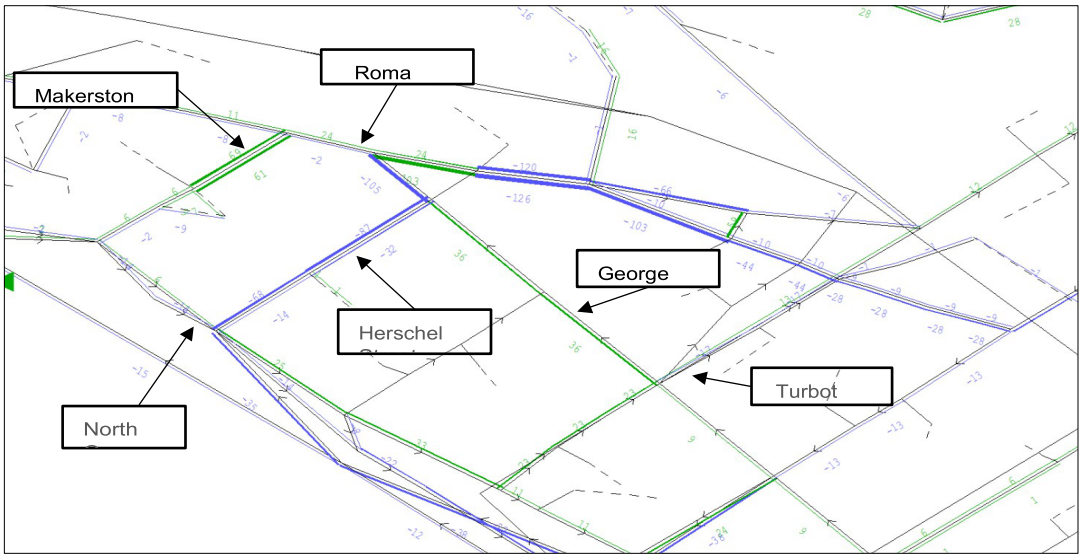
been increased for the “with CRR” scenario, to match forecast traffic flows “without CRR” during the AM Peak.

The traffic forecasts provided under heading **Forecast Traffic Flows** take into the account the redistribution of traffic as implied by the SATURN modelling. SATURN derived traffic flows have been directly extracted and applied to all turning movements in the Roma Street station precinct, with the exception of eastbound traffic flows on Roma Street for the AM Peak “With CRR” scenario, where AM Peak “Without CRR” traffic volumes have been retained for the purposes of this assessment.



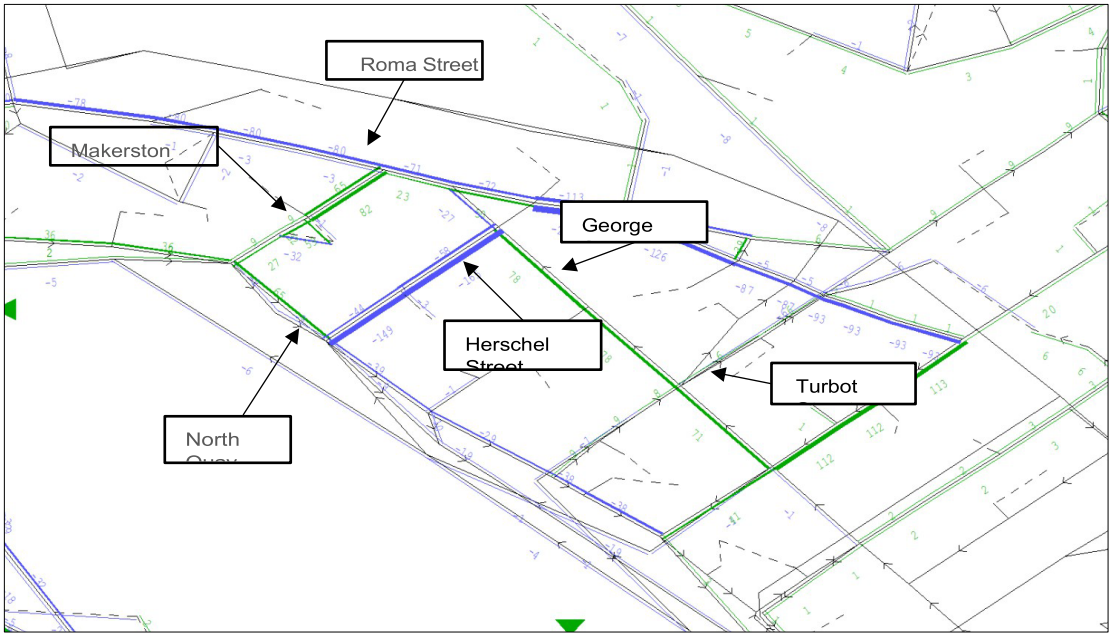
Note: Blue lines indicating negative volumes implies that traffic flows have been reduced following CRR. Conversely, green lines indicating increased volumes implies that traffic flows may increase with CRR.

Figure 29 SATURN Difference Plot (‘With CRR’ minus ‘No CRR’) – 2023 AM Peak



Note: Blue lines indicating negative volumes implies that traffic flows have been reduced following CRR. Conversely, green lines indicating increased volumes implies that traffic flows may increase with CRR.

Figure 30 SATURN Difference Plot (‘With CRR’ minus ‘No CRR’) – 2023 PM Peak



Note: Blue lines indicating negative volumes implies that traffic flows have been reduced following CRR. Conversely, green lines indicating increased volumes implies that traffic flows may increase with CRR.

Figure 31 SATURN Difference Plot ('With CRR' minus 'No CRR') – 2031 AM Peak

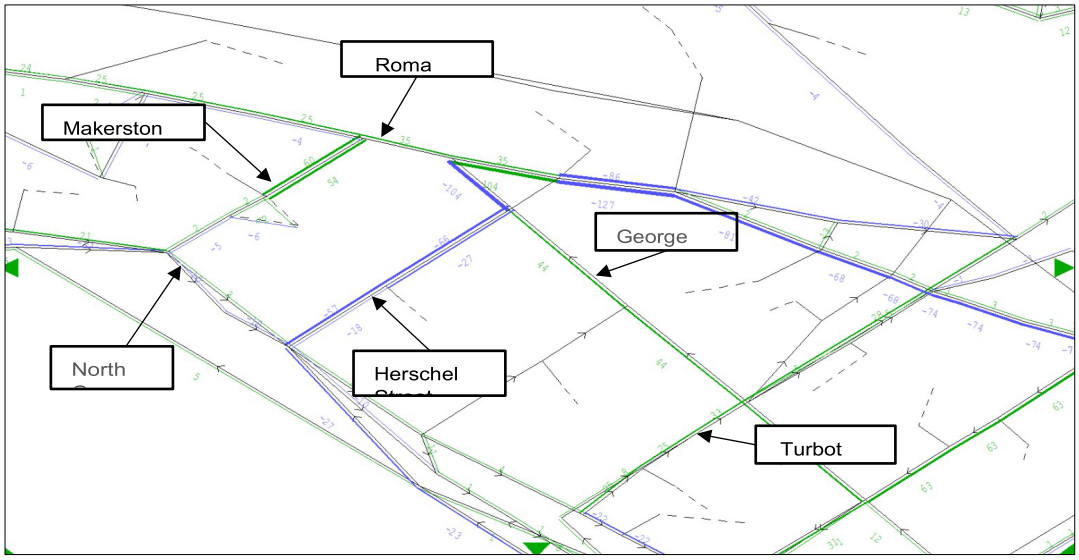


Figure 32 SATURN Difference Plot ('With CRR' minus 'No CRR') – 2031 PM Peak

Note: Blue lines indicating negative volumes implies that traffic flows have been reduced following CRR. Conversely, green lines indicating increased volumes implies that traffic flows may increase with CRR.

Forecast Traffic Flows

Application of the rationale provided under heading **Selected Design Horizons** to heading **Traffic Redistribution Changes with Cross River Rail** yields future year traffic forecasts as shown in Figure 34 to Figure 40.

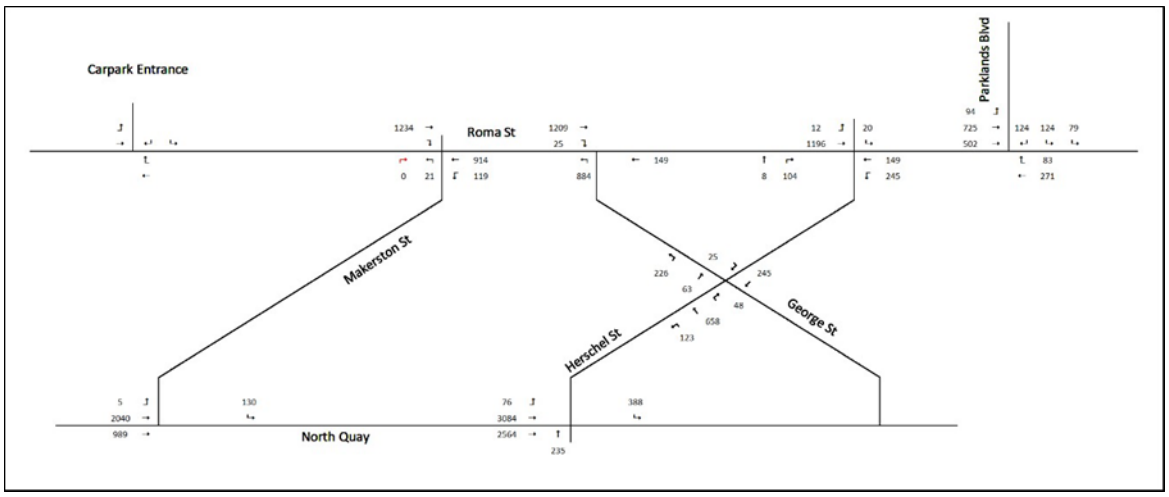


Figure 33 Future Year Traffic Flows (2023) Without CRR – AM Peak

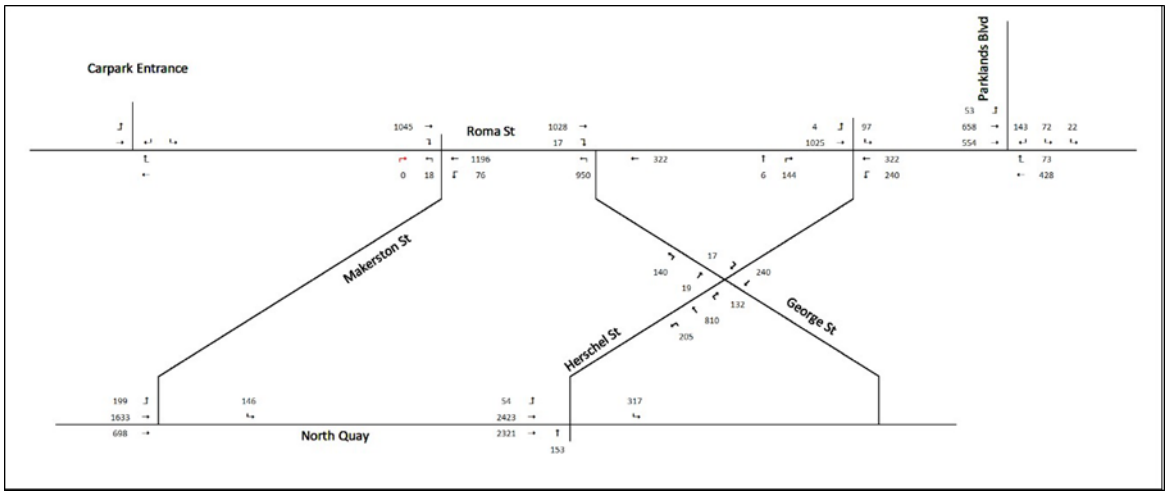


Figure 34 Future Year Traffic Flows (2023) Without CRR – PM Peak

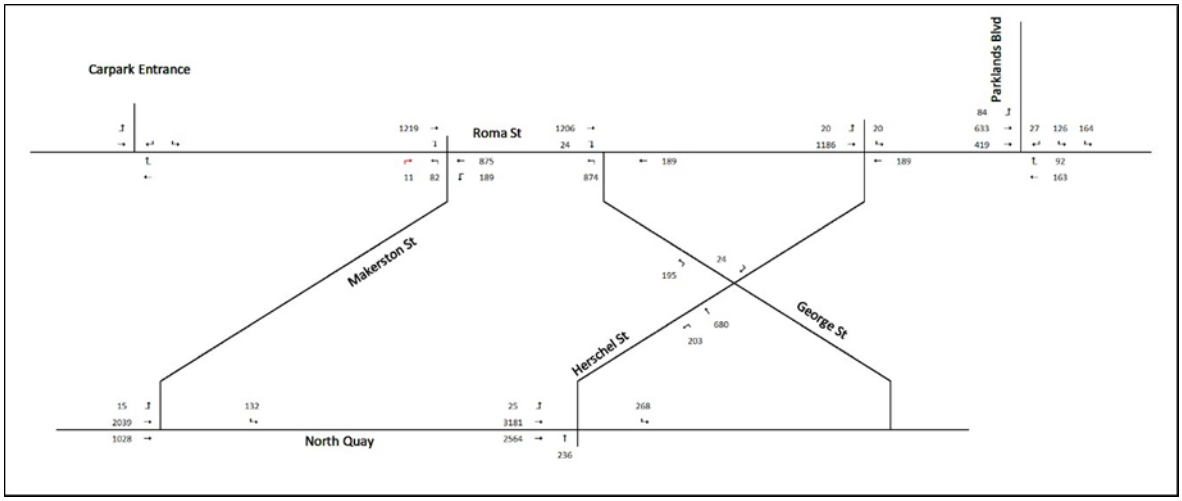


Figure 35 Future Year Traffic Flows (2023) With CRR – AM Peak

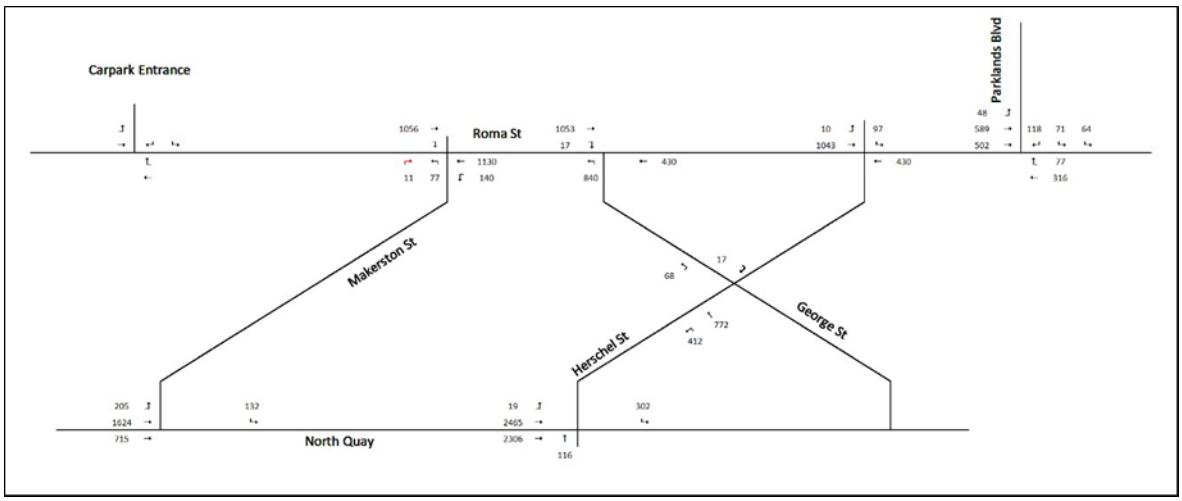


Figure 36 Future Year Traffic Flows (2031) Without CRR – AM Peak

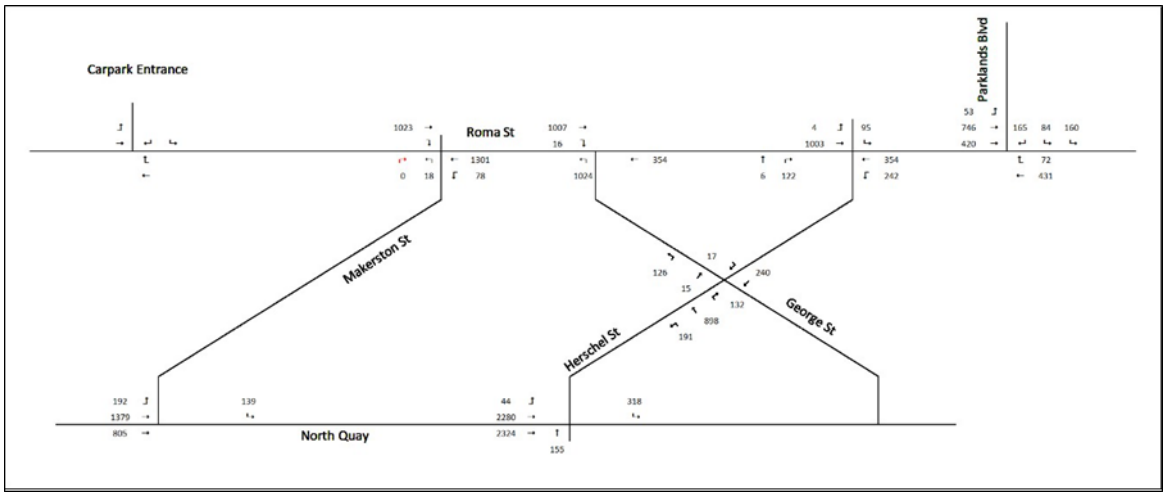


Figure 37 Future Year Traffic Flows (2031) Without CRR – PM Peak

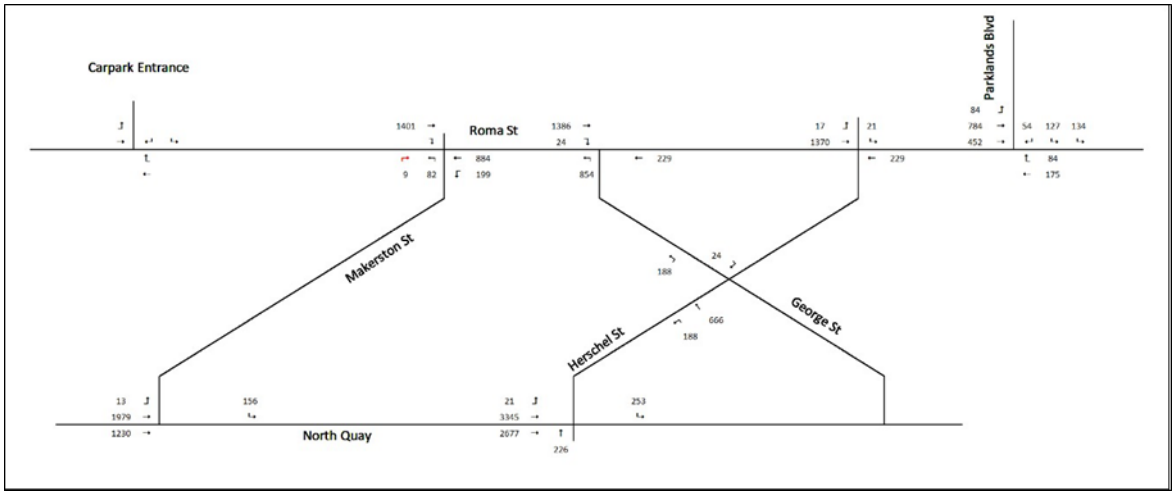


Figure 38 Future Year Traffic Flows (2031) With CRR – AM Peak

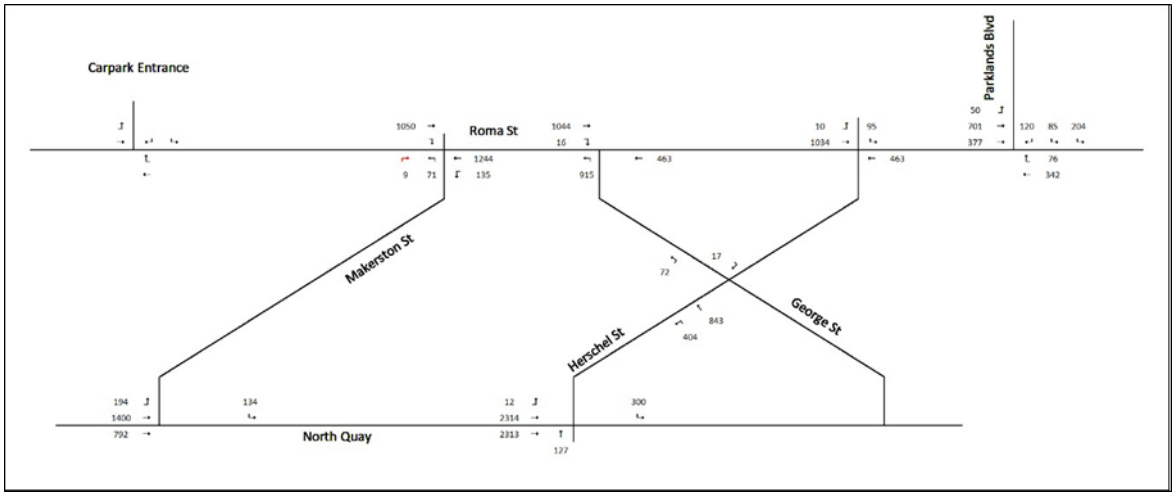


Figure 39 Future Year Traffic Flows (2031) With CRR – PM Peak

Traffic Impact Assessment

Methodology

Methodology

To assess the traffic impact of the Roma Street station precinct it is appropriate to have consideration of a relevant 'base case' against which to test generated traffic. A 'base case' examines the performance of the road network without the Roma Street station precinct at key points in time. Based on BCC's advice and direction at the time of this assessment, these key points in time (referred herein as design horizons) are taken to be:

- 2023 (equivalent design year corresponding to the anticipated year of opening for CRR in 2026)
- 2031 (future design year post CRR opening equivalent to 10-year period of 2036).

Assumptions

The VISSIM models which were developed and calibrated as part of the assessment of the base year operations (see heading **Base Year Operational Assessment**) have been used to assess the future cases. The key characteristics and assumptions relating to the future year models are as per applicable BCC traffic planning for this area, taking into account the changes as proposed in this RfPC.

