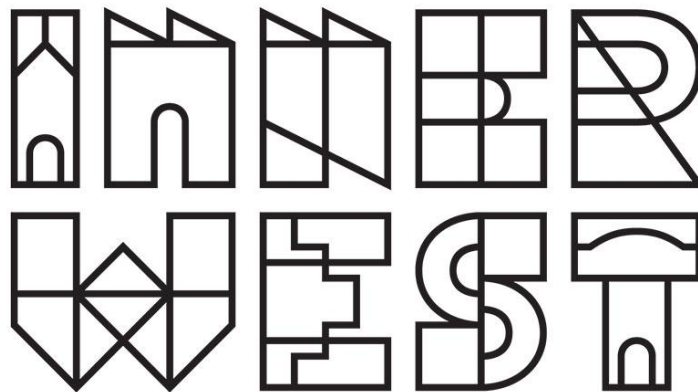


AGENDA



LOCAL TRAFFIC COMMITTEE MEETING

AUGUST 2020

The August 2020 meeting of the Inner West Local Traffic Committee will be held electronically with the Agenda emailed to Members for review. All comments are requested to be returned to Council by 5.00pm Monday 3 August 2020.

Function of the Local Traffic Committee

Background

Roads and Maritime Services (RMS) is legislated as the Authority responsible for the control of traffic on all NSW Roads. The RMS has delegated certain aspects of the control of traffic on local roads to councils. To exercise this delegation, councils must establish a local traffic committee and obtain the advice of the RMS and Police. The Inner West Council Local Traffic Committee has been constituted by Council as a result of the delegation granted by the RMS pursuant to Section 50 of the Transport Administration Act 1988.

Role of the Committee

The Local Traffic Committee is primarily a technical review and advisory committee which considers the technical merits of proposals and ensures that current technical guidelines are considered. It provides recommendations to Council on traffic and parking control matters and on the provision of traffic control facilities and prescribed traffic control devices for which Council has delegated authority. These matters are dealt with under **Part A** of the agenda and require Council to consider exercising its delegation.

In addition to its formal role as the Local Traffic Committee, the Committee may also be requested to provide informal traffic engineering advice on traffic matters not requiring Council to exercise its delegated function at that point in time, for example, advice to Council's Development Assessment Section on traffic generating developments. These matters are dealt with under **Part C** of the agenda and are for information or advice only and do not require Council to exercise its delegation.

Committee Delegations

The Local Traffic Committee has no decision-making powers. The Council must refer all traffic related matters to the Local Traffic Committee prior to exercising its delegated functions. Matters related to State Roads or functions that have not been delegated to Council must be referred directly to the RMS or relevant organisation.

The Committee provides recommendations to Council. Should Council wish to act contrary to the advice of the Committee or if that advice is not supported unanimously by the Committee members, then the Police or RMS have an opportunity to appeal to the Regional Traffic Committee.

Committee Membership & Voting

Formal voting membership comprises the following:

- one representative of Council as nominated by Council;
- one representative of the NSW Police from each Local Area Command (LAC) within the LGA, being Newtown, Marrickville, Leichhardt and Ashfield LAC's.
- one representative from the RMS; and
- State Members of Parliament (MP) for the electorates of Summer Hill, Newtown, Heffron, Canterbury, Strathfield and Balmain or their nominees.

Where the Council area is represented by more than one MP or covered by more than one Police LAC, representatives are only permitted to vote on matters which effect their electorate or LAC.

Informal (non-voting) advisors from within Council or external authorities may also attend Committee meetings to provide expert advice.

Committee Chair

Council's representative will chair the meetings.

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Nil at time of printing.

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9 Close of Meeting

Minutes of Local Traffic Committee Meeting

Held electronically in July 2020

ACKNOWLEDGEMENT OF COUNTRY BY CHAIRPERSON

I acknowledge the Gadigal and Wangal people of the Eora nation on whose country we are meeting today, and their elders past and present.

COMMITTEE REPRESENTATIVES PRESENT

Clr Victor Macri	Councillor – Midjuburi-Marrickville Ward (Chair)
Bill Holliday	Representative for Jamie Parker MP, Member for Balmain
Maryanne Duggan	Representative for Jodi McKay MP, Member for Strathfield
Cathy Peters	Representative for Jenny Leong MP, Member for Newtown
SC Tony Kenny	NSW Police – Inner West Police Area Command
SC Stephen Flanagan	NSW Police – Leichhardt Police Area Command
Tanmila Samin Islam	Transport for NSW (TfNSW)

NON VOTING MEMBERS IN ATTENDANCE

Clr Marghanita da Cruz	Councillor – Gulgadya-Leichhardt Ward (Alternate Chair)
Bob Moore	Inner West Bicycle Coalition
Adrian Prichard	Transit Systems – Inner West Bus Services
Manod Wickramasinghe	IWC's Traffic and Transport Planning Manager
Christina Ip	IWC's Business Administration Officer
George Tsaprounis	IWC's Coordinator Traffic Engineering Services
Stephen Joannidis	IWC's Urban Amenity Improvement Delivery Manager

VISITORS

Nil.

APOLOGIES:

Nil.

DISCLOSURES OF INTERESTS:

Nil.

CONFIRMATION OF MINUTES

The minutes of the Local Traffic Committee meeting held in June 2020 were confirmed.

MATTERS ARISING FROM COUNCIL'S RESOLUTION OF MINUTES

The Local Traffic Committee recommendations of its meeting held in June 2020 were adopted at Council's meeting held on 23 June 2020.

EMAIL CONFIRMATION OF OFFICER'S RECOMMENDATION

The representative for NSW Police – Inner West supported the Officer's recommendations for the items in their PAC.

LTC0720 Item 1 Terrace Road / Ness Avenue, Dulwich Hill – Temporary Full Road Closure of Rail Underpass just north of the roundabout at Ewart Street – Sydney Metro (SSJ) continuation of early enabling works on T3 Line (Djarrawunang-Ashfield Ward / Summer Hill Electorate / Inner West PAC)

SUMMARY

An application has been received from Sydney Metro (SSJ) for the temporary full road closure of the rail underpass on Terrace Road / Ness Avenue just north of the roundabout at Ewart Street, Dulwich Hill for a two day period being 12.00am Saturday, 8 August 2020 until 12.00am Monday, 10 August 2020 in order to carry out the continuation of early enabling works on the Rail bridge and the standing of an Elevated Work Platform (EWP). The road will be temporarily closed to all vehicular traffic, including emergency vehicles and local residents.

Officer's Recommendation

THAT the proposed temporary full road closure of the rail underpass on Terrace Road / Ness Avenue just north of the roundabout at Ewart Street, Dulwich Hill for a two day period being 12.00am Saturday, 8 August 2020 until 12.00am Monday, 10 August 2020 be approved in order to carry out the continuation of early enabling works on the Rail Bridge and the standing of an Elevated Work Platform (EWP) subject to, but not limited to, the following conditions:

1. A Road Occupancy License be obtained by the applicant from the Transport Management Centre;
2. All affected residents and businesses, including the NSW Police Area Commander, Fire & Rescue NSW and the NSW Ambulance Services be notified in writing, by the applicant, of the proposed temporary full road closure at least 7 days in advance of the closure with the applicant making reasonable provision for stakeholders; and
3. The occupation of the road carriageway must not occur until the road has been physically closed.

DISCUSSION

Clr da Cruz requested for advance pedestrian detour signs on approach to the closed section of road. Council Officers will forward this request to the applicant for action.

The Committee members agreed with the Officer's recommendation.

COMMITTEE RECOMMENDATION

THAT the proposed temporary full road closure of the rail underpass on Terrace Road / Ness Avenue just north of the roundabout at Ewart Street, Dulwich Hill for a two day period being 12.00am Saturday, 8 August 2020 until 12.00am Monday, 10 August 2020 be approved in order to carry out the continuation of early enabling works on the Rail Bridge and the standing of an Elevated Work Platform (EWP) subject to, but not limited to, the following conditions:

1. A Road Occupancy License be obtained by the applicant from the Transport Management Centre;
2. All affected residents and businesses, including the NSW Police Area Commander, Fire & Rescue NSW and the NSW Ambulance Services be notified in writing, by the applicant, of the proposed temporary full road closure at least 7 days in advance of the closure with the applicant making reasonable provision for stakeholders; and
3. The occupation of the road carriageway must not occur until the road has been physically closed.

For motion: Unanimous

LTC0720 Item 2 Smith Street, Summer Hill - Proposed Refuge Island east of Flour Mill Way – Plan 10127 (Djarrawunang - Ashfield Ward / Summer Hill Electorate / Burwood PAC)

SUMMARY

Council has finalised a design plan for pedestrian safety improvement works in Smith Street, Summer Hill. The proposed works address concerns about pedestrian safety and driver behaviour in the area.

Officer's Recommendation

THAT the detailed design plan for the new pedestrian refuge island and new adjacent kerb ramps and associated signs and line markings in Smith Street, Summer Hill (as per Plan No.10127) be APPROVED.

DISCUSSION

The representative for TfNSW commented that the distance of the 'No Stopping' on approach to the refuge island is unclear on the plan and stated that the distance should be 20m. Council Officers confirmed that the distance of the 'No Stopping' zone will be 20m from the refuge island. Clr da Cruz requested confirmation of flat footpath widths adjacent to the kerb ramps. Officers advised that there will be approx. 1.2 and 3m of footpath that is not impacted by the kerb ramps on the northern and southern sides of Smith Street respectively.

The Committee members agreed with the Officer's recommendation.

COMMITTEE RECOMMENDATION

THAT the detailed design plan for the new pedestrian refuge island and new adjacent kerb ramps and associated signs and line markings in Smith Street, Summer Hill (as per Plan No.10127) be APPROVED.

For motion: Unanimous

LTC0720 Item 3 Edinburgh Street, Murray Street and Railway Parade, Marrickville – Marrickville Metro Expansion Works (Midjuburi – Marrickville Ward / Newtown Electorate / Inner West PAC)

SUMMARY

Council has received an application from John R Keith P/L (contractor to Marrickville Metro Shopping Centre expansion works) for approval of a temporary full road closure of Edinburgh Street, Murray Street and Railway Parade, Marrickville for a 27 day period starting from Monday 6 July to Saturday 1 August 2020 (10 day contingency period Saturday 1 August to Saturday 10 August 2020) for the purpose of undertaking excavation works for a sewer connection to the main line. The street would be temporary closed to all vehicular traffic, including emergency vehicles. It is recommended that the proposed temporary full road closure be approved, subject to the conditions outlined in this report.

Officer's Recommendation

THAT the proposed temporary full road closure of Edinburgh Street, Murray Street and Railway Parade, Marrickville for a 27 day period starting from Monday 6 July to Saturday 1 August 2020 (10 day contingency period Saturday 1 August to Saturday 10 August 2020) be approved for the purpose of sewer connection works relating to Marrickville Metro Expansion works subject to, but not limited to, the following conditions:

1. A Road Occupancy License be obtained by the applicant from the Transport Management Centre;
2. All affected residents and businesses, including the NSW Police Area Commander, Fire & Rescue NSW and the NSW Ambulance Services be notified in writing, by the applicant, of the proposed temporary full road closure at least 7 days in advance of the closure with the applicant making reasonable provision for stakeholders;
3. The occupation of the road carriageway must not occur until the road has been physically closed; and
4. Written concurrence from Sydney Metro TSE Group is provided to Council.

DISCUSSION

The TfNSW representative stated that although Road Occupancy Licenses are not usually required for closures on local roads, the Transport Management Centre should be informed of the works. The representative asked for clarity on whether the Smidmore Street works for Marrickville Metro will also be occurring at the same time as the proposed temporary road closure. If this is the case the detour route proposed via Smidmore Street will need to be reviewed.

The Transit Systems representative stated that the Transit Systems 308 Route and the State Transit 355 Route currently operate through Edinburgh Road, Murray Street and Smidmore Road. The representative stated that the proposed diversion via Victoria Road and Murray Street is not wide enough for buses to travel through due to the pedestrian refuge and on-road parking. In addition, the left turn from Murray Street into Smidmore Road is not acceptable for a 12.5m vehicle. Transit Systems requested that work at this location be completed in stages so that a stop slow setup can be run to allow buses to continue using Edinburgh Road and Murray Street.

In response to the concerns raised by Transit Systems, part four of the recommendation was amended to state that the proposal also receive concurrence from Transit Systems. The

Committee members agreed to this amendment.

COMMITTEE RECOMMENDATION

THAT the proposed temporary full road closure of Edinburgh Street, Murray Street and Railway Parade, Marrickville for a 27 day period starting from Monday 6 July to Saturday 1 August 2020 (10 day contingency period Saturday 1 August to Saturday 10 August 2020) be approved for the purpose of sewer connection works relating to Marrickville Metro Expansion works subject to, but not limited to, the following conditions:

- 1. A Road Occupancy License be obtained by the applicant from the Transport Management Centre;**
- 2. All affected residents and businesses, including the NSW Police Area Commander, Fire & Rescue NSW and the NSW Ambulance Services be notified in writing, by the applicant, of the proposed temporary full road closure at least 7 days in advance of the closure with the applicant making reasonable provision for stakeholders;**
- 3. The occupation of the road carriageway must not occur until the road has been physically closed; and**
- 4. Written concurrence from Sydney Metro TSE Group and Transit Systems is provided to Council.**

For motion: Unanimous

LTC0720 Item 4 Westconnex M5 – St Peters Interchange Active Transport Works – Part 1 (Midjuburi – Marrickville Ward / Heffron Electorate / Inner West PAC)

SUMMARY

The St Peters Interchange project results from a request by the TfNSW and WestConnex for Council to deliver two (2) active transport projects around the M5 WestConnex Interchange at St Peters. The provision of such walking and cycling facilities with 1km of the St Peters Interchange is a condition of consent for the WestConnex M5 project.

The proposal presented reflects the outcomes of a recent concept design stage, including community consultation, and updates the status of the project in which the concept design was presented to the Local Traffic Committee in November 2019. The proposals includes a combination of a two way separated cycleway and shared path on the southern side of Burrows Avenue, adjacent to Sydenham Station and widening the shared path along Mary Street and upgrades to the existing on road cycle route along the other streets including George Street, Henry Street, Grove Street, Bakers Lane.

Following development of the concept designs, two rounds of community engagement, Local Traffic Committee endorsement in November 2019 to progress with the detailed design and implementation and subsequent preparation of detailed design plans. It is recommended that these detailed design plans be approved.

Officer's Recommendation

THAT:

- 1. The final design solution for the M5 - St Peters Interchange Active Transport Works (plan**

no's. 2997-01 to 2997-07) be approved to enable tender documentation to be prepared and a construction contract advertised; and

2. The TCS designs resulting from this project be forwarded to TfNSW for approval

DISCUSSION

The representative for the Member for Balmain commented that there is a risk of cyclist 'dooring' on the shared path near the bidirectional cycle path on the southern side of Burrows Avenue opposite Sydenham Station. Council Officers advised that the bidirectional cycle path terminates east of the car parking bays, and a shared path is proposed adjacent to the car parking. The alignment of the connection is such that it directs cyclists away from the parking to minimise the risk of dooring. Therefore, there is no specific offset distance as cyclists can be positioned anywhere within the shared path. In addition it was noted that there is shared path linemarking indicated on the plans adjacent to the parked cars to guide cyclists away from the car dooring area.

The representative for the Member for Balmain asked for clarity on the cyclist connection near the intersection of Burrows Avenue and Gleeson Avenue. Council Officers advised that the cycle route for this project at the intersection comprises the shared path on the southern side of Burrows Avenue, a shared signalised crossing on Burrows Avenue on the eastern side of the intersection, and a shared signalised crossing on Gleeson Avenue on the northern side of the intersection. The continuation of the cycle route north then links to the proposed shared path on the western side of Gleeson Avenue (on the overbridge) which is to be implemented as part of the Marrickville Road cycleway project.

The TfNSW representative raised a number of issues with the plans as follows:

- The direction at which cyclists are meant to travel in the intersection of Burrows Avenue and George Street is unclear. Council Officers stated that directional signage will be added to the design plan.
- There should be 'No Parking' or 'No Stopping' at the kerb extension on the northern side of Burrows Avenue. Council Officers stated that 'No Stopping' signage can be added if it is a requirement; however, Council has not proposed this at this kerb extension as it is clear that a vehicle cannot park adjacent to the kerb extension and Council has tried to avoid sign clutter.
- The high angle of the pedestrian crossing at the intersection of Princes Highway and Mary Street is unlikely to be supported by TfNSW. Obscure angles can result in reduced sight distance to pedestrians and other concerns. Council Officers stated that the crossing is to be approved via the TCS process; however, the proposed crossing alignment is considered better at providing sight distance than the current alignment.
- There are concerns with the size of the gaps in the island at the intersection of Unwins Bridge Road and George Street. However, this can be dealt with during the TCS reviews.
- Each of the TCS components will need to be reviewed separately and changes to the entire design layout may be required, subject to TCS approval.
- TfNSW plan checking and admin fees will apply.

The Committee members agreed with the Officer's recommendation.

COMMITTEE RECOMMENDATION

THAT:

1. The final design solution for the M5 - St Peters Interchange Active Transport Works (plan no's. 2997-01 to 2997-07) be approved to enable tender documentation to be prepared and a construction contract advertised; and
2. The TCS designs resulting from this project be forwarded to TfNSW for approval

For motion: Unanimous

LTC0720 Item 5 Urban Amenity Improvement Program – Leichhardt and Camperdown Precincts (Gulgadya - Leichhardt & Damun-Stanmore Wards/Balmain & Newtown Electorates/Leichhardt & Inner West PACs)

SUMMARY

The Urban Amenity Improvement Program (UAIP) aims to reverse the urban decay and lack of design cohesion along Parramatta Road and is a NSW State Government initiative.

Within the Inner West Council LGA, the program comprises 10 separate locations as follows: Rofe Street – Parramatta Road to Jarrett Street, Renwick Street – Parramatta Road to Jarrett Street, Norton Street – Parramatta Road to the Italian Forum, Crystal Street – Parramatta Road to Elswick Street, Balmain Road – Parramatta Road to end of Italian Forum, Catherine Street – Parramatta Road to Albion Street, Dot Lane – Balmain Road to Hay Street, Petersham Street – Parramatta Road to Queen Street, Johnstons Creek, Wigram Road and Pyrmont Bridge Road – Parramatta Road to Booth Street

Following development and approval of the UAIP, Council is now progressing with the detailed design and aims to inform and seek approval of the Local Traffic Committee for the measures proposed under the program.

Officer's Recommendation

THAT the design proposals as discussed in this report and as indicated on the attached plans be approved at the following locations:

1. Rofe Street (plan no. 3010-1A-TCP-001) – public domain upgrades and conversion to a one way road (subject to TfNSW approval of the TMP);
2. Renwick Street (plan no. 3010-1B-TCP-001) – public domain upgrades and provision of a 10km/hr shared zone (subject to TfNSW approval of the speed limit reduction);
3. Norton Street (plan no. 3010-1C-TCP-001) – public domain upgrades;
4. Crystal Street (plan no. 3010-1D-TCP-001 sheets 1 and 2) – public domain upgrades;
5. Balmain Road (plan no. 3010-1E-TCP-001 sheets 1 and 2) – public domain upgrades and cycleway connection;
6. Catherine Street (plan no. 3010-1F-TCP-001) – public domain upgrades and cycleway connection;
7. Dot Lane (plan no. 3010-2A-TCP-001) – new cycleway connection;

8. Petersham Street (plan no. 3010-3-TCP-001) – new pocket park (subject to TfNSW approval of the TMP);
9. Johnstons Creek and Wigram Road – new pedestrian and cycleway connection; and
10. Pyrmont Bridge Road (plan no. 3010-4A-TCP-001 sheets 1 to 3) – public domain upgrades and cycleway connection (subject to TfNSW approval).

DISCUSSION

Officers tabled revised plans which replace Attachment 1 of Item 5. The updates consist of:

- Page 1 & 2 - Rofe Street & Renwick Street 'bicycles excepted' restrictions on the 'No Entry' signs to allow bicycle contraflow.
- Page 9 - Increase of shared path width to a min. 3.5m between Balmain Road and Hay Street with adjustment to car park layout.
- Page 3 & 6 - Temporary shared path between Norton Street and Balmain Road to be used until Dot Lane connection is finalised.

The representative for the Member for Balmain requested that the subgrade at the proposed pedestrian crossing in Norton Street be strengthened to prevent damage to the road surface from bus traffic. Council Officers advised that this will be considered during preparation of the construction detail.

The TfNSW representative made the following comments:

- It was noted that crossing priority is provided for cyclists on Wigram Road at Booth Lane; however, signage be included to indicate priority to pedestrians, such as a 'Give Way' sign. Council Officers will pass this request onto the designers for inclusion.
- The refuge island at the roundabout on Wigram Road needs to be altered to be at least 2m wide and 3m long for the safe storage of prams and wheelchairs. All refuge islands must accommodate at least the 2m width of the island.
- TfNSW do not approve the recommendations for Pyrmont Bridge Road (State Road) through this Committee. There are concerns with the Pyrmont Bridge Road proposal which will be considered separately.

The TfNSW comments were sent to the consultant for consideration.

The Inner West Bicycle Coalition representative requested for:

- a 'Bicycles Excepted' sign be included on the 'One Way' signs on Renwick Street and Rofe Street. Council Officers advised that the updated plans, issued to the Committee on 2 July 2020, have now accommodated this request to allow bicycle contraflow.
- a shared path be provided from Norton Street to Balmain Road. The updated plans include a temporary shared path between Norton Street and Balmain Road, to be used until the Dot Lane connection is finalised.
- the shared path between Balmain Road and Hay Street be at least 3m wide to facilitate connection to urban amenities. Council Officers advised that, in the updated plans, the width of the shared path has been increased to a minimum of 3.5m with adjustment to the car park layout.
- a shared path be provided from Nelson Street to Pyrmont Bridge Road to allow cyclists to complete the EW02 route from Albion Street to Pyrmont Bridge Road until a

connection across Johnson Creek is developed. Council Officers advised that the potential for such a shared path is still in concept design phase, pending and subject to completion of the WestConnex Dive Site and TfNSW approvals.

- a 'pop-up' lane on Pyrmont Bridge Road from Parramatta Road to Booth Street for city bound cyclists. Council Officers stated that this would require consideration and discussion with TfNSW, noting that this is a State Road.

Clr da Cruz requested for:

- consistent road markings be provided for the 10km/h shared zones on Renwick Lane and Renwick Street. Council Officers advised that 10km/h line marking symbols exist in Renwick Lane and will be added to the drawing.
- provision of bicycle parking. Council Officers advised that bicycle parking is proposed for Norton Street, Renwick Street and Catherine Street, and will be included in the detailed design plans.
- pedestrian refuge or pram ramps on Catherine Street to provide a safe crossing from Albion Street to Redmond Street. Council Officers advised that a pedestrian refuge was considered but due to the volume of traffic and pedestrian movements generated by the Function Centre, the Parramatta Road/Catherine Street traffic lights were considered the safest crossing point.

COMMITTEE RECOMMENDATION

THAT the design proposals as discussed in this report and as indicated on the attached plans be approved at the following locations:

1. **Rofe Street (plan no. 3010-1A-TCP-001) – public domain upgrades and conversion to a one way road (subject to TfNSW approval of the TMP);**
2. **Renwick Street (plan no. 3010-1B-TCP-001) – public domain upgrades and provision of a 10km/hr shared zone (subject to TfNSW approval of the speed limit reduction);**
3. **Norton Street (plan no. 3010-1C-TCP-001) – public domain upgrades;**
4. **Crystal Street (plan no. 3010-1D-TCP-001 sheets 1 and 2) – public domain upgrades;**
5. **Balmain Road (plan no. 3010-1E-TCP-001 sheets 1 and 2) – public domain upgrades and cycleway connection;**
6. **Catherine Street (plan no. 3010-1F-TCP-001) – public domain upgrades and cycleway connection;**
7. **Dot Lane (plan no. 3010-2A-TCP-001) – new cycleway connection;**
8. **Petersham Street (plan no. 3010-3-TCP-001) – new pocket park (subject to TfNSW approval of the TMP);**
9. **Johnstons Creek and Wigram Road – new pedestrian and cycleway connection; and**
10. **Pyrmont Bridge Road (plan no. 3010-4A-TCP-001 sheets 1 to 3) – public domain upgrades and cycleway connection (subject to TfNSW approval).**

For motion: Unanimous

LTC0720 Item 6 Goddard Street, Newtown - Proposed continuous footpath treatment in Goddard Street at King Street – Final Signage and Line Marking Plan 10134 (Damum - Stanmore Ward / Newtown Electorate / Inner West PAC)

SUMMARY

Council has finalised a design plan for a continuous footpath treatment in Goddard Street at King Street, Newtown. It is envisaged that the proposed works will have a positive impact on pedestrian and motorist safety and address concerns about pedestrian safety and driver behaviour in the area.

Officer's Recommendation

THAT the detailed design plan for the continuous footpath treatment and associated signs and line markings in in Goddard Street at King Street, Newtown (as per Design Plan No.10134) be approved.

DISCUSSION

The representative for TfNSW requested that signage be included to indicate priority to pedestrians, such as a 'Give Way' sign. Council Officers will pass this request onto the designers for inclusion.

The Committee members agreed with the Officer's recommendation.

COMMITTEE RECOMMENDATION

THAT the detailed design plan for the continuous footpath treatment and associated signs and line markings in in Goddard Street at King Street, Newtown (as per Design Plan No.10134) be approved.

For motion: Unanimous

LTC0720 Item 7 Dulwich Hill Station Precinct Public Domain Improvements (Djarrawunang-Ashfield Ward / Summer Hill Electorate / Inner West PAC)

SUMMARY

A traffic and transport assessment for the detailed design of the Dulwich Hill Station Precinct Public Domain Improvements has now been undertaken.

The works will be delivered in 4 stages: Stage A, Stage B, Stage C and Stage D.

Stage A - Wardell Road - Dudley Street Intersection works, Dudley Street footpath works.

Stage B - Raised Entry Thresholds on Wardell Road, Bedford Cres and Wardell Road - Ewart Street intersection.

Stage C - Road works on Wardell Road from Wilga Ave to Ewart Street.

Stage D - Road works on Ewart Street between Murray Lane and Ewart Lane.

This assessment is only for Stage A of the Master Plan and the detailed design of Stage A has now been progressed. The following works are proposed to be undertaken within the Stage A:

- Raised signalised intersection at Wardell Road / Dudley Street for improved safety and pedestrian movement;
- A 40km/h High Pedestrian Activity Area proposed around the station precinct with relevant signage to further improve the safety of pedestrians;
- New in road trees, raingarden and footpath treatments; and
- Extended footpath areas to allow space for pedestrians, footpath dining, street gathering spaces, trees and planting;

Overall the upgrades for stage A aligns well with the existing and planned pedestrian and cycling networks and are expected to improve the safety and efficiency of the station precinct. In particular, the raised, signalised intersection at Wardell Road / Dudley Street will help to address safety issues at the existing pedestrian crossing where crashes have been recorded, particularly as pedestrian movement increases with the implementation of the Sydney Metro upgrades. The intersection is proposed to be a scramble crossing to maximise space for pedestrian movement and allow pedestrians to cross in any direction at once.

Officer's Recommendation

THAT the following proposed works to be undertaken as part of Stage A be APPROVED:

1. Raised signalised intersection at Wardell Road / Dudley Street for improved safety and pedestrian movements (subject to separate TfNSW approval of TCS design);
2. A 40 km/hr High Pedestrian Activity Area along Wardell Road from Ewart Street to Keith Street, Dudley Street from Wardell Road to Bailey Street and Bedford Crescent from Wardell Road to cul-de-sac (subject to separate TfNSW approval of the speed limit reduction).
3. Extended footpath areas to allow space for pedestrians, footpath dining, street gathering spaces, trees and planting; and
4. New in-road trees, raingarden and footpath treatments.

DISCUSSION

Councillor da Cruz requested a 30km/h speed zone be introduced at the High Pedestrian Activity Area around the station precinct. Council Officers advised that speed zoning is subject to TfNSW approval and a 30km/h speed limit is currently not supported as the TfNSW guidelines for High Pedestrian Activity Areas is set at 40km/h which is consistent with the speed limit within the existing school zone.

The Transit Systems representative requested that the height of the raised signalised intersection at Wardell Road and Dudley Street not exceed 75mm for safe passage of Transit Systems vehicles.

The TfNSW representative advised that each of the elements needs to be reviewed separately

by TfNSW through the appropriate processes and the proposals are presented to the Committee only for information and any community input.

The Committee members agreed with the Officer's recommendation.

COMMITTEE RECOMMENDATION

THAT the following proposed works to be undertaken as part of Stage A be APPROVED:

1. **Raised signalised intersection at Wardell Road / Dudley Street for improved safety and pedestrian movements (subject to separate TfNSW approval of TCS design);**
2. **A 40 km/hr High Pedestrian Activity Area along Wardell Road from Ewart Street to Keith Street, Dudley Street from Wardell Road to Bailey Street and Bedford Crescent from Wardell Road to cul-de-sac (subject to separate TfNSW approval of the speed limit reduction).**
3. **Extended footpath areas to allow space for pedestrians, footpath dining, street gathering spaces, trees and planting; and**
4. **New in-road trees, raingarden and footpath treatments.**

For motion: Unanimous

LTC0720 Item 8 Flood Street, Leichhardt - Road Occupancy (Gulgadya Ward/ Balmain Electorate/ Leichhardt PAC)

SUMMARY

This report considers a request received from BreastScreen NSW for the temporary placement of their mobile lab unit on the western side of Flood Street adjacent to Leichhardt Market Place within the existing 'Taxi Zone', for the duration of eight (8) weeks starting from Friday, 7 August to Saturday, 3 October 2020.

Officer's Recommendation

THAT the road occupancy for the BreastScreen NSW mobile lab unit on the western side of Flood Street, adjacent to Leichhardt Market Place within the existing 'Taxi Zone', for the duration of eight (8) weeks starting from Friday, 7 August to Saturday, 3 October 2020 be supported.

DISCUSSION

The Committee members agreed with the Officer's recommendation.

COMMITTEE RECOMMENDATION

THAT the road occupancy for the BreastScreen NSW mobile lab unit on the western side of Flood Street, adjacent to Leichhardt Market Place within the existing 'Taxi Zone', for the duration of eight (8) weeks starting from Friday, 7 August to Saturday, 3 October 2020 be supported.

For motion: Unanimous

**LTC0720 Item 9 Seven Bridges Walk - Special Event (Gulgadga - Leichhardt & Baludarri
- Balmain Ward/ Balmain Electorate/ Leichhardt PAC)**

SUMMARY

The Cancer Council NSW Seven Bridges Walk event will be held on Sunday, 25 October 2020 at various locations in Sydney, including areas within the Inner West Council. The Event is in its fifteenth year of operation and the applicant seeks approval again in 2020.

Officer's Recommendation

THAT the Cancer Council NSW Seven Bridges Walk to be held on Sunday, 25 October 2020 be approved, subject to a current Public Liability Insurance Policy which includes the Inner West Council being an interested party being submitted by the event organiser prior to the event.

DISCUSSION

The Committee members agreed with the Officer's recommendation.

COMMITTEE RECOMMENDATION

THAT the Cancer Council NSW Seven Bridges Walk to be held on Sunday, 25 October 2020 be approved, subject to a current Public Liability Insurance Policy which includes the Inner West Council being an interested party being submitted by the event organiser prior to the event.

For motion: Unanimous

General Business

LTC0720 Item 9 Illuminated sign outside Haberfield Rowers Club

The representative for the Member for Balmain asked for a progress update regarding the glare from the Haberfield Rowers Club illuminated sign on the City West Link. Council Officers advised that Council's Development Compliance Officers have been in discussions with the Club and have had the illumination levels on the LED pylon decreased. The Club has advised that the decrease in brightness has now come into effect.

LTC0720 Item 10 Request for in-road traffic detector in Mary Street, Leichhardt

The representative for the Member for Balmain requested that an in-road traffic detector be installed in the right turn lane in Mary Street at the intersection of Lilyfield Road. This request was sent to TfNSW for comment.

LTC0720 Item 11 Condition of Hawthorne Parade, Haberfield

The representative for the Member for Balmain commented that Hawthorne Parade is in poor condition with numerous potholes and asked whether this was due to heavy vehicles from WestConnex construction. The representative requested that, if the damage was caused by WestConnex, Council endeavour to have WestConnex maintain Hawthorne Parade during their operations and return it to its original condition when they finish. Council Officers will forward this request to Council's Assets team.

LTC0720 Item 12 Johnson Street, Annandale work site

The Inner West Bicycle Coalition representative requested that the barrier on the Johnson Street bridge work site be moved east about a metre to remove the pinch zone between the refuge and the end of the works, or a 'No Overtaking' sign be displayed at the Wigram Road end of the works. This will tie in with the City of Sydney pop-up lane on Pyrmont Bridge Road and improve safety. The representative also requested a temporary pedestrian crossing be installed on Booth Street at Alexandra Drive so pedestrians and cyclists do not need to travel 300 metres to the traffic lights and back to cross the road.

LTC0720 Item 13 Update on Croydon Road and Parramatta Road intersection improvements

The representative for the Member for Strathfield asked for an update on the improvements proposed for the Croydon Road/Parramatta Road intersection previously raised in the June 2020 meeting. Council Officers stated that TfNSW have indicated that they are finalising the community engagement report to publish by the month end.

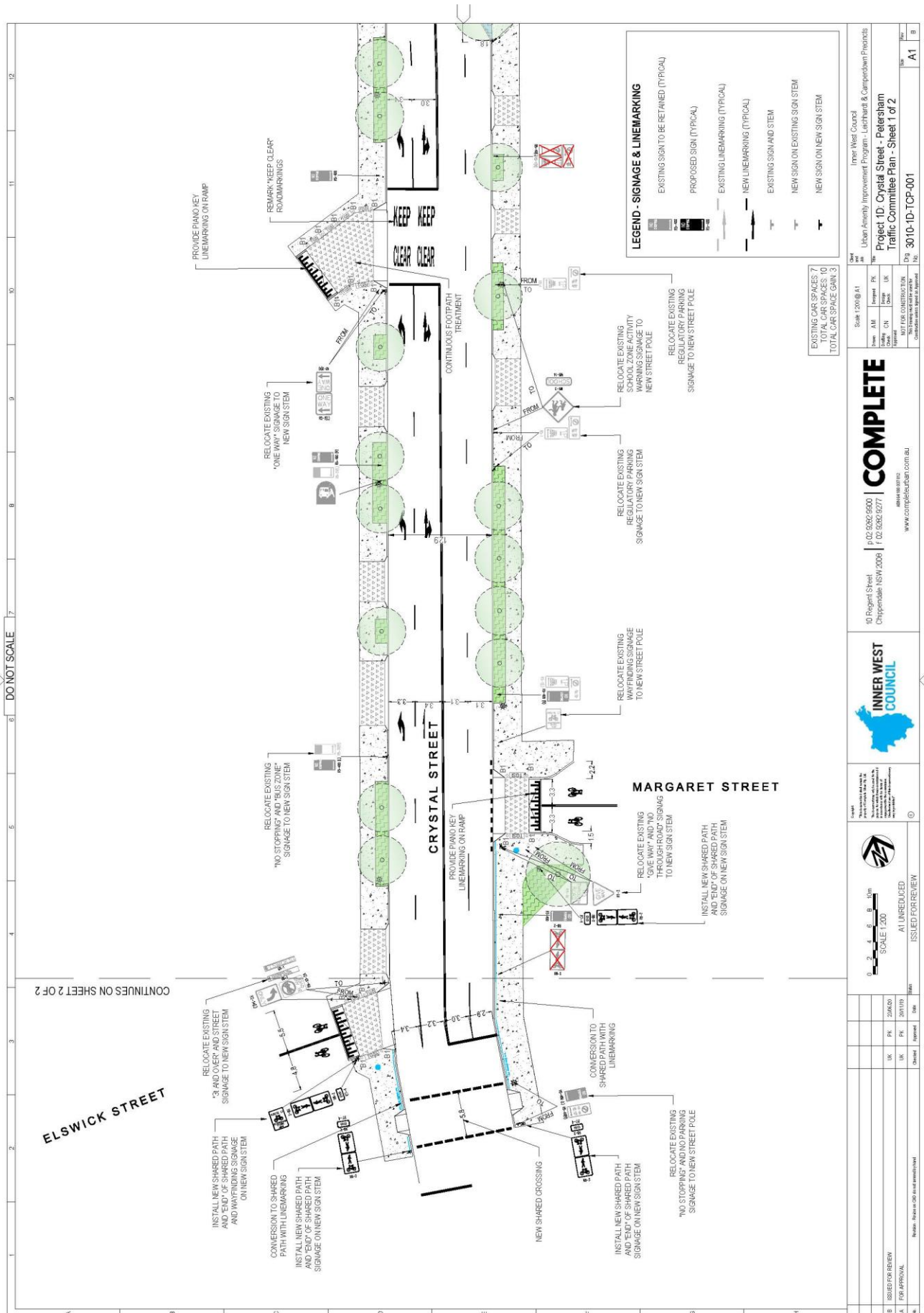
This concluded the business of the meeting.

