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Subject Cross River Rail Request for Project Change 3 – Traffic Assessment Technical Note

1 Introduction

The 2011 EIS for CRR contained a construction site to the east and west of Parkland Boulevard/Parkland Crescent, east of Hotel Jen (refer to Figure 1). 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 (refer to Figure 2). RfPC-2 (June 2018) addressed the temporary solution for the relocation of the Roma Street Coach Terminal (refer to Figure 2).

The subject of RfPC-3 is to consider the demolition of the Brisbane Transit Centre (BTC) (East Tower) and Hotel Jen (refer to Figure 3). This work required as part of RfPC-3 involves new property impacts, and additional demolition works not previously assessed.

The demolition will occur over a 7-month period. Buildings within Lot 1 on SP207220 are proposed to be demolished sequentially with Hotel Jen and BTC (East Tower) first, followed by the Podium and BTC (West Tower). The temporary utilisation of the adjacent open space park is proposed for demolition access and worksite. The additional demolition work will occur before construction of the CRR Project, as part of the required early works. The construction of the temporary Roma Street Coach Terminal is unlikely to overlap with the demolition of Hotel Jen and the BTC (East Tower).

The purpose of this technical note is to review the EIS, the RFPC-1 and the RfPC-2 traffic-related approved works and impacts and compare these with the works and impacts associated with the RfPC-3 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 traffic (including pedestrians, cyclists and bus) impacts to at Roma Street and the surrounds during the demolition works of the BTC (East Tower) and Hotel Jen.

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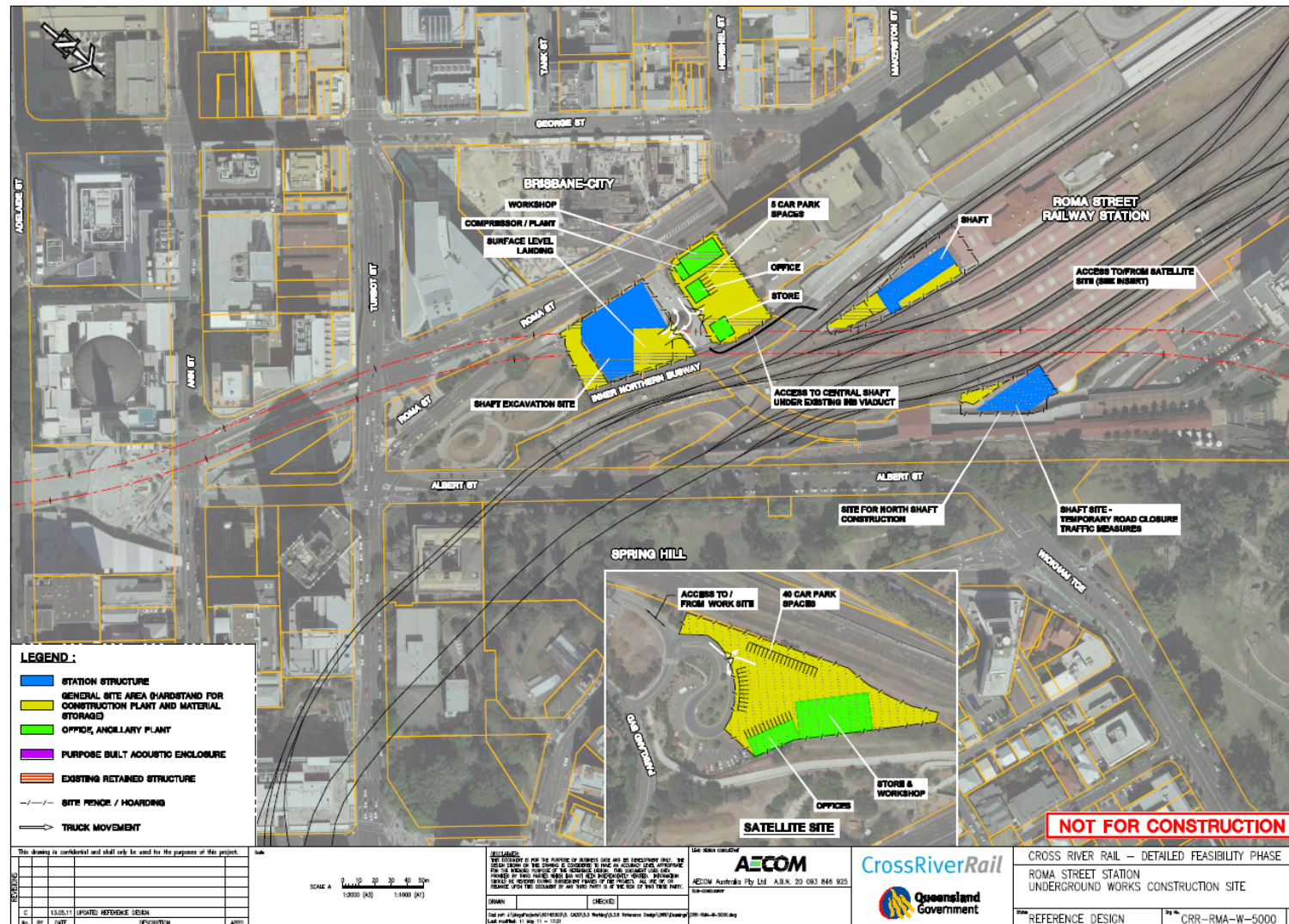