Singal Phasing / Sequencing

The inclusion of the proposed road network changes surrounding the Roma Street station precinct has necessitated modifications to the existing signal phasing arrangements at the intersections of Roma Street / Makerston Street and Roma Street / George Street / Herschel Street. The adopted signal phasing sequences are shown in Figure 41 and Figure 42.

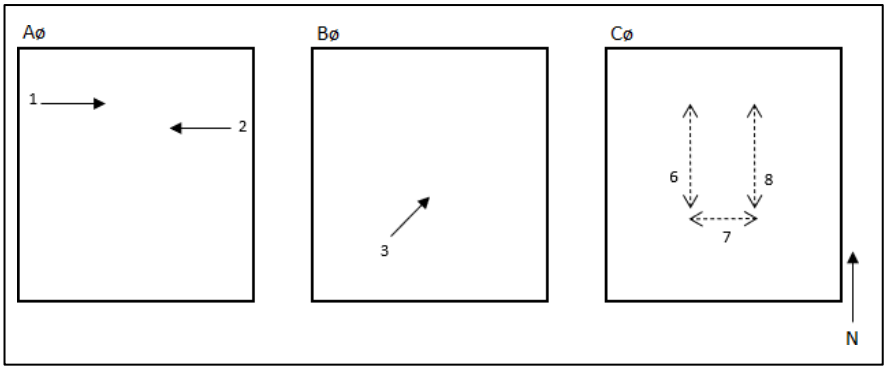


Figure 40 Phasing Sequence – Roma Street / Makerston Street (With CRR)

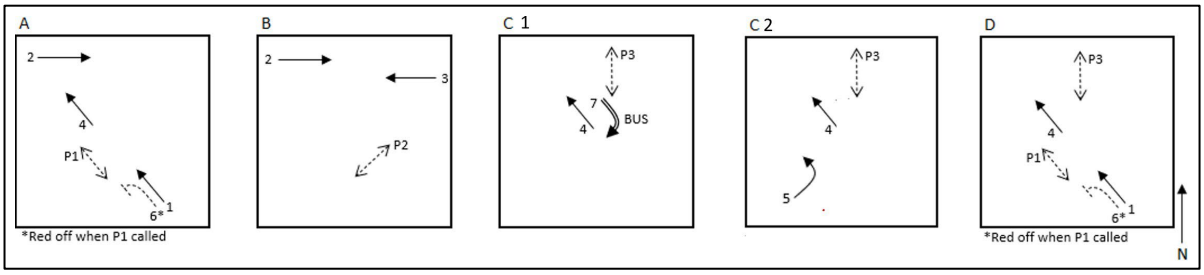


Figure 41 Phasing Sequence – Roma Street / George Street / Herschel Street (With CRR)

The signal timings adopted for these two intersections with the updated phasing arrangements are detailed in Table 5 below.

Table 5 Updated Signal Arrangement Phase Times (with CRR)

Intersection	Peak Period	Phase Green Times (seconds)				
		A	B	C1	C2	D
Roma Street / Makerston Street	AM	50	17	33	N/A	N/A
	PM	50	17	33	N/A	N/A
Rome Street / George Street / Herschel Street	AM	48	22	12	14	4
	PM	48	22	12	12	6

Operational Impact – 2023 Traffic Conditions

The operational indicators of the intersections located proximate to the Roma Street station precinct for forecast 2023 traffic conditions are presented in Table 6 and Figure 43 to Figure 46.

The results indicate the following:

Roma Street / Makerston Street Intersection

- the Roma Street / Makerston Street intersection is expected to operate at a LOS consistent with, or at times better than the 'without CRR' scenario. This equates to a LOS B or better in both the AM and PM peak periods. (LOS B with CRR, LOS C without CRR in AM Peak periods and LOS B with CRR, LOS B without CRR in PM Peak periods).
- this is within acceptable bounds as indicated in the Brisbane City Plan 2014.

Roma Street / George Street Intersection

- the Roma Street / George Street intersection is expected to operate at a LOS consistent with, or at times better than the 'without CRR' scenario. This equates to a LOS B or better in both the AM and PM peak periods. (LOS B with CRR, LOS B without CRR)
- this is within acceptable bounds as indicated in the Brisbane City Plan 2014

George Street / Herschel Street Intersection.

- the George Street / Herschel Street intersection is expected to operate at a LOS consistent with, or at times better than the 'without CRR' scenario. This equates to a LOS C in the AM peak period and LOS D in the PM peak period, with queuing improved in the PM peak from the "without CRR" scenario. (LOS C with CRR, LOS C without CRR for AM Peak period and LOS D with CRR, LOS F without CRR for PM Peak period).
- whilst outside of the desirable bounds (i.e. LOS C) as indicated in the Brisbane City Plan 2014, it is noted that the performance of the road network with the inclusion of the changes in this proposed RfPC (i.e. LOS D) is expected to improve from the Without the changes in this proposed RfPC scenario, where an overall LOS F was modelled in the PM Peak.
- it is further noted that the Roma Street station precinct falls within the "highly constrained" area of Brisbane and therefore some relaxation to the target LOS C applies.
- queuing is expected to improve significantly in the PM peak for the 'With the changes in this proposed RfPC scenario compared to the 'Without the changes in this proposed RfPC' scenario.
- review of the model operations does not indicate any significant queueing on the Herschel Street approach, with queues expected to be dissipated with each signal cycle.

North Quay / Makerston Street

- the overall LOS at the intersection is not expected to change following the inclusion of the changes in this proposed RfPC during both peak periods.
- The North Quay / Makerston Street intersections are expected to operate at a LOS consistent with, or at times better than the 'without CRR' scenario. This equates to a LOS B or better in both the AM and PM peak periods. (LOS B with CRR, LOS B without CRR).
- this is within acceptable bounds as indicated in the Brisbane City Plan 2014.

North Quay / Herschel Street

- the overall LOS at the intersection is not expected to change following the inclusion of the changes in this proposed RfPC during both peak periods.
- the North Quay / Herschel Street intersection is expected to operate at a LOS consistent with, or at times better than the 'without CRR' scenario. This equates to a LOS A in both the AM and PM peak periods. (LOS A with CRR, LOS A without CRR).
- the heatmap indicates traffic at this intersection is expected to operate under free flow traffic conditions during the AM and PM Peak.

Table 6 Operational Impact – 2023 Traffic Conditions

Intersection	Approach / Movement		AM Peak 2023 Without CRR Demand (vph)	AM Peak 2023 Without CRR Avg Delay (sec)	AM Peak 2023 Without CRR LOS	AM Peak 2023 With CRR Demand (vph)	AM Peak 2023 With CRR Avg Delay (sec)	AM Peak 2023 With CRR LOS	PM Peak 2023 Without CRR Demand (vph)	PM Peak 2023 Without CRR Avg Delay (sec)	PM Peak 2023 Without CRR LOS	PM Peak 2023 With CRR Demand (vph)	PM Peak 2023 With CRR Avg Delay (sec)	PM Peak 2023 With CRR LOS
Roma Street / Makerston Street	Roma Street (West)	T	1205	27	C	1195	25	C	1050	12	B	1030	22	**C**
	Roma Street (East)	L	45	32	C	130	5	A	0	53	D	150	41	**D**
		T	930	14	B	795	10	A	1295	10	A	1235	13	**B**
	Makerston Street (South)	L	20	36	D	125	36	D	80	80	F	105	36	**D**
		R	N/A	N/A	N/A	15	33	C	N/A	N/A	N/A	20	42	**D**
	Total Intersection		2200	22	C	2260	19	B	2425	13	B	2540	20	**B**
Roma Street / George Street	Roma Street (West)	T	N/A	N/A	N/A	1185	4	A	N/A	N/A	N/A	1040	1	**A**
	Roma Street (East)	T	N/A	N/A	N/A	190	34	C	N/A	N/A	N/A	460	50	**D**
	George Street (South)	L	N/A	N/A	N/A	745	3	A	N/A	N/A	N/A	925	3	**A**
	Total Intersection		N/A	N/A	N/A	2120	6	A	N/A	N/A	N/A	2425	11	**B**

Intersection	Approach / Movement		AM Peak 2023 Without CRR Demand (vph)	AM Peak 2023 Without CRR Avg Delay (sec)	AM Peak 2023 Without CRR LOS	AM Peak 2023 With CRR Demand (vph)	AM Peak 2023 With CRR Avg Delay (sec)	AM Peak 2023 With CRR LOS	PM Peak 2023 Without CRR Demand (vph)	PM Peak 2023 Without CRR Avg Delay (sec)	PM Peak 2023 Without CRR LOS	PM Peak 2023 With CRR Demand (vph)	PM Peak 2023 With CRR Avg Delay (sec)	PM Peak 2023 With CRR LOS
Roma Street / Herschel Street	Roma Street (West)	L	0	0	A	N/A	N/A	N/A	0	0	A	N/A	N/A	**N/A**
		T	1205	1	A	N/A	N/A	N/A	1050	3	A	N/A	N/A	**N/A**
	Roma Street (East)	L	230	43	D	N/A	N/A	N/A	175	31	C	N/A	N/A	**N/A**
		T	175	56	E	N/A	N/A	N/A	295	56	E	N/A	N/A	**N/A**
	Herschel Street (South)	T	10	55	E	N/A	N/A	N/A	10	55	E	N/A	N/A	**N/A**
		R	105	31	C	N/A	N/A	N/A	170	41	D	N/A	N/A	**N/A**
	Total Intersection		1725	15	B	N/A	N/A	N/A	1700	20	B	N/A	N/A	**N/A**
George Street / Herschel Street	Herschel Street (Southwest)	L	210	29	C	175	56	E	155	32	C	95	56	**E**
		T	80	49	D	N/A	N/A	N/A	50	53	D	N/A	N/A	**N/A**
	George Street (Southeast)	L	150	30	C	215	44	D	140	89	F	355	109	**F**
		T	585	19	B	570	21	C	850	110	F	835	26	**C**
		R	40	35	D	N/A	N/A	N/A	130	389	F	N/A	N/A	**N/A**
	Total Intersection		1065	26	C	960	33	C	1325	124	F	1285	52	**D**

Intersection	Approach / Movement		AM Peak 2023 Without CRR Demand (vph)	AM Peak 2023 Without CRR Avg Delay (sec)	AM Peak 2023 Without CRR LOS	AM Peak 2023 With CRR Demand (vph)	AM Peak 2023 With CRR Avg Delay (sec)	AM Peak 2023 With CRR LOS	PM Peak 2023 Without CRR Demand (vph)	PM Peak 2023 Without CRR Avg Delay (sec)	PM Peak 2023 Without CRR LOS	PM Peak 2023 With CRR Demand (vph)	PM Peak 2023 With CRR Avg Delay (sec)	PM Peak 2023 With CRR LOS
North Quay / Makerston Street	North Quay (West) (Northern approach)	L	20	6	A	40	6	A	80	4	A	50	6	**A**
		T	1985	10	A	1970	8	A	1555	7	A	1625	8	**A**
	North Quay (West) (Centre approach)	T	905	14	B	1045	15	B	675	7	A	800	9	**A**
	North Quay (West) (Southern approach)	T	2415	20	C	2675	18	B	2315	13	B	2295	11	**B**
	Makerston Street (North)	L	175	76	E	150	59	E	175	75	E	205	67	**E**
	Total Intersection		5500	17	B	5880	15	B	4800	12	B	4975	12	**B**
North Quay / Herschel Street	North Quay (West) (Northern approach)	L	80	7	A	0	0	A	50	7	A	0	0	**A**
		T	3015	6	A	3175	4	A	2355	5	A	2625	4	**A**

Intersection	Approach / Movement		AM Peak						PM Peak					
			2023 Without CRR			2023 With CRR			2023 Without CRR			2023 With CRR		
			Demand (vph)	Avg Delay (sec)	LOS	Demand (vph)	Avg Delay (sec)	LOS	Demand (vph)	Avg Delay (sec)	LOS	Demand (vph)	Avg Delay (sec)	LOS
	North Quay (West) (Southern approach)	T	2435	6	A	2685	5	A	2320	5	A	2290	4	**A**
	Herschel St (North)	**L**	**395**	**49**	**D**	**235**	**49**	**D**	**330**	**49**	**D**	**365**	**50**	D
	Riverside Expressway (South)	T	210	56	E	175	52	D	155	54	D	95	50	**D**
	Total Intersection		**6135**	**10**	**B**	**6270**	**8**	**A**	**5210**	**10**	**A**	**5375**	**8**	**A**

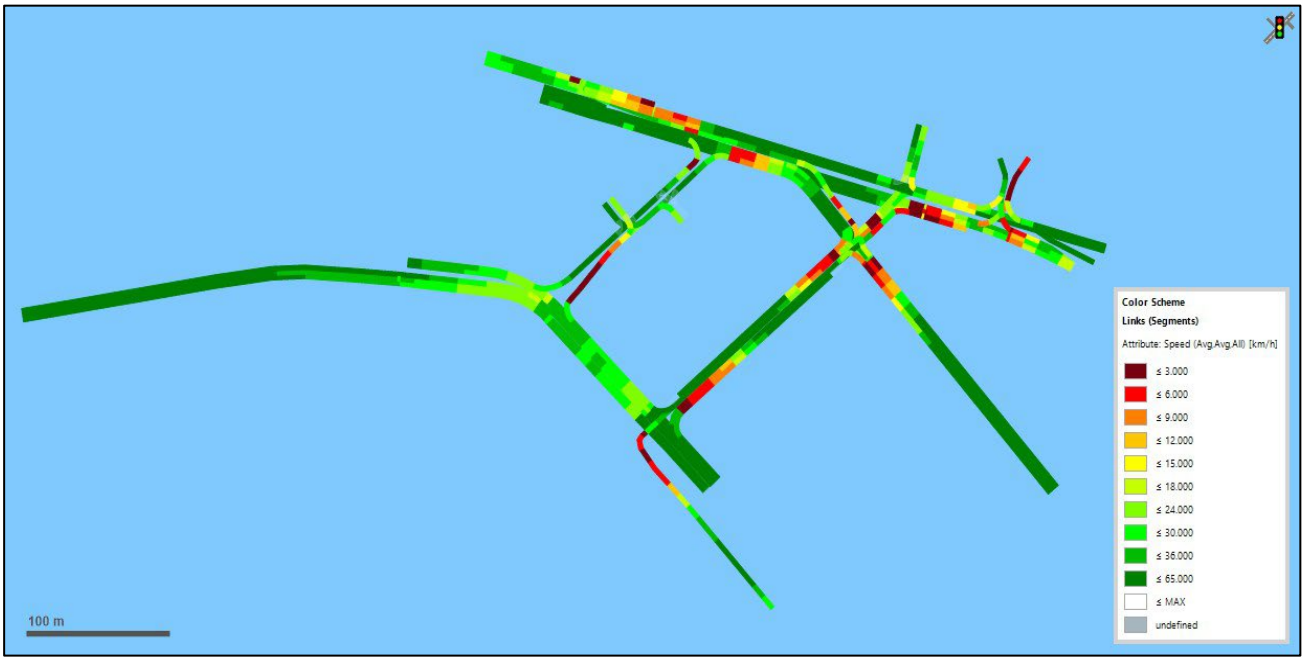


Figure 42 2023 Without CRR Average Speed – AM Peak

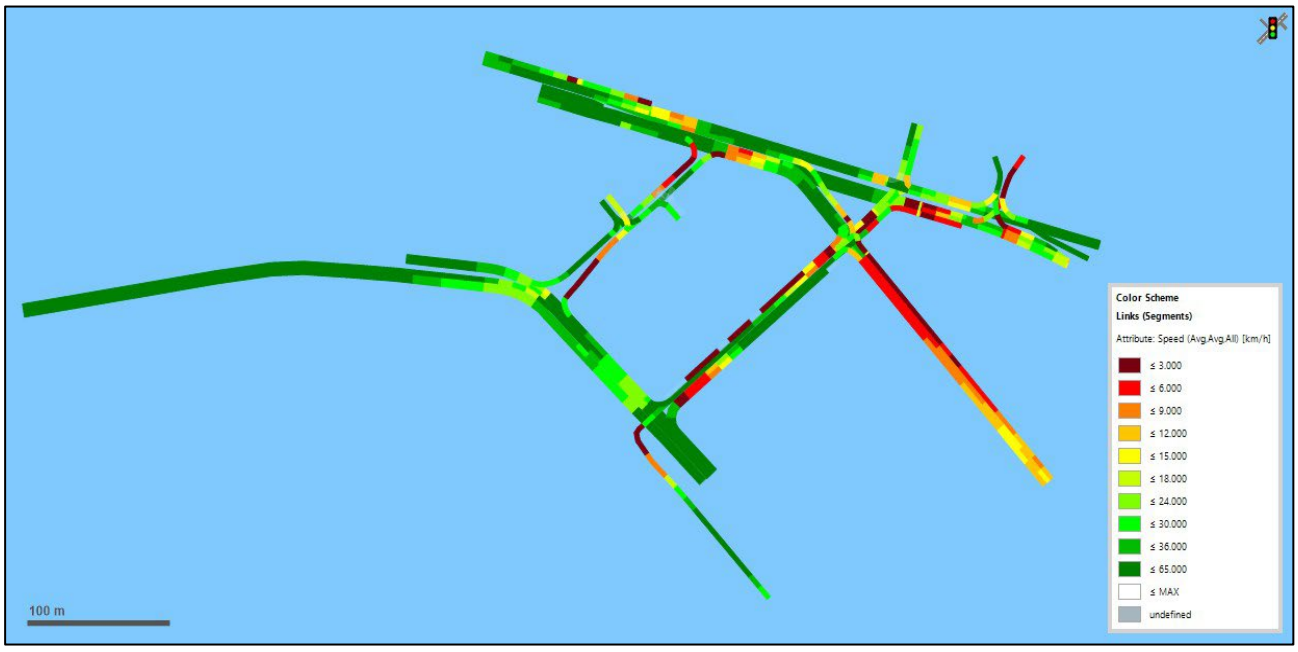


Figure 43 2023 Without CRR Average Speed – PM Peak

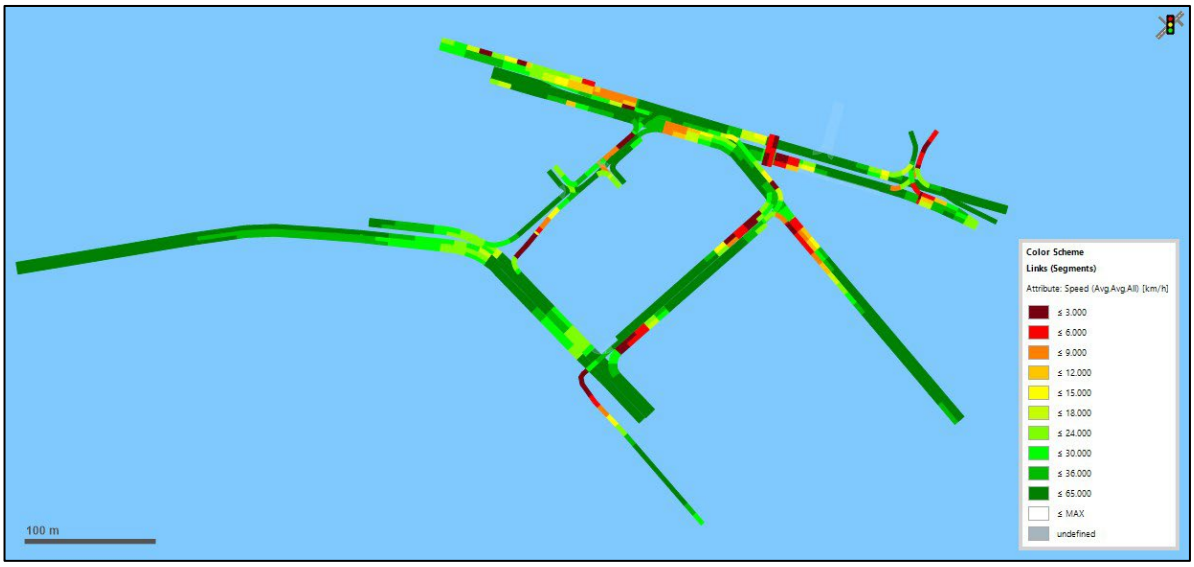


Figure 44 2023 With CRR Average Speed – AM Peak

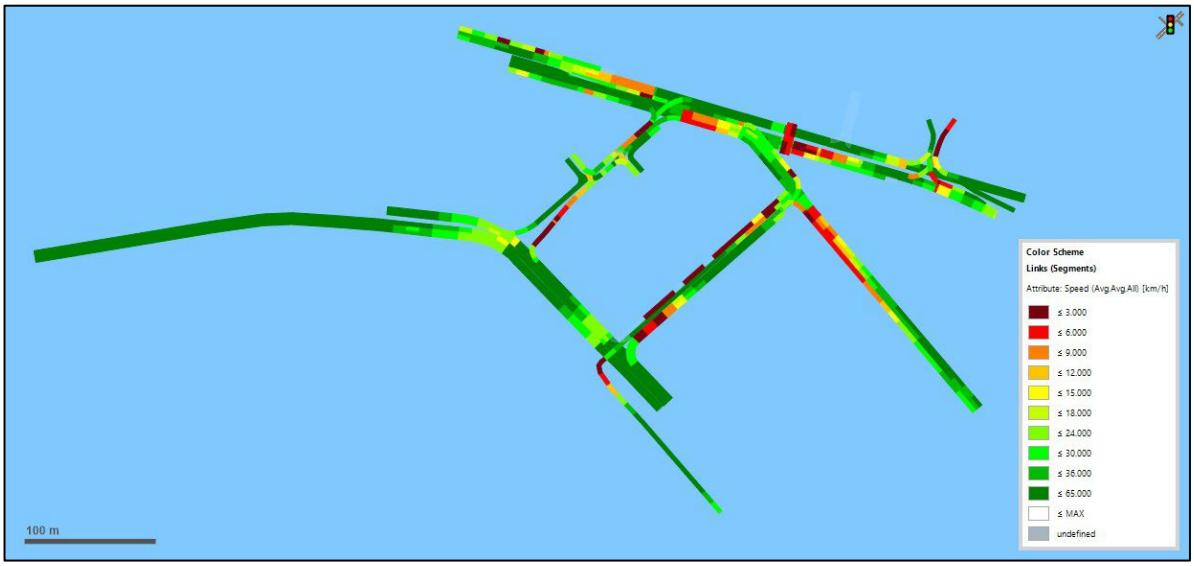


Figure 45 2023 With CRR Average Speed – PM Peak

Operational Impact – 2031 Traffic Conditions

The operational indicators of the intersections located proximate to the Roma Street station precinct for the future design horizon of 2031 are presented in table 7**Error! Reference source not found.** and Figure 47 to Figure 50.