ATTACHMENT (ITEM 5)

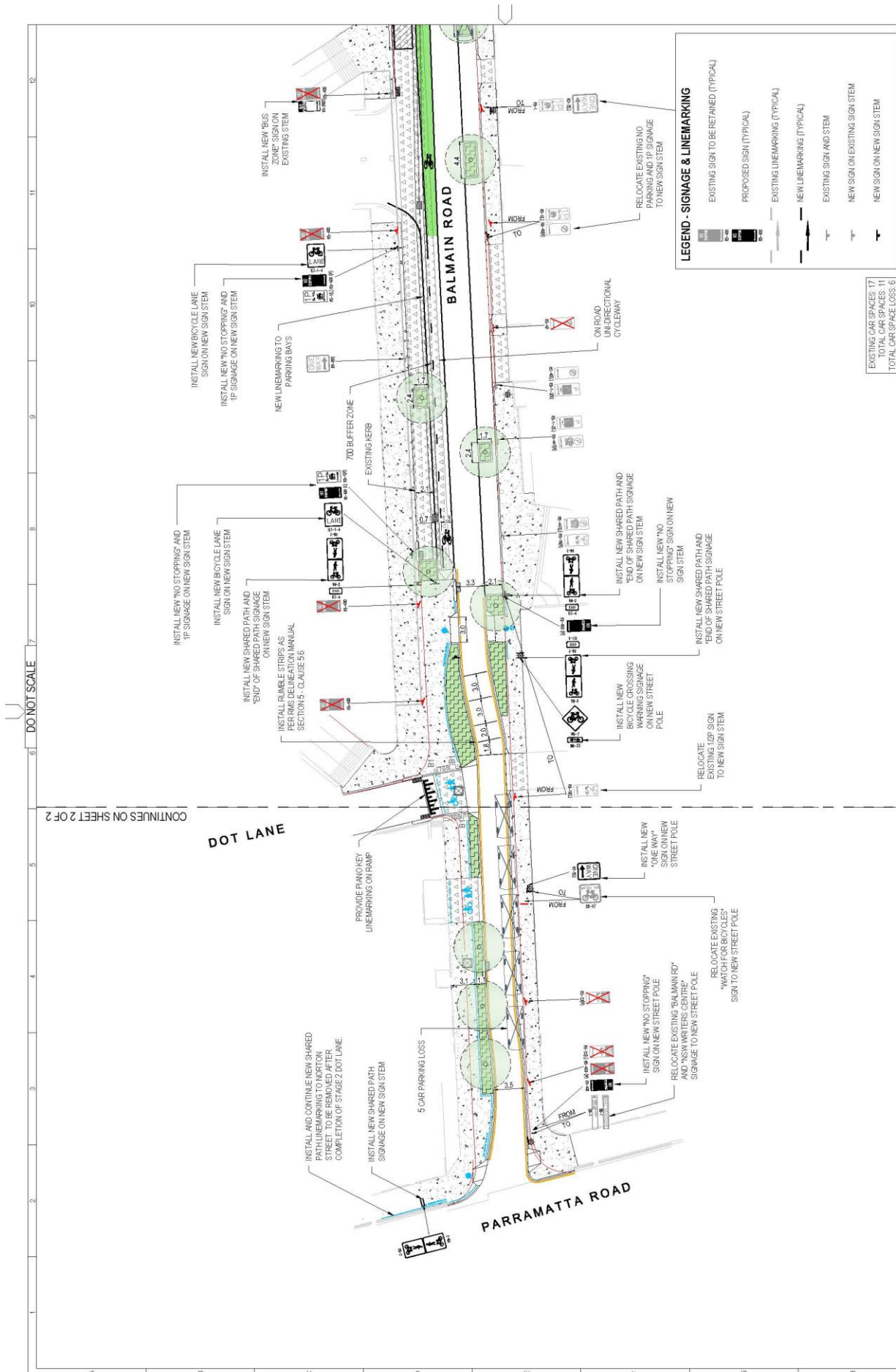






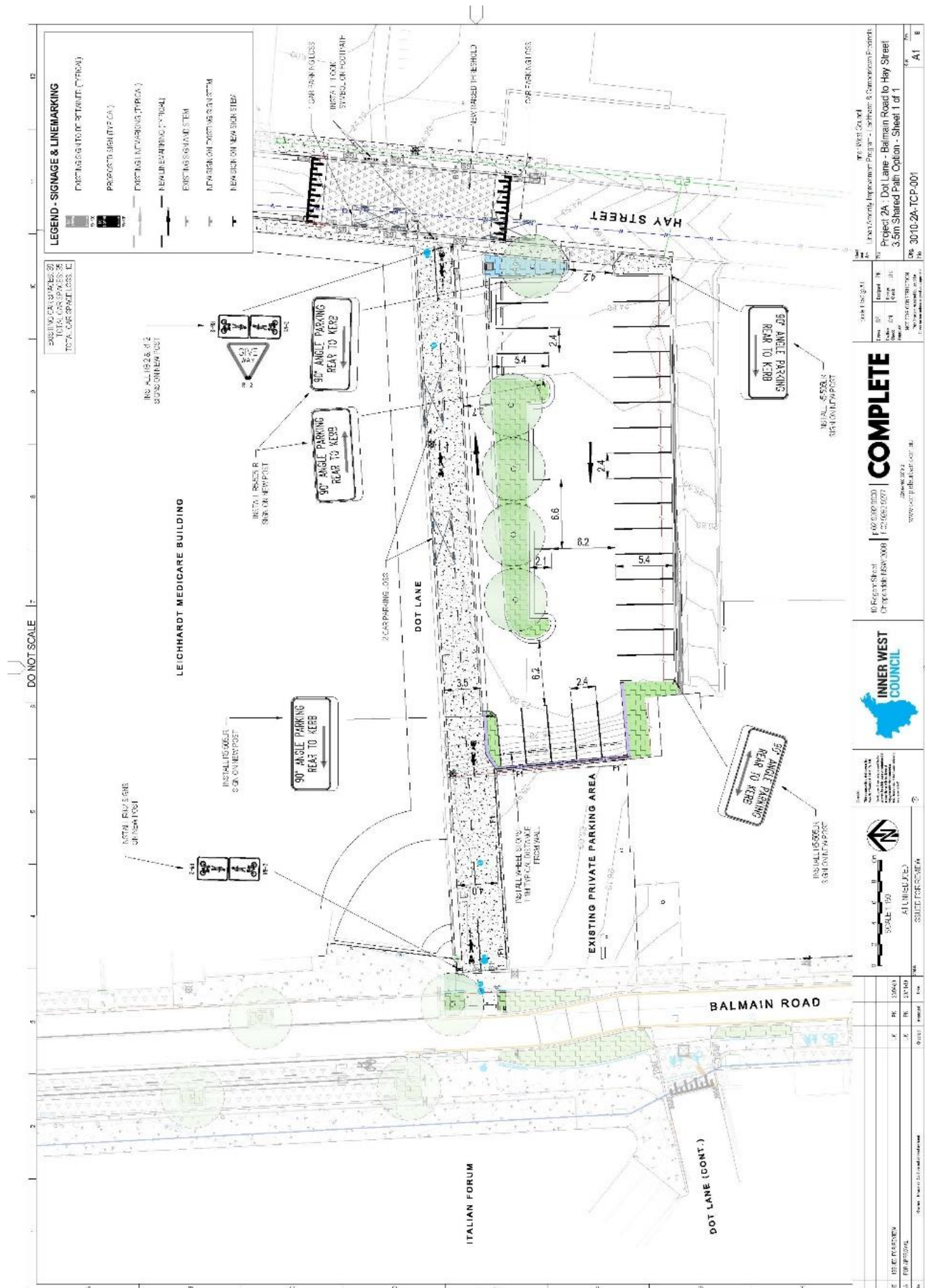


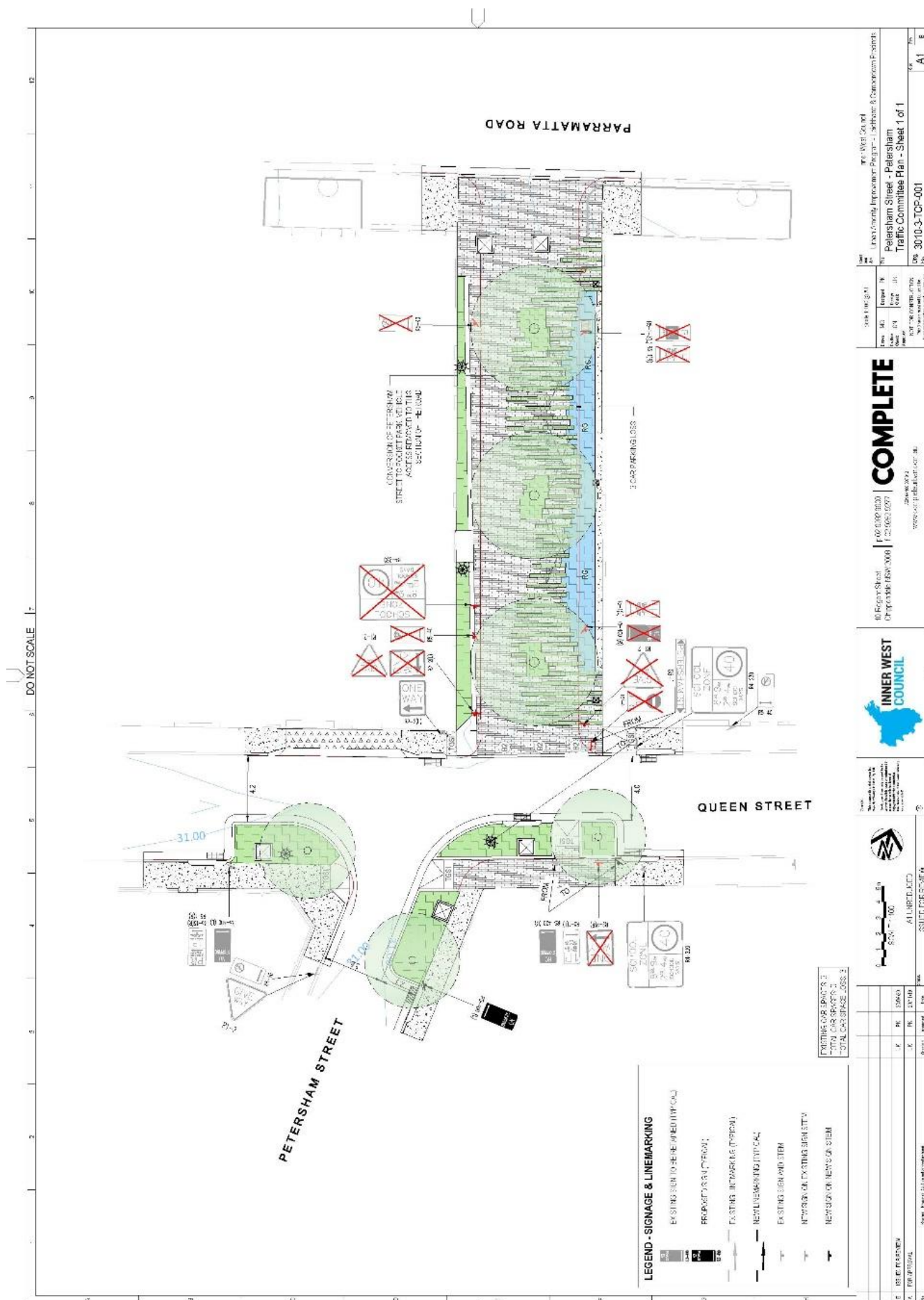


























Item No: LTC0820 Item 1

Subject: WARDELL ROAD AT PILE STREET, MARRICKVILLE – PROPOSED WORKS TO INCREASE AMENITY OF THE AREA AND IMPROVE PEDESTRIAN SAFETY - SIGNAGE AND LINE MARKING PLAN 10141 (MIDJUBURI – MARRICKVILLE WARD / SUMMER HILL ELECTORATE / INNER WEST PAC)

Prepared By: Jennifer Adams - Engineer – Traffic and Parking Services

Authorised By: Manod Wickramasinghe - Traffic and Transport Planning Manager

SUMMARY

Council has finalised a design plan for intersection upgrade works in Wardell Road at Pile Street, Marrickville. The proposed works will improve road safety at the intersection and addresses resident's concerns about speeding, driver behaviour and pedestrian safety in the area.

RECOMMENDATION

THAT the detailed design plan for the intersection upgrade works and associated signs and line markings in Wardell Road at Pile Street, Marrickville (as per Design Plan No.10141) be APPROVED.

BACKGROUND

Over time, there have been a number of serious crashes at the intersection of Wardell Road and Pile Street, Marrickville. Residents repeatedly raised concerns about the safety of the subject intersection citing issues of excessive speed of vehicles approaching the misaligned intersection. Formerly Council adopted a Local Area Traffic Management (LATM) plan for Marrickville West which recommended a series of projects including a proposed at-grade threshold in Pile Street, which is being implemented as part of these proposed works.

Further, it is noted that to improve road safety at the subject location an application for funding under the 2020/21 Federal Black Spot Program was submitted in July 2019 to upgrade the intersection. The project (P.0048226) was successful for funding of \$150,000 under the 2020/21 Federal Black Spot Program. The detailed design plan has now been finalised for the proposed upgrading of the intersection and is presented in this report for consideration, along with results of consultation for the Plan.

FINANCIAL IMPLICATIONS

The estimated cost of the project is \$200,000. Blackspot funding of \$150,000 has been allocated for the works under the 2020/2021 Capital Works Program for Traffic facilities.

OTHER STAFF COMMENTS

Wardell Road is a Regional Road carrying around 9,750 vehicles per day. Wardell Road at its intersection with Pile Street is somewhat misaligned and slopes downward at the bend (travelling southward). There are existing medians/refuges on the southern approach on Wardell Road and on the Pile Street approaches. The present configuration underpins speeding in the subject section of Wardell Road and requires remedial action.

To address the issue of speed at the bend in the subject section of Wardell Road it was proposed to narrow the carriageway along Wardell Road by realigning the kerb lines tapering the carriageway at its intersection with Pile Street, installing median islands to reduce the speed of traffic through the curved section of road, and align existing adjacent at grade threshold treatments accordingly. An associated upgrade of Give Way to MIST treatment (Median Island Stop Treatment) will be installed in Pile Street (east) at its intersection with Wardell Road. Skid surface on Wardell Road will also be checked.



The following works are proposed and are illustrated on the attached Design Plan 10141:

- Existing pedestrian refuge islands at this intersection are proposed to be reconstructed to the current standards;
- Four new landscaped kerb blisters;
- Provide an at-grade stencilled threshold treatment in Pile Street, at Wardell Road;
- Upgrade 3 new kerb ramps;
- Provide a linemarked centre island in Wardell Road with chevron markings;
- Reconstruct existing concrete footpath as required;
- Provide associated signage, RRPMS and linemarking associated with the works; and
- Upgrade lighting according to Australian Standards.

This proposal will result in the loss of two (2) parking spaces in Wardell Road, Marrickville.

PUBLIC CONSULTATION

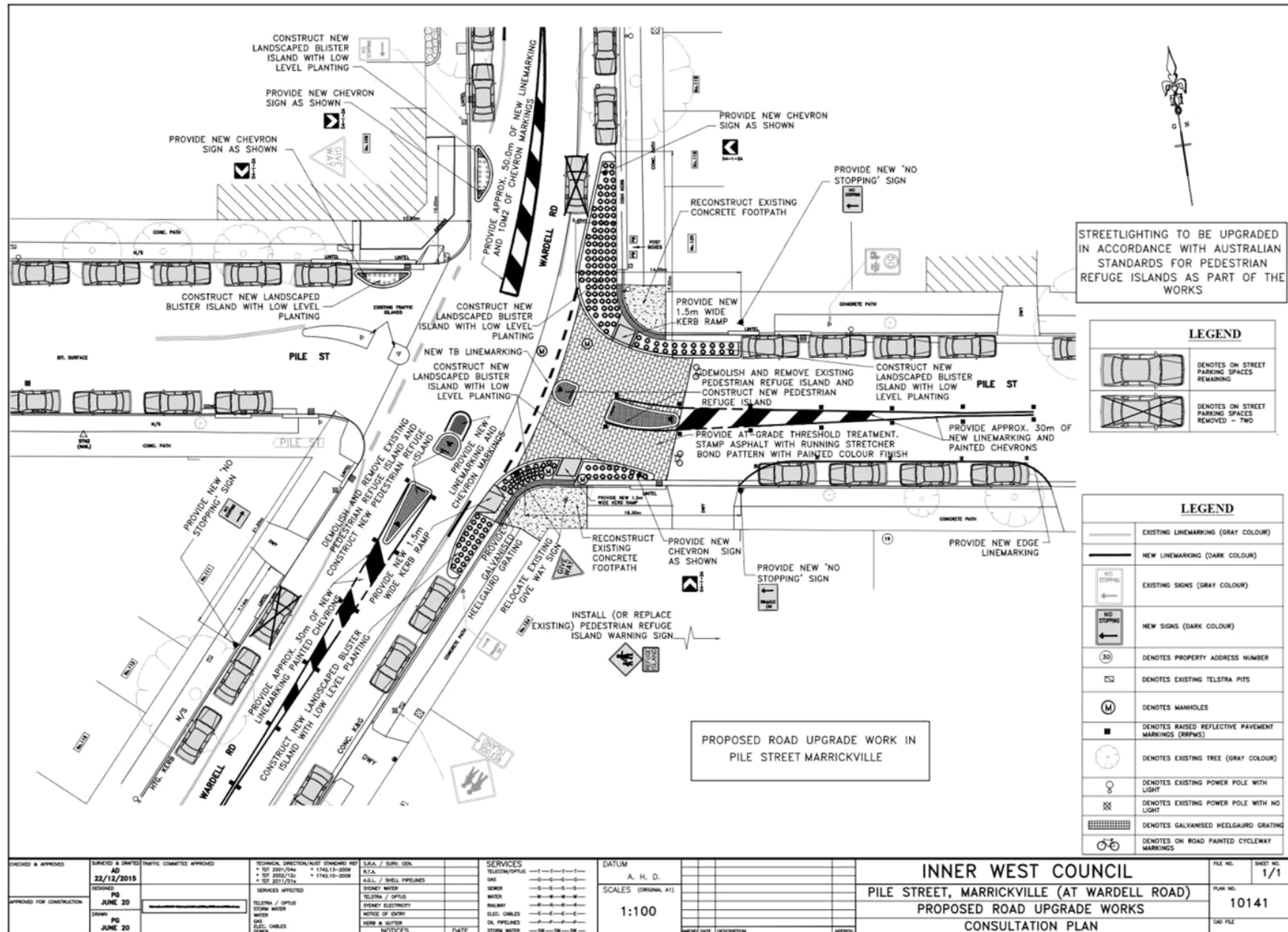
Consultation was conducted between 2 and 22 July 2020. A letter as well as a copy of the design plan was sent to the local residents in Wardell Road and Pile Street. A total of 205 letters were distributed.

Four (4) responses were received regarding this proposal. Responses were all mainly supportive of the proposed intersection upgrade works. One response raised concerns that the works may affect the drainage and flood their property, which will not be the case as kerb blisters are proposed to be separated from the existing kerb. One resident was concerned about loss of parking and requested a mobility parking space outside their property. The final response was a request for an additional grade stencilled threshold on the western side of Pile Street to curtail localized rat-running, which is out of the scope of works of this project noting also that a number of traffic calming devices are already present in Pile Street.

ATTACHMENTS

1. [Design Plan](#)

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Item No: LTC0820 Item 2

Subject: SMIDMORE STREET, MARRICKVILLE – MARRICKVILLE METRO EXPANSION WORKS – NOTICE OF CHANGE OF DATES FOR AN APPROVED OVERNIGHT TEMPORARY FULL ROAD CLOSURE TO INSTALL A PEDESTRIAN BRIDGE (MIDJUBURI – MARRICKVILLE WARD / NEWTOWN ELECTORATE / INNER WEST PAC)

Prepared By: Jennifer Adams - Engineer – Traffic and Parking Services

Authorised By: Manod Wickramasinghe - Traffic and Transport Planning Manager

SUMMARY

Notice of changes to Council approved dates for the temporary full road closure of Smidmore Street, between Edinburgh Road and Murray Street, Marrickville in order to install the pedestrian bridge connecting the existing and new centres at Marrickville Metro Shopping Centre have been received from MLA Transport Planning (MLATP). The previously approved dates were from 3:00pm on Wednesday 1 July 2020 to 9:00am Thursday 2 July 2020. The new proposed dates are now for a period of 16 hours from 2:00pm on Sunday 30 August 2020 to 6:00am Monday 31 August 2020 (contingency period of one-week start date Sunday 6 September 2020). It is recommended that the proposed change of dates for the temporary full overnight road closure be approved, subject to the conditions outlined in this report.

RECOMMENDATION

THAT the proposed temporary full road closure of Smidmore Street , between Edinburgh Road and Murray Street, Marrickville for a period of 16 hours from 2:00pm on Sunday 30 August 2020 to 6:00am Monday 31 August 2020 (contingency period of one-week start date Sunday 6 September 2020) be approved for the purpose of installing the pedestrian bridge connecting the existing and new Centres at Marrickville Metro subject to, but not limited to, the following conditions:

- 1. A Road Occupancy License be obtained by the applicant from the Transport Management Centre;**
- 2. All affected residents and businesses, including the NSW Police Area Commander, Fire & Rescue NSW and the NSW Ambulance Services be notified in writing, by the applicant, of the proposed temporary full road closure at least 7 days in advance of the closure with the applicant making reasonable provision for stakeholders;**
- 3. The occupation of the road carriageway must not occur until the road has been physically closed: and**
- 4. Subject to written concurrence from Sydney Metro TSE Group and Transit Systems / Sydney Buses is provided to Council.**

BACKGROUND

A report went to the 1 June 2020 Local Traffic Committee detailing the application by MLA Transport Planning (MLATP) for the temporary full road closure of Smidmore Street, between Edinburgh Road and Murray Street, Marrickville for a period of 18 hours from 3:00pm on Wednesday 1 July 2020 to 9:00am Thursday 2 July 2020 in order to install the pedestrian

bridge connecting the existing and new centres at Marrickville Metro Shopping Centre. Council adopted the recommendations at its meeting on 23 June 2020.

On 22 July 2020, Council was formally notified by MLATP that a change is required from the Council approved dates for the temporary full road closure of Smidmore Street and a new road closure application was submitted along with an amended TCP and TMP. The previously approved dates were from 3:00pm on Wednesday 1 July 2020 to 9:00am Thursday 2 July 2020. The new proposed dates are now for a period of 16 hours from 2:00pm on Sunday 30 August 2020 to 6:00am Monday 31 August 2020 (contingency period of one-week start date Sunday 6 September 2020).

It is noted that the original road closure did not go ahead due to complications inherent with the nominated proposed detour routes and other conflicting road closures. Meetings have been held amongst the various stakeholders (MLATP, Sydney Metro TSE Group, Council, TfNSW, Transit Systems, Sydney Buses, ADCO and JRK) as required to resolve the issues.

The Traffic Control Plan submitted with the new application and TMP are attached at the end of this report. The street would be temporary closed to all vehicular traffic, including emergency vehicles.

FINANCIAL IMPLICATIONS

Under Council's Fees & Charges, the applicant is to pay a fee for the temporary full road closure.

PUBLIC CONSULTATION

The applicant is to notify all affected residents and businesses in writing at least 7 days prior to the commencement of works.

The proposed road closure has been advertised on Council's website in accordance with the Roads Act 1993.

ATTACHMENTS

1. [↓](#) Smidmore Street Overnight Closure Traffic Control Plan
2. [↓](#) Smidmore Street Overnight Closure Traffic Management Plan



Smidmore St, Marrickville Proposed Overnight Closure

Traffic Management Plan



Smidmore St, Marrickville Proposed Overnight Closure

Traffic Management Plan

Report Version: Final

Report Date: 22 July 2020

Report Reference: 20008r02B-200722

Client: Adco Constructions Pty Ltd

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Appendices

Appendix A	Traffic Control Plan
Appendix B	TfNSW Concurrence



1 Introduction

This traffic management plan (TMP) has been prepared by MLA Transport Planning (MLA) in relation to a proposed overnight closure of Smidmore Street, Marrickville between Murray Street and Edinburgh Road. The proposed closure is required for the installation of a pedestrian foot bridge as part of the approved proposed expansion of Metro Marrickville Shopping Centre which is currently under construction. In addition to the proposed bridge installation, it is also proposed to undertake works associated with the installation of pavers within the approved Smidmore Street shared zone. These works are proposed to occur in the same road closure so to avoid another future road closure of Smidmore Street. Although the footbridge installation and paver installation are proposed to occur in the same road closure event, the works will be sequenced to occur consequentially. The footbridge installation will not occur at the same time as the paver installation.

The proposed closure is from 2:00pm on Sunday 30 August 2020 to 6:00am the next day.

The proposed overnight closure of Smidmore Street has been scheduled for a Sunday as there are no works being undertaken at other nearby construction sites on Sundays. As such, the proposed overnight closure does not overlap with other works in the vicinity. In addition, in the 3 July 2020 meeting with Inner West Council and Adco, Sydney Metro has provided their concurrence for the revised date.

It is noted that Edinburgh Road between Murray Street and Railway Parade is proposed to be closed for a period of six weeks to undertake other works. The closure of Smidmore Street will occur outside of the six-week Edinburgh Road closure period.

Figure 1.1 shows the location of proposed temporary road closure.



Figure 1.1: Location of Proposed Temporary Road Closure





2 Detailed Plan of Proposed Measures

Is a detailed plan of the proposed measures necessary?

Yes	<input checked="" type="checkbox"/>
No	<input type="checkbox"/>

Part of the approved expansion of the Marrickville Metro Shopping Centre includes a new pedestrian footbridge across Smidmore Street connecting the existing Centre with the new Centre. The new Centre is currently under construction. Mobile cranes are proposed to be used to lift the pedestrian footbridge in place. While the installation of the footbridge is taking place, Smidmore Street between Murray Street and Edinburgh Road is required to be closed to all traffic. The temporary closure of Smidmore Street is proposed for 30 August 2020 from 2:00pm to 6:00am the next day.

In the same closure event, it is proposed to undertake works associated with the installation of pavers for the approved Smidmore Street shared zone. The installation of pavers will be scheduled such that it occurs before and/or after the completion of the footbridge installation.

No works at other nearby construction site are being scheduled at the same time as the closure of Smidmore Street. The closure of the Smidmore Street will occur outside of the six-week closure period for Edinburgh Road.

Traffic management measures to manage traffic during the proposed closure are presented in the traffic control plan which is contained in Appendix A.



3 Identification and Assessment of Impact of Proposed Measures

Is a detailed assessment necessary?	
Yes	<input type="checkbox"/>
No	<input checked="" type="checkbox"/>

The proposed temporary closure of Smidmore Street will result in some traffic being re-diverted to alternate traffic routes as shown in Figure 3.1.

Figure 3.1: Diverted Traffic Routes During Temporary Closure



It is noted that traffic modelling conducted as part of the project application for the proposed expansion of Marrickville Metro Shopping Centre indicates that the surrounding intersections immediately adjacent to Smidmore Street where the proposed closure is located will have good intersection operation in the future i.e. Level of Service B or better – see Figure 3.2.



Figure 3.2: Post Development VISSIM Traffic Modelling Results



Although that traffic assessment included the partial closure of Smidmore Street, the modelling results shown in Figure 3.2 are still valid for the subject temporary closure as that traffic assessment factored in future growth of background traffic. Under this additional traffic loading, the nearby intersections are expected to operate with good level of service.

The subject closure involves the full closure of Smidmore Street, but at existing traffic level (not future traffic level as that assessed in the previous assessment).

In the light of the above, the proposed overnight closure of Smidmore Street is not expected to create any traffic impacts in the local road network.



4 Measures to Ameliorate the Impact of Re-Assigned Traffic

Is an assessment required?	
Yes	<input type="checkbox"/>
No	<input checked="" type="checkbox"/>

As discussed in Section 3, the proposed temporary road closure will not create any traffic impacts. As such, traffic measures to ameliorate traffic impacts are not required.



5 Assessment of Affected Public Transport Services

Is an assessment required?	
Yes	<input type="checkbox"/>
No	<input checked="" type="checkbox"/>

Public transport services have been relocated on a temporary basis to other locations. During the closure, Smidmore Street will not have any public transport services using it. As such, the proposed closure will not affect public transport services.

Notwithstanding, MLA has consulted TfNSW, STA and Transit Systems. TfNSW advised that they have no issues with the proposed road closure on the condition Edinburgh Road remains open and no other conflicting works are scheduled at the same time.

Their concurrence is contained in Appendix B.



6 Details of Provision Made for Emergency Vehicles, Heavy Vehicles, Cyclists and Pedestrians

Are these details required?	
Yes	<input type="checkbox"/>
No	<input checked="" type="checkbox"/>

No special provisions for emergency vehicles will be required as emergency vehicles will have the use of alternative routes in the local road network such as Edinburgh Road and Murray Street. However, emergency vehicles can be let through if required.

Provision for heavy vehicles will not be required since the heavy vehicles will have available other alternative routes in the local road network. See traffic control plan in Appendix A for details.

Similarly, cyclists and pedestrians will be directed to use other alternative routes. See traffic control plan in Appendix A for details.



7 Assessment of Effect on Existing and Future Developments with Transport Implications in the Vicinity of the Proposed Measures

Is an assessment required?

Yes	<input type="checkbox"/>
No	<input checked="" type="checkbox"/>

This is not required as the proposed closure is only a temporary one i.e. overnight closure.

At any rate, the proposed closure of Smidmore Street will not have any impacts on the access to existing and future developments in the vicinity.



8 Assessment of Effect of Proposed Measures on Traffic Movements in Adjoining Council Areas

Is an assessment required?	
Yes	<input type="checkbox"/>
No	<input checked="" type="checkbox"/>

The proposed closure will not affect traffic movements in adjoining Council areas.



9 Public Consultation Process

Is a public consultation process required?

Yes	<input type="checkbox"/>
No	<input checked="" type="checkbox"/>

Public consultation has not been undertaken at this stage as this is a proposed temporary overnight closure.

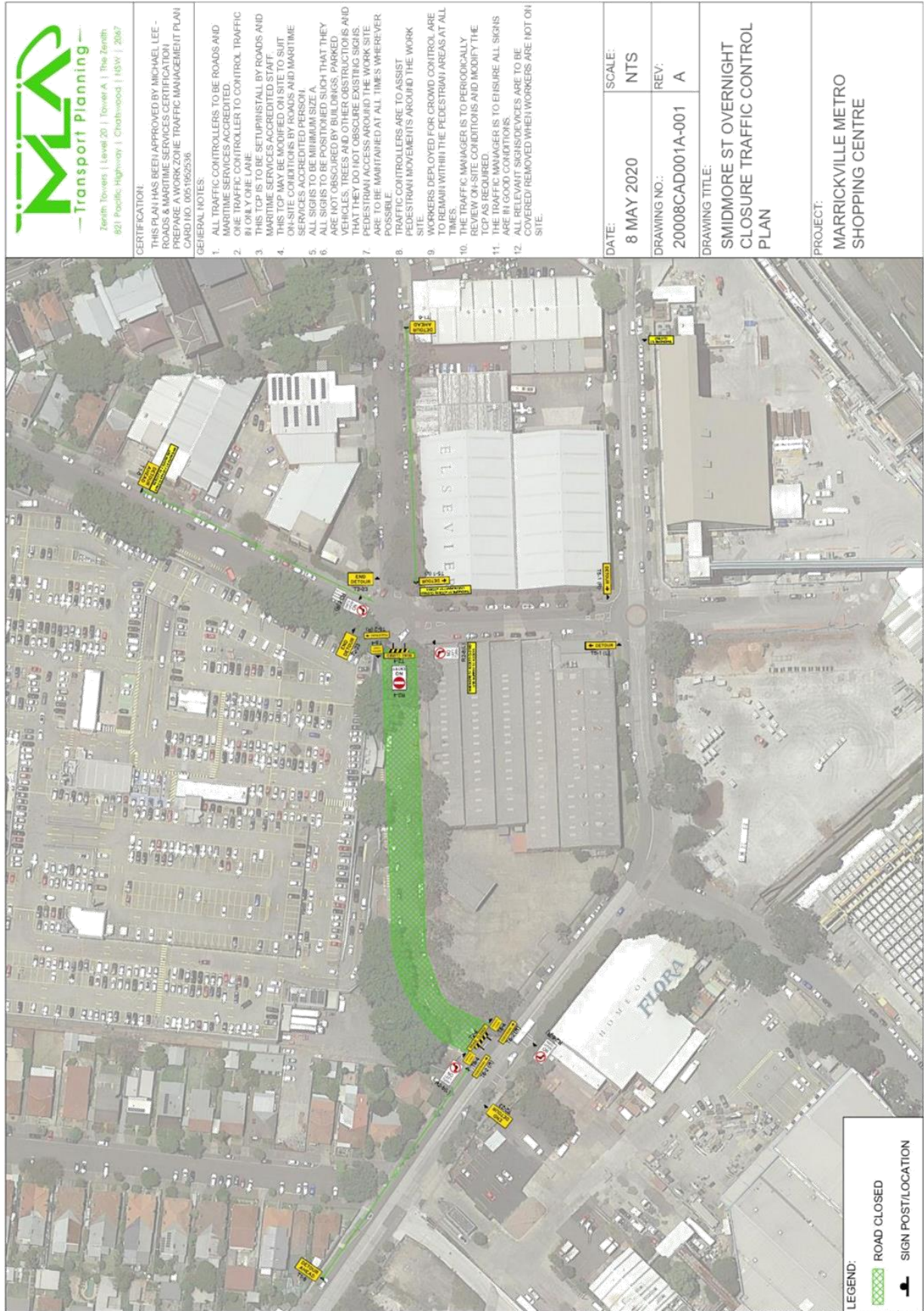
It is noted that, under the Roads Act 1993, Council is required to advertise any proposed road closure.

However, if this is required by Inner West Council Adco will also prepare and distribute a community notification letter to local residents and businesses within 400m of Smidmore Street.



Appendix A

Traffic Control Plan





Appendix B

TfNSW Concurrence

Michael Lee

From: Elizabeth Harrison <Elizabeth.Harrison@tmc.transport.nsw.gov.au>
Sent: Wednesday, 22 July 2020 10:29 AM
To: Michael Lee
Cc: Bushara Gidies; Adrian Prichard
Subject: RE: Marrickville Metro Shopping Centre - Proposed Overnight Closure of Smidmore St

Hi Michael,

I've just spoken with Bushara and can confirm:

- No objections are raised to the overnight closure of Smidmore Street, Marrickville between Murray Street and Edinburgh Road from 5:00pm on Sunday 30 August 2020 to 6:00am the next day, on the condition that Edinburgh Road remains open and no other conflicting works are scheduled at the same time;
- OR
- No objections are raised to the overnight closure of Smidmore Street, Marrickville between Murray Street and Edinburgh Road from 18:45 to 05:15am (outside bus operating hours of Route 355, last trip on Sunday at 18:30 and first trip Monday morning 05:33)

Kind regards – Liz

Elizabeth Harrison
Transport Planning Project Manager | Transport Integration
Sydney Coordination Office, Greater Sydney
Transport for NSW

M: 0488 432 805
E: elizabeth.harrison@tmc.transport.nsw.gov.au
Level 44 680 George Street Sydney NSW 2000



I acknowledge the Australian Aboriginal and Torres Strait Islander peoples as the first inhabitants of the nation and the traditional custodians of the lands where we live, learn and work.

From: Michael Lee [mailto:michael.lee@mlatp.com.au]
Sent: Monday, 20 July 2020 2:45 PM
To: Bushara Gidies <Bushara_Gidies@sta.nsw.gov.au>; Adrian Prichard <APrichard@transitsystems.com.au>
Cc: Elizabeth Harrison <Elizabeth.Harrison@tmc.transport.nsw.gov.au>
Subject: RE: Marrickville Metro Shopping Centre - Proposed Overnight Closure of Smidmore St

Hi Bushara,

During the proposed overnight closure of Smidmore Street (although it will take place during the closure of Edinburgh Road), there will be no other work taking place at the same time as the Smidmore Street closure.

MLA Transport Planning

Zenith Towers | Level 20 | Tower A | The Zenith

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Weekly Notifications - Council's website – amendments 23 July 2020

NOTICE OF TEMPORARY FULL ROAD CLOSURE

Inner West Council intends to apply for consent under the *Roads Act 1993* to close, by the use of temporary barricades, **Edinburgh Street, between Murray Street and Railway Parade, Marrickville for a period of 6 weeks from Monday 31 August 2020 to 12 October 2020 (contingency period of one week start date Monday 7 September 2020)** for the purpose of excavation works for sewer connection to main line.

Any person is entitled to make a written submission regarding this proposed closure via email to council@innerwest.nsw.gov.au by 12 August 2020.

NOTICE OF TEMPORARY FULL ROAD CLOSURE

Inner West Council intends to apply for consent under the *Roads Act 1993* to close, by the use of temporary barricades, **Smidmore Street, Marrickville between Edinburgh Road and Murray Street, Marrickville for a period of 16 hours from 2:00pm on Sunday 30 August 2020 to 6:00am Monday 31 August 2020 (contingency period of one-week start date Sunday 6 September 2020)** in order to install the pedestrian bridge connecting the existing and new Centres at Marrickville Metro.

Any person is entitled to make a written submission regarding this proposed closure via email to council@innerwest.nsw.gov.au by 12 August 2020.

Item No: LTC0820 Item 3

Subject: EDINBURGH STREET, MURRAY STREET AND RAILWAY PARADE, MARRICKVILLE – MARRICKVILLE METRO EXPANSION WORKS – NOTICE OF CHANGE OF DATES OF A TEMPORARY FULL ROAD CLOSURE FOR A 6 WEEK PERIOD STARTING 31 AUGUST 2020 – TO UNDERTAKE EXCAVATION WORKS FOR SEWER CONNECTION TO MAIN LINE (MIDJUBURI – MARRICKVILLE WARD / NEWTOWN ELECTORATE / INNER WEST PAC)

Prepared By: Jennifer Adams - Engineer – Traffic and Parking Services

Authorised By: Manod Wickramasinghe - Traffic and Transport Planning Manager

SUMMARY

Council has received notice, from John R Keith P/L (contractor to Marrickville Metro Shopping Centre expansion works/ADCO), of change of dates of a proposed temporary full road closure of parts of Edinburgh Road, Murray Street and Railway Parade, Marrickville for a 6 week period for the purpose of undertaking excavation works for a sewer connection to the main line. Prior dates were from 6 July to 1 August 2020 and now the new proposed dates are 31 August to 12 October 2020 (contingency period of one week start date Monday 7 September 2020). It is recommended that the proposed change of dates for the temporary full road closure be approved, subject to the conditions outlined in this report.

RECOMMENDATION

THAT the proposed temporary full road closure of Edinburgh Street, Murray Street and Railway Parade, Marrickville for a period of 6 weeks from Monday 31 August 2020 to 12 October 2020 (contingency period of one week start date Monday 7 September 2020) be approved for the purpose of sewer connection works relating to Marrickville Metro Expansion works subject to, but not limited to, the following conditions:

1. A Road Occupancy License be obtained by the applicant from the Transport Management Centre;
2. All affected residents and businesses, including the NSW Police Area Commander, Fire & Rescue NSW and the NSW Ambulance Services be notified in writing, by the applicant, of the proposed temporary full road closure at least 7 days in advance of the closure with the applicant making reasonable provision for stakeholders;
3. The occupation of the road carriageway must not occur until the road has been physically closed;
4. Subject to written concurrence from Sydney Metro TSE Group and Transit Systems / Sydney Buses is provided to Council; and
5. The temporary removal and reinstatement of any Council assets will be at the applicants cost and to Council satisfaction.

BACKGROUND AND OTHER STAFF COMMENTS

These proposed road closures were previously considered and supported at the 6 July 2020 Local Traffic Committee. Council has now received notice, from John R Keith P/L (contractor to Marrickville Metro Shopping Centre expansion works), of change of dates of the proposed 6-week temporary full road closure of parts of Edinburgh Road, Murray Street and Railway Parade, Marrickville. Prior dates were from 6 July to 1 August 2020 and the new proposed dates are 31 August to 12 October 2020 (contingency period of one week start date Monday 7 September 2020) for the purpose of undertaking excavation works for a sewer connection.

The updated Traffic Control Plan (TCP) and Traffic Management Plan (TMP) is attached.

It is noted that concerns regarding this road closure was raised at the 6 July 2020 LTC meeting by both TfNSW and Transit Systems. TfNSW requested that a Road Occupancy Licence be received for these works; this requirement has been incorporated into the recommendation.

Transit Systems raised concern with the adequacy of the proposed detour routes for the Transit Systems 308 Route and the State Transit 355 Route. In response, part four of the recommendation includes a requirement that concurrence is received from Transit Systems/Sydney Buses prior to implementation of any road closure.

It is further noted that meetings have been held amongst the various stakeholders (Sydney Metro TSE Group, Council, TfNSW, Transit Systems, ADCO, MLATP and JRK) as required after the road closure application originally came into Council as the proposed detour route of Smidmore Street was not available due to a Road Occupancy permit that had been issued which included a partial road closure of Smidmore Street with traffic flowing only eastbound in one lane. Sydney Metro TSE Group and JRK have come to some consensus in working together with the temporary full road closure and completing their own works in a condensed time frame.

Edinburgh Road is a local road and acts as a collector road between Victoria Road in the west and Edgeware Road in the east. Between Murray Street and Edgeware Road, Edinburgh Road carries an average 9151 vehicles per day. Along its length it is generally a one lane two-way undivided roadway with kerbside parking on both sides of the road. Its closure will have a major impact especially with the partial closure of Smidmore Street in place at the same time.

As noted, MLATP have been in consultation with Transit Systems /Sydney Buses, along with other relevant stakeholders. Their updated TMP states the following regarding concerns related to bus movements:

"The proposed temporary closure of Edinburgh Road would affect the operation of bus services along Edinburgh Road. Adco and Sydney Metro will continue to work and liaise with the bus operators to ensure disruption to bus services is kept to a minimal.

In addition, MLA has consulted STA and Transit Systems in relation to re-directing their existing bus services in the area, namely Bus Routes 308, 352 and 355. MLA has developed options to re-direct these services which are shown in Appendix B. MLA is currently seeking feedback from the bus operators. (page 7)

Adco and Sydney Metro will continue to work and liaise with the bus operators to ensure disruption to bus services is kept to a minimal. The consulting process will continue post approval by Inner West Council Local Traffic Committee." (page 11)

Thus, this closure has been conditioned to the agreement of Transit Systems/Sydney Buses as well as Sydney Metro.

Temporary removal and reinstatement of Council assets

Further, for suitable bus access a number of Council's assets may need to be temporarily removed and it is noted that removal and reinstatement of Council assets will be at the applicants cost and to Council satisfaction. Should the median strip at the intersection of Murray Street and Victoria Road be removed it is noted that an extension of the existing 'No Parking restrictions on the eastern side of Murray Street at Victoria Road intersection may be required and several on-street car parking spaces be temporarily lost and this will require separate approval.

FINANCIAL IMPLICATIONS

Under Council's Fees & Charges, the applicant is to pay a fee for the temporary full road closure along with any other required road occupancy and/or road opening permit fees.

