



WAVERLEY TRAFFIC COMMITTEE MEETING

A meeting of the WAVERLEY TRAFFIC COMMITTEE will be held via video conference at:

10.00 AM, THURSDAY 28 MARCH 2024

Waverley Council
PO Box 9
Bondi Junction NSW 1355
DX 12006 Bondi Junction
Tel. 9083 8000
E-mail: info@waverley.nsw.gov.au

AGENDA

Apologies

Declaration of Interests

Adoption of Previous Minutes by Council - 22 February 2024 7

The recommendations contained in Part 1 - Matters Proposing that Council Exercise its Delegated Functions - of the minutes of the Waverley Traffic Committee meeting held on 22 February 2024 were adopted by Council at its meeting on 19 March 2024 with the following changes:

1. TC/C.01/24.02(2) – Bennett Street and Ewell Lane, Bondi – Pedestrian Safety Improvements

Council adopted the recommendation of the Traffic Committee subject to the deletion of clause 3 such that the recommendation now reads as follows:

That Council:

1. Installs a stop sign, associated stop line and a caution/beware pedestrian sign on the light post in Ewell Lane, Bondi, facing cars travelling westbound.
2. Installs 'piano key' line marking in Ewell Lane immediately east of the footpath at the intersection of Ewell Lane and Bennett Street.
3. Delegates authority to the Executive Manager, Infrastructure Services, to modify the design should on-site circumstances warrant refinements.

PART 1 – MATTERS PROPOSING THAT COUNCIL EXERCISE ITS DELEGATED FUNCTIONS

NOTE: The matters listed under this part of the agenda propose that Council either does or does not exercise the traffic related functions delegated to it by TfNSW. The recommendations made by the Committee under this part of the agenda will be submitted to Council for adoption.

TC/C STATE ELECTORATE OF COOGEE

TC/C.01/24.03 Charing Cross Streetscape Upgrade (SF23/19) 12

COUNCIL OFFICER'S PROPOSAL:

That Council:

1. Approves the installation of traffic devices, signs and line marking in the Charing Cross commercial precinct, between Carrington Road and Albion Street, Waverley, as shown in Attachment 1 of the report.
2. Delegates authority to the Executive Manager, Infrastructure Services, to modify the designs should

amendments be required.

3. Notes that:

- (a) The State road and traffic signal designs will be submitted to Transport for NSW (TfNSW) for approval, with any required design and signage changes being approved by TfNSW.
- (b) The Charing Cross Streetscape Upgrade Project was approved by Council in April 2023.
- (c) Contractors have been engaged to undertake early electrical works, commencing in April 2024.

TC/C.02/24.03 23 Yanko Avenue, Bronte - 'No Parking' Zone (A24/0156)..... 134

COUNCIL OFFICER'S PROPOSAL:

That Council:

- 1. Installs a 3.9 metre 'No Parking' zone between the driveways of 23 and 25 Yanko Avenue, Bronte.
- 2. Delegates authority to the Executive Manager, Infrastructure Services, to adjust the length, location and duration of, or remove, the 'No Parking' zone as necessary.

TC/C.03/24.03 65 Ocean Street, Bondi - Construction Zone (A03/2514-04) 137

COUNCIL OFFICER'S PROPOSAL:

That Council:

- 1. Installs a 17 metre 'No Parking, 7 am–5 pm Mon–Fri, 8 am–3 pm Sat, Council Authorised Vehicles Excepted' construction zone in King Street, Bondi, adjacent to 65 Ocean Street.
- 2. Requires the applicant to notify residents in the vicinity of the construction zone prior to it being installed.
- 3. Delegates authority to the Executive Manager, Infrastructure Services, to adjust the length and duration of, or remove, the construction zone as necessary.

TC/C.04/24.03 34 Dellview Street, Tamarama - Construction Zone (A03/2514-04) 142

COUNCIL OFFICER'S PROPOSAL:

That Council:

- 1. Installs a 22 metre 'No Parking, 7 am–5 pm Mon–Fri, 8 am–3 pm Sat, Council Authorised Vehicles Excepted' construction zone in front of 34 Dellview Street, Tamarama.
- 2. Requires the applicant to notify residents in the vicinity of the construction zone prior to it being installed.

3. Delegates authority to the Executive Manager, Infrastructure Services to adjust the length and duration of, or remove, the construction zone as necessary.

TC/V STATE ELECTORATE OF VAUCLUSE

TC/V.01/24.03 Anzac Day - Ramsgate Avenue and Campbell Parade, North Bondi - Temporary Road Closure (A19/0394)..... 146

COUNCIL OFFICER'S PROPOSAL:

That Council:

1. Approves the temporary closure of Ramsgate Avenue and Campbell Parade, North Bondi, for Anzac Day on 25 April 2024 between 4 am and 7 am, in accordance with the Traffic Guidance Scheme attached to the report, subject to the applicant:
 - (a) Submitting a Traffic Management Plan to Transport for NSW for approval.
 - (b) Providing public liability insurance for the event.
 - (c) Obtaining NSW Police Force approval and assessment of the event classification.
 - (d) Notifying Transdev John Holland Buses, NSW Ambulance Service and NSW Fire and Rescue (Bondi, Woollahra, and Randwick fire stations) at least seven days prior to the event.
 - (e) Notifying local residents and businesses at least seven days prior to the event.
2. Delegates authority to Executive Manager, Infrastructure Services, to modify the Traffic Control Plans should on-site circumstances warrant changes.

TC/V.02/24.03 Ray O'Keefe Reserve, North Bondi - Parking Restrictions (A23/0539)..... 150

COUNCIL OFFICER'S PROPOSAL:

1. That Council installs the following parking restrictions and area signage at Ray O'Keefe Reserve, North Bondi:
 - (a) '2P, 8 am–10 pm, Area 6 and Beach Parking Permit Holders Excepted.'
 - (b) 'No Stopping, 10 pm–8 am, Area 6 and Beach Parking Permit Holders Excepted.'
2. Delegates authority to the Executive Manager, Infrastructure Services, to adjust the location of signs and parking restrictions as necessary.

TC/V.03/24.03 56 Glasgow Avenue, Bondi Beach - Construction Zone (A03/2514-04)..... 154**COUNCIL OFFICER'S PROPOSAL:**

That Council:

1. Installs a 9 metre 'No Parking, 7 am–5 pm Mon–Fri, 8 am–3 pm Sat, Council Authorised Vehicles Excepted' construction zone in front of 56 Glasgow Avenue, Bondi Beach.
2. Requires the applicant to notify residents in the vicinity of the construction zone prior to it being installed.
3. Delegates authority to the Executive Manager, Infrastructure Services to adjust the length and duration of, or remove, the construction zone as necessary.

TC/V.04/24.03 22 Patterson Street, North Bondi - Construction Zone (A03/2514-04) 158**COUNCIL OFFICER'S PROPOSAL:**

That Council:

1. Installs a 11 metre 'No Parking, 7 am–5 pm Mon–Fri, 8 am–3 pm Sat, Council Authorised Vehicles Excepted' construction zone in front of 22 Patterson Street, North Bondi.
2. Requires the applicant to notify residents in the vicinity of the construction zone prior to it being installed.
3. Delegates authority to the Executive Manager, Infrastructure Services, to adjust the length and duration of, or remove, the construction zone as necessary.

TC/V.05/24.03 49 Military Road, Dover Heights - Construction Zone (A03/2514-04)..... 162**COUNCIL OFFICER'S PROPOSAL:**

That Council:

1. Installs a 20 metre 'No Parking, 7 am–5 pm Mon–Fri, 8 am–3 pm Sat, Council Authorised Vehicles Excepted' construction zone in Pindari Road, Dover Heights, adjacent to 49 Military Road.
2. Requires the applicant to notify residents in the vicinity of the construction zone prior to it being installed.
3. Delegates authority to the Executive Manager, Infrastructure Services to adjust the length and duration of, or remove, the construction zone as necessary.

TC/CV ELECTORATES OF COOGEE AND VAUCLUSE

Nil.

PART 2 – TRAFFIC ENGINEERING ADVICE

NOTE: The matters listed under this part of the agenda seek the advice of the WTC only and do not propose that Council exercise its delegated functions at this point in time (though they may or may not require it in the future).

TC/TEAC STATE ELECTORATE OF COOGEE

Nil.

TC/TEAV STATE ELECTORATE OF VAUCLUSE

Nil.

TC/TEACV ELECTORATES OF COOGEE AND VAUCLUSE

Nil.

**MINUTES OF THE WAVERLEY TRAFFIC COMMITTEE
MEETING HELD VIA VIDEO CONFERENCE ON
THURSDAY, 22 FEBRUARY 2024**



Voting Members Present:

Cr P Masselos	Waverley Council – Chair
Ms T Islam	Transport for NSW
Sgt A Leeson	NSW Police – Eastern Suburbs Police Area Command – Traffic Services
Mr P Pearce	Representing Marjorie O’Neill MP, Member for Coogee

Also Present:

Cr T Kay	Waverley Council – Deputy Chair
Mr N Zervos	Waverley Council – Executive Manager, Infrastructure Services
Mr S Mueller	Waverley Council – Manager, Integrated Transport
Mr S Samadian	Waverley Council – Manager, Asset Systems and Planning
Mr H Wu	Waverley Council – Senior Transport Planner
Mr K Magistrado	Waverley Council – Traffic Engineer

At the commencement of proceedings at 10.00 am, those present were as listed above.

Apologies

Apologies were received from Mr B Gidiess (Transdev John Holland – Traffic and Events Manager) and Mr D Gojak (representing Kellie Sloane MP, Member for Vaucluse).

Declaration of Interest

The Chair called for declarations of interest and none were received.

Adoption of Previous Minutes by Council - 1 February 2024

The recommendations contained in Part 1 – Matters Proposing that Council Exercise its Delegated Functions – of the minutes of the Waverley Traffic Committee meeting held on 1 February 2024 were adopted by Council at its meeting on 20 February 2024.

ITEMS BY EXCEPTION

The following items on the agenda were dealt with together and the Council Officer's Proposal for each item was unanimously supported by the Committee:

TC/C.02/24.02(2) 51 Llandaff Street, Bondi Junction – Construction Zone.

TC/V.01/24.02(2) 34-38 Hall Street, Bondi Beach – Construction Zone.

TC/V.02/24.02(2) 108 Ramsgate Avenue, Bondi Beach – Construction Zone.

PART 1 – MATTERS PROPOSING THAT COUNCIL EXERCISE ITS DELEGATED FUNCTIONS

NOTE: The matters listed under this part of the agenda propose that Council either does or does not exercise the traffic related functions delegated to it by TfNSW. The recommendations made by the Committee under this part of the agenda will be submitted to Council for adoption.

TC/C STATE ELECTORATE OF COOGEE

TC/C.01/24.02(2) Bennett Street and Ewell Lane, Bondi - Pedestrian Safety Improvements (A20/0069)

COUNCIL OFFICER'S PROPOSAL:

That Council:

1. Installs a 'Give Way to Pedestrians' (R2-10) sign on the light post in Ewell Lane, Bondi, facing cars travelling westbound.
2. Installs 'piano key' line marking in Ewell Lane immediately west of the footpath at the intersection of Ewell Lane and Bennett Street.
3. Installs a speed bump in Ewell Lane immediately west of the footpath at the intersection of Ewell Lane and Bennet Street.
4. Delegates authority to the Executive Manager, Infrastructure Services, to modify the design should on-site circumstances warrant refinements.

WTC RECOMMENDATION (UNANIMOUS SUPPORT):

That the Council Officer's Proposal be adopted subject to amendments to clauses 1 and 2, the deletion of clause 3 and the addition of a new clause such that the recommendation now reads as follows:

That Council:

1. Installs a stop sign, associated stop line and a caution/beware pedestrian sign on the light post in Ewell Lane, Bondi, facing cars travelling westbound.
2. Installs 'piano key' line marking in Ewell Lane immediately east of the footpath at the intersection of Ewell Lane and Bennett Street.

3. Investigates reversing the traffic movement in Ewell Lane to eastbound, and then, if this reversal is supported by officers, considers pedestrian safety improvements at the intersection of Ewell Lane and Ocean Street, with a further report to be prepared for the Traffic Committee.
4. Delegates authority to the Executive Manager, Infrastructure Services, to modify the design should on-site circumstances warrant refinements.

Voting members present for this item: Representative of the Member for Coogee, NSW Police representative, TfNSW representative and Waverley Council representative (Chair).

TC/C.02/24.02(2) 51 Llandaff Street, Bondi Junction - Construction Zone (A03/2514-04)

COUNCIL OFFICER'S PROPOSAL:

That Council:

1. Installs a 9 metre 'No Parking, 7 am–5 pm Mon–Fri, 8 am–3 pm Sat, Council Authorised Vehicles Excepted' construction zone in front of 51 Llandaff Street, Bondi Junction.
2. Requires the applicant to notify residents in the vicinity of the construction zone prior to it being installed.
3. Delegates authority to the Executive Manager, Infrastructure Services to adjust the length and duration of, or remove, the construction zone as necessary.

WTC RECOMMENDATION (UNANIMOUS SUPPORT):

That the Council Officer's Proposal be adopted.

Voting members present for this item: Representative of the Member for Coogee, NSW Police representative, TfNSW representative and Waverley Council representative (Chair).

TC/V STATE ELECTORATE OF VAUCLUSE

TC/V.01/24.02(2) 34-38 Hall Street, Bondi Beach - Construction Zone (A03/2514-04)

COUNCIL OFFICER'S PROPOSAL:

That Council:

1. Installs a 22 metre 'No Parking, 7 am–5 pm Mon–Fri, 8 am–3 pm Sat, Council Authorised Vehicles Excepted' construction zone in front of 34–38 Hall Street, Bondi Beach.
2. Requires the applicant to notify residents in the vicinity of the construction zone prior to it being installed.
3. Delegates authority to the Executive Manager, Infrastructure Services to adjust the length and duration of, or remove, the construction zone as necessary.

WTC RECOMMENDATION (UNANIMOUS SUPPORT):

That the Council Officer's Proposal be adopted.

Voting members present for this item: NSW Police representative, TfNSW representative and Waverley Council representative (Chair).

TC/V.02/24.02(2) 108 Ramsgate Avenue, Bondi Beach - Construction Zone (A03/2514-04)

COUNCIL OFFICER'S PROPOSAL:

That Council:

1. Installs a 13.7 metre 'No Parking, 7 am–5 pm Mon–Fri, 8 am–3 pm Sat, Council Authorised Vehicles Excepted' construction zone in front of 108 Ramsgate Avenue, Bondi Beach.
2. Requires the applicant to notify residents in the vicinity of the construction zone prior to it being installed.
3. Delegates authority to the Executive Manager, Infrastructure Services, to adjust the length and duration of, or remove, the construction zone as necessary.

WTC RECOMMENDATION (UNANIMOUS SUPPORT):

That the Council Officer's Proposal be adopted.

Voting members present for this item: NSW Police representative, TfNSW representative and Waverley Council representative (Chair).

TC/CV ELECTORATES OF COOGEE AND VAUCLUSE

Nil.

PART 2 – TRAFFIC ENGINEERING ADVICE

NOTE: The matters listed under this part of the agenda seek the advice of the WTC only and do not propose that Council exercise its delegated functions at this point in time (though they may or may not require it in the future).

TC/TEAC STATE ELECTORATE OF COOGEE

Nil.

TC/TEAV STATE ELECTORATE OF VAUCLUSE

Nil.

TC/TEACV ELECTORATES OF COOGEE AND VAUCLUSE

Nil.

THE MEETING CLOSED AT 10.31 AM.

.....
SIGNED AND CONFIRMED
MAYOR
19 MARCH 2024

REPORT
TC/C.01/24.03

Subject: Charing Cross Streetscape Upgrade

TRIM No: SF23/19

Author: Nick Prell, Project Manager, Major Projects
Cameron Eccles, Senior Project Manager
Simon Mueller, Manager, Integrated Transport

Authoriser: Nikolaos Zervos, Executive Manager, Infrastructure Services

COUNCIL OFFICER'S PROPOSAL:

That Council:

1. Approves the installation of traffic devices, signs and line marking in the Charing Cross commercial precinct, between Carrington Road and Albion Street, Waverley, as shown in Attachment 1 of the report.
2. Delegates authority to the Executive Manager, Infrastructure Services, to modify the designs should amendments be required.
3. Notes that:
 - (a) The State road and traffic signal designs will be submitted to Transport for NSW (TfNSW) for approval, with any required design and signage changes being approved by TfNSW.
 - (b) The Charing Cross Streetscape Upgrade Project was approved by Council in April 2023.
 - (c) Contractors have been engaged to undertake early electrical works, commencing in April 2024.

1. Executive Summary

Council will be conducting streetscape upgrade works at the Charing Cross Local Village on Bronte Road, Waverley (see Figure 1). The upgrade will involve full asset renewal and upgrades within the road reserve along Bronte Road between Victoria and Albion Streets.

This report seeks Council's approval for the traffic control devices associated with the project including pedestrian crossings, kerb realignments, parking restrictions, and line markings.

A separate report was presented to the Finance, Operations and Community Services Committee meeting on 4 April 2023 seeking approval of the design intent for the project, to delegate authority to the Executive Manager, Infrastructure Services, to modify the design should design changes be warranted, and noted the detailed design will progress to final completion.

Modifications to parts of the design considered in this report may arise as the project moves through external approvals processes and/or enters the construction phase. It is proposed that the authorisation of modifications, if they arise, be delegated to the Executive Manager, Infrastructure Services to implement.

Attached to this report are:

- The sign and line marking plans and typical sections for the Charing Cross commercial precinct (Attachment 1).
- A review of the operation of the Charing Cross commercial precinct, including the Carrington/Victoria/Bronte intersection, mid-block raised pedestrian crossing on Bronte Road and the two raised pedestrian crossings at the Bronte/Albion intersection (Attachment 2).
- Pedestrian count of Bronte/Albion intersection observed on 12 October 2023 between 8.35am-9.05 am (Attachment 3).
- Charing Cross Public Domain Safety Assessment (Attachment 4).
- Victoria Street West SIDRA Modelling with the Separated Bike Lane incorporated into the Carrington/Bronte/Victoria intersection (Attachment 5).

Council will need to exercise its delegated functions to implement the proposal.

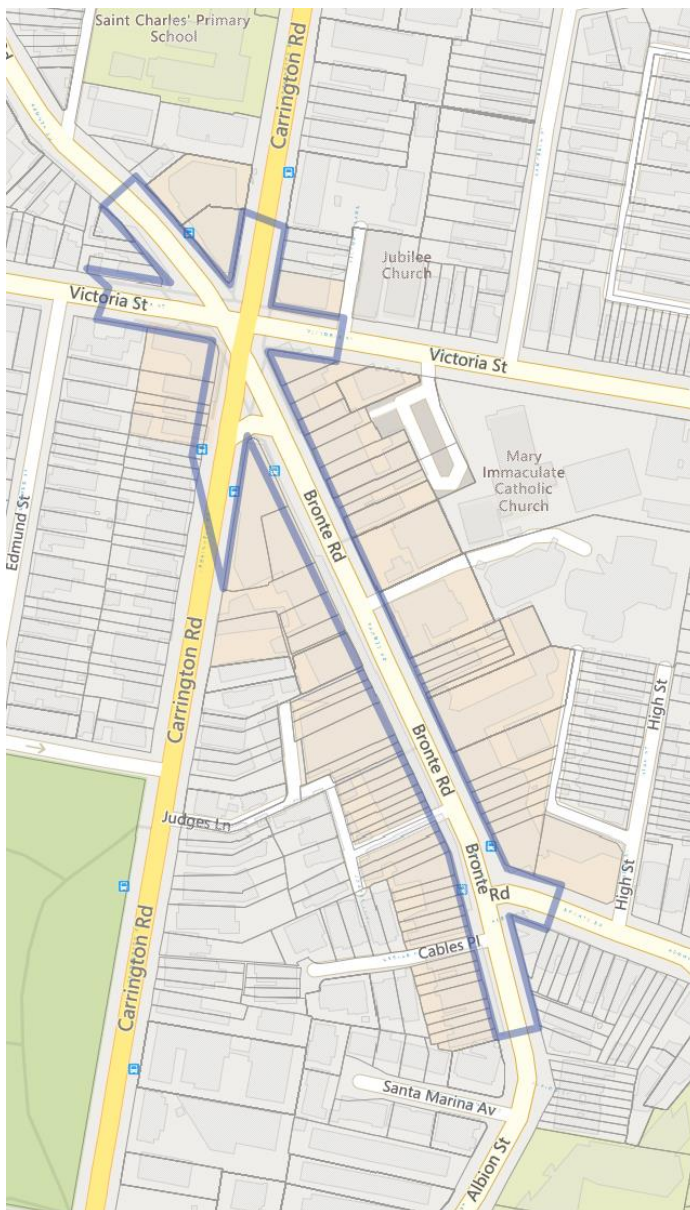


Figure 1. Charing Cross Streetscape Upgrade – Extent of works.

2. Introduction/Background

Charing Cross is a key village centre within Waverley, located along a strip of Bronte Road connecting the eastern beaches, Bondi Junction, Centennial Park and the city. The centre has a diverse range of local shops and services that support the daily needs of residents, workers, and visitors who frequent the area. The centre has a major 'high street' character, supporting the local commercial strip as well as a major transport route, including servicing up to six different bus routes.

The centre is contained within an existing heritage conversation area and continues to fulfil a valuable social role and meeting place for residents and for children attending and travelling to the many surrounding schools. The diverse local population also includes aged housing within the centre.

At present, the public domain is not well defined, blurring into the adjacent residential areas. High through traffic volumes conflict with the centralised commercial nature of the space, which impacts local traffic movements causing congestion. This project proposes a streetscape upgrade to the commercial precinct of Charing Cross village to enhance the sense of arrival and place, including improved safety and convenience for active and public transport modes.

In consideration of the above, it is warranted to carry out a renewal of existing assets as well as incorporate improvements/upgrades to the streetscape in line with Council plans and policies. This justification especially applies to the Community Strategic Plan (2022-2032), and the three themes of the plan: People, Place and Performance. These themes are applicable to these renewals and improvements in the following ways:

- **People:** Charing Cross is traditionally a commercial precinct, where the emphasis on the people occupying the public space of this area not only holds significance within the community, but also builds on the cohesion and connection of the Waverley community. The renewal of the existing assets, and the improvements proposed will increase the pedestrian and public amenity experience whilst retaining the vehicular traffic performance of Bronte Road and the associated intersections, and hence promoting the sense of connectivity within the area.
- **Place:** the by-product of the proposed renewals and improvements to the streetscape allows the amount of public amenity space to be captured from the existing road reserve. This in turn allows the project to include natural elements including street trees, rain gardens, and garden planting amongst an area with a high level of heritage significance in its architectural features. The inclusions are aiming to combat the impacts of climate change through the reduction of greenhouse gases, the increase of urban canopy cover and habitat areas and the conservation and improvement of water quality. They are also ensuring that the public facilities of the area have equitable access, meet the community needs for recreation and promote climate-friendly transport alternatives (i.e. bikes and buses).
- **Performance:** the Charing Cross Commercial Precinct was identified as a major point of interest along the Bronte Road Corridor in the Our Liveable Places Centres Strategy (2020– 2036). This, along with the focus of the 'Performance' component of the Community Strategic Plan is encompassing community engagement opportunities, excellent customer experience, financial sustainability and resource management, governance, capacity and capability, resilient economy, and innovation. In response to these criteria and community feedback the streetscape upgrade achieves the objectives of undergrounding of the powerlines with the installation of smart poles, providing functional and well-designed public furniture, the protection of the heritage significance and characteristics, creating a safer movement corridor for pedestrians, encouraging cycling, improvement to the emphasis of public transport, the increase of planting and greenery, the introduction of street tree pits, and the introduction of kerb planting to encourage safety and a sense of place. The proposed renewals and streetscape upgrades require the proportions of road reserve vs public amenity space to be as detailed to allow the project to effectively respond to the

desires of the community for the area. The proposed improvements and upgrade as they are designed aims to achieve an improvement in the level of service offered to motorists, and a larger improvement in the level of service for pedestrians, cyclists and public transport uses.

Council approved the detailed design intent in April 2023.

Table 1. Previous resolution.

Meeting and date	Item No.	Resolution
Finance, Operations and Community Services Committee 4 April 2023	FC/5.5/23.04	<p>That Council:</p> <ol style="list-style-type: none"> 1. Approves the Charing Cross Streetscape Upgrade design intent, as set out in the report, to inform the detailed design with respect to the following components: <ol style="list-style-type: none"> (a) Selection of appropriate tree species for heritage and non-heritage building façades. (b) Street tree and furniture locations with consideration given to the Posted Awnings Strategy. (c) Material interpretations and treatments to acknowledge original kerb alignment within the widened footpath. (d) Material detailing for lighting, hanging baskets and street furniture. 2. Delegates authority to the Executive Manager, Infrastructure Services, to modify the design should design constraints and on-site circumstances warrant changes. 3. Notes that: <ol style="list-style-type: none"> (a) The Charing Cross Precinct Committee has been consulted in recent months, and its feedback has been considered for the development of the final detailed design. (b) The detailed design will progress to final completion, and Council officers will proceed to advertising a tender for the project to undertake the construction works. (c) The Review of Environmental Factors will be publicly advertised as legislatively required and then the General Manager will make a decision on the project proceeding.

3. Technical Analysis

Our Liveable Places Centres Strategy consultation

In September and October 2019, officers undertook community consultation for the Our Liveable Places Centres Strategy. Consultation was undertaken via an online survey and a Charing-Cross-specific community workshop.

Charing Cross Village Centre received 27 online submissions and 25 people participating in the community workshop. Key themes included:

- Heritage character must be preserved and protected.
- Mixed response on separated cycleway.
- Support for improving active and public transport modes.
- Some would like to see more outdoor seating.
- Minimise loss of parking.
- Urban greening and sustainability supported.

Detailed submissions were attached to a report to the Strategic Planning and Development Committee on 3 November 2020, where Council adopted this strategy.

Stage 1 project consultation

In March 2020, officers created a project specific Have Your Say (HYS) page seeking feedback on a high-level project scope. The community was notified using the following methods:

- Advertised through Council's social media platforms.
- Officers visited all businesses throughout the village centre.
- Letters and emails circulated to residents, schools, and businesses.
- Charing Cross precinct notified and on-site meeting with conveners undertaken.

The project HYS page had over 400 visits, receiving nine formal submissions and 29 people registering to receive project updates. Key themes included:

- Support for more trees.
- Concerns related to on-street seating.
- Support for improving safety for active transport modes.
- Support for wider footpaths.

In August 2020, officers sent letters and email notifications to property owners and tenants regarding the undergrounding of power lines.

Options analysis and concept design

In December 2020, Council endorsed Option 3 (Attachment 2) as the preferred option and subsequently resolved to develop Option 3 to a concept design level suitable for community consultation.

In April 2021, Council endorsed a concept design (Option 3) for the purposes of undertaking community consultation for a 28-day period.

Stage 2 project consultation

Council held an open community consultation on the proposed concept design for the Charing Cross

Streetscape Upgrade project from 21 April to 19 May 2021. The community was notified of the consultation in several ways, including social media, emails, e-newsletters, letterbox drop, business drop-ins and advertising in local papers.

There was significant interest in this project, with Council receiving 200 online survey responses, 8 long-form submissions and 25 attendees across three public and stakeholder meetings. The community response demonstrated majority overall support for the project, with 58% of participants in support of the design and a further 36.5% in support with some change(s). Details of the consultation outcomes were included in the Council report on 22 June 2021 (CM/7.15/21.06).

In May 2022, Council approved progressing Option 3 for the Charing Street Streetscape Upgrade to detailed design with key items to be addressed in development of the design including:

- Selection of tree species to vary and consider the heritage status of building façades.
- Completion of a posted awning review to inform locations of trees and street furniture items in detailed design.
- Undertake an options analysis on materiality interpretations to acknowledge the original kerb alignment within the widened footpath.
- Undertake an options analysis on appropriate lighting, hanging baskets, and street furniture in the detailed design.

Transport components of the upgrade

The signage and line marking changes are shown in Attachment 1 of this report. Key changes to the road network include:

- Kerb alignment alterations to generally provide 3.2 m for travel lanes and 2.4 m for parking lanes.
- General signage relocation and consolidation to accommodate installation of multi-function poles (MFPs) where possible and declutter the streetscape.
- General line marking upgrade to delineate on-street parking areas, bus zones, travel lanes, traffic control signals and pedestrian crossings.
- Carrington/Victoria/Bronte intersection:
 - Removal of Bronte/Carrington left turn slip lane and associated pedestrian crossing.
 - Reducing the width of raised median on Bronte Road north of the traffic control signals.
 - Removal of centreline median on the eastern arm of the intersection (Victoria Street)
 - Realignment of pedestrian crossings on each arm of the intersection
 - Introduction of a kerb extension on the northwestern corner of the intersection (Bronte Road north/Victoria Road west)
 - Introduction of a separated bike lane on the western arm of the intersection (Victoria Street)
- Addition of a mid-block pedestrian crossing, and associated kerb build outs across Bronte Road at 276 Bronte Road.
- Removal of existing pedestrian refuge island and the addition of a pedestrian crossing and associated kerb build outs across Bronte Road at the southern end of site (intersection of Albion Street and Bronte Road).
- Conversion of the existing pedestrian crossing to a raised wombat crossing and realignment, and addition of associated kerb build outs at 338 Bronte Road.
- Addition of a continuous footpath treatment and associated kerb build outs across Cables Place south of Bronte Road.
- Reallocation of 55 metres of parking space on Bronte Road to allow for compliant 'No Stopping' lengths at intersections/pedestrian crossings, kerb build outs and vehicle sweep paths.
- Relocation of the bus stop (ID 202422) at 203 Bronte Road 20 m north.

Carrington Road, Bronte Road and Victoria Street assessment

Current traffic flows were assessed to determine the traffic impact of the proposed changes at the Carrington Road, Bronte Road and Victoria Street intersection. A model was created using SIDRA intersection analysis software. The modelling indicated that:

- The intersection of Bronte/Carrington/Victoria currently operates, with an overall level of service F in both the morning and afternoon peak periods.
- The proposed change to the intersection reduces the average AM peak delay by 3.9 seconds.

The general layout changes to the intersection will improve the pedestrian amenity (refer to item 5.2 in Attachment 2) and in turn improve the vehicular movements through the intersection. The changes include:

- Reducing the pedestrian crossing distance of the Bronte Road North arm from 25 m to 18 m.
- Reducing the pedestrian crossing distance of the Victoria Street west arm from 19 m to 14 m.
- Realignment of the Victoria Streets west arm to better align with pedestrian desire lines and increase car queuing space.
- Introduction of a protected 10 m unidirectional eastbound bike lane on Victoria Street west arm that extends the existing bike lane leading up to the traffic control signals.
- Reducing the pedestrian crossing distance of Victoria Street east arm from 13 m to 10 m.

The removal of the slip lane on the Bronte Road south arm will improve pedestrian amenity and safety by providing an increased waiting space. The resulting trip distribution based on current vehicular traffic patterns is outlined in item 4.3.2 in Attachment 2 of this report.

The introduction of a separated bike lane on the western arm of the intersection will improve bicycle safety leading up to the signals. Within the Waverley Bike Plan 2013, Victoria Street is identified as a bicycle route connecting Queens Park and Henrietta Street. The proposal introduces 10 m of dedicated bike lane leading to the intersection. Overall, the modelled delays on the intersection have reduced by 19.6 seconds from the original proposal (87.3 seconds average delay in the base case, 84.3 seconds in the previous proposal and 59.3 seconds with this proposal). The intersection operation improves to operate at a level of service from F to E in the base case versus the proposed case. This improvement is a result of simplifying cyclist and motorist movements when approaching the intersection as merging traffic will no longer be required. There will be a slight adverse effect on the queuing saturation and length, however, this is significantly offset by the reduction in the average vehicular delay.

Mid-block pedestrian crossing assessment

Current traffic flows were assessed to determine the traffic impact of the additional mid-block pedestrian crossing on Bronte Road. A model was created using SIDRA intersection analysis software. The modelling indicated that there will be:

- Minimal impact on the operation of the road network with respect to vehicular traffic.
- Significant improvement in the pedestrian connectivity between both sides of Bronte Road and therefore promote pedestrian safety and amenity throughout the precinct.

Intersection of Albion Street and Bronte Road assessment - Northern arm

The proposal includes converting the existing pedestrian crossing to a raised pedestrian crossing. This will result in:

- Minimal impact on the operation of the road network with respect to vehicular traffic.

- Improvement street user safety by way of:
 - Reduction in pedestrian crossing distance.
 - Reduction of vehicular speed.
 - Reduction of crossing distances.
 - Improvement of sight lines.
 - Improved lighting.
- Significant improvement to pedestrian connectivity between both sides of Bronte Road and therefore promote pedestrian safety and amenity throughout the precinct by way of:
 - Reduction of crossing distance.
 - Improved lighting.
 - Improved vertical and horizontal sight lines.
 - The inclusion of 'warning' tactile ground surface indicators (TGSIs) in accordance with Council's Public Domain Technical Manual (PDTM).

A model was created using SIDRA intersection analysis software. The modelling indicated that:

- The intersection of Bronte Road and Albion Street currently operates with an overall level of service B in both the morning and afternoon peak periods.
- The proposed change to the intersection reduces the average AM peak delay by 2 seconds due to the reduced crossing distances for pedestrians.

Intersection of Albion Street and Bronte Road Assessment - Eastern arm

Through the detailed design process and community consultation, safety investigations were carried out on the eastern arm of the Albion Street and Bronte Road intersection. To improve safety for all road users, the proposal includes converting the existing pedestrian refuge island to an indented raised pedestrian crossing. A pedestrian survey was undertaken on 12 October 2023 from 8.35 am to 9.05 am with 46 able bodied pedestrians and 7 sensitive pedestrians counted, resulting in an adjusted total of 60 pedestrians with the half hour survey. Referring to Item 6.1.2 of TS0043:1.0 the pedestrian demand is greater than 20 people per hour. There will be:

- Improved intersection operation with respect to vehicular traffic by way of:
 - Reduction of vehicular speed.
 - Reduction of crossing distances.
 - Improvement of sight lines.
 - Protected indent to store waiting vehicles turning south onto Albion or North along Bronte Road.
 - Improved lighting.
- Significant improvement in the pedestrian connectivity between both sides of Bronte Road and therefore promote pedestrian safety and amenity throughout the precinct by way of:
 - Dedicated pedestrian crossing.
 - Reduction of crossing distance.
 - Improved lighting.
 - Improved vertical and horizontal sight lines.
 - The incorporation of 'warning' TGSIs in accordance with Councils PDTM.

A model was created using SIDRA intersection analysis software. The modelling indicated that:

- The intersection of Bronte Road and Albion Street currently operates with an overall level of service B in both the morning and afternoon peak periods.
- The proposed change to the intersection reduces the average AM peak vehicular delay by 2 seconds.

Bus stops

- Stop ID202421 – 7 Albion Street:
 - Maintaining dedicated bus zone.
 - Maintaining current location.
 - Total length of bus zone 35 m.
 - Effective length of bus zone is 40 m considering adjacent driveway.
 - The inclusion of ‘warning’ and ‘directional’ TGSIs in accordance with the PDTM.
- Stop ID202426 – 328 Bronte Road:
 - Maintaining dedicated bus zone.
 - Maintaining current location.
 - Total length of bus zone 31 m.
 - Effective length of bus zone is 37.5 m considering laneway entry.
 - The inclusion of ‘warning’ and ‘directional’ TGSIs in accordance with the PDTM.
- Stop ID202422 – 203 Bronte Road:
 - Maintaining kerb side lane bus stop.
 - Maintaining current location.
 - Total length of bus zone 26 m.
 - Bus zone located 20 m from TCS stop line.
 - Effective length of bus zone is 46 m considering distance to TCS.
 - The inclusion of ‘warning’ and ‘directional’ TGSIs in accordance with the PDTM.
- Stop ID202425 – 232 Bronte Road:
 - Maintaining kerb side lane bus stop.
 - Maintaining current location.
 - Total length of bus zone 38 m.
 - Bus zone located 18 m from TCS stop line.
 - Effective length of bus zone is 46m considering distance to TCS.
 - The inclusion of ‘warning’ and ‘directional’ TGSIs in accordance with the PDTM.

On-street parking

The traffic signage and line marking changes are shown in Attachment 1 of this report. Key changes to the road network include:

- The reallocation of 2 parking spaces with of roadway on Bronte Road to allow for compliant ‘No Stopping’ lengths at the TCS intersection.
- The reallocation of 5 parking spaces’ worth of roadway on Bronte Road to allow for the mid-block pedestrian crossing.
- The reallocation of 1 on-street parking space worth of roadway on Bronte Road to allow for the realignment and upgrade of the southern pedestrian crossing.
- An addition of 1 on-street parking spaces on Victoria Street.

- An addition of 1 on-street parking spaces on Bronte Road.
- A net removal 6 on-street parking spaces throughout the project.

Bicycle parking

The changes to bicycle parking provisions is shown in Attachment 1 of this report. Key changes include:

- Addition of 8 parking racks at the following locations:
 - 3 x racks on the western arm of Victoria Street.
 - 2 x racks on the eastern arm of Victoria Street.
 - 2 x racks on the kerb side of the walkway outside 239 Bronte Road.
 - 1 x rack on the kerb side of the walkway outside 338 Bronte Road.
- Addition of 16 parking spaces assuming each rack identified above can cater to two bicycles each.
- Addition of 9 parking rings on multi-functional poles, which are designed to cater to one bicycle each.
- Given the number of dedicated bike racks at Charing Cross is currently 2, which could cater to up to four bikes, there is a net addition of 21 bicycle spaces throughout the project.

4. Financial Information for Council's Consideration

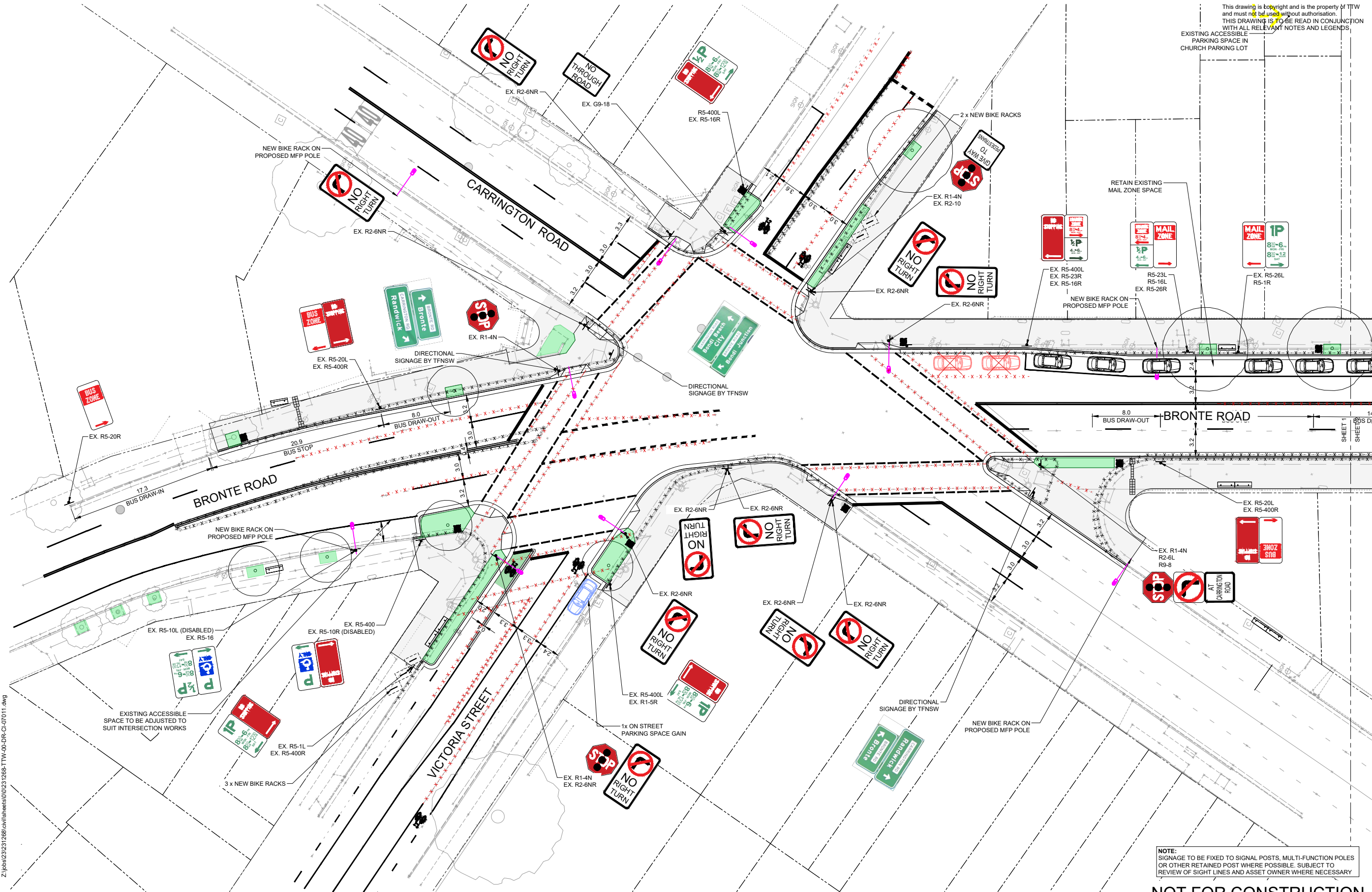
The total budget allocation for the Charing Cross Streetscape Upgrade under the Long Term Financial Plan (LTFP) is \$12 million. Officers will also continue to apply for applicable grants to supplement Council's funding. There are sufficient funds to cover the cost of the project.

5. Conclusion

It is recommended that Council approves the traffic control devices associated with the project including pedestrian crossings, parking restrictions, kerb alignments bike parking and line marking.

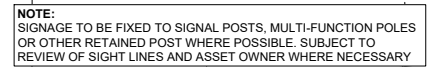
6. Attachments

1. Charing Cross Design - Signals, signs and lines [↓](#)
2. Charing Cross - Traffic Modelling Assessment [↓](#)
3. Bronte-Albion Intersection Pedestrian Count - 12 October 2023 [↓](#)
4. Charing Cross Public Domain Design Safety Assessment [↓](#)
5. Victoria Street west - Bicycle lane traffic modelling [↓](#)
6. Charing Cross Design - TGSi Arrangement Plan [↓](#) .



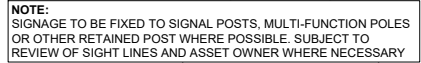
NOT FOR CONSTRUCTION

Scale at A1 1:200				Drawn AS				Designed DM				Approved			
Project No 231268-TTW-00-DR-CI-07011-A				Originator 6:49 PM				Zone				Type			
Rev 13.03.2024				Description				Eng Draft				Date			
A PRELIMINARY ISSUE				DM AS 13.03.24											
Rev Description				Eng Draft Date				Rev Description				Eng Draft Date			
Client: ENVIRONMENTAL PARTNERSHIP (NSW) PTY LTD				Engineer:				Project: CHARING CROSS STREETSCAPE UPGRADE				Drawing Title: TRAFFIC CONTROL DEVICES - PLAN LINES AND SIGNS SHEET 1			
SUITE 3.01, 22-36 MOUNTAIN STREET ULTIMO NSW 2007 AUSTRALIA															



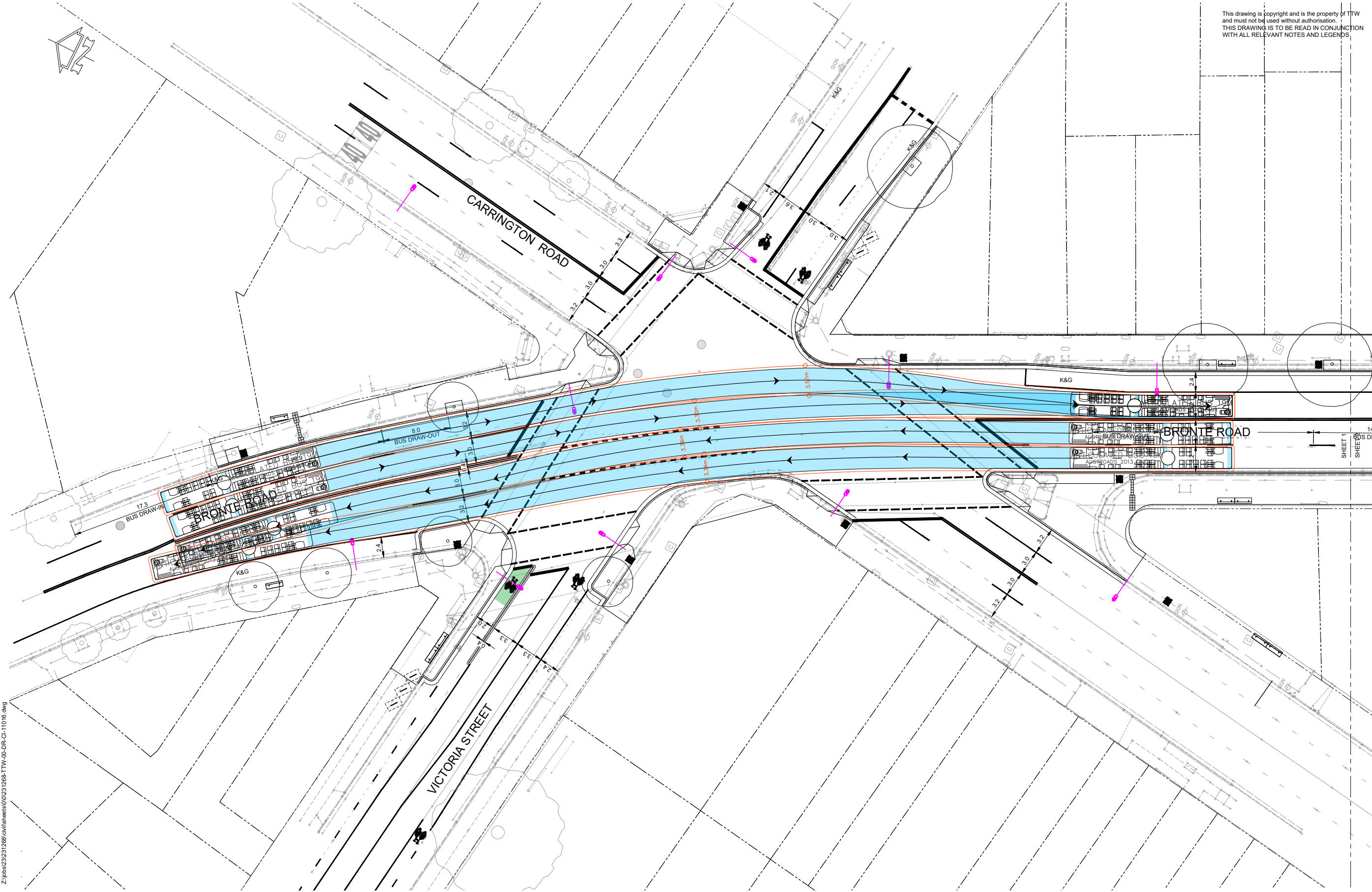
NOT FOR CONSTRUCTION

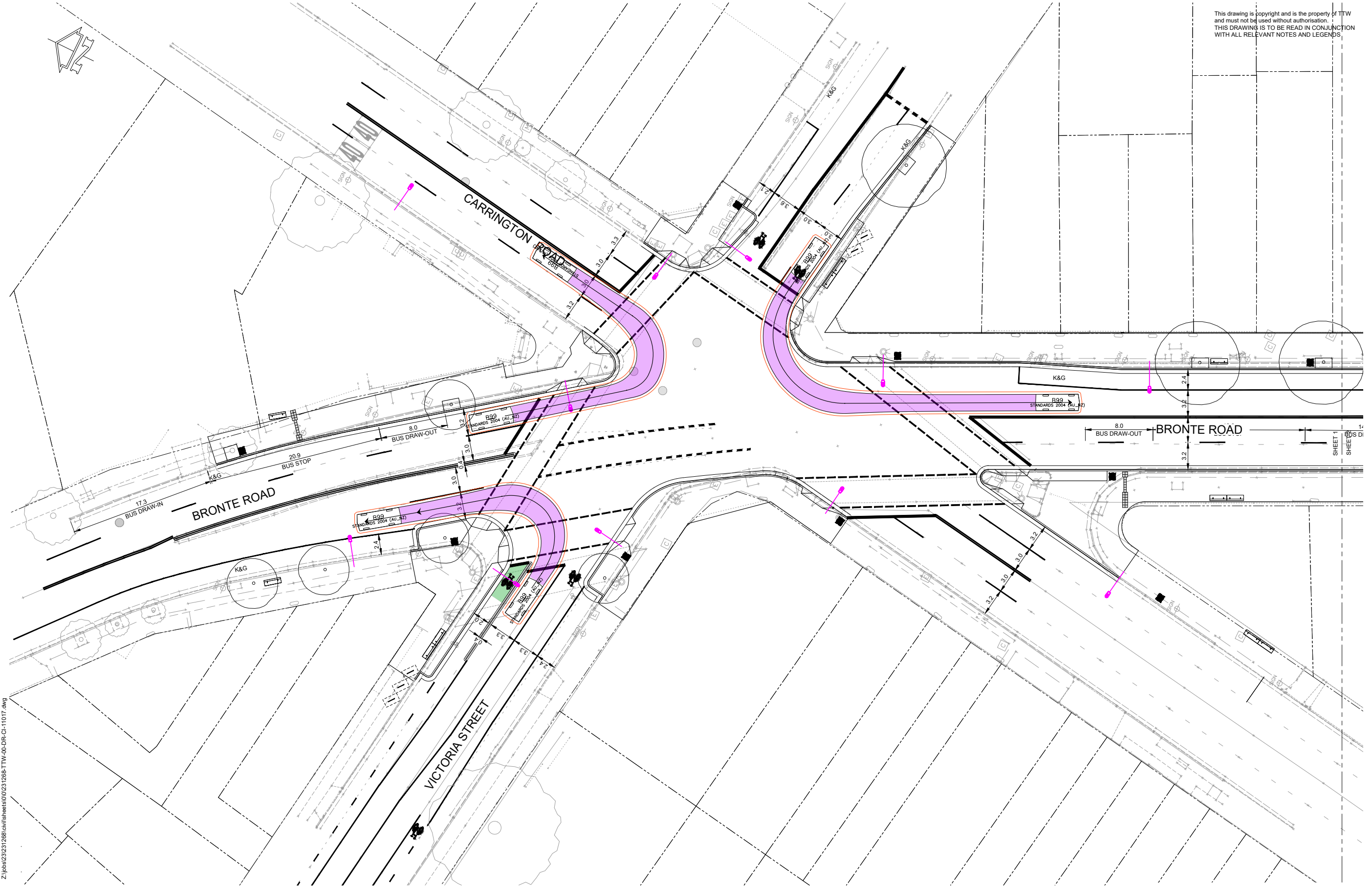
1:200 A1			1:400 A3						Client:			Engineer:			Project:			Drawing Title:			Scale at A1		Drawn		Designed		Approved										
						ENVIRONMENTAL PARTNERSHIP (NSW) PTY LTD						CHARING CROSS STREETSCAPE UPGRADE						TRAFFIC CONTROL DEVICES - PLAN LINES AND SIGNS SHEET 2						1:200		AS		DM									
																								Project No		Originator		Zone		Type		Role		Sheet No.		Rev	
A PRELIMINARY ISSUE																								DM		AS		13.03.24		231268-TTW-00-DR-CI-07012-A							
Rev		Description		Eng Draft																				Date		Rev		Description		Eng Draft		Date		Rev		Description	
						SUITE 3.01, 22-36 MOUNTAIN STREET ULTIMO NSW 2007 AUSTRALIA												13.03.2024 6:49 PM																			



NOT FOR CONSTRUCTION

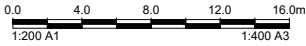
1-200 A1			1-400 A3									Client:						Engineer:						Project:						Drawing Title:						Scale at A1		Drawn		Designed		Approved	
																		ENVIRONMENTAL						CHARING CROSS						TRAFFIC CONTROL						1:200		AS		DM			
																		PARTNERSHIP (NSW) PTY						STREETSCAPE UPGRADE						DEVICES - PLAN													
																		LTD												LINES AND SIGNS													
A PRELIMINARY ISSUE			DM AS 13.03.24																											231268-TTW-00-DR-CI-07013-A													
Rev		Description		Eng Draft		Date		Rev		Description		Eng Draft		Date		Rev		Description		Eng Draft		Date		SUITE 3 01, 22-36 MOUNTAIN STREET ULTIMO NSW 2007 AUSTRALIA																			





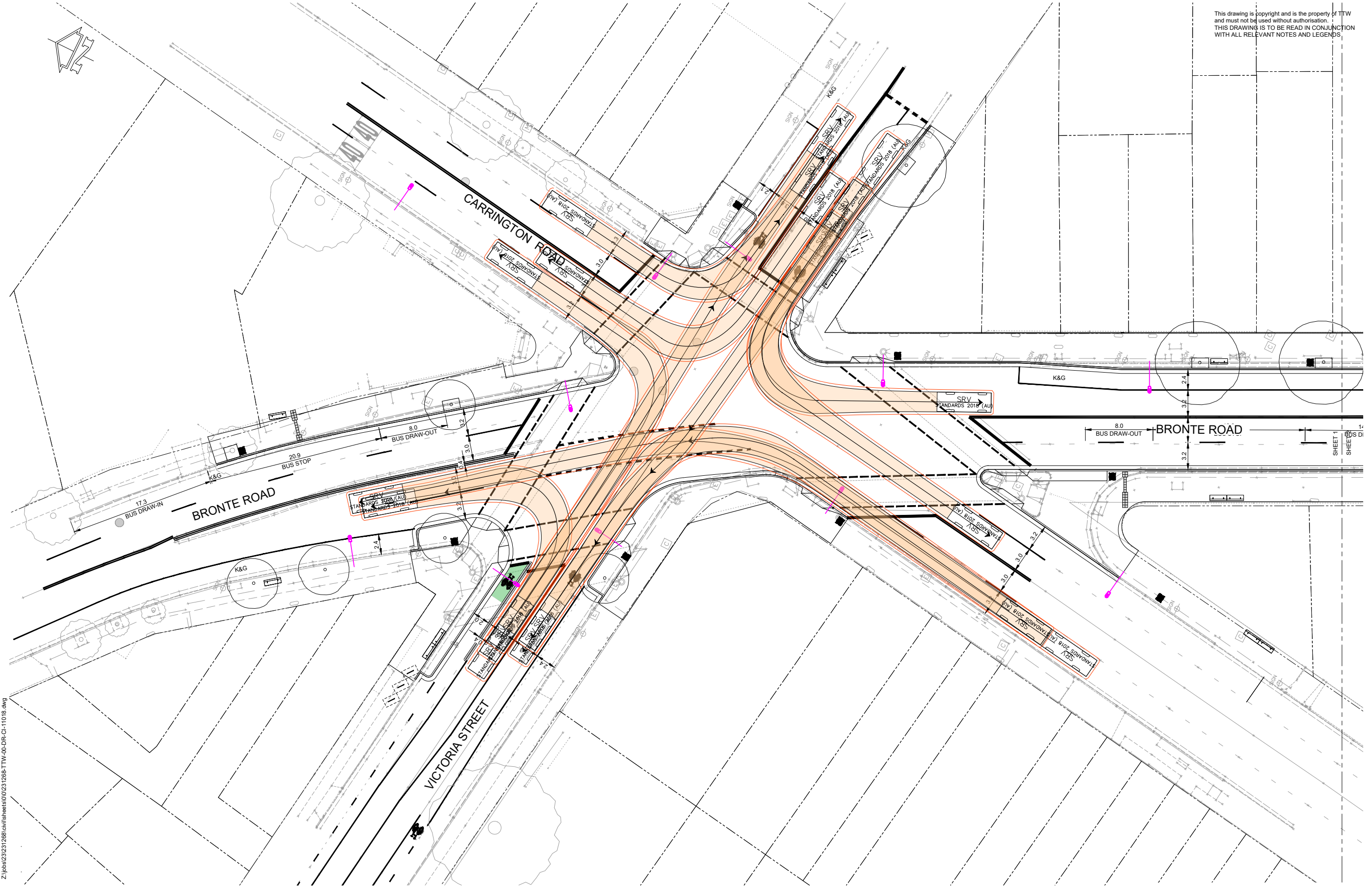
This drawing is copyright and is the property of TTW and must not be used without authorisation. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT NOTES AND LEGENDS.