The results indicate the following:

Roma Street / Makerston Street Intersection

- the Roma Street / Makerston Street intersection expected to operate at a LOS consistent with, or at times better than the 'without CRR' scenario. This equates to a LOS B or better in both the AM and PM peak periods. (LOS B with CRR, LOS C without CRR AM Peak periods and LOS B with CRR, LOS B without CRR PM Peak periods).
- this is within acceptable bounds as indicated in the Brisbane City Plan 2014.

George Street / Herschel Street Intersection

- the George Street / Herschel Street intersection is expected to operate at a LOS C in the AM peak period and LOS E in the PM peak period, with queuing improved in the PM peak from the "without CRR" scenario. (LOS C with CRR, LOS C without CRR in AM Peak periods and LOS E with CRR, LOS F without CRR in FM Peak periods).
- as with the 2023 assessment scenario, the expected performance "with the changes in this proposed RfPC" is at the same level or improved on that of the corresponding 'without the changes in this proposed RfPC' scenarios.
- while the intersection operations are considered to be failing, operations are improved against the "without CRR" scenario and the Roma Street station precinct falls within the "highly constrained" area of Brisbane and therefore some relaxation to the LOS targets apply.
- this change is still an improvement on what would be encountered with a 'without CRR" scenario.
- review of the model operations does not indicate any significant queueing on the Herschel Street approach, with queues expected to be dissipated with each signal cycle.

North Quay / Makerston Street

- the North Quay / Makerston Street intersections are expected to operate at a LOS consistent with, or at times better than the 'without CRR' scenario. This equates to a LOS B or better in both the AM and PM peak periods. (LOS B with CRR, LOS C without CRR AM Peak periods and LOS B with CRR, LOS A without CRR PM Peak periods).
- this is within acceptable bounds as indicated in the Brisbane City Plan 2014.

North Quay / Herschel Street

- the North Quay / Herschel Street intersections are expected to operate at a LOS consistent with, or at times better than the 'without CRR' scenario. This equates to a LOS A in both the AM and PM peak periods. (LOS B with CRR, LOS C without CRR AM Peak periods and LOS A with CRR, LOS B without CRR PM Peak periods).
- the heatmap indicates traffic at this intersection is expected to operate under free flow traffic conditions during the AM and PM Peak.

Table 7 Operational Impact – 2031 Traffic Conditions

Intersection	Approach / Movement		AM Peak 2031 Without CRR Demand (vph)	AM Peak 2031 Without CRR Avg Delay (sec)	AM Peak 2031 Without CRR LOS	AM Peak 2031 With CRR Demand (vph)	AM Peak 2031 With CRR Avg Delay (sec)	AM Peak 2031 With CRR LOS	PM Peak 2031 Without CRR Demand (vph)	PM Peak 2031 Without CRR Avg Delay (sec)	PM Peak 2031 Without CRR LOS	PM Peak 2031 With CRR Demand (vph)	PM Peak 2031 With CRR Avg Delay (sec)	PM Peak 2031 With CRR LOS
Roma Street / Makerston Street	Roma Street (West)	T	1375	32	C	1335	26	C	1020	12	B	1060	23	**C**
	Roma Street (East)	L	20	33	C	190	7	A	30	53	D	105	43	**D**
		T	930	14	B	930	9	A	1390	10	A	1355	13	**B**
	Makerston Street (South)	L	20	35	D	100	35	C	25	64	E	120	37	**D**
		R	N/A	N/A	N/A	25	39	D	N/A	N/A	N/A	20	42	**D**
	Total Intersection		2345	25	C	2580	19	B	2465	12	**B**	2660	19	**B**
Roma Street / George Street	Roma Street (West)	T	N/A	N/A	N/A	1335	4	A	N/A	N/A	N/A	1065	1	**A**
	Roma Street (East)	T	N/A	N/A	N/A	225	35	D	N/A	N/A	N/A	430	44	**D**
	George Street (South)	L	N/A	N/A	N/A	895	3	A	N/A	N/A	N/A	1035	3	**A**

Intersection	Approach / Movement		AM Peak 2031 Without CRR Demand (vph)	AM Peak 2031 Without CRR Avg Delay (sec)	AM Peak 2031 Without CRR LOS	AM Peak 2031 With CRR Demand (vph)	AM Peak 2031 With CRR Avg Delay (sec)	AM Peak 2031 With CRR LOS	PM Peak 2031 Without CRR Demand (vph)	PM Peak 2031 Without CRR Avg Delay (sec)	PM Peak 2031 Without CRR LOS	PM Peak 2031 With CRR Demand (vph)	PM Peak 2031 With CRR Avg Delay (sec)	PM Peak 2031 With CRR LOS
	Total Intersection		N/A	N/A	N/A	2455	7	A	N/A	N/A	N/A	2530	9	**A**
Roma Street / Herschel Street	Roma Street (West)	L	0	0	A	N/A	N/A	N/A	0	0	A	N/A	N/A	**N/A**
		T	1375	2	A	N/A	N/A	N/A	1020	3	A	N/A	N/A	**N/A**
	Roma Street (East)	L	245	36	D	N/A	N/A	N/A	180	41	D	N/A	N/A	**N/A**
		T	150	49	D	N/A	N/A	N/A	335	63	E	N/A	N/A	**N/A**
	Herschel Street (South)	T	10	62	E	N/A	N/A	N/A	10	47	D	N/A	N/A	**N/A**
		R	55	50	D	N/A	N/A	N/A	140	45	D	N/A	N/A	**N/A**
	Total Intersection		1835	12	B	N/A	N/A	N/A	1685	23	C	N/A	N/A	**N/A**
	Herschel Street (Southwest)	L	170	27	C	170	56	E	160	29	C	105	65	**E**
		T	25	54	D	N/A	N/A	N/A	10	49	D	N/A	N/A	**N/A**
		L	150	30	C	205	45	D	255	99	F	345	126	**F**

Intersection	Approach / Movement		AM Peak 2031 Without CRR Demand (vph)	AM Peak 2031 Without CRR Avg Delay (sec)	AM Peak 2031 Without CRR LOS	AM Peak 2031 With CRR Demand (vph)	AM Peak 2031 With CRR Avg Delay (sec)	AM Peak 2031 With CRR LOS	PM Peak 2031 Without CRR Demand (vph)	PM Peak 2031 Without CRR Avg Delay (sec)	PM Peak 2031 Without CRR LOS	PM Peak 2031 With CRR Demand (vph)	PM Peak 2031 With CRR Avg Delay (sec)	PM Peak 2031 With CRR LOS
George Street / Herschel Street	George Street (Southeast)	T	625	20	B	725	23	C	930	95	F	925	28	**C**
		R	40	34	C	N/A	N/A	N/A	140	235	F	N/A	N/A	**N/A**
	Total Intersection		1010	24	C	1100	32	C	1495	101	F	1375	55	**E**
North Quay / Makerston Street	North Quay (West) (Northern approach)	L	20	8	A	45	6	A	25	3	A	80	4	**A**
		T	1975	10	A	2010	8	A	1460	6	A	1270	7	**A**
	North Quay (West) (Centre approach)	T	1090	23	C	1250	21	C	720	7	A	810	9	**A**
	North Quay (West) (Southern approach)	T	2540	30	C	2570	21	C	2100	10	A	2365	11	**B**
	Makerston Street (North)	L	155	70	E	205	71	E	110	61	E	155	57	**E**

Intersection	Approach / Movement		AM Peak 2031 Without CRR Demand (vph)	AM Peak 2031 Without CRR Avg Delay (sec)	AM Peak 2031 Without CRR LOS	AM Peak 2031 With CRR Demand (vph)	AM Peak 2031 With CRR Avg Delay (sec)	AM Peak 2031 With CRR LOS	PM Peak 2031 Without CRR Demand (vph)	PM Peak 2031 Without CRR Avg Delay (sec)	PM Peak 2031 Without CRR LOS	PM Peak 2031 With CRR Demand (vph)	PM Peak 2031 With CRR Avg Delay (sec)	PM Peak 2031 With CRR LOS
	Total Intersection		5780	23	C	6080	18	**B**	4415	9	A	4680	11	**B**
North Quay / Herschel Street	North Quay (West) (Northern approach)	L	25	8	A	0	0	A	10	6	A	0	0	**A**
		T	3220	6	A	3475	5	A	2285	5	A	2235	4	**A**
	North Quay (West) (Southern approach)	T	2555	6	A	2580	5	A	2100	5	A	2365	4	A
	Herschel St (North)	L	410	50	D	220	49	D	455	53	D	355	50	D
	Riverside Expressway (South)	T	170	52	**D**	170	54	**D**	160	54	**D**	110	50	D
	Total Intersection		6380	10	**A**	6445	7	**A**	5010	11	**B**	5065	8	**A**

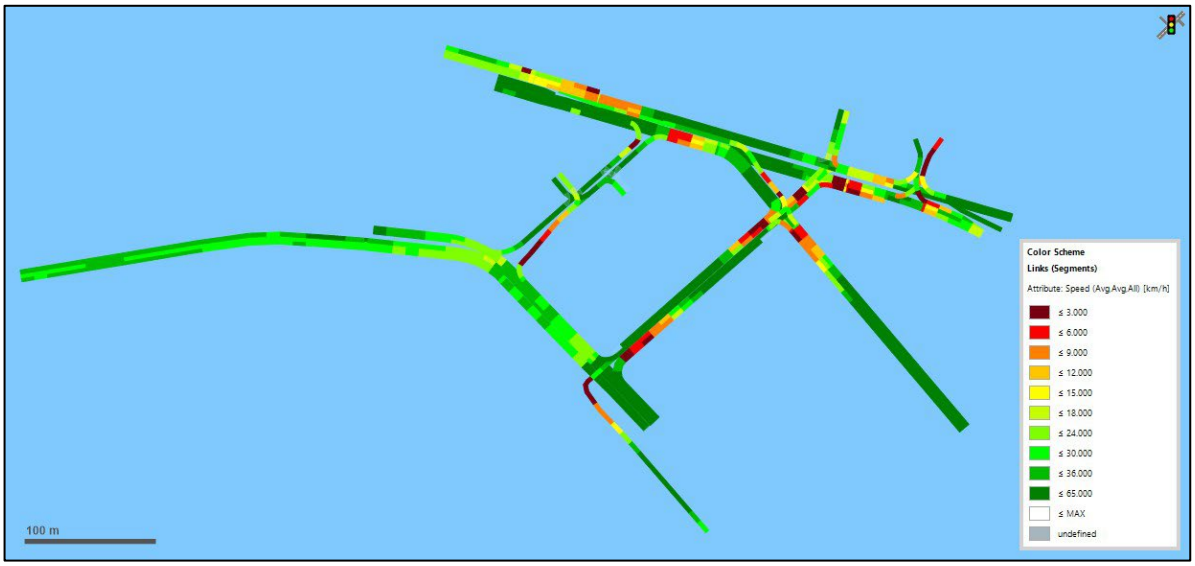


Figure 46 2031 Without CRR Average Speed – AM Peak

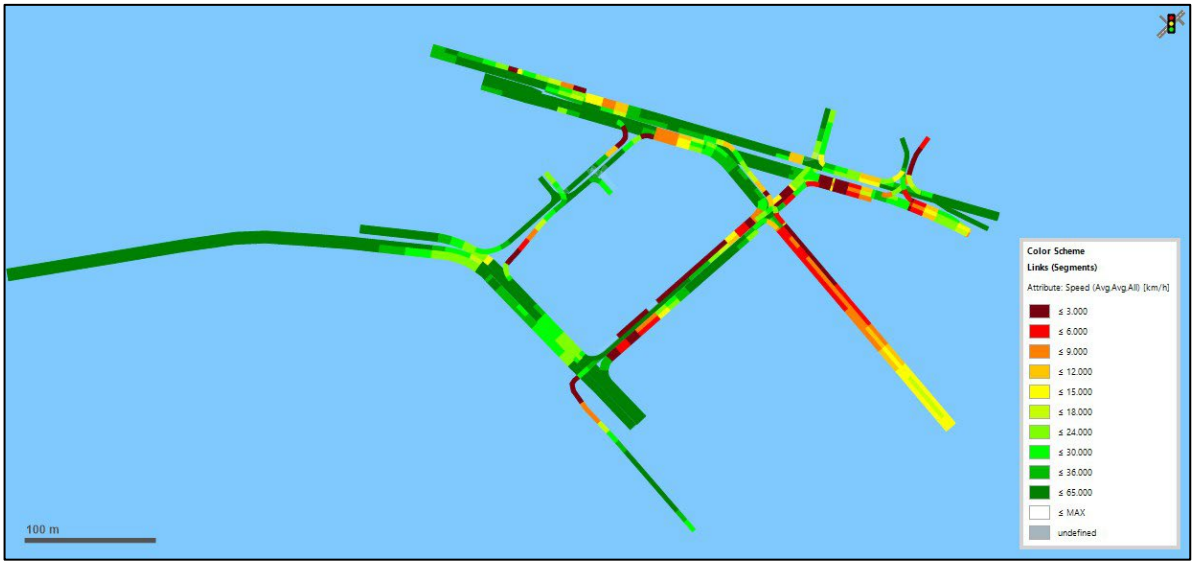


Figure 47 2031 Without CRR Average Speed – PM Peak

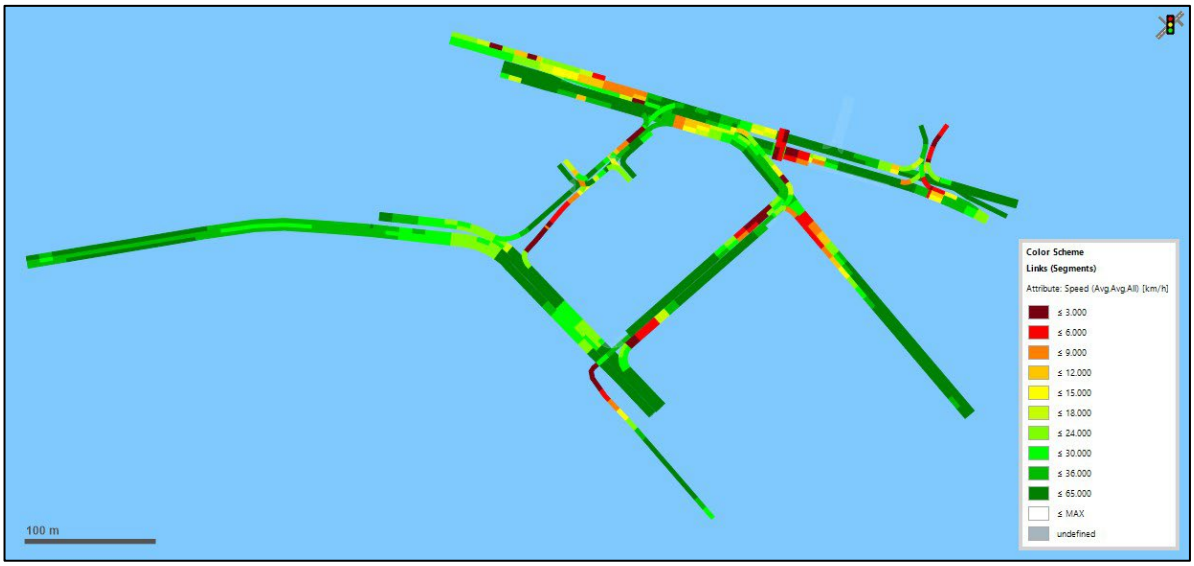


Figure 48 2031 With CRR Average Speed – AM Peak

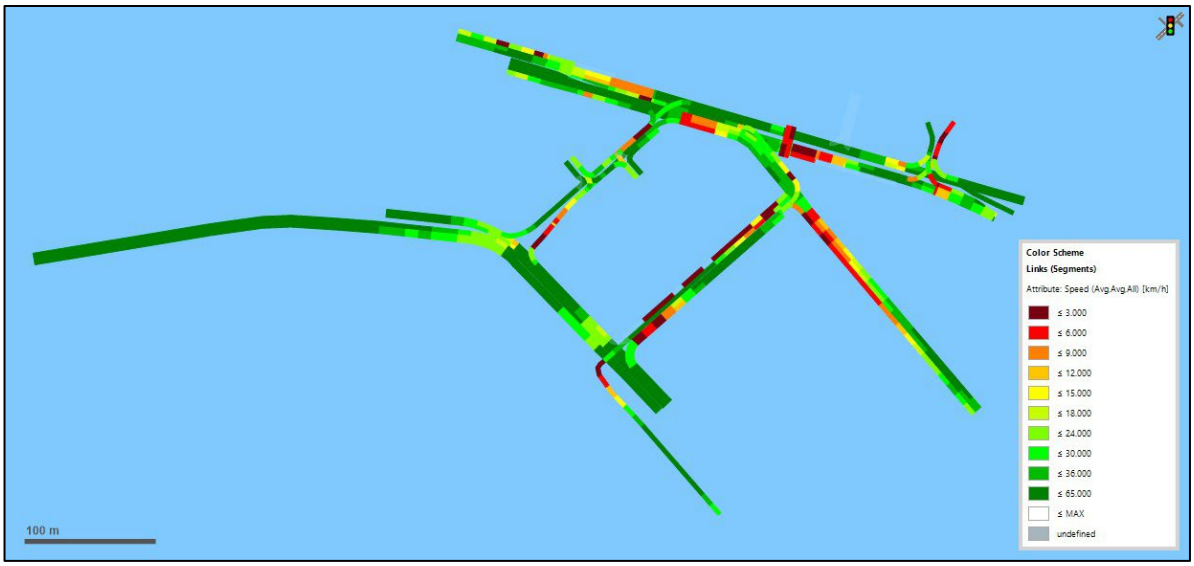


Figure 49 2031 With CRR Average Speed – PM Peak

Traffic Impact Summary

Whilst there is expected to be some measure of traffic redistribution within the Roma Street station precinct as a result of the proposed road network changes, and consequently increased traffic flow on routes such as Makerston Street and George Street, forecast intersection performance at the key intersections proximate to Roma Street station are largely expected to remain within acceptable service thresholds as defined in BCC's City Plan 2014. BCC identifies a target LOS C for off-peak and peak conditions, except where roads are highly constrained as identified in its online mapping tool - *Transport Network Desired Standards of Service – Mode Share Targets (Map C3)*. The Roma Street station precinct falls within the "highly constrained" area and therefore some relaxation to the LOS target will apply.

Whilst the majority of scenarios relating to each assessed intersection 'with CRR' (as per this proposed RfPC) is expected to remain at LOS C or better at the forecast design horizons of 2023 and 2031, the George Street / Herschel Street intersection is expected to operate at an overall LOS E for the critical PM Peak at the 2031 design horizon. Though outside of the operational target of LOS C, it is noted that the forecast intersection performance at the George Street / Herschel Street intersection is expected to improve following the proposed network and demand changes associated "With CRR". In the "Without CRR" scenario, an overall LOS F is expected for the critical PM Peak at the 2031 design horizon. Therefore, though outside of the operational target of LOS C, the forecast operational performance is considered acceptable in the context that intersection performance is expected to improve, and the Roma Street station is located within a busy inner-city environment within the "highly constrained" area of Brisbane, where some relaxation to the LOS target would apply.

It is further noted that though some individual movements fall below the target LOS criteria, these movements generally service lower order traffic movements and are considered acceptable on the balance of total traffic flows.

Review of the traffic operations for each assessed scenario indicate that the impacts of the proposed CRR road network and demand changes are expected to be managed through revised signal phasing, timing and coordination arrangements.

Conclusion

Based on the analysis and discussions presented within this report, the following conclusions are made:

1. The TIA has been conducted in accordance with discussions held with BCC and subsequent written correspondence. It aligns with the requirements as generally set out within BCC's TAPS Policy.
2. A local area validation exercise was undertaken for the Roma Street precinct on the BCC supplied base (2018) SATURN models which indicated that the underlying SATURN model was reasonably well calibrated in the area of interest, thereby indicating a good degree of confidence in the application of the SATURN models (as provided by BCC) within this TIA.
3. A base year model has been developed from the BCC provided VISSIM files provided for use in this TIA. This model has been suitably calibrated against SCATS detector data and achieves conformance with required calibration targets as set out in the RMS Traffic Modelling Guidelines.
4. SATURN modelling undertaken for the 'with CRR' scenario has indicated that redistribution of vehicle traffic will likely occur as a result of the proposed road network modifications proximate to the Roma Street station precinct. It is expected that more traffic will utilize Makerston Street and George Street to access alternative routes.
5. The operational assessment of key intersections surrounding the Roma Street station precinct at the 2026 and 2036 (presented as 2023 and 2031 in this report) design horizons has indicated that the intersections are expected to operate within acceptable service thresholds consistent with or marginally improved compared to the 'without' CRR Project. Impacts of the change proposed as part of this RfPC to the road network and demand changes are demonstrated to be managed through revised signal phasing, timing and coordination arrangements as examined in the TIA.

Given the conclusions made above, changes proposed in this RfPC and as assessed within this report are considered acceptable.

Cross River Rail Environmental Impact Statement – Volume 3 Attachment B

Request for Project Change-14

Changes to the Project and changes to the imposed conditions

Technical Report: Construction Traffic and Transport

Date: *April 2024*

Author: *Cross River Rail Delivery Authority*

Introduction

The 2011 Environmental Impact Statement (EIS) for Cross River Rail (CRR) contained a construction site to the east and west of Parkland Boulevard / Parkland Crescent, east of (the former) Hotel Jen. The subsequently approved 2017 Request for Project Change (RfPC-1) realigned the station and CRR route, relocating and expanding the construction site to the north of Parkland Crescent and Hotel Jen, it also proposed removal of the short section of Herschel Street between George Street and Roma Street. RfPC-2 (June 2018) addressed the temporary solution for the relocation of the Roma Street Coach Terminal while RfPC-3 (November 2018) considered the demolition of the (former) Brisbane Transit Centre (BTC) (East Tower) and Hotel Jen. As part of the 2019 RfPC-4, it was proposed to underground the Inner Northern Busway (INB) and subsequently realign Parkland Boulevard with the Roma Street / Herschel Street intersection.