All works and costs of implementation will be borne by the applicant

PUBLIC CONSULTATION

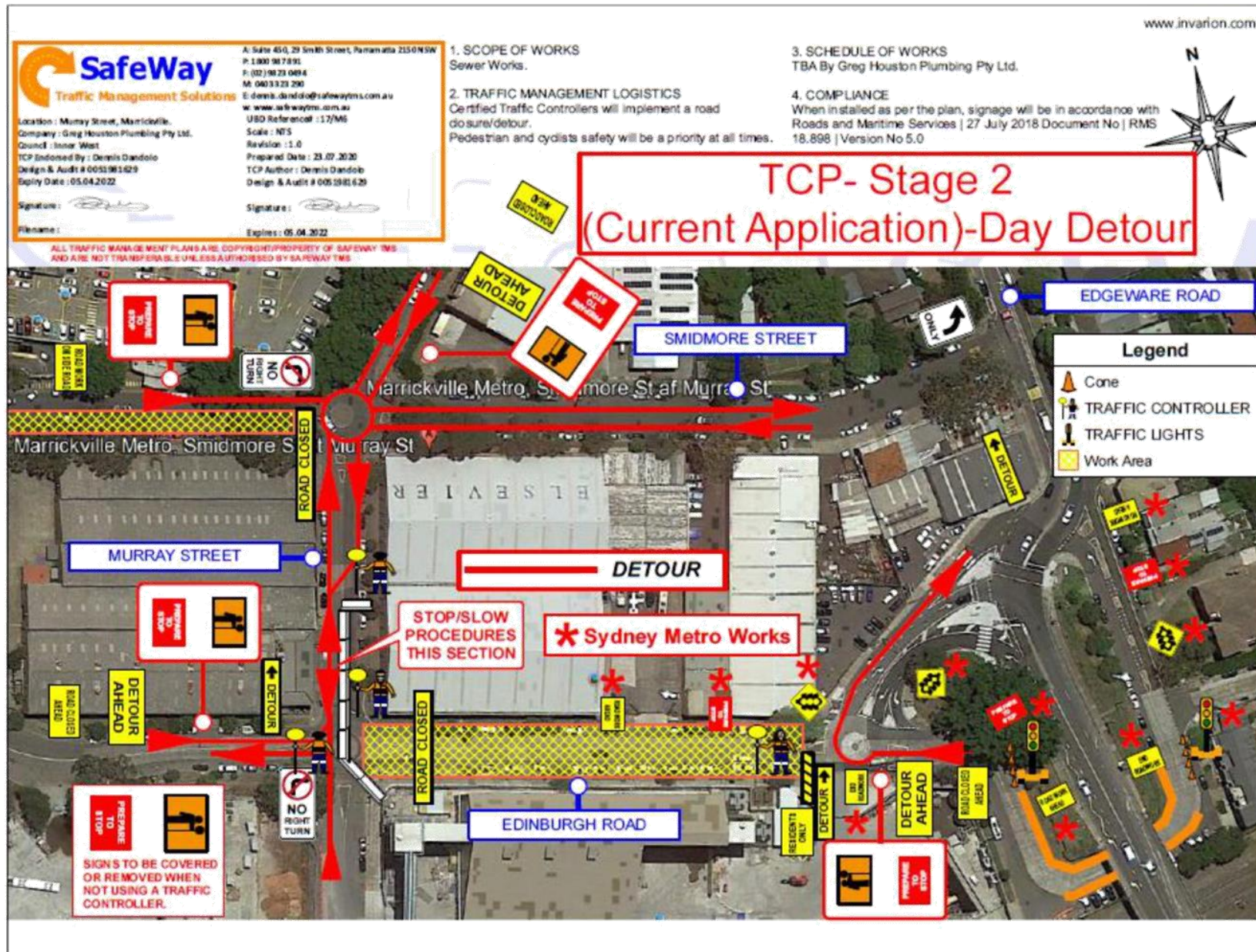
The applicant is to notify all affected residents and businesses in writing at least 7 days prior to the commencement of works.

The proposed road closure has been advertised on Council's website in accordance with the Roads Act 1993.

Two local businesses (1 Edinburgh Road and 11a Edinburgh Road Road) have currently raised concerns regarding the impact the proposed full road closures will have on their businesses as access is solely from Edinburgh Road. The response from MLATP / ADCO to Council is that they have contacted the first business owner and they will work with them and the business has been told they will be provided with additional resources to notify and assist customers how best to access the site during the closure. The second business has also been contacted and advised that traffic controllers will escort customers from the eastern entrance into their business during business hours.

ATTACHMENTS

1. [TCP - 200723-Edinburgh Rd TMP](#)
2. [20008r04D-200723-Edinburgh Rd TMP](#)





Edinburgh Road, Marrickville Proposed Temporary Road Closure

Traffic Management Plan



Edinburgh Road, Marrickville Proposed Temporary Road Closure

Traffic Management Plan

Report Version: Final

Report Date: 23 July 2020

Report Reference: 20008r04D-200723

Client: Adco Constructions Pty Ltd

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Appendices

Appendix A	Traffic Control Plan
Appendix B	Proposed Diversion for Bus Services

1 Introduction

This traffic management plan (TMP) has been prepared by MLA Transport Planning (MLA) in relation to a proposed temporary closure road of Edinburgh Road, Marrickville between Murray Street and Railway Parade. Figure 1.1 shows the location of proposed road closure.

Figure 1.1: Location of Proposed Upgrade Works



The proposed road closure is jointly proposed by Adco and Sydney Metro to undertake works within Edinburgh Road in relation to their respective project as follow:

- Adco proposes to complete the required sewer diversion connection works which connect the existing/new centres and the existing neighbourhood sewer line to the existing oviform on Edinburgh Road, and
- Sydney Metro proposes to complete high voltage electrical trenching works along the southern side of Edinburgh Road.

The works will be undertaken during the hours from 6:00am to 5:00pm.

The proposed road closure is for a period of six weeks starting 31 August 2020 to 11 October 2020.

During the proposed closure period, Edinburgh Road will be closed to through traffic in both directions. Access to affected properties will be maintained. Vehicles accessing affected properties will be escorted through the use of qualified traffic controllers and signage.



In addition, during the period of the proposed closure of Edinburgh Road, Smidmore Street will continue to permit one-way traffic in the eastbound direction only.

2 Detailed Plan of Proposed Measures

Is a detailed plan of the proposed measures necessary?

Yes	<input checked="" type="checkbox"/>
No	<input type="checkbox"/>

Traffic management measures are proposed to manage traffic in the vicinity of the site. The traffic management measures are contained in the traffic control plan (TCP) prepared by SafeWay Traffic Management Solutions which is provided in Appendix A.

3 Identification and Assessment of Impact of Proposed Measures

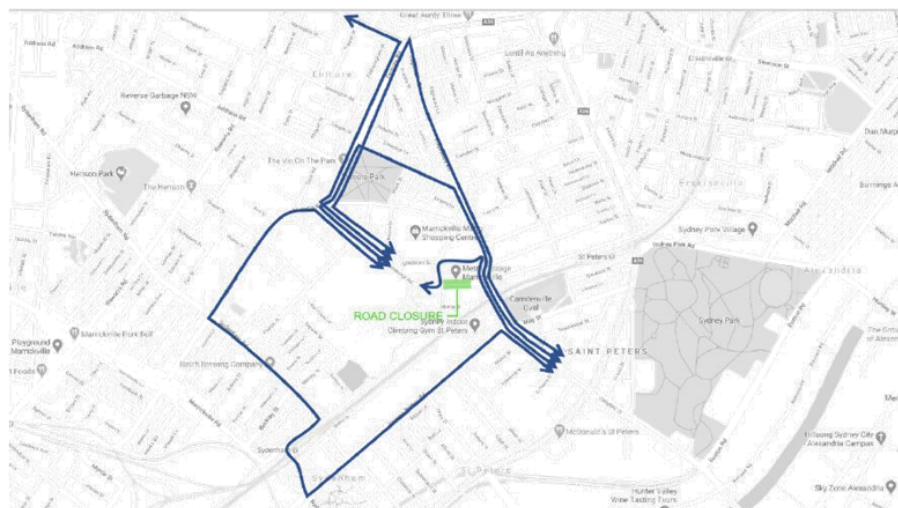
Is a detailed assessment necessary?	
Yes	<input type="checkbox"/>
No	<input checked="" type="checkbox"/>

The closure of Edinburgh Road between Murray Street and Railway Parade will require traffic to be diverted to alternative routes. These include:

- Smidmore Street/Murray Street/Edinburgh Road
- Edgeware Road/Llewellyn Street/Enmore Road/Edinburgh Road
- Edgeware Road/Enmore Road/Edinburgh Road
- Bedwin Road/Unwins Bridge Road/Gleeson Avenue/Railway Parade/Sydenham Road/Victoria Road/Edinburgh Road, and
- Stanmore Road/Enmore Road/Edinburgh Road.

The alternative routes are shown in Figure 3.1.

Figure 3.1: Diverted Traffic Routes



4 Measures to Ameliorate the Impact of Re-Assigned Traffic

Is an assessment required?

Yes	<input type="checkbox"/>
No	<input checked="" type="checkbox"/>

There are numerous available alternative routes. Following the temporary closure of Edinburgh Road, the traffic on Edinburgh Road could be diverted across a number of alternative routes within the road network. As such, the traffic once it has been diverted to the various alternative routes, it would be spread out across the road network and is not expected to create any adverse traffic impacts. Therefore, ameliorate measures would not be required.

5 Assessment of Affected Public Transport Services

Is an assessment required?	
Yes	<input checked="" type="checkbox"/>
No	<input type="checkbox"/>

The proposed temporary closure of Edinburgh Road would affect the operation of bus services along Edinburgh Road.

Adco and Sydney Metro will continue to work and liaise with the bus operators to ensure disruption to bus services is kept to a minimal.

In addition, MLA has consulted STA and Transit Systems in relation to re-directing their existing bus services in the area, namely Bus Routes 308, 352 and 355. MLA has developed options to re-direct these services which are shown in Appendix B. MLA is currently seeking feedback from the bus operators.

6 Details of Provision Made for Emergency Vehicles, Heavy Vehicles, Cyclists and Pedestrians

Are these details required?	
Yes	<input checked="" type="checkbox"/>
No	<input type="checkbox"/>

Emergency vehicles access will be maintained. Emergency vehicles will be let through where required.

Heavy vehicles will be diverted around the closed section of Edinburgh Road using the previous identified alternative routes.

It is noted that the section of Edinburgh Road proposed to be closed at present does not have any facilities for cyclists.

Pedestrian access will be diverted to alternative routes.

7 Assessment of Effect on Existing and Future Developments with Transport Implications in the Vicinity of the Proposed Measures

Is an assessment required?	
Yes	<input type="checkbox"/>
No	<input checked="" type="checkbox"/>

In relation to existing developments, access will be maintained for affected properties.

In relation to future developments, the proposed road closure is a temporary road closure for a period of six weeks. It is not expected that it would have any implications to future developments in the vicinity of the proposed road closure.

8 Assessment of Effect of Proposed Measures on Traffic Movements in Adjoining Council Areas

Is an assessment required?

Yes	<input type="checkbox"/>
No	<input checked="" type="checkbox"/>

There will be no impacts on traffic movements in adjoining Council areas. The proposed works is located entirely within the administrative area of Inner West Council.

9 Public Consultation Process

Is a public consultation process required?	
Yes	<input checked="" type="checkbox"/>
No	<input type="checkbox"/>

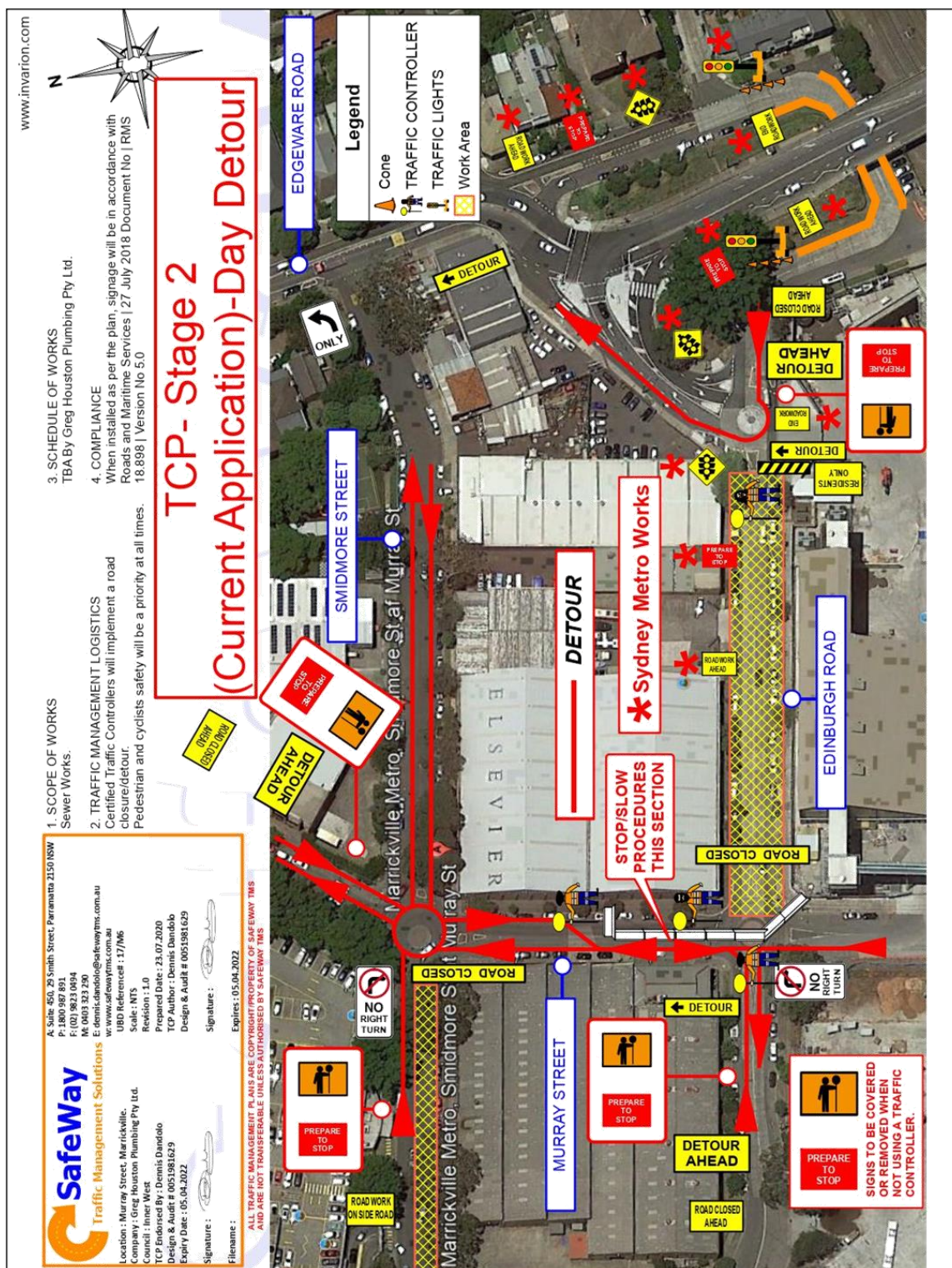
Adco and Sydney Metro will continue to work and liaise with the bus operators to ensure disruption to bus services is kept to a minimal. The consulting process will continue post approval by Inner West Council Local Traffic Committee.

In relation to local residents and businesses, it is understood that Inner West Council has advertised the proposed closure on Council's website for a period of 28 days.



Appendix A

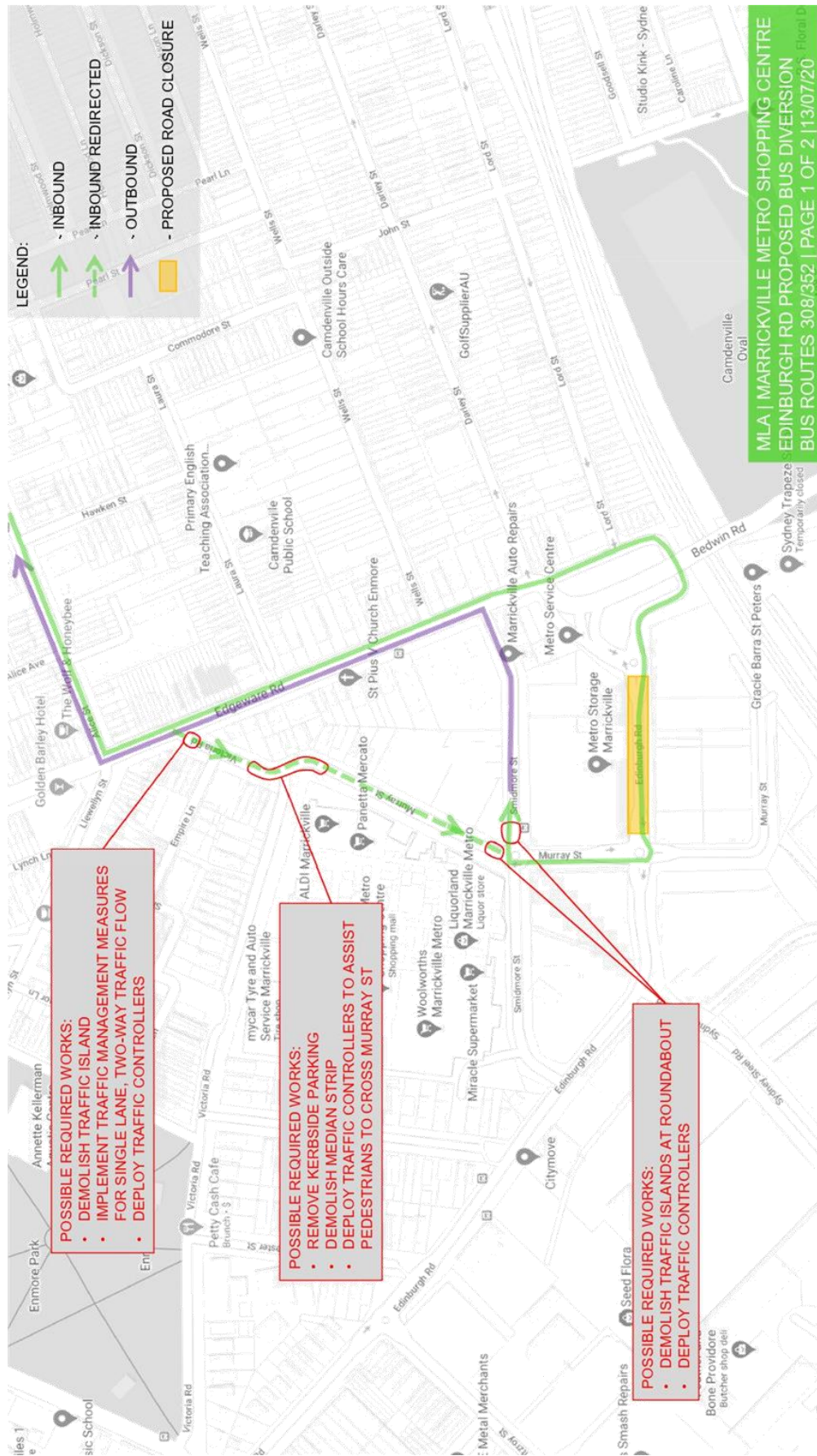
Traffic Control Plan

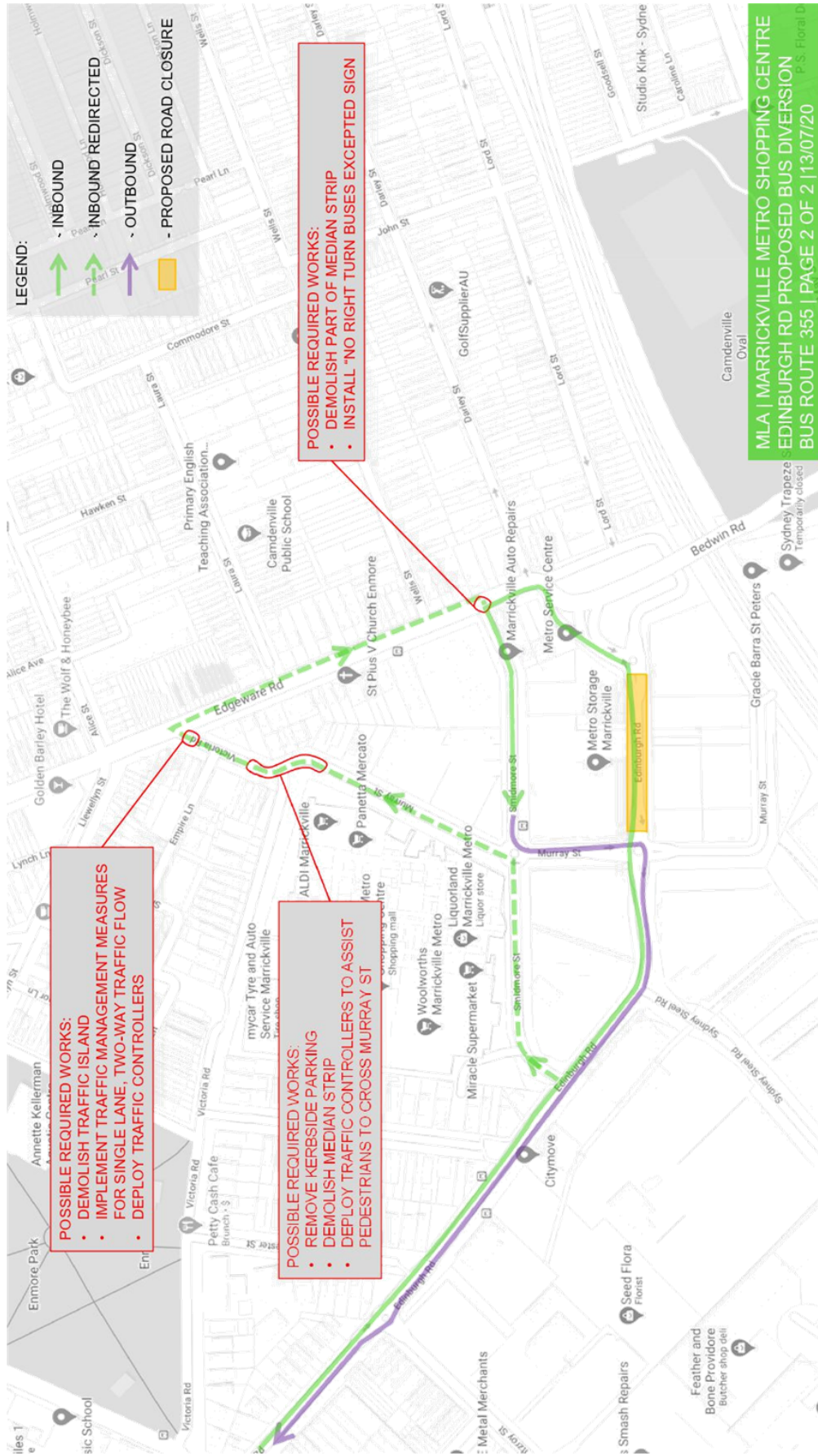




Appendix B

Proposed Diversion for Bus Services





MLA Transport Planning

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Item No: LTC0820 Item 4

Subject: CHANDOS STREET, HABERFIELD - PROPOSED INTERSECTION MODIFICATION (GULGADYA-LEICHHARDT WARD/SUMMER HILL ELECTORATE/BURWOOD PAC)

Prepared By: Felicia Lau - Engineer - Traffic and Parking Services

Authorised By: Manod Wickramasinghe - Traffic and Transport Planning Manager

SUMMARY

Council at its meeting held on 23 June 2020 resolved to close Chandos Street, Haberfield to left turning vehicles from Parramatta Road. This is intended to restrict eastbound rat-run traffic into the Haberfield local street network.

RECOMMENDATION

THAT:

1. The Council resolution to close Chandos Street, Haberfield to left turning vehicles from Parramatta Road be supported and a Traffic Management Plan (TMP) be prepared and forwarded to TfNSW for approval;
2. This closure be implemented by signposting of a 'No Left Turn' restriction and installation of an interim linemarking and road flap treatment; and
3. Design and construction of a kerb extension to physically restrict left turn movements be listed on Council's capital works program.

BACKGROUND AND OTHER STAFF COMMENTS

Council at its meeting held on 23 June 2020 resolved to close Chandos Street, Haberfield to left turning vehicles from Parramatta Road in order to protect the amenity of the street from rat-running traffic. This proposal is in line with Council's Local Area Improvement Strategy (LAIS) which recommended traffic diversions at Chandos Street to restrict traffic from Parramatta Road following the opening of the M4 East tunnels.

Traffic is noted to currently detour via Chandos Street when congestion builds on approach to the M4 East/Parramatta Road eastbound lane merge.

Traffic surveys were undertaken in Chandos Street, Haberfield prior to the opening of the M4-East and further post-opening traffic data was provided by TfNSW. The commuter peak hour identified for the AM and PM peak is 6:00am-7:00am and 5:00pm-6:00pm respectively. The table below details the 3-hour, peak hour traffic volumes.

Survey	AM Peak (vehicle/hour)			PM Peak (vehicle/hour)		
	6-7am	7-8am	8-9am	4-5pm	5-6pm	6-7pm
Pre-Opening	12	39	80	39	43	19
Post-Opening	48	47	104	26	31	13

The traffic surveys show that traffic volumes have increased by 300% between 6-7am during the weekdays, which identifies that there is an increase in rat-running traffic via Chandos Street in the morning peak.

Chandos Street was also identified as being further impacted by the recently exhibited Transport for New South Wales' Road Network Improvement proposal in which the dedicated right turn lane from Parramatta Road into Dalhousie Street was removed and replaced by a U-turn bay between Chandos Street and Bland Street. This allowed westbound vehicles previously accessing Dalhousie Street via the right-turn bay to continue westbound on Parramatta Road prior to undertaking a U-turn and traveling eastbound back towards Dalhousie Street. However, under this arrangement, Chandos Street would be the first left turn opportunity available to re-routed motorists and it is expected that traffic volumes in Chandos Street would be significantly impacted by the re-routed traffic under this TfNSW proposal.

Noting the above, it is proposed to implement the linemarking and 'No Left Turn' signage treatments shown below to support Council's resolution to close Chandos Street, Haberfield to left turning vehicles.



The proposal is expected to result in the following local detour routes:

- Vehicles turning left into Bland Street from Parramatta Road, right turn into Denman Avenue and then a right turn into Chandos Street; or
- Vehicles turning left into Dalhousie Street from Parramatta Road, left turn into Denman Avenue and then a left turn into Chandos Street.

The left turn movement out from Chandos Street into Parramatta Road would be maintained under the proposal.

FINANCIAL IMPLICATIONS

Provision of signs and linemarking treatments will be funded out of Council's operational budget.

A physical kerb extension treatment to restrict left turn movements will be listed on Council's capital works program.

PUBLIC CONSULTATION

A letter outlining the above proposal was mailed out to the 167 properties within the boundary of Parramatta Road, Dalhousie Street, Denman Avenue and Bland Street, Haberfield including Haberfield Public School.

The proposal received a total of 64 responses, with 17 in support of the proposal (support rate of 27%). 10 of these responses were received from Chandos Street properties of which 7 were in support. The targeted notification for the proposal closes on 31 July 2020, and any additional responses will be summarised and distributed to Committee members.

Furthermore, the proposal has been advertised in a local newspaper for 28 days in accordance with the Roads Act.

A summary of the main objections from the consultation are summarised below:

- Objection to the increase travel time to Haberfield Public School as Chandos Street is one of the main access roads to access the school drop-off/pick-up area,
- Objection to the loss of direct access to the driveways of the businesses on Parramatta Road at Chandos Street (childcare centre and car dealership).
- Objection to the increase in traffic in other streets (especially Bland Street) that are currently congested during school pick-up/drop-off times.

A request for the 'No Left Turn' restriction to include a 'Bicycles Excepted' provision was also received. This request has currently not been supported as Parramatta Road is not a Council identified bicycle route and any physical treatments installed would be designed to prevent a left turn movement from Parramatta Road.

ATTACHMENTS

Nil.

Item No: LTC0820 Item 5

Subject: TEMPE SOUTH DRAFT LOCAL AREA TRAFFIC MANAGEMENT (LATM) STUDY (MIDJUBURI - MARRICKVILLE WARD/HEFFRON ELECTORATE/INNER WEST PAC)

Prepared By: Sunny Jo - Traffic and Parking Planner

Authorised By: Manod Wickramasinghe - Traffic and Transport Planning Manager

SUMMARY

Council prepared a draft Local Area Traffic Management (LATM) study to address key community concerns about traffic, pedestrian and cycling facilities for the Tempe South area. The LATM study was undertaken to fulfill the development approval conditions for the Tempe Bunnings development at 728-750 Princess Highway, Tempe.

The recommendations aim to align with Council policies and strategies, with an emphasis on improving pedestrian and cyclist movements, whilst retaining safe and acceptable traffic volume and speeds in local streets.

Traffic count data and on-street parking data in a number of areas was collected in February 2020 to assist the study. Further site observations and intersection counts were used to develop a draft plan to mitigate the impact of the Bunnings development.

Community submissions received during the Tempe Bunnings development were reviewed to gauge local traffic and parking concerns in the area. Considering the changes in the local area in Smith Street, a number of recommendations are provided for endorsement and public exhibition of the draft scheme.

RECOMMENDATION

THAT:

1. The Committee endorse the draft Tempe South Local Area Traffic Management (LATM) Study and proposed treatments for community consultation; and
2. The draft report be placed on Public Exhibition, providing a minimum 28 days for community feedback and the results be reported back to the Traffic Committee.

BACKGROUND

The Tempe South LATM study was undertaken as a condition of consent for the Tempe Bunnings development at 728-750 Princess Highway, Tempe.

The study was undertaken to address traffic and parking impacts arising from the Tempe Bunnings development and the community concerns.

OTHER STAFF COMMENTS

The Tempe South LATM was undertaken by Bitzios Consulting and reviewed existing traffic and parking management in the area. The objective of the local area traffic management planning is to investigate and review the performance of the existing LATM scheme and recommended proposed LATM works. A previous LATM review in Tempe was undertaken in 2011.

The draft LATM study was developed in order to review the traffic management strategy within the Tempe South area. The LATM assessed the traffic conditions as follows:

- Assessment of the traffic volumes, heavy vehicle percentages and vehicle speeds based on the traffic survey results;
- Identification of locations not satisfying with Environmental Performance criteria;
- Analysis of the accident statistics for the 5 year period from 2014 to 2018;
- Review of the community's complaints and concerns raised from the Tempe Bunnings development at 728-750 Princess Highway in relation to traffic and safety issues;
- Assessment of the effectiveness of the existing LATM measures and ensure they are compliant to the up-to-date standard;
- Identification of further opportunities to reduce through traffic volumes and speed of traffic on local streets to address public amenity;
- Identification of pedestrian and cyclist improvements; and
- Development of conceptual LATM proposal options.

The recommendations aim to align with the Inner West Community Strategic Plan (CSP) and the Inner West Integrated Transport Strategy (ITS), by creating a transport planning framework that integrates active and public transport in the land uses to support mode shift from single vehicle travel to active and sustainable transport. Safety for all road users are one of the benefits of the LATM strategy by reducing vehicle speeds through traffic calming treatments.

The study found that local streets in general had a low accident history, and favourable traffic speeds. Treatment options are proposed in locations where safety could be improved anticipating the operation and impact of the Bunnings development. These areas are provided in the attached document and discussed in the report in further detail.

The recommended treatment options are listed below:

Road	Option	Type	Location	Features
Smith Street	1	Road Narrowing & Contrasting Pavement	Immediately south of proposed Bunnings access	<ul style="list-style-type: none"> • Landscaped kerb blisters with low height shrubs • At-grade contrasting pavement treatment (embossed text pattern)
	2	Mountable Concrete Median Treatment		<ul style="list-style-type: none"> • Mountable low-profile concrete median with contrasting pavement
	Addition to both options	Right Turn Only Signage	Opposite and facing Bunnings access	<ul style="list-style-type: none"> • R2-14_R (Right Turn Only) sign
		Line Marking	Between Princes Highway and Bunnings Access	<ul style="list-style-type: none"> • Edge and centre line markings to provide a visual narrowing of the roadway • Road environment would appear distinctively different to the southern section of Smith Street • Delineation of adjusted lane arrangement near Princes Highway
		Bicycle Facilities	Between Princes Highway and Bunnings Access	<ul style="list-style-type: none"> • Extend shared path for a short distance from Princes Highway along both sides of Smith Street • Inclusion of an angled bicycle ramp for southbound cyclists to transition between the shared path and Smith Street • Signage and marking to indicate transitions between shared path and on-road cycling
		Widened Footpath	Western side, between No. 48 and	Option a (Option 1a or Option 2a):

			South Street	<ul style="list-style-type: none"> Widen western footpath Retain existing kerbside parking on the western side of Smith Street Shift centreline to suit road width Option b (Option 1b or Option 2b): <ul style="list-style-type: none"> Widen western footpath with adjacent landscaped verge Removal of existing kerbside parking on the western side of Smith Street Some paved parking bays within the landscaped area to offset loss of parking Turning pocket to allow vehicles to turn right out of No.1 Smith Street
Holbeach Avenue	1	Speed Cushions	Between driveways of 14 and 18 Holbeach Avenue	<ul style="list-style-type: none"> Set of four speed cushions of 100mm height, across roadway
	2	Speed Cushions & Road Narrowing		<ul style="list-style-type: none"> Set of two speed cushions of 100mm height in travel lanes Landscaped kerb blisters with low height shrubs
Stanley Street	1	Flat Top Road Hump	Near streetlight outside 14 Stanley Street	<ul style="list-style-type: none"> Concrete flat top road hump of 100mm height, across road width Contrasting surface treatment ('terracotta' colour surface of similar)
	2	Road Narrowing	Near streetlight outside 37 Stanley Street	<ul style="list-style-type: none"> Landscaped kerb blisters with low height shrubs
Wentworth Street	1	Road Narrowing & Contrasting Pavement	At entry from Princes Highway (specifically south of Tempe Tyre Centre vehicular access)	<ul style="list-style-type: none"> Landscaped kerb blisters with low height shrubs At-grade contrasting pavement treatment (embossed text pattern)
	2	Flat Top Road Hump	At entry from South Street (specifically north of the drainage pit)	<ul style="list-style-type: none"> Concrete flat top road hump of 100mm height, across road width Contrasting surface treatment ('terracotta' colour surface of similar)
	Addition to both options	3 Tonne Truck Limit Signage	Outside 846 Princes Highway Outside 45 Wentworth Street	<ul style="list-style-type: none"> R6-10-2 and R9-231 (Truck Load Limit) signs W8-245N_L (Left Arrow) Signage, only on Princes Highway
Barden, Fanning, Hart and Station Streets	-	Contrasting Pavement Threshold ¹	At entry from Princes Highway	<ul style="list-style-type: none"> At-grade contrasting pavement treatment (embossed text pattern)

1. Subject to a 40km/h Local Traffic Area proposal and/or Transport for NSW review and approval

PUBLIC CONSULTATION

Consultation to date has not been undertaken, however comments from residents and businesses received during the Tempe Bunnings development were reviewed and treatment options were developed to address local concerns, provide improvement to the public domain and residential amenity. The public exhibition of the Tempe South LATM strategy will provide an opportunity for the community to provide feedback on the options put forward.

FINANCIAL IMPLICATIONS

The cost of proposed treatments arising from the Tempe LATM strategy will range between \$273,000 and \$445,000 depending on treatment options chosen. This cost takes into consideration 10% contingency and 10% design costs. Approval conditions for the Bunnings

Tempe development require the applicant to cover the cost of design and construction of approved treatments from the final Tempe LATM strategy.

ATTACHMENTS

1. [Download](#) Draft Tempe South LATM Study

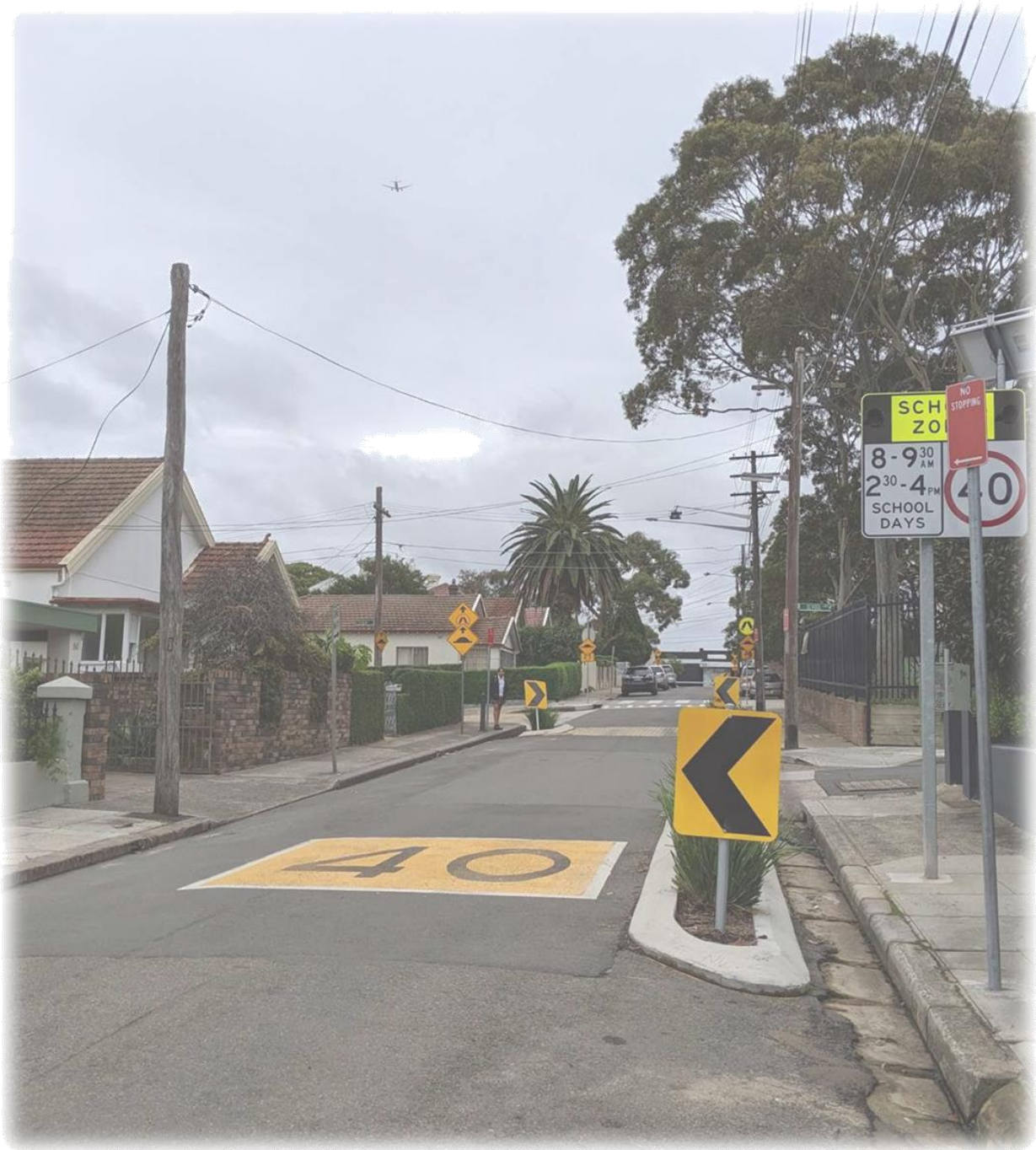
Tempe South LATM Study Draft Report



Inner West Council

24 July 2020

Item 5



Attachment 1

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Document Issue History

Report File Name	Prepared	Reviewed	Issued	Date	Issued to
P4533.001R Tempe South LATM Study – Draft Report_DRAFT	C. Mak / G. Yin	SP. Power	SP. Power	24/07/2020	Sunny Jo < sunny@innerwest.nsw.gov.au >

EXECUTIVE SUMMARY

Background

As part of the conditions of consent for an approved Bunnings Warehouse at 728-750 Princes Highway, the Eastern City Planning Panel has conditioned that a Local Area Traffic Management (LATM) study to be undertaken for the Tempe South area, in order to manage the impacts of the proposed development.

Study Area

The study area for the LATM study consists of local roads in Tempe South, which are Barden Street, Fanning Street, Foreman Street, Hart Street, Holbeach Avenue, Smith Street, South Street, Stanley Street, Station Street, Union Street, Wentworth Street and Zuiton Lane. Data analysed and concept designs developed during the study are limited to these roads.