Figure 1: 2011 EIS construction site – Roma Street

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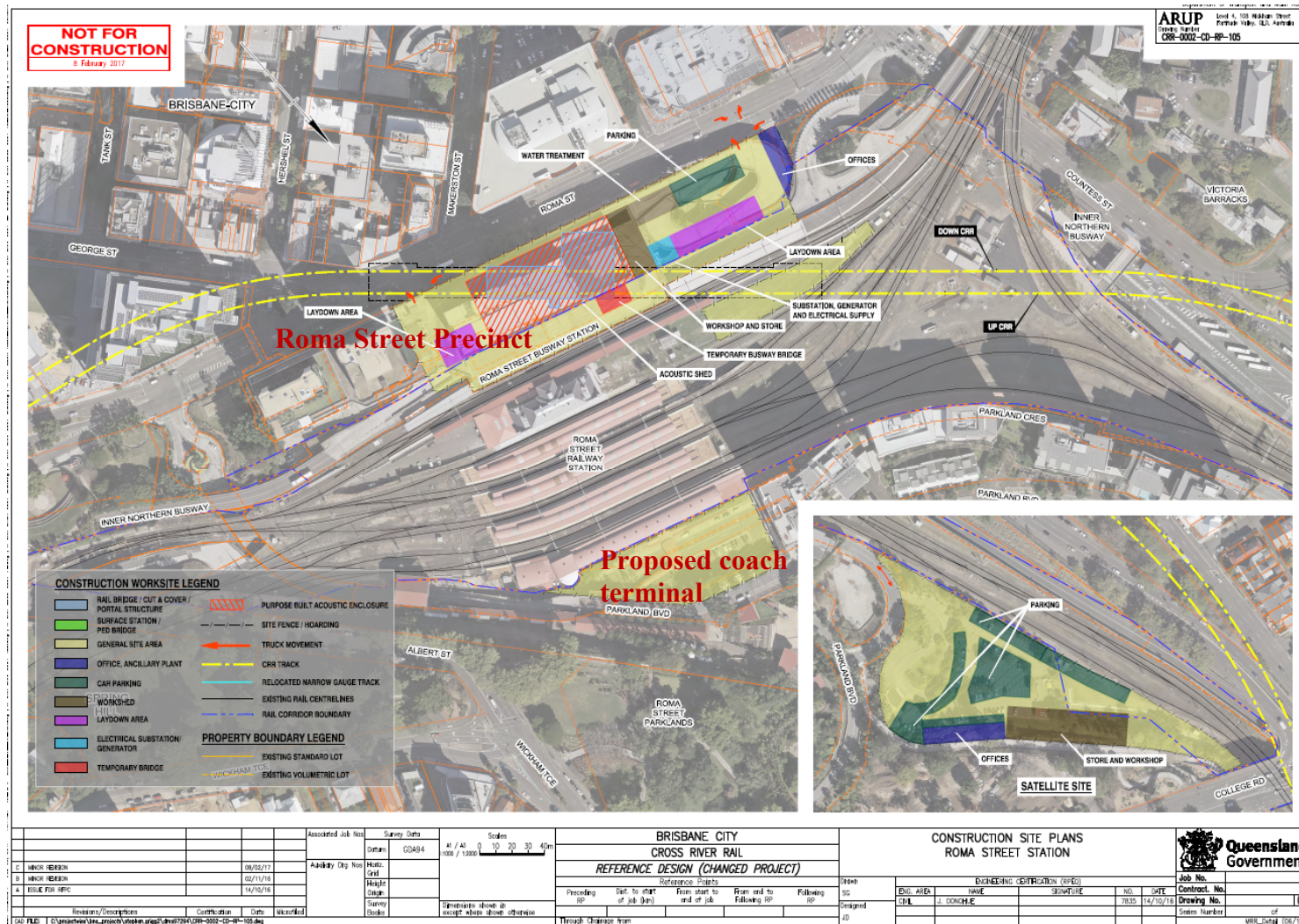


Figure 2: 2017 RfPC 1 construction site and RfPC 2 proposed coach terminal site

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Figure 3: RfPC 3 proposed demolition works

2 CRR Project Approved Work and Impacts

The design progression of the sites relevant to this project is summarised in Table 1. The purpose of this technical note is to compare the impact of RfPC-3 against the previous reviews. Further detail regarding the changes included in each document are summarised further in the following pages.

Table 1: CRR Progression

Location	2011 EIS	2017 RfPC-1	2018 RfPC-2	2018 RfPC-3
Roma Street Station	Redeveloped but remains in the current location.	Relocates site approximately 150m to current BTC site.	As per 2017 RfPC-1	As per 2017 RfPC-1
Brisbane Transit Centre (including Coach Terminal)	No changes proposed.	Demolished as part of Roma Street relocation. Requires relocation of coach terminal (before demolition) and removal of ~600 car parking spaces.	As per 2017 RfPC-1	As per 2017 RfPC-1 but including demolition of the BTC (East Tower) and Hotel Jen and removal of ~190 car parking spaces.
Parkland Crescent Carpark Area	No changes proposed (however worksite proposed on the eastern end of the crescent).	Construction laydown area.	Proposed relocated coach terminal site.	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 proposed changes to the roundabout. Upper level to be utilised for pick-up/drop-off (adjacent to escalators and café).	No road closure required.
Hotel Jen	No proposed changes.	No proposed changes.	No proposed changes.	Proposed demolition

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2.2 2011 EIS

A summary of the identified impacts of the 2011 EIS is presented in Table 2.

Table 2 Construction impacts as per 2011 EIS

Mode	Construction impacts as per 2011 EIS
Vehicle Traffic	Closure of the roundabout on Parkland Boulevard (north of Roma Street) was identified as a permanent change but was brought forward to the construction stage. Closure of the westbound lane of Parkland Crescent, between Platform 10 and the Parkland Boulevard intersection. This is proposed to be managed by utilising the eastbound lane in a contraflow traffic arrangement, which would result in minor delays in accessing and egressing the station.
Car parking at Parkland Crescent	Car park to be retained.
Pick-up/drop-off at Parkland Crescent	Access to be retained.
Pedestrians	Worksite C would require the closure of the pedestrian footpath on the southern side of Parkland Crescent. A pedestrian detour would be required commencing at the Parkland Boulevard / Roma Street intersection and diverting pedestrians through Roma Street Station.
Cyclists	The worksite is not anticipated to impact cycle activity significantly, although cyclists will have to follow detours put in place for vehicles due to the closure of the westbound lane of Parkland Crescent.
Property Access	To be maintained. Possible minor diversions (and traffic control where required) in place at times.

2.3 2017 RfPC-1

A summary of the identified impacts of the 2017 RfPC-1 is presented in Table 3.

Table 3 Construction impacts as per 2017 RFPC-1

Mode	Construction impacts as per 2017 RFPC-1
Vehicle Traffic	As per 2011 EIS
Car parking at Parkland Crescent	Approval for the loss of the 32 car parks displaced by the worksite for the five-year construction period.
Pick-up/drop-off at Parkland Crescent	Not addressed. However, assume this would be impacted if the westbound lane of Parkland Crescent was required to be closed for construction.
Pedestrians	Potential for worksite to require the closure of the pedestrian footpath on the southern side of Parkland Crescent. If this is the case, it was proposed that a pedestrian detour would be provided.
Cyclists	The worksite is not anticipated to impact cycle activity, although cyclists will have to follow detours put in place for vehicles due to the closure of the westbound lane of Parkland Crescent.
Property Access	To be maintained. Possible minor diversions (and traffic control where required) in place at times.

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2.4 2018 RfPC-2

A summary of the identified impacts of the 2018 RfPC-2 is presented in Table 4.