The subject of RfPC-14 is to consider the closure of Herschel Street between George Street and Roma Street and construction of a pocket park (refer to Figure 50), as well as scope confirmation retaining INB in current location (above ground), and Parkland Boulevard access remains as existing. The construction of the pocket park portion of RfPC-14 will occur over approximately a four-month period with pedestrian and cycling access proposed to be maintained throughout this period.

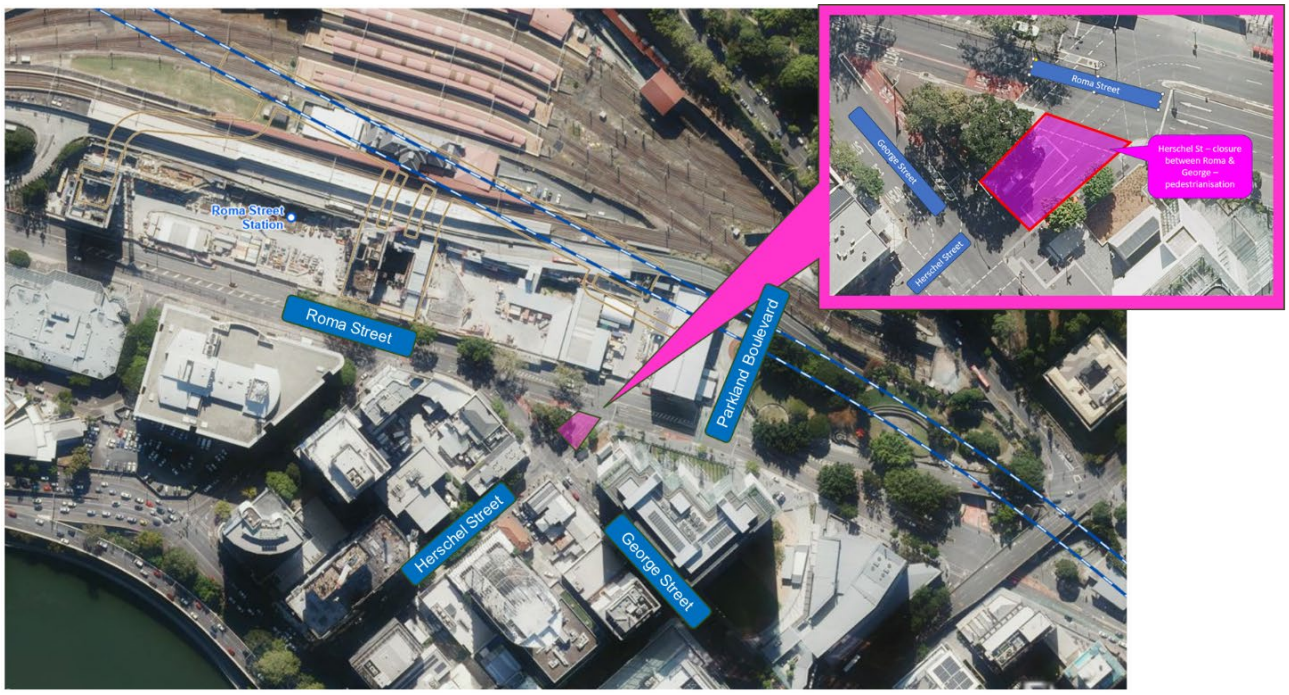


Figure 50 RfPC-14 proposed Herschel Street closure and pocket park

The purpose of this technical note is to review the proposed construction staging and traffic management for the pocket park. This technical note pertains specifically to the transport (including pedestrians, active transport and bus movements) impacts to Roma Street and the surrounds during construction of the pocket park.

CRR Project Approved Work and Impacts

The design progression of the sites relevant to this project is summarised in Table 1. Given the purpose of this review, a comparison of the impact of RfPC-14 against the previous reviews / change requests has been carried out.

Table 1 CRR Progression

Location	2011 EIS	2017 RfPC1	2018 RfPC-3	2019 RfPC-4	2024 RfPC-14
Roma Street Station	Redeveloped but remains in the current location	Relocated site approximately 150m to the current BTC site.	As per 2017 RfPC-1	As per 2017 RfPC-1	As per 2017 RfPC-1 Plus, design update to locate taxi, kiss 'n' ride, rideshare facilities at Makerston Street
Brisbane Transit Centre (including Coach Terminal)	No changes proposed	Demolished as part of Roma Street relocation. Required relocation of coach terminal (before demolition) and removal of ~600 car parking spaces.	As per 2017 RfPC-1 but included demolition of the BTC (East Tower) and Hotel Jen and removal of ~190 car parking spaces.	As per 2018 RfPC-3	As per 2018 RfPC-3
Parkland Crescent Car Park	No changes proposed (however worksite proposed on the eastern end of the crescent)	Construction laydown area	As per 2018 RfPC-2 (Proposed relocated coach terminal site)	As per 2018 RfPC-2	As per 2018 RfPC-2
Parkland Boulevard	Permanent closure of roundabout immediately north of Roma Street. Alternative route via College Road / Gregory Terrace intersection	No proposed changes to the roundabout or upper level.	No road closure required	Re-alignment with Herschel Street / Roma Street intersection	Leave in pre-existing configuration - No changes proposed
Inner Northern Busway	No changes proposed	No changes proposed	No changes proposed	Lowered underground	Leave in pre-existing configuration - No changes proposed

Location	2011 EIS	2017 RfPC1	2018 RfPC-3	2019 RfPC-4	2024 RfPC-14
Herschel Street	No changes proposed	Closed between George Street and Roma Street	As per 2017 RfPC-1	No changes proposed	Generally consistent as per 2017 RfPC-1

Note – reference made to RfPC-3 traffic assessment technical note summary for the above table and updated with current proposed RfPC-14.

Material Changes to Impacts

The changes to the works to be conducted, align with previous RfPC-1 and decision to keep the Inner Northern Busway (INB) at Roma Street on its current alignment, as noted below:

- Closure of a short (approx. 30m) two-way section of Herschel Street between George Street and Roma Street to use by vehicles;
- Construction of a pedestrian and shared pathway/pocket park in the location of Herschel Street;
- Removal of the proposed relocation of the INB underground and realign Parkland Boulevard from the description of the Project; and
- Minor alterations to the existing traffic configuration and turning lanes and kerbside allocations on Makerston Street.

Construction Staging

A Transport Impact Assessment (TIA) has been prepared by the project for these works. This assesses the proposed changes to the road network and intersections within the Roma Street station precinct (as outlined under heading **Material Changes to Impacts**).

Additionally, a preliminary construction staging plan has been developed by projects delivery partner for the pocket park (dated 07/12/2023).

The sections of all documents referred to throughout this Technical Note have been included in Attachment A.

Pedestrian facilities

Pedestrian access is to remain throughout all stages of the construction works.

As noted above, only a preliminary design was available at the time of the assessment, with detailed design not yet finalised. As such an assessment of width provisions has not been undertaken or noted as ‘out of scope’ of the TIA, which focuses on operational aspects (i.e., Attachment A).

Confirmation of the adequacy of path widths should be undertaken when more detailed plans are made available in consultation with Brisbane City Council. This will align with Brisbane City Council requirements of minimum 2.5m pathway widths during construction activities and management of people cycling (including e-wheeling and PMD users) and no restrictions to access. As per the current approved Environmental Management Framework (Section 2.1 of the Volume 1) this should be captured in the revised relevant site-specific Construction Traffic Management Plan.

Cycling facilities

As highlighted in the construction staging plan, during construction, access between George Street and Roma Street along the subject section of Herschel Street is proposed to be maintained. It is noted that temporary ramps will be installed (as part of site establishment) to bring people cycling up onto the footpath from Herschel Street, as shown in Figure 51. This staging and its associated design is still under development with the solution for how people on bikes approaching from Herschel Street safely access the ramps still requiring resolution (i.e., assuming access for confident riders on-road from Bicentennial Bikeway, and from Roma Street towards George/Herschel Street).

Assessment of the Roma Street precinct, particularly the George Street / Herschel Street intersection, has not been undertaken for the construction phase. Therefore, it has not yet been determined how the intersection is intended to operate during construction (i.e., altered phasing of the signalised intersection, existing phasing of the signalised intersection or unsignalised priority movements). As shown in Figure 52, cyclists (heading towards Roma Street) are required to cross diagonally across George Street to access the bike ramps, which without understanding the intended operation of the intersection increases the potential for collisions between people on bikes (as Vulnerable Road Users) and all vehicles (including buses).

These aspects will be resolved in consultation with relevant stakeholders (e.g., Brisbane City Council), with the relevant solution and any required approvals captured in the revised site-specific Construction Traffic Management Plan (CTMP).

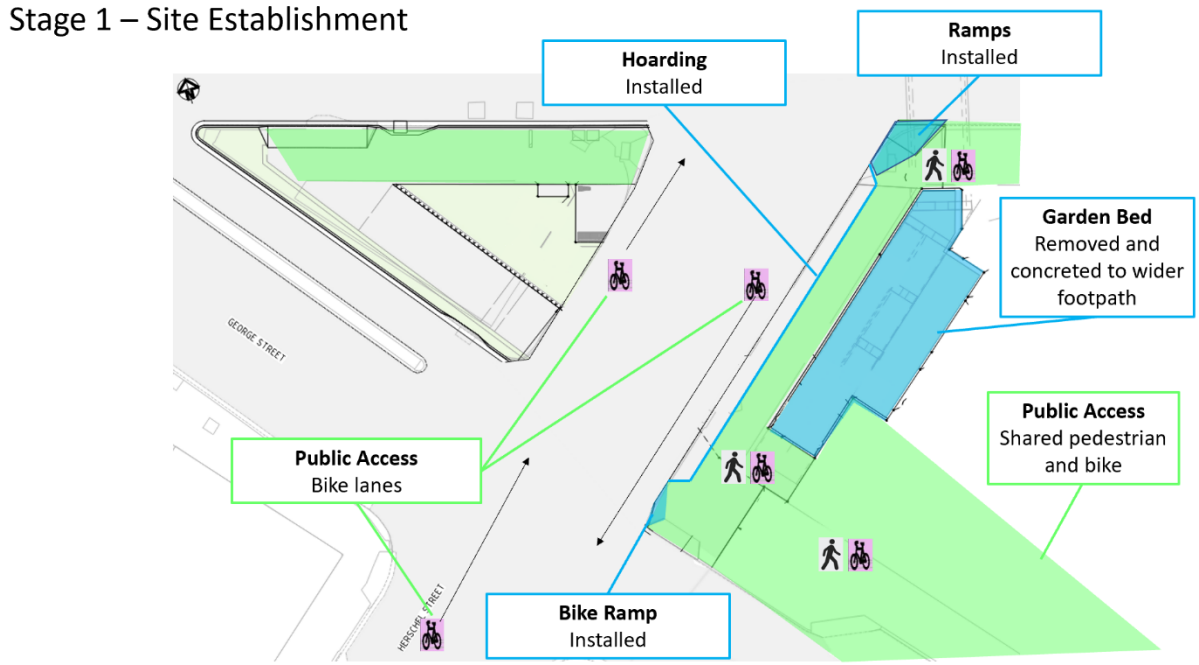


Figure 51 Construction site establishment stage (Source: CBGU, December 2023)

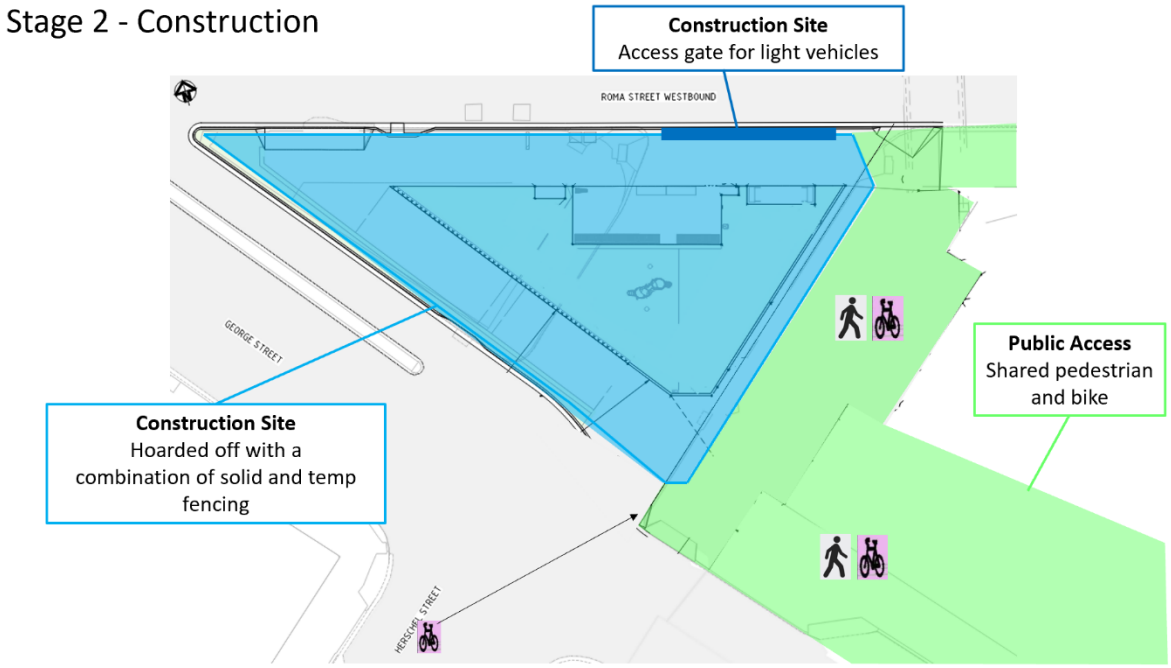


Figure 52 Stage 2 construction (Source: CBGU, December 2023)

Bus Facilities

The existing right turn from George Street into Herschel Street is proposed to be maintained both during and post construction. Dependent on the intended operations of the intersection, the right turning bus would impact both through and left turning vehicles on George Street as well as the cycling movement from Herschel Street discussed under heading **Cycling Facilities**.

The southern most lane of Roma Street (i.e., the lane abutting the construction area) is a designated bus lane. Construction vehicles are proposed to utilise this lane for loading and unloading or manoeuvring into and out of the construction site. There are currently up to 13 bus routes, including one (1) night route, that utilise this bus lane to access bus stops on / along Roma Street.

The site specific CTMP will be revised to consider and incorporate agreed solutions relating to manage the proposed bus movements and bus management during construction to manage and mitigate these impacts. This will be undertaken through existing ongoing consultation with the relevant stakeholders (e.g., Brisbane City Council and Translink).

Construction Vehicle Facilities

The closure of Herschel Street north of George Street under RfPC-14 involves demolition of the existing road surface and remediation of the surface into a pocket park complete with landscaping, and pathways. Construction activities are likely to include demolition of existing pavement, concreting, footpath resurfacing, and rehabilitation of the pocket park extents.

Three options for construction vehicle access to the worksite have been proposed, as shown in Figure 53. Each of these options requires (temporary) lane closures on Roma Street. No assessment of the impact of each option on the road network has been undertaken / documented for review. The site specific CTMP will be revised to consider and incorporate agreed solutions relating new Traffic Guidance Scheme/s (TGS's) for the chosen option, demonstrating the required traffic management for construction vehicle movements.

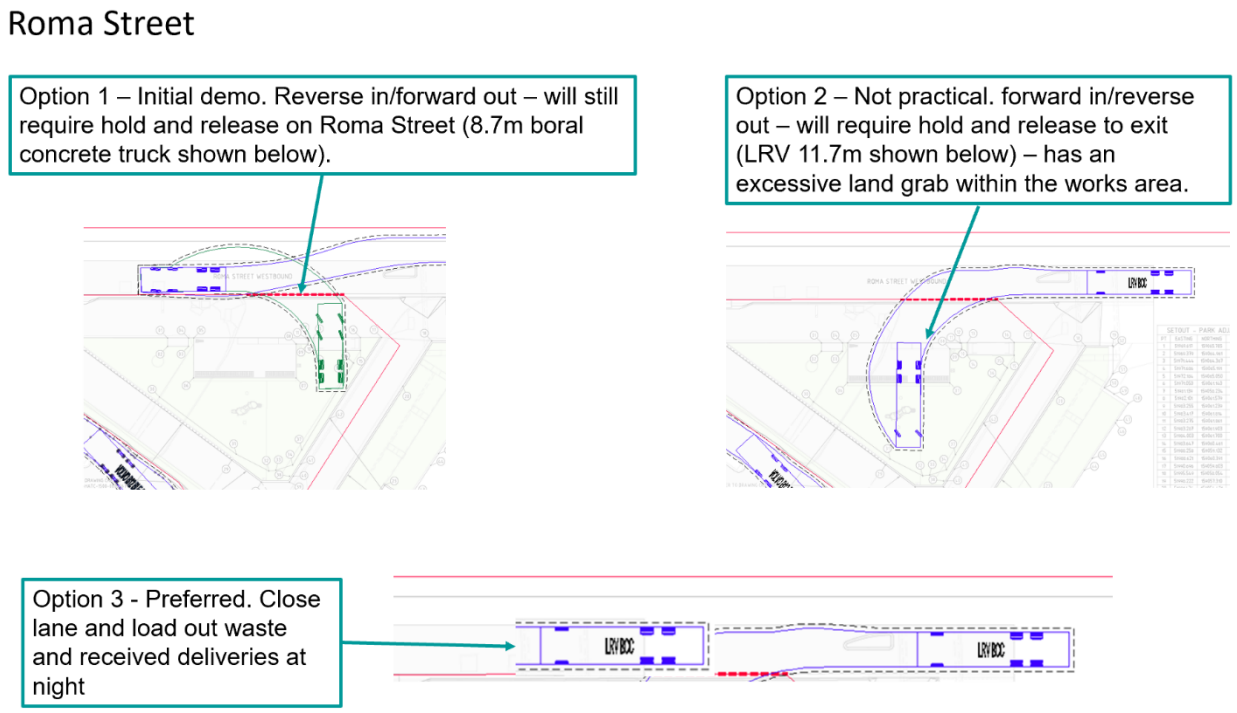


Figure 53 Indicative Construction vehicle access options (Source: CBGU, December 2023)

Haulage routes were approved as part of the 2011 EIS, shown in Figure 54. These routes show inbound haulage vehicles accessing the Roma Street construction area eastbound along Roma Street. The construction zone for the pocket park is located on the southern side of Roma Street and Figure 53 indicates construction vehicles will approach the site in the westbound direction. It is understood that the existing haulage routes will be used, with inbound haulage vehicles able to turn around within the main construction site before approaching the pocket park construction site. No new haulage routes are proposed or required.

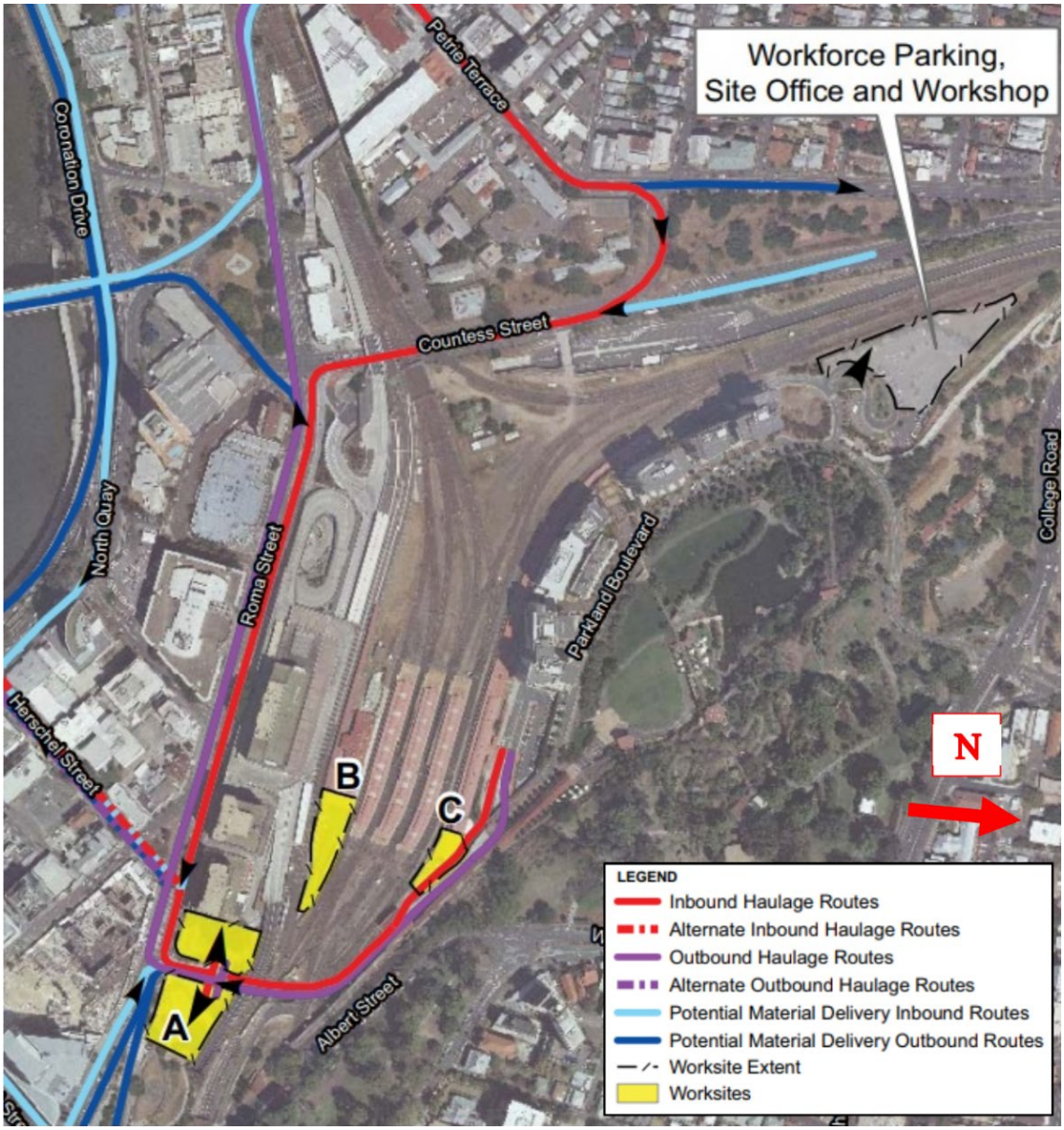


Figure 54 Proposed haulage routes as per 2011 EIS

Table 2 outlines the available construction impact information from previous RfPC and compares the information for RfPC-14. RfPC-1 included closure of Herschel Street and hence for the purposes of this assessment it has been assumed similar proposed works will occur under RfPC-14. Construction traffic previously approved for demolition of the BTC and Hotel Jen (simultaneously) was less than approved construction movements from the 2011 EIS. Which included the demolition of the pedestrian footbridge over Roma Street (in the location of the site for the pocket park). While details on construction vehicle movements are yet confirmed for full inclusion RfPC-14 at this stage. For the purposes of this assessment given the works of RfPC-14 almost identical to those within RfPC-1, and that the proposed works are expected to be minor. It is expected that fewer vehicles, as per what was presented in RfPC -1 will access the site than would be required to address the demolition of the former BTC and Hotel Jen (RfPC-3).