At the beginning of the study, background information and documents relating to the proposed Bunnings development were reviewed, providing information on future proposed traffic and road changes in the area. This included a desktop study of existing site conditions and review of surrounding land uses and road network information.

Data Review

Crash history, traffic and parking data were analysed as part of the study. Traffic and parking surveys were conducted to capture the levels of traffic and parking demand within the study area. This included tube counts, parking occupancy surveys and intersection counts.

Crash history data between January 2014 and December 2018 were analysed. It was found that 10 crashes occur within the study area, with two (2) involving vehicles at intersections with Princes Highway. Five (5) of the crashes occurred along Holbeach Avenue and two (2) occurred along Smith Street. Out of the five (5) Holbeach Avenue crashes, four (4) involved Vulnerable Road Users (VRU), which included motorcyclists, pedal cyclists and pedestrians.

Traffic surveys were undertaken on 19 March 2020, Thursday and 21 March 2020, Saturday, recording relevant data such as traffic volumes, heavy vehicle volumes and 85th percentile speeds. It was found that some of the local roads have relatively higher average daily traffic volumes than other roads in the study area. The 85th percentile speeds on these roads are also relatively higher than the other roads, with speeds of more than 40 km/h but lower than the speed limit of 50 km/h. Some roads with a truck load limit were also found to be used by heavy vehicles.

The crash history and traffic survey data analysed helped to identify roads that require LATM devices in order to provide traffic calming and reduce vehicle speeds, reduce general traffic volumes by deterring traffic, reduce heavy vehicle volumes and reduce crash risk.

Parking occupancy and duration surveys were undertaken for Barden Street, Fanning Street, Smith Street and a section of South Street on 19 March 2020, Thursday and 21 March 2020, Saturday. The data showed that on average, Smith Street had 18 vacant spaces on Thursday and 27 vacant spaces on Saturday.

It is understood that up to 13 parking spaces along Smith Street will be removed as part of the Bunnings development. The parking survey data was used to determine the number of available kerbside parking spaces on a typical Thursday and Saturday and assess the impact of removing spaces due to Bunnings. These numbers then influenced the LATM treatment options proposed along Smith Street, as different LATM devices may also require removal of some kerbside parking spaces. It was found that Smith Street will have very few or no available parking spaces left when excluding parking that was removed due to the Bunnings and the LATM devices. This may result in any parking overflow onto surrounding streets. The existing parking occupancy of around 50% along the surrounding Barden and South Streets mean that these roads are able to absorb any of the Smith Street parking overflow.

Site Audits



Site audits of existing traffic and parking signage, bicycle and pedestrian facilities, LATM devices and refuse collection issues were undertaken on Wednesday 4 March 2020.

A finding of the audit was the lack of truck load limit signage on the northern end of Wentworth Street near Princes Highway, which is peculiar due to the presence of such signage on the southern end of Wentworth Street and other local roads in the study area. This finding was taken into consideration when developing the LATM concept designs.

Risk Priority Scoring Assessment

A scoring system was developed to determine streets that require LATM treatments. This was based on the crash history and traffic data analysed, and other factors such as existing road width, availability of existing LATM devices, distance to schools and existing and future land use. Points were allocated to each road or road section based on the level of risk. The higher the points, the higher the risk for future crashes, and hence the higher the need for LATM devices.

Based on the scoring criteria, four (4) streets (priority streets), being Smith Street, Holbeach Avenue, Stanley Street and Wentworth Street, had relatively higher scores than other roads in the study area. Therefore, LATM devices are recommended to be implemented on these roads.

Proposed Treatments Justification

A detailed selection criteria and list of suitable LATM measures were developed based on existing devices in the area and typical LATM devices presented in *Austroads Guide to Traffic Management Part 8 - Local Area Traffic Management*.

Treatment options were then proposed for each of the four priority streets to address the specific issue(s) identified:

- **Smith Street Option 1:** Road narrowing using kerb blisters to slow down traffic, with contrasting pavement to highlight the change in road environment
- **Smith Street Option 2:** Mountable concrete median to provide a horizontal deflection and slow down traffic
 - Other Smith Street treatments: on-road and off-road bicycle transitions, extension of shared path and angled on-ramp for cyclists, along with a widened footpath on the western side of Smith Street. An optional landscaped verge may also be provided between the widened footpath and roadway, which will result in the removal of kerbside parking.
- **Holbeach Avenue Option 1:** A set of four speed cushions at mid-block to provide a vertical deflection and slow traffic down
- **Holbeach Avenue Option 2:** A set of two speed cushions at mid-block to provide a vertical deflection and road narrowing using kerb blisters, with the aim of slowing down traffic
- **Stanley Street Option 1:** Flat top road humps at two mid-block locations to provide a vertical deflection and slow traffic down
- **Stanley Street Option 2:** Road narrowing using kerb blisters at two mid-block locations to slow traffic down
- **Wentworth Street Option 1:** Road narrowing using kerb blisters at both ends of the road to slow traffic down, with contrasting pavement to highlight the change in road environment
- **Wentworth Street Option 2:** Flat top road humps at both ends of the road to provide a vertical deflection and slow traffic down

Where possible, landscaping is proposed to improve the aesthetics of the street environment and enhance sense of place.

Additionally, contrasting thresholds have also been proposed for Barden Street, Fanning Street, Hart Street and Station Street to visually separate the local streets and the Princes Highway. This assists in highlighting the local road environment and deter non-local traffic from using these streets. This treatment can also be

used to support a reduction in speed limit in the future, subject to discussion and approval by Transport for NSW.

Infrastructure Itemisation

Each option was broken down into individual components including signage. Treatments requiring signage include bicycle infrastructure at Smith Street, speed cushions and flat top road humps. Additionally, truck restriction signage will be provided at the northern end of Wentworth Street where there is no existing signage.

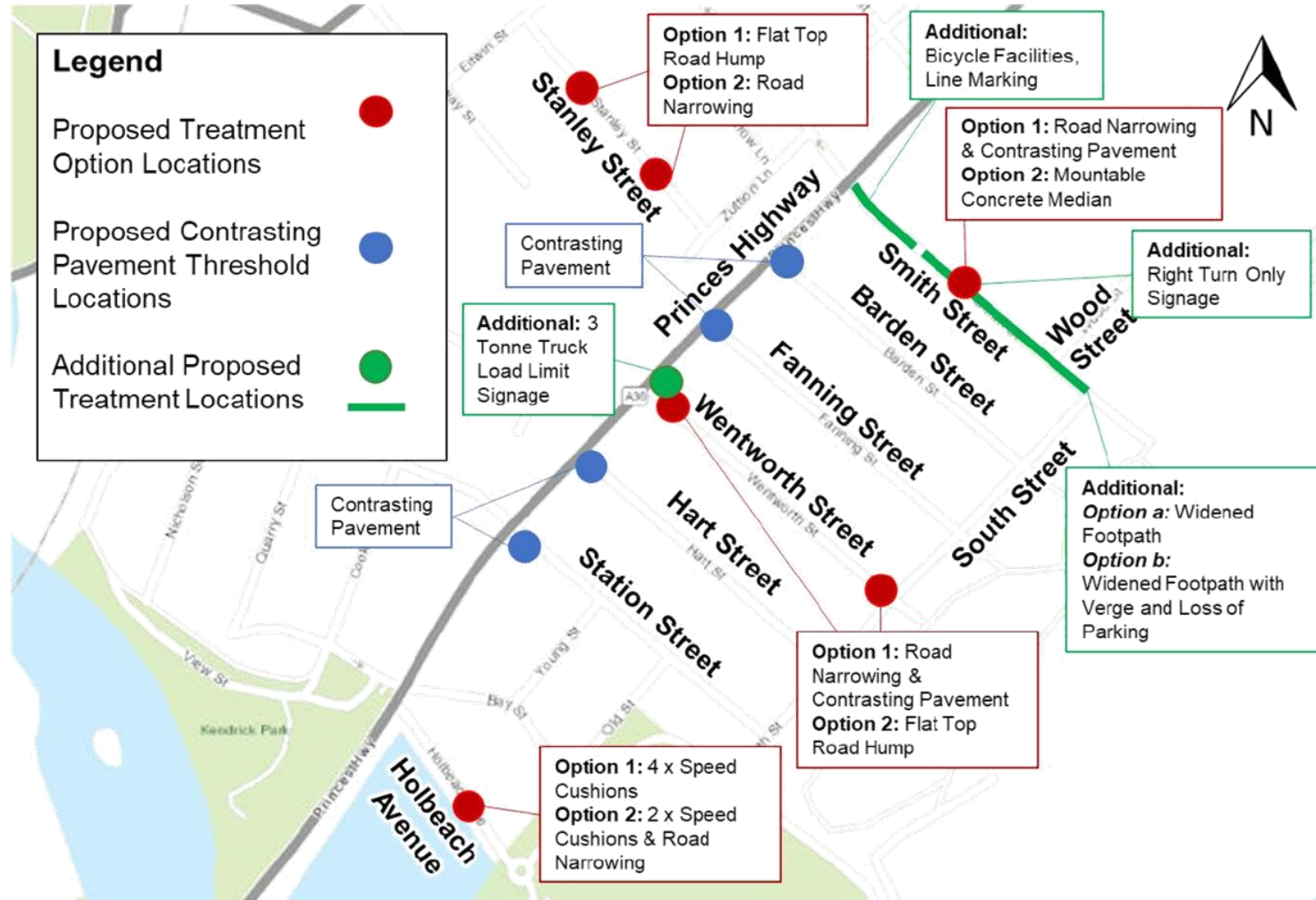
Cost Estimation

Indicative costs for each component were estimated based on average standard costs provided by Inner West Council, as well as rates presented within *Local Infrastructure Benchmark Costs (IPART NSW)*. Naturally, the highest cost treatments include those requiring substantial civil works, such as flat top road humps, footpath widening, and kerb blisters.

Estimated costs for each option and measure ranges from \$18,000 to \$184,000, with the lowest cost treatment being the contrasting pavement, and the highest cost being the Smith Street treatment options.

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Proposed Treatment Locations



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Appendices

Appendix A: Crash Data Maps
 Appendix B: Tube Count & Parking Data Maps
 Appendix C: Site Audit Data and Maps



Appendix D: LATM Treatment Concept Designs

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Tempe South LATM Study: Draft Report
Project: P4533 Version: 001



1. INTRODUCTION

1.1 Background

As part of the conditions of consent for an approved Bunnings Warehouse at 728-750 Princes Highway, the Eastern City Planning Panel has conditioned that a Local Area Traffic Management (LATM) study to be undertaken for the Tempe South area, in order to manage the impacts of the proposed development.

Inner West Council (Council) has commissioned Bitzios Consulting to undertake this LATM study.

1.2 Study Area

The LATM study area includes the local roads adjoining Princes Highway in the Tempe South precinct, namely:

- Barden Street
- Fanning Street
- Foreman Street
- Hart Street
- Holbeach Avenue (excluding the Tempe Recreation Reserve access road)
- Smith Street
- South Street
- Stanley Street
- Station Street (between Princes Highway and South Street)
- Union Street
- Wentworth Street
- Zuitton Lane

The study area and the proposed development (728-750 Princes Highway) are illustrated in Figure 1.1.



Figure 1.1: Study Area

1.3 Purpose and Scope

This report details the assessment of the traffic conditions within the Tempe South study area and its findings. The study included:

- Review of existing conditions, including:
 - Surrounding Land Uses
 - Road Hierarchy
 - Public Transport and Active Transport
 - Garbage Collection
 - Parking Controls
- Review of Future developments, including proposed developments and traffic generation
- Crash Data Analysis
- Traffic and Parking Data Analysis, including:
 - Intersection traffic counts
 - Vehicle tube count speed and volume data
 - Heavy vehicle proportions
 - Parking occupancy data
- On site audit, including:
 - Traffic and parking signs

- LATM and traffic calming devices
- Bicycle and pedestrian facilities
- Waste management
- Development of a scoring system and identification of priority streets for treatment
- Development of potential LATM treatments
- Recommendation and assessment of LATM treatments and locations
- Development of an infrastructure schedule based on treatment options
- Cost estimation of each type of the recommended treatment
- Methodology and assumptions used for cost estimation.

1.4 Local Area Traffic Management

1.4.1 What is Local Area Traffic Management

According to *Austrroads Guide to Traffic Management Part 8 – Local Area Traffic Management* (AGTM08-16) (summarised):

LATM is concerned with the planning and management of the usage of road space within a local traffic area. It involves the use of physical devices, streetscaping treatments and other measures (including regulations and other non-physical measures) to influence vehicle operation, in order to create safer and more pleasant streets in local areas.

LATM is essentially system-based and area-wide. It considers neighbourhood traffic-related problems and their proposed solutions in the context of the local area or a group of streets within it, rather than only at isolated locations. In addition, it requires that physical traffic measures be seen as a sequence of interrelated devices rather than individual treatments.

The primary target of LATM is to change driver behaviour, both directly by physical influence on vehicle operation, and indirectly by influencing the driver's perceptions of what is appropriate behaviour in that street. The objective is to reduce traffic volumes and speeds in local streets to increase amenity, liveability, and improve safety and access for all road users.

The need for LATM usually arises from:

- *an intent to reduce traffic-related problems*
- *orderly traffic planning and management*
- *a need to modify 'transport' behaviour*
- *a desire to improve the community space and sense of place*
- *a desire to improve environmental, economic and social outcomes*
- *traffic interventions associated with new development or the implementation of pedestrian and bicycle plans and other local policies (e.g. RTA 2002).*

1.4.2 Stages of a LATM

The general stages involved in preparing a LATM study, as per AGTM08-16, are outlined in Table 1.1. This study primarily covers Stage 2 of the LATM process, with partial coverage of Stage 3 items.

Table 1.1: Stages of a LATM

Tasks	Status in this study
Stage 1: Initiating an LATM program (completed)	
<ul style="list-style-type: none"> Decide that action is needed Define study area, precincts and functional hierarchy of roads Develop study plan, including type of treatments and study costs Develop consultation strategy Council decision Prepare brief for consultant, if required 	Completed by Council prior to start of the study
Stage 2: Data collection and problem identification	
<ul style="list-style-type: none"> Define and collect required data Identify problems Identify potential solutions Define and confirm objectives 	<ul style="list-style-type: none"> Section 2 outlines the existing condition of the study area. Sections 3 to 5 outlines the data analysis and identification of problems. Section 6 outlines future conditions to be considered in the development of LATM plans. Section 8 outlines potential solutions that can be used in the study.
Stage 3: Development of plans	
<ul style="list-style-type: none"> Clarify suitable strategies (including confirmation of LATM as an appropriate response) Develop outline schemes and supporting arterial improvements Consult on draft plans Assess and refine alternatives Select, present to council for adoption 	<ul style="list-style-type: none"> Section 8 outlines treatment options proposed
Stage 4: Scheme design	
<ul style="list-style-type: none"> Location and design of treatments Consult with nearby owners/occupiers Prepare contract documents 	<ul style="list-style-type: none"> Section 8 outlines the location of treatment options Section 9 lists the rationale for the location and design Section 10 outlines the components of treatments Section 11 outlines the estimated cost of the treatments
Stage 5: Implementation	
<ul style="list-style-type: none"> Confirm timing and staging Conduct additional 'before' studies as required Community information Construct/install Safety audit 	Community consultation to be undertaken in the next stage

Tasks	Status in this study
Stage 6: Monitoring and review	
<ul style="list-style-type: none"> ▪ After data collection, observation and reports ▪ Identify unanticipated impacts or outcomes ▪ Review technical and community assessment of scheme ▪ Revise as needed and feasible ▪ Record and report process and outcomes 	Not undertaken yet

Source: Austroads Guide to Traffic Management Part 8: Local Area Traffic Management

1.5 Referenced Documents

The following documents have been reviewed and referenced as part of this LATM study.

- Draft Integrated Transport Strategy 2019
- Marrickville Bicycle Strategy August 2007
- Marrickville Pedestrian Access and Mobility Plan (PAMP) 2009
- Draft Inner West Council Public Domain Parking Policy 2019
- Crash database provided by Council
- Local Traffic Committee Report and Correspondence relating to traffic and development issues in the study area
- Development Consent conditions in relation to 728—750 Princes Highway, Tempe
 - Joint Regional Planning Panels (JRPP) report
 - Initial and revised traffic assessment reports by Transport and Traffic Planning Associates (TPPA)
 - Peer review of traffic assessment report by GTA Consultants
 - Other assessments
- Austroads Guide to Road Design, Part 6A Pedestrian and Cyclist Paths (AGRD06A-17)
- Austroads Guide to Traffic Management, Part 8 Local Area Traffic Management (AGTM08-16)
- RTA/RMS/Transport for NSW Technical Directions & Guidelines, including:
 - RTA NSW Bicycle Guidelines 2003
 - RTA Guide to Traffic Generating Development, 2002
 - Transport for NSW – Safer Speed policy and Guidelines Version 1 July 2012
 - RMS Permit Parking Guidelines 2005
- Australian Standards AS1742 - Manual of uniform traffic control devices:
 - AS1742.10 – 2009: Part 10: Pedestrian control and protection
 - AS1742.13 – 2009: Part 13: Local area traffic management
- Other RMS/Austroads Guidelines or Australian Standards

1.5.1 Previous LATM Studies

An LATM study was previously conducted by GTA Consultants (for Inner West Council) of the St Peters and Tempe area in 2010 (*St Peters/Tempe LATM Study 2010*). Details on this study are provided in Section 2.10.

2. EXISTING CONDITIONS

2.1 Geographic Location

The study area is located within the suburb of Tempe, approximately 7km south-east of the Sydney CBD (the City). Tempe is the southernmost suburb within the Inner West LGA.

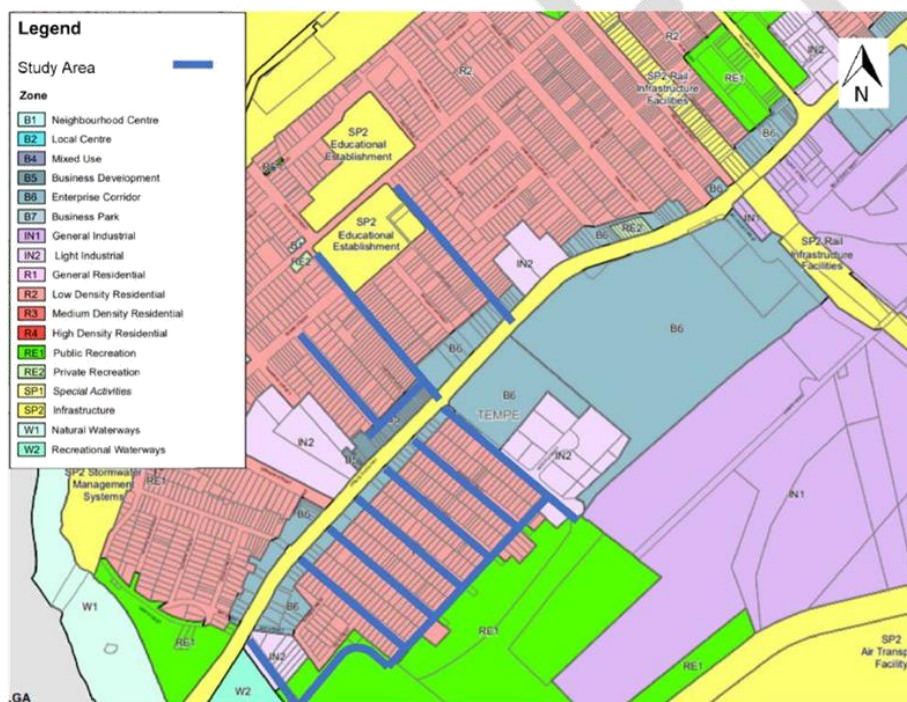
Cooks River and Alexandria Canal run along the western and southern boundaries of Tempe. Wollie Creek is located across Cooks River to the west and Sydney Airport land located across Alexandria Canal to the south.

2.2 Land Use

Based on the Marrickville Council LEP 2011, the study area is primarily comprised of the following land uses:

- R2 – Low Density Residential
- B6 – Enterprise Corridor (Commercial)
- IN2 – Light Industrial

The land zoning map is shown in Figure 2.1.



Source: Marrickville Local Environment Plan 2011, NSW Legislation

Figure 2.1: Tempe Land Zoning Map

2.2.1 Residential

The study area and roads listed in Section 1.1, mostly access low density residential lots, with some service access to commercial lots fronting Princes Highway and Wood Street.

2.2.2 Non-Residential

Commercial

Commercial lots are primarily located along the Princes Highway corridor, including tyre repair shops, motorcycle workshops, cafes, service stations, medical and dental clinics, a pub, a bus depot and other small retail. No large retail developments are located within the study area.

The larger commercial lots occupied by the IKEA Tempe and Decathlon sports stores are located towards the north east of the study area.

Industrial

Industrial land uses are located along the Princes Highway corridor, the eastern side of Smith Street, and Wood Street. As such, heavy vehicles access these lots using Smith Street and Wood Street.

The Tempe Bus Depot is located to the west of the study area on Princes Highway towards Gannon Street.

Schools

Two schools are located to the north of the study area along Unwins Bridge Road. Tempe Public School is further bounded by Union Street and Foreman Street.

2.2.3 Parks & Reserves

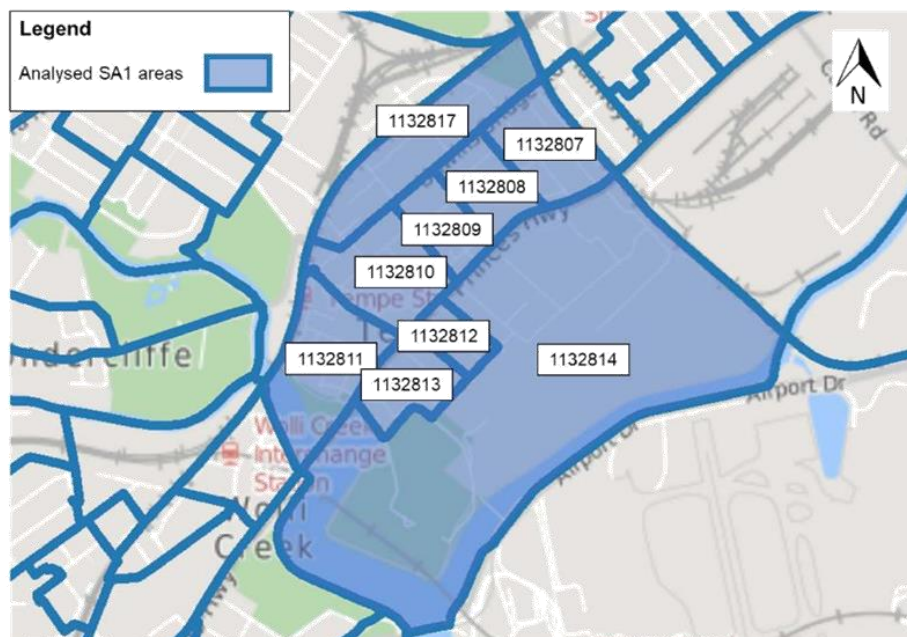
Located towards the south of the study area are large recreation spaces, including Tempe Lands, Tempe Dog Park, Tempe Golf Range, Tempe Recreation Reserve and Tempe Reserve. They are accessed via Holbeach Avenue and South Street.

2.3 Garbage Collection

Council garbage collection occurs on Fridays between 5:00 AM and 12:00 PM. Previous information indicates that 10.5m refuse collection vehicles are used. There are no fixed garbage collection routes.

2.4 Area Demographics

The 2016 Census data was reviewed to identify travel trends to and from the study area. Nine (9) SA1 level statistical areas (codes 1132807-1132814 and 1132817) cover majority of the suburb of Tempe including the study area, shown in Figure 2.2.



Source: Australian Bureau of Statistics (ABS)

Figure 2.2: Analysed SA1 areas

Census data, including Journey to Work data, for the nine (9) SA1 areas were compared to the Greater Sydney average shown in Table 2.1.

Table 2.1: Tempe Demographic Data

	Tempe SA1 areas	Greater Sydney Average
Age		
Young population between age 20 and 34	21%	23%
Aged population over age 65	12%	14%
Vehicle Ownership		
Vehicle ownership of one (1) motor vehicles or more	85%	88%
Vehicle ownership of two (2) motor vehicles or more	36%	50%
Mode of Travel to Work		
Public transport as mode of travel to work	41%	26%
Private vehicles as mode of travel to work	50%	67%
Bicycle riders as mode of travel to work	3%	1%
Walking only as mode of travel to work	4%	5%

A comparison of statistics reveals:

- The study area features a slightly higher proportion of younger residents and lower proportion of older residents than the Greater Sydney average
- Vehicle ownership in Tempe is less than the Greater Sydney average

- Consistent with the lower vehicle ownership rate, a high proportion of Tempe residents use public transport to travel to work
- Proportion of residents cycling to work is higher than the Sydney average

Journey to work patterns are likely attributed to the number of public transport services available, including both buses and trains (detailed in Section 2.6) and active transport facilities (including cycling routes) nearby.

2.5 Road Classification

Road Classification in Tempe is shown in Figure 2.3, featuring:

- State Road - Princes Highway within Tempe is a state road (HW1), while
- Regional Road – Unwins Bridge Road from Richardsons Crescent to Campbell Street, and Richardson Crescent from Cooks River to Unwins Bridge Road
- Local Roads - all other roads



Source: Transport for NSW (Roads & Maritime)

Figure 2.3: Road Classification in Tempe

2.6 Public Transport

2.6.1 Trains

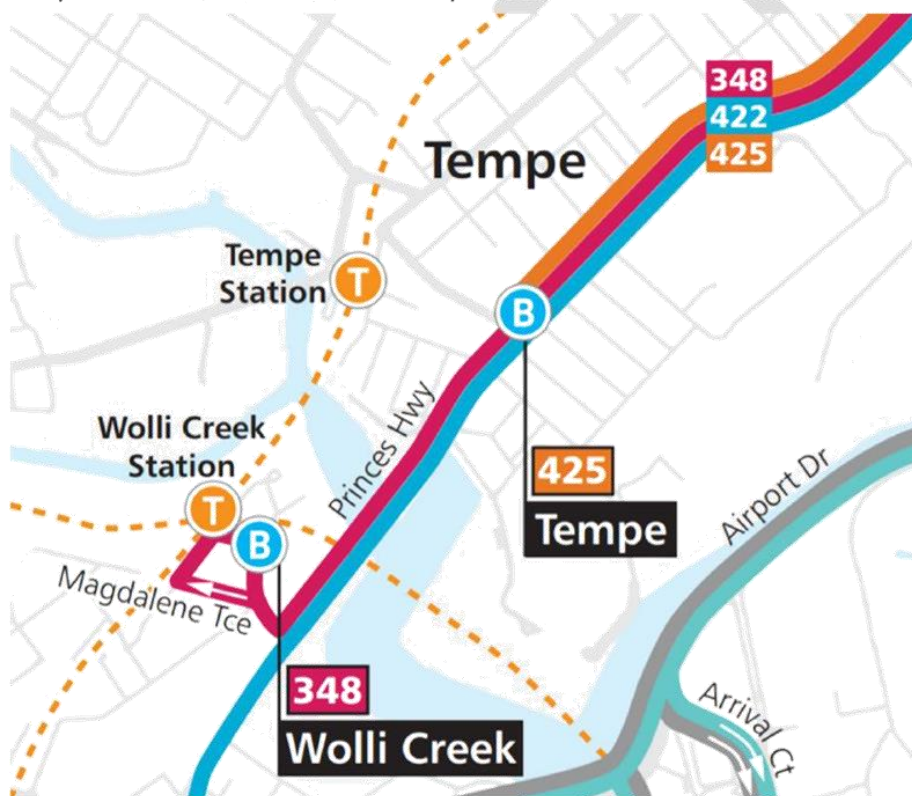
The nearest train station to the study area is Tempe railway station in the west, serviced by the T4 (Eastern Suburbs & Illawarra Line), with services running every 10 minutes per direction on weekdays off-peak. The next nearest station is Wolli Creek railway station located approximately 1km west of the study area and is within walking distance. Wolli Creek is serviced by both the T4 and T8 (Airport & South Line) services. Both T4 and T8 services stop at stations within the City.

2.6.2 Buses

Three public bus routes operate in the Tempe area along Princes Highway. The public bus network is shown in Figure 2.4. Additionally, there is one school bus route servicing Tempe High School students, which runs along Unwins Bridge Road.

The Tempe bus depot is located at the corner of Princes Highway and Gannon Street, accessed via Princes Highway.

The public and school bus services in Tempe are summarised in Table 2.2.



Source: Transit Systems

Figure 2.4: Public Bus Services in Tempe

Table 2.2: Bus Routes

Route Number	Route Description	Roads Served	Weekday Off-peak Frequency (min)
348	Bondi Junction to Wolli Creek	Princes Highway	30
422	Kogarah to Central Pitt Street	Princes Highway	15
425	Tempe to Dulwich Hill	Princes Highway	60
700S (School bus)	Earlwood to Tempe High School	Richardsons Crescent, Unwins Bridge Road, Collins Street	One AM service towards school, one PM service from school

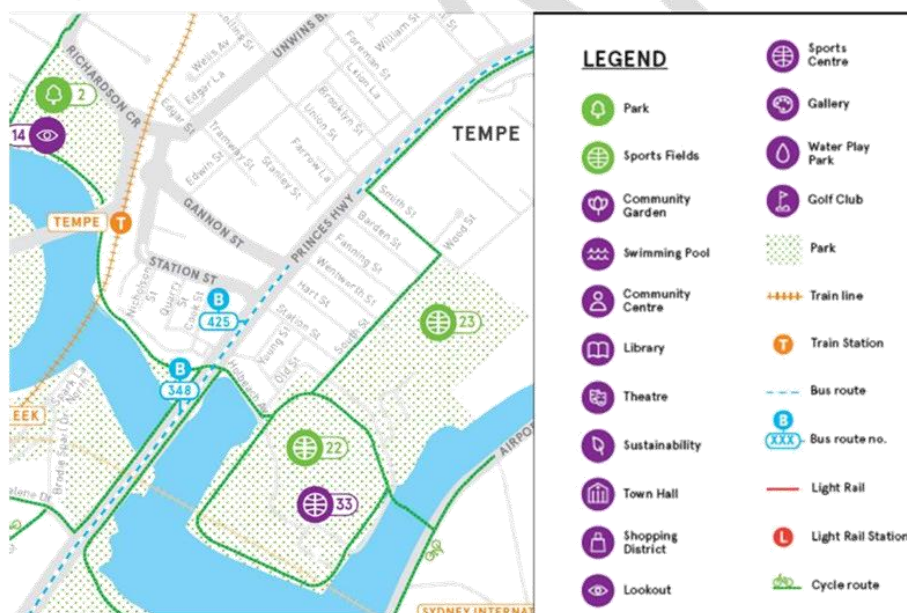
2.7 Other Transport

2.7.1 Bicycles

The local bicycle network (based on the Stay Active in Marrickville Map) is shown in Figure 2.5, and the (previously) proposed bicycle network in the Marrickville Bicycle Strategy 2007 is shown in Figure 2.6.

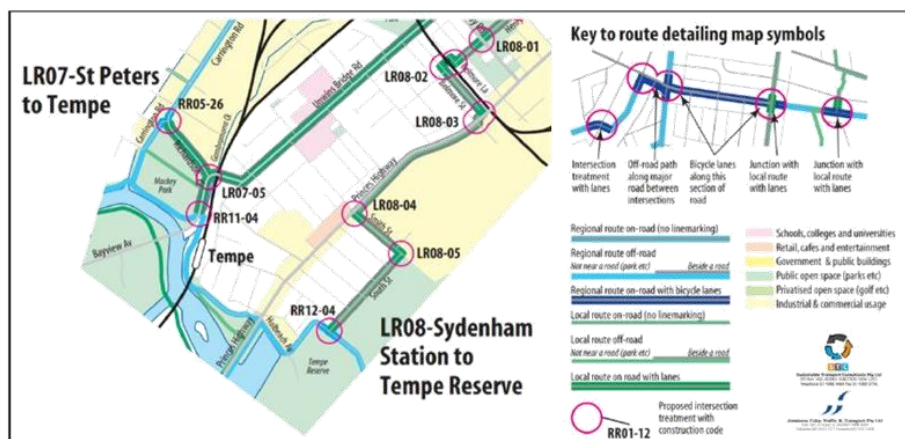
Two routes are present within the study area:

- Local Route L13 (shown as LR08 in Figure 2.6) – following Holbeach Avenue, South Street and Smith Street
- Alexandra Canal cycleway - following Holbeach Avenue, through Tempe Reserve and along Airport Drive on the southern bank of Alexandra Canal



Source: Staying Active in Marrickville Map (Inner West Council)

Figure 2.5: Existing Bicycle Routes in Tempe



Source: Marrickville Bicycle Strategy 2007

Figure 2.6: Proposed Bicycle Network in Tempe

Additionally, there are unpaved off-road paths within Tempe Lands that are used for walking and cycling. Entry points to Tempe Lands are located at the Smith Street cul-de-sac and at various points along South Street.

2.7.1.1 Bicycle Detour

As part of the Sydney Gateway Environment Impact Statement (November 2019), volumes were recorded on the cycleway on the southern bank of Alexandra Canal in March 2019. The average volumes on the cycleway were 600 cyclists and 100 pedestrians per day. During the morning and afternoon peaks, the volumes were 90 cyclists and 10 pedestrians.

Due to the permanent removal of the current shared path along Airport Drive as part of the Sydney Gateway project, a bicycle detour is proposed to follow the road through Tempe Recreation Reserve, to Tempe Wetlands near South Street and through the industrial lands to the east. Details of the detour are described in Section 6.2.2.

2.7.2 Pedestrians

The local footpath network is well connected through and surrounding the study area, with footpaths located along both sides of most roads. Signalised crossings are also provided at intersections and mid-block on Princes Highway and mid-block on Unwins Bridge Road. A pedestrian (zebra) crossing is also located on Union Street outside Tempe Public School.

2.7.3 Carshares

The use of carshare services has been increasingly popular in recent years. Popular carshare services used in Sydney include Car Next Door and GoGet, which operate in the study area and surrounds.

Car Next Door

Car Next Door is a carshare service that allows private car owners to rent their vehicles to other registered users on an hourly or daily service. As of March 2020, six (6) vehicles within or surrounding the study area have been signed up for Car Next Door, shown in Figure 2.7. It is important to note that the shown locations are approximate only.

Go Get

Go Get is another carshare service, where members are able to rent GoGet vehicles from their pods on an hourly or daily basis. As of March 2020, there are no GoGet pods within the study area; however, there are seven (7) nearby car pods within walking distance from the study area, including two (2) within the IKEA Tempe carpark. Additionally, IKEA Tempe has 12 van pods, with vans available to be rented. It is important to note that the pods in IKEA Tempe are located within its carpark and therefore can only be rented during the carpark's opening hours.

The location of GoGet car and van pods around the study area are shown in Figure 2.7.



Source: GoGet & Car Next Door

Figure 2.7: GoGet Pod Locations in Tempe

Bunnings Car Share

As part of the Bunnings development application Consent Condition No.5 four (4) car share spaces are to be provided within the Bunnings development.

2.8 Parking Controls

Kerbside parking controls within the study area are shown in Figure 2.8). Most of the kerbside parking available is unrestricted on-street parallel parking with some time limited parking (one hour) along Union Street and Foreman Street. Due to the narrow nature of the roads in the study area, many vehicles were observed partially parking on the footpath (See Section 5).

Angled parking is provided along Holbeach Avenue near Bay Street. It provides unrestricted parking for residents as well as users of Tempe Recreation Reserve.

Persons with a disability (PWD) spaces are located along Union Street, Foreman Street Wentworth Street and Union Street.

There are 'No Parking' restrictions along Zuitton Lane and Farrow Lane due to their narrow widths. No Stopping restrictions are found along Union Street where kerb blisters are located.

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Figure 2.8: Existing Parking Restrictions

2.9 Truck Load Limits

A 3-tonne truck load limit is implemented in the study area and surrounds, covering local side roads near or connecting to Princes Highway, shown in Figure 2.9.

Wentworth Street was identified to maintain an inconsistent truck restriction, with signage only present at South Street (see traffic sign audit, section 5.2.2). It was confirmed the truck restriction applied along Wentworth street with signage missing at Princes Highway.

A 3-tonne truck load limit does not apply to Holbeach Avenue, South Street, Smith Street, Wood Street, Princes Highway and most of Unwins Bridge Road

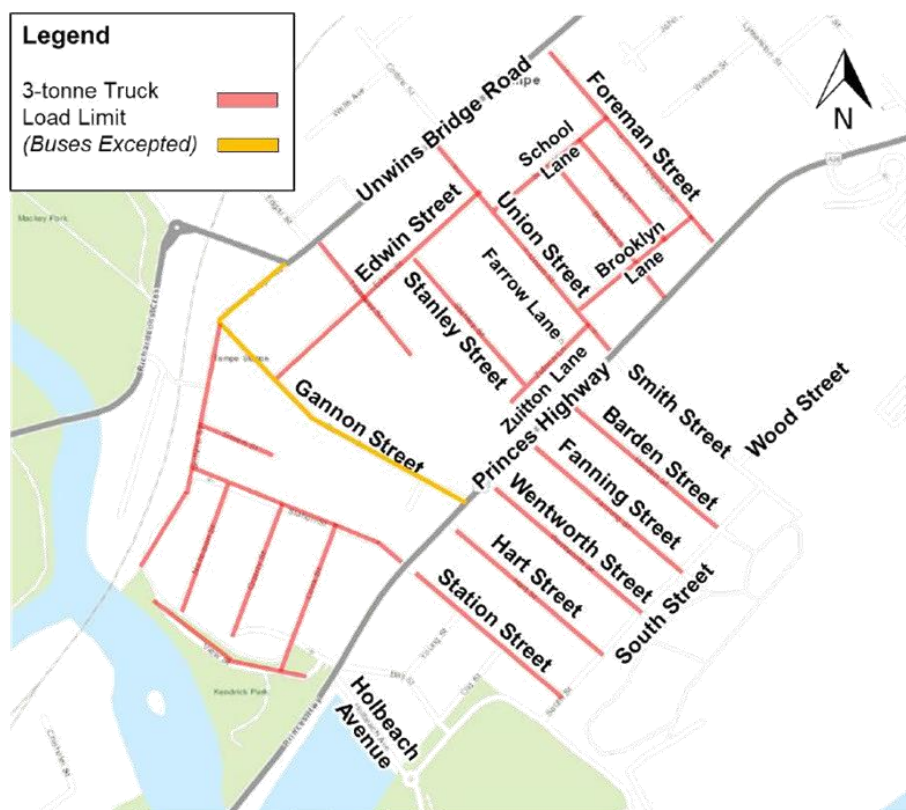


Figure 2.9: Truck Load Limit in Tempe

2.10 Previous LATM Study in Tempe

Planning approval of 630-726 Princes Highway (IKEA Tempe development) was granted by the NSW Department of Planning in July 2009. A condition of the approval required an LATM study to be undertaken by Council "to identify the traffic and transport impacts of the proposed development and recommend ways in which any potential adverse impacts on local residential streets could be mitigated." GTA Consultants was commissioned by the then-Marrickville Council to undertake the study which was completed in October 2010. IKEA Tempe opened in November 2011.

The study identified:

- Smith Street, South Street, Union Street and Wentworth Street have higher 85th percentile speeds compared to the other roads in the areas, ranging between 40 and 50 km/h on Thursdays and Saturdays, with 85th percentile speeds along Smith Street exceeding 50 km/h on Saturdays.
- One 'fixed object' crash occurred on Station Street near South Street.
- Speed humps on South Street and Union Street, and the pedestrian crossing on Union Street outside Tempe Public School required repainting of line marking
 - It is important to note that the school crossing on Union Street was not a raised crossing as of 2010, and the nearby speed hump had since been replaced by a pair of kerb blisters with contrasting pavement.
- Recommendation to introduce further LATM devices

The devices and measures implemented included:

- speed cushions on Smith Street
- the right turn ban from Princes Highway to Union Street
- closing the median gap at Station Street
- raised thresholds on Foreman Street, only at Unwins Bridge Road and Princes Highway

The speed cushions on Smith Street were eventually removed in 2012 and 2017 respectively, as a result of resident complaints about the noise produced by trucks driving over the speed cushions.