Z:\pba\23231268\civil\sheets\0\0231268-TTW-00-DR-CI-11017.dwg



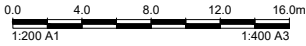
NOT FOR CONSTRUCTION

								Client: ENVIRONMENTAL PARTNERSHIP (NSW) PTY LTD				Engineer:				Project: CHARING CROSS STREETSCAPE UPGRADE				Drawing Title: VEHICLE TURNING PATHS B99 PASSENGER VEHICLE				Scale at A1		Drawn		Designed		Approved					
																								AS		DM									
A PRELIMINARY ISSUE				DM AS 13.03.24																				Project No		Originator		Zone		Role		Sheet No.		Rev	
Rev		Description		Eng		Draft		Date		Rev		Description		Eng		Draft		Date		Rev		Description		Eng		Draft		Date		231268-TTW-00-DR-CI-11017-A		13.03.2024 6:50 PM			



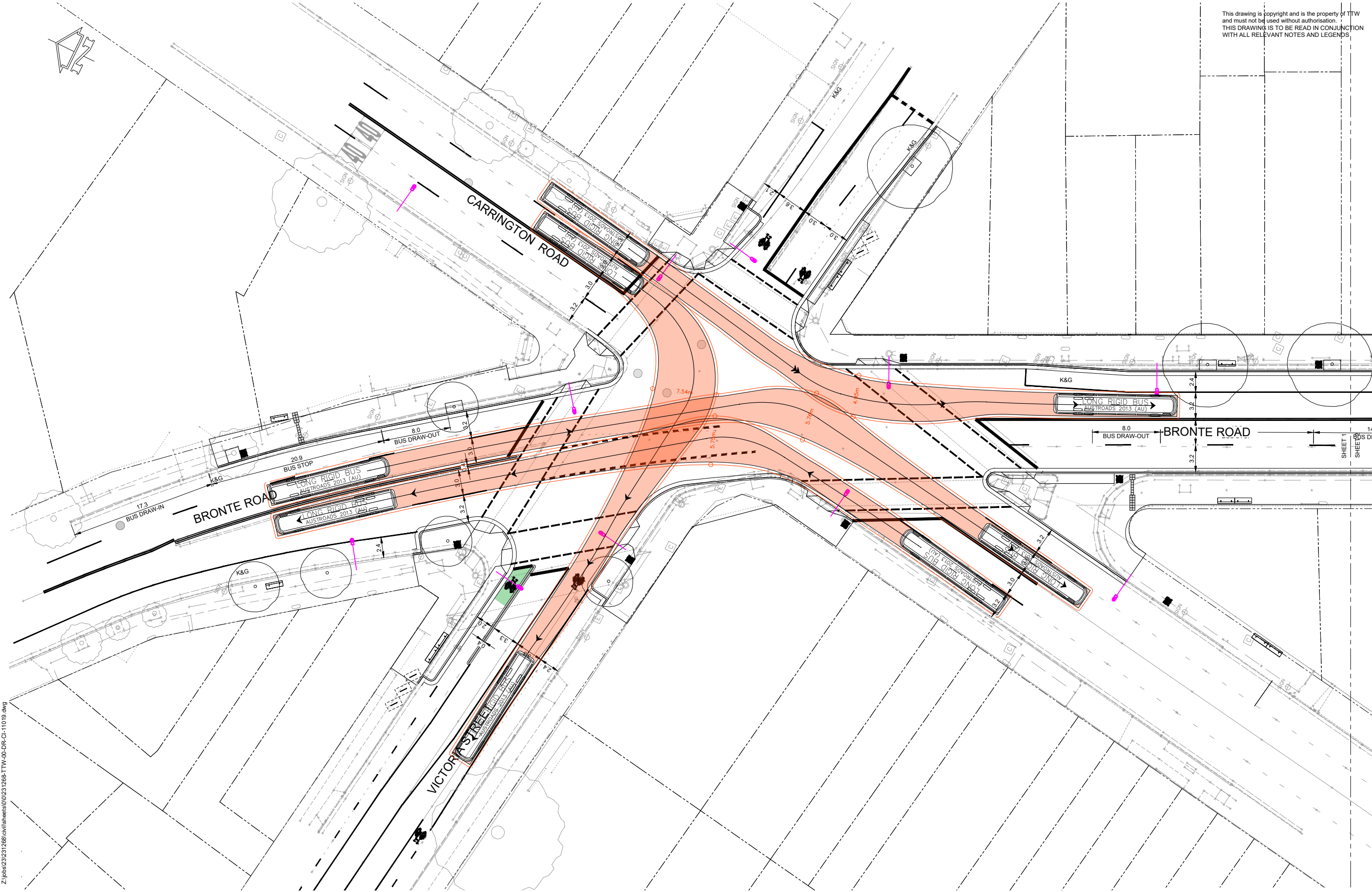
This drawing is copyright and is the property of TTW and must not be used without authorisation. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT NOTES AND LEGENDS.

Z:\pba\23231268\civil\sheet\00\231268-TTW-00-DR-CI-11018.dwg



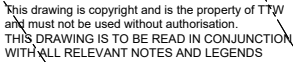
NOT FOR CONSTRUCTION

								Client: ENVIRONMENTAL PARTNERSHIP (NSW) PTY LTD				Engineer:				Project: CHARING CROSS STREETSCAPE UPGRADE				Drawing Title: VEHICLE TURNING PATHS SMALL RIGID VEHICLE				Scale at A1		Drawn		Designed		Approved					
																								AS		DM									
A PRELIMINARY ISSUE				DM AS 13.03.24																				Project No		Originator		Zone		Role		Sheet No.		Rev	
																								231268-TTW-00-DR-CI-11018-A											
Rev Description				Eng Draft Date				Rev Description				Eng Draft Date				Rev Description				Eng Draft Date				13.03.2024		6:50 PM									



NOT FOR CONSTRUCTION

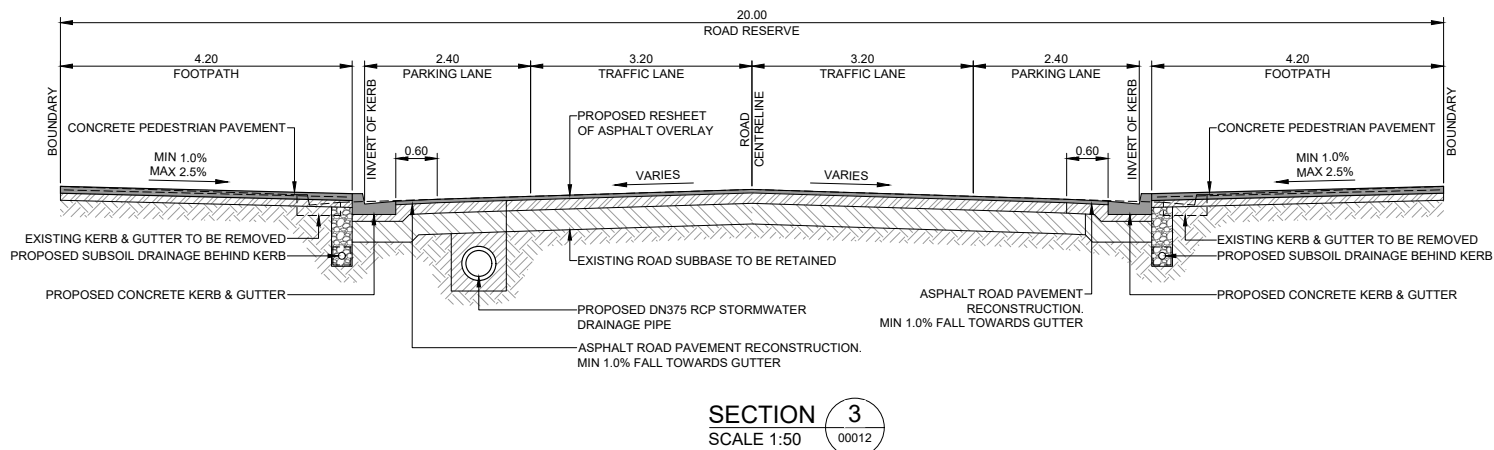
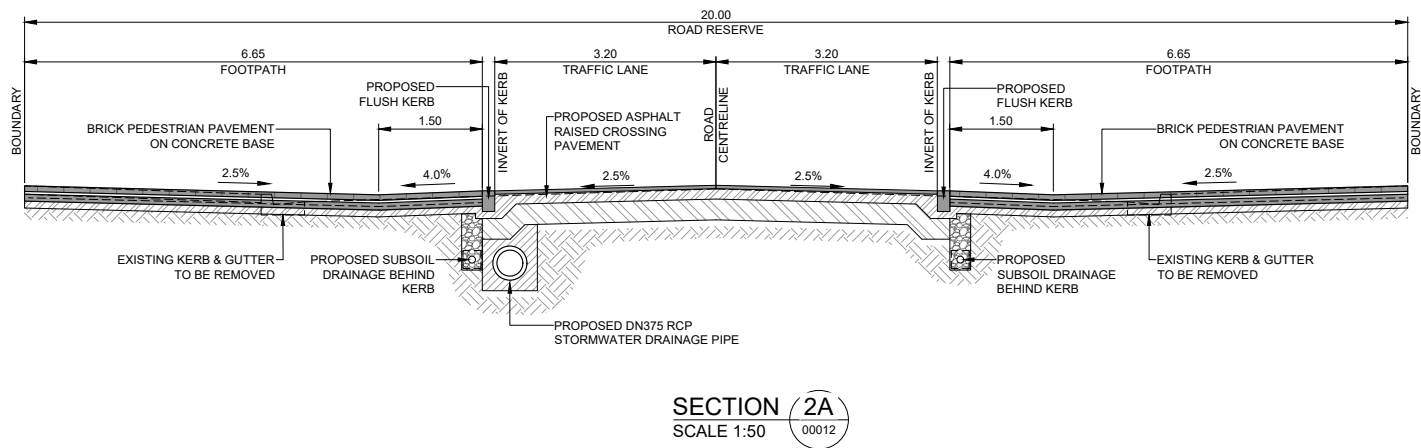
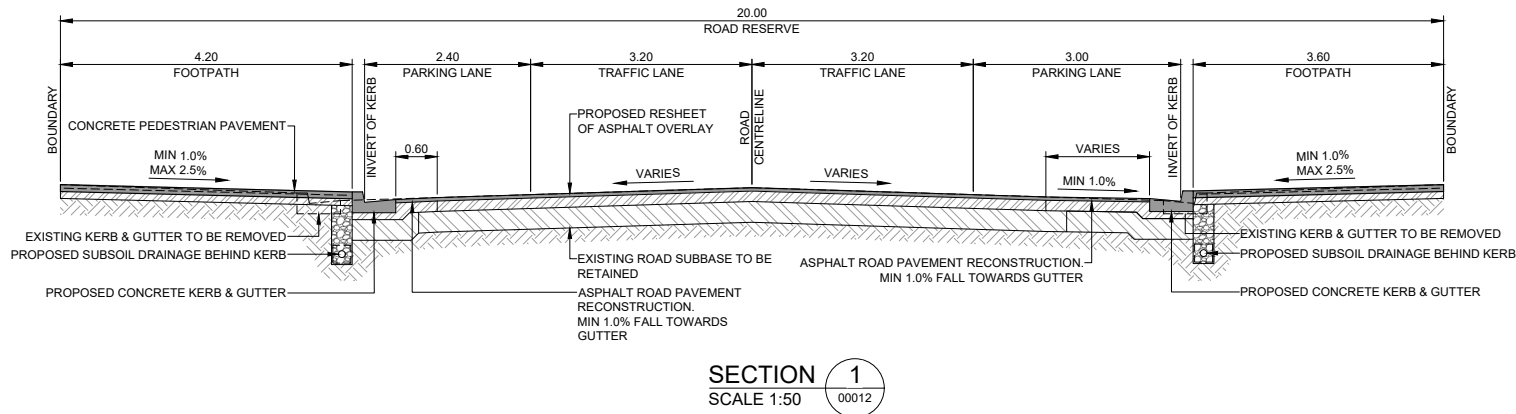
								Client:				Engineer:				Project:				Drawing Title:				Scale at A1		Drawn		Designed		Approved							
								ENVIRONMENTAL								CHARING CROSS				VEHICLE TURNING PATHS						AS		DM									
								PARTNERSHIP (NSW) PTY								STREETSCAPE UPGRADE				LONG RIGID BUS (14.5m)				Project No		Originator		Zone		Type		Role		Sheet No.		Rev	
								LTD																231268-TTW-00-DR-CI-11019-A													
A PRELIMINARY ISSUE				DM		AS		13.03.24						SUITE 3.01, 22-36 MOUNTAIN STREET ULTIMO NSW												13.03.2024		6:50 PM									
Rev		Description		Eng		Draft		Date		Rev		Description		Eng		Draft		Date		Rev		Description		Eng		Draft		Date									



NOT FOR CONSTRUCTION

[illegible]

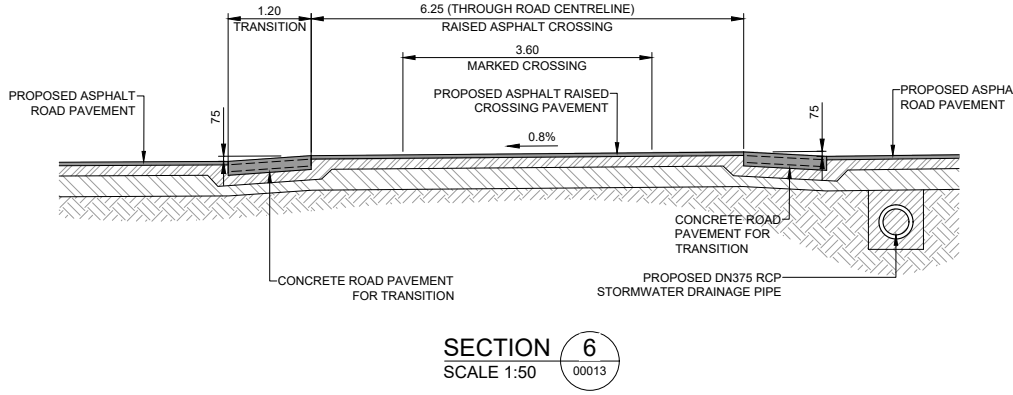
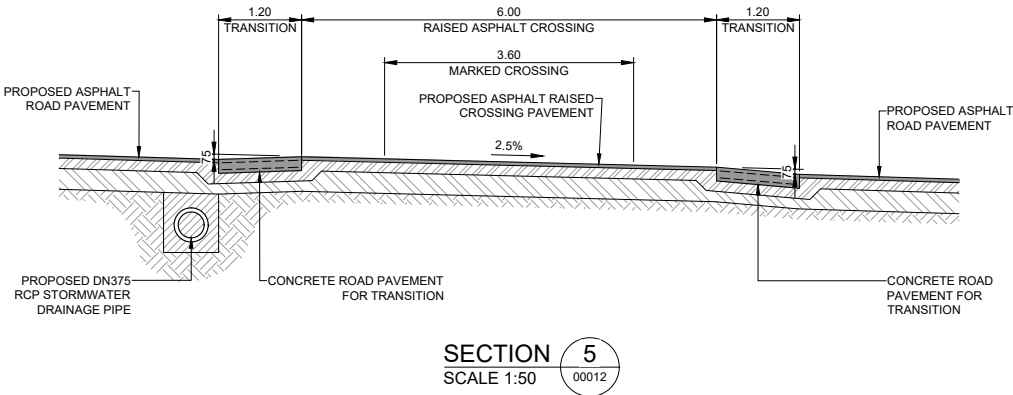
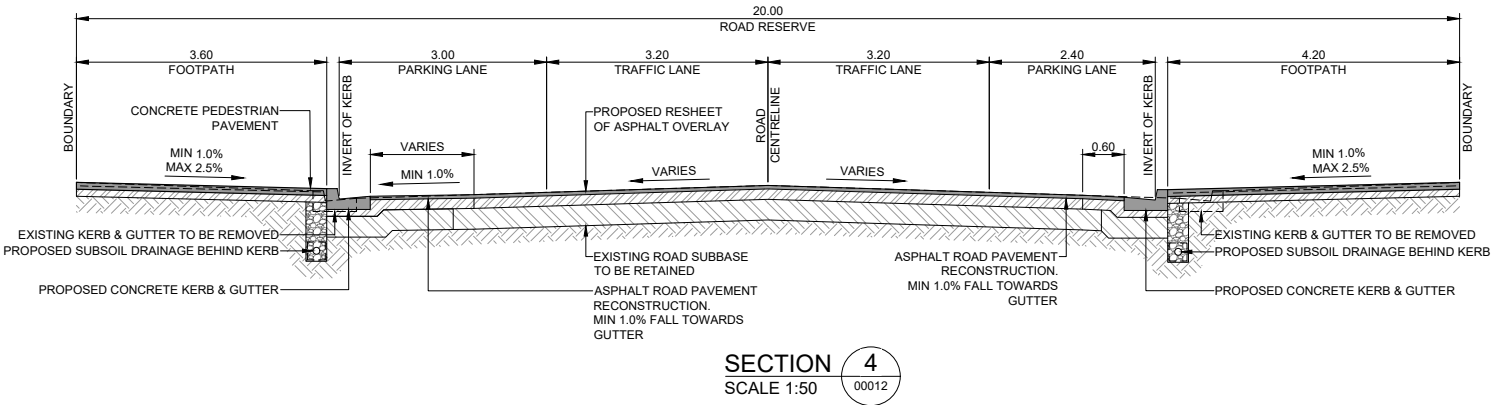
This drawing is copyright and is the property of TTW and must not be used without authorisation. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT NOTES AND LEGENDS



NOT FOR CONSTRUCTION

			Client: ENVIRONMENTAL PARTNERSHIP (NSW) PTY LTD			Engineer: TTW Structural Civil Traffic Façade			Project: CHARING CROSS STREETSCAPE UPGRADE			Drawing Title: GEOMETRY TYPICAL SECTIONS SHEET 1			Scale at A1: 1:50	Drawn: AS	Designed: DM	Approved: TM
B FOR INFORMATION			Suite 3.01, 22-36 MOUNTAIN STREET ULTIMO NSW 2007 AUSTRALIA			612 9439 7288 Level 6, 73 Miller Street, North Sydney, NSW 2060									Project No: 231268-TTW-00-DR-CI-01041-A	Originator:	Zone:	Type:
A WORK IN PROGRESS															13.03.2024	6:49 PM	Role:	Sheet No. Rev
Rev	Description	Eng	Draft	Date	Rev	Description	Eng	Draft	Date	Rev	Description	Eng	Draft	Date				

This drawing is copyright and is the property of TTW and must not be used without authorisation. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT NOTES AND LEGENDS



NOT FOR CONSTRUCTION

			Client: ENVIRONMENTAL PARTNERSHIP (NSW) PTY LTD			Engineer: TTW Structural Civil Traffic Façade			Project: CHARING CROSS STREETSCAPE UPGRADE			Drawing Title: GEOMETRY TYPICAL SECTIONS SHEET 2			Scale at A1 1:50	Drawn AS	Designed DM	Approved TM
B FOR INFORMATION															Project No 231268-TTW-00-DR-CI-01042-A	Originator	Zone	Type
A WORK IN PROGRESS															13.03.2024	Role	Sheet No.	Rev
Rev	Description	Eng Draft	Date	Rev	Description	Eng Draft	Date	Rev	Description	Eng Draft	Date				6:49 PM			



Traffic Modelling Assessment

Charing Cross Streetscape Upgrade

Prepared for Environmental Partnership / 25 October 2023

231268 CAAA TAAA

TTW (NSW) PTY LTD (ACN 649 974 112)
(ABN 74 649 974 112) | Consulting Engineers
Level 6, 73 Miller Street, North Sydney NSW 2060

Your Partner in Engineering

Contents

1.0 Introduction 3

1.1 References 3

2.0 Existing Conditions 4

3.0 Proposed Works 8

4.0 SIDRA Modelling 10

4.1 Assumptions 10

4.2 Base Model 10

4.2.1 Intersection Layout 10

4.2.2 Intersection Performance..... 12

4.3 Proposed Model 14

4.3.1 Intersection Layout 14

4.3.2 Trip Redistribution 16

4.3.3 Intersection Performance..... 17

5.0 Summary of Results and Impacts 20

5.1 Traffic Impacts 20

5.2 Pedestrian Impacts 20

6.0 Conclusion 21

Appendix A 22

1.0 Introduction

TTW have been engaged by Environmental Partnership on behalf of Waverley Council to undertake a modelling assessment to determine the impacts of the proposed design works associated with the Charing Cross Streetscape Upgrade.

In general, the Streetscape Upgrade works include, but are not limited to, the following:

- Upgrade of the Bronte Road, Carrington Road and Victoria Street six-approach intersection, including the removal of the left turn slip lane between Bronte Road and Carrington Road
- Implementation of kerb extensions and the realignment of signalised pedestrian crossings in order to improve pedestrian amenity and accessibility
- Upgrade of the public domain areas along Bronte Road including new pavement, footpath widening, tree planting and street furniture
- Installation of new raised mid-block pedestrian crossings across Bronte Road
- Upgrade to Council stormwater drainage and water sensitive urban design opportunities

This report has been prepared to present the modelling assessment that has been undertaken to project the impact of the proposed works, incorporating the following in the SIDRA analysis:

- The redistribution of traffic associated with the proposed removal of the left turn slip lane and the associated prohibition of left turn traffic movements from Bronte Road (south) to Carrington Road (south)
- Adjusted traffic volumes, where required based on the above mentioned trip redistribution, throughout the six intersections included in the network
- The intersection layouts to align with the revised design, including adjusted lane widths, pedestrian crossing distances and median arrangements

A summary of the findings of the SIDRA network modelling analysis has been provided, describing the performance of a 'Base'^[1] and 'Proposed' network model during the weekday AM, PM and Saturday peak hours.

1.1 References

This report has been prepared in consultation with the Charing Cross Streetscape Upgrade Traffic Study dated 19 November 2020 and accompanying electronic SIDRA files, both prepared by GHD.

[1]: Base model has been adapted from the GHD model as reported on in their Charing Cross Streetscape Upgrade Traffic Study dated 19 November 2020

2.0 Existing Conditions

The SIDRA analysis has included the following six intersections in a network arrangement, being the intersections surrounding and included in the Charing Cross Street Upgrade works:

- Bronte Road, Carrington Road and Victoria Street (signalised)
- Carrington Road, Darley Road and Macpherson Street (signalised)
- Macpherson Street and Albion Street (unsignalised roundabout)
- Albion Street and Bronte Road (unsignalised)
- Bronte Road and Leichhardt Street (unsignalised roundabout)
- Leichhardt Street and Macpherson Street (unsignalised roundabout)

Figure 1 below is an aerial image of the above existing intersections in order to demonstrate their spatial relationship.

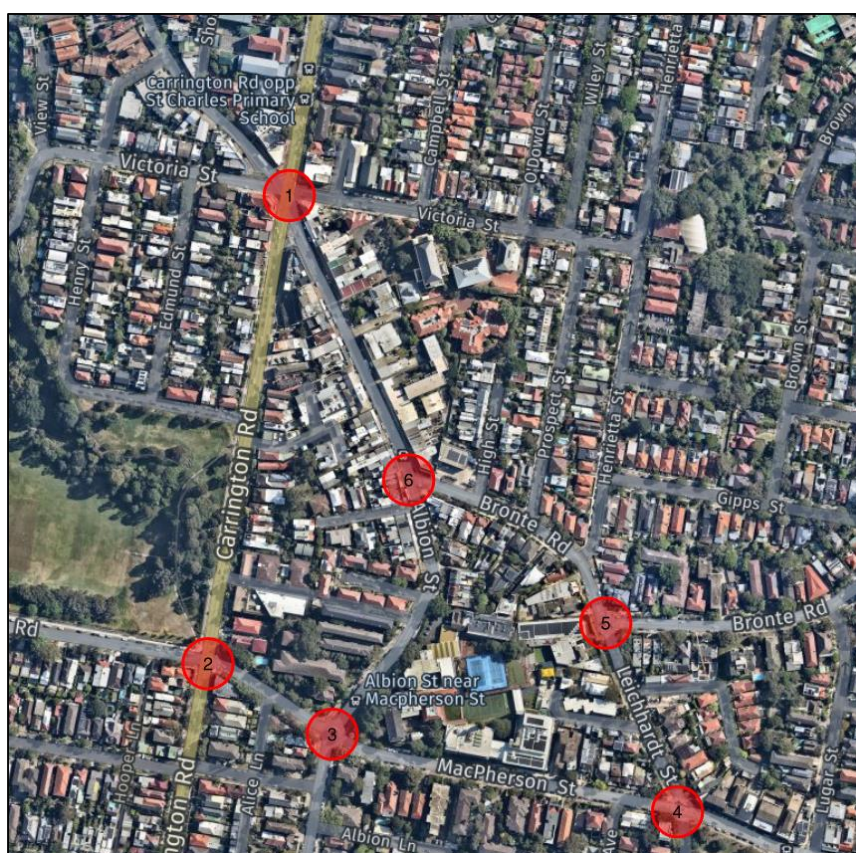


Figure 1 – Aerial Image of Intersection Network, source: Nearmap image dated 3/10/2023

Whilst the SIDRA assessment includes the above-mentioned intersections, the majority of the Streetscape Upgrade design works are associated with the signalised intersection of Bronte Road, Carrington Road and Victoria Street and within Bronte Road (to the south of Victoria Street).

The existing layout of the intersection of Bronte Road, Carrington Road and Victoria Street includes six two-way approaches with signalised pedestrian crossings provided on each approach. The length of the kerb-side lanes on approach to and departure from the intersection depend on the time of day due to the varying sections of 'No Stopping' and 'No Parking' restrictions that apply during the morning peak periods, the afternoon peak periods and on weekends (this has been reflected in the prepared SIDRA analysis). The intersection provides an existing left-turn slip lane between Bronte Road (south) and Carrington Road (south), facilitating filtering left turn movements between Bronte Road (south) and Carrington Road (south) at any time with care.

An aerial image of the existing signalised intersection of Bronte Road, Carrington Road and Victoria Street is provided as Figure 2.



Figure 2 – Aerial Image of Intersection of Bronte Road, Carrington Road and Victoria Street, source: Nearmap image dated 3/10/2023

The intersection currently provides right turn restrictions on the Victoria Street (west), Carrington Road (south), Bronte Road (south) and Carrington Road (north) depending on the time of day.

Figure 3 is taken from the Charing Cross Streetscape Upgrade Traffic Study prepared by GHD, demonstrating the turning restrictions that apply at the intersection of Bronte Road, Carrington Road and Victoria Street at any given time.

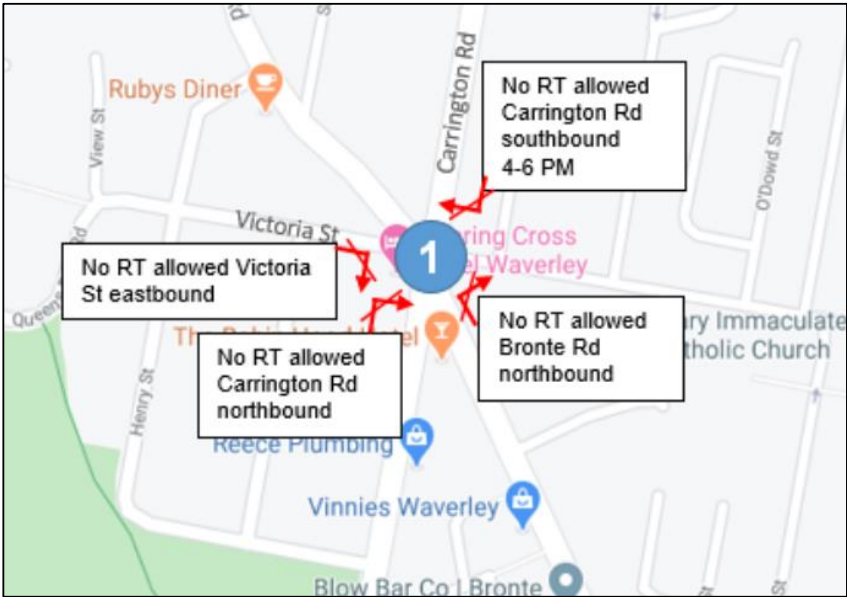


Figure 3 - Turning Restrictions at the Intersection of Bronte Rd, Carrington Rd and Victoria St, source: GHD

Bronte Road, to the south of Victoria Street, currently provides an approximately 12.8m wide pavement facilitating one through lane of traffic in each direction in conjunction to parallel parking permitted along both kerb alignments (the extent of which varying dependent on the time and day). Pedestrian footpaths are provided along both sides of Bronte Road. An existing marked pedestrian crossing is provided across Bronte Road to the north of Albion Street.

An aerial image of a section of Bronte Road, between Victoria Street and Albion Street, is provided as Figure 4.



Figure 4 - Aerial Image of Bronte Road, source: Nearmap image dated 3/10/2023

3.0 Proposed Works

A detailed design plan for the upgrade works associated with the intersection of Bronte Road, Carrington Road and Victoria Street has been developed by TTW, based primarily on the recommendations provided in the Charing Cross Streetscape Upgrade Traffic Study prepared by GHD. The recommendations relevant to the intersection include:

- Removal of the left turn slip lane from Bronte Road (south) into Carrington Road (south)
- Kerb extensions for improved pedestrian crossing facility, notably providing a kerb extension at the Victoria Street (east departure)
- Realignment of pedestrian crossings at Bronte Road and Carrington Road to reduce road crossing length

The proposed intersection design, incorporating the above recommendations is shown below as Figure 5.

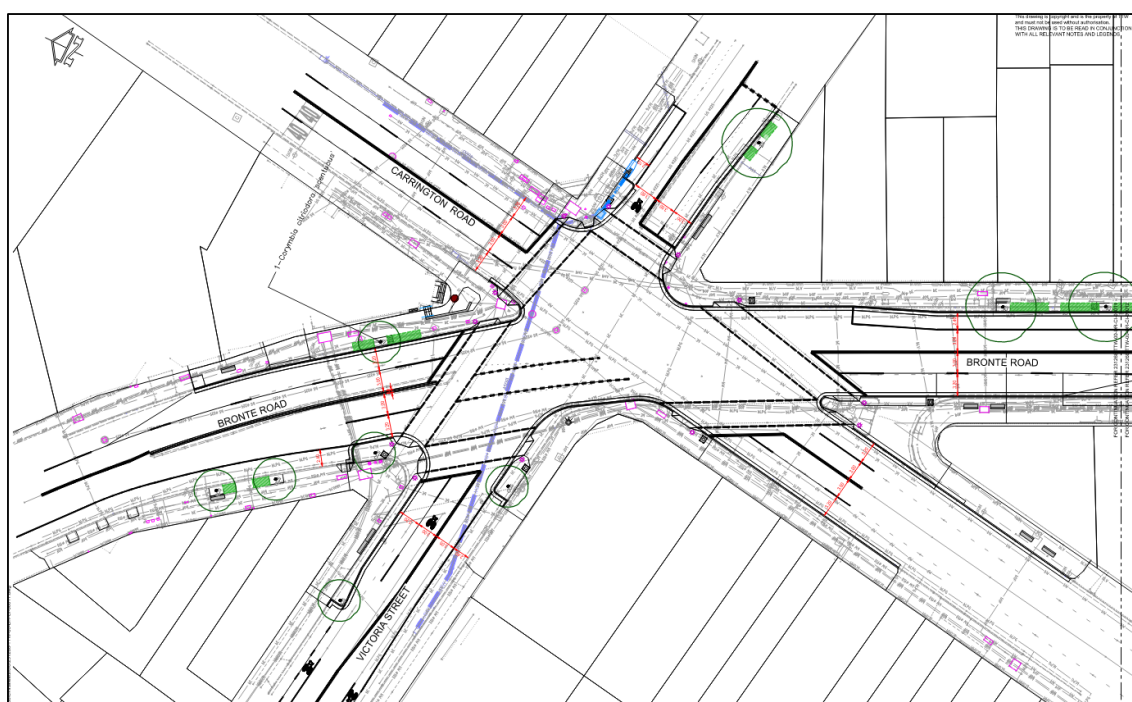


Figure 5 – Proposed Intersection Design, prepared by TTW

The Charing Cross Streetscape Upgrade Traffic Study also provided recommendations with respect to pedestrian infrastructure and public domain to improve pedestrian amenity and connectivity, these recommendations include the following:

- Introduce a new raised mid-block pedestrian crossing across Bronte Road near the pedestrian laneway
- Upgrade the existing pedestrian crossing across Bronte Road to the north of Albion Street to provide a raised crossing
- Introduce a 40m/h high pedestrian activity speed limit within Bronte Road in between the two above mentioned recommended raised pedestrian crossings
- Provide marked parallel parking lanes on both sides of Bronte Road where parking restrictions do not exist

Figures 6 and 7 overleaf indicate the detailed design plans for the public domain works that have been proposed within Bronte Road in accordance with the above GHD recommendations.

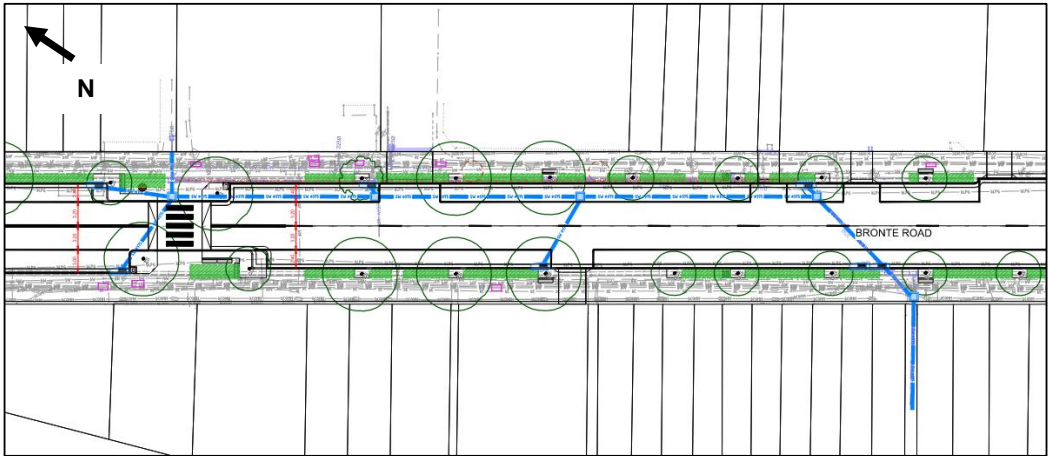


Figure 6 - Proposed Bronte Road Public Domain Works plans, prepared by TTW

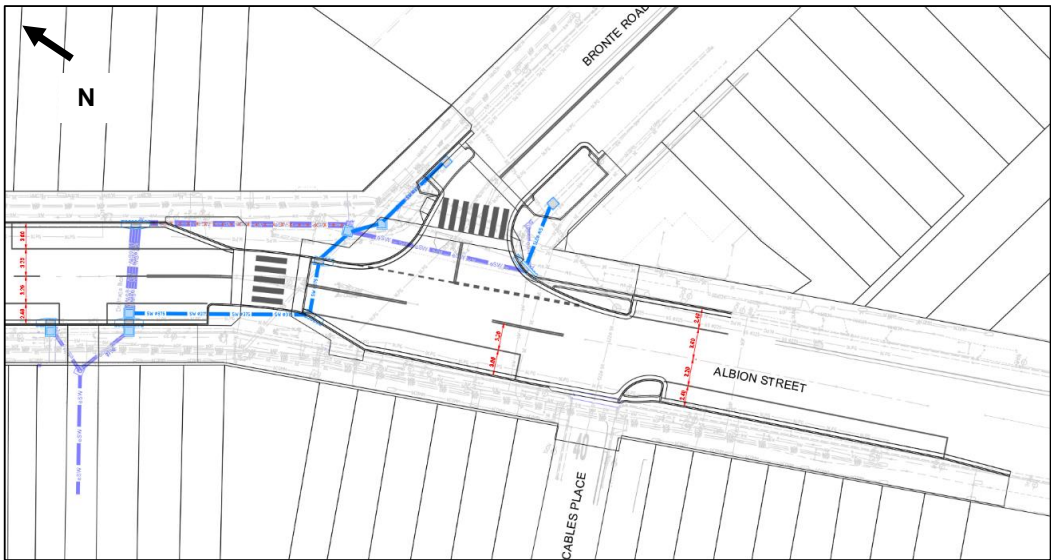


Figure 7 - Proposed Bronte Road Public Domain Works plans, prepared by TTW

Figures 6 and 7 indicate that two new pedestrian crossings are to be provided, being one raised mid-block crossing across Bronte Road and one across Bronte Road to the east of Albion Street. The existing pedestrian crossing across Bronte Road to the north of Albion Street is proposed to be upgraded to a raised pedestrian crossing.

4.0 SIDRA Modelling

4.1 Assumptions

The SIDRA analysis includes, and has been based upon the following information and assumptions:

- Two network models have been prepared. A Base model has been prepared, representing the application of 2030 traffic volumes to the subject intersection network if no changes are made to the existing layout and infrastructure. A Proposed model has been prepared, which applies the 2030 traffic volumes to the proposed Charing Cross Streetscape Upgrade design works as presented within Section 4.0 of this report.
- Both models utilise the traffic volume data as presented within the GHD Charing Cross Streetscape Upgrade Traffic Study, being based upon traffic surveys that occurred on the 22nd and 25th of July 2020.
- The following peak hours were determined from the 2020 traffic volume surveys mentioned above:
 - AM Peak: 7:45 – 8:45am;
 - PM Peak: 4:45 – 5:45pm; and
 - SAT Peak: 12:15 – 1:15pm.
- In order to achieve a 2030 traffic scenario, a total 5% growth rate has applied to all turning movements, in accordance with the methodology used in the GHD report and models.
- The network models utilise a Network User Given Cycle Time, as existing SCATs data for the intersections has not been obtained.
- Pedestrian volumes have been input into the model which have been based upon observations undertaken in the area for the purposes of the Streetscape Upgrade project.
- The above mentioned 5% total growth factor has also been applied to the existing observed pedestrian volumes in order to project the approximate 2030 pedestrian volumes.
- Therefore, the following pedestrian volumes have been input into the Base and Proposed models on all approaches to the intersection of Bronte Road, Carrington Road and Victoria Street as well as all other pedestrian crossings (existing and proposed) within the road network:
 - AM Peak: 158 ped/h;
 - PM Peak: 105 ped/h;
 - SAT Peak: 105 ped/h.

4.2 Base Model

4.2.1 Intersection Layout

A 2030 Base model has been prepared in order to capture the operation of the road network if no changes are made to the existing layout or infrastructure of the network.

Figures 8 – 10 overleaf indicate the existing layout of the intersection of Bronte Road, Carrington Road and Victoria Street during the AM, PM and Saturday peak hours as modelled in SIDRA, as the majority of the proposed design alterations are associated with this intersection.

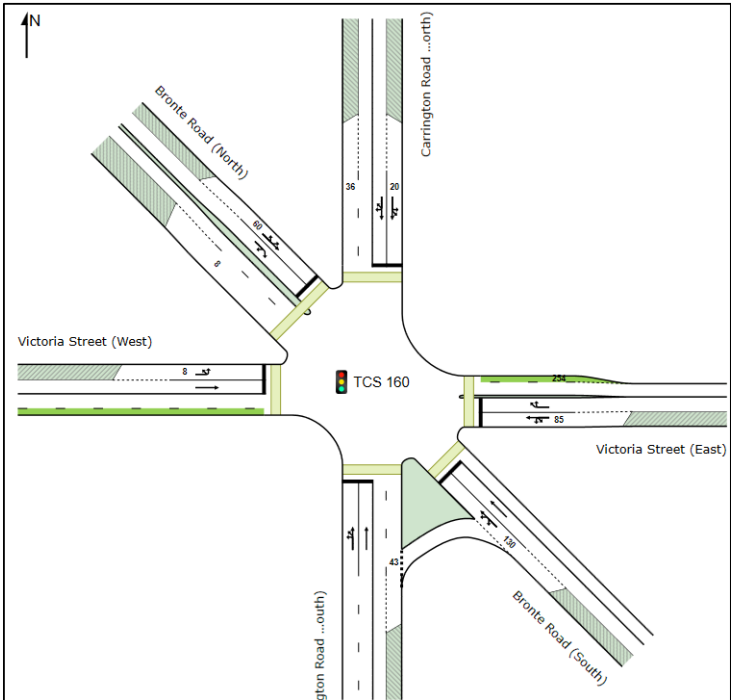


Figure 8 - AM Peak Base Intersection Layout

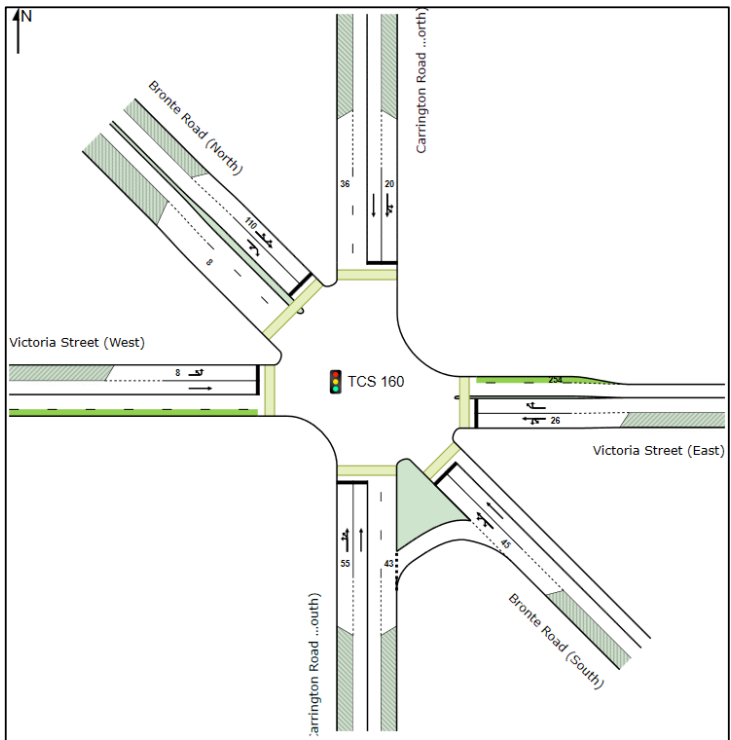


Figure 9 - PM Peak Base Intersection Layout

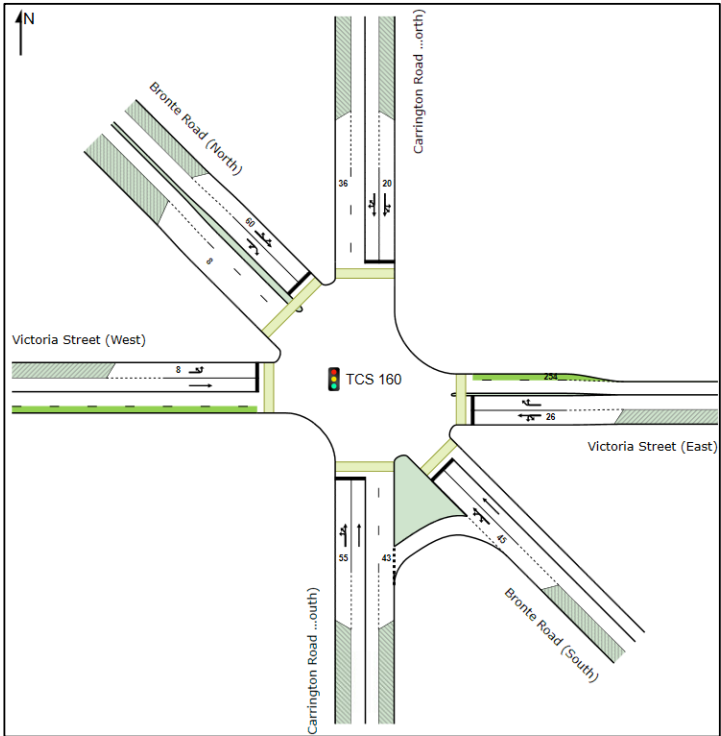


Figure 10 - SAT Peak Base Intersection Layout

4.2.2 Intersection Performance

Table 1 overleaf summarises the operation and performance of the Base network model. Further detailed SIDRA results are included in Appendix A.

Table 1: Base Network Intersection Performance*Data for unsignalised intersections is taken from the movement with the worst delay**LOS = Level of Service*

	AM Peak (7:45 – 8:45am)				PM Peak (4:45 – 5:45pm)				SAT Peak (12:15 – 1:15pm)			
Intersection	Degree of Sat.	Average Delay (sec)	95% Queue Length (veh)	LOS	Degree of Sat.	Average Delay (sec)	95% Queue Length (veh)	LOS	Degree of Sat.	Average Delay (sec)	95% Queue Length (veh)	LOS
Bronte / Carrington / Victoria	1.117	105.4	74.8	F	1.292	138.3	83.3	F	1.296	140.6	79.1	F
Carrington / Macpherson	1.400	183.8	69.2	F	1.134	136.8	56.5	F	1.087	105.5	48.6	F
Albion / Macpherson	1.146	149.9	70.1	F	0.710	14.9	6.8	B	0.882	25.1	16.9	B
Macpherson / Leichhardt	0.896	33.3	18.7	C	0.945	33.6	28.8	C	0.943	32.9	28.7	C
Bronte / Leichhardt	0.600	10.8	6.1	A	0.712	15.6	7.6	B	0.708	17.5	7.5	B
Bronte / Albion	0.835	27.8	6.3	B	0.458	17.6	3.9	B	0.534	19.4	6.2	B

The results in Table 1, in conjunction to the SIDRA Movement Summaries provided in Appendix A, indicate the following with respect to the operation of the Base 2030 network:

- The intersections of Bronte Road, Carrington Road and Victoria Street, and Carrington Road and Macpherson Street are projected to operate with a LOS 'F' during the morning, afternoon and Saturday peak hours if no changes occur to the road network.
- The Saturday peak hour experiences the greatest delay at the intersection of Bronte Road, Carrington Road and Victoria Street. It is estimated that this may be attributed to the layout of the intersection during the Saturday peak period allowing for the greatest amount of parking in the kerb-side lanes as opposed to vehicle queueing space on approach and departure to and from the intersection.