Table 4 Construction impacts as per 2018 RfPC-2

Mode	Construction impacts as per 2018 RfPC-2
Vehicle Traffic	No expected increase in general vehicle traffic volumes compared with existing. Access to Parkland Crescent is to be maintained at all times. Construction may require the occupation of some segments of the roadway adjacent to the site. Management of this closure may include implementing a contraflow traffic arrangement. Exact number of construction vehicles expected to be less than that from the 2017 RfPC-1
Car Parking at Parkland Crescent	All car parking removed to accommodate coach terminal. Relocation requirements not considered as part of this project.
Pick-up/drop-off at Parkland Crescent	Unconfirmed at this stage if existing facilities on Parkland Crescent will remain open during construction. If this is not the case, it is recommended that a pick-up/drop-off zone on Parkland Boulevard shall be provided before the commencement of construction on Parkland Crescent to maintain pick-up/drop off functionality of the area.
Pedestrians	Pedestrian access to be maintained at all times during construction. In some instances, this may involve detours and minor delays.
Cyclists	The worksite is not anticipated to impact cycle activity significantly, although cyclists will have to follow detours put in place for vehicles as a result of lane closures on Parkland Crescent. Impacts during construction expected to be similar to the schemes presented in the 2011 EIS and the 2017 RfPC.
Coaches	No impacts (existing coach terminal at BTC remains open during construction of new facilities).
Property Access	To be maintained. Possible minor diversions (and traffic control where required) in place at times.

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3 Material changes to impacts

3.1 Site location

The changes to property impacts include:

- Increase of impact area to Lot 1 on SP207220 to include the entire lot and the demolition of Hotel Jen and the BTC (East Tower);
- Partial new impact area within Lot 60 on SP207215; and
- Lot 35 on SP207219 not previously impacted by the project.

Buildings within Lot 1 on SP207220 are proposed to be demolished sequentially with Hotel Jen and BTC (East Tower) first, followed by the Podium and BTC (West Tower). The property impact areas are shown in Figure 4.



Figure 4 Site location and property impact areas

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3.2 Assessment methodology

The assessment undertaken to determine the traffic effects of demolition works includes:

- Review of traffic volumes added to Roma Street as a result of the heavy vehicles required movement in comparison with the baseline traffic flows;
- Swept path assessment of haulage trucks along Roma Street; and
- Review of potential changes to access for pedestrians and cyclists using Roma Street.

3.3 Traffic volume review

Demolition of the two buildings is expected to be completed within seven months. It is anticipated that approximately 90,000 tonnes of material will need to be removed from the site as per estimation of waste volume conducted by Arup (2018).

In areas of high pedestrian and cycle activity such as Roma Street, articulated or dog trailer vehicles could present a hazard to road users, due to the swept paths and vehicles tracking across kerbs at intersections, as well as road users failing to observe the trailer component of the vehicle when crossing the road. Therefore, it is suggested that the largest vehicle permitted would be the standard three axle semi-trailer which can carry up to 24 tonnes.

Based on approximate 31 working weeks within seven months, on a 12 hours / 6 days operation week as per approved working hours, it is anticipated that at least 500 tonnes of material can be removed from the site each day, which can be completed with approximately two vehicles per hour (or 4 movements per hour). To allow for possible restrictions during peak periods and unforeseen delays in the program, a total of approximately 4 vehicles per hour is adopted as the worst-case scenario.

It is noted that construction of the proposed coach terminal (refer to RfPC-2) estimated that a maximum of 3 construction vehicles are expected during peak hours. Although it is unlikely that construction vehicles of the two sites could overlap, in the event an overlap occurs, it is assumed that total vehicles will be below the estimated spoil haulage and delivery vehicles resulting from construction (at least ten heavy vehicles in peak hour) analysed in the worst-case scenario assessed in the 2011 EIS. Therefore, considering that this increase in volume would occur before the commencement of main CRR works, it is not expected to impact on the road network operation significantly.

3.4 Swept path analysis

The proposed routes identified in the 2011 EIS are assumed for this analysis, as per shown in Figure 5. It is noted that the truck routes shown represent one feasible way of routing trucks carrying spoil to and from the worksites. The contractor, in determining their Construction Traffic Management Plans, may propose other alternative routes. Heavy vehicle routes for the delivery of plant and materials are likely to have varied origins and destinations, and as such are expected to approach and depart the worksites using a variety of routes.

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Figure 5 - Proposed haulage access routes as per 2011 EIS

Access to the worksite would be provided from Roma Street in two stages. Stage one would include the demolition of the BTC East Tower, during which vehicles would access from the northern leg of Roma Street (current access to the Hotel Jen) via Herschel Street and exit via Roma Street by using the adjacent open space park. Stage two would include the demolition of the Hotel Jen and would start once the BTC East Tower lot has been cleared, stage during which vehicles will access and exit via this lot. The proposed stages are shown in Figure 6.

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Stage 1 – Demolition of BTC East Tower

Stage 2 - Demolition of Hotel Jen

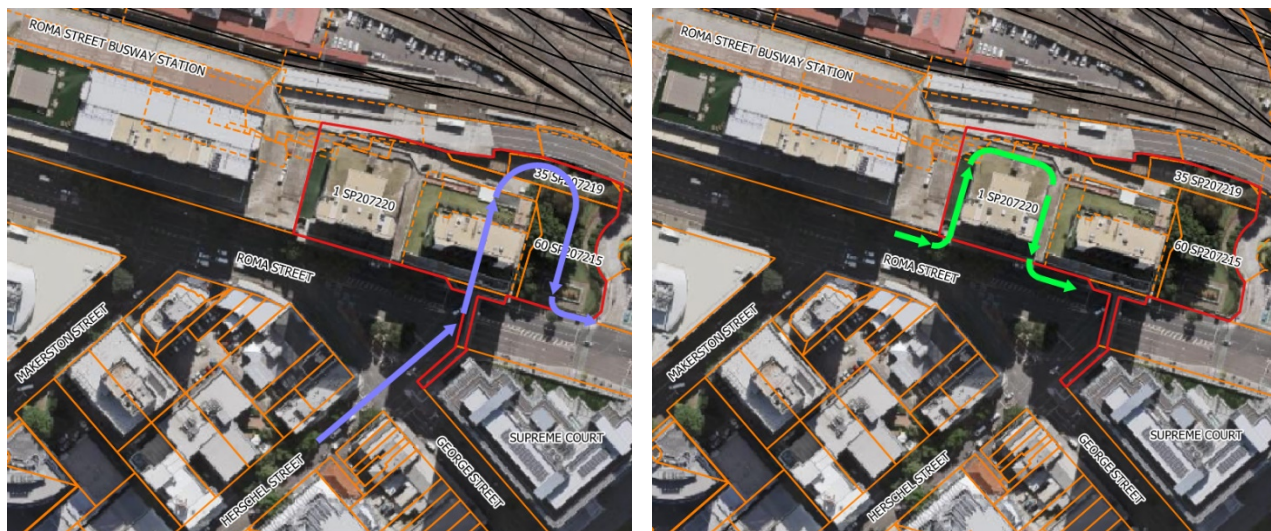


Figure 6 - Haulage access and exit points during demolition works

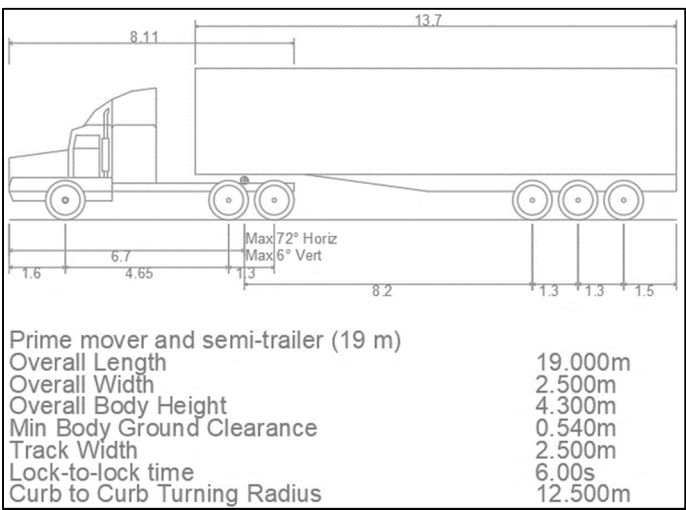


Figure 7 Common 3 axle semi-trailer profile

It is noted that the following analysis is based on aerial images given that a terrain survey was not available at the time of writing. Therefore, vehicle size and road dimensions utilised in this analysis are assumed to provide an approximate image of the scenario.