2.11 Existing LATM Devices & Measures

Existing LATM devices and traffic controls were identified during site audits, detailed in Section 5.2.

3. CRASH DATA ANALYSIS

3.1 Crash History Data

The NSW Speed Zoning Guidelines recommend a minimum of three years of crash data for a statistical crash analysis. For the purpose of this assessment, crash data between 1 January 2014 and 31 December 2018 was sourced from Council representing five (5) years of data. The data included reported crash events within the entire Inner West Council LGA and were filtered to include crashes within the study area. Crashes along Princes Highway within 15 metres from intersections of the study area roads were also included.

As per Rule 287 (3) of the NSW Road Rules 2014, crashes are only recorded if they are reported to police and when one of the following occurs:

- Any person is killed or injured
- Drivers involved in the crash do not exchange particulars
- When a vehicle involved in the crash is towed away.

The crash history between the five (5) years of data within and surrounding the study area were analysed, and a total of 10 crashes were recorded along streets within the study area. Out of the 10 crashes in the study area, two (2) involved vehicles at intersections with Princes Highway.

3.2 Crash Statistics

3.2.1 Crash History

Figure 3.1 shows the crash history between January 2014 and December 2018.

There is an overall trend of steady number of crashes per year, with less than 3 crashes happening each year. Most of the crashes involve an injury.

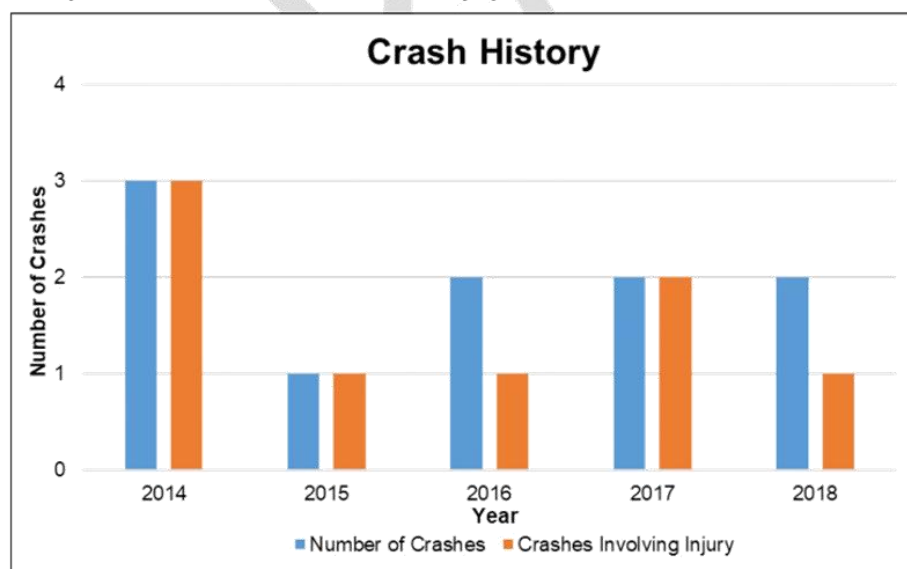


Figure 3.1: Crash History between January 2014 and December 2018

3.2.2 Crash Severity

Table 3.1 summarises the number of crashes within the 5 years of crash data based on crash severity.

Table 3.1: Number of Crashes Based on Crash Severity

Crash Severity	Number of Crashes	Percentage
Fatal	0	0%
Injury	8	80%
Non-casualty (towaway)	2	20%
Total	10	100%

The crash data shows that the majority of crashes within the study area were not fatal but resulted in injury (72%). The locations of the crashes are shown in Figure 3.2. They are also shown in **Appendix A**.

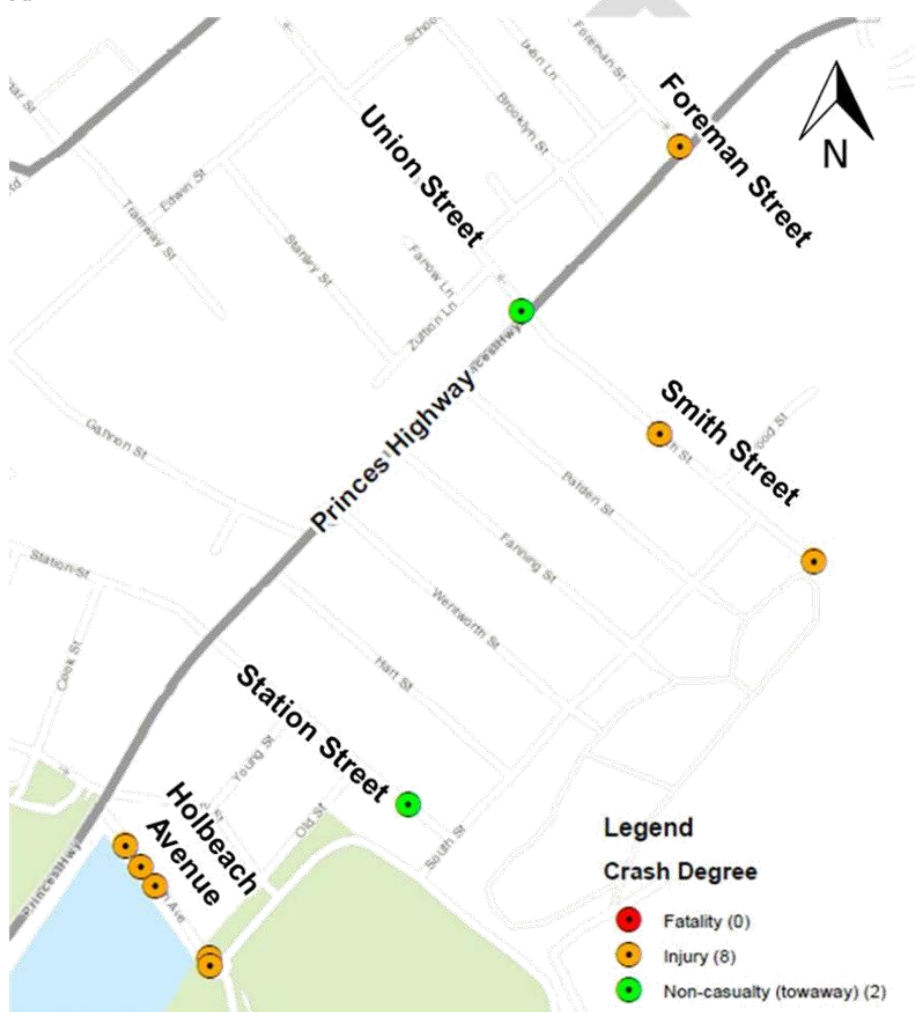


Figure 3.2: Crash Degree Severity

3.2.3 Vulnerable Road Users

Table 3.2 summarises the number of vulnerable road user (VRU) crashes within the 5 years of crash data based on crash severity. VRUs are classified into motorcyclists, pedal cyclists and pedestrians.

Table 3.2: Number of Vulnerable Road User Crashes Based on Crash Severity

Crash Severity	Vulnerable Road User			Total
	Motorcyclist	Pedal Cyclist	Pedestrian	
Fatal	0	0	0	0
Injury	2	3	1	6
Non-casualty (towaway)	0	0	0	0
Total	2	3	1	6
Percentage	33%	50%	17%	-

The crash data shows that all crashes involving vulnerable road users were not fatal, however, resulted in an injury. There were six (6) vulnerable road user crashes out of the total of 10 crashes, which is a relatively high percentage (60%). Pedal cyclists were recorded to have the highest percentage of vulnerable road user crashes (50%). The location of crashes involving VRU are shown in Figure 3.3. They are also shown in **Appendix A**.

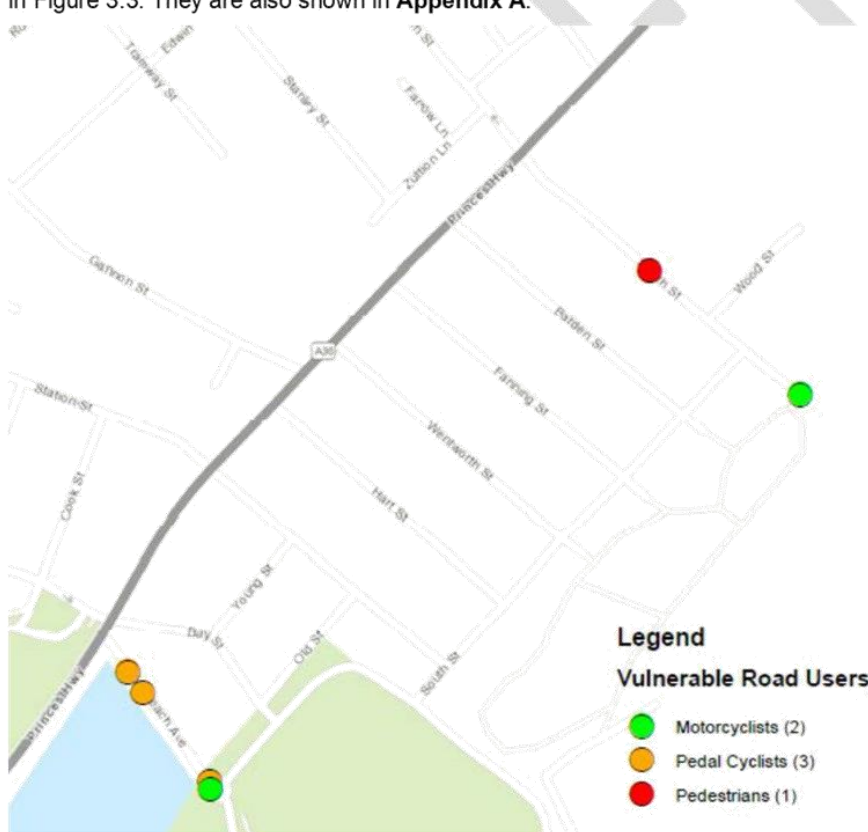


Figure 3.3: Vulnerable Road Users

3.3 Analysis of Trends and Contributing Factors

3.3.1 Crash Type

The 10 crashes were classified into road user movement (RUM) codes, as shown in Table 3.3. The crashes are also further detailed in Table 3.4, ordered by crash severity.

Table 3.3: Crash Summary by Crash Type

Crash Type	RUM Codes	Number of Crashes	Percentage of Total
Crashes involving pedestrians	00 – 09	1	10%
Crashes involving vehicles from adjacent directions	10 – 19	3	30%
Crashes involving vehicles from opposing directions	20 – 29	0	0%
Crashes involving vehicles from the same direction	30 – 39	0	0%
Crashes involving manoeuvring vehicles	40 – 49	4	40%
Crashes involving vehicles overtaking	50 – 59	0	0%
Crashes involving vehicles on path – vehicles hitting parked vehicles or objects on the roadway (e.g. animals, temporary objects)	60 – 69	0	0%
Crashes involving vehicles leaving the roadway on a straight length of road	70 – 79	2	20%
Crashes involving vehicles leaving the roadway on a curve	80 – 89	0	0%
Crashes involving vehicle passengers and miscellaneous crashes	90 – 99	0	0%
Total		10	100%

From Table 3.3, the majority of the crashes resulted from manoeuvring issues (40%).

Holbeach Avenue has the highest number of crashes, recording five (5) out of 10 crashes (50%). Out of the five crashes, three (3) involved pedal cyclists (60%), while four (4) crashes resulted from manoeuvring issues (80%).

The crash occurring on Station Street was one of the only non-casualty crashes, which resulted from a vehicle leaving path and crashing into an object or parked vehicle.

Considering this, this analysis will identify any trending issues and/or contributing factors that may have contributed to the likelihood of the aforementioned crash types.

Table 3.4: Crash Details by Road

Road	Crash Severity	Crash Type	Specific RUM Code	Vulnerable Road User
Holbeach Avenue	Injury	Involving manoeuvring vehicles	RUM 48: From footpath	Pedal Cyclist
Holbeach Avenue	Injury	Involving manoeuvring vehicles	RUM 47: Emerging from driveway	-
Holbeach Avenue	Injury	Involving manoeuvring vehicles	RUM 48: From footpath	Pedal Cyclist
Holbeach Avenue at South Street	Injury	Involving vehicles from adjacent directions	RUM 10: Cross traffic	Motorcyclist
Holbeach Avenue	Injury	Involving manoeuvring vehicles	RUM 49: Other Manoeuvring	Pedal Cyclist
Smith Street	Injury	Involving vehicles leaving the roadway on a straight length of road	RUM 74: Out of control on carriageway	Motorcyclist
Smith Street	Injury	Involving pedestrians	RUM 3: Playing, Working, Lying, Standing on Carriageway	Pedestrian
Princes Highway at Foreman Street	Injury	Involving vehicles from adjacent directions	RUM 13: Right near	-
Station Street	Non-casualty (towaway)	Involving vehicles leaving the roadway on a straight length of road	RUM 71: Left off carriageway into object / parked vehicle	-
Princes Highway at Smith Street	Non-casualty (towaway)	Involving vehicles from adjacent directions	RUM 10: Cross traffic	-

3.3.2 Crash Casualty Rates

Typical casualty crash rates for urban and rural roads are provided within the NSW Speed Zoning Guidelines. A table of typical urban casualty rates from the NSW speed zoning guidelines is shown in Table 3.5.

Table 3.5: Typical Urban Casualty Rates

URBAN TYPICAL CASUALTY RATE (casualties per km per year)							
Road category	Speed zones						
	50	60	70	80	90	100	110
Motorway / freeway	-	-	0.049	0.039	0.463	0.148	1.219
State highway	0.014	0.450	0.827	0.217	0.177	0.101	0.177
Other classified road	0.102	1.351	1.361	0.360	0.253	0.111	0.007
Unclassified road	0.446	0.874	0.376	0.154	0.077	0.064	0.008

NOTE:

- Discretion is needed in comparing these rates to the rate on a particular section of road. A specific road section may not fall comfortably into any single category.
- The values do not suggest an acceptable level.

Source: Transport for NSW Centre for Road Safety - NSW Speed Zoning Guidelines (Section 3)

The typical urban casualty rate for a 50km/h unclassified road is 0.446 casualties per km per year.

Table 3.6 summarises the number of crashes per year and calculated casualty rate (casualties per year per km) for each section of road. Princes Highway was excluded as all other crashes along the road were not analysed. Station Street was also excluded as the only crash had no casualties.

Table 3.6: Crash Casualty Rate by Road

Road	Length (km)	Casualties						Rate	
		2014	2015	2016	2017	2018	Total	Per year	Per km per year
Holbeach Avenue (south of Princes Highway, between Princes Highway & roundabout)	0.15	3	1	0	1	0	5	1	6.7
Smith Street	0.30	0	0	0	1	1	2	0.4	1.3
Total		3	1	0	2	1	7	-	-

From the crash casualty rate results calculated in Table 3.6, it can be seen that both Holbeach Avenue and Smith Street present a rate exceeding the typical urban casualty rate of 0.446 casualties per km per year.

3.4 Crash Data Analysis Summary

Based on the crash analysis results, the majority of the crashes resulted from manoeuvring issues. Most of them also involved a vulnerable road user. Holbeach Avenue has the highest number of crashes, the highest number of crashes involving vulnerable road users, and the highest crash casualty rate in the study area.

4. TRAFFIC SURVEY DATA ANALYSIS

4.1 Environmental Capacity and Speed Performance Standards

The *RTA Guide to Traffic Generating Developments 2002* (GTGD) provides justification for an acceptable environmental limit for each road classification, listed in Table 4.1.

Table 4.1: Environmental Capacity Performance Standards

Road Class	Type	Maximum Speed (km/h)	Max Peak Hour Volume
Local	Access way	25	100
	Street	40	200 goal 300 maximum
Collector	Street	50	300 goal 500 maximum

The *GTGD* also recommends that a typical residential street should ideally exhibit a flow of traffic less than 2,000 vehicles per day (vpd), with a design objective of less than 1,500 vpd to maintain a comfortable traffic environment for local residents.

4.2 Traffic Surveys

4.2.1 Data List

Council has commissioned Austraffic to undertake traffic surveys as part of the study and provided the surveys to Bitzios Consulting for analysis. The traffic surveys undertaken are listed in Table 4.2.

Table 4.2: Traffic Survey Data

Survey	Date(s)	Time	Locations
Intersection Counts	19 March 2020, Thursday	16:00 PM to 18:00 PM	At four locations shown in Figure 4.1: <ul style="list-style-type: none"> Princes Highway / Union Street / Smith Street Smith Street / Wood Street Unwins Bridge Road / Union Street Princes Highway / Holbeach Avenue
	21 March 2020, Saturday	11:00 AM to 13:00 PM	
Tube Counts (Volumes & Speed)	19 March 2020, Thursday to 25 March 2020, Wednesday	24-hour	At locations shown in Figure 4.1
Parking Occupancy & Duration	19 March 2020, Thursday	7:00 AM to 7:00 PM	At locations shown in Figure 4.2
	21 March 2020, Saturday	7:00 AM to 7:00 PM	

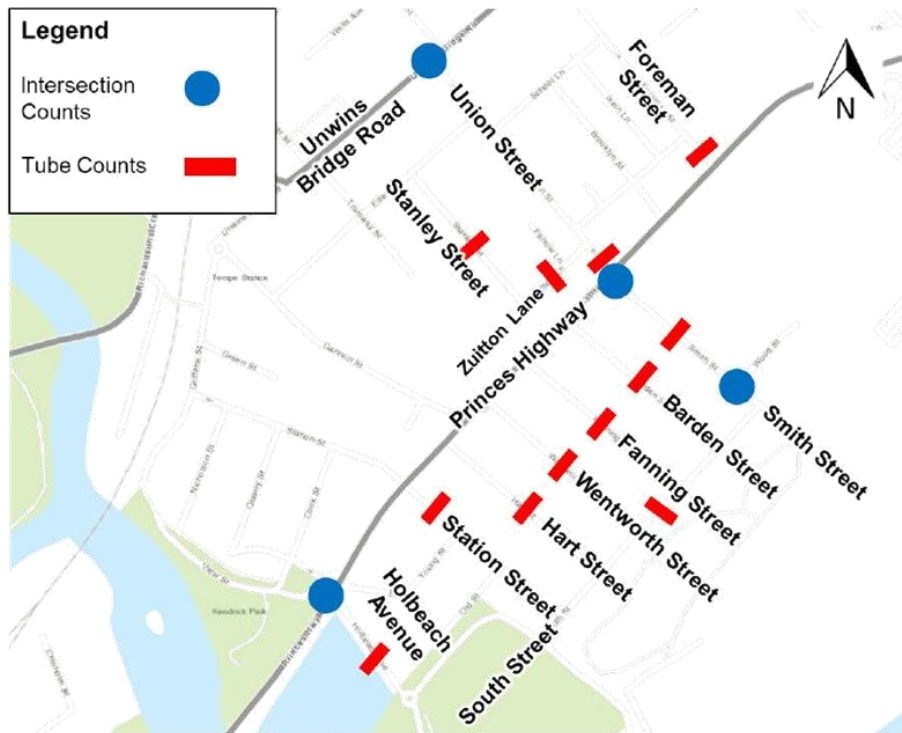


Figure 4.1: Intersection Count & Tube Count Locations

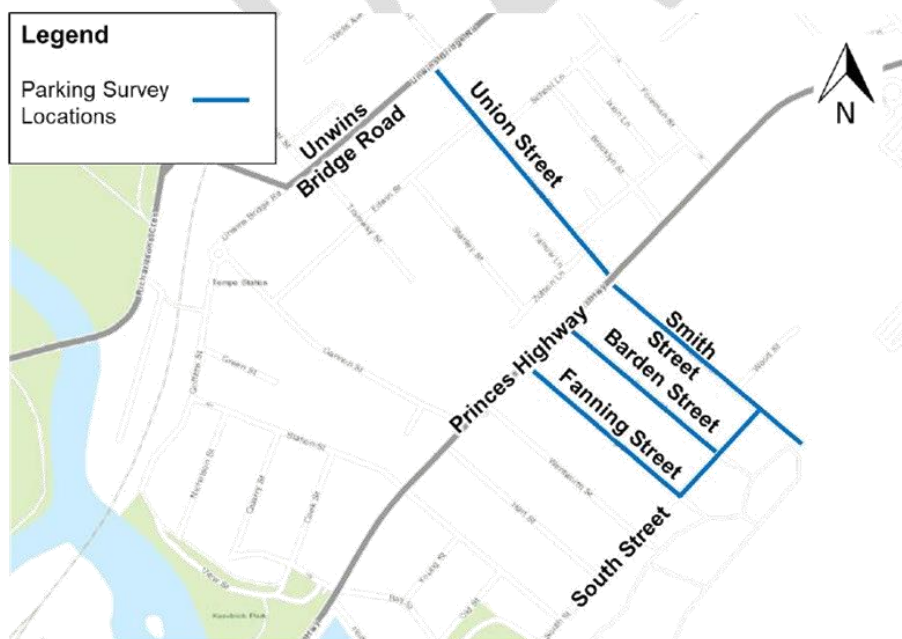


Figure 4.2: Parking Surveys Locations

The data collected was analysed to provide information about traffic operation in the study area, such as volumes and speed. It is important to note that the surveys are undertaken in the midst of the COVID-19 pandemic, as such many workers have opted to stay at home during the dates of the surveys. Therefore, the surveys may not accurately reflect the usual traffic operation before the pandemic.

4.2.2 Intersection Counts

Intersection count surveys were undertaken on a Thursday afternoon and Saturday weekday, for the four intersections listed in Table 4.2. The peak hour intersection counts for the intersections for the Thursday and Saturday are shown in Figure 4.3 and Figure 4.4. It is important to note that there is a No Right Turn restriction from Princes Highway (southwest bound) to Union Street.

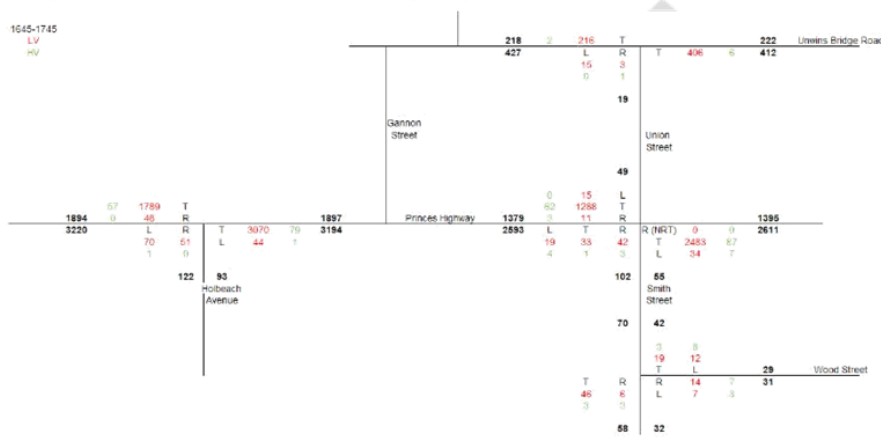


Figure 4.3: Thursday PM Peak Hour Intersection Counts

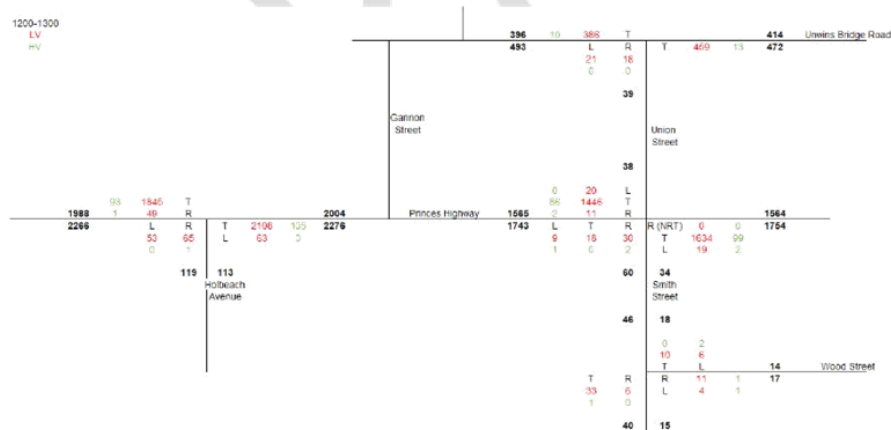


Figure 4.4: Saturday Peak Hour Intersection Counts

The intersection counts are consistent with counts undertaken by Transport and Traffic Planning Associates (TTPA) as part of the Traffic Impact Assessment (TIA) for the Bunnings Development (October 2017) (see Section 6.1.2 for details of the development).

It can be seen that the major vehicular routes are along Princes Highway and along Unwins Bridge Road for the Thursday and Saturday. This is expected as Princes Highway and Unwins Bridge Road are state and regional roads respectively.

As for heavy vehicular movement, due to the truck load limits in the Tempe area (see Section 2.9), heavy vehicles are found along roads without a truck load limit, such as Princes Highway, Smith Street, Wood Street and Unwins Bridge Road. Despite so, with the exception of Princes Highway, the number of heavy vehicles is not high, with at most 15 heavy vehicles per hour.

There are occasional heavy vehicles turning in and out of Holbeach Avenue and Union Street but the numbers are very low (less than 2 per movement). This shows that the existing truck load limit is well implemented and is effective in the Tempe area.

The existing No Right Turn restriction from Princes Highway to Union Street, introduced as part of the previous LATM study (Section 2.10), has also proven effective, with no vehicles observed to be turning right into Union Street.

From the intersection counts, less than 50 vehicles per hour use Union Street. However, tube count surveys will provide a better understanding on the utilisation of Union Street.

4.2.3 Tube Counts

24-hour tube counts were collected for seven days for all the study area roads. Information such as volumes, heavy vehicle composition, and speed data were recorded for both directions of the road.

From the data, the average daily traffic (ADT) volumes, the 85th percentile speeds, and daily heavy vehicle percentage and volumes were extracted for all directions of the locations, shown in Table 4.3. The directions stated were the directions on surveys. Relatively higher values are highlighted orange.

Table 4.3: Tube Count Data Summary

Street	Location	Direction	ADT Volumes	85 th Percentile Speed (km/h)	Heavy Vehicle Composition	
					%	Volumes
Barden Street	Between Princes Highway & South Street	EB	71	30.5	4.9%	3
		WB	74	32.8	8.2%	6
Fanning Street	Between Princes Highway & South Street	EB	108	35.5	6.7%	7
		WB	112	34.4	4.3%	5
Foreman Street	Between Princes Highway and Brooklyn Lane	EB	261	34.1	5.7%	15
Hart Street	Between Princes Highway & South Street	EB	273	30.3	3.0%	8
		WB	63	30.4	9.5%	6
Holbeach Avenue	Between Princes Highway & Roundabout	NB	505	44.1	8.9%	45
		SB	551	40.9	4.9%	27
Smith Street	Between Princes Highway & Wood Street	EB	320	46.5	36.0%	115
		WB	604	38.8	25.0%	151
South Street	Between Smith Street & Station Street	NB	510	28.3	6.0%	31
		SB	182	30	25.0%	46
Stanley Street	Between Edwin Street & Zuitton Lane	EB	164	45.5	7.7%	13
		WB	120	41.9	7.8%	9

Station Street	Between Princes Highway & Young Street	EB	85	30.6	3.7%	3
		WB	20	31.7	7.0%	1
Union Street	Between Princes Highway & Zuitton Lane	WB	487	26.9	3.4%	17
Wentworth Street	Between Princes Highway & South Street	EB	72	32.1	6.7%	5
		WB	151	36.1	6.7%	10
Zuitton Lane	Between Union Street & Stanley Street	NB	123	22	5.6%	7
		SB	82	19.9	2.8%	2

Maps showing the values of ADT, 85th percentile speeds, and heavy vehicle percentage and volumes are shown in **Appendix B**.

Traffic Volumes

All local streets in the study area have a VPD of less than 1,500, the comfortable limit for a local residential traffic environment as according to *GTGD*. Moderately high volumes of more than 500 vpd can be observed on Smith Street, South Street and Holbeach Avenue. Relatively low volumes of more than 200 vpd can also be found on Union Street, Foreman Street and Hart Street. This is expected for Union and Foreman Streets as they are one of the more direct routes between Princes Highway and Unwins Bridge Road.

85th Percentile Speeds

All local streets in the study area have an 85th percentile speed of less than the posted speed limit of 50 km/h. Most recorded 85th percentile speeds are less than 40 km/h, with Holbeach Avenue, Stanley Street and Smith Street having speeds between 40 and 50 km/h. It is important to note that on these roads, LATM devices aimed at reducing speeds and narrowing road widths are not present.

Heavy Vehicle Composition

Many of the streets in the study area with the 3-tonne truck load limit have heavy vehicle volumes of 10 or less. However, roads such as Stanley Street, Union Street, Foreman Street and Wentworth Street have volumes of around 10 to 20 heavy vehicles per day.

Roads without the truck load limit have relatively higher heavy vehicle volumes per day, such as Holbeach Avenue, South Street and Smith Street. In particular, Smith Street has heavy vehicle volumes of more than 100 per day in each direction, justified by the commercial and industrial land use along Smith Street and Wood Street.

In terms of heavy vehicle percentages, most of the roads have a heavy vehicle percentage of more than 5%. In particular, Smith Street and South Street have relatively higher heavy vehicle percentages.

4.2.4 Parking Occupancy & Duration

Parking occupancy and duration surveys were undertaken on a Thursday and a Saturday in March 2020. The surveys were conducted in hourly periods between 7:00 AM to 7:00 PM. Roads surveyed are highlighted in Figure 4.2.

The surveys recorded a total of 291 spaces on the roads surveyed. 57% of these spaces were occupied on the Thursday while 54% of the spaces were occupied on the Saturday.

The parking occupancies by time of day and parking durations for the Thursday and Saturday are summarised in Table 4.4 to Table 4.7.

Table 4.4: Thursday Parking Occupancy Rate by Hourly Period

Road	Side	Section	Restriction	Parking Capacity	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	Average
Fanning Street	West	Entire Section	Unrestricted	34	59%	47%	44%	47%	47%	41%	50%	44%	47%	59%	62%	59%	50%
	East	Entire Section	Unrestricted	29	76%	72%	76%	69%	69%	76%	72%	69%	76%	72%	76%	90%	74%
Barden Street	West	Entire Section	Unrestricted	30	50%	50%	53%	60%	50%	40%	43%	50%	53%	60%	63%	47%	52%
	East	Entire Section	Unrestricted	33	52%	42%	45%	48%	45%	45%	45%	58%	58%	45%	48%	52%	49%
South Street	North	Between Fanning St & Barden St	Unrestricted	9	44%	22%	33%	33%	33%	33%	56%	33%	44%	44%	44%	33%	38%
		Between Barden St & Smith St	Unrestricted	10	40%	40%	40%	40%	40%	40%	40%	40%	50%	50%	50%	70%	45%
	South	Entire Section	Unrestricted	16	0%	0%	0%	6%	0%	0%	0%	0%	0%	0%	0%	0%	1%
Smith Street	West	Between Princes Hwy & South St	Unrestricted	31	61%	65%	74%	81%	77%	77%	84%	77%	87%	81%	77%	61%	75%
		Between South St & cul-de-sac	No Parking	0	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	Cul-de-sac	-	No Parking	0	0%	0%	0%	0%	0%	0%	0%	100%	0%	100%	300% ²	0%	100% ²

Road	Side	Section	Restriction	Parking Capacity	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	Average
Union Street	East	Between cul-de-sac & Wood St	Unrestricted	3	33%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	0%	86%
		Between Wood St & Princes Hwy	Unrestricted	27	59%	59%	63%	63%	63%	63%	70%	67%	63%	67%	63%	56%	63%
	East	Between Princes Hwy & Brooklyn Ln	No Parking	0	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
		Between Brooklyn Ln & School Ln	Unrestricted	7	86%	43%	71%	71%	57%	71%	57%	71%	57%	71%	71%	71%	67%
			PWD	1	100%	100%	100%	100%	100%	100%	0%	0%	0%	0%	0%	100%	58%
			Unrestricted	15	80%	80%	67%	67%	73%	67%	87%	80%	67%	80%	80%	80%	76%
			No Stopping	0	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
		Between School Ln & Unwins Bridge Rd	No Stopping	0	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
			Unrestricted	8	0%	25%	25%	25%	25%	25%	25%	25%	25%	25%	12%	12%	21%
	West	Between Unwins Bridge Rd & Edwin St	No Stopping	0	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
			No Parking	0	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100% ²

Road	Side	Section	Restriction	Parking Capacity	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	Average
			Unrestricted	7	86%	86%	86%	86%	86%	86%	86%	100%	100%	86%	71%	100%	88%
			No Stopping	0	0%	0%	0%	0%	100%	100%	0%	0%	0%	0%	0%	0%	100% ²
		Between Edwin St & Zuitton Ln	No Stopping	0	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
			Unrestricted	27	78%	63%	52%	56%	59%	56%	56%	59%	59%	59%	67%	56%	60%
		Between Zuitton Ln & Princes Hwy	No Stopping	0	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
			1P ¹	4	75%	75%	75%	75%	75%	75%	25%	50%	50%	75%	50%	25%	60%
			No Stopping	0	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
		Total		291	57%	53%	55%	57%	55%	54%	56%	57%	58%	60%	61%	56%	57%

Notes:

1. 1P restriction during 8:30 AM - 6:00 PM Mon-Fri

2. A percentage of 100% for a No Stopping or No Parking restriction means there is a vehicle that is illegally stopping or parked. A percentage of 300% means there are three (3) vehicles that are illegally stopping or parked

Table 4.5: Saturday Parking Occupancy Rate by Hourly Period

Road	Side	Section	Restriction	Parking Capacity	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	Average
Fanning Street	West	Entire Section	Unrestricted	34	50%	50%	41%	44%	41%	53%	62%	56%	59%	56%	50%	59%	52%
	East	Entire Section	Unrestricted	29	90%	93%	97%	93%	93%	90%	100%	83%	72%	69%	86%	90%	88%
Barden Street	West	Entire Section	Unrestricted	30	60%	53%	57%	50%	47%	57%	53%	53%	50%	47%	50%	40%	51%
	East	Entire Section	Unrestricted	33	61%	55%	42%	48%	45%	55%	55%	55%	55%	48%	55%	61%	53%
South Street	North	Between Fanning St & Barden St	Unrestricted	9	33%	22%	22%	33%	33%	33%	67%	67%	78%	67%	67%	67%	49%
		Between Barden St & Smith St	Unrestricted	10	50%	60%	50%	40%	50%	40%	40%	40%	40%	30%	40%	30%	43%
	South	Entire Section	Unrestricted	16	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	6%	6%	1%
Smith Street	West	Between Princes Hwy & South St	Unrestricted	31	71%	61%	65%	55%	61%	68%	71%	71%	71%	65%	68%	65%	66%
		Between South St & cul-de-sac	No Parking	0	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	Cul-de-sac	-	No Parking	0	0%	0%	0%	0%	0%	0%	0%	0%	100%	100%	0%	0%	100% ²

Road	Side	Section	Restriction	Parking Capacity	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	Average
Union Street	East	Between cul-de-sac & Wood St	Unrestricted	3	0%	0%	0%	33%	0%	0%	0%	0%	33%	33%	33%	33%	14%
		Between Wood St & Princes Hwy	Unrestricted	27	48%	48%	48%	44%	48%	41%	52%	52%	56%	59%	52%	56%	50%
	East	Between Princes Hwy & Brooklyn Ln	No Parking	0	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
		Between Brooklyn Ln & School Ln	Unrestricted	7	71%	57%	71%	71%	43%	43%	71%	71%	71%	71%	71%	71%	65%
			PWD	1	100%	100%	100%	100%	100%	0%	0%	0%	0%	100%	100%	100%	67%
			Unrestricted	15	80%	80%	73%	80%	73%	53%	60%	80%	80%	80%	93%	73%	76%
			No Stopping	0	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
		Between School Ln & Unwins Bridge Rd	No Stopping	0	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
			Unrestricted	8	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	12%	1%
	West	Between Unwins Bridge Rd & Edwin St	No Stopping	0	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
			No Parking	0	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Road	Side	Section	Restriction	Parking Capacity	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	Average
			Unrestricted	7	71%	71%	71%	71%	57%	43%	43%	71%	86%	86%	71%	0%	62%
			No Stopping	0	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
		Between Edwin St & Zuitton Ln	No Stopping	0	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
			Unrestricted	27	67%	67%	56%	52%	70%	59%	48%	44%	52%	48%	56%	59%	56%
		Between Zuitton Ln & Princes Hwy	No Stopping	0	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
			1P ¹	4	75%	75%	75%	50%	50%	75%	50%	50%	25%	25%	75%	75%	58%
			No Stopping	0	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
		Total		291	58%	55%	53%	51%	52%	52%	56%	55%	56%	53%	57%	55%	54%

Notes:

1. 1P restriction during 8:30 AM-12:30 PM Sat

2. A percentage of 100% for a No Stopping or No Parking restriction means there are cars that are illegally stopping or parked.