Hence, it can be assumed that the six vehicles per hour for RfPC-1 included any vehicles associated with the demolition and construction of the pocket park.

Noting that smaller vehicles may be used for construction activities at the site, as shown in Figure 53, it is possible that more vehicles may be required than initially assumed for the pocket park construction as per RfPC-1. Assuming a maximum truck load of 22.5 tonnes per truck, consistent with the National Heavy Vehicle Regulator (NHVR) requirements for three-axle rigid trucks, and assuming the original construction vehicle assessment used a maximum load of 30 tonnes of material per truck as per RfPC-4, the total RfPC-1 amount of material to be removed would need eight trucks per hour carrying 22.5 tonnes each. This is still less than the original 2011 EIS approval of ten vehicles per hour and less than the RfPC-4 requirement of 15 vehicles per hour. Therefore, the volume of trucks associated with RfPC-14 is not expected to have a significant impact on the road network surrounding the Roma Street Station precinct greater than what has already been assessed.

This assessment therefore concludes that the construction vehicle movements associated with works for the pocket park will be no greater than previously approved activities, and that impacts will be reduced and manageable. It is expected that consultation with key stakeholders and relevant approvals will be captured and documented in a revision to the site-specific CTMP as per the approved Environmental Management Framework.

Table 2 Construction impacts

Location	2011 EIS	2017 RfPC1	2018 RfPC-3	2019 RfPC-4	2024 RfPC-14
Amount of material	161,000 tonnes total	112,000 tonnes total	90,000 tonnes additional to be removed ~269,000 tonnes total	~451,000 tonnes additional to be removed ~720,000 tonnes total	Forecast to the same, if not less, than RfP-1.
Size of trucks	-	-	3-axle semi-trailer carrying up to 24 tonnes	30 tonnes carried per truck	Preferred construction vehicle access option assumes largest vehicle as an LRV 11.7m shown (Source CBGU)
Number of trucks	6 vehicles per hour 10 vehicles per hour (worst case)	6 vehicles per hour	2 vehicles per hour 4 vehicles per hour (worst case)	15 vehicles per hour	Forecast and assumed to be the same, if not less than 2017 RfPC-1 due to 2024 RfPC-14 works being consistent with 2017 RfPC-1
Timeframe	-	-	Demolition completes in 7 months (12 hours / 6 days operation)	-	Demolition and construction to occur over 4 months
Additional comments	-	-	-	Diversion of buses from INB to Roma Street required	-

Conclusions and Recommendations

The following findings and recommendations are made from this review:

- No changes to the current Imposed Conditions have been identified.
- Recommended mitigation measures for changed traffic impacts are consistent with the Evaluated Project requirements as documented in the existing EMF. As such, the OEMP and TSD CEMP is not required to be updated.
- Only amendments will be required to the site-specific Construction Traffic Management Plan including to adjust the description to reflect these RfPC-14 updates.
- Updates to the site-specific Construction Traffic Management Plan will be required to consider and incorporate agreed solutions relating to the agreed and finalised solutions for the:
    - safe operation of the signals at the George Street / Herschel Street intersection and safe movement of pedestrians, cyclists (including PMD / e-wheeling users);
    - safe access / movement at the entry to the shared path from Roma Street for people walking, riding and using PMD/e-wheeling; and
    - safe operation/movement of buses at the George Street / Herschel Street intersection and along Roma Street.
      This will include any relevant Traffic Guidance Schemes (TGS's) that are developed and approved as part of the works.
- The proposed temporary cycling facilities within the site, and operation of the signalised intersections with Roma Street and George Street will be resolved in consultation with relevant stakeholders (e.g., Brisbane City Council). The relevant solution, and any required approvals, will be captured in the site-specific Construction Traffic Management Plan (CTMP), as per the current approved Environmental Management Framework.
- Preparation of a site-specific TGS will be undertaken, as required, to demonstrate the required traffic management during construction vehicle movements on Roma Street.
- No new haulage routes are expected to be required. The construction vehicles will utilise the existing inbound haulage route, turn around within the main construction site and approach the pocket park construction site ere along Roma Street. Outbound direction will utilise the existing haulage routes.
- Confirmation of the volume of material, expected size of vehicle to be used and duration of construction vehicle movements will be managed in accordance with Condition 14 of the Coordinator-Generals Project wide imposed conditions and recommendations. The forecast proposed activities are consistent with, plus are minor and less than previously approved RFPC's. As such, the impacts of the construction vehicles on the surrounding road network will be reduced compared to previous construction impact assessments. The site specific CTMP will be updated upon confirmation of the detail of construction planning and following approvals with key stakeholders including Brisbane City Council.
- Given that construction detailed planning is still underway there is currently no available data for detailed analysis for footpath widths during all construction stages. Nonetheless, the requirements and conditions for road closure will be in consultation and agreement with Brisbane City Council. This will include the revision of the current site specific CTMP will ensure the required minimum of 2.5m pathway widths are maintained/provided as well as management of people cycling (including e-wheeling / PMD) and no restrictions to access (as per the approved Environmental Management Framework).

Cross River Rail Environmental Impact Statement – Volume 3 Attachment C

Request for Project Change-14

Changes to the Project and changes to the imposed conditions

Technical Report: Operations Traffic and Transport

Date: *April 2024*

Author: *Cross River Rail Delivery Authority*

CROSSRIVERRAIL

Queensland Government

Introduction

The 2011 Environmental Impact Statement (EIS) for Cross River Rail (CRR) contained a construction site to the east and west of Parkland Boulevard / Parkland Crescent, east of (former) Hotel Jen. The subsequently approved 2017 Request for Project Change (RfPC-1) realigned the station and CRR route, relocating and expanding the construction site to the north of Parkland Crescent and Hotel Jen, it also proposed removal of the short section of Herschel Street between George Street and Roma Street. RfPC-2 (June 2018) addressed the temporary solution for the relocation of the Roma Street Coach Terminal while RfPC-3 (November 2018) considered the demolition of the Brisbane Transit Centre (BTC) (East Tower) and Hotel Jen. As part of the 2019 RfPC-4, it was proposed to underground the Inner Northern Busway (INB) and subsequently realign Parkland Boulevard with the Roma Street / Herschel Street intersection.

The subject of RfPC-14 is to consider the closure of Herschel Street between George Street and Roma Street and construction of a pocket park (refer to Figure 50), as well as scope confirmation retaining INB in current location (above-ground), and Parkland Boulevard access remains as existing. The construction of the pocket park portion of RfPC-14 will occur over a 4-month period with pedestrian and cycling access (as understood) proposed to be maintained throughout this period.

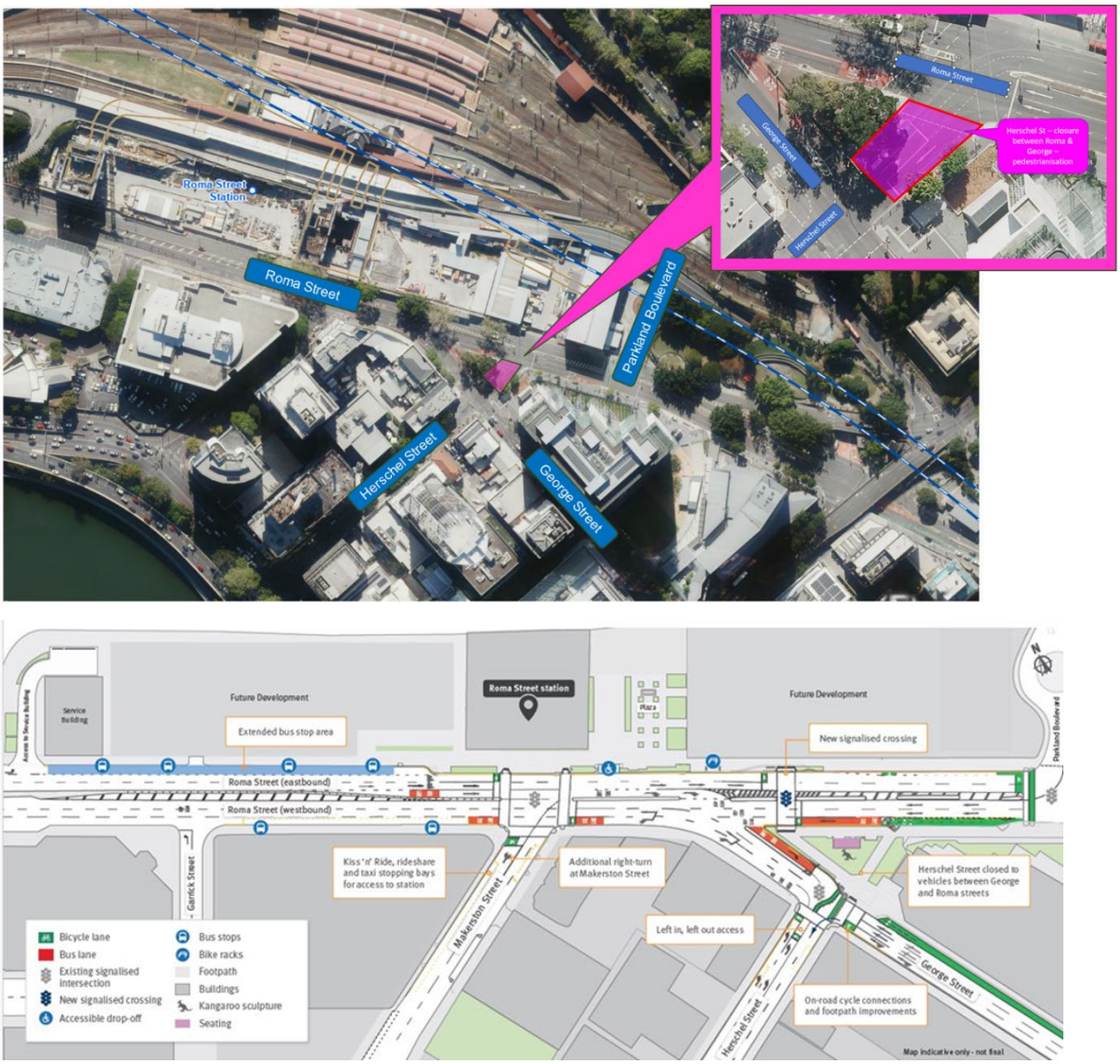


Figure 1 RfPC-14 proposed Herschel Street closure and pocket park

The purpose of this technical note is to review the EIS, previous RfPC's traffic-related approved works and impacts and other specialist technical reports and compare these with the works and impacts associated with the RfPC-14 works. The key aspects addressed in the EIS traffic technical report included strategic transport impacts and benefits, local transport impacts during project operations, and construction transport impacts for the CRR project.

This technical note pertains specifically to the transport (including pedestrians, people riding bikes and bus movements) impacts to Roma Street and the surrounds post-construction (i.e. during operations) of the pocket park. It is noted that the provision of a pocket park is consistent with the Roma Street CRR PDA Development scheme. As such, this RfPC-14 effectively provides a summary of operational impacts with reference to these existing /past technical studies.

CRR Project Approved Work and Impacts

The design progression of the sites relevant to this project is summarised in Table 1. Given the purpose of this review, a comparison of the impact of RfPC-14 against the previous reviews / change requests has been carried out.

Table 1 CRR Progression

Location	2011 EIS	2017 RfPC1	2018 RfPC-3	2019 RfPC-4	2024 RfPC-14
Roma Street Station	Redeveloped but remains in the current location	Relocated site approximately 150m to the current BTC site.	As per 2017 RfPC-1	As per 2017 RfPC-1	As per 2017 RfPC-1 Plus, taxi, kiss 'n' ride, rideshare facilities to be situated at Makerston Street
Brisbane Transit Centre (including Coach Terminal)	No changes proposed	Demolished as part of Roma Street relocation. Required relocation of coach terminal (before demolition) and removal of ~600 car parking spaces.	As per 2017 RfPC-1 but included demolition of the BTC (East Tower) and Hotel Jen and removal of ~190 car parking spaces.	As per 2018 RfPC-3	As per 2018 RfPC-3
Parkland Crescent Car Park	No changes proposed (however worksite proposed on the eastern end of the crescent)	Construction laydown area	As per 2018 RfPC-2 (Proposed relocated coach terminal site)	As per 2018 RfPC-2	As per 2018 RfPC-2
Parkland Boulevard	Permanent closure of roundabout immediately north of Roma Street. Alternative route via College Road / Gregory Terrace intersection	No proposed changes to the roundabout or upper level.	No road closure required	Re-alignment with Herschel Street / Roma Street intersection	Leave in pre-existing configuration - No changes proposed
Inner Northern Busway	No changes proposed	No changes proposed	No changes proposed	Lowered underground	Leave in pre-existing configuration

					- No changes proposed
Herschel Street	No changes proposed	Closed between George Street and Roma Street	As per 2017 RfPC-1	No changes proposed	As per 2017 RfPC-1

Note – reference made to RfPC-3 traffic assessment technical note summary for the above table and updated with current proposed RfPC-14.

Material Changes to Impacts

The changes to the works to be conducted, align with previous RfPC-1 and decision to keep the Inner Northern Busway (INB) at Roma Street on its current alignment, as noted below:

- Closure / removal of a short (approx. 30m) 2-way section of Herschel Street between George Street and Roma Street – as noted within RfPC-1 (approved 8 June 2017);
- Construction of a pocket park in the location of Herschel Street as identified as a recommendation as part of RfPC-1, and supporting changes to kerbside facilities for pick up/drop off; and
- Removal of the RfPC-4 scope to relocate the INB underground and realign Parkland Boulevard, consistent with Queensland Government policy announcement, dated 10 August 2021, to keep the INB at Roma Street on its current alignment and elevation.
- Minor alterations to the existing traffic configuration and turning lanes on Makerston Street.

Transport Impact Assessment Review

A Transport Impact Assessment (TIA) has been prepared by the project for these works. This assesses the proposed changes to the road network and intersections within the Roma Street Station precinct (as outlined under heading **Material Changes to Impacts**). The sections of the TIA referred to throughout this Technical Note have been included in **Cross River Rail Environmental Impact Statement – Volume 3 Attachment APedestrian facilities.**

Pedestrian volumes for the AM and PM peak hour were provided to the project contractor design partners for the purposes of micro-simulation modelling and align with the pedestrian modelling undertaken for the project elsewhere in accordance with the project requirements. A scramble crossing at Makerston Street / Roma Street intersection and a single wide pedestrian crossing linking Roma Street Station precinct to the proposed pocket park on the eastern side of the George Street/Roma Street intersection were modelled.

It was noted that the pedestrian performance assessment is not within scope of the TIA (noted as ‘out of scope’ of the TIA (Pedestrian facilities of Attachment A) and that the adequacy of the pedestrian pathways and crossing is addressed in a separate report undertaken by other project design partners, which is reviewed under heading **Pedestrian Modelling Report Review**.

Cycling facilities

As outlined in the heading **Cycle Infrastructure** of the TIA, cycling connectivity is proposed to be retained between Herschel Street and Roma Street via a new shared use path through the pocket park. Access to the shared path is understood as follows:

- From Roma Street, via a short new section of 2-way cycle track, for people riding from Roma Street Parklands with bicycle ramps for access to / from Roma Street.
- From Herschel Street, via on-road cycle lanes across the George Street / Herschel Street intersection with bicycle ramps for access to / from George Street and the Copenhagen bicycle facility (towards Tank Street/Turbot Street).

Eastbound Roma Street Movements

The proposed closure of the short section of Herchel Street removes the ability to travel eastbound along Roma Street for vehicles travelling from George Street, or North Quay via Herschel Street. Changes proposed to the Makerston Street / Roma Street intersection as part of the project works, enable access Roma Street eastbound. This change is documented within the TIA and included as part of the assessment of intersection performance.

Alternative routes to utilising Makerston Street for vehicles wishing to travel eastbound along Roma Street, or that would have utilised Herchel Street for outbound CBD movements, have been identified

at a high level. Some examples have been shown in the appendix for reference with regards to access to the immediate CRR PDA precinct and include consideration of travel via:

- Eastbound – North Quay via Coronation Drive / William Jolly Bridge
- Eastbound – North quay via Turbot Street
- Westbound – Riverside Expressway – Turbot Street – Parkland Boulevard
- Westbound – Riverside Expressway – Turbot Street – Albert Street.

Drop-off Facilities

The **Drop-Off Facilities** Section of the TIA assumes the provision of drop-off / pick-up facilities, including taxi and rideshare, to be on the northern side of Roma Street, adjacent to the station.

The design for these facilities has since been revised to be provided / accommodated along Makerston Street (with design in progress).

Given the demand for these facilities is expected to be low, as outlined in **Drop-Off Facilities** Section of the TIA, this change, and subsequent change in route for vehicles accessing these facilities, is not expected to materially impact the results and conclusions drawn in the TIA, although it is anticipated that access to these facilities may result in additional turning movements in the precinct.

No further assessment is considered necessary or recommended.

Commercial Vehicle Facilities

As with the drop-off / pick-up facilities, since the drafting of the TIA, the commercial vehicle proposal has been revised to be provided along Makerston Street. It is not expected that this change will materially impact the results and conclusions drawn in the TIA.

Intersection Analysis

The TIA prepared by the project contractor design partners outlines the modelling methodology undertaken and results obtained for the road network and intersections within the Roma Street precinct. The “with CRR” modelling was undertaken with a road network that reflected this RfPC.

The **Forecast Traffic Flows** Sections of the TIA reported intersection operations in terms of Level of Service (LOS), which is assessed based on a range of A to F categories in accordance with Austroads Guide to Traffic Management Part 3. Each of the six LOS categories represents a range of operating conditions and the driver’s perception of those conditions and are generally described in Table 2.

Table 2 Level of Service category descriptions

Level of Service	Description
A	Level of service A is a condition of free flow in which individual drivers are virtually unaffected by the presence of others in the traffic stream. Freedom to select desired speeds and to manoeuvre within the traffic stream is extremely high, and the general level of comfort and convenience provided is excellent.
B	Level of service B is in the zone of stable flow and drivers still have reasonable freedom to select their desired speed and to manoeuvre within the traffic stream, although the general level of comfort and convenience is a little less than with level of service A.
C	Level of service C is also in the zone of stable flow, but most drivers are restricted to some extent in their freedom to select their desired speed and to manoeuvre within the traffic stream. The general level of comfort and convenience declines noticeably at this level.

Level of Service	Description
D	Level of service D is close to the limit of stable flow and is approaching unstable flow. All drivers are severely restricted in their freedom to select their desired speed and to manoeuvre within the traffic stream. The general level of comfort and convenience is poor, and small increases in traffic flow will generally cause operational problems.
Intersection Failure	
E	Level of service E occurs when traffic volumes are at or close to capacity, and there is virtually no freedom to select their desired speeds and to manoeuvre within the traffic stream. Flow is unstable and minor disturbances within the traffic stream will cause flow breakdown.
F	Level of service F is in the zone of forced flow. With it, the amount of traffic approaching the point under consideration exceeds that which can pass it. Flow breakdown occurs, and queuing and delays result.

The results of this modelling highlight that in the opening year (modelled for 2023, but applicable 2026):

- The Roma Street / Makerston Street, Roma Street / George Street and North Quay / Makerston Street intersections are expected to operate at a Level of Service (LOS) consistent with, or at times better than the 'without CRR' scenario. This equates to a LOS B or better in both the AM and PM peak periods.
- The North Quay / Herschel Street intersection is expected to operate at a LOS consistent with, or at times better than the 'without CRR' scenario. This equates to a LOS A in both the AM and PM peak periods.
- The George Street / Herschel Street intersection is expected to operate at a LOS consistent with, or at times better than the 'without CRR' scenario. This equates to a LOS C in the AM peak period and LOS D in the PM peak period, with queuing improved in the PM peak from the "without CRR" scenario.

The results of this modelling highlight that in the future year (2031, but applicable also to 2036 levels):

- The Roma Street / Makerston Street and North Quay / Makerston Street intersections are expected to operate at a LOS consistent with, or at times better than the 'without CRR' scenario. This equates to a LOS B or better in both the AM and PM peak periods.
- The Roma Street / George Street and North Quay / Herschel Street intersections are expected to operate at a LOS consistent with, or at times better than the 'without CRR' scenario. This equates to a LOS A in both the AM and PM peak periods.
- The George Street / Herschel Street intersection is expected to operate at a LOS C in the AM peak period and LOS E in the PM peak period, with queuing improved in the PM peak from the "without CRR" scenario. While the intersection operations are considered to be failing, operations are improved against the "without CRR" scenario and the Roma Street station precinct falls within the "highly constrained" area of Brisbane and therefore some relaxation to the LOS targets apply.
- This change is still an improvement on what would be encountered with a 'without CRR" scenario. The results of the intersection analysis indicate that the Roma Street station precinct is expected to operate satisfactorily with the closure of Herschel Street between George Street and Roma Street, to enable the pocket park as part of this change. Noting also that the precinct falls within the "highly constrained" area of Brisbane and therefore some relaxation to the LOS targets apply.. However, while pedestrian volumes were included in the micro-simulation analysis, the TIA does not report on modelling outcomes for people walking or cycling (e.g., level of service / delay for these users moving through the precinct).