Therefore, to ensure a conservative analysis, a sweep path assessment has been completed with a 19 meter 3 axle semitrailer. As shown in Figure 8, a prime mover (or smaller vehicle) would be able to enter and exit the site during stage one in a forward gear with a minimum 300mm clearance on either side of the vehicle. However, a semitrailer would not be able to maneuver in/out of the waiting bay should any other vehicle be located within its designated servicing area.

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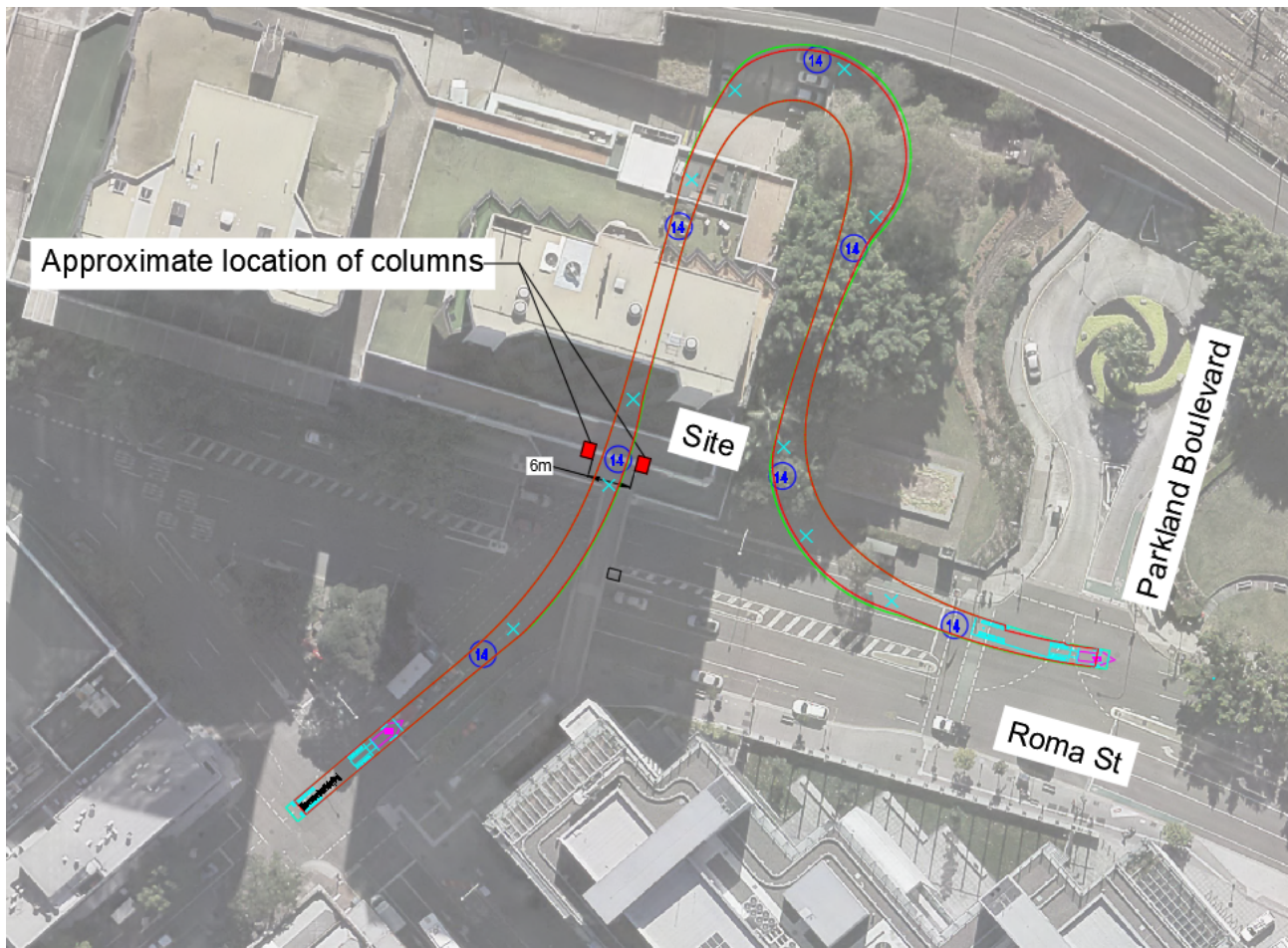


Figure 8 - Swept path analysis for Stage one – Forward in from Herschel Street

The swept path analysis also shows that accessing the site during stage two, eastbound from Roma Street, via a one-way in/one-way out setup adjacent to Roma Street is also possible by straddling the two lanes. Note that this operation is permitted under current Queensland road rules (Figure 9).

Height clearance through Hotel Jen has been reviewed and is sufficient to ensure large heavy vehicles can access safely.

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Figure 9 – Swept path analysis for Stage two – left in from Roma Street

Once the vehicle is loaded, exiting the site will also need to be controlled to mitigate the risk of an accident where Roma Street vehicular traffic could be involved.

Given that this analysis only provides a desktop review of the operation, it is recommended that the maneuver be confirmed with project stakeholders by completing a Road Safety audit to ensure that any impact on Roma Street is mitigated.

It is recommended to minimise heavy vehicle activity during peak times and assist the movement of heavy vehicles with traffic controllers to reduce disruption to the road network and ensure the safety of road users.

It is also noted that modifications to the grade of the adjacent open space park are required to ensure heavy vehicles can exit the site. The open park space is at a higher elevation from the road therefore some levelling will be required. Modifications to be confirmed in the construction phase once a survey of the site is completed.

3.5 Existing car parking spaces

Demolition of the BTC (East Tower) and Hotel Jen will include the loss of approximately 190 car parking spaces.

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The existing BTC car park is principally used by tenants of the transit centre office buildings as well as some paid car parking for CBD commuters. With the demolition of the office buildings, there may be reduced car parking demand at Roma Street Station.