4.3 Proposed Model

4.3.1 Intersection Layout

A 2030 Proposed model has been prepared in order to determine the operation of the road network incorporating the proposed Streetscape Upgrade design alterations as presented in Section 3.0.

Figures 11 – 13 below and overleaf indicate the proposed layout of the intersection of Bronte Road, Carrington Road and Victoria Street during each peak period as modelled in SIDRA, as the majority of the proposed design alterations are associated with this intersection.

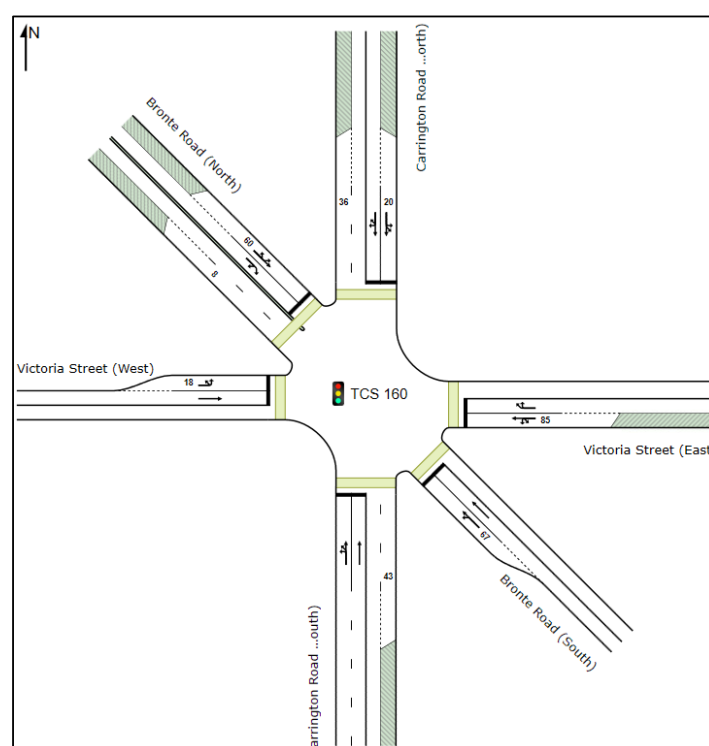


Figure 11 - AM Peak Proposed Intersection Layout

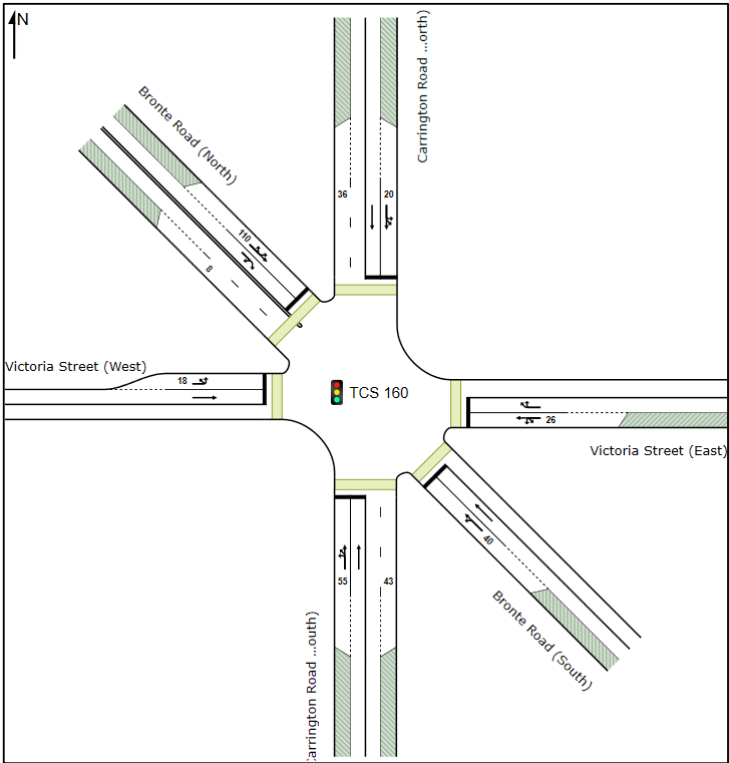


Figure 12 - PM Peak Proposed Intersection Layout

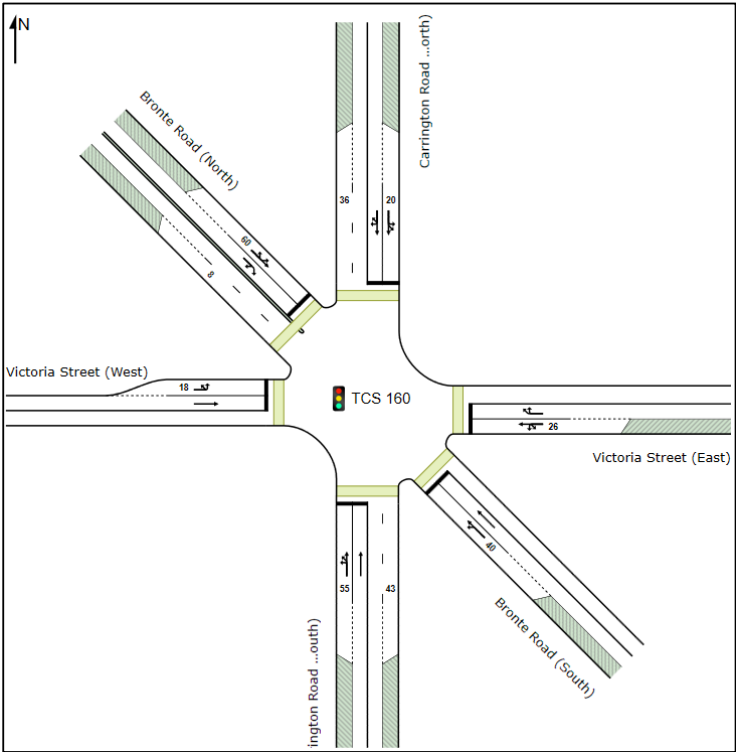


Figure 13 - SAT Peak Proposed Intersection Layout

4.3.2 Trip Redistribution

The layout of the intersection of Bronte Road, Carrington Road and Victoria Street with the introduction of the Streetscape Upgrade works involves the removal of the left turn slip lane from Bronte Road (south) to Carrington Road (south). With the removal of the slip lane, the left turn from Bronte Road (south) to Carrington Road (south) is accordingly prohibited. Therefore, the existing left turn movements between Bronte Road (south) and Carrington Road (south) are required to be redistributed throughout the rest of the road network.

The volume of trips required to be redistributed in each peak hour are as follows:

- AM peak – 22 trips
- PM peak – 24 trips
- SAT peak – 40 trips

The Traffic Study prepared by GHD assumed that vehicles currently turning left between Bronte Road (south) and Carrington Road (south) are most likely to undertake a left turn from Bronte Road (south) to Victoria Street, a left turn to Edmund Street, a left turn to John Street and thence a right or left turn to Carrington Road once this movement is prohibited. Once travelling north or southbound on Carrington Road, it has been assumed that the redistributed volumes are assigned based upon the existing traffic movements within the rest of the road network, particularly the existing turning volumes at the northern approach of the intersection of Carrington Road, Darley Road and Macpherson Street. Accordingly, the morning, afternoon and Saturday peak hour trip distributions have been assigned as shown in Figure 14 below.

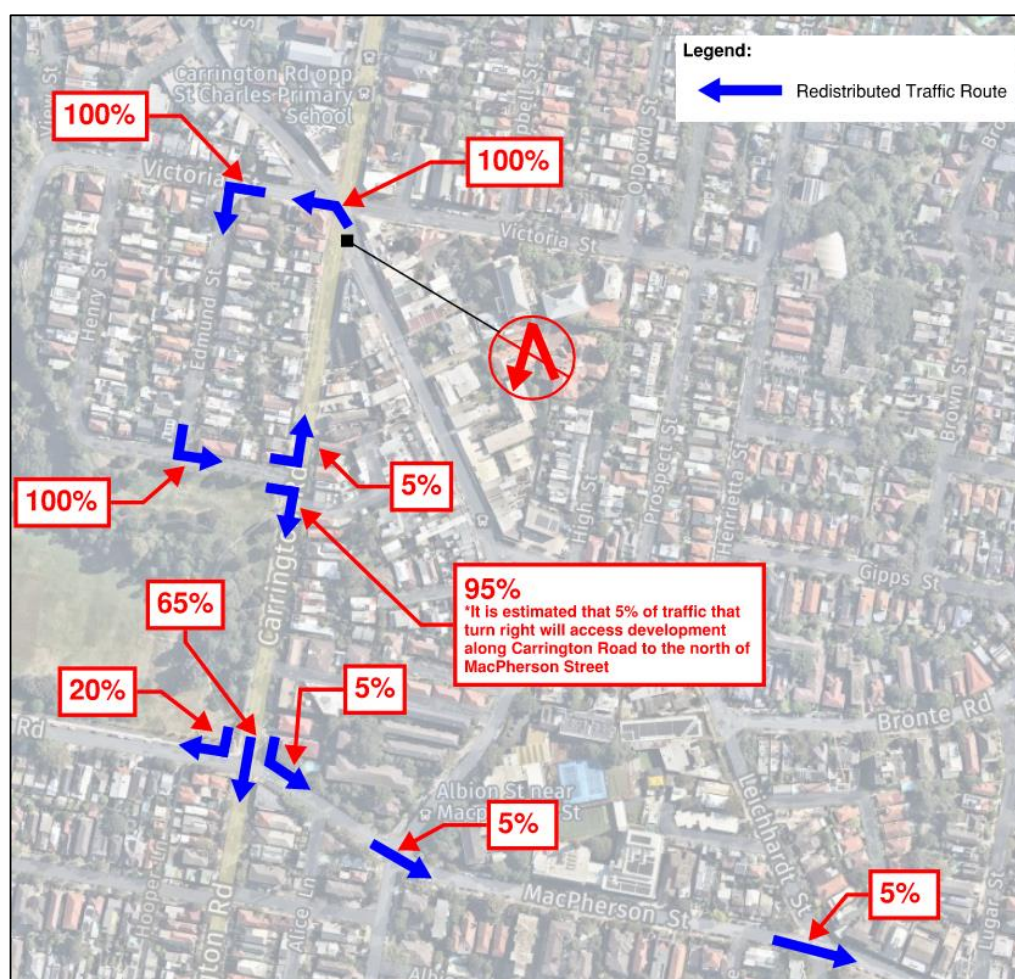


Figure 14 - Redistributed Traffic, prepared by TTW adopted from Nearmap

4.3.3 Intersection Performance

Table 2 overleaf displays the operation and performance of the Proposed network model, as well as the Base model results for ease of comparison between the two models. Further detailed SIDRA results are included in Appendix A.

Environmental Partnership
Traffic Modelling Assessment

25 October 2023
231268 CAAA TAAA

Table 2: Network Intersection Performance (Proposed and Base)

Data for unsignalised intersections is taken from the movement with the worst delay

Intersection	Model	AM Peak (7:45am – 8:45am)				PM Peak (4:45pm – 5:45pm)				SAT Peak (12:15pm – 1:15pm)			
		Degree of Sat.	Average Delay (sec)	95% Queue Length (veh)	LOS	Degree of Sat.	Average Delay (sec)	95% Queue Length (veh)	LOS	Degree of Sat.	Average Delay (sec)	95% Queue Length (veh)	LOS
Bronte / Carrington / Victoria	Base	1.117	105.4	74.8	F	1.292	138.3	83.3	F	1.296	140.6	79.1	F
	Proposed	1.090	101.5	71.0	F	1.272	136.0	81.4	F	1.155	122.5	62.2	F
Carrington / Macpherson	Base	1.400	183.8	69.2	F	1.134	136.8	56.5	F	1.087	105.5	48.6	F
	Proposed	1.155	150.3	60.5	F	1.168	146.1	60.3	F	1.128	128.8	60.8	F
Albion / Macpherson	Base	1.146	149.9	70.1	F	0.710	14.9	6.8	B	0.882	25.1	16.9	B
	Proposed	1.147	150.5	70.3	F	0.709	14.9	6.8	B	0.894	26.2	17.7	B
Macpherson / Leichhardt	Base	0.896	33.3	18.7	C	0.945	33.6	28.8	C	0.943	32.9	28.7	C
	Proposed	0.893	33.0	18.5	C	0.941	32.6	28.1	C	0.941	32.4	28.3	C
Bronte / Leichhardt	Base	0.600	10.8	6.1	A	0.712	15.6	7.6	B	0.708	17.5	7.5	B
	Proposed	0.603	10.8	6.2	A	0.713	15.5	7.6	B	0.696	17.1	7.2	B
Bronte / Albion	Base	0.835	27.8	6.3	B	0.458	17.6	3.9	B	0.534	19.4	6.2	B
	Proposed	0.786	25.8	5.9	B	0.454	17.5	3.9	B	0.614	20.2	6.7	B

The results in Table 2, in conjunction to the SIDRA Movement Summaries provided in Appendix A, indicate the following with respect to the projected operation of the Proposed 2030 network, in relation to the operation of the Base network:

- The LOS for all intersections with the introduction of the Streetscape Upgrade works is projected to remain the same, when compared to the Base network results.
- The operation of the intersection of Bronte Road, Carrington Road and Victoria Street with the introduction of the Streetscape Upgrade works is projected to improve during all peak hours, as the degree of saturation, average delay and 95th percentile queue length is projected to decrease, when compared to the Base network results.
- The operation of the remaining intersections with the introduction of Streetscape Upgrade works is projected to remain the same or be altered by a negligible amount, when compared to the Base network results.

5.0 Summary of Results and Impacts

5.1 Traffic Impacts

Table 2 indicates that the overall operation of the subject road network is not projected to be altered to any measurable extent. To this end, the LOS of each intersection is projected to remain the same in the Base and Proposed models.

The result of the SIDRA modelling also indicates that the Streetscape Upgrade works involving design alterations to the intersection of Bronte Road, Carrington Road and Victoria Street, are projected to improve the operation of this intersection during all peak hours.

Notwithstanding, it is acknowledged that the intersections incur long queues throughout the precinct during the identified peak hours, particularly at the following intersections:

- Bronte Road, Carrington Road and Victoria Street
- Carrington Road and Macpherson Road
- Bronte Road and Albion Street

Whilst the proposed works are projected to decrease queue lengths in some instances, it is considered that reducing queue lengths could further be remedied by imposing additional 'No Stopping' restrictions during peak hours on the approaches to these intersections.

5.2 Pedestrian Impacts

As outlined in Section 4.0 of this report, the Charing Cross Streetscape Upgrade include works largely aimed at improving the amenity, safety and connectivity for pedestrians travelling along Bronte Road and at the intersection of Bronte Road, Carrington Road and Victoria Street.

As a result of the Streetscape Upgrade Design, the pedestrian crossing distances at multiple approaches at the intersection of Bronte Road, Carrington Road and have been reduced, thereby decreasing the time required for pedestrians to cross the intersection and improving the safety of the crossing. Table 3 below indicates the crossing distances of the existing and proposed intersection.

Table 3: Pedestrian Crossing Distance Impacts

Approach	Existing Crossing Distance (m)	Streetscape Upgrade Design Crossing Distance (m)
Bronte Rd (north)	25	18
Bronte Rd (south)	20	20
Carrington Rd (north)	12.5	12.5
Carrington Rd (south)	21	21
Victoria St (east)	13	10
Victoria St (west)	19	14

As shown in Table 3, the proposed design results in a reduced pedestrian crossing distance for the Bronte Road (north) approach and both Victoria Street approaches, by up to 7m.

In addition to the above reported reduction in crossing distances at the intersection of Bronte Road, Carrington Road and Victoria Street, the pedestrian storage capacity between the Bronte Road (South) and Carrington Road (south) has been significantly increased through the removal of the slip lane, further improving the amenity and safety of pedestrians at the intersection.

Further, it is envisioned that, whilst they have little impact on the operation of the road network with respect to vehicular traffic, the introduction of the raised pedestrian crossings, including the mid-block crossing across Bronte Road and the additional pedestrian crossings provided at the junction of Bronte Road and Albion Street, will significantly improve pedestrian connectivity between both sides of Bronte Road and therefore promote pedestrian safety and amenity throughout the precinct.

6.0 Conclusion

This report has been prepared in order to provide an assessment of the impacts of the proposed Charing Cross Streetscape Upgrade Works on the vehicular and pedestrian traffic and the operation of the surrounding road network through SIDRA analysis.

The results of the SIDRA analysis indicate that the intersection of Bronte Road, Carrington Road and Victoria Street is projected to experience reductions in the degree of saturation, average delay and 95th percentile queue lengths during all peak periods, suggesting minor improvements to operation with the upgrade works incorporated. The proposed Streetscape Upgrade works are however projected to improve pedestrian amenity, connectivity and safety of the precinct. Therefore, the Streetscape Upgrade works are anticipated to result in minor impacts to the operation of the surrounding road network, when compared to the Base operation of the network (if no changes are made).

Prepared by
TTW (NSW) PTY LTD



SOPHIE SLADE
Senior Traffic Engineer

Authorised By
TTW (NSW) PTY LTD



PAUL YANNOULATOS
Technical Director (Traffic)

P:\2023\2312\231268\Reports\TTW\Traffic\231012_Charing Cross_Traffic Modelling Assessment.docx

Appendix A

SIDRA MOVEMENT SUMMARIES

MOVEMENT SUMMARY

 Site: TCS 160 [Carrington Rd & Bronte Rd & Victoria St - AM
(Site Folder: AM - 2030)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

■ Network: N101
[2030_AM_Scenario
0_Carrington Rd between
Bronte Rd & Macpherson St -
(120 cycle time) (Network
Folder: General)]

AM peak - existing

Site Category: Future Conditions 1

Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 120 seconds (Network User-Given Cycle Time)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed	
			[Total HV]		[Total HV]					[Veh. veh	Dist]				km/h
			veh/h	%	veh/h	%	v/c	sec			m				
South: Carrington Road (South)															
1	L2	All MCs	29	3.6	25	3.6	0.342	29.2	LOS C	8.1	56.6	0.63	0.68	0.63	30.3
1a	L1	All MCs	229	3.7	196	3.7	0.342	26.3	LOS B	8.1	56.6	0.63	0.68	0.63	35.2
2	T1	All MCs	904	2.8	770	2.8	* 1.117	127.3	LOS F	74.8	535.6	0.99	1.63	1.83	15.6
Approach			1163	3.0	991	3.0	1.117	104.9	LOS F	74.8	535.6	0.91	1.41	1.56	17.9
SouthEast: Bronte Road (South)															
21b	L3	All MCs	23	0.0	22	0.0	0.223	27.7	LOS B	3.4	24.2	0.87	0.81	0.87	15.2
21a	L1	All MCs	55	0.0	53	0.0	0.223	50.8	LOS D	3.4	24.2	0.87	0.81	0.87	20.8
22	T1	All MCs	405	12.2	393	12.4	* 1.114	172.8	LOS F	40.8	314.1	1.00	1.72	2.04	11.8
Approach			483	10.2	468	10.4	1.114	152.0	LOS F	40.8	314.1	0.98	1.57	1.85	12.3
East: Victoria Street (East)															
4b	L3	All MCs	61	0.0	61	0.0	0.883	68.1	LOS E	20.0	139.0	1.00	1.01	1.22	13.6
4	L2	All MCs	123	1.7	123	1.7	0.883	64.4	LOS E	20.0	139.0	1.00	1.01	1.22	13.6
5	T1	All MCs	126	0.0	126	0.0	* 0.883	58.5	LOS E	20.0	139.0	1.00	1.01	1.22	18.4
6a	R1	All MCs	37	2.9	37	2.9	0.745	66.2	LOS E	6.3	44.7	1.00	0.91	1.19	23.2
6	R2	All MCs	63	1.7	63	1.7	0.745	65.7	LOS E	6.3	44.7	1.00	0.91	1.19	21.5
Approach			411	1.0	411	1.0	0.883	63.5	LOS E	20.0	139.0	1.00	0.99	1.21	17.6
North: Carrington Road (North)															
7	L2	All MCs	9	11.1	9	11.1	0.502	73.6	LOS F	7.3	54.2	0.83	0.76	0.83	28.8
7a	L1	All MCs	151	8.4	151	8.4	0.502	69.0	LOS E	7.3	54.2	0.83	0.76	0.83	22.7
8	T1	All MCs	468	3.4	468	3.4	1.055	159.8	LOS F	45.3	324.2	1.00	1.56	1.76	9.6
9	R2	All MCs	6	0.0	6	0.0	1.055	221.8	LOS F	45.3	324.2	1.00	1.56	1.76	12.6
9b	R3	All MCs	1	0.0	1	0.0	1.055	222.6	LOS F	45.3	324.2	1.00	1.56	1.76	16.7
Approach			636	4.6	636	4.6	1.055	137.8	LOS F	45.3	324.2	0.96	1.36	1.53	9.1
NorthWest: Bronte Road (North)															
27b	L3	All MCs	57	0.0	57	0.0	0.789	68.5	LOS E	21.5	162.3	0.98	0.91	1.06	28.5
27a	L1	All MCs	20	5.3	20	5.3	0.789	60.3	LOS E	21.5	162.3	0.98	0.91	1.06	27.3
28	T1	All MCs	300	14.4	300	14.4	0.789	56.9	LOS E	21.5	162.3	0.98	0.91	1.06	21.8
29a	R1	All MCs	114	3.7	114	3.7	0.743	77.4	LOS F	7.1	50.8	1.00	0.96	1.15	17.8
29b	R3	All MCs	4	0.0	4	0.0	* 0.743	79.6	LOS F	7.1	50.8	1.00	0.96	1.15	21.1
Approach			495	9.8	495	9.8	0.789	63.2	LOS E	21.5	162.3	0.99	0.92	1.08	19.4
West: Victoria Street (West)															
10b	L3	All MCs	27	0.0	27	0.0	0.584	91.9	LOS F	10.0	70.6	0.96	0.81	0.96	23.7
10	L2	All MCs	159	0.7	159	0.7	0.584	88.3	LOS F	10.0	70.6	0.96	0.81	0.96	22.1
11	T1	All MCs	25	0.0	25	0.0	0.066	76.3	LOS F	1.2	8.4	0.84	0.61	0.84	23.4
Approach			212	0.5	212	0.5	0.584	87.3	LOS F	10.0	70.6	0.94	0.79	0.94	16.5

All Vehicles	3399	4.9	3211	5.2	1.117	105.4	LOS F	74.8	535.6	0.96	1.25	1.44	14.9
--------------	------	-----	------	-----	-------	-------	-------	------	-------	------	------	------	------

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance											
Mov ID	Crossing	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Eff. Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	sec		[Ped ped	Dist] m			sec	m	m/sec
South: Carrington Road (South)											
P1	Full	166	54.5	LOS E	0.5	0.5	0.96	0.96	69.9	20.0	0.29
SouthEast: Bronte Road (South)											
P5	Full	166	54.5	LOS E	0.5	0.5	0.96	0.96	69.9	20.0	0.29
East: Victoria Street (East)											
P2	Full	166	54.5	LOS E	0.5	0.5	0.96	0.96	69.9	20.0	0.29
North: Carrington Road (North)											
P3	Full	166	54.5	LOS E	0.5	0.5	0.96	0.96	69.9	20.0	0.29
NorthWest: Bronte Road (North)											
P7	Full	166	54.5	LOS E	0.5	0.5	0.96	0.96	69.9	20.0	0.29
West: Victoria Street (West)											
P4	Full	166	54.5	LOS E	0.5	0.5	0.96	0.96	69.9	20.0	0.29
All Pedestrians		998	54.5	LOS E	0.5	0.5	0.96	0.96	69.9	20.0	0.29

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

 Site: TCS 1650 [Carrington Rd & Macpherson St - AM (Site Folder: AM - 2030)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

■ ■ Network: N101
[2030_AM_Scenario
0_Carrington Rd between
Bronte Rd & Macpherson St -
(120 cycle time) (Network
Folder: General)]

AM Peak - existing

Site Category: Future Conditions 1

Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 120 seconds (Network User-Given Cycle Time)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	[Total HV]	[Total HV]	[Total HV]	v/c	sec		[Veh. veh	Dist]				km/h
South: Carrington Road (South)															
1	L2	All MCs	45	2.3	45	2.3	1.206	273.1	LOS F	69.2	488.8	1.00	2.12	2.46	9.7
2	T1	All MCs	892	2.6	892	2.6	* 1.206	267.5	LOS F	69.2	488.8	1.00	2.10	2.48	4.3
Approach			937	2.6	937	2.6	1.206	267.8	LOS F	69.2	488.8	1.00	2.11	2.48	4.3
East: Machpherson Street															
4	L2	All MCs	6	0.0	6	0.0	1.083	187.5	LOS F	25.4	173.0	1.00	1.60	1.91	8.5
5	T1	All MCs	423	0.7	396	0.8	1.083	179.0	LOS F	25.4	173.0	1.00	1.60	1.91	11.5
6	R2	All MCs	47	4.4	44	4.6	1.400	470.6	LOS F	7.4	53.6	1.00	1.38	3.39	0.9
Approach			477	1.1	446	1.1	1.400	208.1	LOS F	25.4	173.0	1.00	1.58	2.05	8.2
North: Carrington Road (North)															
7	L2	All MCs	35	3.0	34	3.0	0.210	48.9	LOS D	6.4	45.1	0.44	0.39	0.44	38.7
8	T1	All MCs	543	2.3	526	2.3	1.015	64.5	LOS E	35.5	252.7	0.75	0.86	1.00	24.2
9	R2	All MCs	202	4.2	196	4.1	* 1.015	101.7	LOS F	35.5	252.7	1.00	1.26	1.47	20.3
Approach			780	2.8	755	2.8	1.015	73.5	LOS F	35.5	252.7	0.80	0.95	1.10	17.7
West: Darley Road															
10	L2	All MCs	227	3.7	227	3.7	0.317	48.9	LOS D	9.1	65.0	0.72	0.75	0.72	27.8
11	T1	All MCs	312	2.4	312	2.4	* 1.194	259.0	LOS F	39.1	279.5	1.00	1.86	2.42	6.7
12	R2	All MCs	11	10.0	11	10.0	1.194	292.9	LOS F	39.1	279.5	1.00	1.88	2.45	9.8
Approach			549	3.1	549	3.1	1.194	172.7	LOS F	39.1	279.5	0.88	1.40	1.72	8.9
All Vehicles															
			2743	2.5	2687	2.5	1.400	183.8	LOS F	69.2	488.8	0.92	1.55	1.86	8.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance											
Mov ID	Crossing	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Eff. Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	sec		[Ped ped	Dist]			sec	m	m/sec
South: Carrington Road (South)											

P1	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	69.7	20.0	0.29
East: Machpherson Street											
P2	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	69.7	20.0	0.29
North: Carrington Road (North)											
P3	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	69.7	20.0	0.29
West: Darley Road											
P4	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	69.7	20.0	0.29
All Pedestrians		211	54.3	LOS E	0.2	0.2	0.95	0.95	69.7	20.0	0.29

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

 Site: Site 3 [Albion St & Macpherson St - AM (Site Folder: AM - 2030)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

■ Network: N101
[2030_AM_Scenario
0_Carrington Rd between
Bronte Rd & Macpherson St -
(120 cycle time) (Network
Folder: General)]

AM peak - existing
Site Category: Future Conditions 1
Roundabout

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed	
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist]				km/h
South: Albion Street															
1	L2	All MCs	52	2.0	52	2.0	0.964	37.6	LOS C	24.5	180.9	1.00	1.78	2.67	19.1
2	T1	All MCs	355	11.0	355	11.0	0.964	38.2	LOS C	24.5	180.9	1.00	1.78	2.67	19.1
3	R2	All MCs	226	2.8	226	2.8	0.964	41.0	LOS C	24.5	180.9	1.00	1.78	2.67	19.1
3u	U	All MCs	2	0.0	2	0.0	0.964	42.3	LOS C	24.5	180.9	1.00	1.78	2.67	26.6
Approach			635	7.3	635	7.3	0.964	39.1	LOS C	24.5	180.9	1.00	1.78	2.67	19.1
East: Macpherson Street (East)															
4	L2	All MCs	241	1.7	239	1.7	1.146	145.2	LOS F	70.1	492.6	1.00	4.40	7.50	11.8
5	T1	All MCs	356	0.6	353	0.6	1.146	145.0	LOS F	70.1	492.6	1.00	4.40	7.50	6.8
6	R2	All MCs	109	11.5	109	11.6	1.146	149.1	LOS F	70.1	492.6	1.00	4.40	7.50	6.8
6u	U	All MCs	32	0.0	31	0.0	1.146	149.9	LOS F	70.1	492.6	1.00	4.40	7.50	6.8
Approach			738	2.6	732	2.6	1.146	145.9	LOS F	70.1	492.6	1.00	4.40	7.50	8.6
North: Albion Street (North)															
7	L2	All MCs	61	19.0	61	19.0	0.532	7.0	LOS A	4.9	37.3	0.63	0.69	0.70	35.6
8	T1	All MCs	266	12.3	265	12.3	0.532	6.5	LOS A	4.9	37.3	0.63	0.69	0.70	41.2
9	R2	All MCs	75	2.8	74	2.8	0.532	9.7	LOS A	4.9	37.3	0.63	0.69	0.70	35.6
9u	U	All MCs	19	0.0	19	0.0	0.532	11.2	LOS A	4.9	37.3	0.63	0.69	0.70	35.6
Approach			421	11.0	419	11.0	0.532	7.4	LOS A	4.9	37.3	0.63	0.69	0.70	39.9
West: Macpherson Street (West)															
10	L2	All MCs	81	1.3	69	1.3	0.531	12.1	LOS A	3.8	27.3	0.77	0.94	0.92	21.0
11	T1	All MCs	219	2.9	187	3.0	0.531	12.2	LOS A	3.8	27.3	0.77	0.94	0.92	21.0
12	R2	All MCs	34	0.0	29	0.0	0.531	15.3	LOS B	3.8	27.3	0.77	0.94	0.92	34.2
12u	U	All MCs	6	0.0	5	0.0	0.531	16.9	LOS B	3.8	27.3	0.77	0.94	0.92	21.0
Approach			340	2.2	290	2.2	0.531	12.6	LOS A	3.8	27.3	0.77	0.94	0.92	23.5
All Vehicles			2134	5.6	2076	5.7	1.146	66.7	LOS E	70.1	492.6	0.89	2.36	3.73	14.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SIDRA INTERSECTION 9.1 | Copyright © 2000-2023 Akcelik and Associates Pty Ltd | sidrasolutions.com

Organisation: TAYLOR THOMSON WHITTING | Licence: NETWORK / 1PC | Processed: Monday, 23 October 2023 2:10:39 PM

Project: P:\2023\2312\231268\Reports\TTW\Traffic\Modelling\231025 - Charing Cross SIDRA Files\231012 Charing Cross - Base (2030).sip9

MOVEMENT SUMMARY

Site: 4 [Macpherson St & Leichhardt St - AM (Site Folder: AM - 2030)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

Network: N101
[2030_AM_Scenario
0_Carrington Rd between
Bronte Rd & Macpherson St -
(120 cycle time) (Network
Folder: General)]

AM peak - existing
Site Category: Future Conditions 1
Roundabout

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed	
			[Total HV]		[Total HV]					[Veh. veh	Dist]				
			veh/h	%	veh/h	%	v/c	sec			m			km/h	
South: Leichhardt Street (South)															
1	L2	All MCs	54	0.0	54	0.0	0.571	24.2	LOS B	5.2	36.5	1.00	1.03	1.38	22.3
2	T1	All MCs	149	1.4	149	1.4	0.571	24.3	LOS B	5.2	36.5	1.00	1.03	1.38	22.3
3	R2	All MCs	6	0.0	6	0.0	0.571	27.0	LOS B	5.2	36.5	1.00	1.03	1.38	33.8
3u	U	All MCs	1	0.0	1	0.0	0.571	28.4	LOS B	5.2	36.5	1.00	1.03	1.38	29.4
Approach			211	1.0	211	1.0	0.571	24.3	LOS B	5.2	36.5	1.00	1.03	1.38	22.9
East: Macpherson Street (East)															
4	L2	All MCs	4	0.0	4	0.0	0.896	27.6	LOS B	18.7	132.3	1.00	1.39	2.00	32.2
5	T1	All MCs	304	4.8	304	4.8	0.896	27.9	LOS B	18.7	132.3	1.00	1.39	2.00	28.1
6	R2	All MCs	277	3.4	277	3.4	0.896	30.7	LOS C	18.7	132.3	1.00	1.39	2.00	28.1
6u	U	All MCs	11	20.0	11	20.0	0.896	33.3	LOS C	18.7	132.3	1.00	1.39	2.00	34.9
Approach			596	4.4	596	4.4	0.896	29.3	LOS C	18.7	132.3	1.00	1.39	2.00	28.3
North: Leichhardt Street (North)															
7	L2	All MCs	325	3.6	324	3.6	0.822	14.0	LOS A	14.4	102.3	1.00	0.89	1.35	37.0
8	T1	All MCs	49	0.0	49	0.0	0.822	13.6	LOS A	14.4	102.3	1.00	0.89	1.35	32.6
9	R2	All MCs	317	1.3	315	1.3	0.822	16.6	LOS B	14.4	102.3	1.00	0.89	1.35	22.8
9u	U	All MCs	26	4.0	26	4.0	0.822	18.2	LOS B	14.4	102.3	1.00	0.89	1.35	22.8
Approach			718	2.3	714	2.4	0.822	15.3	LOS B	14.4	102.3	1.00	0.89	1.35	32.6
West: Macpherson Street (West)															
10	L2	All MCs	251	3.8	234	4.0	0.728	16.1	LOS B	9.6	69.4	0.99	0.98	1.41	28.9
11	T1	All MCs	227	6.0	212	6.2	0.728	16.2	LOS B	9.6	69.4	0.99	0.98	1.41	38.3
12	R2	All MCs	7	0.0	7	0.0	0.728	18.7	LOS B	9.6	69.4	0.99	0.98	1.41	34.3
12u	U	All MCs	57	1.9	53	1.8	0.728	20.2	LOS B	9.6	69.4	0.99	0.98	1.41	28.9
Approach			542	4.5	505	4.6	0.728	16.6	LOS B	9.6	69.4	0.99	0.98	1.41	34.5
All Vehicles			2066	3.4	2026	3.4	0.896	20.7	LOS B	18.7	132.3	1.00	1.07	1.56	30.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SIDRA INTERSECTION 9.1 | Copyright © 2000-2023 Akcelik and Associates Pty Ltd | sidrasolutions.com

Organisation: TAYLOR THOMSON WHITTING | Licence: NETWORK / 1PC | Processed: Monday, 23 October 2023 2:10:39 PM

Project: P:\2023\2312\231268\Reports\TTW\Traffic\Modelling\231025 - Charing Cross SIDRA Files\231012 Charing Cross - Base (2030).sip9

MOVEMENT SUMMARY

 Site: Site 5 [Bronte Rd & Leichhardt St - AM (Site Folder: AM - 2030)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

■ Network: N101
[2030_AM_Scenario
0_Carrington Rd between
Bronte Rd & Macpherson St -
(120 cycle time) (Network
Folder: General)]

AM peak - existing
Site Category: Future Conditions 1
Roundabout

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist]				km/h
South: Leichhardt Street (South)															
2	T1	All MCs	185	2.3	181	2.3	0.600	4.2	LOS A	6.1	43.6	0.59	0.55	0.59	28.3
3	R2	All MCs	487	3.0	476	3.1	0.600	6.8	LOS A	6.1	43.6	0.59	0.55	0.59	33.5
3u	U	All MCs	49	2.1	48	2.2	0.600	7.9	LOS A	6.1	43.6	0.59	0.55	0.59	28.3
Approach			722	2.8	705	2.8	0.600	6.2	LOS A	6.1	43.6	0.59	0.55	0.59	32.6
East: Bronte Road (East)															
4	L2	All MCs	518	2.0	518	2.0	0.585	5.2	LOS A	4.8	34.1	0.60	0.58	0.60	32.8
6	R2	All MCs	112	0.0	112	0.0	0.585	6.9	LOS A	4.8	34.1	0.60	0.58	0.60	32.8
6u	U	All MCs	15	0.0	15	0.0	0.585	8.0	LOS A	4.8	34.1	0.60	0.58	0.60	37.8
Approach			644	1.6	644	1.6	0.585	5.6	LOS A	4.8	34.1	0.60	0.58	0.60	33.0
North: Bronte Road (North)															
7	L2	All MCs	143	3.7	140	3.7	0.412	8.0	LOS A	2.8	19.9	0.77	0.70	0.78	33.5
8	T1	All MCs	151	3.5	147	3.5	0.412	7.2	LOS A	2.8	19.9	0.77	0.70	0.78	29.1
9u	U	All MCs	7	0.0	7	0.0	0.412	10.8	LOS A	2.8	19.9	0.77	0.70	0.78	29.1
Approach			301	3.5	295	3.5	0.412	7.7	LOS A	2.8	19.9	0.77	0.70	0.78	31.9
All Vehicles			1667	2.5	1644	2.5	0.600	6.2	LOS A	6.1	43.6	0.63	0.59	0.63	32.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SIDRA INTERSECTION 9.1 | Copyright © 2000-2023 Akcelik and Associates Pty Ltd | sidrasolutions.com

Organisation: TAYLOR THOMSON WHITTING | Licence: NETWORK / 1PC | Processed: Monday, 23 October 2023 2:10:39 PM

Project: P:\2023\2312\231268\Reports\TTW\TrafficModelling\231025 - Charing Cross SIDRA Files\231012 Charing Cross - Base (2030).sip9

MOVEMENT SUMMARY

Site: Site 6 [Bronte Rd & Albion St - AM (Site Folder: AM - 2030)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

Network: N101
[2030_AM_Scenario
0_Carrington Rd between
Bronte Rd & Macpherson St -
(120 cycle time) (Network
Folder: General)]

AM peak - existing
Site Category: Future Conditions 1
Give-Way (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%				[Veh. veh	Dist]				
South: Albion Street (South)															
2	T1	All MCs	340	15.8	324	16.1	0.593	6.8	LOS A	6.3	47.6	0.65	0.71	1.15	33.1
3	R2	All MCs	213	1.0	202	1.0	0.593	12.7	LOS A	6.3	47.6	0.65	0.71	1.15	33.1
Approach			553	10.1	526	10.3	0.593	9.1	NA	6.3	47.6	0.65	0.71	1.15	33.1
East: Bronte Road (East)															
4	L2	All MCs	108	4.9	107	4.9	0.835	15.7	LOS B	5.9	41.9	0.95	1.39	2.27	20.9
6	R2	All MCs	167	1.3	165	1.3	0.835	27.8	LOS B	5.9	41.9	0.95	1.39	2.27	20.9
Approach			276	2.7	272	2.7	0.835	23.1	LOS B	5.9	41.9	0.95	1.39	2.27	20.9
North: Albion Street (North)															
7	L2	All MCs	221	5.2	221	5.2	0.360	4.7	LOS A	0.0	0.0	0.00	0.23	0.00	44.9
8	T1	All MCs	301	14.3	301	14.3	0.360	0.1	LOS A	0.0	0.0	0.00	0.23	0.00	44.9
Approach			522	10.5	522	10.5	0.360	2.0	NA	0.0	0.0	0.00	0.23	0.00	44.9
All Vehicles			1351	8.7	1320	8.9	0.835	9.2	NA	6.3	47.6	0.46	0.66	0.92	33.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

 Site: TCS 160 [Carrington Rd & Bronte Rd & Victoria St - PM
(Site Folder: PM - 2030)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

■ Network: N101
[2030_PM_Base_Carrington Rd
between Bronte Rd &
Macpherson St - Import
(Network Folder: General)]

PM peak - existing

Site Category: Future Conditions 1

Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 120 seconds (Network User-Given Cycle Time)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed	
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] m				km/h
South: Carrington Road (South)															
1	L2	All MCs	27	0.0	25	0.0	0.300	50.2	LOS D	7.1	49.8	0.67	0.70	0.67	29.0
1a	L1	All MCs	185	1.7	168	1.6	0.300	46.9	LOS D	7.1	49.8	0.67	0.70	0.67	34.0
2	T1	All MCs	573	0.7	519	0.8	0.953	74.8	LOS F	35.5	250.1	0.99	1.10	1.28	25.3
Approach			785	0.9	711	0.9	0.953	67.4	LOS E	35.5	250.1	0.90	0.99	1.11	23.3
SouthEast: Bronte Road (South)															
21b	L3	All MCs	25	0.0	25	0.0	0.174	35.2	LOS C	2.3	16.4	0.87	0.72	0.87	19.4
21a	L1	All MCs	26	0.0	26	0.0	0.174	52.2	LOS D	2.3	16.4	0.87	0.72	0.87	25.2
22	T1	All MCs	273	10.8	268	11.0	* 0.868	74.6	LOS F	16.6	126.2	0.99	1.03	1.23	23.4
Approach			324	9.1	318	9.3	0.868	69.7	LOS E	16.6	126.2	0.97	0.98	1.17	20.7
East: Victoria Street (East)															
4b	L3	All MCs	101	0.0	101	0.0	0.905	100.6	LOS F	16.6	116.1	1.00	1.05	1.34	12.1
4	L2	All MCs	99	0.0	99	0.0	0.905	97.0	LOS F	16.6	116.1	1.00	1.05	1.34	12.1
5	T1	All MCs	42	0.0	42	0.0	* 0.905	90.9	LOS F	16.6	116.1	1.00	1.05	1.34	16.7
6a	R1	All MCs	33	0.0	33	0.0	0.322	78.0	LOS F	3.5	24.2	0.93	0.76	0.93	25.7
6	R2	All MCs	32	0.0	32	0.0	0.322	78.7	LOS F	3.5	24.2	0.93	0.76	0.93	24.0
Approach			306	0.0	306	0.0	0.905	93.4	LOS F	16.6	116.1	0.98	0.99	1.26	12.6
North: Carrington Road (North)															
7	L2	All MCs	11	0.0	11	0.0	1.125	227.4	LOS F	36.7	257.7	1.00	1.66	2.16	10.6
7a	L1	All MCs	313	0.7	313	0.7	1.125	221.8	LOS F	36.7	257.7	1.00	1.66	2.16	6.8
8	T1	All MCs	578	1.6	578	1.6	* 1.292	352.3	LOS F	83.3	590.2	1.00	2.40	2.82	4.3
Approach			901	1.3	901	1.3	1.292	305.6	LOS F	83.3	590.2	1.00	2.14	2.58	4.5
NorthWest: Bronte Road (North)															
27b	L3	All MCs	7	0.0	7	0.0	0.789	53.8	LOS D	25.2	187.0	0.98	0.90	1.03	29.4
27a	L1	All MCs	11	0.0	11	0.0	0.789	46.6	LOS D	25.2	187.0	0.98	0.90	1.03	28.1
28	T1	All MCs	435	8.7	435	8.7	0.789	43.2	LOS D	25.2	187.0	0.98	0.90	1.03	22.6
29a	R1	All MCs	205	1.5	205	1.5	0.919	77.4	LOS F	13.6	96.4	1.00	1.20	1.39	15.9
29b	R3	All MCs	2	0.0	2	0.0	* 0.919	79.7	LOS F	13.6	96.4	1.00	1.20	1.39	19.1
Approach			660	6.2	660	6.2	0.919	54.1	LOS D	25.2	187.0	0.99	0.99	1.14	20.2
West: Victoria Street (West)															
10b	L3	All MCs	14	0.0	14	0.0	0.319	76.3	LOS F	4.4	30.5	0.90	0.76	0.90	24.4
10	L2	All MCs	73	0.0	73	0.0	0.319	72.3	LOS F	4.4	30.5	0.90	0.76	0.90	22.8
11	T1	All MCs	49	0.0	49	0.0	0.180	65.6	LOS E	2.4	16.9	0.87	0.66	0.87	23.0
Approach			136	0.0	136	0.0	0.319	70.3	LOS E	4.4	30.5	0.89	0.72	0.89	18.4
All Vehicles			3113	2.9	3033	2.9	1.292	138.3	LOS F	83.3	590.2	0.96	1.32	1.57	11.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance											
Mov ID	Crossing	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Eff. Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	sec		[Ped	Dist]					
					ped	m			sec	m	m/sec
South: Carrington Road (South)											
P1	Full	111	54.4	LOS E	0.4	0.4	0.95	0.95	69.8	20.0	0.29
SouthEast: Bronte Road (South)											
P5	Full	111	54.4	LOS E	0.4	0.4	0.95	0.95	69.8	20.0	0.29
East: Victoria Street (East)											
P2	Full	111	54.4	LOS E	0.4	0.4	0.95	0.95	69.8	20.0	0.29
North: Carrington Road (North)											
P3	Full	111	54.4	LOS E	0.4	0.4	0.95	0.95	69.8	20.0	0.29
NorthWest: Bronte Road (North)											
P7	Full	111	54.4	LOS E	0.4	0.4	0.95	0.95	69.8	20.0	0.29
West: Victoria Street (West)											
P4	Full	111	54.4	LOS E	0.4	0.4	0.95	0.95	69.8	20.0	0.29
All Pedestrians		663	54.4	LOS E	0.4	0.4	0.95	0.95	69.8	20.0	0.29

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

 Site: TCS 1650 [Carrington Rd & Macpherson St - PM (Site Folder: PM - 2030)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

■ ■ Network: N101
[2030_PM_Base_Carrington Rd
between Bronte Rd &
Macpherson St - Import
(Network Folder: General)]

PM peak - existing

Site Category: Future Conditions 1

Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 120 seconds (Network User-Given Cycle Time)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed	
			[Total HV]	[Total HV]											
			veh/h	%	veh/h	%	v/c	sec		[Veh. veh	Dist]			km/h	
South: Carrington Road (South)															
1	L2	All MCs	71	0.0	71	0.0	0.262	76.1	LOS F	5.9	41.6	0.83	0.72	0.83	29.4
2	T1	All MCs	567	1.1	567	1.1	* 1.134	205.2	LOS F	56.5	398.1	0.98	1.72	1.99	6.0
Approach			638	1.0	638	1.0	1.134	191.0	LOS F	56.5	398.1	0.97	1.61	1.86	6.3
East: Machpherson Street															
4	L2	All MCs	13	0.0	12	0.0	0.660	67.6	LOS E	17.3	122.5	0.94	0.81	0.94	21.0
5	T1	All MCs	326	1.9	322	2.0	0.660	59.4	LOS E	17.3	122.5	0.94	0.81	0.94	26.1
6	R2	All MCs	33	0.0	32	0.0	0.318	84.5	LOS F	1.9	13.4	0.99	0.73	0.99	5.7
Approach			372	1.7	366	1.7	0.660	61.9	LOS E	17.3	122.5	0.94	0.80	0.94	20.0
North: Carrington Road (North)															
7	L2	All MCs	48	2.2	42	2.0	0.233	40.3	LOS C	5.7	40.2	0.39	0.39	0.39	37.9
8	T1	All MCs	675	1.2	583	1.2	1.127	114.5	LOS F	55.4	390.4	0.76	1.05	1.35	17.1
9	R2	All MCs	232	1.4	200	1.4	* 1.127	178.9	LOS F	55.4	390.4	1.00	1.49	1.98	14.4
Approach			955	1.3	824	1.3	1.127	126.3	LOS F	55.4	390.4	0.80	1.13	1.46	14.1
West: Darley Road															
10	L2	All MCs	182	0.6	182	0.6	0.221	44.6	LOS D	6.5	44.4	0.62	0.71	0.62	30.4
11	T1	All MCs	335	0.9	335	0.9	* 1.104	183.3	LOS F	37.8	266.6	0.99	1.65	1.99	9.2
12	R2	All MCs	36	0.0	36	0.0	1.104	214.7	LOS F	37.8	266.6	1.00	1.68	2.03	13.0
Approach			553	0.8	553	0.8	1.104	139.6	LOS F	37.8	266.6	0.87	1.34	1.54	10.8
All Vehicles			2517	1.2	2381	1.2	1.134	136.8	LOS F	56.5	398.1	0.88	1.26	1.51	11.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance											
Mov ID	Crossing	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Eff. Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	sec		[Ped ped	Dist]			sec	m	m/sec
South: Carrington Road (South)											
P1	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	69.7	20.0	0.29

East: Machpherson Street											
P2	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	69.7	20.0	0.29
North: Carrington Road (North)											
P3	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	69.7	20.0	0.29
West: Darley Road											
P4	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	69.7	20.0	0.29
All Pedestrians		211	54.3	LOS E	0.2	0.2	0.95	0.95	69.7	20.0	0.29

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

SIDRA INTERSECTION 9.1 | Copyright © 2000-2023 Akcelik and Associates Pty Ltd | [sidrasolutions.com](https://www.sidrasolutions.com)
Organisation: TAYLOR THOMSON WHITTING | Licence: NETWORK / 1PC | Processed: Monday, 23 October 2023 2:11:22 PM
Project: P:\2023\2312\231268\Reports\TTW\TrafficModelling\231025 - Charing Cross SIDRA Files\231012 Charing Cross - Base (2030).sip9

MOVEMENT SUMMARY

Site: Site 3 [Albion St & Macpherson St - PM (Site Folder: PM - 2030)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

Network: N101
[2030_PM_Base_Carrington Rd
between Bronte Rd &
Macpherson St - Import
(Network Folder: General)]