Pedestrian Modelling Report Review

A Pedestrian Modelling Report was undertaken by the project contractor design partners which documents the pedestrian modelling performance results for all Cross-River Rail (CRR) stations in accordance with project requirements. A review was undertaken on the assessment of Roma Street Station to understand the operational performance of the crossing and footpath widths between Roma Street Station and the proposed pocket park (i.e. George Street/Roma Street pedestrian crossing).

A station precinct and entrances assessment was undertaken by Cross River Rail design consultants using pedestrian volumes (CRR + Background) for 2036 AM and PM peak periods to determine the minimum walkway widths on the surrounding footpaths and crossings leading to/from Roma Street Station. In relation to the connection to the pocket park it was reported that a 7m wide crossing would be required east of the plaza and 4m wide footpaths on George Street. However, it notes that waiting/queuing space will be required in addition to this and is dependent on the signalling times adopted which is provided in the “Traffic Engineer’s assessment”.

When reviewing the dynamic pedestrian modelling undertaken for Roma Street Station, in particular the precinct and connecting footpaths, it was observed that the dynamic pedestrian modelling only encompassed east of the plaza to where the George Street crossing would be located and only assesses Makerston Street crossing, as shown in Figure 2 and Figure 3.

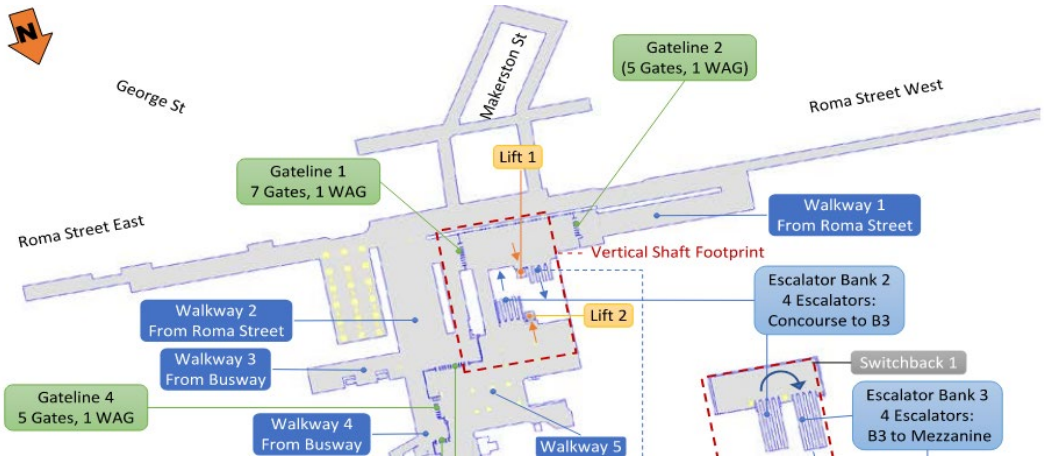


Figure 2 Precinct and Plaza Dynamic Model Extent (Source: Pedestrian Modelling Report was undertaken by the project contractor design partners)

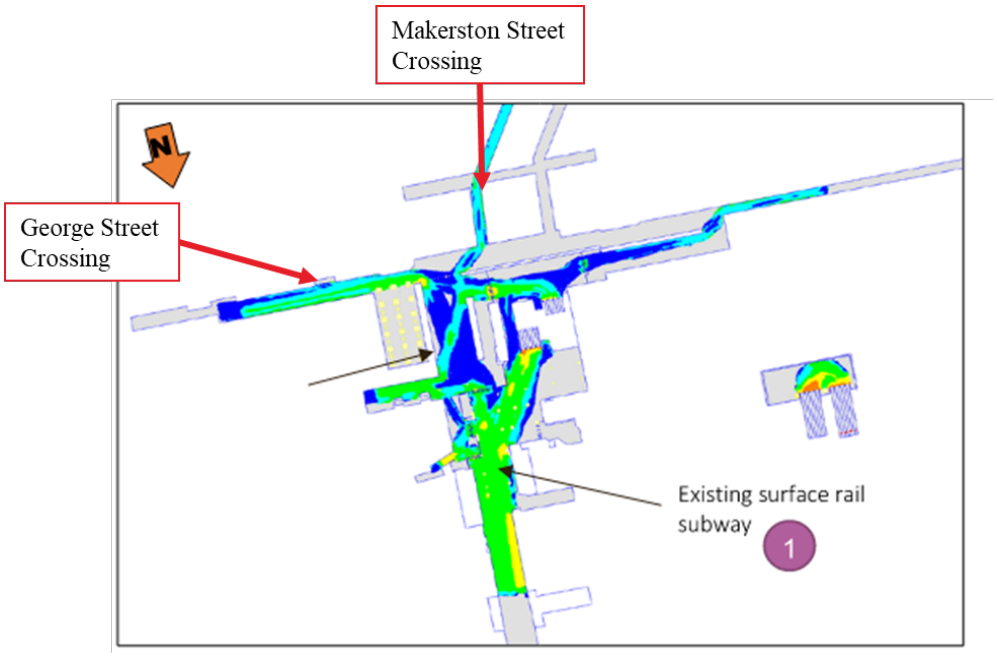


Figure 3 Precinct and Plaza Dynamic Modelling LoS Map (Source: Pedestrian Modelling Report was undertaken by the project contractor design partners)

Pedestrian Crossing Assessment

Due to the gap in the modelling undertaken to date for George Street pedestrian crossing and documented as part of existing reporting associated with Roma Street station pedestrian crossings at Roma Street, a supplementary pedestrian planning assessment was identified as being required for understanding the queuing at the Roma Street/George Street signalised pedestrian crossing. This has been carried out adopting assumptions and inputs listed in Appendix B.

Figure 4 to Figure 7 shows the Fruin Level of Service (LOS) walkways and queuing results for the AM and PM peaks for a peak 5-minute period. As per the project requirements, LOS C (queuing and walkways) is the performance criteria adopted for assessing the operation of the signalised pedestrian crossing. Only the queuing area at the crossing and the crossing itself is being assessed.

For the AM peak, LOS C or better walkways is observed on the crossing (see Figure 4) which meets project requirements. However, the queuing at the northern side of the crossing reaches localised LOS D (see Figure 5). Although this doesn't meet the LOS criteria, it is considered there is ample space for the queue to spread out while not impeding the through-movement circulation around the queue. For the PM peak, LOS C or better walkways and queuing is observed (see Figure 6 and Figure 7) which meets project requirements. Therefore, the proposed design and signal timing for the pedestrian crossing is considered sufficient.

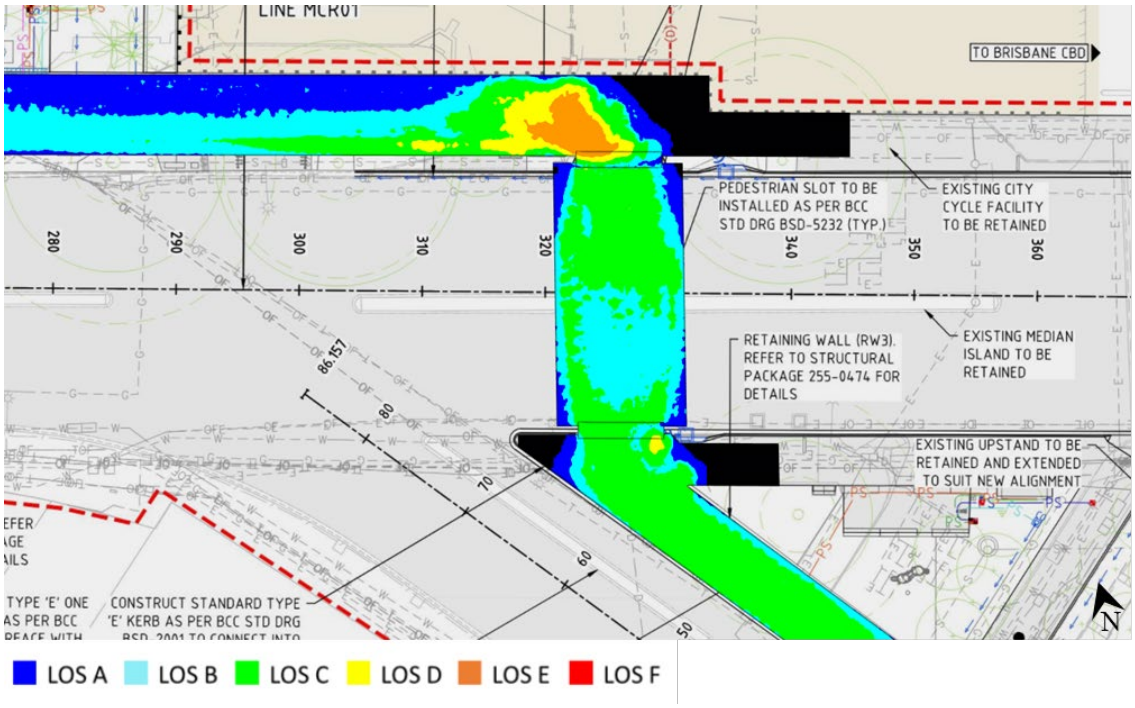


Figure 4 George Street Signalised Pedestrian Crossing LoS (Walkways) - 2036 AM Peak 5min [GeorgeStCrossing_001a_AM]

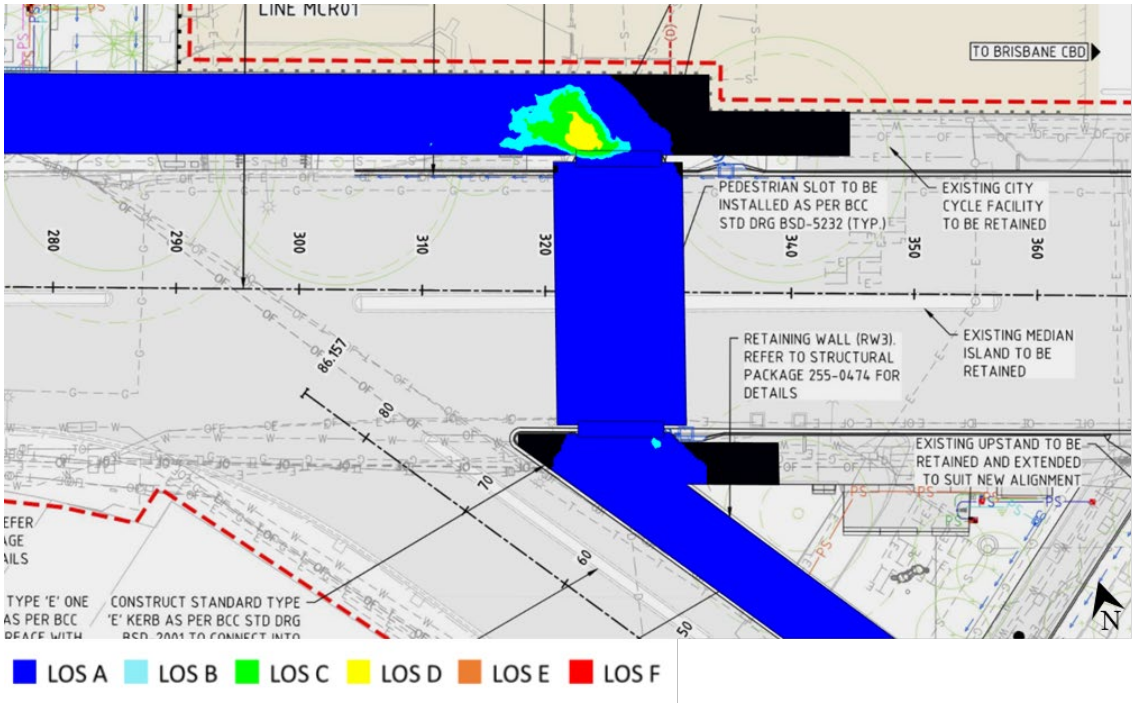


Figure 5 George Street Signalised Pedestrian Crossing LoS (Queuing) - 2036 AM Peak 5min [GeorgeStCrossing_001a_AM]

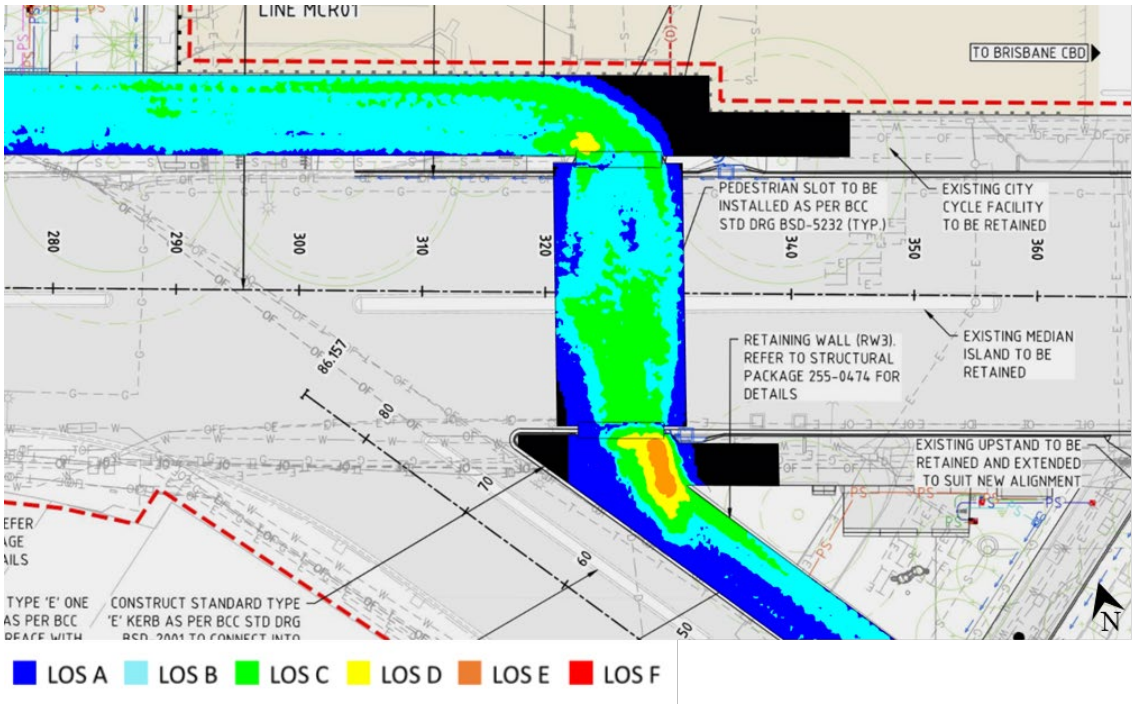


Figure 6 George Street Signalised Pedestrian Crossing LoS (Walkways) - 2036 PM Peak 5min [GeorgeStCrossing_001a_PM]

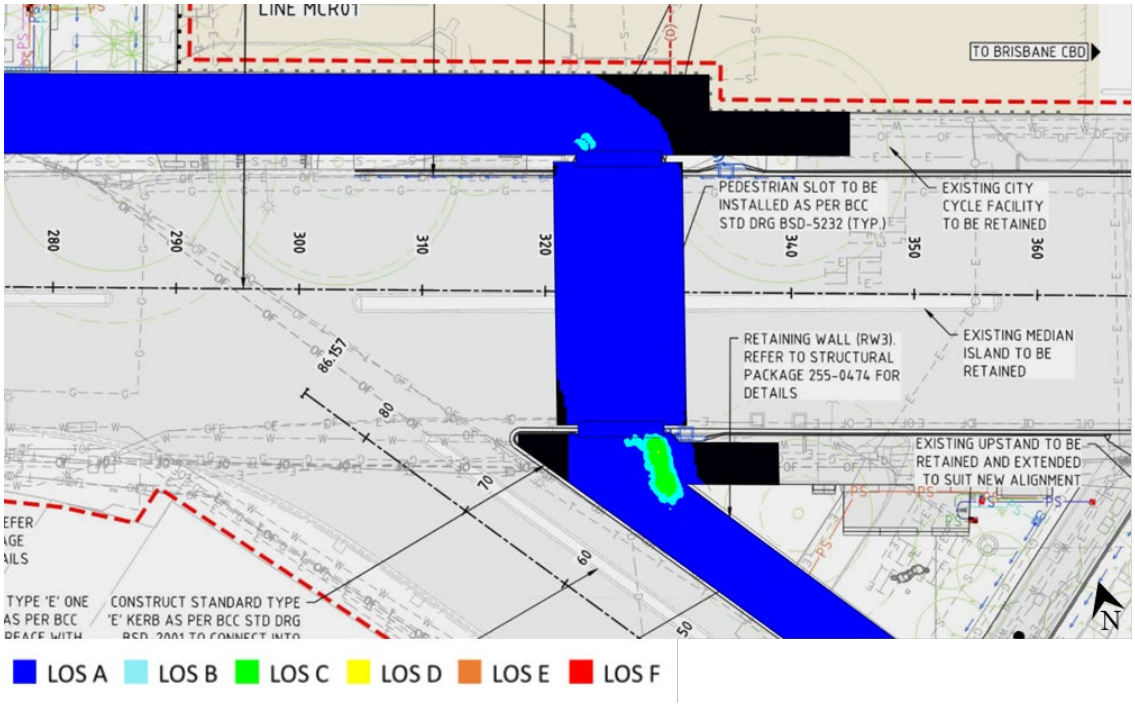


Figure 7 George Street Signalised Pedestrian Crossing LoS (Queuing) - 2036 PM Peak 5min [GeorgeStCrossing_001a_PM]

The Pedestrian Modelling Report was undertaken by the project contractor design partners suggests that there will be no to minimal demand to/from the southern side of Roma Street (i.e., travelling to and from the Queen Elizabeth Law Courts and King George Square direction). Based on current observed usage of the pathway, it is likely that customers will utilise this path/direction, and the

shared path connecting Roma Street and George Street through the pocket park. This will result in an improved LOS walkways performance than what is reported on George Street (north).

The assessment provides confirmation that the crossing widths, queuing space, and pathways at the Roma Street / George Street (pocket park) crossings will be sufficient for the estimated 2036 demand and generally meets the project requirements of LOS C or better walkways/queuing with the exception of the northern side of the crossing during the AM peak.

Assessment of event demand has not been carried out and is understood to be subject to additional overlay and traffic management.

Urban Design and Landscape Architecture Permanent Works Design Report Review

Pedestrian facilities

A review of the *Roma Street Station Precinct – Urban Design and Landscape Architecture Permanent Works Design Report* found that for major events, a width of 7m is to be provided for the pedestrian crossing and 4m for George Street (see Figure 8 below). This aligns with the requirements identified within the project contractor design partners stan report for 2036 AM and PM normal operation, however major events requirements were not identified for this location/site.

The Urban Design and Landscape Architecture plans and reports have been reviewed and consulted with various stakeholders (including Brisbane City Council and TMR) and subject matter experts. The crossing and footpath designs have included the documented width requirements (i.e., 4m path and 7m crossing width). As such, the proposed pocket park layout and sizing for the primary footpaths and crossings to/from the pocket park are consistent with pedestrian movement requirements documented within the Pedestrian Modelling Report for normal operations only.

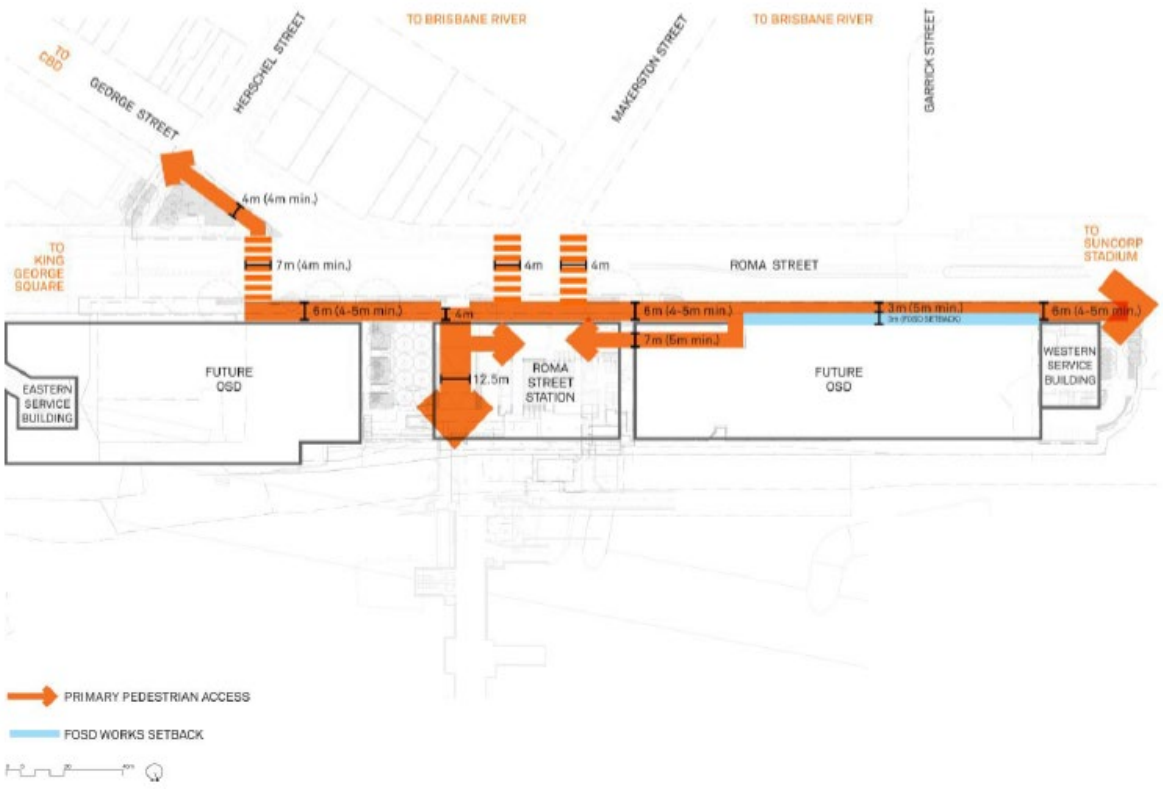


Figure 8 Major Events Pedestrian Movement Paths and Widths

This report also acknowledges the primary pedestrian access and accessible routes (see both Figure 8 and Figure 9) as including the pedestrian crossing proposed at Makerston Street, and pedestrian route along the southern side of George Street to from the King George Square and Roma Street Station. This supports and aligns with enabling access to drop off / pick up facilities, as noted as being relocated to Makerston Street. As such the proposed operational access to this change is considered to have been assessed.