3.6 Pedestrian bridge

An existing pedestrian bridge at the Roma Street and Hershel Street intersection allows BTC customers to overpass Roma Street to and from the CBD. Due to the structural connection of the bridge to the Hotel Jen building, it is likely that the bridge will also be removed. Demolition works of the bridge will involve a temporary closure of Roma Street and the footpath along this section.

Therefore, a moderate impact to the road network is anticipated and is proposed to be controlled by completing the works during periods of lowest demand of traffic and pedestrians on the road network (i.e., Night hours). Mitigation plan to also include coordination with BCC and qualified traffic management controllers. Potential noise impacts from removal of the bridge will depend on the method of removal and may be minimal if the structure is removed by crane. The nearest noise sensitive receiver to the bridge is the supreme court, therefore removal outside of standard hours would likely mitigate impacts to this receiver. Noise during the demolition will be managed through the contractor's Noise and Vibration Management Plan.

3.7 Pedestrians

As per the 2011 EIS, it is anticipated that pedestrian and cyclist access to may be delayed or temporarily detoured during works. Modifications to normal operations caused by the work site will need to be included in the Traffic Management Plan expected to be completed for the works.

A significant number of pedestrians use the footpath on the northern side of Roma Street, adjacent to the site. It is projected that this footpath will remain open during demolition works, although the effective width of the footpath is likely to be reduced (i.e., by the installation of site fencing). Temporary disruptions to the flow of pedestrians will be coordinated by authorised traffic controllers if required, to ensure safety to users and demolition workers.

The existing bridge over the intersection of Roma Street and Herschel Street that caters for pedestrians in and out the BTC will most likely need to be removed due to its structural connection to the Hotel Jen building. Preliminary observations of the site suggest that a significant number of pedestrians frequent this bridge which provides a safe and effective linkage to and from the Brisbane CBD. The bridge location is shown in Figure 10.

In order to mitigate the impact of the loss of this pedestrian crossing, alternative crossing options will need to be provided. This will lead to a requirement for significant modifications to traffic signals at nearby intersections along Roma Street.

A SIDRA assessment of the Roma Street / Herschel Street intersection below the crossing has been undertaken based on a traffic count survey data collected on 15 March 2018 for AM and PM peak periods. In the analysis, it was assumed that to mitigate the impact of the closure of the subjective bridge, the Roma Street / Herschel Street intersection would be modified to provide signalised pedestrian crossing movements.

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Figure 10 Pedestrian bridge location

3.7.1 SIDRA analysis

The intersection analysis was undertaken using the SIDRA Intersection 8.0 package. In order to quantify the intersection performance, the following performance measures have been reported:

- Degree of Saturation (DOS) (%) – This is the ratio of demand flow to capacity. For a signalised intersection, the DOS should remain below 90%;
- Average Delay (sec) – The average delay per vehicle in seconds incurred by vehicles over the modelled time period;
- Level of Service (LOS) – An index of the operational performance of traffic on a given approach based on average delays; and
- 95th percentile Queue – A queue length measured in metres of which only 5% of queues are equal to or greater than.

3.7.2 Scenarios assessed

The Roma Street / Herschel Street intersection was assessed based on the following scenarios to effectively capture the anticipated impact from the demolition of the bridge:

- Base year 2018 – assess the intersection based on current (2018) traffic data for the AM and PM peak periods to demonstrate the current operational condition of the intersections.
- Post-demolition year 2019 – assess the intersection, assuming pedestrians will cross at the intersection at-grade. Due to the very high pedestrian demand demonstrated in the traffic count data, a scramble crossing arrangement has been assumed in the analysis to maximise the ability for pedestrians to cross. This scenario does not consider any growth in traffic as demolition is scheduled to start in early 2019. No additional impacts generated by other stages of the wider CRR project or other projects have been considered.

Layouts showing the two scenarios are presented in Figure 11 for reference.

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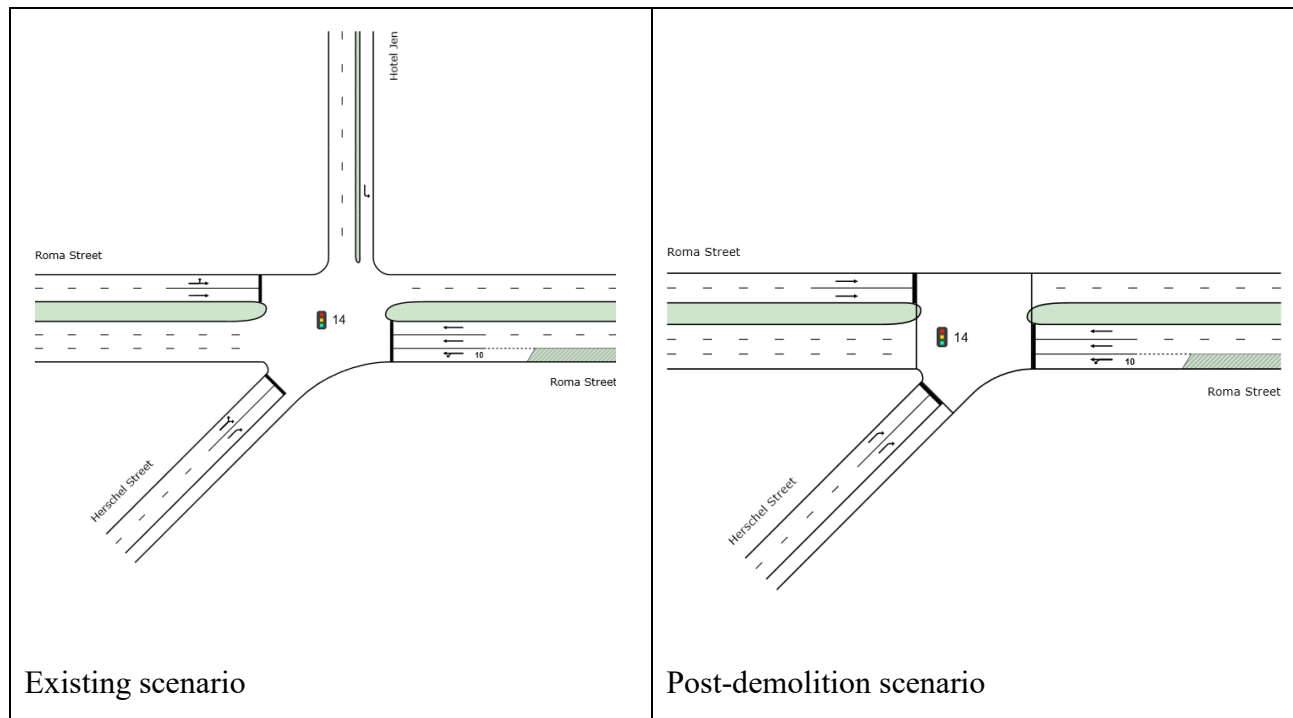


Figure 11 Scenarios layout

3.7.3 Assumptions and limitations

The following assumptions were incorporated into this analysis:

- Considering the CBD location of this intersection, an Area Type Factor of 0.9 has been incorporated into the SIDRA analysis to account for the effects of the operating environment;
- It is assumed at this stage that pedestrians will continue to travel to and from the BTC after demolition; and
- Thursday is assumed to be the peak day of the week based on previous surveys conducted in the CBD. Traffic data was collected on Thursday 15 March 2018.