PM peak - existing
Site Category: Future Conditions 1
Roundabout

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] m				km/h
South: Albion Street															
1	L2	All MCs	46	0.0	46	0.0	0.650	9.4	LOS A	6.8	49.2	0.86	0.79	1.03	34.2
2	T1	All MCs	239	11.0	239	11.0	0.650	9.8	LOS A	6.8	49.2	0.86	0.79	1.03	34.2
3	R2	All MCs	254	0.4	254	0.4	0.650	12.7	LOS A	6.8	49.2	0.86	0.79	1.03	34.2
3u	U	All MCs	3	0.0	3	0.0	0.650	14.2	LOS A	6.8	49.2	0.86	0.79	1.03	39.0
Approach			542	5.0	542	5.0	0.650	11.2	LOS A	6.8	49.2	0.86	0.79	1.03	34.3
East: Macpherson Street (East)															
4	L2	All MCs	200	0.5	198	0.5	0.710	10.2	LOS A	6.3	45.4	0.79	0.90	1.03	39.3
5	T1	All MCs	259	2.8	257	2.9	0.710	10.2	LOS A	6.3	45.4	0.79	0.90	1.03	34.1
6	R2	All MCs	74	11.4	73	11.5	0.710	13.9	LOS A	6.3	45.4	0.79	0.90	1.03	34.1
6u	U	All MCs	9	0.0	9	0.0	0.710	14.9	LOS B	6.3	45.4	0.79	0.90	1.03	34.1
Approach			542	3.1	538	3.1	0.710	10.8	LOS A	6.3	45.4	0.79	0.90	1.03	36.7
North: Albion Street (North)															
7	L2	All MCs	88	8.3	85	8.6	0.579	8.0	LOS A	4.3	31.2	0.70	0.74	0.81	34.8
8	T1	All MCs	392	7.3	377	7.5	0.579	7.6	LOS A	4.3	31.2	0.70	0.74	0.81	40.8
9	R2	All MCs	51	0.0	49	0.0	0.579	10.8	LOS A	4.3	31.2	0.70	0.74	0.81	34.8
9u	U	All MCs	5	0.0	5	0.0	0.579	12.4	LOS A	4.3	31.2	0.70	0.74	0.81	34.8
Approach			536	6.7	516	6.9	0.579	8.0	LOS A	4.3	31.2	0.70	0.74	0.81	39.9
West: Macpherson Street (West)															
10	L2	All MCs	51	0.0	45	0.0	0.497	9.3	LOS A	3.5	24.3	0.67	0.82	0.75	24.0
11	T1	All MCs	263	1.2	237	1.2	0.497	9.3	LOS A	3.5	24.3	0.67	0.82	0.75	24.0
12	R2	All MCs	59	1.8	53	1.7	0.497	12.8	LOS A	3.5	24.3	0.67	0.82	0.75	36.2
12u	U	All MCs	8	0.0	8	0.0	0.497	14.2	LOS A	3.5	24.3	0.67	0.82	0.75	24.0
Approach			381	1.1	344	1.1	0.497	10.0	LOS A	3.5	24.3	0.67	0.82	0.75	27.6
All Vehicles			2001	4.2	1939	4.3	0.710	10.0	LOS A	6.8	49.2	0.77	0.81	0.92	36.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SIDRA INTERSECTION 9.1 | Copyright © 2000-2023 Akcelik and Associates Pty Ltd | sidrasolutions.com

Organisation: TAYLOR THOMSON WHITTING | Licence: NETWORK / 1PC | Processed: Monday, 23 October 2023 2:11:22 PM

Project: P:\2023\2312\231268\Reports\TTW\Traffic\Modelling\231025 - Charing Cross SIDRA Files\231012 Charing Cross - Base (2030).sip9

MOVEMENT SUMMARY

 Site: Site 4 [Macpherson St & Leichhardt St - PM (Site Folder: PM - 2030)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

■ Network: N101
[2030_PM_Base_Carrington Rd
between Bronte Rd &
Macpherson St - Import
(Network Folder: General)]

PM peak - existing
Site Category: Future Conditions 1
Roundabout

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]		[Total HV]					[Veh.	Dist]				
			veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Leichhardt Street (South)															
1	L2	All MCs	26	0.0	26	0.0	0.197	13.0	LOS A	1.4	9.6	0.92	0.80	0.92	30.0
2	T1	All MCs	53	0.0	53	0.0	0.197	12.9	LOS A	1.4	9.6	0.92	0.80	0.92	30.0
3	R2	All MCs	2	0.0	2	0.0	0.197	15.8	LOS B	1.4	9.6	0.92	0.80	0.92	39.2
3u	U	All MCs	1	0.0	1	0.0	0.197	17.2	LOS B	1.4	9.6	0.92	0.80	0.92	35.6
Approach			82	0.0	82	0.0	0.197	13.0	LOS A	1.4	9.6	0.92	0.80	0.92	30.6
East: Macpherson Street (East)															
4	L2	All MCs	13	16.7	13	16.7	0.770	14.3	LOS A	12.2	87.5	1.00	0.88	1.32	38.3
5	T1	All MCs	272	6.6	272	6.6	0.770	13.6	LOS A	12.2	87.5	1.00	0.88	1.32	35.6
6	R2	All MCs	353	0.9	353	0.9	0.770	16.3	LOS B	12.2	87.5	1.00	0.88	1.32	35.6
6u	U	All MCs	13	0.0	13	0.0	0.770	17.6	LOS B	12.2	87.5	1.00	0.88	1.32	40.4
Approach			649	3.6	649	3.6	0.770	15.2	LOS B	12.2	87.5	1.00	0.88	1.32	35.8
North: Leichhardt Street (North)															
7	L2	All MCs	523	2.2	516	2.2	0.945	29.6	LOS C	28.8	202.9	1.00	1.43	2.11	30.1
8	T1	All MCs	68	0.0	67	0.0	0.945	29.3	LOS C	28.8	202.9	1.00	1.43	2.11	24.7
9	R2	All MCs	223	0.0	220	0.0	0.945	32.2	LOS C	28.8	202.9	1.00	1.43	2.11	14.7
9u	U	All MCs	9	0.0	9	0.0	0.945	33.6	LOS C	28.8	202.9	1.00	1.43	2.11	14.7
Approach			824	1.4	813	1.4	0.945	30.3	LOS C	28.8	202.9	1.00	1.43	2.11	27.0
West: Macpherson Street (West)															
10	L2	All MCs	272	0.4	259	0.4	0.797	17.8	LOS B	13.0	91.9	1.00	1.06	1.52	27.9
11	T1	All MCs	314	3.7	299	3.8	0.797	17.9	LOS B	13.0	91.9	1.00	1.06	1.52	37.6
12	R2	All MCs	13	0.0	12	0.0	0.797	20.6	LOS B	13.0	91.9	1.00	1.06	1.52	33.5
12u	U	All MCs	23	0.0	22	0.0	0.797	22.0	LOS B	13.0	91.9	1.00	1.06	1.52	27.9
Approach			621	2.0	592	2.1	0.797	18.0	LOS B	13.0	91.9	1.00	1.06	1.52	34.4
All Vehicles			2177	2.2	2136	2.2	0.945	21.7	LOS B	28.8	202.9	1.00	1.14	1.66	31.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SIDRA INTERSECTION 9.1 | Copyright © 2000-2023 Akcelik and Associates Pty Ltd | sidrasolutions.com

Organisation: TAYLOR THOMSON WHITTING | Licence: NETWORK / 1PC | Processed: Monday, 23 October 2023 2:11:22 PM

Project: P:\2023\2312\231268\Reports\TTW\Traffic\Modelling\231025 - Charing Cross SIDRA Files\231012 Charing Cross - Base (2030).sip9

MOVEMENT SUMMARY

 Site: Site 5 [Bronte Rd & Leichhardt St - PM (Site Folder: PM - 2030)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

■ ■ Network: N101
[2030_PM_Base_Carrington Rd
between Bronte Rd &
Macpherson St - Import
(Network Folder: General)]

PM peak - existing
Site Category: Future Conditions 1
Roundabout

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] m				km/h
South: Leichhardt Street (South)															
2	T1	All MCs	128	0.0	126	0.0	0.545	4.9	LOS A	5.5	38.8	0.51	0.56	0.51	31.3
3	R2	All MCs	546	0.8	536	0.8	0.545	7.5	LOS A	5.5	38.8	0.51	0.56	0.51	38.5
3u	U	All MCs	13	0.0	12	0.0	0.545	8.8	LOS A	5.5	38.8	0.51	0.56	0.51	31.3
Approach			687	0.6	674	0.6	0.545	7.0	LOS A	5.5	38.8	0.51	0.56	0.51	37.8
East: Bronte Road (East)															
4	L2	All MCs	528	1.6	528	1.6	0.712	9.1	LOS A	7.6	53.4	0.84	0.72	0.97	35.0
6	R2	All MCs	86	1.2	86	1.2	0.712	11.0	LOS A	7.6	53.4	0.84	0.72	0.97	35.0
6u	U	All MCs	9	0.0	9	0.0	0.712	12.2	LOS A	7.6	53.4	0.84	0.72	0.97	39.2
Approach			624	1.5	624	1.5	0.712	9.4	LOS A	7.6	53.4	0.84	0.72	0.97	35.1
North: Bronte Road (North)															
7	L2	All MCs	135	0.8	129	0.8	0.618	12.3	LOS A	5.5	38.3	0.88	0.87	1.12	36.3
8	T1	All MCs	288	1.1	277	1.1	0.618	11.7	LOS A	5.5	38.3	0.88	0.87	1.12	28.9
9u	U	All MCs	8	0.0	8	0.0	0.618	15.6	LOS B	5.5	38.3	0.88	0.87	1.12	28.9
Approach			432	1.0	415	1.0	0.618	12.0	LOS A	5.5	38.3	0.88	0.87	1.12	32.2
All Vehicles			1743	1.0	1713	1.0	0.712	9.1	LOS A	7.6	53.4	0.72	0.69	0.82	35.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SIDRA INTERSECTION 9.1 | Copyright © 2000-2023 Akcelik and Associates Pty Ltd | sidrasolutions.com

Organisation: TAYLOR THOMSON WHITTING | Licence: NETWORK / 1PC | Processed: Monday, 23 October 2023 2:11:22 PM

Project: P:\2023\2312\231268\Reports\TTW\Traffic\Modelling\231025 - Charing Cross SIDRA Files\231012 Charing Cross - Base (2030).sip9

MOVEMENT SUMMARY

Site: Site 6 [Bronte Rd & Albion St - PM (Site Folder: PM - 2030)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

Network: N101
[2030_PM_Base_Carrington Rd
between Bronte Rd &
Macpherson St - Import
(Network Folder: General)]

PM peak - existing
Site Category: Future Conditions 1
Give-Way (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%				[Veh. veh	Dist]				
South: Albion Street (South)															
2	T1	All MCs	225	15.0	222	15.2	0.408	9.0	LOS A	3.9	29.1	0.67	0.75	0.95	30.6
3	R2	All MCs	131	0.0	128	0.0	0.408	15.3	LOS B	3.9	29.1	0.67	0.75	0.95	30.6
Approach			356	9.5	350	9.6	0.408	11.3	NA	3.9	29.1	0.67	0.75	0.95	30.6
East: Bronte Road (East)															
4	L2	All MCs	82	0.0	81	0.0	0.458	9.8	LOS A	2.5	17.2	0.72	0.97	1.07	26.6
6	R2	All MCs	131	0.8	129	0.8	0.458	17.6	LOS B	2.5	17.2	0.72	0.97	1.07	26.6
Approach			213	0.5	210	0.5	0.458	14.6	LOS B	2.5	17.2	0.72	0.97	1.07	26.6
North: Albion Street (North)															
7	L2	All MCs	406	0.8	389	0.8	0.423	4.6	LOS A	0.0	0.0	0.00	0.26	0.00	44.4
8	T1	All MCs	444	8.3	427	8.6	0.423	0.1	LOS A	0.0	0.0	0.00	0.26	0.00	44.4
Approach			851	4.7	816	4.9	0.423	2.3	NA	0.0	0.0	0.00	0.26	0.00	44.4
All Vehicles			1419	5.3	1376	5.4	0.458	6.4	NA	3.9	29.1	0.28	0.49	0.40	36.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SIDRA INTERSECTION 9.1 | Copyright © 2000-2023 Akcelik and Associates Pty Ltd | sidrasolutions.com
Organisation: TAYLOR THOMSON WHITTING | Licence: NETWORK / 1PC | Processed: Monday, 23 October 2023 2:11:22 PM
Project: P:\2023\2312\231268\Reports\TTW\Traffic\Modelling\231025 - Charing Cross SIDRA Files\231012 Charing Cross - Base (2030).sip9

MOVEMENT SUMMARY

 Site: TCS 160 [Carrington Rd & Bronte Rd & Victoria St - SAT
(Site Folder: SAT - 2030)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

■ Network: N101
[2030_Sat_Scenario
0_Carrington Rd between
Bronte Rd & Macpherson St -
Import (Network Folder:
General)]

SAT peak - existing

Site Category: Future Conditions 1

Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 120 seconds (Network User-Given Cycle Time)

Vehicle Movement Performance																
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed	
			[Total HV]	[Total HV]						[Veh.	Dist]					
			veh/h	%	veh/h	%	v/c	sec		veh	m				km/h	
South: Carrington Road (South)																
1	L2	All MCs	33	0.0	32	0.0	0.422	48.5	LOS D	9.9	69.1	0.69	0.72	0.69	28.9	
1a	L1	All MCs	231	0.9	225	0.9	0.422	45.3	LOS D	9.9	69.1	0.69	0.72	0.69	34.0	
2	T1	All MCs	506	1.9	495	1.9	1.015	92.1	LOS F	39.6	280.4	1.00	1.31	1.44	21.6	
Approach			769	1.5	752	1.5	1.015	76.2	LOS F	39.6	280.4	0.89	1.11	1.18	21.8	
SouthEast: Bronte Road (South)																
21b	L3	All MCs	42	0.0	42	0.0	0.220	41.1	LOS C	3.8	26.8	0.78	0.70	0.78	21.2	
21a	L1	All MCs	19	0.0	19	0.0	0.220	54.9	LOS D	3.8	26.8	0.78	0.70	0.78	27.0	
22	T1	All MCs	364	6.9	361	7.0	* 1.102	172.2	LOS F	33.0	241.8	0.98	1.53	1.89	13.1	
Approach			425	5.9	422	6.0	1.102	154.0	LOS F	33.0	241.8	0.95	1.41	1.73	12.1	
East: Victoria Street (East)																
4b	L3	All MCs	84	0.0	84	0.0	0.921	104.6	LOS F	17.8	123.8	1.00	1.07	1.38	11.7	
4	L2	All MCs	133	0.8	133	0.8	0.921	100.8	LOS F	17.8	123.8	1.00	1.07	1.38	11.7	
5	T1	All MCs	35	0.0	35	0.0	* 0.921	94.9	LOS F	17.8	123.8	1.00	1.07	1.38	16.2	
6a	R1	All MCs	28	0.0	28	0.0	0.352	80.1	LOS F	3.9	27.1	0.93	0.77	0.93	25.6	
6	R2	All MCs	43	0.0	43	0.0	0.352	78.8	LOS F	3.9	27.1	0.93	0.77	0.93	23.9	
Approach			323	0.3	323	0.3	0.921	96.4	LOS F	17.8	123.8	0.99	1.01	1.28	12.3	
North: Carrington Road (North)																
7	L2	All MCs	9	0.0	9	0.0	0.932	118.5	LOS F	17.6	123.2	1.00	1.14	1.46	19.6	
7a	L1	All MCs	222	0.5	222	0.5	0.932	113.0	LOS F	17.6	123.2	1.00	1.14	1.46	13.8	
8	T1	All MCs	539	0.8	539	0.8	* 1.296	360.0	LOS F	79.1	555.8	1.00	2.40	2.84	4.3	
9	R2	All MCs	4	25.0	4	25.0	1.296	413.4	LOS F	79.1	555.8	1.00	2.40	2.84	5.8	
9b	R3	All MCs	2	0.0	2	0.0	1.296	414.0	LOS F	79.1	555.8	1.00	2.40	2.84	8.3	
Approach			777	0.8	777	0.8	1.296	286.8	LOS F	79.1	555.8	1.00	2.03	2.43	4.8	
NorthWest: Bronte Road (North)																
27b	L3	All MCs	7	0.0	7	0.0	0.746	62.1	LOS E	22.3	163.6	0.95	0.85	0.97	30.4	
27a	L1	All MCs	14	0.0	14	0.0	0.746	55.0	LOS D	22.3	163.6	0.95	0.85	0.97	29.2	
28	T1	All MCs	400	6.8	400	6.8	0.746	51.6	LOS D	22.3	163.6	0.95	0.85	0.97	23.7	
29a	R1	All MCs	144	2.2	144	2.2	0.582	70.7	LOS F	8.3	58.4	0.98	0.93	0.98	19.1	
29b	R3	All MCs	4	25.0	4	25.0	* 0.582	73.1	LOS F	8.3	58.4	0.98	0.93	0.98	22.4	
Approach			569	5.5	569	5.5	0.746	56.8	LOS E	22.3	163.6	0.96	0.87	0.97	19.7	
West: Victoria Street (West)																
10b	L3	All MCs	26	8.0	26	8.0	0.306	75.3	LOS F	3.9	28.0	0.90	0.76	0.90	24.2	
10	L2	All MCs	49	2.1	49	2.1	0.306	71.1	LOS F	3.9	28.0	0.90	0.76	0.90	22.6	
11	T1	All MCs	48	0.0	48	0.0	0.169	64.1	LOS E	2.4	16.5	0.86	0.66	0.86	23.0	
Approach			124	2.5	124	2.5	0.306	69.2	LOS E	3.9	28.0	0.89	0.72	0.89	18.7	

All Vehicles	2988	2.6	2967	2.7	1.296	140.6	LOS F	79.1	555.8	0.95	1.32	1.55	11.5
--------------	------	-----	------	-----	-------	-------	-------	------	-------	------	------	------	------

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance											
Mov ID	Crossing	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Eff. Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	sec		[Ped ped	Dist] m			sec	m	m/sec
South: Carrington Road (South)											
P1	Full	111	54.4	LOS E	0.4	0.4	0.95	0.95	69.8	20.0	0.29
SouthEast: Bronte Road (South)											
P5	Full	111	54.4	LOS E	0.4	0.4	0.95	0.95	69.8	20.0	0.29
East: Victoria Street (East)											
P2	Full	111	54.4	LOS E	0.4	0.4	0.95	0.95	69.8	20.0	0.29
North: Carrington Road (North)											
P3	Full	111	54.4	LOS E	0.4	0.4	0.95	0.95	69.8	20.0	0.29
NorthWest: Bronte Road (North)											
P7	Full	111	54.4	LOS E	0.4	0.4	0.95	0.95	69.8	20.0	0.29
West: Victoria Street (West)											
P4	Full	111	54.4	LOS E	0.4	0.4	0.95	0.95	69.8	20.0	0.29
All Pedestrians		663	54.4	LOS E	0.4	0.4	0.95	0.95	69.8	20.0	0.29

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

 Site: TCS 1650 [Carrington Rd & Macpherson St - SAT (Site Folder: SAT - 2030)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

■ ■ Network: N101
[2030_Sat_Scenario
0_Carrington Rd between
Bronte Rd & Macpherson St -
Import (Network Folder:
General)]

SAT peak - existing

Site Category: Future Conditions 1

Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 120 seconds (Network User-Given Cycle Time)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	[Total HV]	[Total HV]	[Total HV]				[Veh. veh	Dist]				
			veh/h	%	veh/h	%	v/c	sec			m				km/h
South: Carrington Road (South)															
1	L2	All MCs	68	3.1	68	3.1	0.239	73.7	LOS F	5.7	38.9	0.82	0.72	0.82	29.7
2	T1	All MCs	534	1.2	534	1.2	* 1.038	138.9	LOS F	43.4	306.9	0.98	1.41	1.59	8.9
Approach			602	1.4	602	1.4	1.038	131.5	LOS F	43.4	306.9	0.96	1.33	1.50	8.6
East: Machpherson Street															
4	L2	All MCs	27	0.0	27	0.0	0.771	75.8	LOS F	20.4	146.0	0.98	0.89	1.04	19.7
5	T1	All MCs	337	2.8	336	2.8	0.771	67.4	LOS E	20.4	146.0	0.98	0.89	1.04	24.7
6	R2	All MCs	49	0.0	49	0.0	0.523	90.3	LOS F	3.0	21.2	1.00	0.76	1.01	5.6
Approach			414	2.3	413	2.3	0.771	70.7	LOS F	20.4	146.0	0.98	0.88	1.04	17.9
North: Carrington Road (North)															
7	L2	All MCs	49	0.0	43	0.0	0.225	34.2	LOS C	3.8	26.9	0.27	0.29	0.27	41.3
8	T1	All MCs	664	1.0	575	1.0	1.087	90.7	LOS F	48.6	342.1	0.71	0.96	1.19	20.0
9	R2	All MCs	212	2.0	183	2.1	* 1.087	142.1	LOS F	48.6	342.1	1.00	1.39	1.78	17.1
Approach			925	1.1	802	1.2	1.087	99.4	LOS F	48.6	342.1	0.76	1.03	1.28	16.5
West: Darley Road															
10	L2	All MCs	172	3.1	172	3.1	0.212	40.2	LOS C	5.8	41.8	0.60	0.71	0.60	31.0
11	T1	All MCs	288	2.2	288	2.2	* 1.061	148.5	LOS F	29.3	207.2	0.99	1.49	1.82	10.9
12	R2	All MCs	28	3.7	28	3.7	1.061	185.1	LOS F	29.3	207.2	1.00	1.51	1.85	15.1
Approach			488	2.6	488	2.6	1.061	112.6	LOS F	29.3	207.2	0.85	1.22	1.40	12.7
All Vehicles			2429	1.7	2305	1.8	1.087	105.5	LOS F	48.6	342.1	0.87	1.12	1.32	13.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance											
Mov ID	Crossing	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Eff. Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	sec		[Ped ped	Dist]			sec	m	m/sec
						m					
South: Carrington Road (South)											

P1	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	69.7	20.0	0.29
East: Machpherson Street											
P2	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	69.7	20.0	0.29
North: Carrington Road (North)											
P3	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	69.7	20.0	0.29
West: Darley Road											
P4	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	69.7	20.0	0.29
All Pedestrians		211	54.3	LOS E	0.2	0.2	0.95	0.95	69.7	20.0	0.29

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

SIDRA INTERSECTION 9.1 | Copyright © 2000-2023 Akcelik and Associates Pty Ltd | [sidrasolutions.com](https://www.sidrasolutions.com)
Organisation: TAYLOR THOMSON WHITTING | Licence: NETWORK / 1PC | Processed: Monday, 23 October 2023 2:11:48 PM
Project: P:\2023\2312\231268\Reports\TTW\Traffic\Modelling\231025 - Charing Cross SIDRA Files\231012 Charing Cross - Base (2030).sip9

MOVEMENT SUMMARY

 Site: Site 3 [Albion St & Macpherson St - SAT (Site Folder: SAT - 2030)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

■ Network: N101
[2030_Sat_Scenario
0_Carrington Rd between
Bronte Rd & Macpherson St -
Import (Network Folder:
General)]

SAT peak - existing
Site Category: Future Conditions 1
Roundabout

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed	
			[Total HV]		[Total HV]					[Veh. veh	Dist]				
			veh/h	%	veh/h	%	v/c	sec			m			km/h	
South: Albion Street															
1	L2	All MCs	55	0.0	55	0.0	0.882	20.2	LOS B	16.9	120.9	1.00	1.25	1.77	26.3
2	T1	All MCs	320	6.6	320	6.6	0.882	20.6	LOS B	16.9	120.9	1.00	1.25	1.77	26.3
3	R2	All MCs	301	0.7	301	0.7	0.882	23.6	LOS B	16.9	120.9	1.00	1.25	1.77	26.3
3u	U	All MCs	8	0.0	8	0.0	0.882	25.1	LOS B	16.9	120.9	1.00	1.25	1.77	33.1
Approach			684	3.4	684	3.4	0.882	21.9	LOS B	16.9	120.9	1.00	1.25	1.77	26.4
East: Macpherson Street (East)															
4	L2	All MCs	218	1.4	218	1.5	0.836	11.7	LOS A	9.1	64.8	0.90	0.98	1.24	38.4
5	T1	All MCs	312	3.0	311	3.0	0.836	11.7	LOS A	9.1	64.8	0.90	0.98	1.24	32.7
6	R2	All MCs	81	7.8	81	7.8	0.836	15.3	LOS B	9.1	64.8	0.90	0.98	1.24	32.7
6u	U	All MCs	2	0.0	2	0.0	0.836	16.4	LOS B	9.1	64.8	0.90	0.98	1.24	32.7
Approach			613	3.1	612	3.1	0.836	12.2	LOS A	9.1	64.8	0.90	0.98	1.24	35.4
North: Albion Street (North)															
7	L2	All MCs	67	14.1	67	14.1	0.520	7.5	LOS A	3.4	24.6	0.69	0.72	0.77	35.5
8	T1	All MCs	314	5.4	313	5.4	0.520	7.0	LOS A	3.4	24.6	0.69	0.72	0.77	41.3
9	R2	All MCs	45	0.0	45	0.0	0.520	10.3	LOS A	3.4	24.6	0.69	0.72	0.77	35.5
9u	U	All MCs	9	0.0	9	0.0	0.520	11.8	LOS A	3.4	24.6	0.69	0.72	0.77	35.5
Approach			436	6.0	435	6.0	0.520	7.5	LOS A	3.4	24.6	0.69	0.72	0.77	40.3
West: Macpherson Street (West)															
10	L2	All MCs	62	0.0	58	0.0	0.580	12.6	LOS A	4.6	31.8	0.79	0.96	0.97	20.6
11	T1	All MCs	256	2.1	239	2.1	0.580	12.7	LOS A	4.6	31.8	0.79	0.96	0.97	20.6
12	R2	All MCs	20	0.0	19	0.0	0.580	15.9	LOS B	4.6	31.8	0.79	0.96	0.97	33.9
12u	U	All MCs	7	0.0	7	0.0	0.580	17.5	LOS B	4.6	31.8	0.79	0.96	0.97	20.6
Approach			345	1.5	323	1.5	0.580	13.0	LOS A	4.6	31.8	0.79	0.96	0.97	22.1
All Vehicles			2078	3.5	2054	3.6	0.882	14.6	LOS B	16.9	120.9	0.87	1.01	1.27	31.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SIDRA INTERSECTION 9.1 | Copyright © 2000-2023 Akcelik and Associates Pty Ltd | sidrasolutions.com


Organisation: TAYLOR THOMSON WHITTING | Licence: NETWORK / 1PC | Processed: Monday, 23 October 2023 2:11:48 PM

Project: P:\2023\2312\231268\Reports\TTW\Traffic\Modelling\231025 - Charing Cross SIDRA Files\231012 Charing Cross - Base (2030).sip9

MOVEMENT SUMMARY

 **Site: Site 4 [Macpherson St & Leichhardt St - SAT (Site Folder: SAT - 2030)]**

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

 **Network: N101
[2030_Sat_Scenario
0_Carrington Rd between
Bronte Rd & Macpherson St -
Import (Network Folder:
General)]**

SAT peak - existing
Site Category: Future Conditions 1
Roundabout

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]		[Total HV]					[Veh. veh	Dist]				km/h
			veh/h	%	veh/h	%	v/c	sec			m				
South: Leichhardt Street (South)															
1	L2	All MCs	28	0.0	28	0.0	0.247	15.9	LOS B	1.8	12.3	0.97	0.83	0.97	27.3
2	T1	All MCs	42	0.0	42	0.0	0.247	15.8	LOS B	1.8	12.3	0.97	0.83	0.97	27.3
3	R2	All MCs	12	0.0	12	0.0	0.247	18.7	LOS B	1.8	12.3	0.97	0.83	0.97	37.5
3u	U	All MCs	1	0.0	1	0.0	0.247	20.1	LOS B	1.8	12.3	0.97	0.83	0.97	33.6
Approach			83	0.0	83	0.0	0.247	16.3	LOS B	1.8	12.3	0.97	0.83	0.97	29.9
East: Macpherson Street (East)															
4	L2	All MCs	9	0.0	9	0.0	0.891	21.9	LOS B	21.4	152.6	1.00	1.19	1.72	34.4
5	T1	All MCs	312	4.4	312	4.4	0.891	22.0	LOS B	21.4	152.6	1.00	1.19	1.72	30.7
6	R2	All MCs	408	2.3	408	2.3	0.891	24.8	LOS B	21.4	152.6	1.00	1.19	1.72	30.7
6u	U	All MCs	21	0.0	21	0.0	0.891	26.1	LOS B	21.4	152.6	1.00	1.19	1.72	37.0
Approach			751	3.1	751	3.1	0.891	23.6	LOS B	21.4	152.6	1.00	1.19	1.72	31.0
North: Leichhardt Street (North)															
7	L2	All MCs	506	1.2	506	1.2	0.943	28.8	LOS C	28.7	201.8	1.00	1.41	2.08	30.3
8	T1	All MCs	44	0.0	44	0.0	0.943	28.5	LOS C	28.7	201.8	1.00	1.41	2.08	25.0
9	R2	All MCs	273	1.5	272	1.5	0.943	31.6	LOS C	28.7	201.8	1.00	1.41	2.08	14.9
9u	U	All MCs	2	0.0	2	0.0	0.943	32.9	LOS C	28.7	201.8	1.00	1.41	2.08	14.9
Approach			825	1.3	824	1.3	0.943	29.7	LOS C	28.7	201.8	1.00	1.41	2.08	26.8
West: Macpherson Street (West)															
10	L2	All MCs	307	1.4	299	1.4	0.888	28.4	LOS B	18.9	134.4	1.00	1.40	2.01	22.1
11	T1	All MCs	296	3.2	288	3.3	0.888	28.5	LOS B	18.9	134.4	1.00	1.40	2.01	33.1
12	R2	All MCs	14	0.0	13	0.0	0.888	31.1	LOS C	18.9	134.4	1.00	1.40	2.01	28.6
12u	U	All MCs	5	0.0	5	0.0	0.888	32.5	LOS C	18.9	134.4	1.00	1.40	2.01	22.1
Approach			622	2.2	605	2.2	0.888	28.5	LOS C	18.9	134.4	1.00	1.40	2.01	28.9
All Vehicles			2281	2.1	2263	2.1	0.943	26.9	LOS B	28.7	201.8	1.00	1.31	1.90	28.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SIDRA INTERSECTION 9.1 | Copyright © 2000-2023 Akcelik and Associates Pty Ltd | sidrasolutions.com

Organisation: TAYLOR THOMSON WHITTING | Licence: NETWORK / 1PC | Processed: Monday, 23 October 2023 2:11:48 PM

Project: P:\2023\2312\231268\Reports\TTW\Traffic\Modelling\231025 - Charing Cross SIDRA Files\231012 Charing Cross - Base (2030).sip9

MOVEMENT SUMMARY

 Site: Site 5 [Bronte Rd & Leichhardt St - SAT (Site Folder: SAT - 2030)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

■ Network: N101
[2030_Sat_Scenario
0_Carrington Rd between
Bronte Rd & Macpherson St -
Import (Network Folder:
General)]

SAT peak - existing
Site Category: Future Conditions 1
Roundabout

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	[Total HV]	[Total HV]	[Total HV]				[Veh. veh	Dist]				km/h
			veh/h	%	veh/h	%	v/c	sec			m				
South: Leichhardt Street (South)															
2	T1	All MCs	151	0.7	149	0.7	0.617	5.0	LOS A	6.9	49.1	0.57	0.55	0.57	31.1
3	R2	All MCs	623	2.0	616	2.0	0.617	7.7	LOS A	6.9	49.1	0.57	0.55	0.57	38.4
3u	U	All MCs	1	0.0	1	0.0	0.617	8.9	LOS A	6.9	49.1	0.57	0.55	0.57	31.1
Approach			775	1.8	766	1.8	0.617	7.2	LOS A	6.9	49.1	0.57	0.55	0.57	37.6
East: Bronte Road (East)															
4	L2	All MCs	573	1.3	573	1.3	0.708	7.8	LOS A	7.5	53.3	0.79	0.65	0.86	36.5
6	R2	All MCs	77	1.4	77	1.4	0.708	9.7	LOS A	7.5	53.3	0.79	0.65	0.86	36.5
6u	U	All MCs	18	0.0	18	0.0	0.708	11.0	LOS A	7.5	53.3	0.79	0.65	0.86	40.2
Approach			667	1.3	667	1.3	0.708	8.1	LOS A	7.5	53.3	0.79	0.65	0.86	36.6
North: Bronte Road (North)															
7	L2	All MCs	169	0.6	169	0.6	0.643	14.3	LOS A	6.0	42.0	0.93	0.93	1.24	34.9
8	T1	All MCs	220	1.4	219	1.4	0.643	13.7	LOS A	6.0	42.0	0.93	0.93	1.24	26.9
9u	U	All MCs	9	0.0	9	0.0	0.643	17.5	LOS B	6.0	42.0	0.93	0.93	1.24	26.9
Approach			399	1.1	398	1.1	0.643	14.0	LOS A	6.0	42.0	0.93	0.93	1.24	31.4
All Vehicles			1841	1.4	1831	1.4	0.708	9.0	LOS A	7.5	53.3	0.73	0.67	0.82	35.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SIDRA INTERSECTION 9.1 | Copyright © 2000-2023 Akcelik and Associates Pty Ltd | sidrasolutions.com

Organisation: TAYLOR THOMSON WHITTING | Licence: NETWORK / 1PC | Processed: Monday, 23 October 2023 2:11:48 PM

Project: P:\2023\2312\231268\Reports\TTW\TrafficModelling\231025 - Charing Cross SIDRA Files\231012 Charing Cross - Base (2030).sip9

MOVEMENT SUMMARY

Site: Site 6 [Bronte Rd & Albion St - SAT (Site Folder: SAT - 2030)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

Network: N101
[2030_Sat_Scenario
0_Carrington Rd between
Bronte Rd & Macpherson St -
Import (Network Folder:
General)]

SAT peak - existing
Site Category: Future Conditions 1
Give-Way (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows [Total HV]		Arrival Flows [Total HV]		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			veh/h	%	veh/h	%	v/c	sec		[Veh. veh	Dist] m				km/h
South: Albion Street (South)															
2	T1	All MCs	284	8.9	282	9.0	0.516	9.7	LOS A	6.2	45.0	0.69	0.80	1.21	29.9
3	R2	All MCs	185	1.7	184	1.7	0.516	15.8	LOS B	6.2	45.0	0.69	0.80	1.21	29.9
Approach			469	6.1	465	6.1	0.516	12.1	NA	6.2	45.0	0.69	0.80	1.21	29.9
East: Bronte Road (East)															
4	L2	All MCs	46	2.3	46	2.3	0.534	10.7	LOS A	2.9	20.3	0.78	1.06	1.26	24.3
6	R2	All MCs	164	0.6	163	0.6	0.534	19.4	LOS B	2.9	20.3	0.78	1.06	1.26	24.3
Approach			211	1.0	209	1.0	0.534	17.5	LOS B	2.9	20.3	0.78	1.06	1.26	24.3
North: Albion Street (North)															
7	L2	All MCs	333	0.6	333	0.6	0.372	4.6	LOS A	0.0	0.0	0.00	0.25	0.00	44.7
8	T1	All MCs	391	6.7	391	6.7	0.372	0.1	LOS A	0.0	0.0	0.00	0.25	0.00	44.7
Approach			723	3.9	723	3.9	0.372	2.2	NA	0.0	0.0	0.00	0.25	0.00	44.7
All Vehicles			1403	4.2	1398	4.2	0.534	7.8	NA	6.2	45.0	0.35	0.55	0.59	35.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SIDRA INTERSECTION 9.1 | Copyright © 2000-2023 Akcelik and Associates Pty Ltd | sidrasolutions.com

Organisation: TAYLOR THOMSON WHITTING | Licence: NETWORK / 1PC | Processed: Monday, 23 October 2023 2:11:48 PM

Project: P:\2023\2312\231268\Reports\TTW\Traffic\Modelling\231025 - Charing Cross SIDRA Files\231012 Charing Cross - Base (2030).sip9

MOVEMENT SUMMARY

 Site: TCS 160 [Carrington Rd & Bronte Rd & Victoria St - AM
(Site Folder: AM - 2030)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

 Network: N101 [2030_AM
Network (Network Folder:
General)]

AM Peak - Proposed

Site Category: Future Conditions 1

Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 120 seconds (Network User-Given Cycle Time)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows [Total HV] veh/h %		Arrival Flows [Total HV] veh/h %		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh Dist] veh m		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Carrington Road (South)															
1	L2	All MCs	29	3.6	25	3.6	0.326	25.6	LOS B	7.2	50.1	0.57	0.66	0.57	31.6
1a	L1	All MCs	229	3.7	198	3.7	0.326	23.3	LOS B	7.2	50.1	0.57	0.66	0.57	36.3
2	T1	All MCs	904	2.8	780	2.8	* 1.090	99.7	LOS F	71.0	508.7	0.99	1.52	1.68	18.3
Approach			1163	3.0	1004	3.0	1.090	82.7	LOS F	71.0	508.7	0.90	1.33	1.43	20.7
SouthEast: Bronte Road (South)															
21a	L1	All MCs	78	0.0	76	0.0	0.217	61.4	LOS E	4.2	29.5	0.87	0.74	0.87	14.7
22	T1	All MCs	405	12.2	394	12.3	* 1.085	164.8	LOS F	15.9	122.4	1.00	1.62	1.90	10.8
Approach			483	10.2	469	10.4	1.085	148.1	LOS F	15.9	122.4	0.98	1.48	1.74	10.1
East: Victoria Street (East)															
4b	L3	All MCs	61	0.0	61	0.0	1.074	150.8	LOS F	29.6	206.1	1.00	1.43	1.88	6.9
4	L2	All MCs	123	1.7	123	1.7	1.074	146.9	LOS F	29.6	206.1	1.00	1.43	1.88	6.9
5	T1	All MCs	126	0.0	126	0.0	* 1.074	141.0	LOS F	29.6	206.1	1.00	1.43	1.88	10.0
6a	R1	All MCs	37	2.9	37	2.9	0.951	89.9	LOS F	7.5	53.4	1.00	1.12	1.63	19.4
6	R2	All MCs	63	1.7	63	1.7	0.951	89.2	LOS F	7.5	53.4	1.00	1.12	1.63	18.0
Approach			411	1.0	411	1.0	1.074	131.7	LOS F	29.6	206.1	1.00	1.35	1.82	10.4
North: Carrington Road (North)															
7	L2	All MCs	9	11.1	9	11.1	0.469	70.7	LOS F	7.0	52.5	0.80	0.75	0.80	29.4
7a	L1	All MCs	151	8.4	151	8.4	0.469	66.2	LOS E	7.0	52.5	0.80	0.75	0.80	23.3
8	T1	All MCs	468	3.4	468	3.4	1.014	132.3	LOS F	41.8	299.2	1.00	1.42	1.58	11.5
9	R2	All MCs	6	0.0	6	0.0	1.014	198.1	LOS F	41.8	299.2	1.00	1.42	1.58	14.8
9b	R3	All MCs	1	0.0	1	0.0	1.014	198.8	LOS F	41.8	299.2	1.00	1.42	1.58	19.3
Approach			636	4.6	636	4.6	1.014	116.5	LOS F	41.8	299.2	0.95	1.25	1.39	10.3
NorthWest: Bronte Road (North)															
27b	L3	All MCs	57	0.0	57	0.0	0.735	62.5	LOS E	20.1	152.0	0.96	0.85	0.98	29.7
27a	L1	All MCs	20	5.3	20	5.3	0.735	54.4	LOS D	20.1	152.0	0.96	0.85	0.98	28.5
28	T1	All MCs	300	14.4	300	14.4	0.735	50.9	LOS D	20.1	152.0	0.96	0.85	0.98	23.0
29a	R1	All MCs	114	3.7	114	3.7	0.750	76.2	LOS F	7.1	50.9	1.00	0.96	1.15	17.7
29b	R3	All MCs	4	0.0	4	0.0	* 0.750	78.4	LOS F	7.1	50.9	1.00	0.96	1.15	21.0
Approach			495	9.8	495	9.8	0.750	58.5	LOS E	20.1	152.0	0.97	0.88	1.02	20.3
West: Victoria Street (West)															
10b	L3	All MCs	27	0.0	27	0.0	0.690	89.1	LOS F	10.7	75.2	0.99	0.84	1.04	22.6
10	L2	All MCs	159	0.7	159	0.7	0.690	85.5	LOS F	10.7	75.2	0.99	0.84	1.04	20.9
11	T1	All MCs	25	0.0	25	0.0	0.079	71.9	LOS F	1.3	8.8	0.88	0.64	0.88	22.2
Approach			212	0.5	212	0.5	0.690	84.3	LOS F	10.7	75.2	0.98	0.82	1.02	16.9
All Vehicles			3399	4.9	3226	5.2	1.090	101.5	LOS F	71.0	508.7	0.95	1.24	1.43	14.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance											
Mov ID	Crossing	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Eff. Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	sec		[Ped ped	Dist] m			sec	m	m/sec
South: Carrington Road (South)											
P1	Full	166	54.5	LOS E	0.5	0.5	0.96	0.96	69.9	20.0	0.29
SouthEast: Bronte Road (South)											
P5	Full	166	54.5	LOS E	0.5	0.5	0.96	0.96	69.9	20.0	0.29
East: Victoria Street (East)											
P2	Full	166	54.5	LOS E	0.5	0.5	0.96	0.96	69.9	20.0	0.29
North: Carrington Road (North)											
P3	Full	166	54.5	LOS E	0.5	0.5	0.96	0.96	69.9	20.0	0.29
NorthWest: Bronte Road (North)											
P7	Full	166	54.5	LOS E	0.5	0.5	0.96	0.96	69.9	20.0	0.29
West: Victoria Street (West)											
P4	Full	166	54.5	LOS E	0.5	0.5	0.96	0.96	69.9	20.0	0.29
All Pedestrians		998	54.5	LOS E	0.5	0.5	0.96	0.96	69.9	20.0	0.29

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

 Site: TCS 1650 [Carrington Rd & Macpherson St - AM (Site Folder: AM - 2030)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

 Network: N101 [2030_AM Network (Network Folder: General)]

AM Peak - Proposed

Site Category: Future Conditions 1

Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 120 seconds (Network User-Given Cycle Time)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] m				km/h
South: Carrington Road (South)															
1	L2	All MCs	45	2.3	45	2.3	1.155	233.8	LOS F	60.5	426.8	1.00	1.93	2.23	11.3
2	T1	All MCs	892	2.6	892	2.6	* 1.155	227.6	LOS F	60.5	426.8	1.00	1.94	2.25	5.1
Approach			937	2.6	937	2.6	1.155	227.9	LOS F	60.5	426.8	1.00	1.94	2.25	5.0
East: Machpherson Street															
4	L2	All MCs	6	0.0	6	0.0	0.953	110.3	LOS F	25.4	173.0	1.00	1.21	1.38	14.5
5	T1	All MCs	423	0.7	396	0.8	0.953	101.8	LOS F	25.4	173.0	1.00	1.21	1.38	18.8
6	R2	All MCs	47	4.4	44	4.6	1.132	228.4	LOS F	4.8	35.1	1.00	1.15	2.39	2.0
Approach			477	1.1	446	1.1	1.132	114.5	LOS F	25.4	173.0	1.00	1.20	1.48	13.2
North: Carrington Road (North)															
7	L2	All MCs	36	2.9	35	2.9	0.211	51.0	LOS D	6.8	48.5	0.50	0.41	0.50	36.7
8	T1	All MCs	558	2.3	547	2.3	1.022	74.0	LOS F	39.4	280.6	0.80	0.95	1.13	21.8
9	R2	All MCs	206	4.1	202	4.1	* 1.022	114.6	LOS F	39.4	280.6	1.00	1.31	1.55	19.0
Approach			800	2.8	785	2.8	1.022	83.4	LOS F	39.4	280.6	0.84	1.02	1.21	16.5
West: Darley Road															
10	L2	All MCs	227	3.7	227	3.7	0.299	46.1	LOS D	8.7	62.1	0.68	0.75	0.68	28.8
11	T1	All MCs	312	2.4	312	2.4	* 1.136	209.9	LOS F	35.1	250.8	0.99	1.71	2.16	8.1
12	R2	All MCs	11	10.0	11	10.0	1.136	249.1	LOS F	35.1	250.8	1.00	1.73	2.19	11.6
Approach			549	3.1	549	3.1	1.136	142.9	LOS F	35.1	250.8	0.87	1.31	1.55	10.4
All Vehicles			2763	2.5	2718	2.5	1.155	150.3	LOS F	60.5	426.8	0.93	1.43	1.68	9.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance											
Mov ID	Crossing	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Eff. Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	sec		[Ped ped	Dist] m			sec	m	m/sec
South: Carrington Road (South)											
P1	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	69.7	20.0	0.29
East: Machpherson Street											

P2	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	69.7	20.0	0.29
North: Carrington Road (North)											
P3	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	69.7	20.0	0.29
West: Darley Road											
P4	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	69.7	20.0	0.29
All Pedestrians		211	54.3	LOS E	0.2	0.2	0.95	0.95	69.7	20.0	0.29

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

SIDRA INTERSECTION 9.1 | Copyright © 2000-2023 Akcelik and Associates Pty Ltd | sidrasolutions.com
Organisation: TAYLOR THOMSON WHITTING | Licence: NETWORK / 1PC | Processed: Monday, 23 October 2023 5:02:25 PM
Project: P:\2023\2312\231268\Reports\TTW\TrafficModelling\231010 Charing Cross - Proposed Design (2030).sip9

MOVEMENT SUMMARY

 Site: Site 3 [Albion St & Macpherson St - AM (Site Folder: AM - 2030)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

 Network: N101 [2030_AM Network (Network Folder: General)]

AM Peak - proposed
Site Category: Future Conditions 1
Roundabout

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed	
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] m				km/h
South: Albion Street															
1	L2	All MCs	52	2.0	52	2.0	0.963	37.5	LOS C	24.4	180.4	1.00	1.77	2.66	19.1
2	T1	All MCs	355	11.0	355	11.0	0.963	38.1	LOS C	24.4	180.4	1.00	1.77	2.66	19.1
3	R2	All MCs	226	2.8	226	2.8	0.963	40.9	LOS C	24.4	180.4	1.00	1.77	2.66	19.1
3u	U	All MCs	2	0.0	2	0.0	0.963	42.2	LOS C	24.4	180.4	1.00	1.77	2.66	26.6
Approach			635	7.3	635	7.3	0.963	39.0	LOS C	24.4	180.4	1.00	1.77	2.66	19.2
East: Macpherson Street (East)															
4	L2	All MCs	241	1.7	239	1.7	1.147	145.8	LOS F	70.3	494.1	1.00	4.41	7.52	11.8
5	T1	All MCs	356	0.6	353	0.6	1.147	145.6	LOS F	70.3	494.1	1.00	4.41	7.52	6.8
6	R2	All MCs	109	11.5	109	11.6	1.147	149.6	LOS F	70.3	494.1	1.00	4.41	7.52	6.8
6u	U	All MCs	32	0.0	31	0.0	1.147	150.5	LOS F	70.3	494.1	1.00	4.41	7.52	6.8
Approach			738	2.6	732	2.6	1.147	146.5	LOS F	70.3	494.1	1.00	4.41	7.52	8.6
North: Albion Street (North)															
7	L2	All MCs	61	19.0	61	19.1	0.534	7.1	LOS A	3.8	28.7	0.64	0.70	0.71	35.5
8	T1	All MCs	266	12.3	264	12.3	0.534	6.6	LOS A	3.8	28.7	0.64	0.70	0.71	41.2
9	R2	All MCs	75	2.8	74	2.8	0.534	9.8	LOS A	3.8	28.7	0.64	0.70	0.71	35.5
9u	U	All MCs	19	0.0	19	0.0	0.534	11.3	LOS A	3.8	28.7	0.64	0.70	0.71	35.5
Approach			421	11.0	418	11.1	0.534	7.5	LOS A	3.8	28.7	0.64	0.70	0.71	39.9
West: Macpherson Street (West)															
10	L2	All MCs	81	1.3	72	1.3	0.557	12.6	LOS A	4.2	29.6	0.78	0.96	0.95	20.5
11	T1	All MCs	220	2.9	196	2.9	0.557	12.7	LOS A	4.2	29.6	0.78	0.96	0.95	20.5
12	R2	All MCs	34	0.0	30	0.0	0.557	15.8	LOS B	4.2	29.6	0.78	0.96	0.95	33.8
12u	U	All MCs	6	0.0	6	0.0	0.557	17.4	LOS B	4.2	29.6	0.78	0.96	0.95	20.5
Approach			341	2.2	304	2.2	0.557	13.0	LOS A	4.2	29.6	0.78	0.96	0.95	23.0
All Vehicles			2135	5.6	2089	5.7	1.147	66.6	LOS E	70.3	494.1	0.90	2.36	3.72	14.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SIDRA INTERSECTION 9.1 | Copyright © 2000-2023 Akcelik and Associates Pty Ltd | sidrasolutions.com

Organisation: TAYLOR THOMSON WHITTING | Licence: NETWORK / 1PC | Processed: Monday, 23 October 2023 5:02:25 PM

Project: P:\2023\2312\231268\Reports\TTW\TrafficModelling\231010 Charing Cross - Proposed Design (2030).sip9

MOVEMENT SUMMARY

 Site: 4 [Macpherson St & Leichhardt St - AM (Site Folder: AM - 2030)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

 Network: N101 [2030_AM Network (Network Folder: General)]

AM Peak - proposed
Site Category: Future Conditions 1
Roundabout

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] m				km/h
South: Leichhardt Street (South)															
1	L2	All MCs	54	0.0	54	0.0	0.571	24.2	LOS B	5.2	36.5	1.00	1.03	1.38	22.3
2	T1	All MCs	149	1.4	149	1.4	0.571	24.3	LOS B	5.2	36.5	1.00	1.03	1.38	22.3
3	R2	All MCs	6	0.0	6	0.0	0.571	27.0	LOS B	5.2	36.5	1.00	1.03	1.38	33.8
3u	U	All MCs	1	0.0	1	0.0	0.571	28.4	LOS B	5.2	36.5	1.00	1.03	1.38	29.4
Approach			211	1.0	211	1.0	0.571	24.4	LOS B	5.2	36.5	1.00	1.03	1.38	22.9
East: Macpherson Street (East)															
4	L2	All MCs	4	0.0	4	0.0	0.893	27.4	LOS B	18.5	131.1	1.00	1.38	1.98	32.3
5	T1	All MCs	304	4.8	304	4.8	0.893	27.6	LOS B	18.5	131.1	1.00	1.38	1.98	28.2
6	R2	All MCs	277	3.4	277	3.4	0.893	30.4	LOS C	18.5	131.1	1.00	1.38	1.98	28.2
6u	U	All MCs	11	20.0	11	20.0	0.893	33.0	LOS C	18.5	131.1	1.00	1.38	1.98	35.0
Approach			596	4.4	596	4.4	0.893	29.0	LOS C	18.5	131.1	1.00	1.38	1.98	28.5
North: Leichhardt Street (North)															
7	L2	All MCs	325	3.6	323	3.6	0.826	14.3	LOS A	14.7	104.1	1.00	0.91	1.36	36.8
8	T1	All MCs	49	0.0	49	0.0	0.826	14.0	LOS A	14.7	104.1	1.00	0.91	1.36	32.4
9	R2	All MCs	317	1.3	315	1.3	0.826	17.0	LOS B	14.7	104.1	1.00	0.91	1.36	22.5
9u	U	All MCs	26	4.0	26	4.0	0.826	18.5	LOS B	14.7	104.1	1.00	0.91	1.36	22.5
Approach			718	2.3	713	2.4	0.826	15.6	LOS B	14.7	104.1	1.00	0.91	1.36	32.4
West: Macpherson Street (West)															
10	L2	All MCs	251	3.8	237	3.9	0.741	16.7	LOS B	10.0	72.8	1.00	1.00	1.44	28.5
11	T1	All MCs	228	6.0	217	6.1	0.741	16.7	LOS B	10.0	72.8	1.00	1.00	1.44	38.0
12	R2	All MCs	7	0.0	7	0.0	0.741	19.2	LOS B	10.0	72.8	1.00	1.00	1.44	34.0
12u	U	All MCs	57	1.9	54	1.9	0.741	20.8	LOS B	10.0	72.8	1.00	1.00	1.44	28.5
Approach			543	4.5	515	4.6	0.741	17.2	LOS B	10.0	72.8	1.00	1.00	1.44	34.1
All Vehicles			2067	3.4	2034	3.4	0.893	20.8	LOS B	18.5	131.1	1.00	1.08	1.57	30.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SIDRA INTERSECTION 9.1 | Copyright © 2000-2023 Akcelik and Associates Pty Ltd | sidrasolutions.com