Table 4.6: Thursday Parking Duration Proportions

Road	Side	Section	Restriction	Total Vehicles	Parking Duration											
					1 hour	2 hours	3 hours	4 hours	5 hours	6 hours	7 hours	8 hours	9 hours	10 hours	11 hours	12 hours
Fanning Street	West	Entire Section	Unrestricted	47	26%	15%	19%	6%	4%	2%	11%	0%	2%	2%	2%	11%
	East	Entire Section	Unrestricted	51	25%	14%	12%	4%	6%	4%	8%	2%	2%	10%	0%	14%
Barden Street	West	Entire Section	Unrestricted	43	23%	28%	9%	7%	7%	5%	0%	0%	2%	2%	5%	12%
	East	Entire Section	Unrestricted	40	30%	15%	5%	10%	10%	0%	3%	3%	5%	0%	5%	15%
South Street	North	Between Fanning St & Barden St	Unrestricted	9	44%	11%	0%	11%	0%	0%	11%	0%	0%	0%	0%	22%
		Between Barden St & Smith St	Unrestricted	8	38%	0%	0%	13%	0%	0%	0%	0%	0%	0%	13%	38%
	South	Entire Section	Unrestricted	1	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Smith Street	West	Between Princes Hwy & South St	Unrestricted	42	19%	12%	5%	5%	2%	5%	5%	5%	7%	5%	5%	26%
		Between South St & cul-de-sac	No Parking	0	-	-	-	-	-	-	-	-	-	-	-	-
	Cul-de-sac	-	No Parking	4	75%	25%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	East	Between cul-de-sac & Wood St	Unrestricted	3	0%	0%	0%	0%	0%	0%	0%	0%	0%	67%	33%	0%
		Between Wood St & Princes Hwy	Unrestricted	29	17%	14%	3%	3%	0%	7%	3%	3%	10%	3%	0%	34%
Union Street	East	Between Princes Hwy & Brooklyn Ln	No Parking	0	-	-	-	-	-	-	-	-	-	-	-	-

Road	Side	Section	Restriction	Total Vehicles	Parking Duration											
					1 hour	2 hours	3 hours	4 hours	5 hours	6 hours	7 hours	8 hours	9 hours	10 hours	11 hours	12 hours
		Between Brooklyn Ln & School Ln	Unrestricted	14	43%	7%	14%	7%	0%	0%	0%	7%	14%	0%	0%	7%
			PWD	2	50%	0%	0%	0%	0%	50%	0%	0%	0%	0%	0%	0%
			Unrestricted	30	20%	30%	13%	3%	3%	7%	0%	0%	3%	3%	0%	17%
			No Stopping	0	-	-	-	-	-	-	-	-	-	-	-	-
		Between School Ln & Unwins Bridge Rd	No Stopping	0	-	-	-	-	-	-	-	-	-	-	-	-
			Unrestricted	2	0%	0%	0%	0%	0%	0%	0%	0%	50%	0%	50%	0%
		West	Between Unwins Bridge Rd & Edwin St	No Stopping	0	-	-	-	-	-	-	-	-	-	-	-
				No Parking	1	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	Unrestricted			12	42%	0%	0%	0%	0%	17%	0%	0%	8%	0%	0%	33%
	No Stopping			1	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
		Between Edwin St & Zuitton Ln	No Stopping	0	-	-	-	-	-	-	-	-	-	-	-	-
			Unrestricted	38	34%	16%	5%	0%	5%	3%	8%	3%	0%	3%	0%	24%
Between Zuitton Ln & Princes Hwy		No Stopping	0	-	-	-	-	-	-	-	-	-	-	-	-	

Road	Side	Section	Restriction	Total Vehicles	Parking Duration											
					1 hour	2 hours	3 hours	4 hours	5 hours	6 hours	7 hours	8 hours	9 hours	10 hours	11 hours	12 hours
			1P ¹	9	44%	11%	11%	11%	11%	0%	0%	0%	0%	0%	11%	0%
			No Stopping	0	-	-	-	-	-	-	-	-	-	-	-	-
Total				386	28%	16%	9%	5%	4%	4%	4%	2%	4%	4%	3%	18%

Notes:

1. 1P restriction during 8:30 AM - 6:00 PM Mon-Fri

Table 4.7: Saturday Parking Duration Proportions

Road	Side	Section	Restriction	Total Vehicles	Parking Duration											
					1 hr	2 hr	3 hr	4 hr	5 hr	6 hr	7 hr	8 hr	9 hr	10 hr	11 hr	12 hr
Fanning Street	West	Entire Section	Unrestricted	52	37%	13%	15%	4%	6%	4%	0%	2%	4%	2%	2%	12%
	East	Entire Section	Unrestricted	60	25%	17%	10%	3%	7%	7%	2%	3%	7%	2%	0%	18%
Barden Street	West	Entire Section	Unrestricted	40	23%	13%	13%	8%	13%	10%	5%	3%	3%	0%	3%	10%
	East	Entire Section	Unrestricted	45	29%	16%	7%	11%	9%	4%	4%	0%	0%	0%	2%	18%
South Street	North	Between Fanning St & Barden St	Unrestricted	9	22%	11%	0%	11%	0%	22%	0%	0%	11%	0%	0%	22%
		Between Barden St & Smith St	Unrestricted	10	30%	10%	20%	0%	0%	0%	0%	20%	0%	0%	0%	20%
	South	Entire Section	Unrestricted	1	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Smith Street	West	Between Princes Hwy & South St	Unrestricted	39	18%	13%	10%	5%	5%	3%	8%	5%	0%	0%	3%	31%
		Between South St & cul-de-sac	No Parking	0	-	-	-	-	-	-	-	-	-	-	-	-
	Cul-de-sac	-	No Parking	2	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	East	Between cul-de-sac & Wood St	Unrestricted	2	50%	0%	0%	50%	0%	0%	0%	0%	0%	0%	0%	0%
		Between Wood St & Princes Hwy	Unrestricted	32	22%	6%	13%	13%	16%	6%	3%	3%	0%	0%	0%	19%
Union Street	East	Between Princes Hwy & Brooklyn Ln	No Parking	0	-	-	-	-	-	-	-	-	-	-	-	-

Road	Side	Section	Restriction	Total Vehicles	Parking Duration											
					1 hr	2 hr	3 hr	4 hr	5 hr	6 hr	7 hr	8 hr	9 hr	10 hr	11 hr	12 hr
West		Between Brooklyn Ln & School Ln	Unrestricted	9	11%	0%	0%	22%	22%	22%	0%	0%	0%	0%	0%	22%
			PWD	2	0%	0%	50%	0%	50%	0%	0%	0%	0%	0%	0%	0%
			Unrestricted	29	24%	10%	10%	14%	17%	3%	0%	0%	3%	3%	0%	14%
			No Stopping	0	-	-	-	-	-	-	-	-	-	-	-	-
		Between School Ln & Unwins Bridge Rd	No Stopping	0	-	-	-	-	-	-	-	-	-	-	-	-
			Unrestricted	1	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
		Between Unwins Bridge Rd & Edwin St	No Stopping	0	-	-	-	-	-	-	-	-	-	-	-	-
			No Parking	0	-	-	-	-	-	-	-	-	-	-	-	-
			Unrestricted	8	0%	13%	0%	38%	13%	0%	0%	0%	0%	0%	38%	0%
			No Stopping	0	-	-	-	-	-	-	-	-	-	-	-	-
		Between Edwin St & Zuitton Ln	No Stopping	0	-	-	-	-	-	-	-	-	-	-	-	-
			Unrestricted	46	35%	22%	4%	9%	4%	7%	2%	2%	0%	2%	0%	13%
		Between Zuitton Ln & Princes Hwy	No Stopping	0	-	-	-	-	-	-	-	-	-	-	-	-

Road	Side	Section	Restriction	Total Vehicles	Parking Duration											
					1 hr	2 hr	3 hr	4 hr	5 hr	6 hr	7 hr	8 hr	9 hr	10 hr	11 hr	12 hr
			1P ¹	6	17%	33%	17%	0%	0%	0%	0%	17%	0%	0%	0%	17%
			No Stopping	0	-	-	-	-	-	-	-	-	-	-	-	-
Total				393	26%	14%	10%	8%	9%	6%	3%	3%	2%	1%	2%	16%

Notes:

1. 1P restriction during 8:30 AM-12:30 PM Sat

A map showing the average parking occupancy rates is provided in **Appendix B**.

Parking Data Summary

The parking occupancy data shows that

- Out of the 291 spaces, about 50 to 60% of the spaces are occupied at any one time on both days.
- There are little differences in parking occupancy between Thursday and Saturday, except for Smith Street.
- For Smith Street, the occupancy rate is higher on the Thursday and lower on Saturday.
 - The occupancy rates for the section of Smith Street southeast of South Street (up to the cul-de-sac) are significantly different between Thursday and Saturday. This is because of the low number of spaces resulting in high fluctuations of occupancy rates.
- For Fanning Street the occupancy rate on the eastern side is higher than the western side on both days, with occupancy rates of 74% and 88% on Thursday and Saturday respectively.
- On the Thursday, there are occasional vehicles parking or stopped at each section with No Stopping or No Parking restrictions. These restrictions are along Smith Street and Union Street.
- The southern side of South Street is rarely occupied, which is consistent with site observations and Street View. This is due to the narrow width of South Street which is only wide enough for a parking lane and a trafficable lane.
- All other roads have parked vehicles on both sides of the road, if allowed
- Parking occupancy is relatively higher on Union Street near the school on Thursdays, with the western and eastern sides having occupancy rates of 88% and 76% respectively.

The parking duration data shows that:

- Almost 400 vehicles parked during the surveyed time period.
- On both Thursday and Saturday:
 - about 27% of all users park less than an hour
 - about 15% park less than 2 hours
 - about 17% of users park for at least 12 hours, i.e. potentially residents

The parking occupancy and duration data will be considered when determining locations and suitability of LATM devices. This data also sets a base line for the parking demand in the study area. This can be used for a comparative study to identify changes in parking demand after any new developments have been built.

An assessment of the Smith Street on-street parking availability considering changes to Smith Street as a result of the proposed Bunnings development is detailed in Section 6.1.2.

5. SITE INSPECTIONS

5.1 Site Audits - Overview

A site inspection and audit within the study area was undertaken, on Wednesday 4 March 2020, to gain an understanding of the current conditions of the streets within the study area (including parking behaviour), and identify existing LATM devices and traffic control infrastructure. Details on traffic and parking signage were also recorded.

The site audit covered the following traffic items and are detailed in the sections below:

- LATM Devices
- Traffic Signs
- Parking Signs
- Bicycle Facilities
- Pedestrian Facilities
- Waste Management/Collection Issues

5.2 Audit

The signage audit included the following items:

- Type of Sign (and relevant codes) or device
- Direction of sign control
- Restrictions and times of operation
- Condition
- Location (GPS co-ordinates)
- Applicable direction of traffic

Bicycle and Pedestrian Facilities

- Cycle related signage / road markings and their location
- Wayfinding signage and their location
- Kerb ramps and crossings

Waste Management

- Evidence of issues with road geometry or surfaces that can affect waste collection

A database of the audit findings was developed including photographs of signs and infrastructure, located in **Appendix C**.

5.2.1 LATM Audit

An audit of existing LATM devices within the study area was conducted, covering the following aspects:

- LATM type
- Location (including road name)
- Line marking and physical condition

A total of 16 LATM devices were identified within the study area, presented in Table 5.1 and Figure 5.1.

Table 5.1: Existing LATM Devices & Controls

Road	Traffic Calming or Treatment	Treatment Type
Union Street	Yes	<ul style="list-style-type: none"> Road Hump (Watts Profile) Road Hump (Flat Top) – Raised Thresholds Kerb Blisters Contrasting Pavement Raised Pedestrian Crossing (Wombat Crossing) One-way restriction
Foreman Street	Yes	<ul style="list-style-type: none"> Road Hump (Watts Profile) Road Hump (Flat Top) - Raised Thresholds Kerb Blisters One-way restriction
Edwin Street	Yes	<ul style="list-style-type: none"> Road Hump (Flat Top) Contrasting Pavement
South Street	Yes	<ul style="list-style-type: none"> Road Hump (Watts Profile)
Holbeach Avenue	Yes	<ul style="list-style-type: none"> Roundabout (with Pedestrian Refuge Islands)

A number of these devices are in addition to those proposed as part of the previous *St Peters/Tempe LATM Study*. This includes:

- Raised thresholds, kerb blisters, raised pedestrian crossing and contrasting pavement on Union Street
- An additional Watts Profile hump on South Street
- Roundabout at Holbeach Avenue.

Signage associated with the LATM devices are covered under the Traffic Sign Audit in Section 5.2.2.

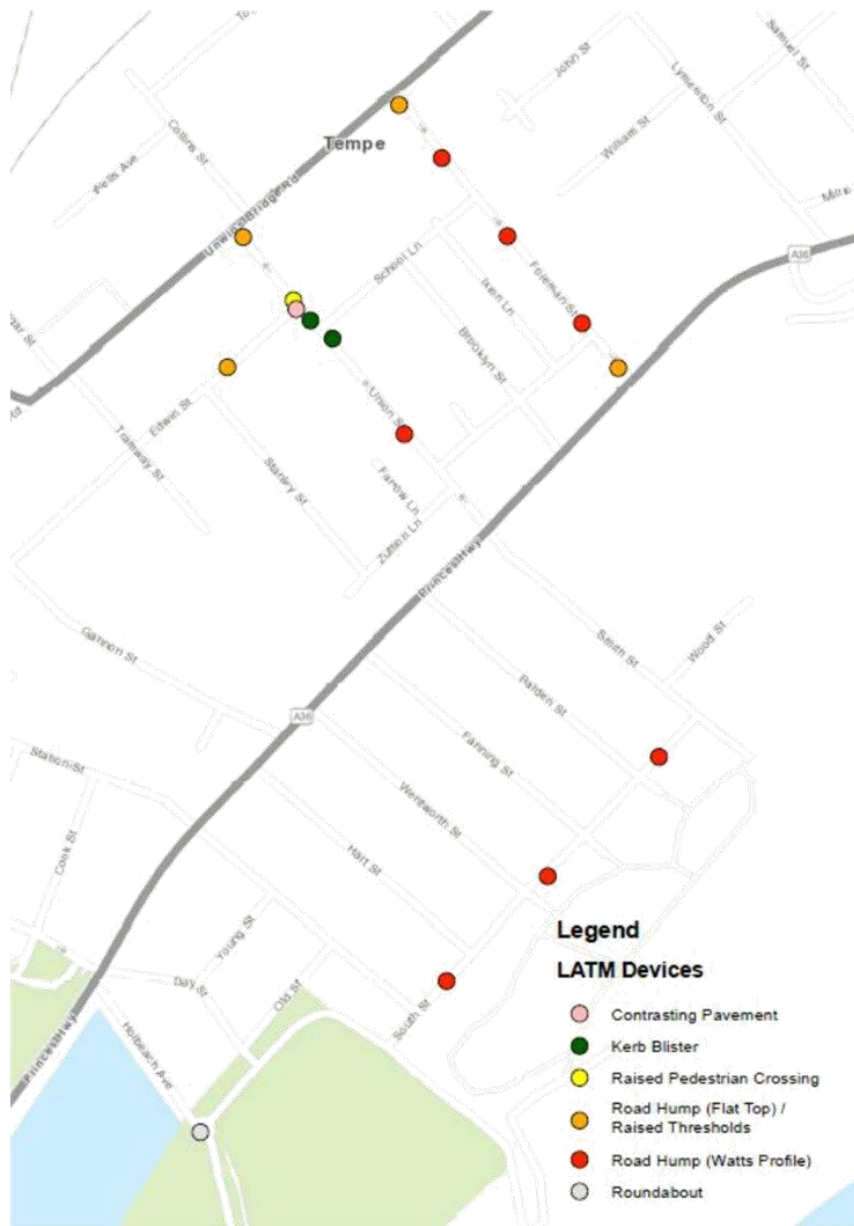


Figure 5.1: Existing LATM Devices

5.2.2 Traffic Sign Audit

The traffic sign audit covered all traffic signs along each roadway, including regulatory, warning and wayfinding signage. Signage associated with LATM devices (such as directional hazard markers or speed hump warning sign) were included in the traffic signage audit. The audit covered:

- Sign type & associated RMS code
- Road and location (including road name and co-ordinates)
- Applicable direction of traffic
- Sign condition
- Visibility obstruction (if any)

A total of 130 traffic signs were recorded within the study area. A database of traffic signs identified in the audit is provided in **Appendix C**.

Majority of the signs were found to be in a good condition with unobstructed visibility. Some signs were found to be vandalised with stickers or graffiti, or faded, however, were still mostly legible. A number of signs were also found to be dislocated or facing the wrong way. Some signs were also obstructed by trees, or covered by another sign immediately above or below the obstructed sign.

A large proportion of the traffic signs are speed hump and speed hump ahead signs (with relevant tag plates), one-way, and the 3-tonne truck load limit signs. The speed hump related signage are mostly along South Street, Union Street and Foreman Street, while the 3-tonne truck load limit signage are located on the entry to roads with the load limit restriction (see Section 2.9).

Table 5.2: Traffic Signs Audit

Traffic Sign Recorded	Sign Code	Locations
No Through Road	G9-18	Holbeach Avenue, Smith Street, Wood Street
Stop	R1-1	Holbeach Avenue
Roundabout Give Way	R1-13	Holbeach Avenue
Give Way	R1-2	Holbeach Avenue, Station Street, Union Street, Foreman Street
Traffic Signal Stop	R1-4	Holbeach Avenue, Smith Street
All Traffic Left Only	R2-14_L	Station Street, Fanning Street
All Traffic Right Only	R2-14_R	School Lane
One Way Left	R2-2_L	Princes Highway, Zuiton Lane, Unwin's Bridge Road, Edwin Street
One Way Right	R2-2_R	School Lane, Princes Highway, Brooklyn Lane, Unwins Bridge Road
Two Way	R2-223	Holbeach Avenue
Keep Left	R2-3	Holbeach Avenue
No Entry	R2-4N	Foreman Street
No Right Turn	R2-6	Unwins Bridge Road
Pedestrian Crossing	R3-1	Union Street
Speed Limit Sign (25 km/h)	R4-1	Holbeach Avenue
School Zone Sign (including illuminated)	R4-230 & R4-230-1	School Lane, Foreman Street, Union Street

Traffic Sign Recorded	Sign Code	Locations
End School Zone	R4-231	Foreman Street, Edwin Street
Local Traffic Area (50 km/h)	R4-240 (50 km/h)	Fanning Street, Barden Street, Smith Street
End Local Traffic Area (50 km/h)	R4-241	Fanning Street, Barden Street, Smith Street
Trucks Prohibited 3-tonne & over	R6-222, R6-10-2 and R9-221	Old Street, Bay Street, Union Street, Fanning Street, Barden Street, Station Street, Hart Street
"When Signals Black Out or Flashing" Tag Plate	R9-201	Smith Street
Hazard Warning Marker	T5-5	Union Street, Foreman Street, Holbeach Avenue
Roundabout Warning	W2-7	Holbeach Avenue
Speed Hump Ahead	W3-4	South Street, Union Street, Edwin Street, Foreman Street
Speed Hump	W5-10	South Street, Union Street, Edwin Street, Foreman Street
Pedestrian Warning	W6-1	Holbeach Avenue, Union Street
Pedestrian Crossing Ahead / Left	W6-2 & W6-2-1	Union Street, Edwin Street
Children Crossing	W6-3	Union Street
"School" Tag Plate	W8-14	Union Street
Speed Tag Plates for Speed Hump signs (various speeds)	W8-2	South Street, Union Street, Edwin Street, Foreman Street
"Refuge Island" Tag Plate	W8-211	Holbeach Avenue

5.2.3 Parking Sign Audit

The parking sign audit captured any signage associated with kerbside and parking controls, including 'No Stopping' and 'No Parking' areas. The audit covered (where applicable):

- Location (road name and co-ordinates)
- Sign type & associated RMS sign code
- Direction of arrow
- Time restrictions and operation days/times
- Applicable traffic direction
- Sign Condition
- Any visibility obstructions

As most of the study area has unrestricted on-street parking, there are very few parking signs with timed or conditional restrictions. The rest of the signs, particularly, those close to intersections, are No Stopping and No Parking signs. A total of 89 parking signs were recorded.

Majority of signs are legible, with some signs heavily faded and illegible (including wording and arrow).

Parking zones associated with the parking signs was previously presented in Figure 2.8. A map of parking signs recorded is provided in **Appendix C**.

5.2.4 Bicycle Facilities Audit

The bicycle facilities audit covered both physical and visual treatments provided for cyclists, such as ramps or crossings and cycle route pavement markings and signage. The audit included:

- Any bicycle-related route-finding signage
- Any shared paths and cycleways
- Any shared bicycle/pedestrian signalised crossing
- Location of bicycle facility (including road name)

Most bicycle facilities are located along the bicycle routes shown in Section 2.7.1, which include Holbeach Avenue, South Street and Smith Street. This includes shared paths and associated signage and bicycle route signage. Signalised shared pedestrian / bicycle crossings are also located at the intersections of Princes Highway / Holbeach Avenue and Princes Highway / Smith Street.

A bicycle on-ramp is also present near the Holbeach Avenue approach to Princes Highway. This allows cyclists along the roadway of Holbeach Avenue to join the shared path along Holbeach Avenue and Princes Highway.

A map of bicycle facilities is provided in **Appendix C**.

5.2.5 Pedestrian Facilities Audit

The pedestrian facilities audit identified features providing accessible pedestrian connectivity within the study area. This included:

- Any kerb ramps
- Any pedestrian refuges
- Any signalised pedestrian crossing or shared bicycle/pedestrian crossings
- Any pedestrian (zebra) crossings

The study area is well-connected by footpaths, with the exception of laneways such as Farrow Lane and Zuitton Lane and were therefore not included as part of the pedestrian facilities audit.

Kerb ramps are present at crossing points at most intersections in the study area. In most circumstances, the kerb ramps occur in pairs; one on each side of the road. Where pairs of kerb ramps are not present, this creates a break in footpath connectivity, presenting accessibility issues for low mobility pedestrians, such as wheelchair users.

These issues should be further explored and addressed as part of a different study such as a Pedestrian Accessibility Mobility Plan.

5.2.6 Waste Management Audit

The waste management audit focussed on identifying evidence of issues or potential issues affecting waste collection. This may include items such as insufficient geometry, damage to kerbs/corners or other evidence of manoeuvring issues.

Very few issues were found that may affect residential waste collection in the study area.

A kerb runover was observed at the corner of Farrow Lane and Zuitton Lane, shown in Figure 5.2. These roadways feature narrow road widths which would be expected to be limiting for waste collection vehicles.



Figure 5.2: Kerb Runover at Farrow Lane

6. FUTURE CONDITIONS

6.1 Future Development

6.1.1 Residential

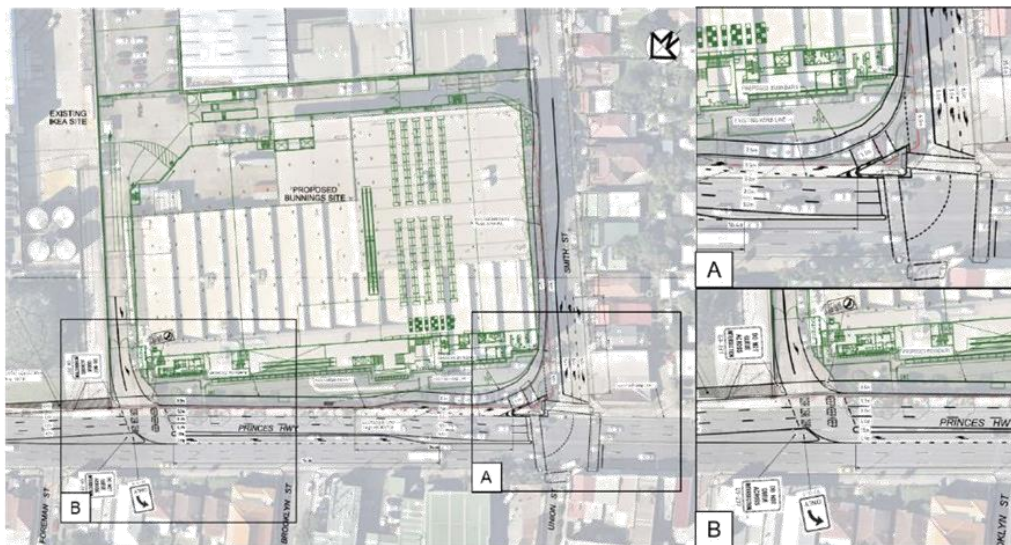
There are not any known high impact residential developments, such as medium or high-density developments, currently pending within Tempe and the study area.

Based on population forecasts provided by Forecast ID (using Census data from 2006 to 2016), Tempe is expected to experience a negative population growth until 2031. As such, it is expected that there will be very little traffic growth in traffic volumes in Tempe for the next 10 years. This excludes traffic along major through roads and connectors such as Princes Highway or Unwins Bridge Road.

6.1.2 Bunnings Development

The proposed Bunnings Development is to be located at the south-east corner of Princes Highway and Smith Street, with vehicular access to be provided via Smith Street and Princes Highway. A Traffic Impact Assessment (TIA) was undertaken by Transport and Traffic Planning Associates (TTPA) in October 2017, indicating the following proposed road changes (also shown in Figure 6.1):

- A new left turn slip lane from Princes Highway to Smith Street
- Removal of parking on the eastern side of Smith Street and a reduction to one departure lane on Smith Street
- Widening of Smith Street approach to Princes Highway to three lanes
- Customer and delivery access ("Smith Street access") to Bunnings from Smith Street at existing driveway location
- Access to Bunnings from Princes Highway to be located north-east of the Smith Street intersection
- A new unsignalised right turn bay from Princes Highway eastbound to Bunnings Warehouse Princes Highway access
- Only left turns permitted from the Bunnings Princes Highway access
- Relocation of the southwest-bound bus stop on Princes Highway, currently located on the approach to Smith Street.



Source: Bunnings Warehouse Tempe – Proposed Road Layout General Arrangement Plan 2 – AT&L 2017

Figure 6.1: Proposed Road Changes

Smith Street On-Street Parking Assessment

It is understood that up to 13 spaces of on-street parking of Smith Street are proposed to be removed as part of the Bunnings development. To mitigate the loss of on-street parking, as part of the Bunnings development application consent conditions (condition number 6), 13 of the car spaces within Bunnings warehouse are to be dedicated as public car parking spaces available to local residents to offset the loss of on street parking. However, these public car spaces are intended to be available during Bunnings trading hours only. This removes the flexibility of parking at any time of the day for any duration. Given that most residents are expected to park overnight or outside business hours, as a worst-case scenario, these spaces will not be considered as part of the assessment. Further, Bunnings customers are assumed to not use on-street parking on Smith Street as 424 on-site parking spaces are provided.

Based on parking occupancy data, Table 6.1 shows the average number of occupied spaces and vacant spaces along Smith Street on the Thursday and Saturday. There are on average 18 vacant spaces along Smith Street on Thursday and 27 vacant spaces on Saturday. The removal of 13 on-street spaces result in an estimated 5 and 14 vacant spaces remaining on Thursday and Saturday respectively. Therefore, Smith Street will be able to cope with the loss of 13 on-street spaces, and residents do not have to seek other on-street parking elsewhere.

Table 6.1: Parking Occupancy on Smith Street

Side	Section	Parking Capacity	Occupied Spaces (Average)	Vacant Spaces
Thursday				
West	Between Princes Highway & South Street	31	23	8
East	Between cul-de-sac & Wood Street	3	3	0
	Between Wood Street & Princes Highway	27	17	10

Side	Section	Parking Capacity	Occupied Spaces (Average)	Vacant Spaces
Total		61	43	18
Saturday				
West	Between Princes Highway & South Street	31	20	11
East	Between cul-de-sac & Wood Street	3	0	3
	Between Wood Street & Princes Highway	27	14	13
Total		61	34	27

Any proposed treatments resulting in the removal of further parking spaces on Smith Street (mainly the western side) may further reduce the number of vacant spaces along Smith Street.

Future Traffic Generation

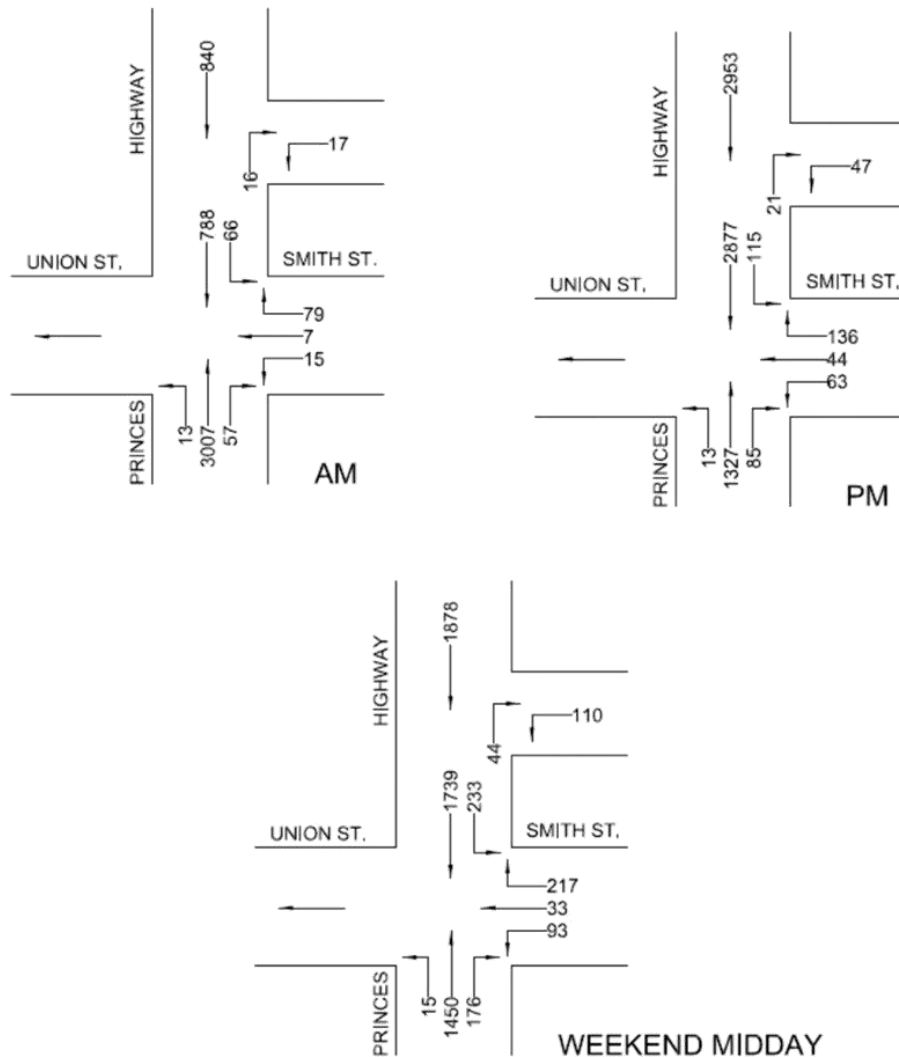
It is expected that there will be an increase in traffic turning between Princes Highway and Smith Street, due to traffic generated by the proposed Bunnings Development,

The projected peak hour traffic at the intersection is shown in Figure 6.2, with notable increases to the following turn volumes

- Right turn from Smith Street to Princes Highway east-bound
- Left turn from Princes Highway west-bound to Smith Street
- Right turn from Princes Highway east-bound to Smith Street

The projected counts are expected to increase up to 233 vehicles per hour. The intersection upgrade is expected to be able to deal with the increase in traffic volumes.

The increase in volumes along Smith Street will be limited to the section of Smith Street between Princes Highway and the proposed Bunnings access. Generated trips by the Bunnings development are not expected to use Smith Street south of the Bunnings access and subsequently South Street.



Source: 728-750 Princes Highway Traffic Impact Assessment – Transport and Traffic Planning Associates (TTPA)

Figure 6.2: Projected Peak Hour Turn Counts – Princes Highway / Union Street / Smith Street

6.2 Future Road Network

6.2.1 WestConnex

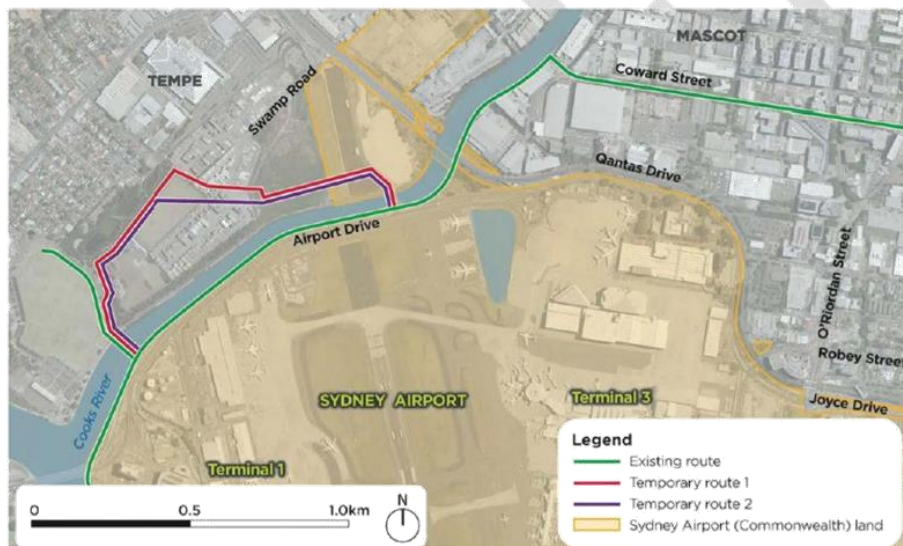
The new M5 tunnels, opening in 2020, will run underneath the study area as part of the WestConnex project. There will be no connections or changes to study area roads. The St. Peters interchange, located approximately 2km northeast of Tempe, will allow the new M5 to connect with roads towards the eastern suburbs such as Mascot and Kingsford, and the City's inner south such as Alexandria and Waterloo.

Currently, traffic from the M5 exit at Arncliffe will run via Princes Highway, through Tempe, then via Canal Road or Sydney Park Road to get to the inner south and eastern suburbs respectively. The opening of the new M5 East and St Peters interchange will be able to provide an alternative route from the existing M5 to these suburbs, bypassing the Tempe area and is expected to reduce traffic along Princes Highway through Tempe.

6.2.2 Sydney Gateway

Sydney Gateway is a future motorway connection between the St Peters interchange and Sydney Kingsford Smith Airport, scheduled to be completed by 2023. The proposed alignment is located adjacent to between Tempe Golf Range and the Alexandria Canal, and does not pass through the study area. However, a construction site is proposed to be located within Tempe Lands on the sites of the Tempe Golf Range and Tempe Dog Park. It is expected for up to 100 light vehicles to access the site via Holbeach Avenue, to be undertaken between 2021 and 2023. Construction vehicle trucks will not be allowed to use Holbeach Avenue to access the Tempe Lands construction site.

Additionally, the current Alexandria Canal shared path will be closed and relocated as part of the project, a temporary active transport link is proposed to run adjacent to Tempe Recreation Reserve and Tempe Lands, shown in Figure 6.3, serving as a temporary detour of the closed shared path. As such, a greater number of cyclists and pedestrians expected towards the south of the study area.



Source: Sydney Gateway Environmental Impact Assessment

Figure 6.3: Sydney Gateway - Temporary Active Transport Link

7. RISK PRIORITY ASSESSMENT

7.1 Methodology

Each study area road was assessed against criteria to determine its risk for future crashes based on the data collected. Criteria included:

- Crash history
- 24-hour vehicle volumes (existing)
- 85th percentile vehicle speeds
- Heavy vehicle volumes (existing)
- Road width
- Availability of existing LATM devices
- Distance to schools
- Land use (future)

Points were allocated to each road or road section based on the level of risk. The higher the points, the higher the risk for future crashes, and hence the higher the need for LATM devices.

a) Crash History

- 4 points for crash casualty rates of more than the typical urban casualty rate of 0.446, as listed in Table 3.6.

b) 24-hour vehicle volumes

- 2 points (per direction) for ADT of more than 400, as listed in Table 4.3.

c) 85th percentile vehicle Speeds

- 2 points (per direction) for 85th percentile speeds of more than 40 km/h, as listed in Table 4.3.

d) Heavy vehicle volumes

- For roads without a truck load limit
 - 1 point (per direction) for daily heavy vehicle volumes of more than 50, as listed in Table 4.3; and
 - 1 point (per direction) for daily heavy vehicle percentages of more than 10%, as listed in Table 4.3.
- For roads with the 3-tonne truck load limit
 - 1 point (per direction) for daily heavy vehicle volumes of more than 10, as listed in Table 4.3; and
 - 1 point (per direction) or daily heavy vehicle percentages of more than 5%, as listed in Table 4.3.

e) Available Road Width

- 4 points for a wider two-way road where the available trafficable road width is more than two car widths
- 2 points for a narrow two-way road where the available trafficable road width is less than two car widths
- 0 points given for a one-way road as the road is typically at least one car width and traffic is unopposed.

f) Existing LATM Devices

- -1 (negative one) point for each LATM devices located on that road. Multiple LATM devices at the same location are counted as one set (e.g. A flat top road hump with kerb blisters and contrasting

pavement). Roundabouts are excluded, but any pedestrian refuge islands or median islands are included.

g) Distance to Schools

- 4 points if there are school zones.

h) Existing Land Use

- 4 points for local traffic and residential streets. While this does not directly contribute to crash risk, safety is more paramount in a local traffic areas, and residential roads should be given some priority for implementation of LATM schemes.

i) Future Traffic

- 4 points where additional Bunnings Warehouse generated traffic may flow onto
- 4 points for local streets forecasted to have daily volumes are to exceeding 1500

7.2 Assessment

Based on the above scoring criteria, Table 7.1.presents the accumulated scores of each roadway.

Table 7.1: Risk Score by Road

Road	Criteria									Total score
	Crash	Volume	Speed	Heavy Vehicle	Width	Existing LATM	Schools	Existing Lane Use	Future Land Use	
Barden Street	-	-	-	1	2	-	-	4	-	7
Fanning Street	-	-	-	1	2	-	-	4	-	7
Foreman Street	-	-	-	2	-	-5	4	4	-	5
Hart Street	-	-	-	1	2	-	-	4	-	7
Holbeach Avenue (Princes Highway to roundabout)	4	4	4	-	4	-1	-	-	-	15
Holbeach Avenue (roundabout to South Street)	-	-	-	-	4	-	-	-	-	4
Smith Street	-	2	2	4	4	-	-	-	4	16
South Street	-	2	-	1	2	-3	-	4	-	6
Stanley Street	-	-	4	3	4	-	-	4	-	15
Station Street	-	-	-	1	2	-	-	4	-	7
Union Street	-	-	-	1	-	-5	4	4	4	8
Wentworth Street	-	-	-	3	2	-	-	4	-	9
Zuitton Lane	-	-	-	1	2	-	-	-	-	3

Based on the above assessment, Smith Street exhibits the highest score, followed by Holbeach Avenue (between Princes Highway and the roundabout) and Stanley Street. Wentworth Street also has achieved a relatively high score for a local residential road.

Other local streets, including Barden, Fanning, Hart, Station and Union Streets, have an accumulated score between 5 and 8 points. Given the lack of crash history, low vehicle speeds and heavy vehicle composition, these roads may not require any ATM treatments. However, other treatments may be proposed to further deter non-local traffic from using these roads.

7.3 Summary

From the risk priority assessment, LATM devices are recommended to be implemented on:

- Smith Street – to deal with traffic volume, speed and heavy vehicle issues
- Holbeach Avenue – to deal with crash risks, traffic volume and speed issues
- Stanley Street – to deal with speed issues
- Wentworth Street – to deal with heavy vehicle issues

These priority streets are shown in Figure 7.1.

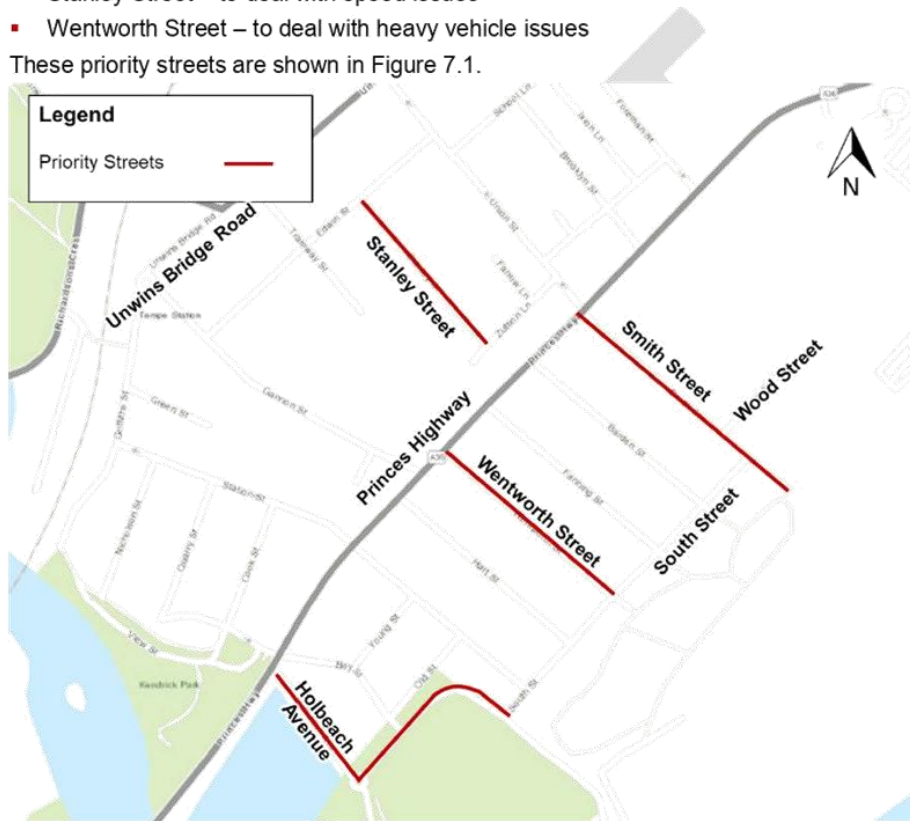


Figure 7.1: Priority Streets for Treatment

8. PRELIMINARY ROAD TREATMENTS

8.1 Traffic Calming and Local Area Traffic Management

Road treatments, including Local Area Traffic Management (LATM) Schemes and traffic calming measures can be implemented to change traffic conditions and speed environments, such that driver behaviour and perception of the road environment would be more appropriate along local residential streets and activity areas.

The primary objectives in introducing LATM schemes as part of this study is to address the following:

- Vehicle speeds
- Vehicle volumes
- Heavy vehicle volumes
- Reducing potential for traffic using local roads (with the exception of Smith Street) to access Princes Highway
- Improving amenity along Smith Street

8.2 Existing Road Treatments

As detailed in Section 2.11, the numerous LATM devices already in use within the study area include:

- Road humps (Watts profile & flat top), including raised thresholds
- Kerb blisters
- Contrasting pavement
- Raised pedestrian (wombat) crossing
- Roundabouts
- Pedestrian refuge islands

The majority of LATM devices are located along Union Street and Foreman Street in the vicinity of Tempe Public School.

8.3 Preliminary Road Treatment Options

To address the issues identified, a wide range of traffic calming devices can be implemented. LATM devices presented in *Austrroads Guide to Traffic Management Part 8 – Local Area Traffic Management* were used as a basis for developing a list of suitable devices that could be used.