3.7.4 Traffic volumes

Results of the survey used for the SIDRA analysis for light vehicles and heavy vehicles are provided in Figure 12 and Figure 13 respectively. The number of pedestrians currently using the bridge in peak hours is also shown on the right-hand side of the figures.

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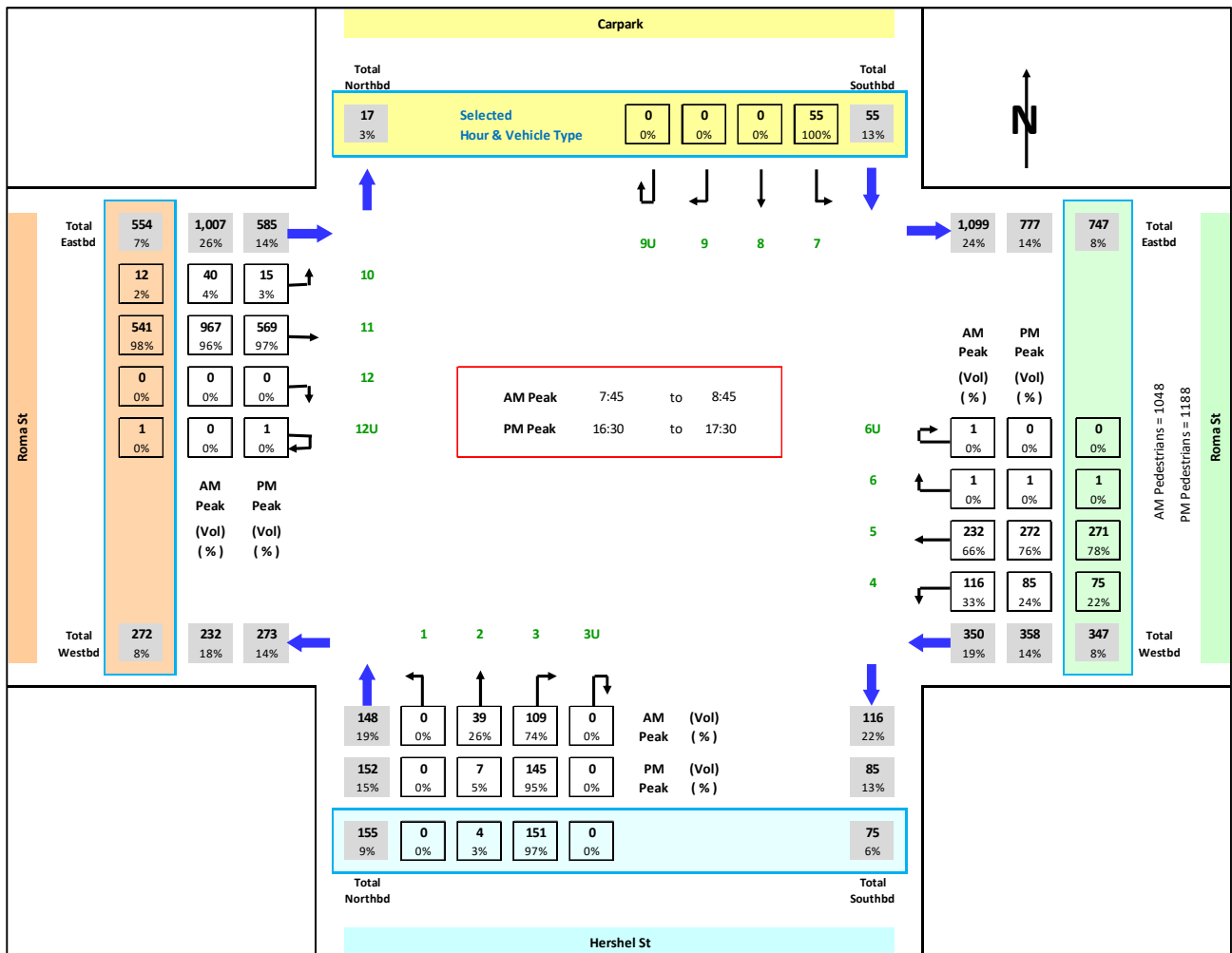
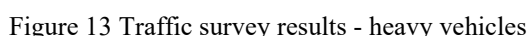


Figure 12 Traffic survey results - light vehicles

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The signal phase sequence proposed in the SIDRA model was extracted from a 2015 SATURN model provided by BCC (Refer for CRR-ARP-TN-RSP-TRA-002 for further information about the SATURN modelling). The proposed phasing sequence only adds one phase dedicated to pedestrian movement only.

In the current phasing sequence, the intersection operates in a three-phase configuration and does not include a pedestrian phase. This phasing sequence has been slightly amended and optimised in the future scenario assessment to accommodate the pedestrians and to maintain an acceptable level of service. As a very high number of pedestrians are expected to cross this intersection in the post-demolition scenario, the optimisation prioritises the pedestrian movements over vehicle performance. Figure 14 and Figure 15 shows the phasing sequence considered in existing and future year scenarios respectively.

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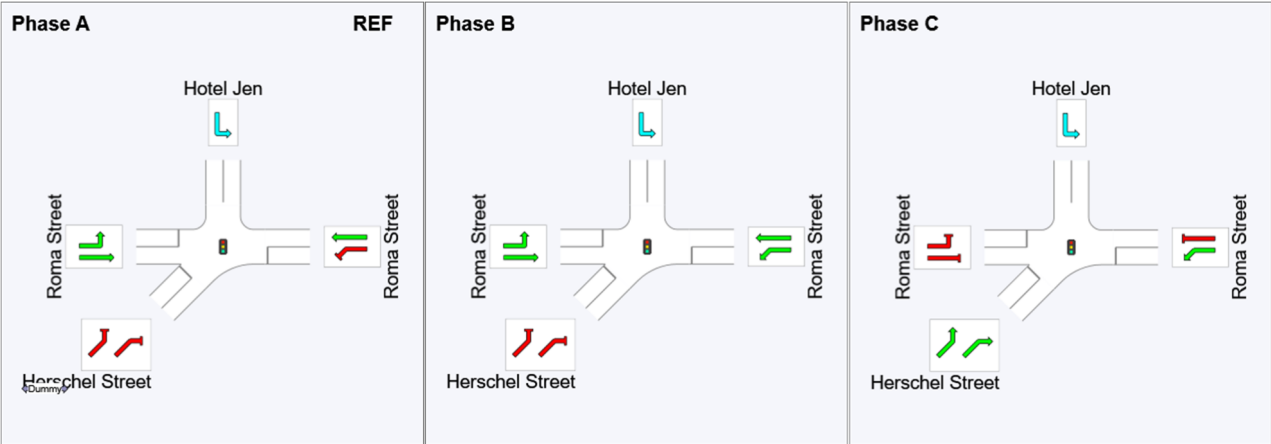