Organisation: TAYLOR THOMSON WHITTING | Licence: NETWORK / 1PC | Processed: Monday, 23 October 2023 5:02:25 PM

Project: P:\2023\2312\231268\Reports\TTW\TrafficModelling\231010 Charing Cross - Proposed Design (2030).sip9

MOVEMENT SUMMARY

 Site: Site 5 [Bronte Rd & Leichhardt St - AM (Site Folder: AM - 2030)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

 Network: N101 [2030_AM
Network (Network Folder:
General)]

AM Peak - proposed
Site Category: Future Conditions 1
Roundabout

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows [Total HV] veh/h %		Arrival Flows [Total HV] veh/h %		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh Dist] veh m		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Leichhardt Street (South)															
2	T1	All MCs	185	2.3	182	2.3	0.603	4.2	LOS A	6.2	44.0	0.60	0.55	0.60	28.3
3	R2	All MCs	487	3.0	478	3.1	0.603	6.8	LOS A	6.2	44.0	0.60	0.55	0.60	33.5
3u	U	All MCs	49	2.1	49	2.2	0.603	7.9	LOS A	6.2	44.0	0.60	0.55	0.60	28.3
Approach			722	2.8	709	2.8	0.603	6.2	LOS A	6.2	44.0	0.60	0.55	0.60	32.6
East: Bronte Road (East)															
4	L2	All MCs	518	2.0	518	2.0	0.585	5.2	LOS A	4.8	34.1	0.60	0.58	0.60	32.8
6	R2	All MCs	112	0.0	112	0.0	0.585	6.9	LOS A	4.8	34.1	0.60	0.58	0.60	32.8
6u	U	All MCs	15	0.0	15	0.0	0.585	8.0	LOS A	4.8	34.1	0.60	0.58	0.60	37.8
Approach			644	1.6	644	1.6	0.585	5.6	LOS A	4.8	34.1	0.60	0.58	0.60	33.0
North: Bronte Road (North)															
7	L2	All MCs	143	3.7	140	3.7	0.413	8.0	LOS A	2.8	20.0	0.77	0.71	0.78	33.5
8	T1	All MCs	151	3.5	147	3.5	0.413	7.3	LOS A	2.8	20.0	0.77	0.71	0.78	29.0
9u	U	All MCs	7	0.0	7	0.0	0.413	10.8	LOS A	2.8	20.0	0.77	0.71	0.78	29.0
Approach			301	3.5	294	3.6	0.413	7.7	LOS A	2.8	20.0	0.77	0.71	0.78	31.9
All Vehicles			1667	2.5	1647	2.5	0.603	6.2	LOS A	6.2	44.0	0.63	0.59	0.63	32.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SIDRA INTERSECTION 9.1 | Copyright © 2000-2023 Akcelik and Associates Pty Ltd | sidrasolutions.com

Organisation: TAYLOR THOMSON WHITTING | Licence: NETWORK / 1PC | Processed: Monday, 23 October 2023 5:02:25 PM

Project: P:\2023\2312\231268\Reports\TTW\Traffic\Modelling\231010 Charing Cross - Proposed Design (2030).sip9

MOVEMENT SUMMARY

Site: Site 6 [Bronte Rd & Albion St - AM (Site Folder: AM - 2030)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

Network: N101 [2030_AM
Network (Network Folder:
General)]

AM Peak - Proposed
Site Category: Future Conditions 1
Give-Way (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] m				km/h
South: Albion Street (South)															
2	T1	All MCs	340	15.8	326	16.0	0.565	7.5	LOS A	5.9	45.1	0.62	0.74	1.05	32.7
3	R2	All MCs	213	1.0	203	1.0	0.565	12.3	LOS A	5.9	45.1	0.62	0.74	1.05	32.7
Approach			553	10.1	529	10.2	0.565	9.3	NA	5.9	45.1	0.62	0.74	1.05	32.7
East: Bronte Road (East)															
4	L2	All MCs	108	4.9	107	4.9	0.786	14.1	LOS A	5.4	38.2	0.91	1.27	2.00	21.8
6	R2	All MCs	167	1.3	165	1.3	0.786	25.8	LOS B	5.4	38.2	0.91	1.27	2.00	21.8
Approach			276	2.7	273	2.7	0.786	21.2	LOS B	5.4	38.2	0.91	1.27	2.00	21.8
North: Albion Street (North)															
7	L2	All MCs	221	5.2	220	5.3	0.373	3.5	LOS A	0.0	0.0	0.00	0.19	0.00	36.0
8	T1	All MCs	301	14.3	299	14.4	0.373	0.1	LOS A	0.0	0.0	0.00	0.19	0.00	36.0
Approach			522	10.5	519	10.5	0.373	1.5	NA	0.0	0.0	0.00	0.19	0.00	36.0
All Vehicles			1351	8.7	1321	8.9	0.786	8.7	NA	5.9	45.1	0.44	0.64	0.84	30.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SIDRA INTERSECTION 9.1 | Copyright © 2000-2023 Akcelik and Associates Pty Ltd | sidrasolutions.com

Organisation: TAYLOR THOMSON WHITTING | Licence: NETWORK / 1PC | Processed: Monday, 23 October 2023 5:02:25 PM

Project: P:\2023\2312\231268\Reports\TTW\TrafficModelling\231010 Charing Cross - Proposed Design (2030).sip9

MOVEMENT SUMMARY

 Site: TCS 160 [Carrington Rd & Bronte Rd & Victoria St - PM
(Site Folder: PM - 2030)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

 Network: N101 [2030_PM
Network (Network Folder:
General)]

PM Peak - Proposed

Site Category: Future Conditions 1

Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 120 seconds (Network User-Given Cycle Time)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed	
			[Total HV]		[Total HV]					[Veh. veh	Dist]				
			veh/h	%	veh/h	%	v/c	sec			m			km/h	
South: Carrington Road (South)															
1	L2	All MCs	27	0.0	25	0.0	0.282	43.5	LOS D	6.5	45.9	0.62	0.69	0.62	30.1
1a	L1	All MCs	185	1.7	168	1.6	0.282	40.5	LOS C	6.5	45.9	0.62	0.69	0.62	35.0
2	T1	All MCs	573	0.7	519	0.8	0.879	52.4	LOS D	29.2	205.3	0.92	0.91	1.04	30.2
Approach			785	0.9	712	0.9	0.879	49.3	LOS D	29.2	205.3	0.84	0.85	0.93	27.1
SouthEast: Bronte Road (South)															
21a	L1	All MCs	52	0.0	51	0.0	0.177	66.9	LOS E	3.0	20.9	0.89	0.72	0.89	14.0
22	T1	All MCs	273	10.8	268	11.0	* 0.885	81.3	LOS F	16.1	122.4	1.00	1.06	1.27	19.7
Approach			324	9.1	319	9.3	0.885	79.0	LOS F	16.1	122.4	0.98	1.01	1.21	16.1
East: Victoria Street (East)															
4b	L3	All MCs	101	0.0	101	0.0	1.094	197.7	LOS F	24.5	171.8	1.00	1.44	2.04	6.1
4	L2	All MCs	99	0.0	99	0.0	1.094	193.9	LOS F	24.5	171.8	1.00	1.44	2.04	6.1
5	T1	All MCs	42	0.0	42	0.0	* 1.094	187.8	LOS F	24.5	171.8	1.00	1.44	2.04	8.9
6a	R1	All MCs	33	0.0	33	0.0	0.369	83.9	LOS F	3.6	25.0	0.95	0.76	0.95	25.0
6	R2	All MCs	32	0.0	32	0.0	0.369	84.5	LOS F	3.6	25.0	0.95	0.76	0.95	23.3
Approach			306	0.0	306	0.0	1.094	171.3	LOS F	24.5	171.8	0.99	1.30	1.81	7.8
North: Carrington Road (North)															
7	L2	All MCs	11	0.0	11	0.0	1.101	206.1	LOS F	35.3	247.8	1.00	1.59	2.05	11.5
7a	L1	All MCs	313	0.7	313	0.7	1.101	200.5	LOS F	35.3	247.8	1.00	1.59	2.05	7.4
8	T1	All MCs	578	1.6	578	1.6	* 1.272	332.1	LOS F	81.4	576.9	1.00	2.35	2.74	4.5
Approach			901	1.3	901	1.3	1.272	285.0	LOS F	81.4	576.9	1.00	2.08	2.49	4.8
NorthWest: Bronte Road (North)															
27b	L3	All MCs	7	0.0	7	0.0	0.772	52.0	LOS D	24.6	182.8	0.97	0.88	1.00	29.8
27a	L1	All MCs	11	0.0	11	0.0	0.772	44.9	LOS D	24.6	182.8	0.97	0.88	1.00	28.6
28	T1	All MCs	435	8.7	435	8.7	0.772	41.4	LOS C	24.6	182.8	0.97	0.88	1.00	23.1
29a	R1	All MCs	205	1.5	205	1.5	0.951	85.1	LOS F	14.4	101.5	1.00	1.25	1.49	14.9
29b	R3	All MCs	2	0.0	2	0.0	* 0.951	87.2	LOS F	14.4	101.5	1.00	1.25	1.49	18.0
Approach			660	6.2	660	6.2	0.951	55.3	LOS D	24.6	182.8	0.98	0.99	1.16	19.9
West: Victoria Street (West)															
10b	L3	All MCs	14	0.0	14	0.0	0.299	57.3	LOS E	4.5	31.6	0.92	0.77	0.92	23.6
10	L2	All MCs	73	0.0	73	0.0	0.299	53.2	LOS D	4.5	31.6	0.92	0.77	0.92	22.0
11	T1	All MCs	53	0.0	53	0.0	0.158	46.4	LOS D	2.7	17.9	0.89	0.68	0.89	22.0
Approach			139	0.0	139	0.0	0.299	51.0	LOS D	4.5	31.6	0.91	0.73	0.91	22.2
All Vehicles			3116	2.9	3036	2.9	1.272	136.0	LOS F	81.4	576.9	0.95	1.30	1.56	11.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance											
Mov ID	Crossing	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Eff. Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	sec		[Ped ped	Dist] m			sec	m	m/sec
South: Carrington Road (South)											
P1	Full	111	54.4	LOS E	0.4	0.4	0.95	0.95	69.8	20.0	0.29
SouthEast: Bronte Road (South)											
P5	Full	111	54.4	LOS E	0.4	0.4	0.95	0.95	69.8	20.0	0.29
East: Victoria Street (East)											
P2	Full	111	54.4	LOS E	0.4	0.4	0.95	0.95	69.8	20.0	0.29
North: Carrington Road (North)											
P3	Full	111	54.4	LOS E	0.4	0.4	0.95	0.95	69.8	20.0	0.29
NorthWest: Bronte Road (North)											
P7	Full	111	54.4	LOS E	0.4	0.4	0.95	0.95	69.8	20.0	0.29
West: Victoria Street (West)											
P4	Full	111	54.4	LOS E	0.4	0.4	0.95	0.95	69.8	20.0	0.29
All Pedestrians		663	54.4	LOS E	0.4	0.4	0.95	0.95	69.8	20.0	0.29

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

 Site: TCS 1650 [Carrington Rd & Macpherson St - PM (Site Folder: PM - 2030)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

 Network: N101 [2030_PM Network (Network Folder: General)]

PM Peak - proposed

Site Category: Future Conditions 1

Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 120 seconds (Network User-Given Cycle Time)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows [Total HV]		Arrival Flows [Total HV]		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue [Veh. Dist]		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			veh/h	%	veh/h	%	v/c	sec			veh	m			km/h
South: Carrington Road (South)															
1	L2	All MCs	71	0.0	71	0.0	0.269	77.5	LOS F	6.0	42.0	0.84	0.73	0.84	29.1
2	T1	All MCs	567	1.1	567	1.1	* 1.168	231.3	LOS F	60.3	424.6	0.98	1.83	2.13	5.3
Approach			638	1.0	638	1.0	1.168	214.3	LOS F	60.3	424.6	0.97	1.71	1.99	5.7
East: Machpherson Street															
4	L2	All MCs	13	0.0	12	0.0	0.678	69.3	LOS E	17.5	124.0	0.95	0.82	0.95	20.8
5	T1	All MCs	326	1.9	322	2.0	0.678	61.0	LOS E	17.5	124.0	0.95	0.82	0.95	25.8
6	R2	All MCs	33	0.0	32	0.0	0.330	86.2	LOS F	1.9	13.5	0.99	0.73	0.99	5.7
Approach			372	1.7	366	1.7	0.678	63.5	LOS E	17.5	124.0	0.95	0.81	0.95	19.7
North: Carrington Road (North)															
7	L2	All MCs	49	2.1	43	2.0	0.230	39.0	LOS C	6.0	41.9	0.41	0.40	0.41	37.6
8	T1	All MCs	692	1.2	599	1.2	1.112	109.0	LOS F	56.4	397.0	0.77	1.05	1.34	17.4
9	R2	All MCs	237	1.3	205	1.3	* 1.112	168.9	LOS F	56.4	397.0	1.00	1.46	1.92	15.0
Approach			978	1.3	846	1.3	1.112	120.0	LOS F	56.4	397.0	0.81	1.12	1.43	14.6
West: Darley Road															
10	L2	All MCs	182	0.6	182	0.6	0.229	45.2	LOS D	6.6	45.3	0.63	0.72	0.63	30.1
11	T1	All MCs	335	0.9	335	0.9	* 1.146	216.4	LOS F	41.1	289.7	0.99	1.77	2.17	8.0
12	R2	All MCs	36	0.0	36	0.0	1.146	249.1	LOS F	41.1	289.7	1.00	1.80	2.22	11.3
Approach			553	0.8	553	0.8	1.146	162.1	LOS F	41.1	289.7	0.87	1.42	1.67	9.6
All Vehicles			2540	1.2	2403	1.2	1.168	146.1	LOS F	60.3	424.6	0.89	1.30	1.56	10.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance											
Mov ID	Crossing	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Eff. Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	sec		[Ped ped	Dist] m			sec	m	m/sec
South: Carrington Road (South)											
P1	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	69.7	20.0	0.29
East: Machpherson Street											

P2	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	69.7	20.0	0.29
North: Carrington Road (North)											
P3	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	69.7	20.0	0.29
West: Darley Road											
P4	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	69.7	20.0	0.29
All Pedestrians		211	54.3	LOS E	0.2	0.2	0.95	0.95	69.7	20.0	0.29

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

SIDRA INTERSECTION 9.1 | Copyright © 2000-2023 Akcelik and Associates Pty Ltd | sidrasolutions.com
Organisation: TAYLOR THOMSON WHITTING | Licence: NETWORK / 1PC | Processed: Tuesday, 24 October 2023 10:28:13 AM
Project: P:\2023\2312\231268\Reports\TTW\TrafficModelling\231010 Charing Cross - Proposed Design (2030).sip9

MOVEMENT SUMMARY

 Site: Site 3 [Albion St & Macpherson St - PM (Site Folder: PM - 2030)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

 Network: N101 [2030_PM Network (Network Folder: General)]

PM Peak - proposed
Site Category: Future Conditions 1
Roundabout

Vehicle Movement Performance																
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed	
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] m				km/h	
South: Albion Street																
1	L2	All MCs	46	0.0	46	0.0	0.650	9.3	LOS A	6.8	49.2	0.86	0.79	1.03	34.2	
2	T1	All MCs	239	11.0	239	11.0	0.650	9.8	LOS A	6.8	49.2	0.86	0.79	1.03	34.2	
3	R2	All MCs	254	0.4	254	0.4	0.650	12.7	LOS A	6.8	49.2	0.86	0.79	1.03	34.2	
3u	U	All MCs	3	0.0	3	0.0	0.650	14.2	LOS A	6.8	49.2	0.86	0.79	1.03	39.0	
Approach			542	5.0	542	5.0	0.650	11.1	LOS A	6.8	49.2	0.86	0.79	1.03	34.3	
East: Macpherson Street (East)																
4	L2	All MCs	200	0.5	198	0.5	0.709	10.1	LOS A	6.3	45.0	0.79	0.90	1.02	39.4	
5	T1	All MCs	259	2.8	257	2.9	0.709	10.1	LOS A	6.3	45.0	0.79	0.90	1.02	34.2	
6	R2	All MCs	74	11.4	73	11.5	0.709	13.9	LOS A	6.3	45.0	0.79	0.90	1.02	34.2	
6u	U	All MCs	9	0.0	9	0.0	0.709	14.9	LOS B	6.3	45.0	0.79	0.90	1.02	34.2	
Approach			542	3.1	537	3.1	0.709	10.7	LOS A	6.3	45.0	0.79	0.90	1.02	36.8	
North: Albion Street (North)																
7	L2	All MCs	88	8.3	85	8.6	0.575	7.8	LOS A	4.2	30.7	0.69	0.73	0.80	35.0	
8	T1	All MCs	392	7.3	377	7.5	0.575	7.5	LOS A	4.2	30.7	0.69	0.73	0.80	40.9	
9	R2	All MCs	51	0.0	48	0.0	0.575	10.7	LOS A	4.2	30.7	0.69	0.73	0.80	35.0	
9u	U	All MCs	5	0.0	5	0.0	0.575	12.2	LOS A	4.2	30.7	0.69	0.73	0.80	35.0	
Approach			536	6.7	516	6.9	0.575	7.9	LOS A	4.2	30.7	0.69	0.73	0.80	40.0	
West: Macpherson Street (West)																
10	L2	All MCs	51	0.0	44	0.0	0.483	9.1	LOS A	3.3	23.1	0.67	0.81	0.73	24.3	
11	T1	All MCs	264	1.2	231	1.2	0.483	9.2	LOS A	3.3	23.1	0.67	0.81	0.73	24.3	
12	R2	All MCs	59	1.8	52	1.7	0.483	12.6	LOS A	3.3	23.1	0.67	0.81	0.73	36.4	
12u	U	All MCs	8	0.0	7	0.0	0.483	14.0	LOS A	3.3	23.1	0.67	0.81	0.73	24.3	
Approach			382	1.1	334	1.1	0.483	9.8	LOS A	3.3	23.1	0.67	0.81	0.73	27.8	
All Vehicles			2002	4.2	1929	4.4	0.709	9.9	LOS A	6.8	49.2	0.76	0.81	0.91	36.2	

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SIDRA INTERSECTION 9.1 | Copyright © 2000-2023 Akcelik and Associates Pty Ltd | sidrasolutions.com

Organisation: TAYLOR THOMSON WHITTING | Licence: NETWORK / 1PC | Processed: Tuesday, 24 October 2023 10:28:13 AM

Project: P:\2023\2312\231268\Reports\TTW\TrafficModelling\231010 Charing Cross - Proposed Design (2030).sip9

MOVEMENT SUMMARY

 Site: Site 4 [Macpherson St & Leichhardt St - PM (Site Folder: PM - 2030)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

 Network: N101 [2030_PM Network (Network Folder: General)]

PM Peak - proposed
Site Category: Future Conditions 1
Roundabout

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] m				km/h
South: Leichhardt Street (South)															
1	L2	All MCs	26	0.0	26	0.0	0.197	13.0	LOS A	1.4	9.6	0.92	0.80	0.92	30.0
2	T1	All MCs	53	0.0	53	0.0	0.197	12.9	LOS A	1.4	9.6	0.92	0.80	0.92	30.0
3	R2	All MCs	2	0.0	2	0.0	0.197	15.8	LOS B	1.4	9.6	0.92	0.80	0.92	39.2
3u	U	All MCs	1	0.0	1	0.0	0.197	17.2	LOS B	1.4	9.6	0.92	0.80	0.92	35.6
Approach			82	0.0	82	0.0	0.197	13.0	LOS A	1.4	9.6	0.92	0.80	0.92	30.6
East: Macpherson Street (East)															
4	L2	All MCs	13	16.7	13	16.7	0.770	14.2	LOS A	12.2	87.4	1.00	0.87	1.31	38.3
5	T1	All MCs	272	6.6	272	6.6	0.770	13.6	LOS A	12.2	87.4	1.00	0.87	1.31	35.6
6	R2	All MCs	353	0.9	353	0.9	0.770	16.3	LOS B	12.2	87.4	1.00	0.87	1.31	35.6
6u	U	All MCs	13	0.0	13	0.0	0.770	17.6	LOS B	12.2	87.4	1.00	0.87	1.31	40.4
Approach			649	3.6	649	3.6	0.770	15.1	LOS B	12.2	87.4	1.00	0.87	1.31	35.9
North: Leichhardt Street (North)															
7	L2	All MCs	523	2.2	516	2.2	0.941	28.6	LOS C	28.1	198.0	1.00	1.40	2.06	30.5
8	T1	All MCs	68	0.0	67	0.0	0.941	28.2	LOS B	28.1	198.0	1.00	1.40	2.06	25.1
9	R2	All MCs	223	0.0	220	0.0	0.941	31.2	LOS C	28.1	198.0	1.00	1.40	2.06	15.1
9u	U	All MCs	9	0.0	9	0.0	0.941	32.6	LOS C	28.1	198.0	1.00	1.40	2.06	15.1
Approach			824	1.4	812	1.4	0.941	29.3	LOS C	28.1	198.0	1.00	1.40	2.06	27.4
West: Macpherson Street (West)															
10	L2	All MCs	272	0.4	255	0.4	0.790	17.3	LOS B	12.6	89.0	1.00	1.05	1.49	28.2
11	T1	All MCs	315	3.7	297	3.8	0.790	17.4	LOS B	12.6	89.0	1.00	1.05	1.49	37.8
12	R2	All MCs	13	0.0	12	0.0	0.790	20.1	LOS B	12.6	89.0	1.00	1.05	1.49	33.7
12u	U	All MCs	23	0.0	22	0.0	0.790	21.5	LOS B	12.6	89.0	1.00	1.05	1.49	28.2
Approach			622	2.0	586	2.1	0.790	17.6	LOS B	12.6	89.0	1.00	1.05	1.49	34.6
All Vehicles			2178	2.2	2130	2.2	0.941	21.1	LOS B	28.1	198.0	1.00	1.12	1.63	31.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SIDRA INTERSECTION 9.1 | Copyright © 2000-2023 Akcelik and Associates Pty Ltd | sidrasolutions.com

Organisation: TAYLOR THOMSON WHITTING | Licence: NETWORK / 1PC | Processed: Tuesday, 24 October 2023 10:28:13 AM

Project: P:\2023\2312\231268\Reports\TTW\TrafficModelling\231010 Charing Cross - Proposed Design (2030).sip9

MOVEMENT SUMMARY

 Site: Site 5 [Bronte Rd & Leichhardt St - PM (Site Folder: PM - 2030)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

 Network: N101 [2030_PM Network (Network Folder: General)]

PM Peak - proposed
Site Category: Future Conditions 1
Roundabout

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] m				km/h
South: Leichhardt Street (South)															
2	T1	All MCs	128	0.0	125	0.0	0.543	4.9	LOS A	5.5	38.5	0.51	0.56	0.51	31.3
3	R2	All MCs	546	0.8	533	0.8	0.543	7.5	LOS A	5.5	38.5	0.51	0.56	0.51	38.6
3u	U	All MCs	13	0.0	12	0.0	0.543	8.8	LOS A	5.5	38.5	0.51	0.56	0.51	31.3
Approach			687	0.6	671	0.6	0.543	7.0	LOS A	5.5	38.5	0.51	0.56	0.51	37.8
East: Bronte Road (East)															
4	L2	All MCs	528	1.6	528	1.6	0.713	9.1	LOS A	7.6	53.6	0.84	0.72	0.97	35.0
6	R2	All MCs	86	1.2	86	1.2	0.713	11.0	LOS A	7.6	53.6	0.84	0.72	0.97	35.0
6u	U	All MCs	9	0.0	9	0.0	0.713	12.2	LOS A	7.6	53.6	0.84	0.72	0.97	39.2
Approach			624	1.5	624	1.5	0.713	9.4	LOS A	7.6	53.6	0.84	0.72	0.97	35.1
North: Bronte Road (North)															
7	L2	All MCs	135	0.8	129	0.8	0.617	12.3	LOS A	5.4	38.1	0.88	0.86	1.11	36.3
8	T1	All MCs	288	1.1	277	1.1	0.617	11.7	LOS A	5.4	38.1	0.88	0.86	1.11	28.9
9u	U	All MCs	8	0.0	8	0.0	0.617	15.5	LOS B	5.4	38.1	0.88	0.86	1.11	28.9
Approach			432	1.0	414	1.0	0.617	11.9	LOS A	5.4	38.1	0.88	0.86	1.11	32.3
All Vehicles			1743	1.0	1710	1.0	0.713	9.1	LOS A	7.6	53.6	0.72	0.69	0.82	35.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SIDRA INTERSECTION 9.1 | Copyright © 2000-2023 Akcelik and Associates Pty Ltd | sidrasolutions.com

Organisation: TAYLOR THOMSON WHITTING | Licence: NETWORK / 1PC | Processed: Tuesday, 24 October 2023 10:28:13 AM

Project: P:\2023\2312\231268\Reports\TTW\Traffic\Modelling\231010 Charing Cross - Proposed Design (2030).sip9

MOVEMENT SUMMARY

Site: Site 6 [Bronte Rd & Albion St - PM (Site Folder: PM - 2030)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

Network: N101 [2030_PM
Network (Network Folder:
General)]

PM Peak - proposed
Site Category: Future Conditions 1
Give-Way (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] m				km/h
South: Albion Street (South)															
2	T1	All MCs	225	15.0	221	15.2	0.412	10.1	LOS A	3.9	28.9	0.65	0.80	0.95	29.7
3	R2	All MCs	131	0.0	128	0.0	0.412	15.4	LOS B	3.9	28.9	0.65	0.80	0.95	29.7
Approach			356	9.5	349	9.7	0.412	12.0	NA	3.9	28.9	0.65	0.80	0.95	29.7
East: Bronte Road (East)															
4	L2	All MCs	82	0.0	81	0.0	0.454	9.7	LOS A	2.5	17.0	0.72	0.97	1.06	26.5
6	R2	All MCs	131	0.8	129	0.8	0.454	17.5	LOS B	2.5	17.0	0.72	0.97	1.06	26.5
Approach			213	0.5	209	0.5	0.454	14.5	LOS A	2.5	17.0	0.72	0.97	1.06	26.5
North: Albion Street (North)															
7	L2	All MCs	406	0.8	388	0.8	0.439	3.5	LOS A	0.0	0.0	0.00	0.22	0.00	35.6
8	T1	All MCs	444	8.3	425	8.6	0.439	0.1	LOS A	0.0	0.0	0.00	0.22	0.00	35.6
Approach			851	4.7	813	4.9	0.439	1.7	NA	0.0	0.0	0.00	0.22	0.00	35.6
All Vehicles			1419	5.3	1371	5.4	0.454	6.3	NA	3.9	28.9	0.28	0.48	0.40	31.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SIDRA INTERSECTION 9.1 | Copyright © 2000-2023 Akcelik and Associates Pty Ltd | sidrasolutions.com

Organisation: TAYLOR THOMSON WHITTING | Licence: NETWORK / 1PC | Processed: Tuesday, 24 October 2023 10:28:13 AM

Project: P:\2023\2312\231268\Reports\TTW\TrafficModelling\231010 Charing Cross - Proposed Design (2030).sip9

MOVEMENT SUMMARY

 Site: TCS 160 [Carrington Rd & Bronte Rd & Victoria St - SAT
(Site Folder: SAT - 2030)]

 Network: N101 [2030_SAT
Network (Network Folder:
General)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

SAT Peak - proposed

Site Category: Future Conditions 1

Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 120 seconds (Network User-Given Cycle Time)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]		[Total HV]					[Veh.	Dist]				
			veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Carrington Road (South)															
1	L2	All MCs	33	0.0	30	0.0	0.366	41.4	LOS C	9.0	62.5	0.66	0.71	0.66	29.5
1a	L1	All MCs	231	0.9	214	1.0	0.366	38.5	LOS C	9.0	62.5	0.66	0.71	0.66	34.5
2	T1	All MCs	506	1.9	469	1.9	0.836	44.5	LOS D	24.1	170.8	0.88	0.84	0.96	31.6
Approach			769	1.5	713	1.5	0.836	42.5	LOS D	24.1	170.8	0.81	0.80	0.86	28.9
SouthEast: Bronte Road (South)															
21a	L1	All MCs	61	0.0	60	0.0	0.231	75.8	LOS F	3.7	28.4	0.90	0.74	0.90	13.8
22	T1	All MCs	364	6.9	359	7.0	* 1.155	229.8	LOS F	17.0	122.4	1.00	1.76	2.21	8.4
Approach			425	5.9	419	6.0	1.155	207.7	LOS F	17.0	122.4	0.98	1.62	2.02	7.7
East: Victoria Street (East)															
4b	L3	All MCs	84	0.0	84	0.0	1.117	216.4	LOS F	26.8	187.1	1.00	1.48	2.13	5.5
4	L2	All MCs	133	0.8	133	0.8	1.117	212.5	LOS F	26.8	187.1	1.00	1.48	2.13	5.5
5	T1	All MCs	35	0.0	35	0.0	* 1.117	206.6	LOS F	26.8	187.1	1.00	1.48	2.13	8.2
6a	R1	All MCs	28	0.0	28	0.0	0.405	84.6	LOS F	4.0	27.9	0.95	0.77	0.95	25.0
6	R2	All MCs	43	0.0	43	0.0	0.405	84.2	LOS F	4.0	27.9	0.95	0.77	0.95	23.3
Approach			323	0.3	323	0.3	1.117	184.5	LOS F	26.8	187.1	0.99	1.32	1.87	7.2
North: Carrington Road (North)															
7	L2	All MCs	9	0.0	9	0.0	0.822	89.3	LOS F	14.1	98.6	0.97	0.95	1.17	24.5
7a	L1	All MCs	222	0.5	222	0.5	0.822	84.2	LOS F	14.1	98.6	0.97	0.95	1.17	18.2
8	T1	All MCs	539	0.8	539	0.8	* 1.143	224.9	LOS F	62.2	436.9	1.00	1.88	2.16	6.7
9	R2	All MCs	4	25.0	4	25.0	1.143	267.3	LOS F	62.2	436.9	1.00	1.88	2.16	9.0
9b	R3	All MCs	2	0.0	2	0.0	1.143	267.9	LOS F	62.2	436.9	1.00	1.88	2.16	12.4
Approach			777	0.8	777	0.8	1.143	183.4	LOS F	62.2	436.9	0.99	1.60	1.86	7.1
NorthWest: Bronte Road (North)															
27b	L3	All MCs	7	0.0	7	0.0	0.749	62.4	LOS E	22.4	164.3	0.95	0.85	0.98	30.3
27a	L1	All MCs	14	0.0	14	0.0	0.749	55.4	LOS D	22.4	164.3	0.95	0.85	0.98	29.1
28	T1	All MCs	400	6.8	400	6.8	0.749	51.9	LOS D	22.4	164.3	0.95	0.85	0.98	23.6
29a	R1	All MCs	144	2.2	144	2.2	0.589	70.8	LOS F	8.3	58.4	0.98	0.93	0.98	19.0
29b	R3	All MCs	4	25.0	4	25.0	* 0.589	73.1	LOS F	8.3	58.4	0.98	0.93	0.98	22.3
Approach			569	5.5	569	5.5	0.749	57.1	LOS E	22.4	164.3	0.96	0.87	0.98	19.6
West: Victoria Street (West)															
10b	L3	All MCs	26	8.0	26	8.0	0.291	57.8	LOS E	4.0	29.0	0.92	0.76	0.92	23.4
10	L2	All MCs	49	2.1	49	2.1	0.291	53.3	LOS D	4.0	29.0	0.92	0.76	0.92	21.7
11	T1	All MCs	48	0.0	48	0.0	0.151	46.4	LOS D	2.4	17.1	0.89	0.67	0.89	22.0
Approach			124	2.5	124	2.5	0.291	51.6	LOS D	4.0	29.0	0.91	0.73	0.91	22.2
All Vehicles			2988	2.6	2926	2.7	1.155	122.5	LOS F	62.2	436.9	0.94	1.20	1.43	12.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance											
Mov ID	Crossing	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Eff. Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	sec		[Ped ped	Dist] m			sec	m	m/sec
South: Carrington Road (South)											
P1	Full	111	54.4	LOS E	0.4	0.4	0.95	0.95	69.8	20.0	0.29
SouthEast: Bronte Road (South)											
P5	Full	111	54.4	LOS E	0.4	0.4	0.95	0.95	69.8	20.0	0.29
East: Victoria Street (East)											
P2	Full	111	54.4	LOS E	0.4	0.4	0.95	0.95	69.8	20.0	0.29
North: Carrington Road (North)											
P3	Full	111	54.4	LOS E	0.4	0.4	0.95	0.95	69.8	20.0	0.29
NorthWest: Bronte Road (North)											
P7	Full	111	54.4	LOS E	0.4	0.4	0.95	0.95	69.8	20.0	0.29
West: Victoria Street (West)											
P4	Full	111	54.4	LOS E	0.4	0.4	0.95	0.95	69.8	20.0	0.29
All Pedestrians		663	54.4	LOS E	0.4	0.4	0.95	0.95	69.8	20.0	0.29

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

 Site: TCS 1650 [Carrington Rd & Macpherson St - SAT (Site Folder: SAT - 2030)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

 Network: N101 [2030_SAT Network (Network Folder: General)]

SAT Peak - proposed

Site Category: Future Conditions 1

Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 120 seconds (Network User-Given Cycle Time)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] m				km/h
South: Carrington Road (South)															
1	L2	All MCs	68	3.1	68	3.1	0.254	76.5	LOS F	5.8	39.6	0.84	0.72	0.84	29.2
2	T1	All MCs	534	1.2	534	1.2	* 1.100	180.8	LOS F	49.5	350.0	0.98	1.61	1.85	6.8
Approach			602	1.4	602	1.4	1.100	169.0	LOS F	49.5	350.0	0.97	1.51	1.73	7.0
East: Machpherson Street															
4	L2	All MCs	27	0.0	27	0.0	0.785	78.0	LOS F	20.7	148.2	0.99	0.91	1.06	19.4
5	T1	All MCs	337	2.8	335	2.8	0.785	69.6	LOS E	20.7	148.2	0.99	0.91	1.06	24.3
6	R2	All MCs	49	0.0	49	0.0	0.534	91.8	LOS F	3.0	21.2	1.00	0.76	1.02	5.5
Approach			414	2.3	412	2.3	0.785	72.8	LOS F	20.7	148.2	0.99	0.89	1.06	17.6
North: Carrington Road (North)															
7	L2	All MCs	52	0.0	47	0.0	0.233	39.1	LOS C	5.7	40.0	0.38	0.38	0.38	38.5
8	T1	All MCs	692	0.9	633	0.9	1.128	118.1	LOS F	60.8	427.6	0.77	1.08	1.39	16.5
9	R2	All MCs	220	1.9	202	2.0	* 1.128	180.2	LOS F	60.8	427.6	1.00	1.49	1.98	14.3
Approach			963	1.1	882	1.1	1.128	128.1	LOS F	60.8	427.6	0.80	1.14	1.47	13.9
West: Darley Road															
10	L2	All MCs	172	3.1	172	3.1	0.219	40.7	LOS C	5.9	42.7	0.61	0.71	0.61	30.7
11	T1	All MCs	288	2.2	288	2.2	* 1.093	172.0	LOS F	31.3	221.1	0.99	1.57	1.96	9.6
12	R2	All MCs	28	3.7	28	3.7	1.093	209.3	LOS F	31.3	221.1	1.00	1.59	1.99	13.4
Approach			488	2.6	488	2.6	1.093	128.0	LOS F	31.3	221.1	0.86	1.27	1.49	11.6
All Vehicles			2467	1.7	2384	1.7	1.128	128.8	LOS F	60.8	427.6	0.89	1.22	1.47	11.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance											
Mov ID	Crossing	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Eff. Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	sec		[Ped ped	Dist] m			sec	m	m/sec
South: Carrington Road (South)											
P1	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	69.7	20.0	0.29
East: Machpherson Street											

P2	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	69.7	20.0	0.29
North: Carrington Road (North)											
P3	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	69.7	20.0	0.29
West: Darley Road											
P4	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	69.7	20.0	0.29
All Pedestrians		211	54.3	LOS E	0.2	0.2	0.95	0.95	69.7	20.0	0.29

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

 Site: Site 3 [Albion St & Macpherson St - SAT (Site Folder: SAT - 2030)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

 Network: N101 [2030_SAT Network (Network Folder: General)]

SAT Peak - proposed
Site Category: Future Conditions 1
Roundabout

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] m				km/h
South: Albion Street															
1	L2	All MCs	55	0.0	55	0.0	0.894	21.3	LOS B	17.7	126.6	1.00	1.29	1.83	25.7
2	T1	All MCs	320	6.6	320	6.6	0.894	21.7	LOS B	17.7	126.6	1.00	1.29	1.83	25.7
3	R2	All MCs	301	0.7	301	0.7	0.894	24.7	LOS B	17.7	126.6	1.00	1.29	1.83	25.7
3u	U	All MCs	8	0.0	8	0.0	0.894	26.2	LOS B	17.7	126.6	1.00	1.29	1.83	32.5
Approach			684	3.4	684	3.4	0.894	23.0	LOS B	17.7	126.6	1.00	1.29	1.83	25.8
East: Macpherson Street (East)															
4	L2	All MCs	218	1.4	217	1.5	0.869	12.9	LOS A	10.0	71.8	0.94	1.03	1.36	37.6
5	T1	All MCs	312	3.0	311	3.0	0.869	12.8	LOS A	10.0	71.8	0.94	1.03	1.36	31.6
6	R2	All MCs	81	7.8	81	7.8	0.869	16.5	LOS B	10.0	71.8	0.94	1.03	1.36	31.6
6u	U	All MCs	2	0.0	2	0.0	0.869	17.6	LOS B	10.0	71.8	0.94	1.03	1.36	31.6
Approach			613	3.1	612	3.1	0.869	13.4	LOS A	10.0	71.8	0.94	1.03	1.36	34.5
North: Albion Street (North)															
7	L2	All MCs	67	14.1	67	14.2	0.519	7.5	LOS A	3.3	24.3	0.69	0.72	0.77	35.5
8	T1	All MCs	314	5.4	310	5.4	0.519	7.0	LOS A	3.3	24.3	0.69	0.72	0.77	41.3
9	R2	All MCs	45	0.0	45	0.0	0.519	10.2	LOS A	3.3	24.3	0.69	0.72	0.77	35.5
9u	U	All MCs	9	0.0	9	0.0	0.519	11.8	LOS A	3.3	24.3	0.69	0.72	0.77	35.5
Approach			436	6.0	431	6.1	0.519	7.5	LOS A	3.3	24.3	0.69	0.72	0.77	40.3
West: Macpherson Street (West)															
10	L2	All MCs	62	0.0	57	0.0	0.575	12.5	LOS A	4.5	31.2	0.79	0.96	0.96	20.7
11	T1	All MCs	258	2.0	237	2.0	0.575	12.6	LOS A	4.5	31.2	0.79	0.96	0.96	20.7
12	R2	All MCs	20	0.0	18	0.0	0.575	15.8	LOS B	4.5	31.2	0.79	0.96	0.96	34.0
12u	U	All MCs	7	0.0	7	0.0	0.575	17.4	LOS B	4.5	31.2	0.79	0.96	0.96	20.7
Approach			347	1.5	319	1.5	0.575	12.9	LOS A	4.5	31.2	0.79	0.96	0.96	22.2
All Vehicles			2080	3.5	2046	3.6	0.894	15.3	LOS B	17.7	126.6	0.88	1.04	1.33	31.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SIDRA INTERSECTION 9.1 | Copyright © 2000-2023 Akcelik and Associates Pty Ltd | sidrasolutions.com

Organisation: TAYLOR THOMSON WHITTING | Licence: NETWORK / 1PC | Processed: Tuesday, 24 October 2023 10:28:45 AM

Project: P:\2023\2312\231268\Reports\TTW\TrafficModelling\231010 Charing Cross - Proposed Design (2030).sip9

MOVEMENT SUMMARY

 Site: Site 4 [Macpherson St & Leichhardt St - SAT (Site Folder: SAT - 2030)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

 Network: N101 [2030_SAT Network (Network Folder: General)]

SAT Peak - proposed
Site Category: Future Conditions 1
Roundabout

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] m				km/h
South: Leichhardt Street (South)															
1	L2	All MCs	28	0.0	28	0.0	0.247	15.9	LOS B	1.8	12.3	0.97	0.83	0.97	27.3
2	T1	All MCs	42	0.0	42	0.0	0.247	15.8	LOS B	1.8	12.3	0.97	0.83	0.97	27.3
3	R2	All MCs	12	0.0	12	0.0	0.247	18.7	LOS B	1.8	12.3	0.97	0.83	0.97	37.5
3u	U	All MCs	1	0.0	1	0.0	0.247	20.1	LOS B	1.8	12.3	0.97	0.83	0.97	33.6
Approach			83	0.0	83	0.0	0.247	16.3	LOS B	1.8	12.3	0.97	0.83	0.97	29.9
East: Macpherson Street (East)															
4	L2	All MCs	9	0.0	9	0.0	0.890	21.7	LOS B	21.3	151.8	1.00	1.19	1.71	34.4
5	T1	All MCs	312	4.4	312	4.4	0.890	21.9	LOS B	21.3	151.8	1.00	1.19	1.71	30.8
6	R2	All MCs	408	2.3	408	2.3	0.890	24.7	LOS B	21.3	151.8	1.00	1.19	1.71	30.8
6u	U	All MCs	21	0.0	21	0.0	0.890	25.9	LOS B	21.3	151.8	1.00	1.19	1.71	37.1
Approach			751	3.1	751	3.1	0.890	23.5	LOS B	21.3	151.8	1.00	1.19	1.71	31.1
North: Leichhardt Street (North)															
7	L2	All MCs	506	1.2	505	1.3	0.941	28.3	LOS B	28.3	198.8	1.00	1.39	2.05	30.5
8	T1	All MCs	44	0.0	44	0.0	0.941	28.0	LOS B	28.3	198.8	1.00	1.39	2.05	25.2
9	R2	All MCs	273	1.5	272	1.5	0.941	31.1	LOS C	28.3	198.8	1.00	1.39	2.05	15.1
9u	U	All MCs	2	0.0	2	0.0	0.941	32.4	LOS C	28.3	198.8	1.00	1.39	2.05	15.1
Approach			825	1.3	823	1.3	0.941	29.2	LOS C	28.3	198.8	1.00	1.39	2.05	27.0
West: Macpherson Street (West)															
10	L2	All MCs	307	1.4	297	1.4	0.884	27.9	LOS B	18.6	131.9	1.00	1.38	1.99	22.3
11	T1	All MCs	298	3.2	288	3.2	0.884	27.9	LOS B	18.6	131.9	1.00	1.38	1.99	33.3
12	R2	All MCs	14	0.0	13	0.0	0.884	30.6	LOS C	18.6	131.9	1.00	1.38	1.99	28.8
12u	U	All MCs	5	0.0	5	0.0	0.884	32.0	LOS C	18.6	131.9	1.00	1.38	1.99	22.3
Approach			624	2.2	603	2.2	0.884	28.0	LOS B	18.6	131.9	1.00	1.38	1.99	29.2
All Vehicles			2283	2.1	2259	2.1	0.941	26.5	LOS B	28.3	198.8	1.00	1.30	1.88	29.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SIDRA INTERSECTION 9.1 | Copyright © 2000-2023 Akcelik and Associates Pty Ltd | sidrasolutions.com

Organisation: TAYLOR THOMSON WHITTING | Licence: NETWORK / 1PC | Processed: Tuesday, 24 October 2023 10:28:45 AM

Project: P:\2023\2312\231268\Reports\TTW\TrafficModelling\231010 Charing Cross - Proposed Design (2030).sip9

MOVEMENT SUMMARY

 Site: Site 5 [Bronte Rd & Leichhardt St - SAT (Site Folder: SAT - 2030)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

 Network: N101 [2030_SAT Network (Network Folder: General)]

SAT Peak - proposed
Site Category: Future Conditions 1
Roundabout

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows [Total HV] veh/h %		Arrival Flows [Total HV] veh/h %		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh Dist] veh m		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Leichhardt Street (South)															
2	T1	All MCs	151	0.7	148	0.7	0.615	5.0	LOS A	6.9	48.6	0.56	0.55	0.56	31.1
3	R2	All MCs	623	2.0	615	2.0	0.615	7.7	LOS A	6.9	48.6	0.56	0.55	0.56	38.4
3u	U	All MCs	1	0.0	1	0.0	0.615	8.9	LOS A	6.9	48.6	0.56	0.55	0.56	31.1
Approach			775	1.8	764	1.8	0.615	7.1	LOS A	6.9	48.6	0.56	0.55	0.56	37.7
East: Bronte Road (East)															
4	L2	All MCs	573	1.3	573	1.3	0.696	7.6	LOS A	7.2	51.2	0.77	0.64	0.83	36.7
6	R2	All MCs	77	1.4	77	1.4	0.696	9.5	LOS A	7.2	51.2	0.77	0.64	0.83	36.7
6u	U	All MCs	18	0.0	18	0.0	0.696	10.7	LOS A	7.2	51.2	0.77	0.64	0.83	40.3
Approach			667	1.3	667	1.3	0.696	7.9	LOS A	7.2	51.2	0.77	0.64	0.83	36.9
North: Bronte Road (North)															
7	L2	All MCs	169	0.6	167	0.6	0.629	13.9	LOS A	5.8	40.4	0.92	0.92	1.21	35.1
8	T1	All MCs	220	1.4	217	1.5	0.629	13.3	LOS A	5.8	40.4	0.92	0.92	1.21	27.3
9u	U	All MCs	9	0.0	9	0.0	0.629	17.1	LOS B	5.8	40.4	0.92	0.92	1.21	27.3
Approach			399	1.1	394	1.1	0.629	13.7	LOS A	5.8	40.4	0.92	0.92	1.21	31.7
All Vehicles			1841	1.4	1825	1.4	0.696	8.8	LOS A	7.2	51.2	0.72	0.66	0.80	36.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SIDRA INTERSECTION 9.1 | Copyright © 2000-2023 Akcelik and Associates Pty Ltd | sidrasolutions.com

Organisation: TAYLOR THOMSON WHITTING | Licence: NETWORK / 1PC | Processed: Tuesday, 24 October 2023 10:28:45 AM

Project: P:\2023\2312\231268\Reports\TTW\Traffic\Modelling\231010 Charing Cross - Proposed Design (2030).sip9

MOVEMENT SUMMARY

Site: Site 6 [Bronte Rd & Albion St - SAT (Site Folder: SAT - 2030)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

Network: N101 [2030_SAT
Network (Network Folder:
General)]

SAT Peak - proposed

Site Category: Future Conditions 1

Give-Way (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] m				km/h
South: Albion Street (South)															
2	T1	All MCs	284	8.9	281	9.0	0.586	11.8	LOS A	6.7	48.7	0.70	0.88	1.37	28.1
3	R2	All MCs	185	1.7	183	1.7	0.586	16.8	LOS B	6.7	48.7	0.70	0.88	1.37	28.1
Approach			469	6.1	464	6.1	0.586	13.8	NA	6.7	48.7	0.70	0.88	1.37	28.1
East: Bronte Road (East)															
4	L2	All MCs	46	2.3	46	2.2	0.614	11.2	LOS A	3.0	21.3	0.80	1.11	1.38	23.6
6	R2	All MCs	164	0.6	163	0.6	0.614	20.2	LOS B	3.0	21.3	0.80	1.11	1.38	23.6
Approach			211	1.0	209	1.0	0.614	18.3	LOS B	3.0	21.3	0.80	1.11	1.38	23.6
North: Albion Street (North)															
7	L2	All MCs	333	0.6	328	0.6	0.383	3.4	LOS A	0.0	0.0	0.00	0.21	0.00	35.8
8	T1	All MCs	391	6.7	386	6.8	0.383	0.1	LOS A	0.0	0.0	0.00	0.21	0.00	35.8
Approach			723	3.9	714	4.0	0.383	1.6	NA	0.0	0.0	0.00	0.21	0.00	35.8
All Vehicles			1403	4.2	1387	4.2	0.614	8.2	NA	6.7	48.7	0.36	0.57	0.67	29.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SIDRA INTERSECTION 9.1 | Copyright © 2000-2023 Akcelik and Associates Pty Ltd | sidrasolutions.com

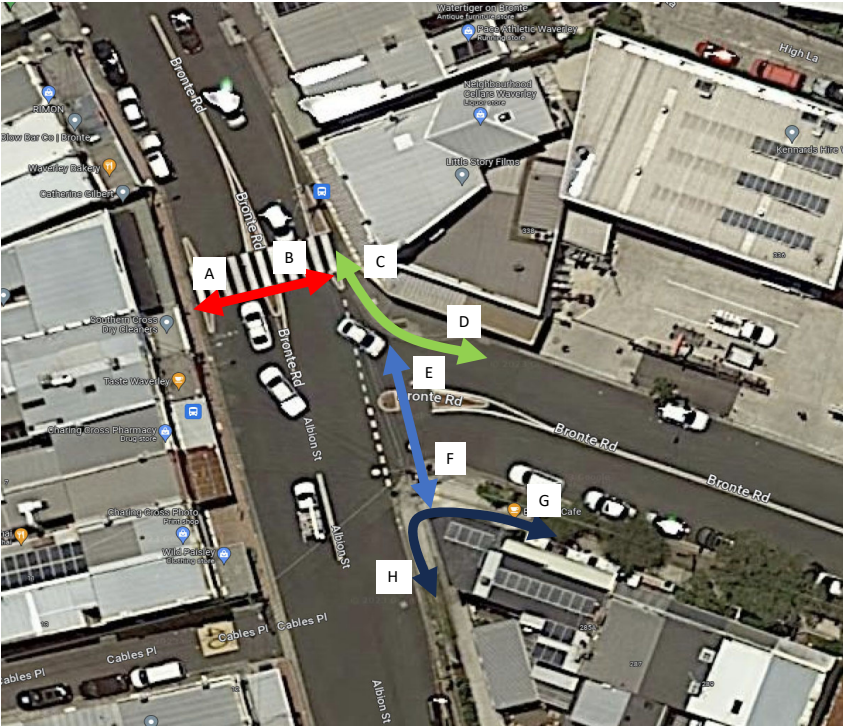
Organisation: TAYLOR THOMSON WHITTING | Licence: NETWORK / 1PC | Processed: Tuesday, 24 October 2023 10:28:45 AM