To create safer local road environments, the key targets for any proposed treatment options include:

- Reducing vehicle speeds
- Minimising traffic levels, including non-resident traffic in local streets
- Deterring heavy vehicles
- Reducing crash risk
- Improving local amenity, including walking and cycling options.

The following traffic calming treatments may potentially be implemented across the study area:

- Entry thresholds
- Flat top road humps
- Raised Pedestrian Crossings
- Speed cushions

- Slow points
- Road narrowing / Kerb blisters
- Pedestrian refuge / Median / Splitter islands
- Line marking (edge line and/or centreline).

Descriptions of each of these treatments are provided in Table 8.1.

Table 8.1: Road Treatment Types

Name	Type	Description
Entry Threshold	Physical / Visual	<ul style="list-style-type: none"> ▪ Provides a physical and visual gateway to a local street ▪ May control vehicle speeds in both directions ▪ Design can be varied to accommodate different traffic types and road geometries (such as bicycles) ▪ Include raised platforms, medians and kerb blisters ▪ Opportunity to introduce landscaping elements to enhance streetscape ▪ Commonly used throughout study area ▪ May impact large vehicle movements near intersections
Flat Top Road Hump	Physical	<ul style="list-style-type: none"> ▪ Wide raised platform type 'speed hump' ▪ Controls vehicle speeds by vertical deflection and may reduce traffic volumes ▪ More visually appealing than typical speed humps (such as Watts Profile) ▪ Typically 75-150mm high, 2-6m long ▪ Fullwidth designs control speeds in both directions ▪ Design can be varied to adapt to different road geometries and traffic, including medians and kerb blisters ▪ Can be misconstrued as a pedestrian crossing ▪ Typically low cost
Raised Pedestrian Crossing (Wombat Crossing)	Physical	<ul style="list-style-type: none"> ▪ Flat Top Road Hump combined with marked Pedestrian Crossing ▪ Controls vehicle speeds and provides pedestrian crossing location ▪ Improves pedestrian safety by raising walkway (for better visibility) and calming traffic vehicles ▪ Allows for pedestrian priority
Speed Cushions	Physical	<ul style="list-style-type: none"> ▪ Small plastic or rubber 'cushion' in centre of travel lane (or series across travel lanes) ▪ Controls vehicle speeds by vertical deflection ▪ Smaller and narrower than speed humps or flat top road humps ▪ Slows light vehicles with little impact to heavy vehicles (such as buses) ▪ Can be combined with a median and kerb blisters for further control ▪ Low cost and quick installation

Name	Type	Description
Slow Points	Physical	<ul style="list-style-type: none"> Controls vehicles by horizontal deflection Uses series of kerb extensions or blisters on alternating sides of road to create an angled travel lane Opportunity to introduce landscaping elements to enhance streetscape Requires considerable length of road to install and potentially high cost Must consider local driveway access May impact kerbside parking
Road Narrowing	Physical	<ul style="list-style-type: none"> Kerb extensions or blisters to reduce available road width at a single point Use of kerb blisters may allow for kerbside drainage Often used in conjunction with other treatments (such as entry thresholds and road humps) Opportunity to introduce landscaping elements to enhance streetscape
Pedestrian Refuge / Median / Splitter Islands	Physical	<ul style="list-style-type: none"> Raised or flush island positioned at the intersection or the centreline of a street Narrows lanes Provide pedestrians with a refuge Used in areas where there is a need to reduce entry speed of vehicles to a residential street May not be used on narrow two-lane streets, and where there is insufficient sight distance Must consider local driveway access May impact kerbside parking
Line Marking	Visual	<ul style="list-style-type: none"> May be used where physical treatments are not appropriate Can provide a visual narrowing of the roadway such that drivers perceive a narrower travel lane and reduce speed Assists in delineating road components such as cycle lanes and kerbside parking Available roadway width through bends is visually narrowed when combined with centreline marking May not be effective along considerably wide roadways
Contrasting Pavement	Visual	<ul style="list-style-type: none"> Highlight the change in road conditions to drivers Colour and texture can be designed to fit with local area context Typically located at start of traffic areas (such as High Pedestrian Activity Areas) Textured pattern (such as Embossed Hex) can also provide a tactile and audible warning to drivers Typically low cost

8.4 Standard LATM Treatments

Based on existing LATM devices found and the types presented by Austroads, a number of potential standard treatment options are proposed for installation across the study area, presented in Table 8.2.

These devices are identified as being appropriate for the context of the study area and address the issues identified on local roads.

Table 8.2: Proposed Standard LATM Treatments

Infrastructure	Description
Flat-top Road Hump	Standard flat top road hump
Speed Cushion	Standard speed cushion(s)
Road Narrowing	Kerb blisters (landscaping)
Median Treatments	Median Island (standard or low-profile)
Line marking	Edge and centre line marking
Contrasting Pavement	Standard at-grade contrasting pavement

Examples of some of these treatments are provided in Figure 8.1 below.



Left to Right: Flat top road hump, road narrowing (kerb blisters with landscaping)

Figure 8.1: Examples of Treatments

There are other treatments that may be implemented or installed additionally, complementing the proposed LATM treatments. Treatments identified as suitable for the study area include:

- Bicycle facilities, including bicycle ramps, shared paths and bicycle markings
- Signage, to complement the LATM treatments
- Footpath widening

8.5 Treatment Criteria

As there is a large range of available LATM devices available, the selection and location of these devices is important to address the specific issues along each street. A range of factors and considerations are to be given in the selection process to determine suitable and appropriate LATM treatments. As such, a treatment selection criteria was developed to inform the selection and location of proposed LATM devices.

8.5.1 Austroads LATM Selection Toolkit

The selection of an appropriate LATM is greatly dependent on the overall objective for the particular roadway, the local context of the road environment and the needs of local road users.

Austroads Guide to Traffic Management Part 8 - Local Area Traffic Management provides a toolkit and selection rubric, which outlines the relative use of different LATM devices based on previous research and practice within Australia and New Zealand. The Austroads Toolkit which provides a description and use of LATM devices is provided in Table 8.3.

Table 8.3: Austroads LATM Toolkit

Measure		Reduce speeds	Reduce traffic volume	Reduce crash risk	Increase pedestrian safety	Increase bicycle safety
Vertical deflection devices (Section 7.2)	Road humps	✓	✓	✓	–	–
	Road cushions	✓	✓	✓	–	✓
	Flat-top road humps	✓	✓	✓	–	✓
	Wombat crossings	✓	✓	✓	✓	✓
	Raised pavements	✓	✓	✓	–	✓
Horizontal deflection devices (Section 7.3)	Lane narrowings/kerb extensions	✓	–	–	✓	–
	Slow points	✓	✓	–	–	–
	Centre blister islands	✓	✓	–	✓	–
	Driveway links	✓	✓	–	✓	✓
	Mid-block median treatments	✓	–	✓	✓	✓
Diversion devices (Section 7.4)	Roundabouts	✓	✓	✓	–	–
	Full road closure	–	✓	✓	✓	✓
	Half road closure	–	✓	✓	✓	✓
	Diagonal road closure	–	✓	✓	✓	✓
	Modified T-intersection	✓	✓	✓	✓	✓
Signs, linemarking and other treatments (Section 7.5)	Left-in/left-out islands	–	✓	✓	✓	–
	Speed limit signs	✓	–	✓	✓	✓
	Prohibited traffic movement signs	–	✓	✓	–	✓
	One-way (street) signs	–	✓	✓	✓	–
	Give-way signs	✓	✓	✓	✓	✓
	Stop signs	✓	✓	✓	✓	✓
	Shared zones	✓	✓	–	✓	✓
	School zones	✓	–	✓	✓	✓
	Threshold treatments	✓	✓	✓	–	✓
	Tactile surface treatments	✓	–	–	–	–
	Bicycle facilities	–	–	✓	–	✓
	Bus facilities	–	✓	–	–	–

8.5.2 Treatment Criteria

The information presented within the Austroads LATM selection toolkit and consideration of other road environment elements was used to develop a specific treatment selection criteria and is presented in Table 8.4.

The criteria include considerations of the following:

- Speed and traffic volume reduction
- Crash risk reduction
- Relative traffic volumes
- Deterrence against non-local traffic
- Pedestrians, bicycles and buses
- Kerbside parking
- Road and traffic noise generation
- Roadway width requirements.

Table 8.4: Proposed Treatment Selection Criteria

Type	Details	Reduce Speed	Reduce Traffic Volumes	Reduce Crash Risk	Suitable for High Traffic Volumes	Deter Non-Local Traffic	Accommodate Pedestrians	Bicycle Friendly	Bus Route friendly	Parking friendly	Noise Considerations	Wide Road required	Other remarks
LATM Treatments													
Road hump	Flat top road hump	Yes	Yes	Yes	Yes	Yes	No	Yes ³	Yes ⁴	Yes	Yes	No	Preferred for lower traffic volumes
Speed Cushion	Speed Cushion	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes ¹⁰	Yes	No ⁷	Preferred for lower traffic volumes
Road narrowing	Kerb blisters (landscaping)	Yes	No	No	Yes	Yes	No	No	No ⁵	No	No	Yes	Not to be used on bus routes on a one-way street
Median Treatment	Median Island (standard or low-profile)	Yes	No	Yes	Yes	Yes	No	No ⁵	Yes ⁶	No	No	Yes	Must conform to Transport for NSW standards
Line-Marking	Edge, centre and lane line marking	Yes ¹	No	Yes ²	Yes	Yes	-	-	Yes	Yes	No	Yes ⁸	Parking lane width may vary, minimum 2.1m
Contrasting Pavement	Standard Contrasting Pavement	Yes	No	No	Yes	Yes	-	-	Yes	Yes	Yes ⁹	No	Visual and tactile treatment only
Other Treatments													
Bicycle Facilities	Bicycle ramps, shared paths and bicycle markings	-	-	-	-	-	No	Yes	-	-	No	No	
Signage	Signage to complement LATM treatments	varies					-	-	-	-	No	No	

Type	Details	Reduce Speed	Reduce Traffic Volumes	Reduce Crash Risk	Suitable for High Traffic Volumes	Deter Non-Local Traffic	Accommodate Pedestrians	Bicycle Friendly	Bus Route friendly	Parking friendly	Noise Considerations	Wide Road required	Other remarks
Footpath widening	Widened footpath	-	-	-	-	-	Yes	Yes	-	No	No	Yes	

Notes:

1. If travel lane is sufficiently narrowed
2. May effectively reduce kerbside crashes
3. Ramps can be designed to be bicycle friendly
4. Flat top road humps can be designed to bus friendly specifications (ref. STA guidelines)
5. Bus routes require 3.2m to 3.5m wide travel lane, which will not be an effective road narrowing for regular traffic
6. If 3.5m travel lane is maintained
7. More effective on narrow roads. Installation on bus routes require 3.5m travel lane
8. Generally applied to wide road
9. Noise to be considered if using textured surface treatment (such as embossed pattern or similar)

8.6 Proposed Treatment and Locations

Based on the selection criteria, a number of proposed treatment options were developed for the priority roads identified in Section 7.3. Additional proposed treatments for other roads in the study area were also developed. The proposed treatments are outlined in Table 8.5.

Table 8.5: Proposed Treatment and Locations

Road	Option	Type	Location	Features
Smith Street	1	Road Narrowing & Contrasting Pavement	Immediately south of proposed Bunnings access,	<ul style="list-style-type: none"> Landscaped kerb blisters with low height shrubs At-grade contrasting pavement treatment (embossed text pattern)
	2	Mountable Concrete Median Treatment		<ul style="list-style-type: none"> Mountable low-profile concrete median with contrasting pavement
	Addition to both options	Right Turn Only Signage	Opposite and facing Bunnings access	<ul style="list-style-type: none"> R2-14_R (Right Turn Only) sign
		Line Marking	Between Princes Highway and Bunnings Access	<ul style="list-style-type: none"> Edge and centre line markings to provide a visual narrowing of the roadway Road environment would appear distinctively different to the southern section of Smith Street Delineation of adjusted lane arrangement near Princes Highway
		Bicycle Facilities	Between Princes Highway and Bunnings Access	<ul style="list-style-type: none"> Extend shared path for a short distance from Princes Highway along both sides of Smith Street Inclusion of an angled bicycle ramp for southbound cyclists to transition between the shared path and Smith Street Signage and marking to indicate transitions between shared path and on-road cycling

Road	Option	Type	Location	Features
		Widened Footpath	Western side of road, between No. 48 and South Street	Option a (Option 1a or Option 2a): <ul style="list-style-type: none"> Widen western footpath Retain existing kerbside parking on the western side of Smith Street Shift centreline to suit road width Option b (Option 1b or Option 2b): <ul style="list-style-type: none"> Widen western footpath with adjacent landscaped verge Removal of existing kerbside parking on the western side of Smith Street Some paved parking bays within the landscaped area to offset loss of parking Turning pocket to allow vehicles to turn right out of No.1 Smith Street
Holbeach Avenue	1	Speed Cushions	Between driveways of 14 and 18 Holbeach Avenue	<ul style="list-style-type: none"> Set of four speed cushions of 100mm height, across roadway
	2	Speed Cushions & Road Narrowing		<ul style="list-style-type: none"> Set of two speed cushions of 100mm height in travel lanes Landscaped kerb blisters with low height shrubs
Stanley Street	1	Flat Top Road Hump	Near streetlight outside 14 Stanley Street Near streetlight outside 37 Stanley Street	<ul style="list-style-type: none"> Concrete flat top road hump of 100mm height, across road width Contrasting surface treatment ('terracotta' colour surface of similar)
	2	Road Narrowing		<ul style="list-style-type: none"> Landscaped kerb blisters with low height shrubs
Wentworth Street	1	Road Narrowing & Contrasting Pavement	At entry from Princes Highway (specifically south of Tempe Tyre Centre vehicular access)	<ul style="list-style-type: none"> Landscaped kerb blisters with low height shrubs At-grade contrasting pavement treatment (embossed text pattern)
	2	Flat Top Road Hump	At entry from South Street (specifically north of the drainage pit)	<ul style="list-style-type: none"> Concrete flat top road hump of 100mm height, across road width Contrasting surface treatment ('terracotta' colour surface of similar)

Road	Option	Type	Location	Features
	Addition to both options	3 Tonne Truck Limit Signage	Outside 846 Princes Highway Outside 45 Wentworth Street	<ul style="list-style-type: none"> R6-10-2 and R9-231 (Truck Load Limit) signs W8-245N_L (Left Arrow) Signage, only on Princes Highway
Barden, Fanning, Hart and Station Streets	-	Contrasting Pavement Threshold ¹	At entry from Princes Highway	<ul style="list-style-type: none"> At-grade contrasting pavement treatment (embossed text pattern)

1. Subject to a 40km/h Local Traffic Area proposal and/or Transport for NSW review and approval

The following considerations were given when locating each of the above treatments:

- Spacing: a maximum spacing between 80m and 120m was adopted (following *Austrroads LATM Guidelines*)
- Presence of existing street lighting and light posts
- Kerb ramps
- Property accesses and driveways
- Road gradients
- Driver sight distances and visibility.

Assessment of the different treatments are further detailed in Section 9.

The locations of the proposed treatments options, contrasting pavement thresholds and additional Smith Street treatments are shown in Figure 8.2 and in Appendix D.

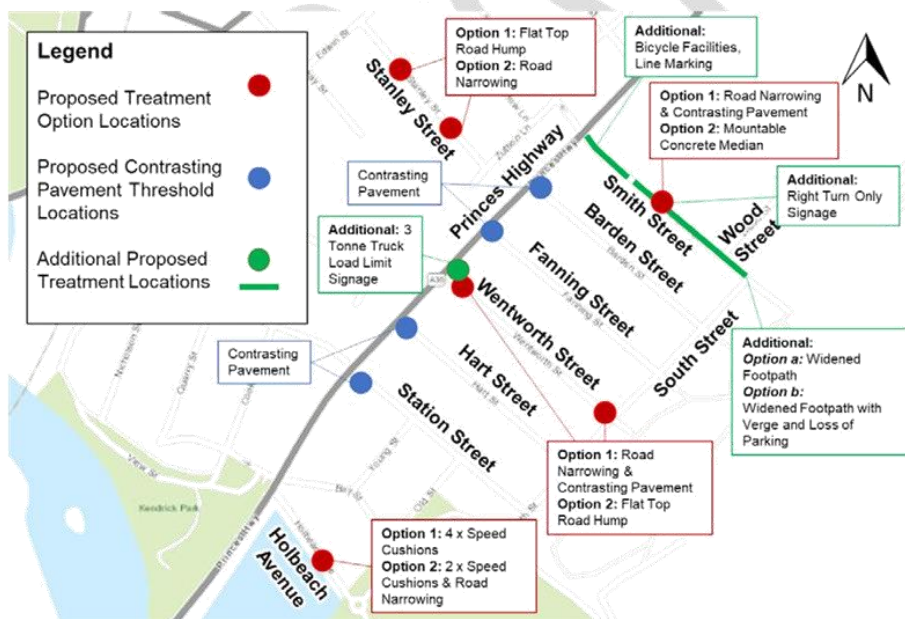
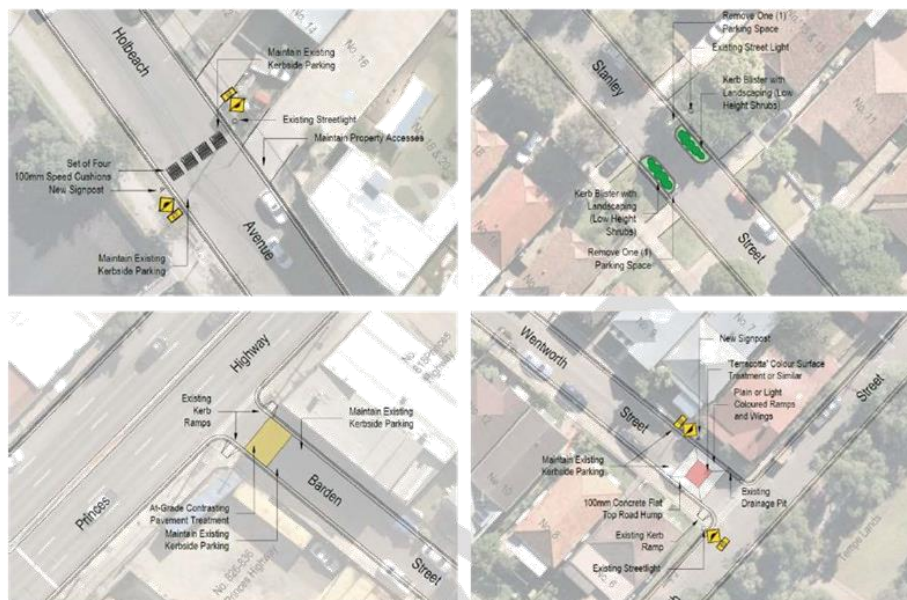


Figure 8.2: Proposed Treatment Locations

8.7 Concept Designs

A sample of concept designs related to the proposed treatment are presented in Figure 8.3. Detailed treatment concept designs are provided in **Appendix D**.



Clockwise from top: Speed Cushions, Road Narrowing (kerb Blisters), Flat Top Road Hump, Kerb Blisters and Contrasting Pavement

Figure 8.3: Sample Concepts of Proposed Treatments

9. PROPOSED TREATMENT JUSTIFICATION

9.1 Overview

This section describes each treatment option in detail by street and discusses its merits and potential impacts to the road environment such as property access and kerbside parking. The merits and impacts are summarised at the end of this section in Table 9.2 and Table 9.3 respectively.

Any LATM measures proposed may have an impact on the travel time of emergency service vehicles through the area. However, in consideration of the existing road environment along these local streets, any additional proposed LATM measures are not expected to have a significant impact to emergency service vehicle access. Additionally, the treatments proposed are not located along public or school bus routes, therefore, there are no anticipated impacts to buses.

9.2 Smith Street

9.2.1 Issues

As discussed in previous sections, the issues present on Smith Street are:

- Smith Street has relatively high average daily traffic (ADT) volumes, up to 600 vehicles per day in each direction, compared to other local roads in the study area.
- Smith Street has relatively high 85th percentile speeds of up to 46 km/h per direction compared to other local roads.
- Due to industrial land use located along Smith Street and its adjoining Wood Street, heavy vehicles are common along Smith Street. From the tube count data, on average, between 100 and 150 heavy vehicles travel along Smith Street daily in each direction, and make up 25 to 36% of the total daily traffic.
- Based on crash history, three (3) crashes occurred along Smith Street between January 2014 and December 2018, with two (2) crashes resulting in injuries.
- The proposed Bunnings development will be mainly accessed via Smith Street. There are concerns that the development will generate both light and heavy vehicle traffic, not just on Smith Street, but on other local roads such as Barden Street, South Street and Holbeach Avenue.
- Speed cushions were installed along Smith Street, as part of a previous LATM study, were removed in 2012 and 2017 respectively. This was due to resident complaints about the noise produced by trucks driving over the speed cushions. As such, vertical deflection devices such as speed humps were not considered as treatment options on Smith Street.

9.2.2 Location of Treatment Options

Treatment options for Smith Street will be located between the Bunnings access and access to No.1 Smith Street. The placement of treatment options mid-block on Smith Street breaks up the long straight section of the roadway, preventing drivers from gathering speed along the length of the road.

9.2.3 Option 1: Road Narrowing & Contrasting Pavement

This option involves landscaped kerb blisters on each side of the road, and an at-grade embossed text pattern as contrasting pavement between the kerb blisters. Additional measures to Smith Street regardless of Options 1 or 2 are described separately in Section 9.2.5.

Merits

Road narrowing will provide a narrow travel width, similar to existing treatments on neighbouring streets like Barden or Fanning Streets, which have an 85th percentile speed of less than 40 km/h. Therefore, providing road narrowing will strongly encourage traffic to slow down. Lower speeds will in turn increase travel time and may deter non-local traffic from utilising Smith Street.

Landscaping on the kerb blisters will also improve the aesthetics of the roadway and enhance sense of place. It may also provide clearer changes in road geometry for vehicles approaching the treatment.

The contrasting pavement will highlight the entry to a local traffic area by providing a physical and visual gateway treatment to the south section of Smith Street. The differentiation of road environment may be able to deter vehicles from turning left from the proposed Bunnings access onto Smith Street southbound. Combined with road narrowing, the reduced geometry may also be less favourable to heavy vehicles.

Road narrowing will result in a loss of parking along Smith Street. However, the removal of parking will improve sightlines for vehicles exiting the driveways from Bunnings and No.1 Smith Street. It also improves manoeuvrability of these turns as there is a reduced likelihood of parked vehicles obstructing the access points.

Impacts to Parking

The Bunnings development will result in the proposed removal of up to 13 spaces of on-street parking along Smith Street. These spaces are compensated with 13 spaces within Bunnings warehouse, which are open to access during Bunnings trading hours only. This removes the flexibility of parking at any time of the day for any duration. Given that most residents are expected to park overnight or outside business hours, as a worst-case scenario, these spaces will not be considered as part of the assessment.

From the parking surveys conducted on 19th and 21st March 2020, on a Thursday and Saturday respectively, it was deduced that on average, Smith Street has 18 vacant spaces on Thursday and 27 vacant spaces on Saturday. With the loss of 13 parking spaces due to the Bunnings development, this will result in an estimated 5 and 14 vacant spaces remaining on Thursday and Saturday respectively.

Road narrowing will result in a loss of up to two (2) parking spaces on the western side and one (1) space on the eastern side, a total of three (3) spaces. The remaining availability of on-street parking on Smith Street will therefore be able to cope with the further removal of spaces due to road narrowing.

Other Impacts

The kerb blisters will be built between the Bunnings access and the access to No.1 Smith Street. There are no property accesses on the western side at the proposed location. As such, there will be no impacts of the treatments on the accesses along Smith Street.

The at-grade contrasting pavement also means that there will be no additional noise generated as compared to vertical deflection devices such as speed cushions. An at-grade pavement also provides minimal or no impacts to cyclists riding along Smith Street.

The treatment option may have an impact on the travel time of emergency service vehicles through the area. However, in consideration of the existing road environment along these local streets, any additional proposed LATM measures are not expected to have a significant impact to emergency service vehicle access.

9.2.4 Option 2: Mountable Concrete Median

This option is a mountable low-profile concrete median. The pavement on the top of the median will also be contrasted against the road surface. Additional measures to Smith Street regardless of Options 1 or 2 are described separately in Section 9.2.5.

Merits

The change in road geometry highlights local traffic area by providing a physical and visual gateway treatment to the south section of Smith Street. The reduction in geometry also aid in the differentiation of road environment and may deter vehicles turning left from proposed Bunnings access onto Smith Street southbound.

The treatment is a horizontal deflection device and will be able to slow traffic by diverting vehicles around the island, particularly heavy vehicles due to their larger turn radius.

The median island will result in a loss of parking along Smith Street (see next section). Similar to option 1, the removal of parking may improve sightlines of vehicles turning out from the accesses onto Smith Street. It also improves manoeuvrability of these turns as there is a reduced likelihood of parked vehicles obstructing the access points of 1 Smith Street.

The median island is low-profile and mountable to allow vehicles to turn right out of 1 Smith Street onto Smith Street northbound and mount over the median.

Impacts to Parking

As mentioned in Option 1, Smith Street will have an estimated 5 and 14 vacant spaces remaining on Thursday and Saturday respectively, after spaces are removed for the Bunnings development.

The median island will result in a loss of seven (7) parking spaces on the western side and one (1) space on the eastern side, a total of eight (8) spaces. With the removal of these eight spaces, this will result in a **shortage of three (3) spaces** on a Thursday, and residential parking will be displaced onto adjacent streets such as Barden Street or South Street. Parking availability on Saturday will still be able to cope with the additional removal of spaces due to the median island.

On Thursday, Barden Street has a parking occupancy rate of around 50% out of 63 spaces, and South Street between Smith and Fanning Streets has a parking occupancy rate of around 40% out of 19 spaces. This means out of a total of 82 spaces, 39 are occupied and 42 are vacant, and therefore, Barden and South Streets will be able to cope with the additional parking demand of the three displaced vehicles.

It is also important to note that this is based on the worst-case scenario where most residents are expected to park overnight or outside Bunnings trading hours. It is possible that some residents may park within Bunnings overnight.

Other Impacts

As the median island is built in the centre of the roadway, it will not require changes to accesses along Smith Street. Traffic exiting 1 Smith Street will still be able to turn right onto Smith Street northbound by mounting over the concrete median.

The island will also slow down cyclists riding along Smith Street as they need to divert around the island. However, the impact is minimal and the device is still 'bicycle-friendly'.

The treatment option may have an impact on the travel time of emergency service vehicles through the area. However, in consideration of the existing road environment along these local streets, any

additional proposed LATM measures are not expected to have a significant impact to emergency service vehicle access.

9.2.5 Additional Measures to Options 1 & 2

In addition to the location specific treatment as part of Option 1 and 2, other measures are proposed along Smith Street between Princes Highway and South Street. Some of these measures will also aid in increased connectivity for cyclists along pedestrians and Smith Street.

Right Turn Only Sign

The "Right turn only" sign located opposite and facing Bunnings will enforce turn restrictions, preventing traffic exiting Bunnings from turning left onto Smith Street and using local streets.

Line Marking

Edge and centre line markings will be provided along Smith Street (partially under Option 1, full length under Option 2), in addition to proposed line marking as part of Bunnings development arrangement. It will also provide differentiation between the northern and southern sections of Smith Street. Recommended delineation alignments to tie in with the proposed treatments have also been provided in the concept drawings in **Appendix B**.

Bicycle Infrastructure

To provide off and on road bicycle transitions and connect the route on Smith Street to Princes Highway, the existing shared paths along Princes Highway will be extended on Smith Street, with kerb ramps and delineation. This aims to aid bicycles to transition to mixed traffic (bicycle and vehicles) along Smith Street away from the Princes Highway intersection. This will involve realignment and widening of the existing footpaths to allow one-way bicycle travel at minimum.

An angled bicycle ramp for southbound cyclists will be located on the eastern shared path, along with wayfinding and pavement markings to guide cyclists onto the road. Northbound cyclists will utilise the existing driveway of 48 Smith Street to access the extended shared path. Signage and marking will be used to guide cyclists to transition onto the shared path to travel along the existing Princes Highway shared paths.

On-road bicycle markings spaced evenly along Smith Street reaffirm that Smith Street is a mixed-traffic cycling route.

Widened Footpath

Option a

The non-shared path section of the western footpath will be widened to 2.5m width to provide improved pedestrian facility. This option is known as **Option 1a or 2a** in the concept plans. Kerbside parking will be retained and delineated by edge line marking. The delineation will also provide a road narrowing along Smith Street and assist in slowing down vehicles.

Option b

Alternatively, the kerbside parking may be replaced with a landscaped verge of 1.6m width to provide a form of screening between the widened footpath and the roadway. This option is known as **Option 1b or 2b** in the concept plans. The reduced roadway width will also assist in slowing down vehicles. However, this will result in the loss of 31 kerbside parking spaces on the western side of the road. Six (6) spaces will be retained for parking, resulting in a net loss of 25 spaces on the western side of the road, i.e. a total of 26 spaces on both sides.

As mentioned previously, Smith Street will have an estimated 5 and 14 vacant spaces remaining on Thursday and Saturday respectively, after spaces are removed for the Bunnings development. The removal of 26 spaces will result in the overflow of 21 and 12 spaces onto adjacent streets on Thursday and Saturday respectively. Barden and South Streets, with a total of 42 vacant spaces, will be able to absorb the overflow of parking from Smith Street.

A summary of the loss in parking on Smith Street for the different options is shown in .

Table 9.1: Loss of Smith Street Parking Spaces between Different Options

Option	Western side	Eastern side	Total spaces lost from Design	Spaces removed for Bunnings	Total spaces removed	Existing vacant spaces	Vacant spaces remaining ¹
Thursday							
Option 1a	1	1	2	13	15	18	3
Option 2a	7	1	8	13	21	18	-3
Option 1b	25	1	26	13	39	18	-21
Option 2b	25	1	26	13	39	18	-21
Saturday							
Option 1a	1	1	2	13	15	27	12
Option 2a	7	1	8	13	21	27	6
Option 1b	25	1	26	13	39	27	-12
Option 2b	25	1	26	13	39	27	-12

1. Negative vacant spaces indicates parking demand exceeds capacity, resulting in parking overflow

9.3 Holbeach Avenue

9.3.1 Issues

As discussed in previous sections, the issues present on Holbeach Avenue are:

- Holbeach Avenue has relatively high average daily traffic (ADT) volumes, up to 550 vehicles per day in each direction, compared to other local roads in the study area.
- Holbeach Avenue has relatively high 85th percentile speeds of up to 44 km/h per direction compared to other local roads.
- Based on crash history, five (5) crashes occurred along Holbeach Avenue between January 2014 and December 2018, all resulting in injuries.

9.3.2 Location of Treatment Options

Treatment options for Smith Street will be located between the accesses of 14 and 16 Holbeach Avenue. Placing treatment options mid-block on Holbeach Avenue breaks up the long straight section of the roadway, preventing drivers from speeding up along the road.

The existing streetlight outside 14 Holbeach Avenue will also provide visibility of the device at night.

9.3.3 Option 1: Speed Cushions

This option involves a set of four (4) speed cushions of 100mm height across the roadway, along with associated signage.

Merits

It is generally uncomfortable for drivers of vehicles to travel over vertical deflections at high speeds. By providing speed cushions as vertical deflections, vehicles will slow down in order to safely travel over the speed cushions. Lower speeds will in turn increase travel time and may deter non-local traffic from utilising Holbeach Avenue as an alternative route.

Impacts to Parking

As speed cushions do not require changes in roadway geometry, there will also be no impacts to kerbside parking or driveway accesses. Vehicles can still park over the road hump.

Other Impacts

The low profile of speed cushions allows for buses and service vehicles to travel to the Tempe recreation area. Bicycles can also safely get over speed cushions after slowing down.

Noise generated from travelling over speed cushions is not an issue as the land use along Holbeach Avenue is non-residential in nature.

9.3.4 Option 2: Speed Cushions and Road Narrowing

This option is similar to option 1 in providing speed cushions. However, only a set of two (2) speed cushions of 100mm height will be provided across the roadway, with landscaped kerb blisters on each side of the road to provide narrowing of the roadway.

Merits

Similar to Option 1 for Smith Street, road narrowing will provide a narrow travel width and will likely be able to force traffic to slow down. Landscaping on the kerb blisters may also improve the aesthetics of the roadway and enhance sense of place. It may also provide clearer changes in road geometry for vehicles approaching the treatment.

Road narrowing will result in a loss of parking along Holbeach Avenue (see next section). However, the removal of parking may improve sightlines of vehicles turning out from the accesses onto Holbeach Avenue. It also improves manoeuvrability of these turns as there is a reduced likelihood of parked vehicles obstructing the access points of 14 and 16 Holbeach Avenue.

Impacts to Parking

Road narrowing will result in a loss of up to one (1) parking space on each side of the road, a total of two (2) spaces. While there are no parking surveys available for Holbeach Avenue, observations during site visit show that there are ample vacant on-street parking spaces along Holbeach Avenue during the daytime. It is very likely that the parking availability of Holbeach Avenue is able to cope with the loss of a mere two spaces.

Other Impacts

Impacts of speed cushions on traffic have been outlined in Option 1 and will not differ in Option 2.

The kerb blisters will be built between 14 and 16 Holbeach Avenue. There are no property accesses on the western side at the same location. As such, there will be no impacts of the treatments on the accesses along Holbeach Street.

The treatment option (road narrowing) may have an impact on the travel time of emergency service vehicles through the area. However, in consideration of the existing road environment along these local streets, any additional proposed LATM measures are not expected to have a significant impact to emergency service vehicle access.

9.4 Stanley Street

9.4.1 Issues

As discussed in previous sections, the issues present on Stanley Street are:

- Stanley Street has relatively high 85th percentile speeds of up to 45 km/h per direction compared to other local roads, although these speeds are below the speed limit of 50 km/h.
- Stanley Street also has up to 13 heavy vehicles per direction daily, despite the 3 tonne truck load limit imposed.

9.4.2 Location of Treatment Options

Treatment options for Stanley Street will be located at two locations: outside 14 and 37 Stanley Street. The treatments to be installed at both locations will be the same.

Placing treatment options on two mid-block locations along Stanley Street breaks up the long straight section of the roadway, preventing drivers from speeding up along the road. The spacing between both locations are also consistent with spacing recommendations

Existing streetlights outside 13-15 Stanley Street and 37 Stanley Street will also provide visibility of the devices at night.

9.4.3 Option 1: Flat Top Road Hump

This option involves a 100mm high concrete flat top road hump across the roadway at each location. The hump will have a contrasting surface treatment, usually a 'terracotta' colour surface.

Merits

Similar to speed cushions, by providing flat top road humps as vertical deflections, vehicles will slow down in order to safely travel over the humps. Lower speeds will in turn increase travel time and may deter non-local traffic from utilising Stanley Street.

Flat top road humps are consistent with other LATM devices in the area, particularly along Edwin Street.

Impacts to Parking

As flat top road humps do not require changes in roadway geometry, there will also be no impacts to kerbside parking or driveway accesses. Vehicles can still park over the road hump.

Other Impacts

As Stanley Street is not a heavy vehicle or bus route, there will be no noise generated as a result of trucks or buses travelling over the road hump. Bicycles will still be able to safely get over speed cushions.

9.4.4 Option 2: Road Narrowing

This option involves landscaped kerb blisters on each side of the road at each location.

Merits

Similar to road narrowing options proposed in other roads, road narrowing will provide a narrow travel width and will likely be able to force traffic to slow down. Lower speeds will in turn increase travel time and may deter non-local traffic from utilising Stanley Street.

Landscaping on the kerb blisters may also improve the aesthetics of the roadway and blend into the local landscape. It may also provide clearer changes in road geometry for vehicles approaching the treatment.

Road narrowing will result in a loss of parking along Stanley Street (see next section). However, the removal of parking may improve sightlines of vehicles turning out from the accesses onto Stanley Street. It also improves manoeuvrability of these turns as there is a reduced likelihood of parked vehicles obstructing nearby access points.

Kerb blisters are consistent with other LATM devices in the area, particularly along Union Street.

Impacts to Parking

Road narrowing will result in a loss of up to one (1) parking space on each side of the road at each of the two (2) locations, a total of four (4) spaces. While there are no parking surveys available for Stanley Street, observations made during a site visit show that there are ample vacant on-street parking spaces along Stanley Street during the daytime. It is very likely that the parking availability of Stanley Street is able to cope with the loss of four spaces.

Other Impacts

The kerb blisters will be built in between driveways of properties along Stanley Street. As such, there will be no impacts on the property access.

Road narrowing in general may slightly increase travel time of emergency service vehicles through the area due to reduced speed. However, considering the existing road environment along these local streets, any additional proposed LATM measures are not expected to have a significant impact on emergency service vehicle access.

9.5 Wentworth Street

9.5.1 Issues

As discussed in previous sections, the issues present on Wentworth Street are:

- Wentworth Street has up to 10 heavy vehicles per direction daily, despite the 3-tonne truck load limit imposed.
- A signage audit noted missing truck load limit signage when approaching Wentworth Street from Princes Highway.

9.5.2 Location of Treatment Options

Treatment options for Wentworth Street will be located at two locations: north of South Street (outside 5 Wentworth Street) and south of Princes Highway (outside 846-854 Princes Highway, south of the Tempe Tyre Centre access). The treatments to be installed at both locations will be the same.

9.5.3 Option 1: Road Narrowing & Contrasting Threshold

This option involves landscaped kerb blisters on each side of the road at each location, and an at-grade embossed text pattern as contrasting pavement between the kerb blisters.

Merits

Similar to Option 1 for Smith Street, providing road narrowing will encourage traffic to slow down. Lower speeds will in turn increase travel time and may deter non-local traffic from utilising Stanley Street.

Landscaping on the kerb blisters may also improve the aesthetics of the roadway and enhance sense of place. It may also provide clearer changes in road geometry for vehicles approaching the treatment.

The contrasting pavement will highlight the local traffic area by providing a physical and visual gateway treatment to Wentworth Street. The differentiation of road environment may discourage vehicles from turning into Wentworth Street, particularly from South Street. Combined with road narrowing, the reduce geometry may also be less favourable to heavy vehicles and deter them from turning into Wentworth Street.

Road narrowing will result in a loss of parking along Wentworth Street. However, the removal of parking may improve sightlines for vehicles exiting driveways onto Wentworth Street. It also improves manoeuvrability of these turns as there is a reduced likelihood of obstruction from parked vehicles .

Impacts to Parking

Road narrowing will result in a loss of up to one (1) parking space on each side of the road at the location south of Princes Highway. There is no nominal loss of parking spaces at the location north of South Street as it is within 10 metres from a T-intersection, meaning it has an existing non-signposted No Stopping restriction. Therefore, a total of two (2) spaces will be lost.

While there are no parking surveys available for Wentworth Street, observations during site visit show that there are ample vacant on-street parking spaces along Wentworth Street during the daytime. It is very likely that the parking availability of Wentworth Street is able to cope with the loss of two spaces.

Other Impacts

At the location south of Princes Highway, the kerb blisters will be built between the property access of 846 Princes Highway and Tempe Tyre Centre access. At the location north of South Street, there are no property accesses adjacent to the device location. As such, there will be no impacts on the accesses along Wentworth Street.

Road narrowing in general may slightly increase travel time of emergency service vehicles through the area due to reduced speed. However, considering the existing road environment along these local streets, any additional proposed LATM measures are not expected to have a significant impact on emergency service vehicle access.

9.5.4 Option 2: Flat Top Road Hump

This option involves a 100mm high concrete flat top road hump across the roadway at each location. The road hump will have a contrasting surface treatment, usually a 'terracotta' colour surface.

Merits

By providing flat top road humps as vertical deflections, vehicles will slow down in order to safely travel over the humps. Lower speeds will in turn increase travel time and may deter non-local traffic from utilising Wentworth Street.

Impacts to Parking

As flat top road humps do not require changes in roadway geometry, there will also be no impacts to kerbside parking or driveway accesses. Vehicles can still park over the road hump.

Other Impacts

As Wentworth Street is not a heavy vehicle or bus route, there will be no noise generated as a result of trucks or buses travelling over the road hump. Bicycles will still be able to safely get over the road humps.