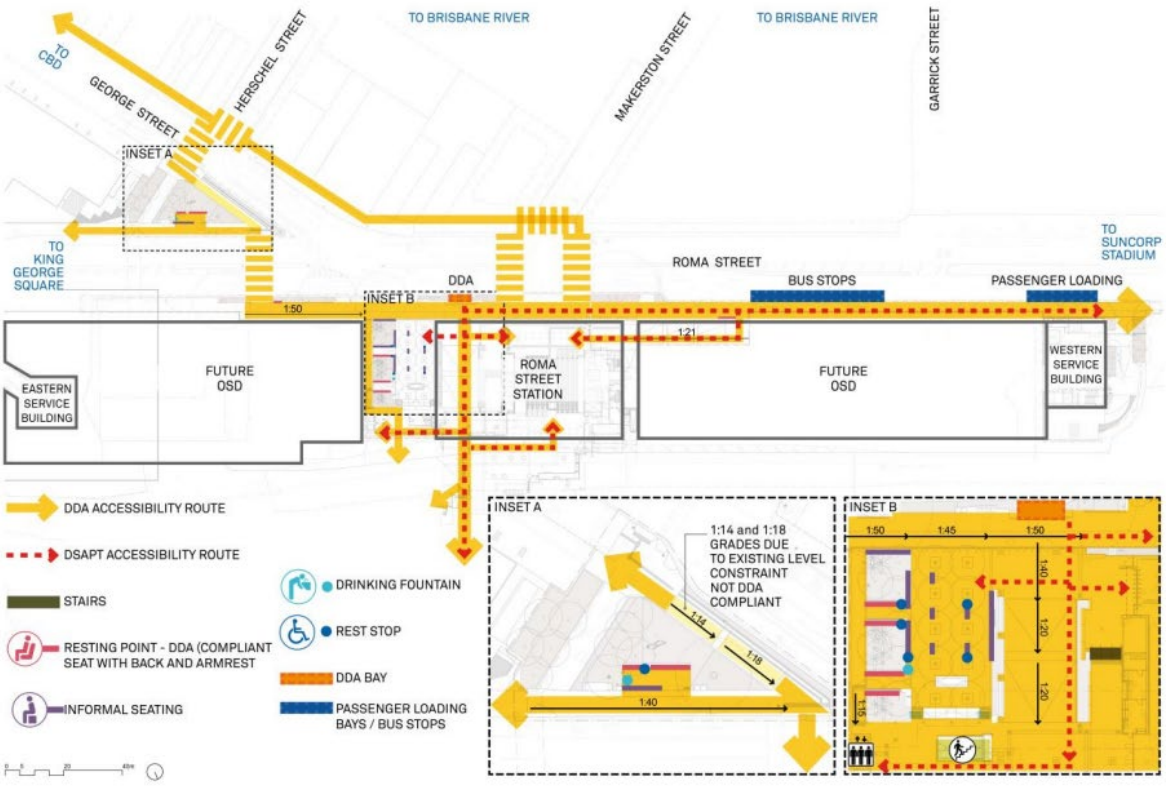


Figure 9 Precinct Accessibility Diagram

Cycling facilities

Cycling connectivity information for the Roma Street precinct and beyond has been provided within Section 4.2.6.7.2 of the Urban Design and Landscape Architecture Permanent Works Design Report (see Figure 10 and Figure 11). A review of these and comparison against the TIA was undertaken. The review determined that the cycling facilities align with those proposed within the TIA.

The Urban Design and Landscape Architecture plans and reports have been reviewed and consulted with various stakeholders (including Brisbane City Council and TMR) and subject matter experts. The proposed pocket park layout and cycle infrastructure provisions are consistent with TIA.

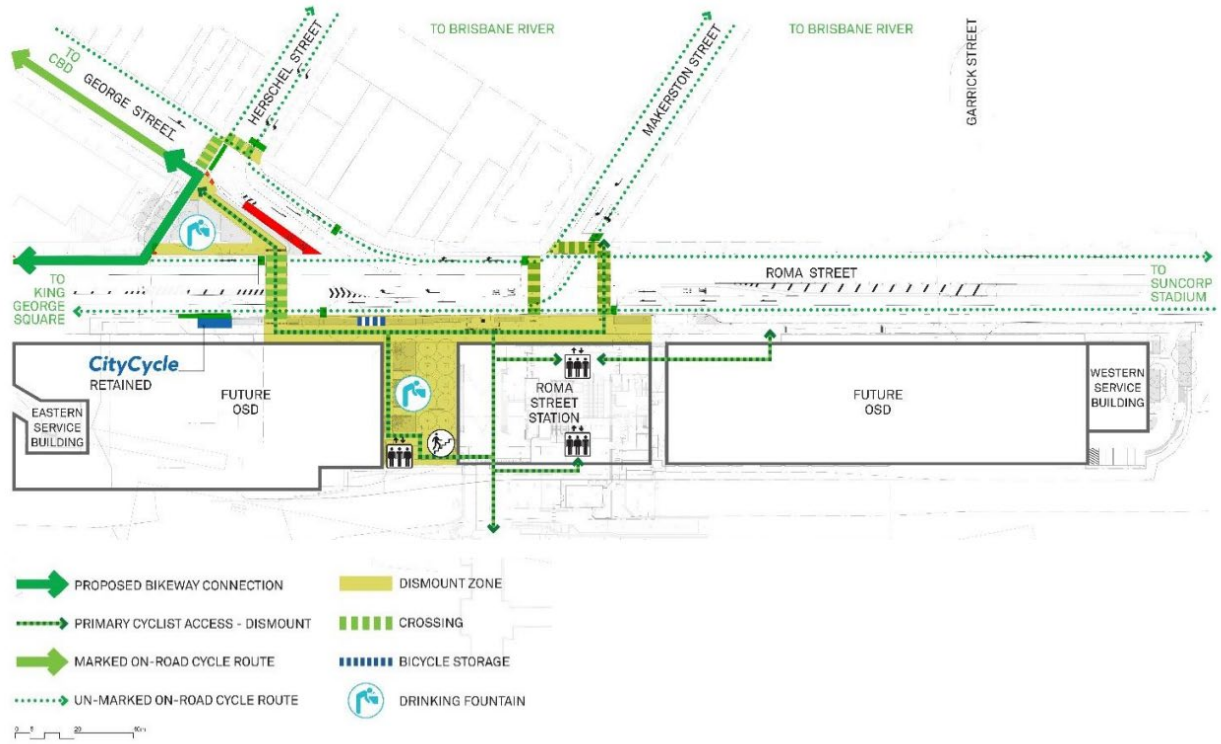


Figure 10 Cycle Movement Diagram

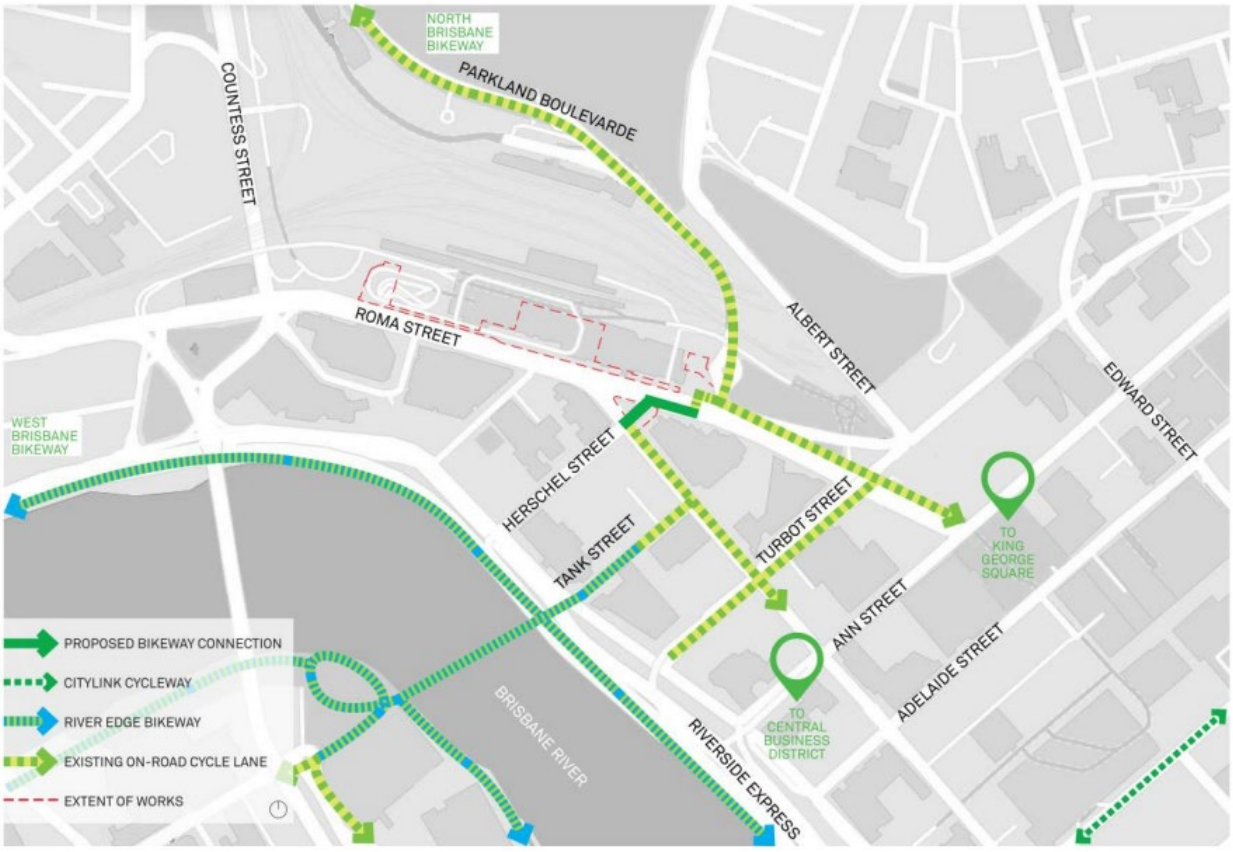


Figure 11 Cycle Network Connectivity

Conclusions and recommendations

The following findings and recommendations are made from this review:

- The location of drop-off / pick-up and commercial vehicle facilities has changed from the northern side of Roma Street to Makerston Street since the preparation of the Project TIA, however, this is not expected to materially impact the results and conclusions drawn in the TIA.
- The results of the intersection analysis conducted in the Project TIA indicate that the Roma Street Station precinct is expected to operate satisfactorily with the closure of Herschel Street between George Street and Roma Street - noting also that the precinct falls within the “highly constrained” area of Brisbane and therefore some relaxation to the LOS targets apply.
- The TIA is suitable for presenting the anticipated impacts/outcomes for operations in the road/street environment. However, the TIA is silent on the future operational level of service for people walking and active transport users (including cyclists, e-wheeling and PMD users) at the intersections with the site (including queuing areas) and along the paths.
- The pedestrian modelling information assessed to understand the operational performance of pathways, and crossings at the pocket park was identified as having a gap in the modelling for the George Street / Roma Street signalised pedestrian crossing – as such the review was unable to identify whether the operational performance was sufficient. To confirm the assumptions and inputs that determined the minimum required widths for the footpath, crossing provisions, and queuing space at the George Street / Roma Street signalised pedestrian crossing, a supplementary assessment was carried out. This has confirmed that the current proposed design as per Roma Street Station Precinct – Urban Design and Landscape Architecture Permanent Works Design Report is considered sufficient to meet the project requirements and caters for operational day to day demand (2036 AM and PM peak periods).
- With reference to the review of documents, the width requirements and queuing space for major events have not been identified at this location/site. An additional assessment has not been carried out as part of this review, as it is understood to be subject to additional overlay and traffic management.
- Therefore, it has not been identified that any alteration to the current Imposed Conditions are required.

Cross River Rail Environmental Impact Statement – Volume 3 Attachment D

Request for Project Change 14

Changes to the Project and changes to the imposed conditions

Technical Report: Noise and Vibration

Date: *April 2024*

Author: *Cross River Rail Delivery Authority*

CROSSRIVERRAIL

Queensland Government

Introduction

This noise and vibration technical note has been prepared for the Cross River Rail (CRR) project with respect to Request for Project Change 14 (RfP-14).

This technical note reviews the proposed changes under RfPC14 against historical approvals received for the CRR Project through the original EIS and subsequent RfPC's to ascertain whether the changes proposed in RfPC-14 are consistent with works and operations previously approved. Where construction or operation from RfPC14 is identified to result in new impacts additional assessment is presented.

The key aspects of change with potential to materially change noise and vibration impacts sought through RfPC-14 are:

- Removal of hard (road and pavement) surface at the Herschel Street connection between George Street and Roma Street to form a pocket park. The proposed demolition is adjacent to the Supreme Court and is identified for removal to make way for the proposed landscaped pedestrian space bordered by these streets.
- Revised alignment of the INB through the Roma Street Station precinct from underground to surface level operation (no physical work – reduction of impact from the previously Evaluated Project).
- Maintaining the existing alignment of Parklands Boulevard rather than constructing on a modified alignment (no physical work – reduction of impact from previously Evaluated Project).

A summary of the proposed changes is provided in Table 1 below:

Table 1 Summary of proposed changes pertinent to RfPC14

Location	2011 EIS	2017 RfPC-1	2018 RfPC-3	2019 RfPC-4	2024 RfPC-14
Herschel Street North of George Street	No changes proposed	Considered closure of section north of George Street and slight realignment of George St intersection with Roma St	No changes proposed	Re-alignment with Herschel Street / Roma Street intersection	Proposed closure of section north of George Street. Substantially similar to original recommendation in RfPC-1.
Roma Street Station	Redeveloped but remains in the current location	Relocated site approximately 150m to the current BTC site.	As per 2017 RfPC-1	As per 2017 RfPC-1	As per 2017 RfPC-1 through to 3 inclusive
Brisbane Transit Centre (including Coach Terminal)	No changes proposed	Demolished as part of Roma Street relocation. Requires relocation of coach terminal	As per 2017 RfPC-1 but including demolition of the BTC (East Tower) and Hotel Jen and	As per 2018 RfPC-3	As per 2018 RfPC-3

Location	2011 EIS	2017 RfPC-1	2018 RfPC-3	2019 RfPC-4	2024 RfPC-14
		(before demolition) and removal of ~600 car parking spaces	removal of ~190 car parking spaces		
Parkland Boulevard	Permanent closure of roundabout immediately north of Roma Street. Alternative route via College Road / Gregory Terrace intersection	Removed worksite adjacent to Parkland Boulevard. No road closure required.	No road closure required	Re-alignment with Herschel Street / Roma Street intersection	Leave in pre-existing configuration - No changes proposed.
Inner Northern Busway	No changes proposed	No changes proposed	No changes proposed	Lowered underground	Leave in pre-existing configuration - No changes proposed.

CRR Project Approved Work and Impacts

Relevant approved documents which assess works comparable to those requested under RfPC-14 for CRR are listed below:

EIS (2011) – Proposals under the original approval considered in this report include:

- **No underground connection of INB to Roma Street Station** (i.e. existing INB surface level connection to remain. Note: station moved in later proposed project changes).
- **No realignment of Parkland Boulevard**, i.e. existing alignment to remain.

RfPC-1 works and assessment considered in this report include:

- Proposed horizontal and vertical realignment of railway tunnel between Albert Street and Roma Street Stations from original EIS. Tunnel alignment to later change in RfPC-4.
    - Minor relocation of Roma Street Station (approx. 150m towards Brisbane Transit Centre (BTC)) and demolition of the BTC West Tower to accommodate the realignment. **Location of station as per RfPC-14**
- Proposed creation of a signalised T-intersection between George Street and Roma Street and necessary re-alignments in addition to **closure of Herschel Street north of George Street**.
- Proposed relocation of construction worksite adjacent to Parkland Boulevard over to the old BTC West Tower and coach terminal
- Lower peak hourly and daily spoil and material delivery trucks proposed over original EIS.

RfPC-3 works considered in this report include:

- Generalised construction activities previously considered in the vicinity of the old BTC (East Tower) and Hotel Jen, i.e. groundworks and hardstand construction adjacent to Hotel Jen, building demolition, stockpile management, ground remediation and finishing works.
    - The potential for vibratory compaction was assessed in preparation for an equipment hardstand adjacent to (former) Hotel Jen. **This activity is likely as part of the pocket park.**
- Demolition of the pedestrian footbridge over Roma Street connecting the (now demolished) BTC to George Street. Proposed demolition activities were somewhat closer to the Supreme Court than what is proposed for the **closure of Herschel Street north of George Street**.

RfPC-4 works (to be reversed) in the context of this requested change include:

- Relocation of the INB – Underground cut and cover tunnel to run between the old BTC and existing INB intersection adjacent to Countess Street.
- Closure of the Parkland Boulevard and Roma Street intersection and realignment of Herschel Street to connect directly to Parkland Boulevard.

RfPC-14

Figure 1 provides a visual of the proposed layout changes to Roma Street and connection with Herschel Street. The extent of works include:

Traffic network:

- Demolition and closure of the Herschel Street connection with Roma Street
- Provision for a new pocket park bordered by Roma and George Street
- Additional right turn at Makerston Street
- Provision for rideshare/taxi stopping bays at Makerston Street
- New signal crossing near proposed pocket park
- Extension of existing bus stop area along Roma Street
- Lane marking changes to accommodate active transport.

Inner Northern Busway Alignment:

- Removal of underground option (Surface level connection proposed)
- No realignment of Parkland Boulevard.

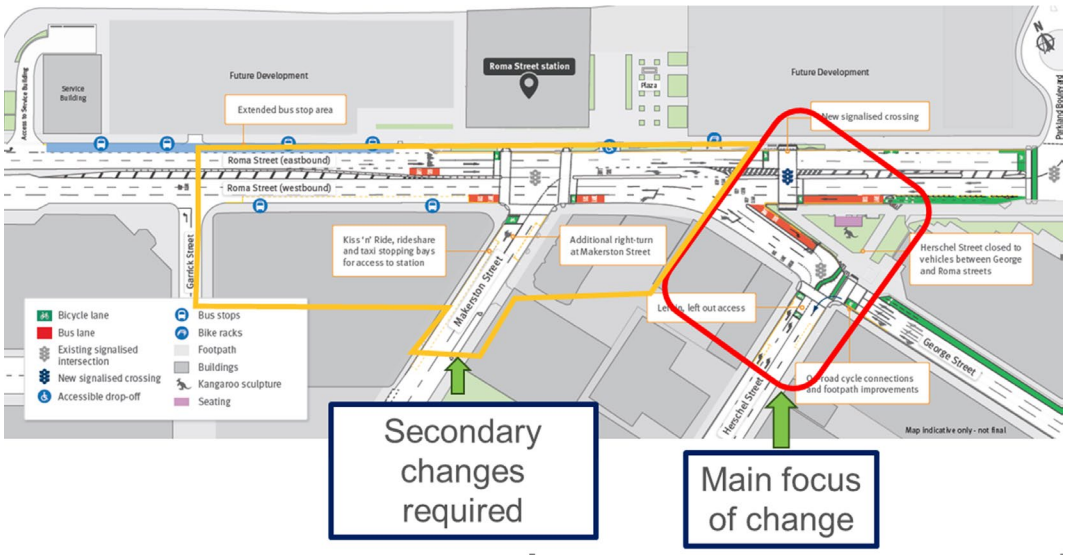


Figure 1 Visual description of proposed changes (RfPC-14)

Assessment methodology

A review of the original EIS and previously approved RfPC's for CRR has been conducted to assess the proposed changes at Roma Street Station outlined in RfPC-14. Documentation of previously approved construction and operation for CRR are publicly available on the Queensland Government (State Development and Infrastructure) website.

The approach in this technical note is to compare all major noise and vibration generating activities proposed under RfPC-14 and identify if an equivalent or greater impact has been previously assessed (and approved) through prior assessments, namely RfPC-1 – 4 and the original EIS.

Where no comparable activities are identified in prior approved works, recommendations are made for further assessment to quantify the impacts.

Closure of Herschel Street and Construction of New Pocket Park

Construction phase (Noise)

The proposed closure of Herschel Street north of George Street under RfPC-14 involves demolition of the existing road surface and remediation of the surface into a grassed pocket park.

RfPC-1 includes closure of this section of Herschel Street to improve pedestrianised access to the station, this is considered similar to the proposed works under RfPC-14 requiring removal and re-purposing of hard surfaces.

RfPC-3 includes demolition of the former pedestrian footbridge which connected the old BTC to George Street, removal of this footbridge included demolition and reinstatement in the same area as the proposed pocket park under RfPC-14. This was assessed in RfPC-3 as part of the demolition of Hotel Jen and BTC (East Tower) in the noise and vibration assessment with a total sound power level of 121 dB considered for modelling purposes. It is understood that machinery used for demolition and construction of the new pocket park for RfPC-14 will be no worse than the demolition works proposed in RfPC-3 given that the high noise and vibration activities of breaking out the current hard surfaces are applicable to both.

Figure 2 below shows the extent of construction works proposed under RfPC-3. Of note, the proximity of the demolition area shown in red outline to the Supreme Court identifies that intensive construction works approved under RfPC-3 occur at least as close to the Supreme Court as the construction works for the proposed pocket park in RfPC-14.

While the extent of construction area under RfPC-14 does move closer to the Abbey and Meriton Apartments than previously approved, the construction is indicated to only involve concreting, footpath resurfacing and rehabilitation of the indicated pocket park extents. Similar scenarios (Earthworks, Hardstand Construction, stockpile management, ground remediation and finishing works) have been previously assessed and approved under RfPC-3 and are predicted to be at least 2 – 11 dB quieter than the approved demolition activities. This is expected to offset the slight lateral movement towards these receivers such that no additional noise or vibration impacts would occur.