Project: P:\2023\2312\231268\Reports\TTW\TrafficModelling\231010 Charing Cross - Proposed Design (2030).sip9

Pedestrian Count

Date 12/10/2023
Weather Fine - 17°C
Time 8:35-9:05 am

	Pedestrian	Sensitive Pedestrian	Adjusted Total
A	37	3	43
B	40	5	50
C	8	1	10
D	8	0	8
E	24	5	34
F	22	2	26
G	7	0	7
H	2	1	4



Safety in Design				
Project Details				
	Project Name	CHARING CROSS STREETSCAPE UPGRADE		
	Project Location	Bronte Road Charing Cross		
	Council team	Cameron Eccles and Nick Prell		
	Designer or Design Consultants	Ennvironmental Partnership and TTW Engineers		
	DSA Prepared by	Ennvironmental Partnership and TTW Engineers		
	Project Description	Public domain improvements to enhance pedestrian environment and improve environment and character of village centre. Works include footpath widenings, kerb and gutter replacement, footway pavement, stormwater drainage upgrde , street furniture, street trees and gardens, interpretive signage, street lighting, undergrounding of power and telecommunications		
	Relevant WHS Guides	WHS Act 2011, WHS Regulation 2011 Code of Practice or Australian Standard relevant to this DSA, BCA Codes		
Consultation, Review and Document Control				
Project Phases	At Concept Design	At 80% Documentation	At Completion / handover	
Consultation				
WHS - (Name)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Asset Manager - (Name)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
End user reps/Other* -(Name)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Reviewed				
Project Design Manager	<u>[insert signature]</u>	<u>[insert signature]</u>	<u>[insert signature]</u>	
date	<u>[insert date]</u>	<u>[insert date]</u>	<u>[insert date]</u>	
Business Unit Manager	<u>[insert signature]</u>	<u>[insert signature]</u>	<u>[insert signature]</u>	
date	<u>[insert date]</u>	<u>[insert date]</u>	<u>[insert date]</u>	
Document Control				
Copy to Asset Manager	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Copy to Relevant Contractors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Reference	<u>[insert TRIM Ref no]</u>	<u>[insert TRIM Ref no]</u>	<u>[insert TRIM Ref no]</u>	

* For example, Operational staff, Union, Health and Safety Representative, Contractor, Other Asset managers

Doc No. 6.2 Design Safety Assessment
Hard copy document is only
valid for 30 days from date printed 24/1/24
Owner: WHS Manager

Created on: 01/10/2007
Reviewed on: 29/09/2015

1 of 1
Version No. 1.7
Next Review: July 2018

Design Safety Assessment (DSA)																
Safety Assessment			Date [date/month/year]													
Project Name Project Location Project Team Business Unit Designer or Design Consultants	CHARING CROSS STREETSCAPE UPGRADE															
	Bronte Road Charing Cross															
	Cameron Eccles and Nick Prell															
	Ennvironmental Partnership and TTW Engineers															
					INITIAL ASSESSMENT							REVISED ASSESSMENT				
Life Phase	Hazard Identified	Location and work activity of WHS Hazard	Potential impact of hazard	Persons Affected	Likelihood	Consequences	Risk Rating	Alternatives/Suggested Controls	Likelihood	Consequences	Risk Rating	Responsibility/ Management	Residual Risk	Additional Requirements		
1.0	Buildability															
1.1 Decommissioning and transferring power/ electrical connections 1.2 Trenching for power/ electrical connections 1.3 Trenching for stormwater pits and connections 1.4 Excavation of trees pits and structural soil cells 1.5 Pavement and kerb removal & installation 1.6 Pavement and kerb removal & installation 1.7 Multi function pole footing installation 1.8 Injury from reinforcement bars	Utilities and Services	Potential for accidents in decommissioning works for power and Telecoms	Fatality Potential for major damage costs Potential for major project delays	Construction workers	D	4	13	Contractor to have appropriate SWMS in place.	D	4	13	Contractor				
	Utilities and Services	Potential for finds of hazardous material / facilities in alignments for new / upgraded services and at the road crossings of the same	Fatality Potential for major damage costs Potential for major project delays	Construction workers	D	4	13	Services surveys completed by Council and integrated to demolition / construction dwgs. Contractor to have appropriate SWMS in place. Contracror to do appropriate on site verification of alignments and depths	D	4	13	Contractor				
	Excavation	Potential for finds of hazardous material / facilities in areas to be excavated / graded along widened footway and at road crossings	Fatality Potential for major damage costs Potential for major project delays	Construction workers	D	4	13	Services surveys completed by Council and integrated to demolition / construction dwgs. Contractor to have appropriate SWMS in place. Contracror to do appropriate on site verification of alignments and depths	D	4	13	Contractor				
	Excavation	Potential for finds of hazardous material / facilities in areas to be excavated or trees pits and structural soils along kerblne and at crossing nodes	Fatality Potential for major damage costs Potential for major project delays	Construction workers	C	4	9	Services surveys completed by Council and integrated to demolition / construction dwgs. Contractor to have appropriate SWMS in place. Contracror to do appropriate on site verification of alignments and depths	C	4	9	Contractor				
	Ergonomics and Hazardous Manual Tasks	Potential for injury demolishing and removing existing pavements and other structures	Serious lost time / injury Potential for damage costs Potential for project delays	Construction workers	C	3	12	Demolished material lifted by appropriate procedure for weight including mechanically where appropriate Contractor to have appropriate SWMS in place	C	3	12	Contractor				
	Excavation	Potential for finds of hazardous material / facilities in areas to be excavated / graded along widened footway and at pedestrian crossings	Serious lost time / injury Potential for damage costs Potential for project delays	Construction workers	C	3	12	Stones lifted by appropriate procedure for weight including mechanically where appropriate Contractor to have appropriate SWMS in place	C	3	12	Contractor				
	Excavation	Potential for finds of hazardous material / facilities in areas to be excavated for light pole footings	Fatality Potential for major damage costs Potential for major project delays	Construction workers	D	4	13	Services surveys completed by Council and integrated to demolition / construction dwgs. Contractor to have appropriate SWMS in place. Contracror to do appropriate on site verification of alignments and depths	D	4	13	Contractor				
	Building materials used	Potential for cuts, abrasions, impaling	Serious injury	Construction workers and Public	C	3	12	Length of reinforcement to be kept as short as possible. Minimise projections. Contractor to provide safety ends to projecting bars.	E	1	25	Contractor				

					INITIAL ASSESSMENT			REVISED ASSESSMENT						
Life Phase	Hazard Identified	Location and work activity of WHS Hazard	Potential impact of hazard	Persons Affected	Likelihood	Consequences	Risk Rating	Alternatives/Suggested Controls	Likelihood	Consequences	Risk Rating	Responsibility/ Management	Residual Risk	Additional Requirements
1.9 Pollution of downstream water ways	Environmental conditions	Erosion of soil and transportation of sediment through the construction site into the receiving wayenways.	Environmental damage, Reputational damage Repair/mitigation time/cost	Construction workers/Public	C	3	12	Ensure adequate sedimentation and erosion control measures are provided as part of the construction works. Contractor to ensure final sediment and erosion control measures comply with the Department of Environment and Conservation 'Managing Urban Stormwater' aka Blue Book published by Landcom.	E	3	20	Contractor		
	Excavation	Potential of flooding and collapse of excavations or structures	Serious lost time / injury Potential for damage costs Potential for project delays	Construction workers and Public	C	4	9	Check geotechnical report for anticipated ground water level. Provide dewatering system as necessary. Contractor to provide method statement for safe working	E	2	24	Contractor		
	1.11 Vehicle/plant movement	Movement of materials, plant and vehicles, including public traffic	Potential for injury to workers or public caused by vehicle/plant movement	Serious injury Potential for damage costs	Construction workers and Public	C	4	9	Contractor to supply and comply with traffic management plan and provide adequate site traffic control including trained bankman to supervise vehicle movements where necessary. Ensure adequate distance between workers and public traffic is maintained, speed restrictions to be introduced where necessary	E	2	24	Contractor	

Design Safety Assessment (DSA)															
Safety Assessment			Date [date/month/year]												
Project Name Project Location Project Team Business Unit Designer or Design Consultants	CHARING CROSS STREETSCAPE UPGRADE														
	Bronte Road Charing Cross														
	Cameron Eccles and Nick Prell														
	Ennvironmental Partnership and TTW Engineers														
					INITIAL ASSESSMENT			REVISED ASSESSMENT							
Life Phase	Hazard Identified	Location and work activity of WHS Hazard	Potential impact of hazard	Persons Affected	Likelihood	Consequences	Risk Rating	Alternatives/Suggested Controls	Likelihood	Consequences	Risk Rating	Responsibility/ Management	Residual Risk	Additional Requirements	
1.0	Buildability														
1.1	Decommissioning and transferring power/ electrical connections	Utilities and Services	Potential for accidents in decommissioning works for power and Telecoms	Fatality Potential for major damage costs Potential for major project delays	Construction workers	D	4	13	Contractor to have appropriate SWMS in place.	D	4	13	Contractor		
1.2	Trenching for power/ electrical connections	Utilities and Services	Potential for finds of hazardous material / facilities in alignments for new / upgraded services and at the road crossings of the same	Fatality Potential for major damage costs Potential for major project delays	Construction workers	D	4	13	Services surveys completed by Council and integrated to demolition / construction dwgs. Contractor to have appropriate SWMS in place. Contracror to do appropriate on site verification of alignments and depths	D	4	13	Contractor		
1.3	Trenching for stormwater pits and connections	Excavation	Potential for finds of hazardous material / facilities in areas to be excavated / graded along widened footway and at road crossings	Fatality Potential for major damage costs Potential for major project delays	Construction workers	D	4	13	Services surveys completed by Council and integrated to demolition / construction dwgs. Contractor to have appropriate SWMS in place. Contracror to do appropriate on site verification of alignments and depths	D	4	13	Contractor		
1.4	Excavation of trees pits and structural soil cells	Excavation	Potential for finds of hazardous material / facilities in areas to be excavated or trees pits and structural soils along kerblne and at crossing nodes	Fatality Potential for major damage costs Potential for major project delays	Construction workers	C	4	9	Services surveys completed by Council and integrated to demolition / construction dwgs. Contractor to have appropriate SWMS in place. Contracror to do appropriate on site verification of alignments and depths	C	4	9	Contractor		
1.5	Pavement and kerb removal & installation	Ergonomics and Hazardous Manual Tasks	Potential for injury demolishing and removing existing pavements and other structures	Serious lost time / injury Potential for damage costs Potential for project delays	Construction workers	C	3	12	Demolished material lifted by appropriate procedure for weight including mechanically where appropriate Contractor to have appropriate SWMS in place	C	3	12	Contractor		
1.6	Pavement and kerb removal & installation	Excavation	Potential for finds of hazardous material / facilities in areas to be excavated / graded along widened footway and at pedestrian crossings	Serious lost time / injury Potential for damage costs Potential for project delays	Construction workers	C	3	12	Stones lifted by appropriate procedure for weight including mechanically where appropriate Contractor to have appropriate SWMS in place	C	3	12	Contractor		
1.7	Multi function pole footing installation	Excavation	Potential for finds of hazardous material / facilities in areas to be excavated for light pole footings	Fatality Potential for major damage costs Potential for major project delays	Construction workers	D	4	13	Services surveys completed by Council and integrated to demolition / construction dwgs. Contractor to have appropriate SWMS in place. Contracror to do appropriate on site verification of alignments and depths	D	4	13	Contractor		
1.8	Injury from reinforcement bars	Building materials used	Potential for cuts, abrasions, impaling	Serious injury	Construction workers and Public	C	3	12	Length of reinforcement to be kept as short as possible. Minimise projections. Contractor to provide safety ends to projecting bars.	E	1	25	Contractor		

					INITIAL ASSESSMENT			REVISED ASSESSMENT						
Life Phase	Hazard Identified	Location and work activity of WHS Hazard	Potential impact of hazard	Persons Affected	Likelihood	Consequences	Risk Rating	Alternatives/Suggested Controls	Likelihood	Consequences	Risk Rating	Responsibility/ Management	Residual Risk	Additional Requirements
1.9 Pollution of downstream water ways	Environmental conditions	Erosion of soil and transportation of sediment through the construction site into the receiving wayeways.	Environmental damage, Reputational damage Repair/mitigation time/cost	Construction workers/Public	C	3	12	Ensure adequate sedimentation and erosion control measures are provided as part of the construction works. Contractor to ensure final sediment and erosion control measures comply with the Department of Environment and Conservation 'Managing Urban Stormwater' aka Blue Book published by Landcom.	E	3	20	Contractor		
	Excavation	Potential of flooding and collapse of excavations or structures	Serious lost time / injury Potential for damage costs Potential for project delays	Construction workers and Public	C	4	9	Check geotechnical report for anticipated ground water level. Provide dewatering system as necessary. Contractor to provide method statement for safe working	E	2	24	Contractor		
	1.11 Vehicle/plant movement	Movement of materials, plant and vehicles, including public traffic	Potential for injury to workers or public caused by vehicle/plant movement	Serious injury Potential for damage costs	Construction workers and Public	C	4	9	Contractor to supply and comply with traffic management plan and provide adequate site traffic control including trained bankman to supervise vehicle movements where necessary. Ensure adequate distance between workers and public traffic is maintained, speed restrictions to be introduced where necessary	E	2	24	Contractor	

Design Safety Assessment (DSA)																						
Design Safety Assessment					Date [date/month/year]																	
Project Name Project Location Council team Business Unit Designer or Design Consultants	CHARING CROSS STREETSCAPE UPGRADE																					
	Bronte Road Charing Cross												24/1/24	ISSUE 3								
	Cameron Eccles and Nick Prell																					
	Ennvironmental Partnership and TTW Engineers																					
Life Phase	Hazard Identified	Location and work activity of WHS Hazard	Potential impact of hazard	Persons Affected	INITIAL ASSESSMENT			Alternatives/Suggested Controls/Mitigation Measures	REVISED ASSESSMENT			(Responsibility) /Management	Residual Risk	Additional Requirements								
					Likelihood	Consequences	Risk Rating		Likelihood	Consequences	Risk Rating											
3.0	Useability	EXISTING CONDITIONS ON SITE							PROPOSED DESIGN													
PAVEMENT SURFACES	3.1 Pavement areas generally	Slips, Trips and Falls	Slipping / tripping on pavement	Moderate injury	Public	B	3	8	Pavement finishes to comply with wet slip resistance standard P5 as specified - certification to be provided prior to laying and material to be tested after laying. Deflection / lip between pavement surfaces shall not exceed +/- 2mm as specified.	C	3	12	(Council) Regular inspections to monitor trip hazards Slip resistance testing every 5 years	Slip resistance declines Lips develop between surfaces								
		3.2 Transition/Temporay paved areas	Slips, Trips and Falls	Tripping on pavement/gravel	Moderate injury	Public	B	3	8	Accessible hard paved route provided through overall pavement treatment to provide even surface and comply with with wet slip resistance standard P5 as specified. Deflection / lip between pavement surfaces shall not exceed +/- 2mm as specified.	C	3	12	(Council) Regular inspections to monitor trip hazards Slip resistance testing every 5 years								
			3.3 Available footpath width	Slips, Trips and Falls	Tripping falls due to limited footway width due to café seating / other obstacles	Moderate injury	Public	C	3	12	Design increases width of available footway from 3.6m to 4.5m approx for over 75% of works area - balance increased between 0-0.9m. Increased width allows for greater pedestrian movement space.	D	3	18	(Lease / license holders for mobile seating). Maintenance / policing of café outdoor seating arrangements	Outdoor seating arrangements are not maintained to lease area						
	3.4 Pavement in area of access covers for services	Slips, Trips and Falls		Tripping on pit lids							Moderate injury	Public	B	3	8	Pit lids to meet pavement tolerances for deflections between surfaces when installed. Contractor to have appropriate SWMS in place for checking of lid placement after use including on hot days - including appropriate remedial action if lid cannot be placed correctly.	B	3	8	(Council) Regular inspections to monitor trip hazards	Slip resistance declines Lips develop between surfaces	
		3.5 Steps (existing)	Slips, Trips and Falls	Steps at comer Victoria Street and Bronte Rd west	Serious injury	Public	C	4	9	Replacement step slabs to comply with wet slip resistance standard P5 as specified - certification to be provided prior to laying and material to be tested after laying. Provision of handrails in accoprndance with AS 1428 and BCA.	C	4	9	(Council) Regular inspections to monitor trip / fall hazards								
	3.5 Balustrades and Handrails	Structural strength and stability	Steps at comer Victoria Street and Bronte Rd west	Serious injury	Public	D	4	13	Balustrades/Handrails design AS and BC standards as specified.	D	4	13	(Council) Regular inspections to monitor handrail stability									
	3.7 Flooding at Grated Drain Pits affecting access	Slips, Trips and Falls	Slipping / tripping on flooded pavement	Moderate injury	Public	B	3	8	No grated drains provided in footway or crossings. Where required junction pits to have solid non slip lid.	C	3	12	(Council)									
	KERBS TO PARKING LANE	3.8 Access from parking lane to footway across kerb	Slips, Trips and Falls	Tripping falls due to height of kerb	Serious injury	Public	B	4	5	Maintain height of kerb to 150-175 mm comfortable stepping height. Provide kerb in finish with visual definition to adjoining pavements.	B	4	13	(Council) Mobile seat placements can obstruct pedestrian access from parking lane	New fixtures place on footway adjacent kerb (eg bins)							
			Slips, Trips and Falls							Tripping falls due to obstacles on footway	Serious injury	Public	C	4			9	New tree pits may obstruct pedestrian access - limit tree pit length to 2m length.	C	4	9	(Council)
	SIGNALISED CROSSING	3.9 Access from footway to crossing	Slips, Trips and Falls	Tripping or falls due to quality of kerb crossing and available space	Serious injury	Public	B	3	8	Remove slip lane from Bronte Rd to Carrington. Street to create more pedestrian gathering space and improved pram crossings. Improve alignment and width of kerb crossings.	C	3	12	(Council / TfNSW)								
			Slips, Trips and Falls							Tripping or falls due to being hurried across intersection. Noted that there are vulnerable users due to the presence of the aged care community and numerous schools within the area	Serious injury	Public	B	3	8	Footpath widenings at intersection reduce crossing distance to following locations : -Victoria Road at all corners. -Bronte Raod west - east and west sides.	C	3	12	(Council / TfNSW)		

					INITIAL ASSESSMENT			REVISED ASSESSMENT						
Life Phase	Hazard Identified	Location and work activity of WHS Hazard	Potential impact of hazard	Persons Affected	Likelihood	Consequences	Risk Rating	Alternatives/Suggested Controls/Mitigation Measures	Likelihood	Consequences	Risk Rating	(Responsibility) /Management	Residual Risk	Additional Requirements
3.11 Pedestrian hit by vehicle	Traffic Management	Pedestrian hit by vehicle at crossing	Fatality or permanent disability	Public	C	5	6	As for 3.10. Signal phasing meets required standards for corssing times.	C	5	6	(Council / TfNSW)		
		Arrangement of pedestrian crossings at intersections results in public jaywalking across intersection at shorter distances. Potential for pedestrians struck by oncoming/turning vehicles	Fatality or permanent disability	Public	C	5	6	Pedestrian crossings adjusted to better align with pedestrian desire lines. Pedestrian crossing distances are reduced. Where the above not possible pedestrian fences to be installed at selected locations to prohibit crossing at locations other than where marked.	D	4	13	(Council / TfNSW)		
MID BLOCK CROSSING														
3.13 Provision of mid block crossing	Traffic Management	Pedestrian hit by vehicle trying to cross Bronte Road as there is a 250m gap between existing crossing points	Fatality or permanent disability	Public	C	5	6	Provision of warranted linemarked (zebra) mid block crossing providing safe mid block access point. Provision of raised crossing threshold providing slower traffic environment and more comfortable and accessible movement.	D	4	13	(Council)		
3.14 Traffic speed	Traffic Management	Speed of traffic to middle of block in long straight run of road	Serious injury	Public	C	5	6	Provision of raised crossing threshold providing slower traffic environment	D	5	10	(Council)		
3.15 Sight lines at crossing	Traffic Management	Visibility of an at grade crossing	N/A for existing condition	N/A for existing condition				Provision of raised crossing threshold enhances sight line performance of new crossing by improving vertical sight lines	D	4	13	(Council) Maintenance of structures and pavements		
3.16 Sight lines at crossing	Traffic Management	Tree trunk and / or canopy restricts sight lines of drivers and / or pedestrians at new mid block crossing	N/A for existing condition	N/A for existing condition				Provision and arrangement of tree planting at mid block crossing maintains Crossing sight distance in accordance with Austroad Part 4a Unsignalised and Signalised Intersections	D	4	13	(Council) Maintenance of planting		
3.17 Sight lines at crossing	Traffic Management	Garden shrub planting restricts sight lines of drivers and / or pedestrians at new mid block crossing	N/A for existing condition	N/A for existing condition				Provision and arrangement of garden planting at mid block crossing maintains height of less than 1m and related Crossing sight distance in accordance with Austroad Part 4a Unsignalised and Signalised Intersections	D	4	13	(Council) Maintenance of planting		
3.18 Visibility at crossing	Traffic Management	Lighting of crossing	N/A for existing condition	N/A for existing condition				New street lights and crossing flood lighting complying with relevant AS/NZ Standards	D	4	13	(Council) Maintenance of lights		
3.19 Ccrossing distance	Traffic Management	Crossing distance for pedestrians - longer crossing distance can increase risk of traffic incident and increase delays to traffic	N/A for existing condition	N/A for existing condition				Localised kerb buildouts and narrowing of carriageway reduce crossing distance from 11.8m to 6.4m (almost half)	D	4	13	(Council) Maintenance of structures and pavements		
SOUTH PEDESTRIAN CROSSING														
3.20 Access from footway to crossing	Slips, Trips and Falls	Tripping or falls due to quality of kerb crossing and available space	Serious injury	Public	B	3	8	Provision of raised crossing threshold providing more comfortable and accessible pedestrian movement.	C	3	12	(Council)		
3.21 Traffic speed	Traffic Management	Speed of traffic approaching at grade zebra crossing	Serious injury	Public	C	5	6	Provision of raised crossing threshold providing slower traffic environment	D	5	10	(Council)		
3.22 Sight lines at crossing	Traffic Management	Visibility of at grade crossing	Serious injury	Public	C	5	6	Provision of raised crossing threshold enhances sight line performance of new crossing by improving vertical sight lines	D	4	13	(Council) Maintenance of structures and pavements		
3.23 Sight lines at crossing	Traffic Management	Tree trunk and / or canopy restricts sight lines of drivers and / or pedestrians at new mid block crossing	N/A for existing condition	N/A for existing condition				Provision and arrangement of tree planting at mid block crossing maintains Crossing sight distance in accordance with Austroad Part 4a Unsignalised and Signalised Intersections	D	4	13	(Council) Maintenance of planting		
3.24 Sight lines at crossing	Traffic Management	Garden shrub planting restricts sight lines of drivers and / or pedestrians at new mid block crossing	N/A for existing condition	N/A for existing condition				Provision and arrangement of garden planting at mid block crossing maintains height of less than 1m and related Crossing sight distance in accordance with Austroad Part 4a Unsignalised and Signalised Intersections	D	4	13	(Council) Maintenance of planting		
3.25 Ccrossing distance	Traffic Management	Crossing distance for pedestrians	Serious injury	Public	C	5	6	Localised kerb buildouts and narrowing of carriageway reduce crossing distance from 11.8m to 6.4m (almost half)	D	4	13	(Council) Maintenance of structures and pavements		
BRONTE RD EAST - SIDE STREET JUNCTION														
3.26 Access from footway to crossing	Slips, Trips and Falls	Tripping or falls due to quality of kerb crossing and available space	Serious injury	Public	B	3	8	Provision of raised crossing threshold providing continuous footway, slower traffic environment and more comfortable and accessible movement.	C	3	12	(Council)		
3.27 Confusion regarding priority	Traffic Management	Existing refuge crossing - potential for confusion / hesitation at busy corssing point	Fatality or permanent disability	Public	C	5	6	Provision of warranted linemarked (zebra) crossing providing clear pedestrian priority and reducing confusion Provision of raised crossing threshold providing slower traffic environment.	D	4	13	(Council)		

					INITIAL ASSESSMENT			REVISED ASSESSMENT							
Life Phase	Hazard Identified	Location and work activity of WHS Hazard	Potential impact of hazard	Persons Affected	Likelihood	Consequences	Risk Rating	Alternatives/Suggested Controls/Mitigation Measures	Likelihood	Consequences	Risk Rating	(Responsibility) /Management	Residual Risk	Additional Requirements	
3.28	Sight lines at crossing	Traffic Management	Tree trunk and / or canopy restricts sight lines of drivers and / or pedestrians at new mid block crossing	N/A for existing condition	N/A for existing condition			Provision and arrangement of tree planting at crossing maintains Crossing sight distance in accordance with Austroad Part 4a Unsignalised and Signalised Intersections	D	4	13	(Council) Maintenance of planting			
	3.29	Sight lines at crossing	Traffic Management	Garden shrub planting restricts sight lines of drivers and / or pedestrians at new mid block crossing	N/A for existing condition	N/A for existing condition			Provision and arrangement of garden planting at crossing maintains height of less than 1m and related Crossing sight distance in accordance with Austroad Part 4a Unsignalised and Signalised Intersections	D	4	13	(Council) Maintenance of planting		
3.30		Sight lines at crossing	Traffic Management	Visibility of at grade crossing	Serious injury	Public	C	5	6	Provision of raised crossing threshold enhances sight line performance of new crossing by improving vertical sight lines	D	4	13	(Council) Maintenance of structures and pavements	
	3.31	Slip road pedestrian median	Slips, Trips and Falls	Large volume of pedestrians crossing at the slip road median results in overcrowding and pedestrians standing within the traffickable roadway.	Fatality or permanent disability	Public	C	5	6	Removal of slip lane increases available pedestrian area for queuing and reduces the instance of pedestrians crossing the roadway. Queuing of pedestrians can occur on the footpath once this has been removed.	C	3	12	(Council)	
3.32		Pedestrian crossing distance	Traffic Management	Crossing distance for pedestrians	Serious injury	Public	C	5	6	Localised kerb buildouts and narrowing of carriageway reduce crossing distance from 12.8m to 10m	D	4	13	(Council) Maintenance of structures and pavements	
	3.33	Vehicle crossing distance	Traffic Management	Crossing / entering distance for vehicles to Bronte Rd traffic	Serious injury	Public	C	5	6	Reduce the length of entry for north and southbound vehicles entering bronte road via use of kerb extentions as part of pedestrian crossing	D	4	13	(Council) Maintenance of structures and pavements	
3.34		Vehicle sight lines at intersection entering Bromte Rd	Traffic Management	Alignment and adequacy of waiting space for vehicles to Bronte Rd traffic	Serious injury	Public	C	5	6	Mitigation - provide protected vehicle stopping spot (6m) on the exit of the pedestrian crossing with clear sight lines for vehicles north and southbound traffic at intersection	D	4	13	(Council) Maintenance of structures and pavements	
	3.35	Sight lines at continuous footpath	Traffic Management	Visibility of crossing of lane by footpath	Serious injury	Public	C	5	6	Provision of raised continuous pavement threshold enhances sight line performance by improving vertical sight lines	D	4	13	(Council) Maintenance of structures and pavements	
CABLES LANE - SIDE STREET JUNCTION															
3.36	Access from footway to crossing	Slips, Trips and Falls	Tripping or falls due to quality of kerb crossing	Serious injury	Public	C	3	12	Provision of continuous footway providing continuous pedestrian movement, slower traffic environment and more comfortable and accessible movement.	D	3	18	(Council)		
	3.37	Sight lines	Traffic Management	Tree trunk and / or canopy restricts sight lines of drivers and / or pedestrians for vehicles turning into lane / driveway	N/A for existing condition	N/A for existing condition			Provision and arrangement of tree planting at footpath widening maintains Crossing sight distance in accordance with Austroad Part 4a Unsignalised and Signalised Intersections	D	4	13	(Council) Maintenance of planting		
3.38		Sight lines	Traffic Management	Garden shrub planting restricts sight lines of drivers and / or pedestrians for vehicles turning into lane / driveway	N/A for existing condition	N/A for existing condition			Provision and arrangement of garden planting at footpath widening maintains height of less than 1m and related Crossing sight distance in accordance with Austroad Part 4a Unsignalised and Signalised Intersections	D	4	13	(Council) Maintenance of planting		
	STREET LIGHTING														
3.39	Street generally	Traffic Management	Street and pedestrian lighting levels meet required compliance for traffic category	Fatality or permanent disability	Public	D	5	10	New streelighting in form of Multi Function poles addresses all applicable compliance requirements.	D	5	10	(Council) Maintenance of street lighting		
	3.40	Street generally	Violence and Crime	Streetscape improvements do contribute to less safe night time pedestrian environment by reducing lighting effectiveness and creating non-survellable spaces	Serious injury	Public	D	4	13	New streelighting in form of Multi Function poles addresses all applicable compliance requirements. Street lighting is positioned outside of future canopy spread of street trees. Design of street gardens and other street elements (eg signage) do not create spaces that cannot be seen and potentially restrict surveillance of the footway space	D	4	13	(Council) Maintenance of street lighting Maintenance of tree and garden planting	
3.41		Pedestrian crossings	Traffic Management	Street and pedestrian lighting levels meet required compliance at pedestrian crossing			D	5	10	New streelighting in form of Multi Function poles addresses all applicable compliance requirements, including targeted flood lighting at opedestrian crossings to meet compliance requirements	D	5	10	(Council) Maintenance of flood lighting Maintenance of tree and garden planting	
	FLOODING														

					INITIAL ASSESSMENT			REVISED ASSESSMENT							
Life Phase	Hazard Identified	Location and work activity of WHS Hazard	Potential impact of hazard	Persons Affected	Likelihood	Consequences	Risk Rating	Alternatives/Suggested Controls/Mitigation Measures	Likelihood	Consequences	Risk Rating	(Responsibility) /Management	Residual Risk	Additional Requirements	
3.42	Flooding at Grated Drain Pits affecting access	Slips, Trips and Falls	Slipping / tripping on flooded pavement	Moderate injury	Public	C	3	12	Drainage upgrade works improve performance of drainage system but ultimately are limited by capacity of downstream drainage. New works in particular raised crossings maintain effective overland flow paths to avoid ponding of water to footway areas Some temporary ponding/ flows may be experienced over raised crossings	C	3	12	(Council) Maintenance of kerb inlet pits and pipes		
	3.43	Ponding on road pavements	Environmental conditions	Ponding on road surfaces due to insufficient maintenance of stormwater elements, maintenance procedures not followed, stormwater network not constructed as designed	Vehicle incident due to aquaplaning or obscured linemarking - senior injury. Reputational risk Repair or mitigation time/cost	Public	C	4	9	Regular inspection and maintenance is to be carried out on the elements of the site stormwater system as outlined in the maintenance schedule. Provision of Works As Executed drawings by a registered surveyor showing all elements of the as built stormwater system. Provide an Operation and Maintenance Manual for the designed system	C	2	17		
3.44	Ponding on footpath pavements	Environmental conditions	Localised nuisance ponding on pavements resulting in slips/trips, reduced useability	Moderate injury Reputational risk Repair or mitigation time/cost	Public	C	3	12	Ensure pavements are constructed with adequate crossfall and within tolerance as specified in the civil specification. Regular inspections and maintenance of pavements to identify any movements over time	C	2	17	Contractor, Council Maintenance		
PEDESTRIAN SAFETY GENERALLY															
3.45	Pedestrian safety within the project area generally	Traffic Management	Pedestrian / vehicle incidents Slipping / tripping on footpaths General amenity and comfort of pedestrians	Serious injury	Public	C	5	6	Wider footpath Reduction and unification of cross falls Removal of trip hazards Raised pedestrian crossings Improved visibility/ sight lines vertical and horizontal Improved separation of pedestrians and vehicles Vehicle speed reduction through strategic design Shorter crossing distances Improved crossing locations Removal of trip hazards. Improved shade	D	5	10	(Council) Maintenance of surfaces Policing of al fresco seating licenses (NSW Police) Policing of road rules		
MOTORIST SAFETY GENERALLY															
3.46	Motorist safety within the project area generally	Traffic Management	Vehicle accidents causing injury to drivers	Serious injury	Public	C	5	6	Vehicle speed reduction through strategic design Improved sight lines to vehicles and pedestrians Parking lane protection through kerb extensions Reduce crossing distance to enter traffic lane. i.e. albion bronte rd Improved lighting Improved road surface Improved street amenity, improving alertness of drivers. Clear delineation of travel lanes through linemarking and kerb extensions	D	5	10	(Council) Maintenance of vegetation to prevent any impact to sight lines (NSW Police) Policing of road rules		
PUBLIC TRANSPORT SAFETY GENERALLY															
3.47	Safety of public transport users within the project area generally	Traffic Management	Accidents accessing and alighting buses	Moderate injury	Public	C	3	12	Improved queuing space at bus stops Tactiles indicators Seating Improved grades enhancing boarding areas Improved sight lines to vehicles and pedestrians Better pedestrian connection to stops	D	3	18	(Council) Maintenance of vegetation to prevent any impact to sight lines (NSW Police) Policing of road rules		
ACTIVE TRANSPORT SAFETY GENERALLY															
3.48	Safety of active transport users within the project area generally	Traffic Management	Vehicle / cycle accidents causing injury to riders	Serious injury	Public	C	5	6	Reduced traffic speeds through strategic design Improved bike parking	D	5	10	(Council) Maintenance of vegetation to prevent any impact to sight lines (NSW Police) Policing of road rules		

Safety in Design	
Explanation Sheet	
Site Location	Street and suburb location and description of facility.
Completed by	Designer, Engineer Architect etc with authority of the design process.
Project Description	Brief outline of the project and what will be happening on site including the proposed methods and materials for construction i.e. design and build of a 23 storey commercial building. Construction includes reinforced concrete structure and concrete block and brick cladding.
Area/Level	Describes the location or area of the building that is being addressed i.e. Level 1.
Life Phase	The Safety Design Assessment should take into consideration the life cycle of the product being developed and should include as a minimum - Builtability - The safety implications and associated risk in the construction of the product; Maintainability - The safety implications and associated risk in the maintenance and up keep of the product once constructed; Usability - The safety implications and the associated risk in the general use of the product; Decommissioning - The safety implications and associated risk with the decommissioning, alteration and demolition of the building i.e. concrete tensioning.
Hierarchy of Control	The hierarchy of control is implemented in developing the most appropriate/effective control measure for the identified hazard and is provided in the order of priority - Elimination : Can the risk be eliminated i.e. can it be designed out, is the hazard required. Substitution : Can the process of product be substituted for a less hazardous process or product i.e. A filtration system requiring 75% HCl substituted for a system requiring 10% H2. Engineering : Can engineering controls be provided to the product i.e. Lift motor can be encased in insulated container to reduce noise. Administrative : Can controls be developed through procedures to reduce the level of risk associated with the hazard i.e. Rotating employees exposed to excessive level of noise or vibration to reduce the exposure duration. Personal Protective Equipment (PPE) : What PPE can be provided to reduce the level of risk associated with the hazard i.e. reuesting the use of a harness for working at height.
Work Activity	The work task to be carried out in the Area/Level detailed i.e. window cleaning.
WHS Hazards	The activities that have the potential to harm the health and safety of a person or cause a serious near miss or environmental incident i.e. damaged structure, pollution event or lost time injury.
Some example categories of hazards:	Manual Handling Hazards Maintenance/ Operational hazards Hazards relating to: -Geological Issues -Existing services -Commissioning / decommissioning structures / plant -Demolition -Working at height -Excavation -Manufacture of materials associated with design -Storage, handling and use of hazardous chemicals -Construction methods -Site layout -Movement of plant -Noise -Site access and egress
C - P - R*	The key identifiers for the assessment of risk associated with the above - C = Consequence - What are the effects if an incident occurs. P = Probability - What is the likelihood of an incident occurring. R = Risk - A calculation of the of the level of risk associated with the hazard and the probability of it being realised.
Initial Assessment	The C-P-R calculated on the basis that no control measures are implemented to eliminate or minimise the identified hazard.
Persons Affected	Include those that may be affected if the risk is realised taking into account the life phase of the product or service.
Control Measures	Identify those control measures included within the design to ensure the process or works in that part of the life phase can be carried out with the risk eliminated or reduced as low as reasonably practicable. Provide an
Revised Assessment	The C-P-R re-calculated on the basis after the recommended control measures are implemented to eliminate or minimise the risks for the identified hazard.
Residual Risk	Those risks that could not be eliminated during the design phase of the project.
Additional Requirements	The further requirements, issues, instructions etc that should be detailed to those affected during each life phase. This may include providing a copy of this assessment, manufacturers and maintenance books, specifications for construction etc.

*The Consequence, Probability and Risk is determined using the Risk Matrix provided with this document.

Design Safety Assessment (DSA)														
Design Safety Assessment										Date		[date/month/year]		
Project Name Project Location Project Team Business Unit Designer or Design Consultants	24/1/24 ISSUE 3													
Life Phase	Hazard Identified	Location and work activity of WHS Hazard	Potential impact of hazard	Persons Affected	INITIAL ASSESSMENT			Alternatives/Suggested Controls	REVISED ASSESSMENT			Responsibility/ Management	Residual Risk	Additional Requirements
					Likelihood	Consequences	Risk Rating		Likelihood	Consequences	Risk Rating			
4.0	Decommissioning													
4.1														
4.2														
4.3														

Safety in Design										
Risk Matrix										
Step 1 – Consider the Consequences			Step 2 – Consider the Probability		Step 3 – Calculate the Risk					
What are the consequences of this incident occurring?			What is the probability of the consequence identified in Step 1 happening?		Step 1 Consequences - select the correct line. Step 2 Probability - select the correct column. Step 3 Risk Score - the risk score is determined where the two ratings cross on the matrix below.					
Consequence		Description				Consequence				
						1	2	3	4	5
1	Insignificant – No injury or illness	A	Almost Certain - It's occurring now; or it is likely to occur within the near future; or it's a common or repeating occurrence	Probability	A	15	7	4	2	1
2	Minor - Injury or illness requiring first aid treatment	B	Likely - It will probably occur in the near future; it has been known to occur, or "it has happened"		B	16	11	8	5	3
3	Moderate - Injury or illness requiring medical treatment	C	Possible - Could occur in the near future, but it most likely won't; "I've heard of it happening"		C	21	17	12	9	6
4	Major - Serious or extensive injury or illness	D	Unlikely - May occur, but it would not be anticipated to happen		D	23	22	18	13	10
5	Extraordinary - Fatality or permanent disability	E	Rare - Occurrence is unlikely and requires exceptional circumstances, even in the long term future.		E	25	24	20	19	14
Calculation of Risk - 1-6 are considered very high risk , 7-14 high risk, 15-20 moderate risk and over 21 considered low risk.										
Hierarchy of Controls – The hierarchy or controls is to be considered in controlling risk - Elimination, Substitution, Isolation, Engineering, Administration, Personal protective equipment										

Safety in Design		
Typical Buildability Hazards		
Hazard	Examples	Design Considerations
Building materials used	Flammable materials Materials emitting toxic fumes	
Building profile	Construction risks relating to shape and complexity of building	
Confined spaces	Working in enclosed spaces Release of fumes Inadequate ventilation	
Construction Method	Temporary placement of construction plant and materials Use of scaffolding Movement & operation of plant and equipment Sequencing and timing of works	
Demolition	Premature / uncontrolled collapse and emission of hazardous materials	<p>-Provide information on load paths including critical loading conditions that could cause collapse, critical load bearing elements that should not be removed without supporting arrangement s (eg. Individual truss members, load bearing walls, clumns under supporting beams, floor beams and lintels), pre-stressed concrete which contains considerable tension in its tendons</p> <p>- Consider risks from temporary structures (e.g. creation of retaining walls and excavations when basements and foundations are removed or destabilising structures) when demolishing an adjoining structure</p> <p>-Risks from exposure to dust and hazardous substances e.g. surface treatments or materials such as sandstone</p>
Electrical wiring and equipment	Location of Overhead and underground cables, switch rooms, switch boxes and electrical equipment (portable and fixed) Earthing of electrical installations Protection of leads and cables	<p>- Specify that overhead powerlines be disconnected, re-routed, vovered or have them run underground before construction begins to avoid contact with cranes, mobile plant, scaffolding etc.</p> <p>- Access roads, building material dumpsites and unloading areas should be located away from overhead powerlines</p> <p>-Electrical services to be designed to minimise need for electricians to work in cramped areas (e.g. lift motor rooms)</p> <p>- Provide adequate working space when switchboard doors are opened and extra room for manual handling aids such as trolleys if needed</p> <p>- Consider location of, access to and egress from, and work space in the switchroom e.g. enough space when switchboard doors are opened and room for trolleys</p> <p>-Minimise the length of large cables by considering location of submains or switchroom. Where possible, cables to be laid "top down"</p> <p>-Design to allow for use of mechanical cable pulling devices and mechanical movement of cable drums to reduce MH risks</p> <p>-Conduits to be pre-installed to eliminate the need to chase walls</p>
Environmental conditions	Risks created be weather (high and low temperature, wind and rain). Impact of environmental extremes	<p>-Program rain affected work for drier months</p> <p>-Sufficient drainage is provided to manage effects of rainwater and ponding (especially during excavation)</p> <p>-Anti-slip surface materials, grills, grates and tapes to be specified to prevent the risk of slips, trips and falls</p> <p>-Design should ensure structural integrity of building under the action of rain, snow, wind, ground water, thermal effects and extreme environmental conditions</p>

Safety in Design		
Typical Buildability Hazards		
Hazard	Examples	Design Considerations
Ergonomics and Hazardous Manual Tasks	Risks relating to posture, static loading, manual handling and repetitive movements	-Consider tasks to be carried out at the site and environment
	Methods of material handling	-Consider effect of Design and layout of the work environment
	Accessibility of material handling	- Consider Design to accommodate people with particular needs
	Loading docks and storage facilities	- Consider reach distances and the heights of built in shelving, storage and bench tops
	Workplace space and layout to prevent musculoskeletal disorders, including facilitating use of mechanical aids	- During construction, Specify the lightest product that meets the Design criteria. Consider impact of heavy building materials (concrete blocks or cladding) as well as temporary structures (e.g. scaffolding on workers moving and installing them)
Excavation	Assembly and disassembly of pre-fabricated fixtures and fittings	- Ensure specifications and plans are clearly marked with weight of the materials
		- Ensure length of long members and components allows them to be manoeuvred through corridors
		If possible, eliminate the need to excavate (e.g. piling when soil is poor or trenchless technologies for installing underground utilities)
	-Stability of structures	-Assist constructor in establishing the exact location of existing underground utilities (e.g. electrical power cables, fas pipes, sewer/water pipes by providing service plans)
	-Using plant and equipment near and excavation and falling into the excavation	-Modify the siting of the building to avoid contact with underground services or relocate the services. Installation of plant should be kept away from underground cables.
Fire and Emergencies	- Exposure to substances in an excavation e.g. carbon monoxide from plant or digging into contaminated materials	-If provided with old drawings, allow for location of inaccuracies or hidden / new services
	-A person falling into an excavation	-Ensure works are not undertaken in vicinity of overhead powerlines
	-Objects falling into an excavation	-Consider risks relating to transportation of excavated material, including the length of the haul and risks posed by its route
	-Damaging underground utilities (e.g. power cables or gas pipes)	-Allow sufficient space for the sloping or benching of excavations to minimise risk of collapse.
		-Avoid locating excavations near static loads (e.g. buildings, walls and immobile plant or dynamic loads)
Fire and Emergencies		-Design works so that workers avoid having to be near deep trenches
	Storage and use of flammable materials	
	Fire risks	
	Fire detection systems	
	Availability of fire fighting equipment	
Fire and Emergencies	Access for and structural capacity to carry fire tenders	
	Emergency routes and exits	

Safety in Design		
Typical Buildability Hazards		
Hazard	Examples	Design Considerations
		Consider reducing the use of hazardous chemicals in adhesives, surface coatings, concrete work (including cement, accelerants & retardants and joint sealants), masonry work (including cleaners, sealants, insulation and dust), steelwork (including paints, rust-proofing, grouts and welding fumes) and timberwork (including paints, preservatives and flar retardants).
Hazardous Chemicals	Storage, use and transportation of hazardous chemicals during construction and post works	<div>-Where possible, replace hazardous chemicals with ones that are less hazardous (e.g. water bas paints or high flashpoint solvenents)</div> <div>-Eliminate the need for dust by cast-in ducting or alternative means of joint formation.</div> <div>-Use a physical fastening system instead of a solvent based adhesive</div> <div>-Consider if asbestos is in products e.g. acoustic ceiling tiles, cement building tiles (e.g. corrugated and flat sheets, pipes and gutters, chimney, heater and hot water tiles), electrical metering backing boards, eaves (pre 1984), firedoors, old heater pipes, lift motor rooms, wall and ceiling sheeting in wet areas e.g. bathrooms (pre 1984)</div>
Movement of materials, plant and vehicles	Space required for safe movement of plant and materials including ramps, slops, floor surfaces, distances and equipment to be moved.	Consider how the following plant can be safely installed, accessed, operatated and maintained (e.g. air conditioning, fire detection & supression systems, lifts & escalators, hot water systems, boilers and building maintenance units
	Safe access and egress, including for people with disability	
	Traffic management	Allow for the use of temporary works equipment & scaffolding, providing level surfaces and sufficient room (including heights and widths) around temporary work and equipment for easy access
	Loading bays and ramps	
	Safe crossings	Provide sufficient room for cranes and ensure solid/sturdy foundations are provided. Poor or uneven ground, heavy or irregular loads, or large lifting radii should be avoided
	Exclusion zones	
Noise	Site security	
	Use of equipment which produces hazardous noise during construction and in completed workspace	
		Specify non-slip surfaces or the application of non-slip floor coating
		Consider impact of weather conditions
Slips, Trips and Falls	Including steps, ramps, ladders and floor surfaces	Consider the gradient of stairs and ensure that adequate handrails, ramps and lighting are provided
		Designing adequate storage facilities to remove/reduce obstacles and poor house keeping
Structural strength and stability	Erection of steelwork or concrete frameworks	
	Permanent & temporary loads borne by the structure itself	

Safety in Design		
Typical Buildability Hazards		
Hazard	Examples	Design Considerations
Traffic Management	Risks raised by the movement of trucks, forklifts and other vehicles and mobile plant	Separate heavy transport access from lighter vehicle access and separate pedestrian from vehicle access. Consider the movement of vehicles and plan with regard to the turning space, waiting and queuing space, traffic calming devices, visibility of approach and avoid blind sports and safe short term parking
	Falls	
Utilities and Services	Dust and fumes from drilling and cutting	Specify in the design whether ducts, channels and openings are either cast or built into the structure
	Electric shock or fire from electrical services	Provide adequate space for ducts and equipment for installers to work from safe positions
	Fire from gas services	
Violence and Crime	Risks from violent customers and robberies particularly entrapment points risks for individuals working in isolation	Positioning windows to ensure that people inside the building have a clear view of the street and that people outside can see inside
		Ensuring that landscaping and fencing do not obscure views from the workplace
		Providing adequate lighting to fully illuminate the interior and exterior of the building, parking areas and other surrounding spaces
		Providing clear entry points access from the main street frontage, to avoid indentations or alleyways
		Positioning ATMs in low risk areas
		Keeping parking areas close to the entry points and ensuring that they are connected by a well lit pathway
Working at heights	Inspecting, cleaning, maintenance and testing of plant and structures. Accessing to and working from roofs, plant rooms and windows	Clearly defining public and private space to avoid confusion about which areas are accessible to the public
		Using fittings, fixtures and paint surfaces that are positioned and designed to deter vandalism
		Serviceable plant and pipe work to be located at ground level rather than roofs or at heights
		If unavoidable, provide permanent safe access (e.g. stairs or walkway with guardrails, or access platform.
		Avoid locating high maintenance items above stairways and other recesses,
		Provide access for window cleaning and other facade maintenance requirements (e.g. externally provide a building maintenance unit or internally provide balconies or suitable reversible window)
		Specify materials with high durability and low maintenance
		Installation of guard rails and anchorage points for building maintenance and cleaning
		Use of scaffolding or other temporary work platforms
		Using roofing materials and surface characteristics such as fragility, slip resistance and pitch

Safety in Design		
Typical Buildability Hazards		
Hazard	Examples	Design Considerations
Working Environment	Ventilation for thermal comfort and general air quality and specific ventilation requirements for the work to be performed on the premises	
	Temperature	
	Lighting including that of plant rooms	
	Acoustic properties and noise control, for example, noise isolation, insulation and absorption	
	Seating	
	Floor surfaces to prevent slips and trips	
	Space for occupants	

Safety in Design			
Typical Maintainability Hazards			
Hazard Category	Hazard	Examples	Design Considerations
Trees	Conflict with underground/ overhead obstruction.		
Trees	obstruction hazard	Inappropriate tree selection due to size	
Trees	Inappropriate location for maintenance workers eg too close to structures.		
		Layout - load capacity of pavements/pathways for equipment to maintain trees eg cherry pickers.	
	strike hazard	Tree limb drop	
		Tree collapses.	
Trees			
	Cut hazard	Star Pickets around trees not capped	
		Protection around trees - cut hazard if broken/damaged	
Trees	Slip hazard	Fruit / leaf drop	
Trees	Exposure to chemical hazard.	Poor quality turf - chemicals required to remediate turf.	
Turf/Lawn	Trip hazard.	Potholes not filled in - overgrown grass.	
Turf/Lawn		Turf too sloped for mowers	
	Overturn hazard		
Turf/Lawn		Setback from retaining walls	
Turf/Lawn	Manual Handling hazard.	Difficulty with plant accessing turf area due to design layout. Inaccessible areas require hand tools to be	
Turf/Lawn	Environmental hazard -	machinery can't be used in wet weather. Design consideration for large amounts of turf.	
Turf/Lawn	Adjacent material hazard	eg gravel on grass. Projectile strike hazard. Provide separation.	
Turf/Lawn	Services located beneath turf	eg drainage, pit irrigation.	
Turf/Lawn	trip hazard	Netting in lawn -	
Drainage	Manual Handling hazard.	Failure of pit lid	
	Failure of system	resulting in overflow due to lack of understanding of catchment areas or consideration of offsite	
Drainage		stormwater flows.	
		Tree damage from inappropriate drainage (need subsoil drainage).	
	Strike hazard.		
		Location of drainage - potential for destabilising trees if location is inappropriate.	
Drainage			
Drainage	Exposure to gases	confined spaces if entering drains	
		Uneven surface -	
Garden	trip hazard		
Edging		Timber edging not as durable as metal -	
		Increased maintenance with `annual' plant.	
	Manual Handling hazard.	Rubbish / litter in plant area - increased maintenance.	
Horticulture/		Wild gardens - increased maintenance.	
Gardens			
Horticulture/	biological hazard	Needlesticks in plant / garden area -	
Gardens			
Horticulture/	accessibility hazard	Plant located on steep slopes -	
Gardens			
Horticulture/	work at heights.	Roof gardens -	
Gardens		Plaques located on ground level	
	trip hazard		
Open Museum		Murals in turf	