Figure 14 Output phase sequence for the existing scenario

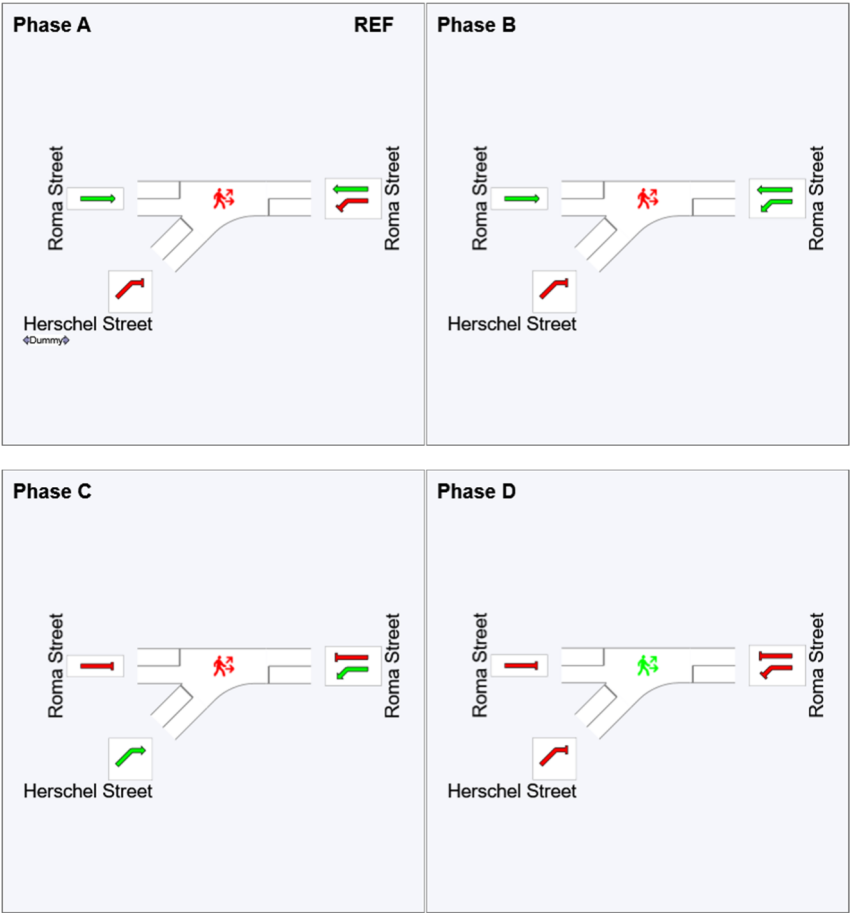


Figure 15 Output phase sequence for the post-demolition scenario

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3.7.6 Analysis results – existing scenario

Results obtained from the analysis for the existing scenario are presented in Table 5.

Table 5 SIDRA analysis results for the existing scenario

Existing 2018		AM Peak					PM Peak				
Mov ID	OD Mov	Demand flows (veh/h)	DOS (v/c)	Average delay (Sec)	Level of service	% Back of queue (m)	Demand flows (veh/h)	DOS (v/c)	Average delay (Sec)	Level of service	% Back of queue (m)
East Roma Street											
4a	L1	123	11%	8	LOS A	12	80	12%	18	LOS B	13
5	T1	261	11%	6	LOS A	13	294	12%	6	LOS A	14
Approach		384	11%	6	LOS A	13	374	12%	8	LOS A	14
North Hotel Jen											
7	L2	25	2%	3	LOS A	0	58	4%	3	LOS A	0
Approach		25	2%	3	LOS A	0	58	4%	3	LOS A	0
West: Roma Street											
7	L2	42	45%	12	LOS B	69	13	27%	11	LOS B	35
8	T1	1048	45%	7	LOS A	69	609	27%	6	LOS A	35
Approach		1091	45%	7	LOS A	69	622	27%	6	LOS A	35
Southwest: Herschel Street											
10	L2	42	21%	27	LOS C	16	4	21%	27	LOS C	16
12	R2	117	21%	27	LOS C	16	159	21%	27	LOS C	16
Approach		159	21%	27	LOS C	16	163	21%	27	LOS C	16
All Vehicles		1659	45%	9	LOS A	69	1217	27%	9.5	LOS A	35

3.7.7 Analysis results – post-demolition scenario

Results obtained from the analysis for the existing scenario are presented in Table 6.

Table 6 SIDRA analysis results for the post-demolition scenario

Post-demolition		AM Peak					PM Peak				
Mov ID	OD Mov	Demand flows (veh/h)	DOS (v/c)	Average delay (Sec)	Level of service	% Back of queue (m)	Demand flows (veh/h)	DOS (v/c)	Average delay (Sec)	Level of service	% Back of queue (m)
East Roma Street											
4a	L1	123	22%	20	LOS B	3	91	29%	25	LOS C	23
5	T1	261	22%	18	LOS B	3	295	29%	22	LOS C	29
Approach		384	22%	19	LOS B	3	385	29%	23	LOS C	29
West: Roma Street											
11	T1	1048	83%	30	LOS C	19	639	63%	25	LOS C	73
Approach		1048	83%	30	LOS C	19	639	63%	25	LOS C	73
Southwest: Herschel Street											
12	R2	117	40%	38	LOS D	2	153	52%	38	LOS D	19
Approach		117	40%	38	LOS D	2	153	52%	38	LOS D	19
All Vehicles		1549	83%	28	LOS C	19	1177	63%	26	LOS C	73

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Although results show that the intersection will still operate within the acceptable level of services for a CBD intersection, it is possible that some queue will impact on the Roma Street /Makerston Street pedestrian intersection. Due to limited data availability of the origins and destinations of the pedestrians currently using the bridge, this analysis only provides a conservative summary of the anticipated impacts based on current traffic demand volumes.

It is recommended that a more detailed assessment be undertaken in the proceeding stages of this study to effectively capture the wider road network impacts associated with the proposed bridge closure. This may include analysis of this intersection in conjunction with other nearby intersections to identify the effects of coordination.

3.8 CityCycle

It is anticipated that the CityCycle station in front of the BTC (East Tower) and Hotel Jen will need to be removed due to the reduction of the effective footpath width. A suitable area for relocation may be available nearby (i.e., eastern side of Parkland Boulevard). Relocation will have no significant impact on the road network.