Under RfPC-14, hoarding is also recommended to be installed along the boundary of the Supreme Court and perimeter of the pocket park construction site with solid and temporary fencing to minimise impacts at ground level with light vehicle access proposed off Roma Street. It This will be considered and implemented, as appropriate, as per existing Construction Environmental Management Plan processes.

Figure 2 Proposed extent of construction – Orange/Blue/Northern Green section) (Red outline – Proposed demolition extent of RfPC-3)

Construction traffic previously approved for demolition of both the BTC and Hotel Jen (simultaneously) was less than approved construction movements from the 2011 EIS. While details on construction traffic movement are not available for RfPC-14 at this stage, the proposed works are minor, and it is expected that fewer vehicles will access this site than would be required to remove extensive spoil from demolition of the former BTC and Hotel Jen.

Outcome

Based on the above, construction noise and vibration impacts from RfPC-14 were anticipated to be lower than has previously been assessed (and approved) and therefore no further assessment has been recommended or considered.

Construction phase (Vibration)

Construction of the new pocket park is expected to involve surface preparation, demolition of the existing pavement, grading, and landscaping.

The noise and vibration report for RfPC-3 identifies ground remediation as the only activity which is predicted to exceed human comfort goals from demolition of the BTC East Tower and Hotel Jen (at the Supreme Court, Bank of Queensland (Former) and Baby Clinic (Former)) and building damage goals at King George Chambers and Transcontinental Hotel.

Outcome

These construction activities at Roma Street station have already been completed in accordance with the existing approved EMF, OEMP and CEMP documents and processes. As such, given that these impacts are likely to be less then what has already been completed to date, it is viewed as appropriate and sufficient that the project be required to continue to comply with existing requirements to manage these works.

Operational phase

The closure of Herschel Street, north of George Street, was previously assessed in the Traffic Impact Assessment Report (Cross **River Rail Environmental Impact Statement – Volume 3 Attachment A**).

The summary of the findings indicate that vehicles are expected to "…utilise Makerston and George Street to access alternative routes" in lieu of the Herschel Street connection. It is however understood from this report that the road network is no worse off with the closure of Herschel Street. As such, operational traffic noise is expected to be no worse than the current traffic network layout (considered in approvals for RfPC's prior to RfPC-4) and reflects the Herschel Street closure north of George Street, first introduced in RfPC-1.

Outcome

Operational proposals under RfPC-14 have previously been approved under RfPC-1 and 4 and are no worse than the existing situation prior to the Project.

No further assessment is considered necessary or recommended.

Removal of INB (Underground Option)

Background

The RfPC-14 proposal to remove the previous proposal for a cut and cover earthworks process and proposed structure for a lowered busway is expected to improve upon previously predicted airborne noise levels from works required at Roma Street Station and the realignment of the INB identified in RfPC-4.

The revised surface construction is comparable to the design and construction required under RfPCs-1 through to 3 and construction noise and vibration impacts are considered comparable accordingly. As such it was considered that the scenarios assessed in RfPCs-1 – 3 represent the construction noise and vibration impacts that would be associated with RfPC-14 proposal for the INB alignment, and no further assessment would be required. These works are not changing from their existing configuration. Further, construction of the new underground station is currently underway, at the time of this technical note, in accordance with these approvals. Accordingly, no further assessment is recommended.

See Figure 3 and Figure 4 below:

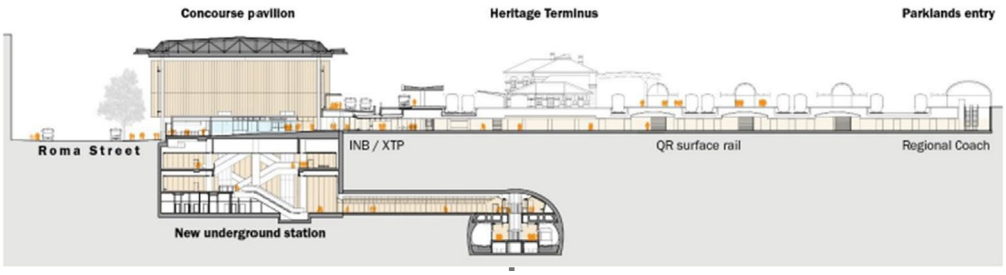


Figure 3 Revised location of new underground Roma Street Station and tunnel alignment (As per RfPC-1)

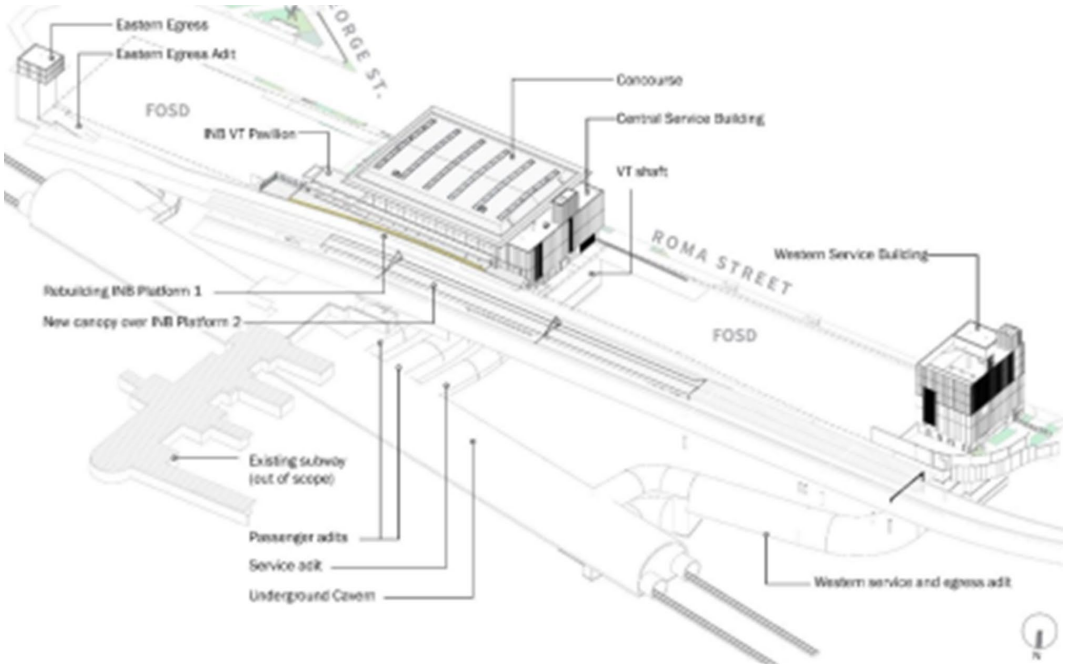


Figure 4 3D view of proposed new underground Roma Street Station and mined tunnel alignment

14.

Construction phase (Noise and Vibration)

New INB alignment

Proposals in RfPC-14 to remove the need to provide a cut and cover structure for a lowered busway is expected to improve upon previously predicted airborne noise levels from works required at Roma Street Station and the realignment of the INB identified in RfPC-4.

Relocating the INB back to surface level effectively removes the need for associated construction as the INB is retained in its existing configuration. The revised surface construction is comparable to the design and construction required under RfPC-1 through to 3 with the aboveground station building/canopy as per RfPC-4. As such construction noise and vibration impacts are considered comparable accordingly.

Outcome

RfPC-1 – 3 represent the construction noise and vibration impacts that will be associated with the RfPC-14 proposal for the INB alignment and no further assessment is required.

Station location and tunnel alignment

The Roma Street station box location and train tunnel alignment are consistent with prior RfPC's (for the purposes of assessing noise and vibration impacts) and have been constructed in accordance with the current imposed conditions from these approvals.

Accordingly, no further assessment is recommended.

Operational phase (Noise and Vibration)

New INB alignment

The proposal in RfPC-14 reverts to a design with the INB at surface level and reintroduces airborne noise impacts previously assessed in RfPC-1 and the 2011 EIS where a comparable surface level alignment was employed.

RfPC-1 however, notes that there are minimal differences in predicted operational airborne noise and ground borne noise and vibration levels from the previously approved 2011 EIS with the new alignment and station location.

Outcome

No further assessment is considered necessary for RfPC-14 and it is recommended that operational noise conditions for the INB alignment proposed in RfPC-14 replicate those proposed in the EIS and RfPC-1.

Tunnel alignment connection to Roma Street Station

Ground borne noise and vibration compliance is noted in RfPC-1 for the unaltered design with proposed resilient and highly resilient rail fasteners in place. RfPC-14 follows this same alignment and as such is consistent with impacts as assessed in RfPC-1.

Accordingly, no further assessment is recommended for RfPC-14.

It is further recommended that there is no need to alter the existing conditions of approval for operational groundborne noise and vibration for RfPC-14 as outlined above.

No realignment of Parkland Boulevard

As part of the decision to retain the INB on its current alignment, Parkland Boulevard is no longer impacted, with no realignment of the Parkland Boulevard connection with Roma Street and Herschel Street required.

Outcome

RfPC-1 noted that there are minimal differences in predicted operational airborne noise and ground borne noise and vibration levels from that previously evaluated as part of the 2011 EIS As such, the construction methodology and operational noise assessments for the Parklands Boulevard alignment proposed in RfPC-14 are consistent with impacts previously assessed.

As the Parkland Boulevard is to remain on its current alignment and its operation is not changed as part of the Project, no further assessment proposed for RfPC-14.

Rideshare (Kiss ‘n’ Ride) facility

RfPC-14 proposes the inclusion of a dedicated stopping bay area along Makerston Street to improve access to Roma Street station. Forecast traffic will not increase as a result of this facility and no significant construction activities, i.e., road widening, is required to accommodate parked vehicles.

Outcome

As such, no greater impact than previously assessed is anticipated, and no further assessment of noise and vibration impacts are required.

Lane marking changes

To accommodate connections with public and active transport, there will be alteration to the existing bus stop configuration along Roma Street as has previously been evaluated and a dedicated signalled crossing and an active transport path to integrate with the proposed pocket park created.

Active transport does not materially contribute to noise and vibration impacts over that predicted by vehicles and as such does not warrant assessment. Further, the new signalised pedestrian crossing at the pocket park is deemed to be an insignificant change and also reflects the existing traffic connection through the proposed pocket park.

Vehicles accelerating at this new pedestrian crossing would not materially change the noise levels from those previously approved given the relatively minor nature of realignment, but more importantly, the closure of Herschel Street between Roma Street and George Street to make way for the pocket park does not significantly alter the operation of Roma Street.

Outcome

Accordingly, no further assessment is warranted for line marking changes proposed under RfPC-14.

Alternation to the bus stopping zone has not triggered an increase in predicted buses accessing Roma Street station in RfPC-14. Operational noise and vibration impacts from this lengthening is expected to similar to prior evaluations of the Project.

Summary of Assessment of Changes

RfPC-14 proposes to reverse some elements of changes first introduced in RfPC-4 and return to the evaluated project as per RfPC-1 – 3 for these aspects of the Project. Namely this includes:

Closure of Herschel Street (north of George Street)

Construction (Noise and Vibration)

- Assessment of similar activities, i.e. Earthworks, Hardstand Construction, Stockpile Management, Ground Remediation and Finishing Works undertaken in RfPC-3.
    - Construction of pocket park expected to be substantially quieter than loudest activity previously assessed (demolition of BTC East Tower and Hotel Jen) despite being slightly closer to the western façade of the courts, Abbey Apartments and Meriton Apartments.
    - Demolition of old pedestrian footbridge connecting BTC Tower to George Street generally closer to courts than proposed construction activities

Operational (Noise and Vibration)

- Originally proposed in RfPC-1 and assessed in Traffic Impact Assessment (Appendix A, Attachment A).
    - Traffic report does not anticipate material changes in traffic volumes – No significant change in noise emissions from transport noise expected (<1 dB)

Reversal of decision to lower and relocate INB underground connection.

Construction (Noise and Vibration)

- Reversal of cut-and-cover construction of subterranean INB connection and section of route between the old BTC East Tower and intersection underneath the eastern end of Emma Miller Place. This will significantly reduce the additional spoil haulage required (15 trucks per hour down to 6 as per RfPC-4)
- No extension of the previously approved construction worksite to the east of the current Roma Street worksite (Lot 60 adjacent to the old Hotel Jen) is required to support excavation of the subterranean INB connection. Construction noise impacts in the area will be lower as a result of this change.

Operational (Noise and Vibration)

- Reversing the changes leaves the INB untouched with traffic impacts understood to be substantially similar to existing operation which does not require assessment.

Reversal of decision to realign Parkland Boulevard and connect with Herschel Street

Construction (Noise and Vibration)

- Reversing the proposed connection of Parkland Boulevard with Herschel Street brings the proposed design in line with RfPC-1-3.
- As no changes to the existing alignment are proposed (including no closure of the existing connection to Roma Street), no assessable impacts exist as part of the proposed change.

Operational (Noise and Vibration)

- Reversing the proposed connection of Parkland Boulevard with Herschel Street brings the proposed design in line with RfPC-1-3.
- As no changes to the existing alignment are proposed (including no closure of the existing connection to Roma Street), no assessable impacts exist as part of the proposed change.

Summary of Mitigation Measures

Construction Phase

The noise and vibration impacts as a result of the Proposed Changes align with the magnitude of the construction noise and vibration impacts assessed within the Evaluated Project for residential Sensitive Places.

Mitigation measures will be applied to manage the impacts of the Proposed Change as per the requirements of the current Coordinator-General's current Imposed Conditions, which include:

- Implementing specific mitigation measures consistent with current CEMP mitigation measures;
- conducting consultation with identified DAPs to provide information on the duration of works and level of noise impacts. This will occur in accordance with the Coordinator Generals Imposed Conditions, Appendix 1 Condition 9 and the approved TSD Community Engagement Plan;
- monitoring of noise levels during high noise emission works to confirm noise impacts and the accuracy of the predicted noise levels to nearby Sensitive Places and adjust mitigation measures where relevant;
- additional noise and/or vibration monitoring in response to complaints;
- reviewing construction methodologies to assess if alternative equipment can be used (e.g. substituting a 13T excavator for a 6T excavator would theoretically achieve a 4dB(A) reduction for the same Project works within the same footprint); and
- where there is no alternative to undertaking construction works during Non-Standard Hours, noise intensive works planned to be scheduled where practicable during less disruptive periods of the Non-Standard Working Hours shift, such as in the early evening.

As the mitigation measures are consistent with the existing EMF and have been successfully implemented to date during construction of the Project, no changes are required to the Project OEMP, the CEMP nor the Imposed Conditions.

Operational Phase

As outlined above, the alterations to the operational aspects of the Cross River Rail project as a result of this RfPC are consistent with or no worse than what has previously been assessed as part of the project. As such, no further assessment of operational impacts is required and therefore no changes to the existing Imposed Conditions are recommended.

Cross River Rail Environmental Impact Statement – Volume 3 Attachment E

Request for Project Change-14

Changes to the Project and changes to the imposed conditions

Technical Report: Air Quality

Date: *April 2024*

Author: *Cross River Rail Delivery Authority*

CROSSRIVERRAIL

Queensland Government

Introduction

This technical report has been prepared for the CRR Project to assess the impacts to air quality as a result of the Proposed Changes under RfPC-14 to the Evaluated Project. The Proposed Changes are described in "*Cross River Rail Request for Project Change Volume 1 Section 1*".

This RfPC is proposing changes that alter the project design as proposed and approved in RfPC-4, by reverting to a pedestrian movement design for Roma Street station similar to that presented in RfPC-1. In addition, this RfPC proposes the removal of the Inner Northern Busway relocation and associated changes to the Parkland Boulevard/Roma Street intersection from the description of the Project.

To facilitate the closing Herschel Street to vehicles between George and Roma Streets and installing pedestrian, active transport and landscaping arrangements to support a safe, effective and efficient movement of passengers from the adjoining Supreme and Magistrate Courts and George Street precincts across Roma Street to the station precinct.

As the INB will no longer be changed from its existing alignment, there would be no impact on existing traffic conditions and therefore no significant effect on traffic related emissions and air quality. This Air Quality Technical Memo focusses on the closure of Herschel Street only.

Methodology

The methodology used for the assessment of air quality impacts associated with the Proposed Changes consisted of:

- An initial qualitative review to determine which changes would be likely to result in a material air quality impact.
- A comparison of the scale of works of the Proposed Changes with that assessed for the Evaluated Project.
- Consideration of changes to work locations potentially resulting in works being closer to sensitive receptors.

State legislation governing air quality was updated in 2019. The Environmental Protection (Air) Policy 2019 includes relevant air quality objectives, such as particulate matter. This update to legislation has not changed the relevant air quality objectives from that assessed for the Evaluated Project.

Existing air quality and air quality goals

Background air quality information used in the original assessment, as well as the air quality goals for the projects are shown in Table 1.

There are no additional pollutants that need to be considered as part of RfPC-14 due to changes in legislation or requirements. The air quality goals apply at areas off site where members of the public are exposed for time periods comparable with the air quality goal averaging period.

A review of data from the nearest monitoring stations used to determine the background concentrations in Table 1 for 2022 was carried out to ensure there had been no significant changes in existing air quality conditions since the assessment for RfPC-1 was undertaken. Monitored annual average PM10 and PM2.5 concentrations for 2022 were found to be similar to those background concentrations in Table 1 and therefore these remain valid.

Table 1 Background concentrations of air quality indicators against CRR Project goals

Air quality indicator	Averaging period	Units	Background concentration	Air quality goal	Criterion
TSP	Annual	$\mu g/m^3$	24	90	Human health
PM10	24 hours	$\mu g/m^3$	17	50	
	Annual	$\mu g/m^3$	14.5	25	
PM2.5	24 hours	$\mu g/m^3$	8.3	25	
	Annual	$\mu g/m^3$	6.5	8	
Dust deposition	30 days	$mg/m^2/day$	60	120	Nuisance
TSP	24 hours	$\mu g/m^3$	26	80	No changes proposed. (As per RfPC-3)

Changes to Potential Impacts

Assessment Methodology

A qualitative assessment approach has been completed to determine any potential material changes to the predicted air quality impacts detailed in the Evaluated Project, from the closure and transformation of Herschel Street.

It is not considered that these changes warrant any detailed assessment such as dispersion modelling. The main dust-generating activities that would occur in this area would continue to be limited to site excavation and spoil removal and transportation previously assessed in the Evaluated Project.

Therefore, the methodology used is as follows:

- Determine the type and proximity of sensitive receptors from the site.
- Establish predicted changes to traffic movements at the site.
- Provide commentary on the likelihood of localised air quality impacts and potential mitigation measures.

Site Location – Herschel Street Pocket Park

The site is in an urban area within the Brisbane Central Business District (CBD). It is bounded by George Street, Roma Street and Herschel Street.

There are sensitive community and open space receptors immediately adjacent to the site. The closest residential receptors to the site, is the Abbey Apartments approximately 80m west and the Meriton Apartments approximately 60m to the south. There is also a hotel and backpacker accommodation to the south of Roma Street.

Sensitive receivers are likely to include office workers in the area and transient receptors such as community members and train passengers enter/leaving the station complex. Residential receivers nearby may also be affected depending on wind direction.

Potential Construction Impacts

Minor removal works and construction at the Herschel Street site, such as resurfacing of the road and extending the landscaping of the park, has the potential to result in minor dust generation as well as some exhaust emissions associated with construction traffic travelling to and from the site. Impacts are likely to be similar to those identified in the Evaluated Project, noting that this site required significantly less dust generating activities than other construction sites and works associated with the Evaluated Project, and could be effectively managed by the implementation of standard dust management measures as per requirements of the existing Imposed Conditions, EMF and approved CEMP.

With regard to construction traffic, limited vehicle movements are anticipated and onsite machinery would only be required for short periods of time. These impacts would not be significant compared to the construction traffic movements assessed for the Evaluated Project.

Dust management measures outlined in the Outline Environmental Management Plan (OEMP) would also be implemented during the construction phase at the site to manage dust generation and minimise dust spread. Not all measures are likely to be required given the size and scale of construction works for the site, but best practice should be implemented to minimise dust generation as far as practicable. According to the OEMP, dust monitoring would continue as is currently being reported upon within the required Monthly Environmental Reports.

While the predominant wind direction in Brisbane is south-westerly and receptors downwind (i.e. north-east of the site) are likely to be most impacted during construction, the nearest sensitive receptors are south-west and south-east of the site. Site specific dust deposition monitoring would continue as is currently being reported upon within the required Monthly Environmental Reports would be representative of impacts at nearby sensitive receptors.

There is no requirement for any additional air quality monitoring to be installed to monitor construction associated with the closure of Herschel Street.

A comparison of RfPC-14 impacts with the Evaluated Project are shown in Table 2.

As the mitigation measures are consistent with the existing EMF, no changes are required to the Project OEMP, the CEMP nor the Imposed Conditions.

Potential Operational Impacts

The closure of Herschel Street is not anticipated to have an adverse impact on traffic movements on the local road network, therefore it is considered to have no significant effect on traffic related emissions and air quality. A comparison of RfPC-14 impacts with the Evaluated Project are shown in Table 2.

Changes to Mitigation Measures

The air quality management measures described in the Project's OEMP are relevant and should be implemented across the changed Project. General dust suppressant measures should be implemented at all locations where works are to be carried out.

Recommendations and Conclusion

This technical note established that additional construction (removal of a section of Herschel Street and construction of active travel facilities and a pocket park) is not expected to result in any material change to the predicted air quality impacts presented in the Evaluated Project.

Retaining the Inner Northern Busway in its existing alignment is also not anticipated to result in any material change to existing air quality impacts or the predicted air quality impacts presented in the Evaluated Project.

With effective management measures outlined in the OEMP the CRR Project air quality goals would not be exceeded based on existing levels in the area and the likely scale of impact associated with the RfPC-14 activities. Table 2 summarises the construction and operational impacts and mitigation measures required for the Evaluated Project and works assessed as part of RfPC-14. Therefore, no required changes to the existing Imposed Conditions have been identified.

Table 2 Impact comparison with the Evaluated Project

Assessment factor	Evaluated project	RfPC-14	Change comparison
Construction impact	Dust generation from construction activities.	Dust generation from construction activities.	No material change from Evaluated Project
Operational impact	No significant effect on air quality	No significant effect on air quality	No material change from Evaluated Project
Mitigation	Dust monitoring and dust suppression specified	Apply mitigation specified in the assessment of the Evaluated Project	No material change from Evaluated Project