Safety in Design			
Typical Maintainability Hazards			
Hazard Category	Hazard	Examples	Design Considerations
Open Museum	strike hazard	Plaques protruding from wall -	
		Plaques/ murals informally constructed by public/non tradesmen - poor quality.	
		Potential collapse of structure -	
		Graffiti /vandalism of open museum	
		Stability of plaques	
Open Museum	fall hazard	Speeding vehicles in parks -	
		Installation / Maintenance of Open Museum pieces involves work at heights -	
		Access to plaques when maintaining or dressing eg Captain Cook.	
Open Museum Park Layout	Manual Handling hazard.	Use of chemicals when cleaning / maintaining artwork. Inhalation	
		Hazardous materials used in artwork	
		No vehicle access / not enough parking to load unload equipment.	
Park Layout	strike hazard	Traffic Flow in park - other vehicles if facing oncoming traffic or blind spots exist	
		Vehicle overhang in traffic when removing bollards - due to short length of driveway.	
		Bins located in close proximity to seating - garbage trucks reversing	
Park Layout	. Trip hazard	Uneven bitumen / paving due to vehicles exceeding load capacity	
Park Layout	biological hazard	Dog and animal droppings	
Wildlife	Wildlife refers to bats, possums, rats, snakes, spiders and ibis). Animals nesting - risk of attack during maintenance activities.		
Wildlife	Redback spiders in pits/ underground - bite hazard		
Wildlife	Bat/ Ibis droppings - slip hazard		
Wildlife	Handling of bats/ sick animals by public - risk of disease		
Wildlife	Animals surprising workers carrying out high risk work eg using chainsaw in tree. Cut/ Fall hazard		
Wildlife	Ibis picking rubbish out of bins - attracting other pests and creating potential public hygiene hazard		
Bridges and Decks	Fall from heights	during maintenance	
	Bridge may not be accessible to plant required for maintenance	Load capacity of bridge may not support vehicles	
Bridges and Decks	Materialshandling	treated pine is more hazardous as it requires more maintenance.	
Bridges and Decks	drown hazard	Maintenance persons working on bridges / deck	
	slip hazard	Water overflow onto bridge/deck	
	public hygiene hazard.	Wet weather - Rats / Animals accessing deck area -	
Viewing Platforms/ Stairs	fall hazard	Fall from heights due to slippery floor surface/ trip hazard	
	slip hazard	Lack of barrier protection -	
	slip hazard	Algae on stairs - Steep slope of toe plate -	

Safety in Design			
Typical Maintainability Hazards			
Hazard Category	Hazard	Examples	Design Considerations
Viewing Platforms/ Stairs Community Garden	environmental hazard	Maintenance - poor quality water entering harbour during pressure cleaning works	
	environmental hazard	Contaminated soil - exposure risk	
	trip hazard	Raised beds on lawn (unstable)	
Community Garden Community Garden Community Garden Fountain, Lake, Wetlands, Foreshore Fountain, Lake, Wetlands, Foreshore Fountain, Lake, Wetlands, Foreshore Fountain, Lake, Wetlands, Foreshore		No powerpoints in garden - need to access from long distance	
	Hazardous Chemicals	Use of chemicals / pesticides -	
	access / egress issues	Inappropriate fencing -	
	slip/ drown hazard	Lack of defined edge	
	confined space.	Plant room - Potential hazard for maintenance workers.	
	slip hazard	Workers/ Public in water -	
	Environmental Hazard	Ibis/ birds defecating in water - contamination / exposure hazard.	
Fountain, Lake, Wetlands, Foreshore Fountain, Lake, Wetlands, Foreshore Fountain, Lake, Wetlands, Foreshore Fountain, Lake, Wetlands, Foreshore Wetlands/ Foreshore	Biological Hazard	Rubbish/ needles in water - needlestick injury for maintenance workers.	
		Lack of space for chemical storage - potential exposure hazard.	
	electrical hazard	Lighting in fountain/ water feature	
	Trip hazard	Power source not close to pond - extended cords used by maintenance workers.	
	slip hazard	Algae on stairs	
Asphalt/ Bitumen, Concrete, Granite Asphalt/ Bitumen, Concrete, Granite	Fall Hazard	Paths too narrow for maintenance vehicle access	
		Access path for maintenance vehicles - interface with pedestrians	
		Paths wide enough for trucks to turn - avoid reversing	
		Bins located in inappropriate locations	
		Inappropriate use of paths by vehicles	
Asphalt/ Bitumen, Concrete, Granite Asphalt/ Bitumen, Concrete, Granite	Cut hazard	Inappropriate use of crushed gravel in park locations eg sloped incline and near softfall (difficult to remove broken glass).	
	Trip hazard	Excessive rain - crushed granite on pavement.	
	Trip hazard	Sinking pavers due to poor workmanship or load capacity exceeded.	
Steps/ Pavers		Poor joint selection	
	slip hazard	Concrete surface slippery -	
Steps/ Pavers		Slippery steps -	
Steps/ Pavers	potential strike hazard	Paving in grass in inappropriate location -	

Safety in Design			
Typical Maintainability Hazards			
Hazard Category	Hazard	Examples	Design Considerations
Steps/ Pavers Steps/ Pavers	fall hazard	Uneven stairs - No colour contrast on stairs - Sandstone stairs eroded -	
	Manual Handling	Materials being carried down stairs -	
	Trip hazard.	Irrigation around brick/ sand paving - build up of moss/ algae.	
Paths/ Pavements BBQ	slip hazard	Fat overflow	

Safety in Design			
Typical Useability Hazards			
Hazard Category	Hazard	Examples	Design Considerations
Trees	- trip hazard	Uneven pavement due to growth of tree roots	
Trees	Potential Fall hazard.	Climbability/ Tree Strenght - ability to hold children climbing onto tree.	
Trees	- strike hazard	Tree limb drop	
		Blackbean / Pines - large fruits can be strike hazard if planted in an inappropriate location	
		Poor quality stock - tree failure / collapse	
		Failure to conduct assessment of failing trees at design stage	
Trees	Proximity of inappropriate trees to playground equipment eg poisonous		
Trees	Protection around trees - cut hazard if broken/damaged		
Trees	slip hazard	Fruit / leaf drop	
Trees	Layout - public related. Surveillance hazard/ anti-social behaviour		
Turf/Lawn	Exposure to chemical hazard.	Poor quality turf - chemicals required to remediate turf.	
Turf/Lawn	Trip hazard.	Potholes not filled in - overgrown grass.	
Turf/Lawn	Weeds causing irritation for children		
Turf/Lawn	Adjacent material hazard -	eg gravel on grass. Projectile strike hazard. Provide separation.	
Drainage	- trip hazard / overturn hazard for wheelchairs.	Site drainage interface with access pathways	
Drainage	Strike hazard.	Location of drainage - potential for destabilising trees if location is inappropriate.	
Drainage	- drown hazard	Public access to open drain	
Drainage	Exposure of public to polluted water from drains		
Drainage	Drown hazard for toddlers.	Varying water levels around drains - raising and lowering.	
Drainage	Inappropriate treatment plan for managing re-use of water.		
Garden	- trip hazard	uneven surface	
Edging		Timber edging not as durable as metal	
Horticulture/ Gardens	Type selected -	uneven / prickly. Hazard during maintenance works and for children.	
Horticulture/ Gardens	Plant height - surveillance. Public safety issue.	Poisonous / Allergies	
Horticulture/ Gardens	biological hazard	Needlesticks in plant / garden area -	
Horticulture/ Gardens	Animal risks / hazards	due to type of garden selected eg bees, spiders	
Open Museum	trip hazard	Plaques located on ground level -	
Open Museum	strike hazard	Plaques protruding from wall -	
Open Museum	entrapment hazard	Children climbing onto plaques /	
Open Museum	fall hazard	Public climbing onto sculptures /artwork -	
Open Museum	Risk of collapse	Graffiti /vandalism of open museum - destabilising structure.	
Doc No. 6.2 Design Safety Assessment Hard copy document is only valid for 30 days from date printed 24/1/24 Owner: WHS Manager			
Created on: 01/10/2007 Reviewed on: 29/09/2015			
1 of 4 Version No. 1.7 Next Review: July 2018			

Safety in Design			
Typical Useability Hazards			
Hazard Category	Hazard	Examples	Design Considerations
Open Museum	slip/cut hazard	Murals in turf -	
Open Museum	Stability of plaques -	risk of falling over if pushed or strong winds	
Park Layout	Traffic Flow in park -	vehicle strike hazard with other vehicles if facing oncoming traffic or	
Park Layout	Trip hazard and manual handling risk	uneven bitumen / paving due to vehicles exceeding load capacity.	
Park Layout	trip / strike hazard with public.	Driving over lawn -	
Park Layout	Lack of emergency vehicle access to site.		
Park Layout	Entrapment	confronted by aggressive members of public - due to limited egress	
Park Layout	hygiene issue (odours, rats etc)	Bins located in close proximity to seating -	
Park Layout	potential public hazard.	Lack of clear sight lines -	
Park Layout	potential entrapment hazard for public	Fenced dog running areas -	
Park Layout	dogs biting/ mauling children	Off leash parks -	
Park Layout	biological hazard	Dog and animal droppings -	
Traffic Management	strike hazard	Shared zone - interface between speeding bicycles and public (
Wildlife	Potential public hazard.	Ponds/ Pools - encourage nuisance animals.	
Wildlife	Poison hazard.	Rat Baits - accessible to children and animals.	
Wildlife	bite hazard	Redback spiders in pits/ underground	
Wildlife	slip hazard	Bat/ Ibis droppings -	
Wildlife	risk of disease	Handling of bats/ sick animals by public -	
Wildlife	hygiene hazard	Ibis picking rubbish out of bins - attracting other pests	
Bridges and Decks	Potential public related hazard	Homeless people sleeping under bridges / decks.	
Bridges and Decks	Timber orientation	(gap) can create a potential hazard for cyclist	
Bridges and Decks	Load capacity of bridge may not support vehicles		
Bridges and Decks	drown hazard	Children playing on decks -	
Bridges and Decks	slip hazard	Wet weather -	
Bridges and Decks	strike hazard	Items eg keys falling through meshing on bridges and decks -	
Bridges and Decks	public hygiene hazard.	Rats / Animals accessing deck area -	
Bridges and Decks	slip/ fall / drown hazard	Water overflow onto bridge/deck -	
Viewing Platforms/ Stairs	fall/ drown hazard	Fall from heights due to slippery floor surface/ trip hazard -	
Viewing Platforms/ Stairs	slip hazard	Algae on stairs -	
Viewing Platforms/ Stairs	potential hazard in the event of an emergency	No ladder access to viewing platform from water -	
Viewing Platforms/ Stairs	potential collision hazard for boats.	Poor design of pontoon -	
Viewing Platforms/ Stairs	accessibility/ slip hazard	Steep slope of toe plate -	
Viewing Platforms/ Stairs	Accessibility of wharf for emergency vehicles		
Viewing Platforms/ Stairs	entrapment issues.	Poor design of wharf -	
Viewing Platforms/ Stairs	potential for uncotntrolled access by children.	Platform located in close proximity to playground -	
Viewing Platforms/ Stairs	fall hazard.	Accessibility of bottom of stairs to viewing platforms - some stairs	
Community Garden	potential hazard if public drink (ingestion hazard).	Recycled water used -	
Community Garden	Contaminated soil - exposure risk		
Community Garden	Vehicle access for large deliveries - soil		
Community Garden	- trip hazard	Raised beds on lawn (unstable)	
Community Garden	(trip/ electrical hazard)	No powerpoints in garden - need to access from long distance	
Doc No. 6.2 Design Safety Assessment Hard copy document is only valid for 30 days from date printed 24/1/24 Owner: WHS Manager		Created on: 01/10/2007 Reviewed on: 29/09/2015	2 of 4 Version No. 1.7 Next Review: July 2018

Safety in Design			
Typical Useability Hazards			
Hazard Category	Hazard	Examples	Design Considerations
Community Garden	Chemical hazards	Exposure from use of pesticides and herbicides	
Community Garden	access / egress issues	Inappropriate fencing -	
Fountain, Lake, Wetlands, Foreshore	potential drown hazard	Depth of water - Lack of defined edge	
Fountain, Lake, Wetlands, Foreshore	- slip/ drown hazard		
Fountain, Lake, Wetlands, Foreshore	slip hazard	Workers/ Public in water -	
Fountain, Lake, Wetlands, Foreshore	contamination hazard.	Ibis/ birds defecating in water -	
Fountain, Lake, Wetlands, Foreshore	electrical hazard	Lighting in fountain/ water feature -	
Fountain, Lake, Wetlands, Foreshore	Unauthorised access by public /	intoxicated persons entering water.	
Wetlands	Potential drown hazard.	Profile of wetlands - steep incline in water level.	
Wetlands/ Foreshore	fall hazard.	People falling off seawalls into water / onto sand/rock	
Wetlands / Foreshore	Inappropriate material selected for seawall eg sand vs concrete		
Wetlands/ Foreshore	Unstable surface	Building / Plant equipment falling into water	
Wetlands / Foreshore	infection or collapse of furniture.	Corrosion of park furniture on foreshore / around wetlands.	
Wetlands	Biological Hazard for	Contaminated water - algae. Public or animals entering the water, fishing	
Wetlands/ Foreshore	slip hazard	Algae on stairs -	
Asphalt/ Bitumen, Concrete, Granite	(strike hazard)	Access path for maintenance vehicles - interface with pedestrians Paths too narrow for shared access between pedestrians/ cyclists Bins located in inappropriate locations - potential colission between public and waste truck	
Asphalt/ Bitumen, Concrete, Granite	Gravel too large - public throw them around		
Asphalt/ Bitumen, Concrete, Granite	Trip hazard	Excessive rain - crushed granite on pavement.	

Safety in Design			
Typical Useability Hazards			
Hazard Category	Hazard	Examples	Design Considerations
Steps/ Pavers	Trip/Fall hazard	Sinking pavers due to poor workmanship or load capacity exceeded.	
		Overgrown tree roots causing pavements to rise.	
		Large gaps in pavements - heels caught.	
		Poor joint selection	
		Concrete joint expands & pops up	
		Concrete surface slippery	
		Uneven stairs	
		Sandstone stairs eroded	
		Slippery steps	
		No colour contrast on stairs	
Steps/ Pavers	Small paving pulled out and used as weapon (assault or breaking into vehicles).	Irrigation around brick/ sand paving - build up of moss/ algae.	
Steps/ Pavers Steps/ Pavers Steps/ Pavers	Burn hazard. strike hazard	Heat in summer- barefoot on concrete.	
		Paving in grass in inaappropriate location	
		Design of paths encourage skateboarding	
Paths/ Pavements Paths/ Pavements BBQ BBQ BBQ BBQ BBQ BBQ	Location of paths to other amenities. - noise hazard burn hazard Biological hazards Potential for violence. Chemical hazards Crush hazard excessive noise for local residents.		
		Excessive noise from skateboarders on paving	
		Poor hygiene due to animals / faeces on BBQ	
		Residents assuming ownership of BBQ's	
		Cleaning products used on BBQ - potential for poisoning/digestion	
		Fingers caught in stainless steel lids	
		People congregating around BBQ areas -	
Bike Rack Bike Rack	strike hazard not visible or well lighted.	Located in path of traffic -	
		Inappropriate location -	

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]		[Total HV]		v/c	sec		[Veh. veh	Dist]				km/h
			veh/h	%	veh/h	%					m				
West: Victoria Street (West)															
10b	L3	All MCs	27	0.0	27	0.0	0.584	91.9	LOS F	10.0	70.6	0.96	0.81	0.96	23.7
10	L2	All MCs	159	0.7	159	0.7	0.584	88.3	LOS F	10.0	70.6	0.96	0.81	0.96	22.1
11	T1	All MCs	25	0.0	25	0.0	0.066	76.3	LOS F	1.2	8.4	0.84	0.61	0.84	23.4
Approach			212	0.5	212	0.5	0.584	87.3	LOS F	10.0	70.6	0.94	0.79	0.94	16.5

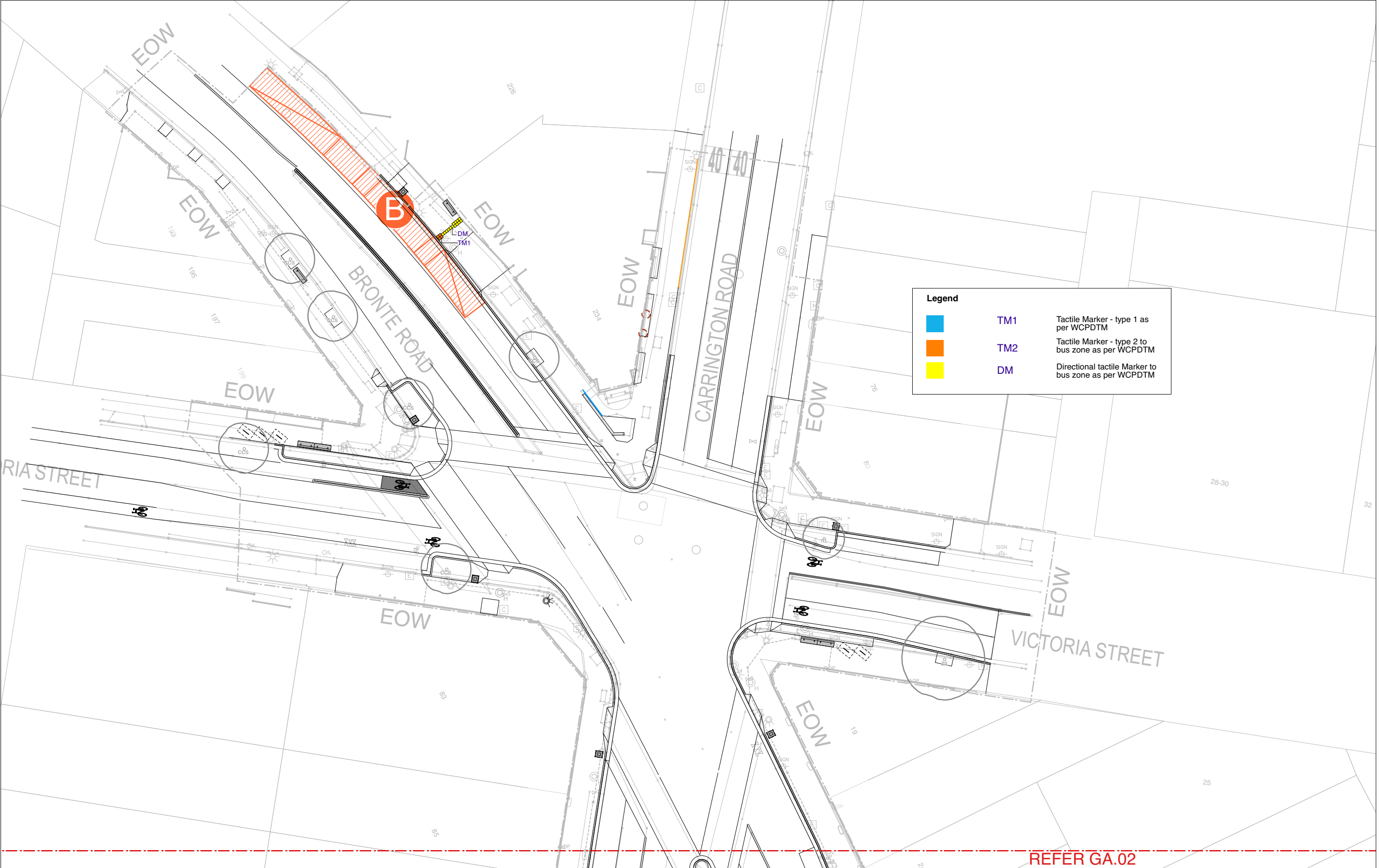
Figure 1: AM Peak Existing




Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Ave Speed	
			[Total HV]		[Total HV]					[Veh. veh	Dist]				
			veh/h	%	veh/h	%	v/c	sec			m			km/h	
West: Victoria Street (West)															
10b	L3	All MCs	38	0.0	38	0.0	0.801	69.7	LOS E	15.1	106.3	0.99	0.84	1.05	21.1
10	L2	All MCs	186	0.6	186	0.6	0.801	68.0	LOS E	15.1	106.3	1.00	0.91	1.08	19.0
11	T1	All MCs	26	0.0	26	0.0	0.801	62.8	LOS E	15.1	106.3	1.00	0.90	1.08	17.4
Approach			251	0.4	251	0.4	0.801	67.7	LOS E	15.1	106.3	1.00	0.90	1.07	19.2

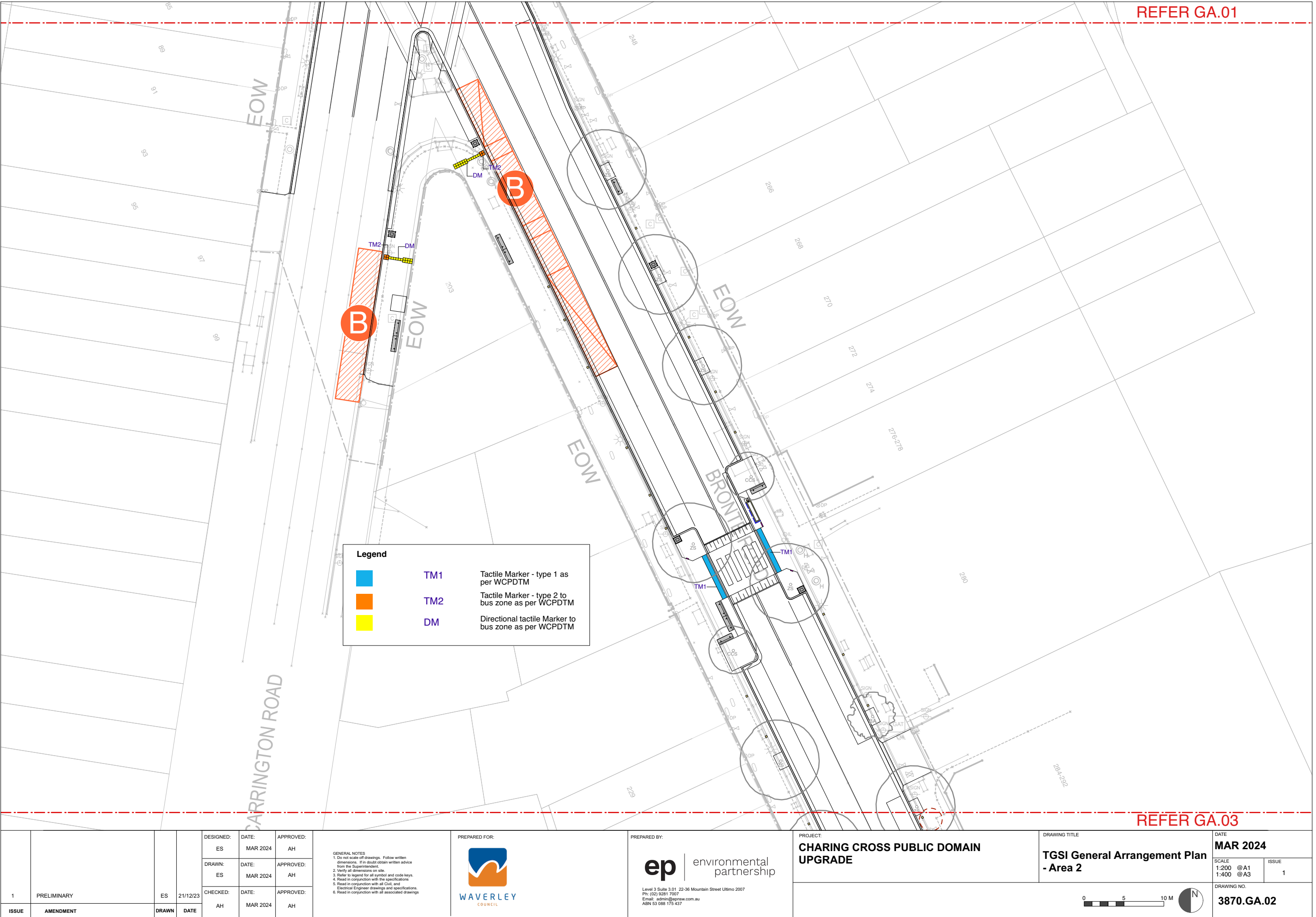
Figure 2: Am Peak Proposed



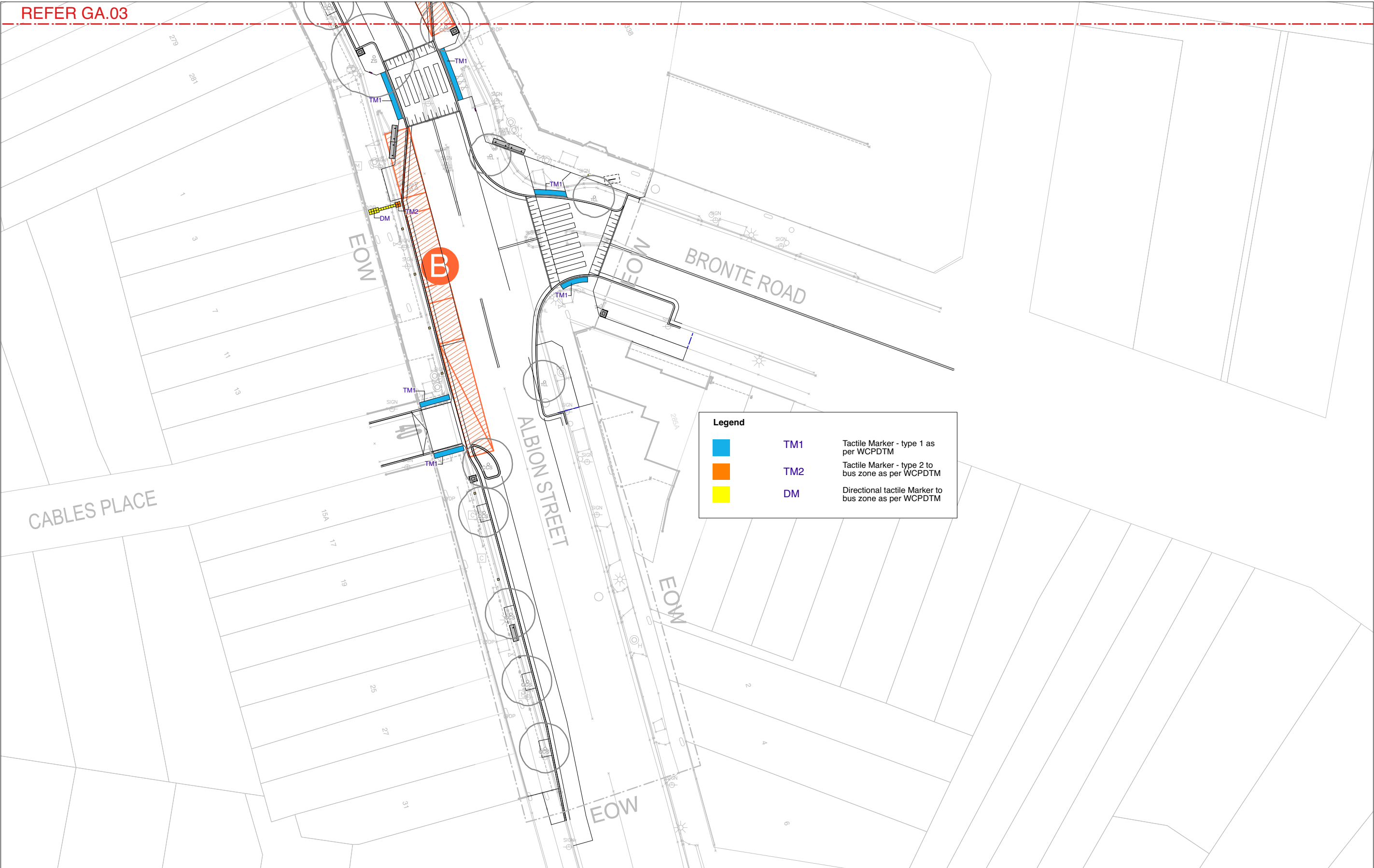
1	PRELIMINARY	ES	21/12/23	DESIGNED: ES	DATE: MAR 2024	APPROVED: AH	<div>GENERAL NOTES</div> <div>1. Do not scale off drawings. Follow written dimensions. If in doubt obtain written advice from the Superintendent.</div> <div>2. Verify all dimensions on site.</div> <div>3. Refer to legend for all symbol and code keys.</div> <div>4. Read in conjunction with the specifications.</div> <div>5. Read in conjunction with all Civil, and Electrical Engineer drawings and specifications.</div> <div>6. Read in conjunction with all associated drawings.</div>	<div>PREPARED FOR:</div> <div></div> <div>WAVERLEY COUNCIL</div>	<div>PREPARED BY:</div> <div></div> <div>Level 3 Suite 3.01 22-36 Mountain Street Ultimo 2007 Ph: (02) 9281 7007 Email: admin@epsw.com.au ABN 53 088 175 437</div>	<div>PROJECT:</div> <div>CHARING CROSS PUBLIC DOMAIN UPGRADE</div>	<div>DRAWING TITLE</div> <div>TGSI General Arrangement Plan - Overall</div>	DATE MAR 2024	
				DRAWN: ES	DATE: MAR 2024	APPROVED: AH						SCALE 1:800 @A1 1:1600 @A3	ISSUE 1
				CHECKED: AH	DATE: MAR 2024	APPROVED: AH						DRAWING NO. 3870.GA.00	
				ISSUE	AMENDMENT	DRAWN	DATE					<div>0 10 20 30 M</div> <div></div>	



1	PRELIMINARY	ES	21/12/23	DESIGNED:	DATE:	APPROVED:	<div>GENERAL NOTES</div> <div>1. Do not scale off drawings. Follow written dimensions. If in doubt obtain written advice from the Superintendent.</div> <div>2. Verify all dimensions on site.</div> <div>3. Refer to legend for all symbol and code keys.</div> <div>4. Read in conjunction with the specifications.</div> <div>5. Read in conjunction with all Civil, and Electrical Engineer drawings and specifications.</div> <div>6. Read in conjunction with all associated drawings.</div>	<div>PREPARED FOR:</div> <div></div> <div>WAVERLEY COUNCIL</div>	<div>PREPARED BY:</div> <div> environmental partnership</div> <div>Level 3 Suite 3.01 22-36 Mountain Street Ultimo 2007 Ph: (02) 9281 7007 Email: admin@gpsw.com.au ABN 53 088 175 437</div>	PROJECT: CHARING CROSS PUBLIC DOMAIN UPGRADE	DRAWING TITLE TGSI General Arrangement Plan - Area 1	DATE MAR 2024	
				DRAWN:	DATE:	APPROVED:						SCALE 1:200 @A1 1:400 @A3	ISSUE 1
				CHECKED:	DATE:	APPROVED:							
				AH	MAR 2024	AH							
ISSUE	AMENDMENT	DRAWN	DATE	AH	MAR 2024	AH					<div>0510 M</div> <div></div>		DRAWING NO. 3870.GA.01







TM1




Tactile Marker - type 1 as per WCPDTM

TM2

Tactile Marker - type 2 to bus zone as per WCPDTM

DM

Directional tactile Marker to bus zone as per WCPDTM

1	PRELIMINARY	ES	21/12/23	DESIGNED:	DATE:	APPROVED:	<div>GENERAL NOTES</div> <div>1. Do not scale off drawings. Follow written dimensions. If in doubt obtain written advice from the Superintendent.</div> <div>2. Verify all dimensions on site.</div> <div>3. Refer to legend for all symbol and code keys.</div> <div>4. Read in conjunction with the specifications.</div> <div>5. Read in conjunction with all Civil, and Electrical Engineer drawings and specifications.</div> <div>6. Read in conjunction with all associated drawings.</div>	<div>PREPARED FOR:</div> <div></div> <div>WAVERLEY COUNCIL</div>	<div>PREPARED BY:</div> <div></div> <div>environmental partnership</div> <div>Level 3 Suite 3.01 22-36 Mountain Street Ultimo 2007</div> <div>Ph: (02) 9281 7007</div> <div>Email: admin@epnw.com.au</div> <div>ABN 53 088 175 437</div>	<div>PROJECT:</div> <div>CHARING CROSS PUBLIC DOMAIN UPGRADE</div>	<div>DRAWING TITLE</div> <div>TGSI General Arrangement Plan - Area 4</div>	DATE			
				MAR 2024											
				DRAWN:	DATE:	APPROVED:						SCALE	ISSUE		
				ES	MAR 2024	AH						1:200 @A1	1		
ISSUE	AMENDMENT	DRAWN	DATE	AH	MAR 2024	AH									
												<div>0 5 10 M</div> <div></div>		DRAWING NO.	
														3870.GA.04	

REPORT
TC/C.02/24.03

Subject: 23 Yanko Avenue, Bronte - 'No Parking' Zone

TRIM No: A24/0156

Author: Simon Mueller, Manager, Integrated Transport

Authoriser: Nikolaos Zervos, Executive Manager, Infrastructure Services

COUNCIL OFFICER'S PROPOSAL:

That Council:

1. Installs a 3.9 metre 'No Parking' zone between the driveways of 23 and 25 Yanko Avenue, Bronte.
2. Delegates authority to the Executive Manager, Infrastructure Services, to adjust the length, location and duration of, or remove, the 'No Parking' zone as necessary.

1. Executive Summary

There is inadequate space between the driveways of 23 and 25 Yanko Avenue to adequately facilitate vehicle parking. To provide improved street safety and movement outcomes, Council officers propose the installation of a 'No Parking' zone.

Council will need to exercise its delegated functions to implement the proposal.

2. Introduction/Background

The property located at 23 Yanko Avenue has recently been redeveloped to include an approved standard driveway. There is an existing driveway to the property at 25 Yanko Avenue. There is inadequate on-street kerb space to adequately accommodate a parking space between the two driveways.

Vehicle drivers have been documented using the space between the two driveways to park. This often causes obstruction to cars accessing driveways of 23 and 25 Yanko Avenue and creates sightline challenges. These sightline challenges are becoming more challenging given the trend towards larger vehicles. Local residents have also expressed concerns.

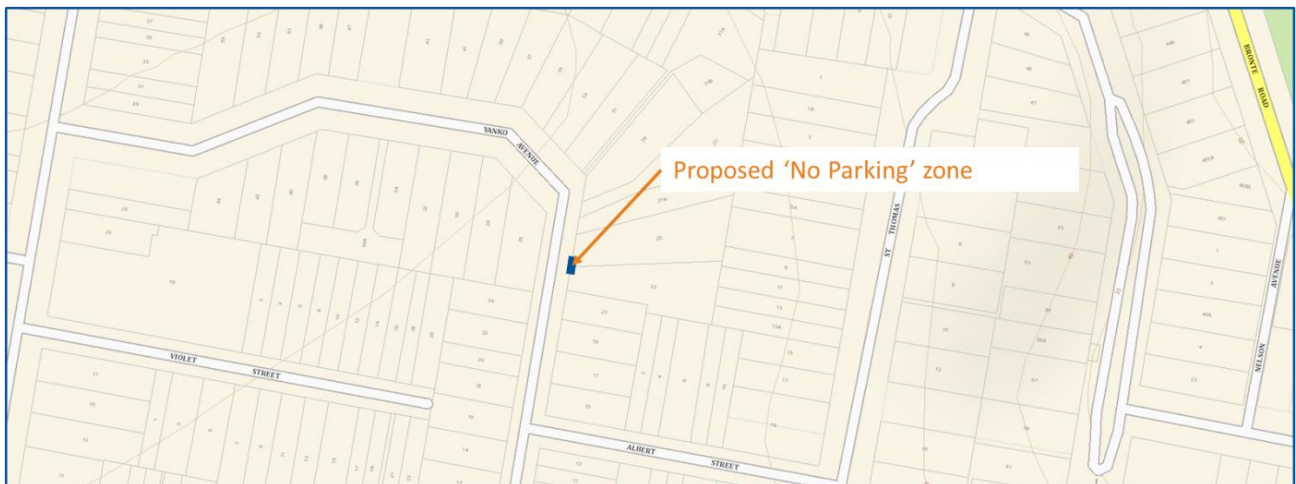


Figure 1. Location of Proposed No Parking Zone.

3. Technical Analysis

Council officers surveyed neighbouring residents. Four responses were received out of 21 surveys administered. Two of the responses were generally in favour, one suggested a time-restricted 'No Stopping' zone, and one was opposed, noting current difficulties finding available parking spaces.

Given that the kerb space in question is inadequate to support on-street parking, a 'No Parking' zone is proposed. This will improve sightlines for car drivers entering and exiting driveways and allow vehicles to manoeuvre more safely. It will also increase the visibility of people walking on the footpath, creating a safer environment for all street users.

The 'No Parking' zone will also facilitate a vehicle bypass opportunity, noting that Yanko Avenue currently functions as a yield street. To retain this benefit, motorcycle parking is not recommended at this time.

The proposed 'No Parking' zone will be 3.9 metres long. It is shown in Figure 2 below.

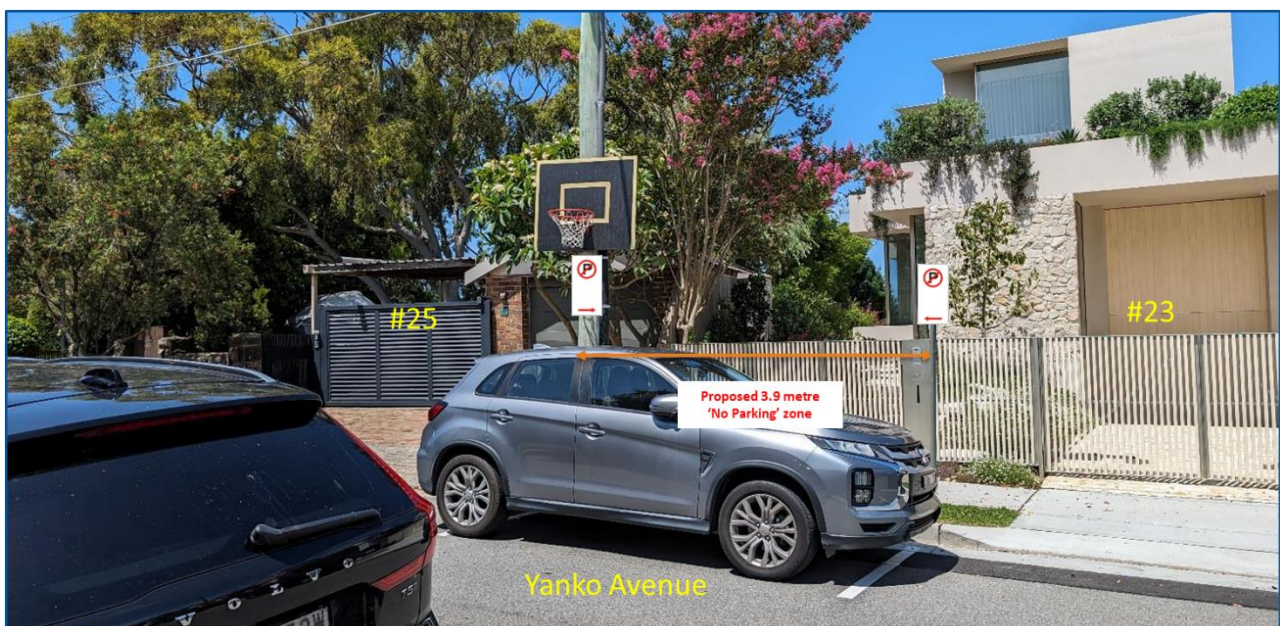


Figure 2. Proposed 'No Parking' area.

Proposed signage is show in Figure 3.

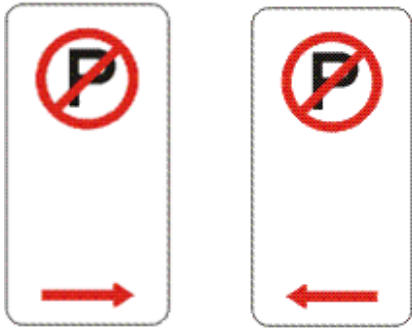


Figure 3. Proposed Signage

4. Financial Information for Council's Consideration

Council will fund the works from existing budgets.

5. Attachments

Nil.

REPORT
TC/C.03/24.03

Subject: 65 Ocean Street, Bondi - Construction Zone

TRIM No: A03/2514-04

Author: Mohammed Soomro, Traffic Engineer

Authoriser: Nikolaos Zervos, Executive Manager, Infrastructure Services

COUNCIL OFFICER'S PROPOSAL:

That Council:

1. Installs a 17 metre 'No Parking, 7 am–5 pm Mon–Fri, 8 am–3 pm Sat, Council Authorised Vehicles Excepted' construction zone in King Street, Bondi, adjacent to 65 Ocean Street.
2. Requires the applicant to notify residents in the vicinity of the construction zone prior to it being installed.
3. Delegates authority to the Executive Manager, Infrastructure Services, to adjust the length and duration of, or remove, the construction zone as necessary.

1. Executive Summary

Council has received an application for the installation of a construction zone at the address of 65 Ocean Street, Bondi. The site location is shown in Figure 1. It has dual frontages, such that it also fronts King Street. The construction zone will be installed on King Street.

Council officers propose the installation of a 17-metre construction zone as shown in Figure 1.

Council will need to exercise its delegated functions to implement the proposal.

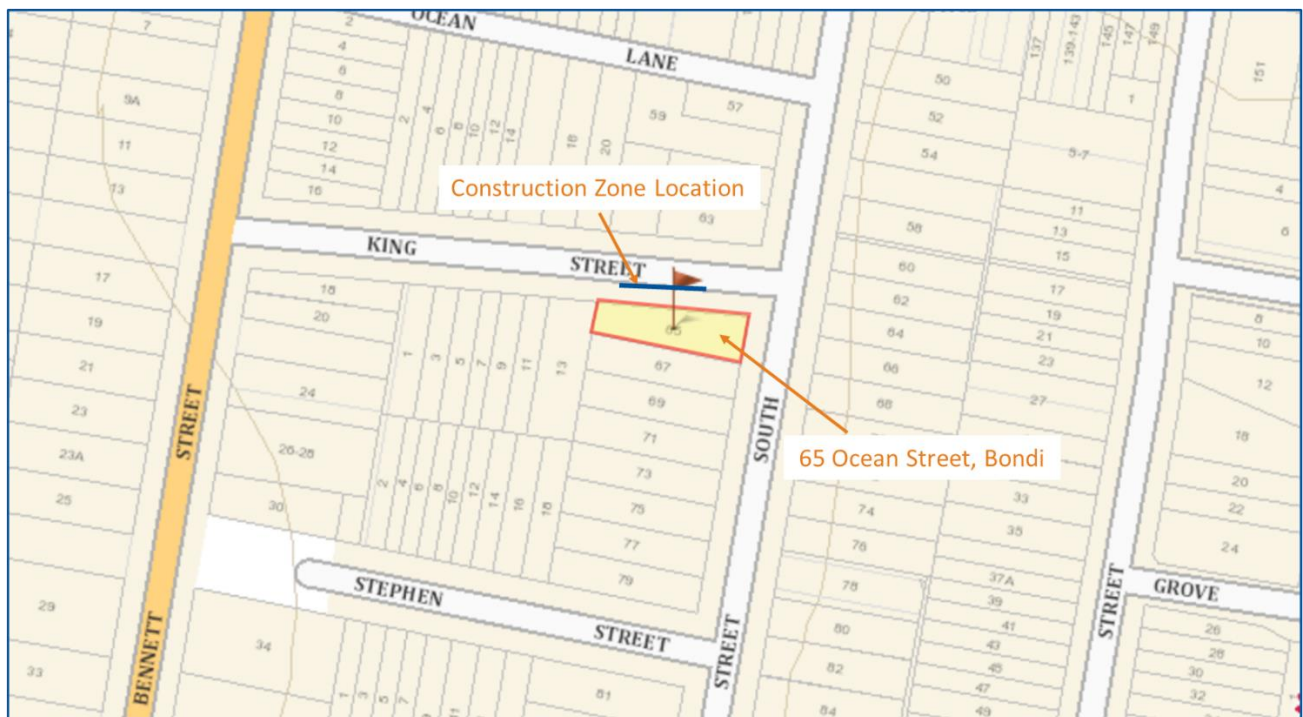


Figure 1. Site location.



Figure 2. Location to install construction zone signs on King St.

2. Introduction/Background

In accordance with standard practice at Council, it is proposed that the construction zone is signposted 'No Parking, 7 am–5 pm Mon–Fri, 8 am–3 pm Sat, Council Authorised Vehicles Excepted' for the approved construction hours under the development consent. Council will then supply the applicant with transferable permits to be used on the applicant's construction vehicles. Outside of the 'No Parking' hours,

the typical 2P kerbside parking restrictions for the street apply. Council's requirements for permit approvals are a minimum length of 9 metres along the site frontage and a minimum period of 13 weeks.

3. Technical Analysis

The subject site has a frontage of 40.6 metres on King Street. The applicant has requested a 16.5-metre construction zone along the frontage on King Street. Council officers propose to install a 17-metre construction zone. There is not enough space for a vehicle to park after measuring 16.5 metres, therefore it is rounded up to 17 metres to allow one space for parking leftover. Parking restrictions go back to normal once the construction zone timings end. The existing and recommended parking allocation is shown in Figure 3.

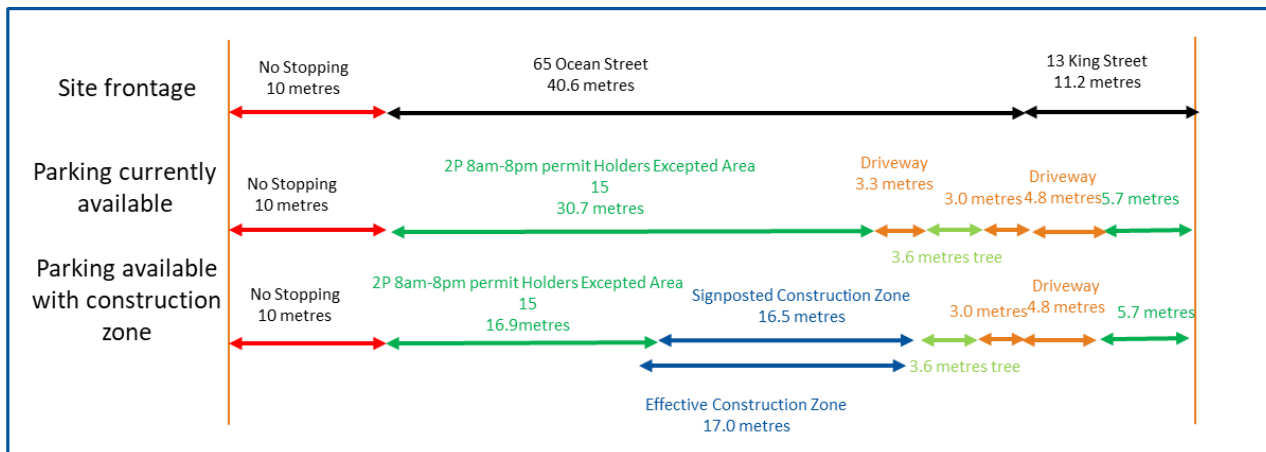


Figure 3. On-street parking for site and adjacent properties.

Table 1. Application details.

Applicant	Adrian Vartuli
Development application	DA-28/2022
Works	Alterations and additions to dwelling house, including first floor addition. PAN-185928
Approved hours of construction	7 am–5 pm Monday–Friday; 8 am–3 pm Saturday
Frontage length	40.6 metres
Road	King Street
Existing parking	2P, 8 am–8 pm, Permit Holders Excepted Area 15
Length requested by applicant	16.5 metres
Length to be signposted	17 metres
Effective construction zone - Total length available for construction	17 metres
Duration	60 weeks
Fee area	Low-density residential

Signage

The proposed signage is shown in Figure 4.

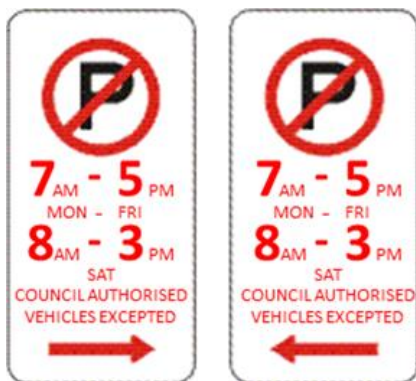


Figure 4. Proposed signage.

Notification

Residents in the vicinity of the construction zone will be notified prior to it being installed.

Figure 4 shows the properties to be notified about the construction zone.

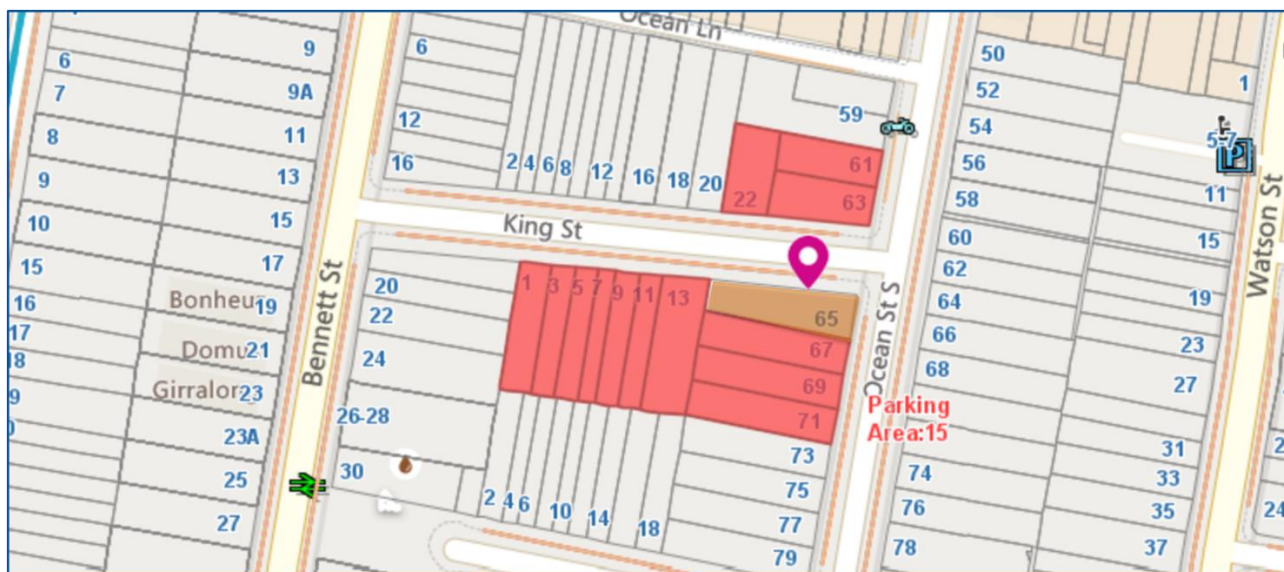


Figure 4. Notification area (hatched).