3.9 Cyclists

Previous surveys organised by Arup (2018) showed that Roma Street currently caters for over 30 heavy vehicles in a single direction during peak times. As demonstrated before, additional volume generated by the site is estimated to be approximately two heavy vehicles. Generally, the limit for when impacts do not need to be considered is when the increase is under 5% (refer to TMR's Guide to Traffic Impact Assessment). In this case, the impacts are slightly above 5%. However, in vehicle terms, the level of exceedance is less than one vehicle in each direction. Therefore, provided that drivers and riders follow the road rules, it is assumed that the on-road cycleway will not be impacted significantly.

Parkland Boulevard is a primary cycle route under the BCC bicycle network overlay and is identified as a priority cycle route on the South East Queensland Principal Cycle Network Plan (SEQPCNP). Parkland Boulevard is expected to remain open to cyclists during the demolition. However, cyclists may have to follow detours or experience temporary delays due to the proposed Roma Street access. This to ensure the safety of riders during heavy vehicles movements in and out of the site. It is recommended that operation of the site access be controlled by a Traffic Management Plan.

3.10 Bus services

A bus stop shelter and seat currently located on the northern footpath of Roma Street, adjacent to the site (as per Figure 16) appears to be a decommissioned Translink bus stop. Available information from the Translink portal (at the time of writing) does not indicate that bus services require this bus stop for boarding or alighting purposes. However, bus operations on Roma Street are currently under review as part of the wider CRR project; modifications could include the activation of this stop.

A total of three Translink bus services (Routes No. 61, 350 and 352) travel eastbound on Roma Street daily through the intersection of Parkland Boulevard and Roma Street. However, no

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significant disruptions or re-routing of these services are expected as a result of the demolition works.



Figure 16 - Decommissioned bus stop on Roma Street near Parkland Boulevard

No other Translink services on Roma Street were identified to be within the scope of the demolition works.

Bus network operation through the Inner Northern Busway will not be affected by the demolition works as the BTC (West Tower) will still be operational during works. Some minor disruptions to services are possible during demolition if required to ensure safety to users.

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4 Results and discussion

The demolition impacts on the various modes of transport as a result of the proposed demolition works are shown in Table 7 with proposed mitigation measures.

Table 7 Demolition impacts as per proposed RfPC-3

Mode	Demolition impacts as per 2018 RfPC-3
Vehicle Traffic	No expected increase in general vehicle traffic volumes compared with existing. Access to Parkland Crescent is to be maintained at all times. Management of access and exit points to the site from Roma Street will include implementing Traffic Management Control. Number of construction vehicles expected to be less than that from the 2017 RfPC-1 and would occur before the commencement of main CRR works. It is not expected to impact on the road network operation significantly.
Car parking at Parkland Crescent	As per RfPC-1
Roma Busway	No significant impacts expected on the Translink network operations
Pedestrians	Potential for the worksite to require temporary delays to pedestrians on Roma Street. If this is the case, it is proposed that a mitigation plan be provided and controlled by a Traffic Management Plan. Potential significant impact on Roma Street vehicular traffic as a consequence of closing the pedestrian bridge that links the BTC (East tower) to Herschel Street
Cyclists	The worksite is not anticipated to impact cycle activity on Roma St, although cyclists may have to follow detours or experience temporary delays due to the proposed Roma Street access and exit points. This to ensure safety of riders during heavy vehicles movements in and out of the site. It is recommended that operation of the site access be controlled by a Traffic Management Plan.
Coaches	No impacts (existing coach terminal at BTC remains open during demolition works).
Property Access	To be maintained. Possible minor diversions (and traffic control where required) in place at times.

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5 Conclusions and Recommendations

The following findings and recommendations are made as a result of this study:

- Additional traffic as a result of the demolition will not have a significant impact on the road network. However, due to spatial requirements/capacity impacts for turning movements – i.e. from the left/eastbound direction, it is recommended that consideration be given to these operations/movements only occurring outside of peak traffic periods.
- It is recommended that heavy vehicle traffic to and from the site be coordinated with the assistance of traffic management controllers;
- Public transport operations at the Inner Northern Busway, Roma Street Station and Roma Street bus stops are not expected to be significantly affected at this stage. However, modifications as part of the CRR project could include the activation of the decommissioned bus stop near the site.
- Closure of the pedestrian bridge that connects the BTC (East Tower) to Herschel Street could have an adverse impact on the road network. At this stage, it is assumed that pedestrian traffic to and from the BTC (East Tower) will be re-accommodated on the Roma Street/Herschel Street intersection. Minor changes to the signal phases at this intersection could facilitate pedestrian crossing movements. However, further analysis is recommended to be undertaken to capture the wider impact generated as a result of changes of origin-destination patterns.
- A list of the identified impacts and mitigation for each aspect is included in Table 8.

Table 8 Summary of key traffic issues from RfPC-3

Aspect	Approved project	RfPC 3 Change in traffic impacts (with mitigation)
Traffic Generation	The transport of demolition waste is expected to have minimal impact on existing traffic as demolition truck activity is unlikely to coincide with the main construction activities. 27 trucks per day peak delivery and six trucks per hour peak total from Roma Street construction.	No expected significant increase in general vehicle traffic volumes compared with existing. Approximately two heavy vehicles per hour (at peak four per hour) for the demolition. It is recommended to operate outside peak times to reduce any impact on the network and increase safety to road users.
Bus Network	The inbound bus stop at Roma Street adjacent to the worksite will need to be relocated in coordination with TransLink during the demolition phase. This may include moving the bus stop further east along Roma Street in front of the BTC (East Tower) for buses continuing along Roma Street. Services travelling via Herschel Street may temporarily be unable to stop at Roma Street. Establishment of the construction worksite may also result in temporary disruption to the Inner Northern Busway adjacent to Roma Street Station.	This bus stop appears to be inactive. However, modification as part of the wider CRR project could activate the stop. No significant disruptions or re-routing of Roma Busway services expected as a result of the demolition works. Demolition works should not have adverse implications on any other bus stops or services on Roma street. Minor disruptions to the INB busway operation are expected to ensure safety of users. This is to be coordinated with Translink during demolition works.
CityCycle	The CityCycle station in front of the BTC (West Tower) will need to be relocated in coordination with BCC.	Suitable area for relocation may be available nearby (i.e., eastern side of Parkland Boulevard). Relocation will have no significant impact on the road network.
Worksite Access	During construction, there will be two access points to the work site off Roma Street, one at either end of the worksite.	Access to the worksite would be provided from Roma Street. Operation to be assisted by Traffic Management Controllers.

Technical Note

246209

15 November 2018

Pedestrian and Cycle Movement	Some delays to pedestrian and cycle movements will be caused by vehicles accessing the worksite along Roma Street.	Signals on Roma Street to be modified to relocate flow from the pedestrian bridge expected to be closed as a result of the demolition works. Modifications will be modelled and coordinated with BCC before demolition works commence. Cyclists and pedestrians will have to follow temporary roadwork instructions put in place for vehicles at the Roma Street accesses.
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