4. Financial Information for Council's Consideration

The cost to the applicant for the 17 metres made available for construction vehicles will be \$1317.50 per week during the 2023-24 financial year. The estimated weekly fees are shown in Table 1.

Table 1. Calculation of estimated fees (2023-24 financial year).

Category	Unit	Number/ Dimensions	Rate (GST Exempt)	Weekly Fee
Fee (Areas zoned low, medium, or high density residential)				
- Parallel parking	per metre	17	\$77.50	\$1,317.50
- Angle parking	per week	0	\$156.00	\$0.00
Fee (Areas zoned neighbourhood centre, commercial core, or mixed use)				
- Parallel parking	per metre	0	\$107.50	\$0.00
- Angle parking	per week	0	\$210.00	\$0.00
Occupation of metered parking spaces (in addition to the above fees)				
- 5.5 metres per unmarked parallel space	per space	0	\$430.00	\$0.00
- 2.8 metres per unmarked angle parking space	per week			
Weekly Fee				\$1,317.50

5. Attachments

Nil.

REPORT

TC/C.04/24.03



Subject: 34 Dellview Street, Tamarama - Construction Zone

TRIM No: A03/2514-04

Author: Mohammed Soomro, Traffic Engineer

Authoriser: Nikolaos Zervos, Executive Manager, Infrastructure Services

COUNCIL OFFICER'S PROPOSAL:

That Council:

1. Installs a 22 metre 'No Parking, 7 am–5 pm Mon–Fri, 8 am–3 pm Sat, Council Authorised Vehicles Excepted' construction zone in front of 34 Dellview Street, Tamarama.
2. Requires the applicant to notify residents in the vicinity of the construction zone prior to it being installed.
3. Delegates authority to the Executive Manager, Infrastructure Services to adjust the length and duration of, or remove, the construction zone as necessary.

1. Executive Summary

Council has received an application for the installation of a construction zone in front of 34 Dellview Street, Tamarama. The site location is shown in Figure 1. Council officers propose the installation of a 22 metre construction zone as shown in Figure 1.

Council will need to exercise its delegated functions to implement the proposal.

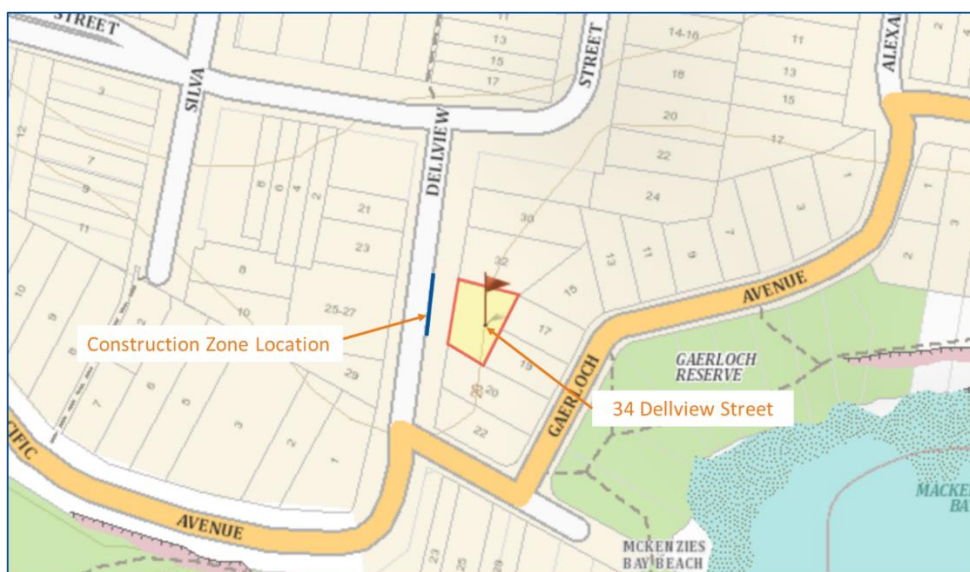


Figure 1. Site location.

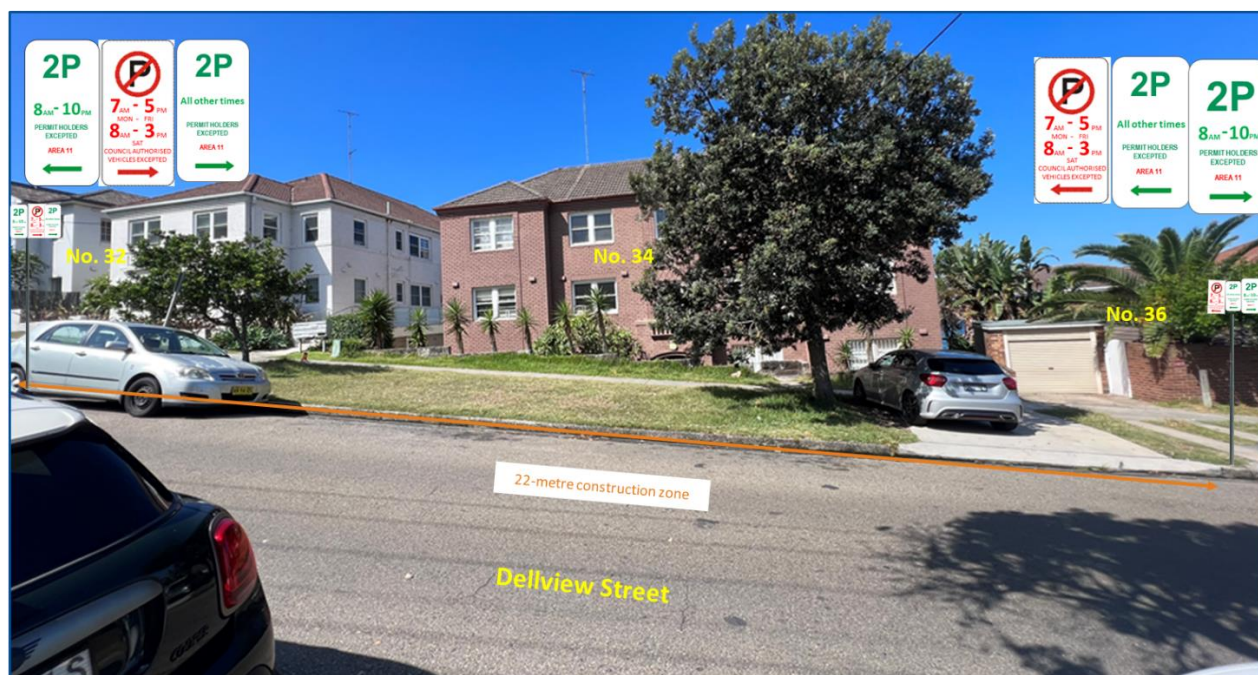


Figure 2. Location to install construction zone signs on Dellview Street.

2. Introduction/Background

In accordance with standard practice at Council, it is proposed that the construction zone is signposted 'No Parking, 7 am–5 pm Mon–Fri, 8 am–3 pm Sat, Council Authorised Vehicles Excepted' for the approved construction hours under the development consent. Council will then supply the applicant with transferable permits to be used on the applicant's construction vehicles. Outside of the 'No Parking' hours, the typical 2P kerbside parking restrictions for the street apply. Council's requirements for permit approvals are a minimum length of 9 metres along the site frontage and a minimum period of 13 weeks.

3. Technical Analysis

The subject site has a frontage of 21.8 metres on Dellview Street. The applicant has requested a 20 metre construction zone along the frontage on Dellview Street. Council officers propose to install a 22 metre construction zone. The total frontage length of the property is almost 22 metres, hence the reason why the construction zone is rounded up to 22 metres. Parking restrictions go back to normal once the construction zone timings end. The existing and recommended parking allocation is shown in Figure 3.

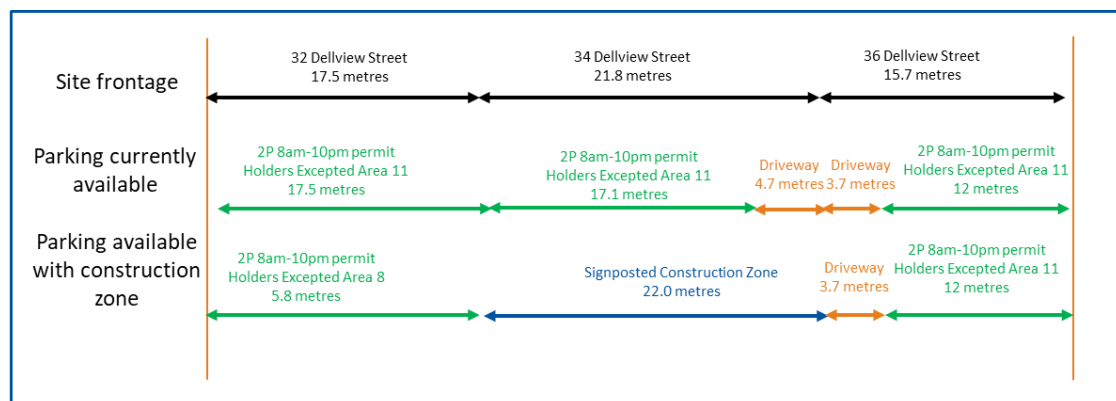


Figure 3. On-street parking for site and adjacent properties.

Table 1. Application details.

Applicant	Spiro Magliveras
Development application	DA-317/2007
Approved hours of construction	7 am–5 pm Monday–Friday; 8 am–3 pm Saturday
Frontage length	21.8 metres
Road	Dellview Street
Existing parking	2P, 8 am–10 pm, Permit Holders Excepted Area 11
Length requested by applicant	20 metres
Length to be signposted	22 metres
Effective construction zone - Total length available for construction	22 metres
Duration	20 months
Fee area	Medium-density residential

Signage

The proposed signage is shown in Figure 4.

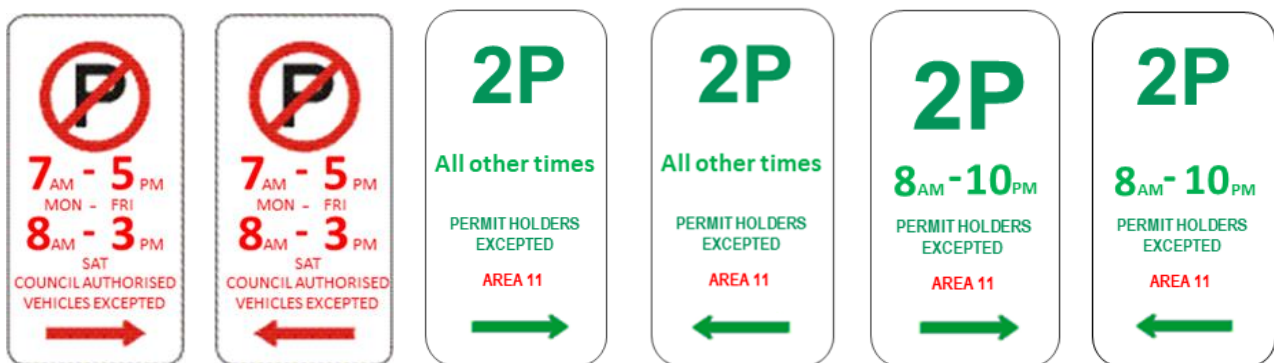


Figure 4. Proposed signage.

Notification

Residents in the vicinity of the construction zone will be notified prior to it being installed.

Figure 4 shows the properties to be notified about the construction zone.

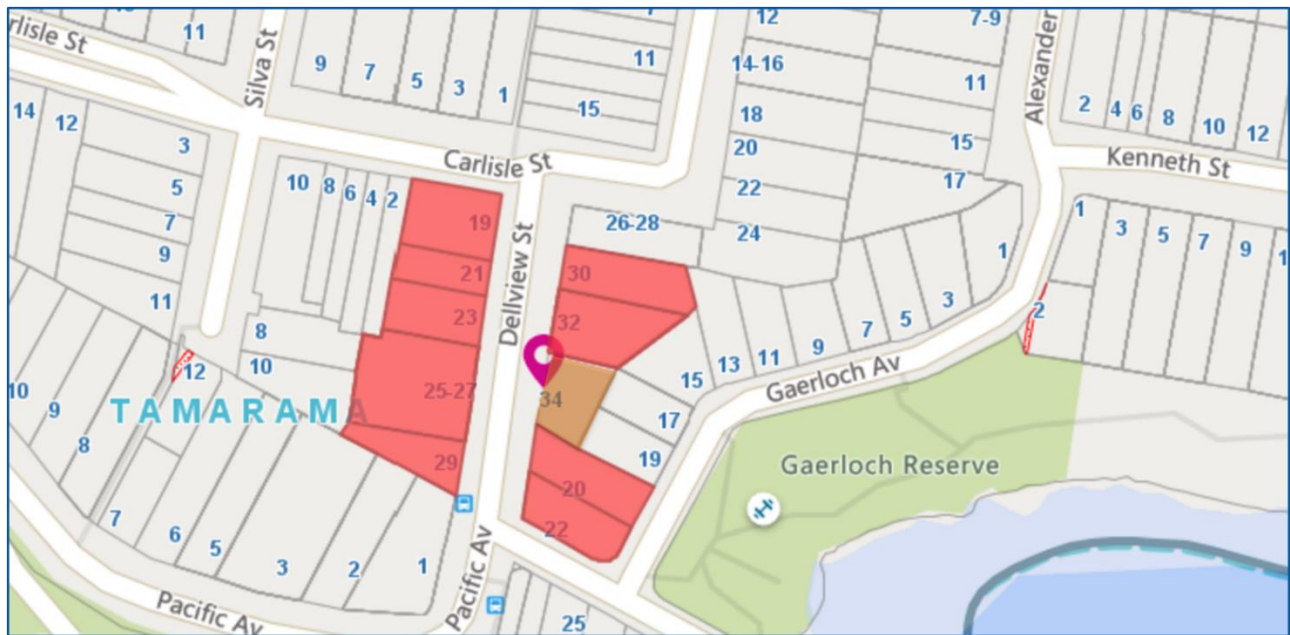


Figure 4. Notification area (hatched).

4. Financial Information for Council's Consideration

The cost to the applicant for the 22 metres made available for construction vehicles will be \$1705.00 per week during the 2023-24 financial year. The estimated weekly fees are shown in Table 1.

Table 1. Calculation of estimated fees (2023-24 financial year).

Category	Unit	Number/ Dimensions	Rate (GST Exempt)	Weekly Fee
Fee (Areas zoned low, medium, or high density residential)				
- Parallel parking	per metre	22	\$77.50	\$1,705.00
- Angle parking	per week	0	\$156.00	\$0.00
Fee (Areas zoned neighbourhood centre, commercial core, or mixed use)				
- Parallel parking	per metre	0	\$107.50	\$0.00
- Angle parking	per week	0	\$210.00	\$0.00
Occupation of metered parking spaces (in addition to the above fees)				
- 5.5 metres per unmarked parallel space	per space	0	\$430.00	\$0.00
- 2.8 metres per unmarked angle parking space	per week			
Weekly Fee				\$1,705.00

5. Attachments

Nil.

REPORT
TC/V.01/24.03

Subject: Anzac Day - Ramsgate Avenue and Campbell Parade,
North Bondi - Temporary Road Closure

TRIM No: A19/0394

Author: Eashan Sharma, Senior Traffic Engineer
Simon Mueller, Manager, Integrated Transport

Authoriser: Nikolaos Zervos, Executive Manager, Infrastructure Services

COUNCIL OFFICER'S PROPOSAL:

That Council:

1. Approves the temporary closure of Ramsgate Avenue and Campbell Parade, North Bondi, for Anzac Day on 25 April 2024 between 4 am and 7 am, in accordance with the Traffic Guidance Scheme attached to the report, subject to the applicant:
 - (a) Submitting a Traffic Management Plan to Transport for NSW for approval.
 - (b) Providing public liability insurance for the event.
 - (c) Obtaining NSW Police Force approval and assessment of the event classification.
 - (d) Notifying Transdev John Holland Buses, NSW Ambulance Service and NSW Fire and Rescue (Bondi, Woollahra, and Randwick fire stations) at least seven days prior to the event.
 - (e) Notifying local residents and businesses at least seven days prior to the event.
2. Delegates authority to Executive Manager, Infrastructure Services, to modify the Traffic Control Plans should on-site circumstances warrant changes.

1. Executive Summary

Council has received an application on behalf of North Bondi RSL Club requesting consideration be given to approving the temporary closure of Ramsgate Avenue and Campbell Parade, North Bondi, to hold an Anzac Day dawn service on 25 April 2024.

The closure and traffic control will be the same as that implemented for the 2023 Anzac Day event (see Figure 1).

Council will need to exercise its delegated functions to implement the proposal.

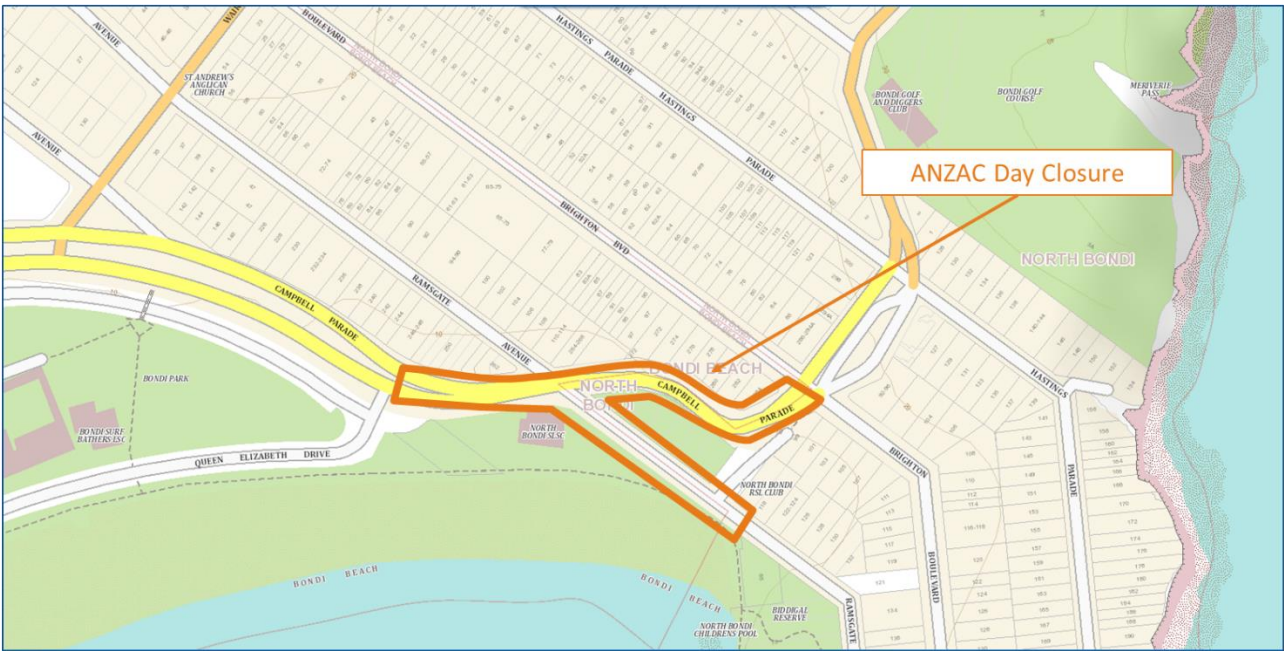


Figure 1. Anzac Day closure.

2. Introduction/Background

The event was last hosted by North Bondi RSL in 2023. This year’s event does not propose any changes to the temporary road closure implemented in 2023. The traffic guidance plans are attached to this report. A traffic management plan is being prepared for submission to Transport for NSW.

This event is considered to be a Class 2 Special Event in accordance with the Transport for NSW’s Guide to Traffic and Transport Management for Special Events.

This event will require an approval from the Transport Management Centre (TMC), as a temporary full closure is proposed. The applicant will be advised to contact the TMC to obtain the required approval.

Once all approvals have been received and all conditions have been met, Council’s Executive Manager, Infrastructure Services, can approve the application.

3. Technical Analysis

The Traffic Management Plan proposes the following closure schedule:

Table 1. Proposed closure schedule.

Date	Time	Activity
Tuesday, 25 April 2024	4.00 am	Implement temporary closure of Ramsgate Avenue and Campbell Parade. Access for emergency vehicles and pedestrians to remain.
	5.00 am	Participants to form up in Ramsgate Avenue.
	5.30 am	Participants and spectators assemble in Ramsgate Avenue, adjacent to North Bondi War Memorial.
	6.00 am	Dawn service and wreath-laying ceremony commences.
	6.45 am	Participants and spectators invited to RSL Club
	7.00 am	Ramsgate Avenue and Campbell parade opens and all normal traffic conditions to resume.

4. Financial Information for Council's Consideration

The applicant will be required to meet the cost of all traffic control, waste removal and damage restoration.

5. Attachments

1. Traffic Guidance Schemes [↓](#) .

REPORT
TC/V.02/24.03

Subject: Ray O'Keefe Reserve, North Bondi - Parking Restrictions

TRIM No: A23/0539

Author: Simon Mueller, Manager, Integrated Transport

Authoriser: Nikolaos Zervos, Executive Manager, Infrastructure Services

COUNCIL OFFICER'S PROPOSAL:

1. That Council installs the following parking restrictions and area signage at Ray O'Keefe Reserve, North Bondi:
 - (a) '2P, 8 am–10 pm, Area 6 and Beach Parking Permit Holders Excepted.'
 - (b) 'No Stopping, 10 pm–8 am, Area 6 and Beach Parking Permit Holders Excepted.'
2. Delegates authority to the Executive Manager, Infrastructure Services, to adjust the location of signs and parking restrictions as necessary.

1. Executive Summary

Due to ongoing unauthorised removal of existing 'No Stopping' signage, and documented occurrences of overnight parking in the Ray O'Keefe Reserve car park, enhanced parking management is required. Council has received complaints from residents in relation to overnight camping. The proposed signage and restrictions to enable this includes the implementation of '2P, 8 am-10 pm' parking, and area parking that includes the existing and proposed restrictions.

Council will need to exercise its delegated functions to implement the proposal.

2. Introduction/Background

Ray O'Keefe Reserve is located in North Bondi. It is a popular spot for residents and visitors to embark on local walks, take in sweeping views and recreate. It contains 16 perpendicular parking spaces. Parking is currently managed with the following regulations and associated signage:

- Unrestricted parking: 6.00 am-11.00 pm
- Restricted parking: 'No Stopping, 11.00 pm-6.00 am, Permit Holders Excepted Area 6.'



Figure 1. Ray O'Keefe Reserve and parking arrangement.

3. Technical Analysis

The current parking regulations allow visitors to park for an unrestricted duration during the daytime. This results in two negative impacts:

- Creates limited parking turnover, such that fewer visitors are able to find available parking.
- Provides the false indication to parking visitors that the daytime unrestricted parking is a de facto condition—or should be—at all times of the day. This is further resulting in:
 - Occurrences of overnight camping.
 - Unauthorised removal of 'No Stopping' signs, making enforcement challenging. In recent weeks, four 'No Stopping' signs have been removed.

Proposed modifications

Table 1. Modifications and rationale.

Modification	Rationale
Implement 2P time-restricted parking from 8.00 am to 10.00 pm, Permit holders excepted (Area 6 & Beach)	<ul style="list-style-type: none"> • Increases parking turnover. • Harmonizes time restrictions with those immediately north on Ramsgate Avenue. • Allows those with a Beach Permit to park, such as users of the Ben Buckler Fisherman's Club.
Modify 'No Stopping' times to 10.00 pm to 8.00 am, Permit holders excepted (Area 6 & Beach)	<ul style="list-style-type: none"> • This provides more legible signage and restrictions that are easier to follow for users.
Area entry and end signs with noted restrictions	<ul style="list-style-type: none"> • Provides visible signage and immediate indication of the restriction that visitors in vehicles must be aware of. • Supports enforcement.

These modifications will mean that visitors arriving by vehicle without a resident or beach permit are able to park for a maximum of 2 hours from 8.00 am until 10.00 pm. Outside these times, those without permits will not be permitted to stop or park for any length of time.

The proposed signs and locations are shown below.



Figure 2. Location of proposed signage.



Figure 3. Proposed signage.

4. Financial Information for Council's Consideration

Council will fund the works from existing budgets.

5. Attachments

Nil.

REPORT
TC/V.03/24.03

Subject: 56 Glasgow Avenue, Bondi Beach - Construction Zone

TRIM No: A03/2514-04

Author: Simon Mueller, Manager, Integrated Transport
Mohammed Soomro, Traffic Engineer

Authoriser: Nikolaos Zervos, Executive Manager, Infrastructure Services

COUNCIL OFFICER'S PROPOSAL:

That Council:

1. Installs a 9 metre 'No Parking, 7 am–5 pm Mon–Fri, 8 am–3 pm Sat, Council Authorised Vehicles Excepted' construction zone in front of 56 Glasgow Avenue, Bondi Beach.
2. Requires the applicant to notify residents in the vicinity of the construction zone prior to it being installed.
3. Delegates authority to the Executive Manager, Infrastructure Services to adjust the length and duration of, or remove, the construction zone as necessary.

1. Executive Summary

Council has received an application for the installation of a construction zone in front of 56 Glasgow Avenue, Bondi Beach. The site location is shown in Figure 1.

Council officers propose the installation of a 9 metre construction zone as shown in Figure 2.

Council will need to exercise its delegated functions to implement the proposal.



Figure 1. Site location.



Figure 2. Location to install construction zone signs.

2. Introduction/Background

In accordance with standard practice at Council, it is proposed that the construction zone is signposted 'No Parking, 7 am–5 pm Mon–Fri, 8 am–3 pm Sat, Council Authorised Vehicles Excepted' for the approved construction hours under the development consent. Council will then supply the applicant with transferable permits to be used on the applicant's construction vehicles. Council's requirements for permit approvals are a minimum length of 9 metres along the site frontage and a minimum period of 13 weeks.

3. Technical Analysis

The subject site has a frontage of 9.2 metres on Glasgow Avenue. The applicant has requested a 9 metre construction zone along the frontage on Glasgow Avenue. Council officers propose to install a 9 metre construction zone. The existing and recommended parking allocation is shown in Figure 3.

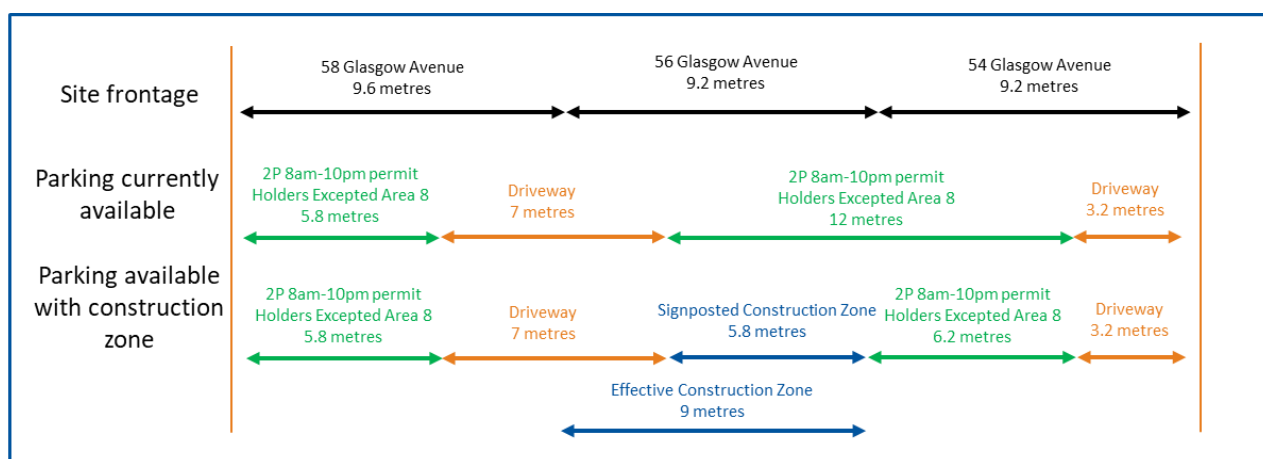


Figure 3. On-street parking for site and adjacent properties.

Table 1. Application details.

Applicant	Jonathan Denby
Development application	DA-496/2022
Works	Alteration and Additions to semi-detached dwelling, including substantial demolition, first floor addition & solar panel to roof
Approved hours of construction	7 am–5 pm Monday–Friday; 8 am–3 pm Saturday
Frontage length	9.2 metres
Road	Glasgow Avenue
Existing parking	2P, 8 am–10 pm Mon–Sat, Permit Holders Excepted Area 8
Length requested by applicant	9 metres
Length to be signposted	5.8 metres
Effective construction zone - Total length available for construction	9 metres
Duration	13 weeks
Fee area	Low-density residential

Signage

The proposed signage is shown in Figure 4.

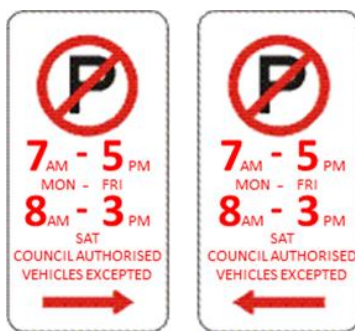


Figure 4. Proposed signage.

Notification

Residents in the vicinity of the construction zone will be notified prior to it being installed.

Figure 5 shows the properties to be notified about the construction zone.

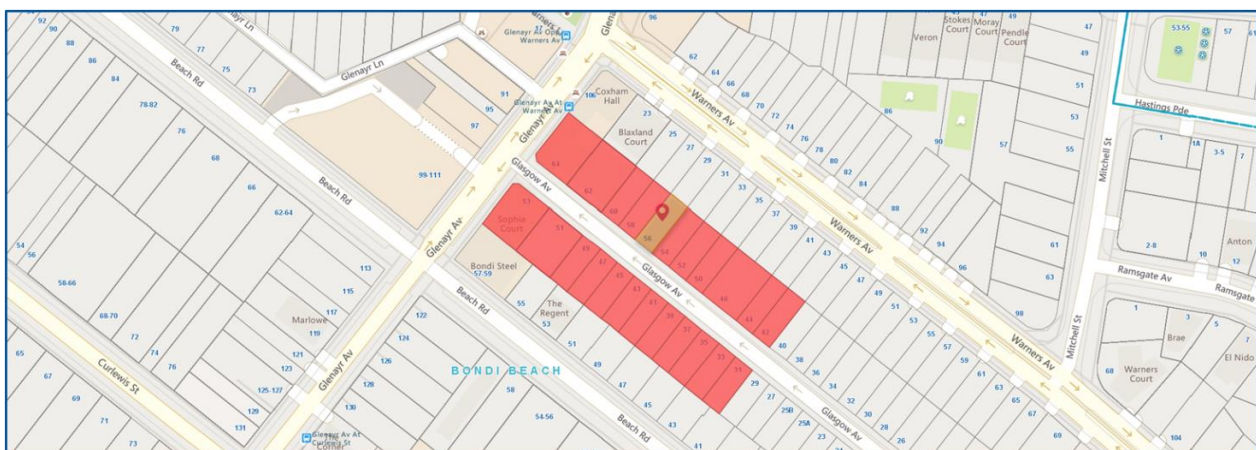


Figure 5. Notification area (hatched).

4. Financial Information for Council's Consideration

The cost to the applicant for the 9 metres made available for construction vehicles will be \$697.5 per week during the 2023-24 financial year. The estimated weekly fees are shown in Table 1.

Table 1. Calculation of estimated fees (2023-24 financial year).

Category	Unit	Number/ Dimensions	Rate (GST Exempt)	Weekly Fee
Fee (Areas zoned low, medium, or high density residential)				
- Parallel parking	per metre	9	\$77.50	\$697.50
- Angle parking	per week	0	\$156.00	\$0.00
Fee (Areas zoned neighbourhood centre, commercial core, or mixed use)				
- Parallel parking	per metre	0	\$107.50	\$0.00
- Angle parking	per week	0	\$210.00	\$0.00
Occupation of metered parking spaces (in addition to the above fees)				
- 5.5 metres per unmarked parallel space	per space	0	\$430.00	\$0.00
- 2.8 metres per unmarked angle parking space	per week			
Weekly Fee				\$697.50

5. Attachments

Nil.

REPORT
TC/V.04/24.03

Subject: 22 Patterson Street, North Bondi - Construction Zone

TRIM No: A03/2514-04

Author: Mohammed Soomro, Traffic Engineer

Authoriser: Nikolaos Zervos, Executive Manager, Infrastructure Services

COUNCIL OFFICER'S PROPOSAL:

That Council:

1. Installs a 11 metre 'No Parking, 7 am–5 pm Mon–Fri, 8 am–3 pm Sat, Council Authorised Vehicles Excepted' construction zone in front of 22 Patterson Street, North Bondi.
2. Requires the applicant to notify residents in the vicinity of the construction zone prior to it being installed.
3. Delegates authority to the Executive Manager, Infrastructure Services, to adjust the length and duration of, or remove, the construction zone as necessary.

1. Executive Summary

Council has received an application for the installation of a construction zone in front of 22 Patterson Street, North Bondi. The site location is shown in Figure 1. Council officers propose the installation of an 11 metre construction zone as shown in Figure 2.

Council will need to exercise its delegated functions to implement the proposal.



Figure 1. Site location.



Figure 2. Location to install construction zone signs.

2. Introduction/Background

In accordance with standard practice at Council, it is proposed that the construction zone is signposted 'No Parking, 7 am–5 pm Mon–Fri, 8 am–3 pm Sat, Council Authorised Vehicles Excepted' for the approved construction hours under the development consent. Council will then supply the applicant with transferable permits to be used on the applicant's construction vehicles. Council's requirements for permit approvals are a minimum length of 9 metres along the site frontage and a minimum period of 13 weeks.

3. Technical Analysis

The subject site has a frontage of 10.7 metres on Patterson Street. The applicant has requested an 11 metre construction zone along the frontage on Patterson Street. 0.3 metres of the unrestricted parking adjacent to the site will be used for the construction zone. Council officers propose to install an 11 metre construction zone. The existing and recommended parking allocation is shown in Figure 3. Parking restrictions revert to unrestricted parking after the prescribed construction hours and during Sundays.

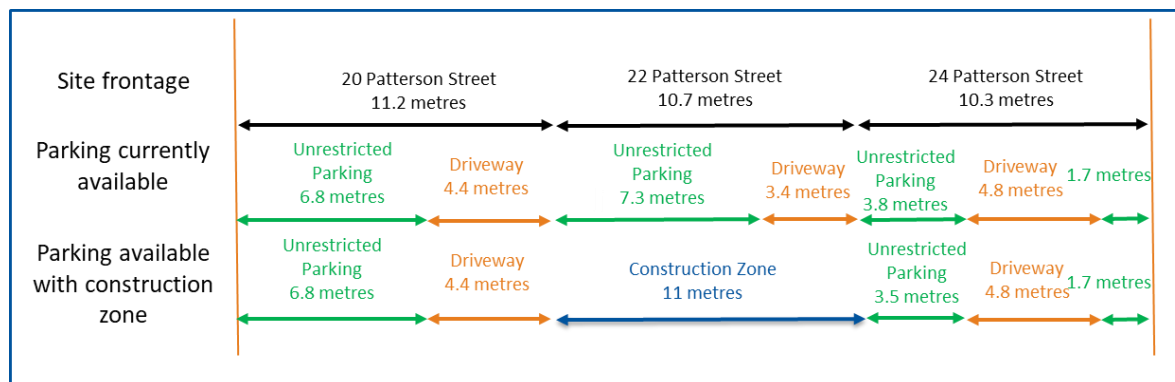


Figure 3. On-street parking for site and adjacent properties.

Table 1. Application details.

Applicant	Talia Sobel
Development application	DA-33/2023
Works	Demolition and construction of a new two storey dwelling with basement level, double garage, driveway and new swimming pool at rear
Approved hours of construction	7 am–5 pm Monday–Friday; 8 am–3 pm Saturday
Frontage length	10.7
Road	Patterson Street
Existing parking	Unrestricted
Length requested by applicant	11 metres
Length to be signposted	11 metres
Effective construction zone - Total length available for construction	11 metres
Duration	40 weeks
Fee area	Low-density residential

Signage

The proposed signage is shown in Figure 4.

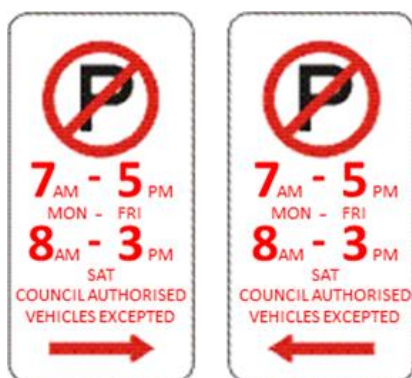


Figure 4. Proposed signage.

Notification

Residents in the vicinity of the construction zone will be notified prior to it being installed.

Figure 5 shows the properties to be notified about the construction zone.

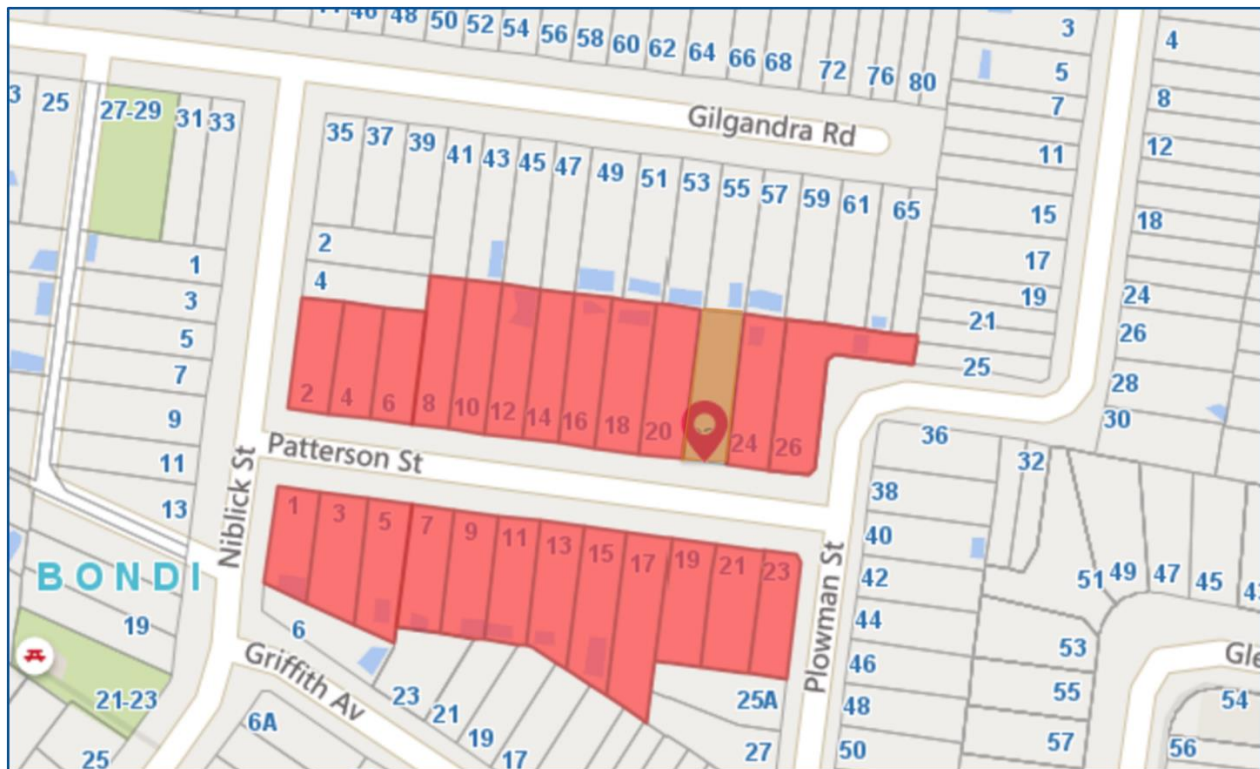


Figure 5. Notification area (hatched).

4. Financial Information for Council's Consideration

The cost to the applicant for the 11 metres made available for construction vehicles will be \$852.50 per week during the 2023-24 financial year. The estimated weekly fees are shown in Table 2.

Table 2. Calculation of estimated fees (2023-24 financial year).

Category	Unit	Number/ Dimensions	Rate (GST Exempt)	Weekly Fee
Fee (Areas zoned low, medium, or high density residential)				
- Parallel parking	per metre	11	\$77.50	\$852.50
- Angle parking	per week	0	\$156.00	\$0.00
Fee (Areas zoned neighbourhood centre, commercial core, or mixed use)				
- Parallel parking	per metre	0	\$107.50	\$0.00
- Angle parking	per week	0	\$210.00	\$0.00
Occupation of metered parking spaces (in addition to the above fees)				
- 5.5 metres per unmarked parallel space	per space	0	\$430.00	\$0.00
- 2.8 metres per unmarked angle parking space	per week			
Weekly Fee				\$852.50

5. Attachments

Nil.

REPORT
TC/V.05/24.03

Subject: 49 Military Road, Dover Heights - Construction Zone

TRIM No: A03/2514-04

Author: Mohammed Soomro, Traffic Engineer

Authoriser: Nikolaos Zervos, Executive Manager, Infrastructure Services

COUNCIL OFFICER'S PROPOSAL:

That Council:

1. Installs a 20 metre 'No Parking, 7 am–5 pm Mon–Fri, 8 am–3 pm Sat, Council Authorised Vehicles Excepted' construction zone in Pindari Road, Dover Heights, adjacent to 49 Military Road.
2. Requires the applicant to notify residents in the vicinity of the construction zone prior to it being installed.
3. Delegates authority to the Executive Manager, Infrastructure Services to adjust the length and duration of, or remove, the construction zone as necessary.

1. Executive Summary

Council has received an application for the installation of a construction zone at 49 Military Road, Dover Heights. The site location is shown in Figure 1. The site also fronts Pindari Road. The construction zone will be installed in Pindari Road.

Council officers propose the installation of a 20 metre construction zone as shown in Figure 1.

Council will need to exercise its delegated functions to implement the proposal.



Figure 1. Site location.



Figure 2. Location to install construction zone signs.

2. Introduction/Background

In accordance with standard practice at Council, it is proposed that the construction zone is signposted 'No Parking, 7 am–5 pm Mon–Fri, 8 am–3 pm Sat, Council Authorised Vehicles Excepted' for the approved construction hours under the development consent. Council will then supply the applicant with transferable permits to be used on the applicant's construction vehicles. Council's requirements for permit approvals are a minimum length of 9 metres along the site frontage and a minimum period of 13 weeks.

3. Technical Analysis

The subject site (49 Military Road) has a frontage of 49.7 metres on Pindari Road. The applicant has requested a 20 metre construction zone along the frontage on Pindari Road. Council officers propose to install a 20 metre construction zone. The existing and recommended parking allocation is shown in Figure 3.

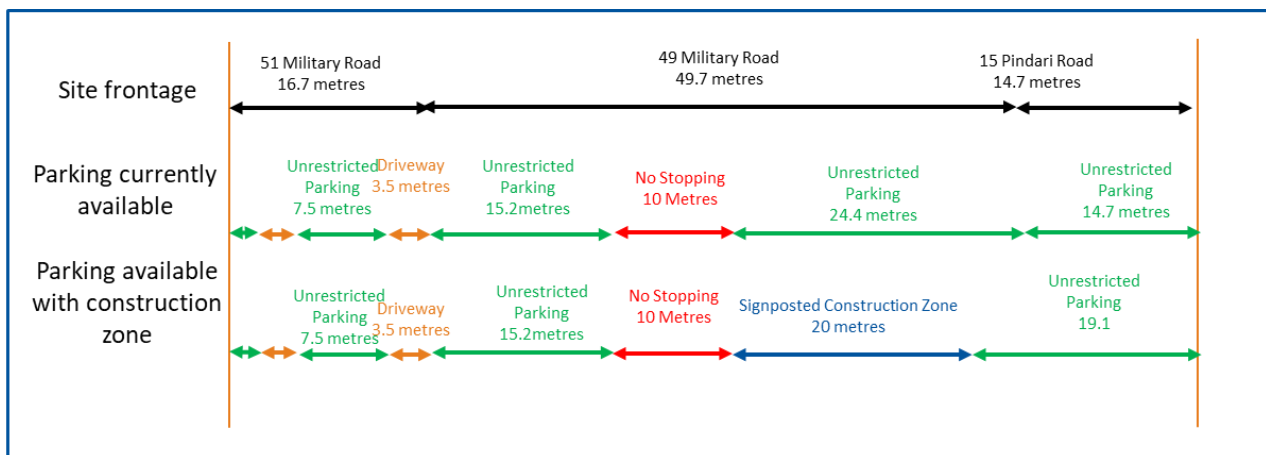


Table 1. Application details.

Applicant	Mark Maurice
Development application	DA-345/2021
Works	Demolition of dwelling and construction of new two-storey dwelling with integrated basement garage, roof top terrace and swimming pool at rear.
Approved hours of construction	7 am–5 pm Monday–Friday; 8 am–3 pm Saturday
Frontage length	49.7 Metres
Road	Pindari Road
Existing parking	Unrestricted
Length requested by applicant	20 metres
Length to be signposted	20 metres
Effective construction zone - Total length available for construction	20 metres
Duration	12 months
Fee area	Low-density residential

Signage

The proposed signage is shown in Figure 4.

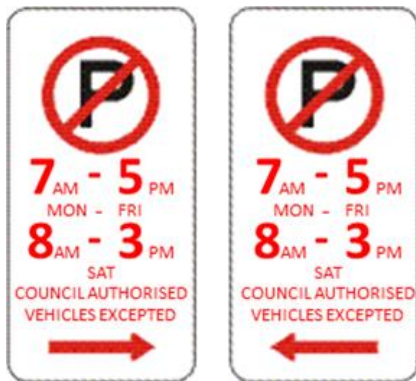


Figure 4. Proposed signage.

Notification

Residents in the vicinity of the construction zone will be notified prior to it being installed.

Figure 5 shows the properties to be notified about the construction zone.

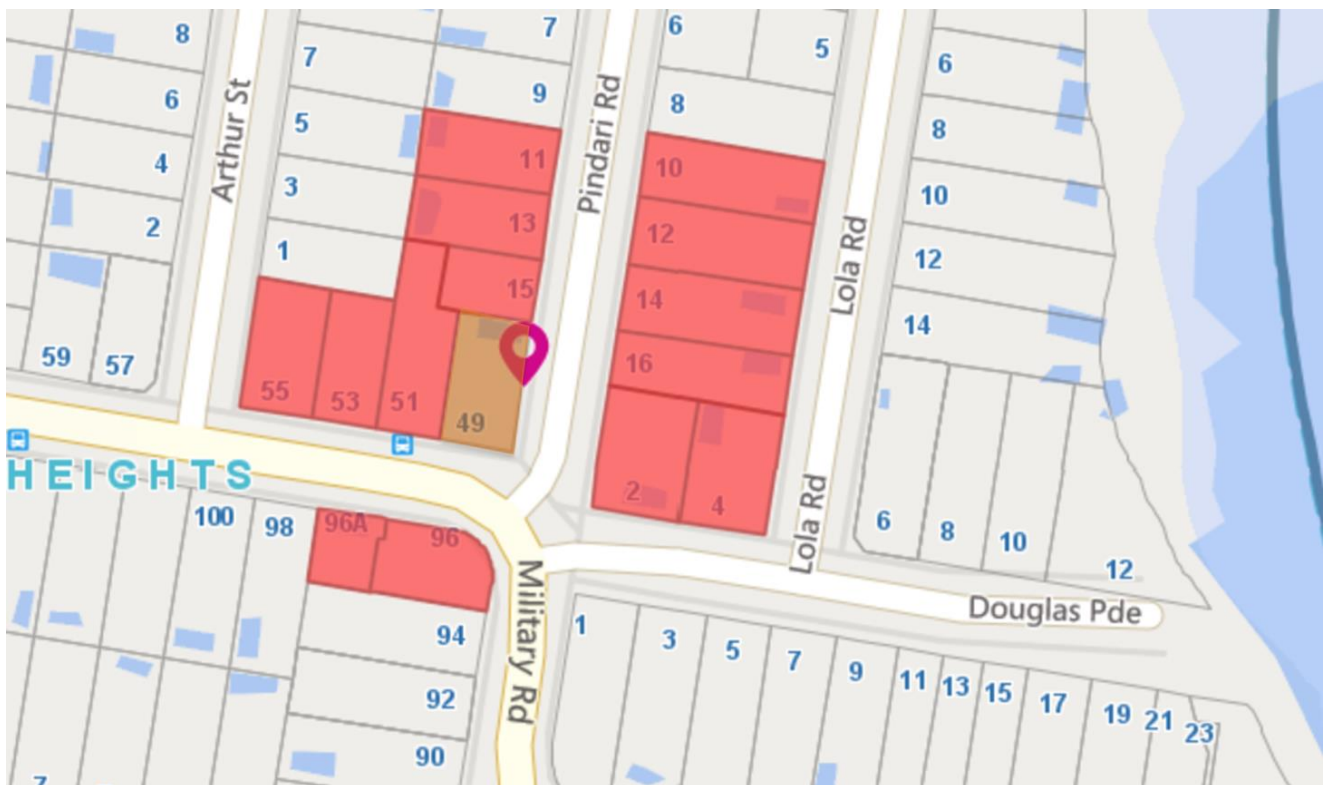


Figure 5. Notification area (hatched).

4. Financial Information for Council's Consideration

The cost to the applicant for the 20 metres made available for construction vehicles will be \$1,550 per week during the 2023-24 financial year. The estimated weekly fees are shown in Table 1.

Table 1. Calculation of estimated fees (2023-24 financial year).

Category	Unit	Number/ Dimensions	Rate (GST Exempt)	Weekly Fee
Fee (Areas zoned low, medium, or high density residential)	per metre			
- Parallel parking	per week	20	\$77.50	\$1,550.00
- Angle parking		0	\$156.00	\$0.00
Fee (Areas zoned neighbourhood centre, commercial core, or mixed use)	per metre			
- Parallel parking	per week	0	\$107.50	\$0.00
- Angle parking		0	\$210.00	\$0.00
Occupation of metered parking spaces (in addition to the above fees)	per space			
- 5.5 metres per unmarked parallel space	per week	0	\$430.00	\$0.00
- 2.8 metres per unmarked angle parking space				
Weekly Fee				\$1,550.00

5. Attachments

Nil.