9.5.5 Additional Measures to Options 1 & 2

In addition to Option 1 or 2, truck restriction (3t limit) is proposed at the northern end of Wentworth Street. The signage along Princes Highway will provide an early indication and warning of the truck restriction along Wentworth Street, while the signage along Wentworth Street south of the Tempe Tyre Centre access will enforce the truck load limit and reinforce the local road environment. The signage aims to reduce heavy vehicles accessing Wentworth Street from Princes Highway, with the exception of delivery vehicles accessing Tempe Tyre Centre.

9.6 Barden, Fanning, Hart and Station Streets

At-grade contrasting threshold pavements are proposed along Barden, Fanning, Hart and Station Streets just south of Princes Highway.

While there are no existing issues with these four roads, LATM measures should still be put in place to further deter non-local traffic from travelling along these local roads, particularly from Princes Highway.

It is understood that a 40 km/h Local Traffic Area, including the study area south of Princes Highway, is intended to be implemented in the future. This reduction in speed limit will be subject to a speed review study, potentially including further proposed traffic calming treatments. These treatments and the 40km/h Local Traffic Area will be subject to review and approval by Transport for NSW.

Merits

The contrasting pavement will highlight the local traffic area by providing a physical and visual gateway treatment to these local roads. The differentiation of road environment may be able to deter vehicles turning left from Princes Highway onto the local roads.

Impacts to Parking

As the threshold pavements require no physical change to the roadway geometry, there will be no impacts to parking. As the proposed locations are within 10 metres from T-intersections, there are already existing No Stopping restrictions at the locations in accordance with the Australian Road Rules.

Other Impacts

As the contrasting pavements do not involve any horizontal or vertical deflection of the roadway, there will be no impacts to property access, cyclists or emergency service vehicles.

9.7 Summary of Merits

The merits of each proposed treatment are summarised in Table 9.2. Deterring non-local traffic was a key objective in all proposed treatments.

Table 9.2: Merits of Proposed Treatments

Road	Option	Type	Rationale
Smith Street	1	Road Narrowing and Contrasting Pavement	<ul style="list-style-type: none"> Historic non-preference for vertical deflection devices such as speed humps or cushions Kerb blisters slows traffic by providing a narrow travel width Can reduce travel width similar to neighbouring streets Highlights local traffic area by providing a physical and visual gateway treatment to the south section of Smith Street Differentiation of road environment may deter vehicles turning left from proposed Bunnings access Smith Street south Reduced geometry less favourable to heavy vehicles Breaks up long straight section of roadway Landscaped elements may enhance sense of place Removal of parking improves sightlines and manoeuvrability of traffic entering Smith Street No noise impacts to residences Bicycle friendly (with appropriate road markings)
	2	Mountable Concrete Median Treatment	<ul style="list-style-type: none"> Historic non-preference for vertical deflection devices such as speed humps or cushions Highlights local traffic area by providing a physical and visual gateway treatment to the south section of Smith Street Differentiation of road environment may deter vehicles turning left from proposed Bunnings access Smith Street south Reduced geometry less favourable to heavy vehicles and slows traffic by diverting vehicles around the island Breaks up long straight section of roadway Removal of parking improves sightlines and manoeuvrability of traffic entering Smith Street No noise impacts to residences Bicycle friendly (with appropriate road markings) Low-profile allows right-turning trucks out of 1 Smith Street to mount over the median
		Right Turn Only Signage	<ul style="list-style-type: none"> Right turn only" sign deters traffic exiting Bunnings from turning left onto Smith Street

Road	Option	Type	Rationale
	Additional to both options	Line Marking	<ul style="list-style-type: none"> ▪ Difference in line marking between the northern and southern sections of Smith Street provide differentiation of road environment between both sections ▪ Differentiation of road environment may deter vehicles turning left from proposed Bunnings access Smith Street south ▪ Recommended lane delineation alignments tie in with the proposed treatments ▪ Provides clear travel lanes for vehicles and cyclists, with sufficient clearance from parked vehicles and opposing traffic
		Bicycle Facilities	<ul style="list-style-type: none"> ▪ Shared paths allow cyclists to ride between on-road cycling along Smith Street and the Princes Highway shared path without dismounting ▪ Bicycle ramps provide off and on-road bicycle transitions between the Smith Street roadway and the shared path ▪ On-road bicycle markings spaced evenly along Smith Street reaffirm that Smith Street is a mixed-traffic cycling route
		Widened Footpath	<ul style="list-style-type: none"> ▪ Provide improved pedestrian facility ▪ Reduced roadway provides a road narrowing along Smith Street and assist in slowing down vehicles
		Optional Landscaped Verge (Option b)	<ul style="list-style-type: none"> ▪ Provides form of screening from the roadway
Holbeach Avenue	1	Speed Cushions (x4)	<ul style="list-style-type: none"> ▪ Slows vehicles down by providing vertical deflection which may be inconvenient to speeding vehicles ▪ Lower speeds increase travel time and may deter non-local traffic ▪ Allows for bus and service vehicle travel to Tempe recreation area ▪ Does not impact kerbside parking ▪ Minimises impact to driveway access ▪ No noise impacts to residences (industrial area) ▪ Located near street lighting for better visibility at night ▪ Spacing between intersections consistent with recommendations ▪ Bicycle friendly

Road	Option	Type	Rationale
Stanley Street	2	Speed Cushions (x2) & Road Narrowing	<ul style="list-style-type: none"> Slows vehicles down by providing vertical deflection which may be inconvenient to speeding vehicles Lower speeds increase travel time and may deter non-local traffic Provides further traffic calming by narrowing the available roadway Landscaped kerb blisters may enhance the local streetscape Provides physical and visual gateway to area No noise impacts to residences (industrial area) Located near street lighting for better visibility at night Spacing between intersections consistent with recommendations Bicycle friendly
	1	Flat Top Road Hump	<ul style="list-style-type: none"> Breaks up long straight section of roadway Slows vehicles down by providing vertical deflection which may be inconvenient to speeding vehicles Lower speeds increase travel time and may deter non-local traffic Consistent with other LATM devices in the area Located near street lighting for better visibility at night Treatment spacing consistent with spacing recommendations Does not impact kerbside parking
	2	Road Narrowing	<ul style="list-style-type: none"> Slows vehicles down by providing horizontal deflection Lower speeds increase travel time and may deter non-local traffic Kerb blisters break up long straight section of roadway Provides a permanent narrowing of roadway Landscaped features are visually more appealing and will allow the device to blend into the local streetscape Located near street lighting for better visibility at night Treatment spacing consistent with spacing recommendations Consistent with other LATM devices in the area
	1	Road Narrowing & Contrasting Pavement	<ul style="list-style-type: none"> May deter heavy vehicle traffic and slow vehicles down by reducing roadway widths and increasing roadway friction Lower speeds increase travel time and may deter non-local traffic Highlights local traffic area by providing a visual gateway treatment to the local roads Differentiation of road environment may deter vehicles from turning into Wentworth Street
Wentworth Street			

Road	Option	Type	Rationale
	2	Flat Top Road Hump	<ul style="list-style-type: none"> Slows vehicles down by providing vertical deflection which may be inconvenient to speeding vehicles Lower speeds increase travel time and may deter non-local traffic Highlights local traffic area by providing a visual gateway treatment to the local roads Differentiation of road environment may deter vehicles turning into Wentworth Street
	Additional to both options	3 Tonne Truck Limit Signage	<ul style="list-style-type: none"> Deter heavy vehicles from turning into Wentworth Street from Princes Highway, other than to access Tempe Tyre Centre
Barden, Fanning, Hart and Station Streets	-	Contrasting Pavement Threshold	<ul style="list-style-type: none"> Highlights local traffic area by providing a visual gateway treatment to the local roads Differentiation of road environment may deter vehicles from turning into these local streets from Princes Highway Complements existing truck load limit signage

9.8 Summary of Impacts

The possible impacts on kerbside parking, property accesses and cyclists are summarised in Table 9.3.

Table 9.3: Impacts of Proposed Treatments

Road	Option	Type	Impacts to Parking & Access	Impacts to Cyclists
Smith Street	1	Road Narrowing and Contrasting Pavement	<ul style="list-style-type: none"> Up to two (2) parking spaces removed on the western side and one (1) space on the eastern side Combined with the loss of 13 on-street parking as part of Bunnings development, a total of 16 on-street parking will be lost. Two (2) vacant spaces will still be available on Smith Street on an average Thursday. No impacts to 1 Smith Street access. 	<ul style="list-style-type: none"> Minimal impacts to cyclists on roadway

Road	Option	Type	Impacts to Parking & Access	Impacts to Cyclists
	2	Mountable Concrete Median Treatment	<ul style="list-style-type: none"> Up to seven (7) parking spaces removed on the western side and one (1) space on the eastern side. Combined with the loss of 13 on-street parking as part of Bunnings development, a total of 21 on-street parking will be lost. On average Thursday, there will be a shortage of three (3) spaces and will result in a flow-on effect of residential parking onto other streets such as Barden Street or South Street. Right-turning vehicles exiting 1 Smith Street access may and will be allowed to mount over the low-profile median. 	<ul style="list-style-type: none"> Cyclists on roadway will have to slow down to divert around the median treatment
	Additional to both options	Right Turn Only Signage	<ul style="list-style-type: none"> Vehicles exiting the Bunnings access must turn right 	<ul style="list-style-type: none"> No impact to cyclists
		Line Marking	<ul style="list-style-type: none"> Minimal impacts 	<ul style="list-style-type: none"> Minimal negative impacts
		Bicycle Facilities	<ul style="list-style-type: none"> Minimal impacts 	<ul style="list-style-type: none"> Minimal negative impacts
		Widened Footpath	<ul style="list-style-type: none"> Footpath must be designed to allow access driveways and the roadway Minimal impacts to parking, as kerbside parking will be retained 	<ul style="list-style-type: none"> No impact to cyclists
		Optional Landscaped Verge (Option b)	<ul style="list-style-type: none"> Removal of 25 parking spaces on the western side 	<ul style="list-style-type: none"> No impact to cyclists
Holbeach Avenue	1	Speed Cushions (x4)	<ul style="list-style-type: none"> No impacts to parking, as vehicles are still able to park over speed cushions No impacts to property accesses. 	<ul style="list-style-type: none"> Minimal impacts to cyclists as they are expected to utilise the shared path adjacent to roadway
	2	Speed Cushions (x2) and Road Narrowing	<ul style="list-style-type: none"> One (1) parking space removed on each side of the roadway, total two (2) No impacts to property accesses. 	<ul style="list-style-type: none"> Minimal impacts to cyclists as they are expected to utilise the shared path adjacent to roadway
Stanley Street	1	Flat Top Road Hump	<ul style="list-style-type: none"> No impacts to parking, as vehicles are still able to park over flat top road humps No impacts to property accesses. 	<ul style="list-style-type: none"> Cyclists on roadway will have to slow down to safely get over the hump

Road	Option	Type	Impacts to Parking & Access	Impacts to Cyclists
	2	Road Narrowing	<ul style="list-style-type: none"> For each location: one (1) parking space removed on each side of the roadway, total two (2) per location No impact to property accesses. 	<ul style="list-style-type: none"> Minimal impacts to cyclists on roadway
Wentworth Street	1	Road Narrowing & Contrasting Pavement	<ul style="list-style-type: none"> For the location south of Princes Highway: one (1) parking space removed on each side of the roadway, total two (2) spaces No nominal loss of parking spaces for the location north of South Street, as it is located within 10 metres from a T-intersection, meaning it has an existing non-signposted No Stopping restriction Minimal impacts to property accesses, including vehicular access to Tempe Tyre Centre. May impact waste access to Tempe Tyre Centre. 	<ul style="list-style-type: none"> Minimal impacts to cyclists on roadway
	2	Flat Top Road Hump	<ul style="list-style-type: none"> No impacts to parking, as vehicles are still able to park over flat top road humps No impacts to property accesses. 	<ul style="list-style-type: none"> Cyclists on roadway will have to slow down to safely get over the hump
	Additional to both options	3 Tonne Truck Limit Signage	<ul style="list-style-type: none"> Any heavy vehicle accidentally turning into Wentworth Street will have to exit via Tempe Tyre Centre 	<ul style="list-style-type: none"> No impact to cyclists
Barden, Fanning, Hart and Station Streets	-	Contrasting Pavement Threshold	<ul style="list-style-type: none"> No impacts to parking and access. 	<ul style="list-style-type: none"> No impact to cyclists

10. INFRASTRUCTURE ITEMISATION

10.1 Methodology

Most of the concept designs of LATM treatments were designed against on-site conditions such as road width and geometry, with reference to Australian Standards and Austroads design guidelines. However, the contrasting pavement thresholds presented are typical designs which may be adapted in each treatment location.

The following general costing methodology was adopted:

- Treatments were itemised and broken down into their composite elements, such as reinforced concrete platforms, line marking, signs, and landscaping
- Previous LATM studies, benchmark infrastructure costs and pedestrian facility planning reports recently undertaken in NSW were consulted to estimate a baseline treatment unit cost
- A unit cost per treatment type was developed based on the itemisation and base line unit costs
- The total estimated cost was developed based on the quantity and unit cost of each treatment.

The assumptions and exclusions made as a part of our cost estimations are outlined in the sections below.

10.2 Relevant Guidelines

10.2.1 Australian Standards

AS1742 Manual of Uniform Traffic Control Devices was the primary reference consulted for this study for specifications on traffic calming devices, and relevant signage and line marking. Both *AS1742 Part 10: Pedestrian Control and Protection* and *AS1742 Part 13: Local Area Traffic Management* were consulted for the specifications, with the former relating to refuge and median islands, and wombat crossings, and the latter relating to thresholds and other humps.

The *Roads and Maritime Supplement to Australian Standard 1742 - Manual of Uniform Traffic Control Devices parts 1-15 (Version 2.4)* (known simply as *RMS supplement to AS1742*) was consulted for any Roads and Maritime (RMS) modification or practices that differ from AS1742. The supplement cross references a number of RMS (and its predecessor Roads and Traffic Authority) technical directions, which are listed in Section 10.2.4.

10.2.2 Austroads Guide to Traffic Management

Austroads Guide to Traffic Management Part 8 – Local Area Traffic Management was also consulted for recommended specifications on treatments not covered in AS1742 or the RMS supplement to AS1742.

The *RMS Austroads Guide Supplements – Austroads Guide to Traffic Management Part 8 – Local Area Traffic Management* (known simply as *RMS supplement to Austroads*) was consulted for any Roads and Maritime (RMS) modification or practices that differ from Austroads.

10.2.3 STA Bus Infrastructure Guidelines

The *State Transit Authority Bus Infrastructure Guidelines* outlines a number of infrastructure design aspects which must be taken into considering when implementing traffic calming treatments along bus routes. These are recommended to ensure a minimisation of impacts to bus operations.

10.2.4 Transport for NSW Technical Directions and Guidelines

Transport for NSW (and its predecessors Roads and Maritime Services (RMS) and Roads and Traffic Authority (RTA)) delineation guidelines were also consulted for specification for zebra crossings and edge and centre line markings:

- *Roads and Traffic Authority Delineation Section 4 – Longitudinal Markings* was consulted for dimensions of edge and centre line markings.
- *Roads and Traffic Authority Delineation Section 7 – Transverse Lines Pedestrian Facilities* was consulted for dimensions of pedestrian (zebra) crossings.

10.3 Treatments


Each proposed treatment option was broken down into its key components, such as physical components and any required signage. Itemised components of the proposed standard treatments may include (but are not limited to):







- Concrete components (such as platforms, kerb blisters, refuge islands etc)
- Line marking or road surface marking
- Surfacing or surface colour treatment
- Signage
- Landscaping
- Civil works

Table 10.1 details the breakdown of each proposed treatment type.

These traffic calming devices are identified as being appropriate for the context of the zone and can assist in creating a safer local road environment.

Table 10.1: Proposed Treatments

LATM Treatments	Description	Components	Signs and Posts
Road narrowing	Landscaped kerb blisters with low height shrubs	<ul style="list-style-type: none"> Kerb blisters Treatment surfacing Civil works Landscaping 	n/a
Contrasting pavement	At-grade contrasting pavement treatment (embossed text pattern)	<ul style="list-style-type: none"> Contrasting pavement (at-grade) Treatment surfacing Civil works 	n/a
Line marking	Edge, centre line and lane delineation marking	<ul style="list-style-type: none"> Edge line marking Centre line marking Lane Delineation (L1 and C1) 	n/a
Mountable concrete median	Mountable low-profile concrete median with contrasting pavement	<ul style="list-style-type: none"> Low-profile median island Treatment surfacing Signage Civil works 	n/a
Right Turn Only signage		<ul style="list-style-type: none"> Signage Civil works 	<ul style="list-style-type: none"> 1 x R2-14_R  <ul style="list-style-type: none"> 1 x signpost

LATM Treatments	Description	Components	Signs and Posts
Speed cushions	100mm high speed cushions (either in set of 2 or set of 4)	<ul style="list-style-type: none"> Speed cushions Signage Civil works 	<ul style="list-style-type: none"> 2 x W5-10  2 x W8-2 (25 km/h)  1 x signpost¹
Flat top road hump	100mm high flat top road hump with contrasting surface treatment ('terracotta' colour surface of similar)	<ul style="list-style-type: none"> Raised Hump Line marking Treatment surfacing Signage Civil works 	<ul style="list-style-type: none"> 2 x W5-10  2 x W8-2 (25 km/h)  1 x signpost²
Bicycle facilities	Shared path and Bicycle on-ramp	<ul style="list-style-type: none"> Footpath demolition Shared path (new) Bicycle ramp Bicycle marking (bicycle symbols and arrows) Signage Civil works 	<ul style="list-style-type: none"> 5 x R8-2  2 x R7-4  3 x signposts




LATM Treatments	Description	Components	Signs and Posts
Widened footpath	Widened footpath of 2.5m width, with optional landscaped verge	<ul style="list-style-type: none"> Footpath demolition Footpath (new) Treatment surfacing Civil works Landscaping (verge) 	n/a
3 tonne truck limit signage	3 tonne truck limit signage	<ul style="list-style-type: none"> Signage 	<ul style="list-style-type: none"> 2 x R6-10-2  2 x R9-231 (3 tonne)  1 x W8-245N_L  1 x signpost³

Image Source: Transport for NSW

1. The speed cushion treatment will only be installed at Holbeach Avenue, using an existing streetlight pole and a new signpost instead of two signposts.

2.

- The flat top road hump treatment (Option 2) at Wentworth Street north of South Street will utilise an existing streetlight pole and a new signpost

- The flat top road hump treatment (Option 2) at Wentworth Street south of Princes Highway will utilise the signpost used for the 3 tonne truck limit signage, and a new signpost

- The flat top road hump treatment (Option 1) at Stanley Street (at each location) will utilise an existing streetlight pole and a new signpost instead of two signposts. In all cases, only one new signpost is needed.

3. The 3 tonne truck limit signage treatment will only be installed at Wentworth Street south of Princes Highway, using an existing streetlight pole and a new signpost instead of two signposts.

11. COST ESTIMATION

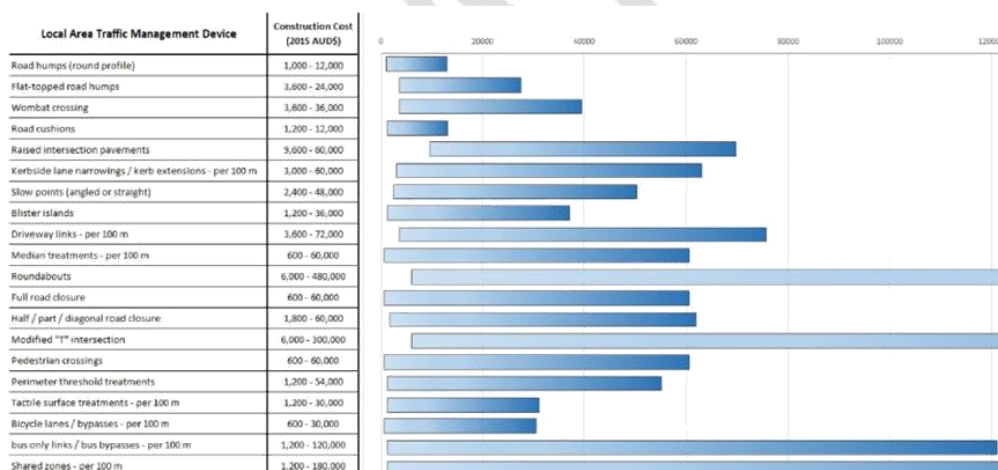
11.1 Treatments

11.1.1 Cost Factors

The cost of implementing these treatments is highly dependent upon the contextual surroundings at each install site. Factors which can affect the costs include:

- Material selection
- Size of treatment
- Accommodation for drainage
- Street lighting
- Any kerb or gutter works
- Adjustments to any pits
- Any landscaping
- Requirement of street closures or traffic control
- Any other additional features, such as supplementary line marking or pedestrian fencing.

In developing cost estimates for the different types of treatments, *Austroads Guide to Traffic Management Part 8 (Local Area Traffic Management)* was consulted. The graph in Figure 11.1 shows the relative construction costs of LATM devices.



Source: Damen (2007) cited in *Austroads Guide to Traffic Management Part 8*

Figure 11.1: Relative LATM Device Costs

Council has provided average standard costs for various LATM treatments, signage, installation and marking, which is the main source used for cost estimation. The Independent Pricing and Regulatory Tribunal New South Wales (IPART NSW) report *Local Infrastructure Benchmark Costs* was also consulted for the cost estimates of some treatments.

The costs detailed in this report should be taken as indicative only. The final treatment costs will ultimately be subject to detailed design at each specific site location.

11.1.2 Treatment Signage

There is a minimum provision of signs required to be installed to accompany the specific treatments proposed, as previously detailed in Section 10.3. These primarily include warning signage associated with the treatments modifying road geometry, such as 'speed hump' warning signs. The provision of these signs is included within the treatment-specific signage costs.

The standard costs of signs were provided for 3 tonne load limit (two signs), speed hump and speed advisory signs, which is \$83 per sign. The standard cost of a galvanised signpost is \$105, and the cost of installing a signpost in concrete is \$205.

11.1.2.1 Assumptions

The following assumptions were made for estimating treatment-associated signage costs:

- The cost of a single sign was estimated at \$83
- All signposts are assumed to be installed in concrete. As such, the total cost for a signpost and its installation was assumed to be \$310.
- Parking restriction signs (certain treatments like kerb blisters have specific restrictions on nearby on-street parking) have **not** been included, as their implementation will be specific to parking conditions at each location.

The minimum sign requirement for each type of treatment is presented in Table 11.1 below.

Table 11.1: Signage Costs per Treatment

LATM Treatment	No. of Signs (each)	No. of Posts (each)	Cost
Road narrowing	-	-	-
Contrasting pavement	-	-	-
Line marking	-	-	-
Mountable concrete median	-	-	-
Right Turn Only signage (Smith Street)	1	1	\$393
Speed cushions	4	1	\$642
Flat top road hump	4	1	\$642
3 tonne truck limit Signage (Wentworth Street south of Princes Highway)	5	1	\$725
Bicycle facilities (Smith Street)	7	3	\$1511

It should be noted the values presented in Table 11.1 do not include labour and installation costs, other than the installation of signposts. The costs of the individual signs and posts are shown to be a relatively small component of the total treatment cost.

Depending on Council's sign inventory and the quality of replaced/removed signs, there may be opportunities to recycle use of old signs where appropriate. Due to their nature, these considerations are subject to detailed design and the actual installation process.

11.1.3 Item Unit Costs

The total unit cost of each component of the treatments identified in Table 10.1 have been estimated at the following costs in Table 11.2. It is important to note that these prices are indicative.

Table 11.2: Item Unit Cost

Item	Unit	Unit Cost (\$)
Treatment (excludes treatment-specific signage)		
Kerb blister	Each	\$5,000
Contrasting pavement (at-grade)	Each	\$15,000
Mountable concrete median	Each	\$10,000
Speed cushion	Each	\$900
Flat top road hump	Each	\$35,000
Footpath demolition	Per square metre	\$55
New footpath or shared path	Per square metre	\$120
Kerb and gutter	Per metre	\$115
Bicycle ramp	Each	\$5,000
Signage		
Right Turn Only signage at Smith Street	-	\$393
Speed cushions signage	Per set of speed cushions	\$642
Flat top road hump signage	Per flat top road hump	\$642
Bicycle signage at Smith Street	-	\$1511
3 tonne truck limit signage at Wentworth Street south of Princes Highway	-	\$725
Marking		
Line marking of 100-150mm width (including edge and centreline)	Per metre	\$6
Bicycle symbols	Per symbol	\$62
Directional symbols (arrow)	Per symbol	\$62

These estimates are based on the following assumptions:

- Estimates were prepared for a 'standard' treatment for typical conditions within the study area
 - Dimensions and specifications (other than width) are assumed to be the same for each treatment regardless of site and conditions
- Cost of the treatments exclude costs of treatment-specific signage (speed hump warning signs for flat top road humps etc.)
- Costs of treatment-specific and associated sign posts exclude associated parking restriction signs (see Section 11.1.2).
- Flat top road humps have the same cost as a raised pedestrian crossing, which has a cost of \$35,000 based on Council's average standard costs
- Footpath widening or shared path construction includes a complete demolition of the old footpath and construction of a 100mm tall reinforced concrete footpath
- Landscaping and maintenance costs are not included

11.2 Landscaping

The provision of landscaped treatments allows for visually attractive devices with additional functionality. For example, landscaped kerb blisters deter pedestrians from using devices such as flat-top road humps as road crossing devices.

Landscaped treatments can contribute to a more positive community reception of new traffic calming devices. Residents may be inclined to more readily accept a device which contributes to the local streetscape aesthetic with landscaping reflective of the contextual surrounds. Conversely, there may be community backlash over an excessive implementation of devices perceived as intrusive and utilitarian due to the impact to local amenity.

An example of a landscaped versus non-landscaped kerb blister is displayed in Figure 11.2.



Figure 11.2: Kerb Blisters – Landscaping (left) and Standard (right)

However, providing landscaping on treatments requires additional costs, both capital costs for the installation process (soil infill, plant species, etc.) and on-going maintenance costs (watering, general upkeep of the plants, potential future replacements).

Austroads Guide to Traffic Management Part 8, citing City of Knox's Annual LATM Program Review (2002), suggests that the construction costs of an LATM can be reduced by 20-25% with the removal of landscaped features.

11.3 Maintenance

Maintenance costs are an additional consideration when installing treatments, dependent upon a number of factors including:

- Material choice: concrete treatments tend to have a longer life-span than those made out of asphalt or small unit pavers, therefore requiring less future maintenance costs
- Any supplementary elements to the treatment, including street furniture and accompanying warning signage is vulnerable to ongoing damage and potential vandalism
- Devices which require a horizontal deflection of the vehicle (chicane slow points, wide median splitter islands, etc.) may require further reinforcement works to the pavement to handle the side pressures exerted by the vehicle tyres
- Line marking and road symbols must be maintained and refreshed if their condition deteriorates, as efficiency and effectiveness is strongly linked to their visibility.

The high degree of variability in maintenance costs renders it difficult to estimate with a satisfactory degree of accuracy. Maintenance needs and costs will be monitored by Council following the installation of the treatments.

11.4 Estimated Total Treatment Costs

The estimated treatment cost for the entire study area is itemised in Table 11.3. This cost includes all treatment and sign costs identified in the earlier sections. Lengths measured for line marking treatments are approximate only.

Table 11.3: Treatment Unit Costs

Road	Option	Item	Unit Cost (\$)	Quantity	Total (\$)	Including 10% Contingency Cost & 10% Design Cost
Smith Street	Option 1a - Road Narrowing & Contrasting Pavement (including additional measures)	Kerb blisters	\$5,000	2	\$10,000	\$12,000
		Contrasting pavement	\$15,000	1	\$15,000	\$18,000
		Right Turn Only signage	\$393	1	\$393	\$472
		Line marking	\$6 / m	approx. 350m	\$2,100	\$2,520
		Shared path (western)	\$120 / m ²	approx. 30m x 2m	\$7,200	\$8,640
		Shared path (eastern)	\$120 / m ²	approx. 65m x 2.5m	\$19,500	\$23,400
		Bicycle ramp	\$5,000	1	\$5,000	\$6,000
		Bicycle symbols and arrows	\$62	11	\$682	\$818
		Footpath demolition	\$55 / m ²	approx. 230m x 1.5m	\$18,975	\$22,770
		New footpath	\$120 / m ²	approx. 200m x 2m	\$48,000	\$57,600
		Kerb and gutter	\$115 / m	approx. 230m	\$26,450	\$31,740
		Total			\$153,300	\$183,960
	Option 1b - Road Narrowing & Contrasting Pavement (including additional measures)	Similar to Option 1a	\$153,900	1	\$153,300	\$183,960
		<i>Less one kerb blister</i>	\$5,000	- 1	- \$5,000	- \$6,000
		<i>Less line marking (on western side)</i>	\$6 / m	- 100 m	- \$600	- \$720
		Verge landscaping	TBD	-	-	-
		Total			\$147,700 + verge landscaping	\$177,240 + verge landscaping

Road	Option	Item	Unit Cost (\$)	Quantity	Total (\$)	Including 10% Contingency Cost & 10% Design Cost
Smith Street	Option 2a - Mountable Concrete Median Treatment (including additional measures)	Mountable concrete median	\$10,000	1	\$10,000	\$12,000
		Right turn only signage	\$393	1	\$393	\$472
		Line marking	\$6 / m	approx. 500m	\$3,000	\$3,600
		Shared path (western)	\$120 / m ²	approx. 30m x 2m	\$7,200	\$8,640
		Shared path (eastern)	\$120 / m ²	approx. 65m x 2.5m	\$19,500	\$23,400
		Bicycle ramp	\$5,000	1	\$5,000	\$6,000
		Bicycle symbols and arrows	\$62	11	\$682	\$818
		Footpath demolition	\$55 / m ²	approx. 230m x 1.5m	\$18,975	\$22,770
		New footpath	\$120 / m ²	approx. 200m x 2m	\$48,000	\$57,600
		Kerb and gutter	\$115 / m	approx. 230m	\$26,450	\$31,740
		Total			\$139,200	\$167,040
	Option 2b - Mountable Concrete Median Treatment (including additional measures)	Similar to Option 1a	\$138,900	1	\$139,200	\$167,040
		Less line marking (on western side)	\$6 / m	- 140 m	- \$840	- \$1,008
		Verge landscaping	TBD	-	-	-
		Total			\$138,360 + verge landscaping	\$166,032 + verge landscaping
Holbeach Avenue	Option 1 - Speed Cushions	Speed cushions	\$900	4	\$3,600	\$4,320
		Speed cushion signage	\$642	1 set	\$642	\$770
		Total			\$4,242	\$4,666
	Option 2 - Speed Cushions & Road Narrowing	Speed cushions	\$900	2	\$1,800	\$4,320
		Kerb blister	\$5,000	2	\$10,000	\$12,000
		Speed cushion signage	\$642	1	\$642	\$770
		Total			\$14,242	\$17,090

Road	Option	Item	Unit Cost (\$)	Quantity	Total (\$)	Including 10% Contingency Cost & 10% Design Cost
Stanley Street	Option 1 – Flat Top Road Hump	Flat top road humps	\$35,000	2	\$70,000	\$84,000
		Flat top road hump signage	\$642	2	\$1,284	\$1,541
		Total			\$71,284	\$85,541
	Option 2 – Road Narrowing	Kerb blisters	\$5,000	4	\$20,000	\$24,000
		Total			\$20,000	\$24,000
Wentworth Street	Option 1 - Road narrowing & Contrasting Pavement (including additional measures)	Kerb blisters	\$5,000	4	\$20,000	\$24,000
		Contrasting pavement	\$15,000	2	\$30,000	\$36,000
		3 Tonne Truck Limit signage	\$725	1 set	\$725	\$870
		Total			\$50,275	\$60,870
	Option 2 - Flat Top Road Hump (including additional measures)	Flat top road humps	\$35,000	2	\$70,000	\$84,000
		Flat top road hump signage	\$642	2	\$1,284	\$1,541
		3 Tonne Truck Limit signage	\$725	1 set	\$725	\$870
		Total			\$72,009	\$86,411
Barden Street	Contrasting Pavement Threshold	Contrasting Pavement	\$15,000	1	\$15,000	\$18,000
Fanning Street	Contrasting Pavement Threshold	Contrasting Pavement	\$15,000	1	\$15,000	\$18,000
Hart Street	Contrasting Pavement Threshold	Contrasting Pavement	\$15,000	1	\$15,000	\$18,000
Station Street	Contrasting Pavement Threshold	Contrasting Pavement	\$15,000	1	\$15,000	\$18,000

12. CONCLUSION

In order to manage the traffic impacts related to the proposed Bunnings Development at No. 728-750 Princes Highway, an LATM study was conducted on behalf of Inner West Council. The study area included a number of local streets within Tempe South adjoining the Princes Highway.

The study reviewed existing conditions on site and expected future traffic conditions within the local area and makes recommendation on appropriate LATM treatment options to be implemented along certain streets.

A summary of key processes undertaken and findings in this study is as follows:

- Background information and documents relating to the proposed Bunnings development were reviewed, providing information on future proposed traffic and road changes in the area
- Existing site conditions, surrounding land uses and road network information was reviewed
- A site inspection and audit was conducted, including identification of existing LATM devices, traffic signs, parking signs and restrictions, pedestrian and bicycle facilities, and refuse collection issues
- Traffic and parking surveys were conducted to capture the levels of traffic and parking demand within the study area. This included tube counts, parking occupancy surveys and intersection counts
- The survey of on-street parking on Smith Street showed that on average, there are 18 vacant spaces on Thursday and 27 vacant spaces on Saturday. After the removal of spaces due to the Bunnings development and the proposed LATM treatments Smith street parking is expected to be at capacity.
- The traffic survey data was analysed and identified streets requiring further LATM devices in order to:
 - Provide traffic calming and reduce vehicle speeds
 - Reduce general traffic volumes by deterring traffic
 - Reduce Heavy Vehicle volumes
 - Reduce crash risk
- A scoring system was developed to determine priority streets requiring LATM treatments
- A detailed selection criteria and list of suitable LATM measures were developed based on existing devices in the area and typical LATM devices presented in *Austroads Guide to Traffic Management Part 8 - Local Area Traffic Management*
- Two LATM Treatment options were presented for each priority street. These treatment options included:
 - Holbeach Avenue – Outside No. 14 and No 16 Holbeach Avenue
 - Option 1: *Speed Cushions*, set of four across roadway
 - Option 2: *Speed Cushions*, set of two with *Kerb Blisters*
 - Smith Street – Outside No. 28 Smith Street and south of proposed Bunnings Access
 - Option 1: *Road Narrowing using Kerb blisters and contrasting pavement marking*
 - Option 2: *Mountable Concrete Median and associated line marking*
 - Both options are to be supplemented by *Right Turn Only signage, edge line marking, bicycle ramp, and shared path* between Princes Highway and the LATM treatment, and *widened footpath* between Princes Highway and South Street. An optional *landscaped verge* may also be provided between the widened footpath and roadway, which will result in the removal of kerbside parking.
 - Stanley Street – Outside No. 14 and No. 35 Stanley Street
 - Option 1: *Flat Top Road Hump*
 - Option 2: *Road narrowing using Kerb Blisters*

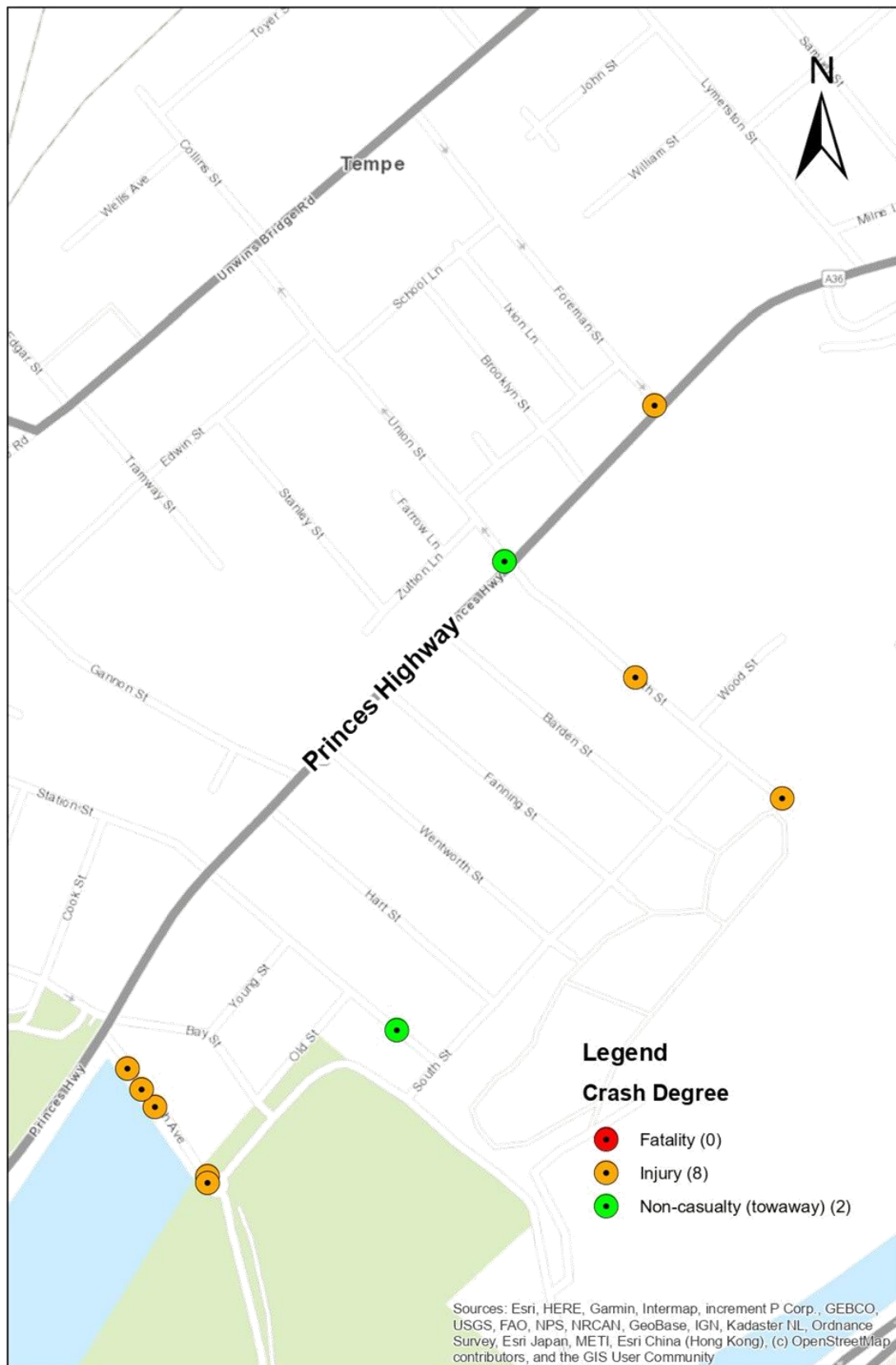
- Wentworth Street – South of Princes Highway and North of South Street
 - Option 1: Road narrowing using *Kerb Blisters* and *contrasting pavement marking*
 - Option 2: *Flat Top Road Hump*
 - Both options will include *3 Tonne Truck Limit signage* at Princes Highway and Wentworth Street to deter heavy vehicles from entering Wentworth Street
- Additionally, contrasting pavements were proposed for the entries of Barden, Fanning, Hart and Station Streets from Princes Highway.
- Each treatment was assessed for its merits and impacts to parking, property accesses, cyclists and emergency service vehicles.
- Concept designs of each treatment were developed
- The treatments proposed were itemised into their constituent parts, including signage and line marking
- The type and number of signs associated with each type of treatment were identified, along with the number of signposts required
- A baseline treatment unit cost was established, based on:
 - Previous experience
 - IPART Benchmark infrastructure costs
 - Austroads Guide to Traffic Management Part 8
 - A review of previous LATM studies and pedestrian facility planning reports for other studies in NSW
- A standard cost of signs (such as speed hump warning signs etc.) was included in the treatment unit cost
- Ancillary signs such as advance warning signs and parking restriction signs were not included in the treatment unit cost, as they are subject to the specific implementation site of each treatment
- Estimated costs for each option or measure, including contingency and design costs, range from **\$18,000** to **\$184,000**, with an at-grade contrasting pavement as the least cost option and treatment options along Smith Street resulting with the highest cost.

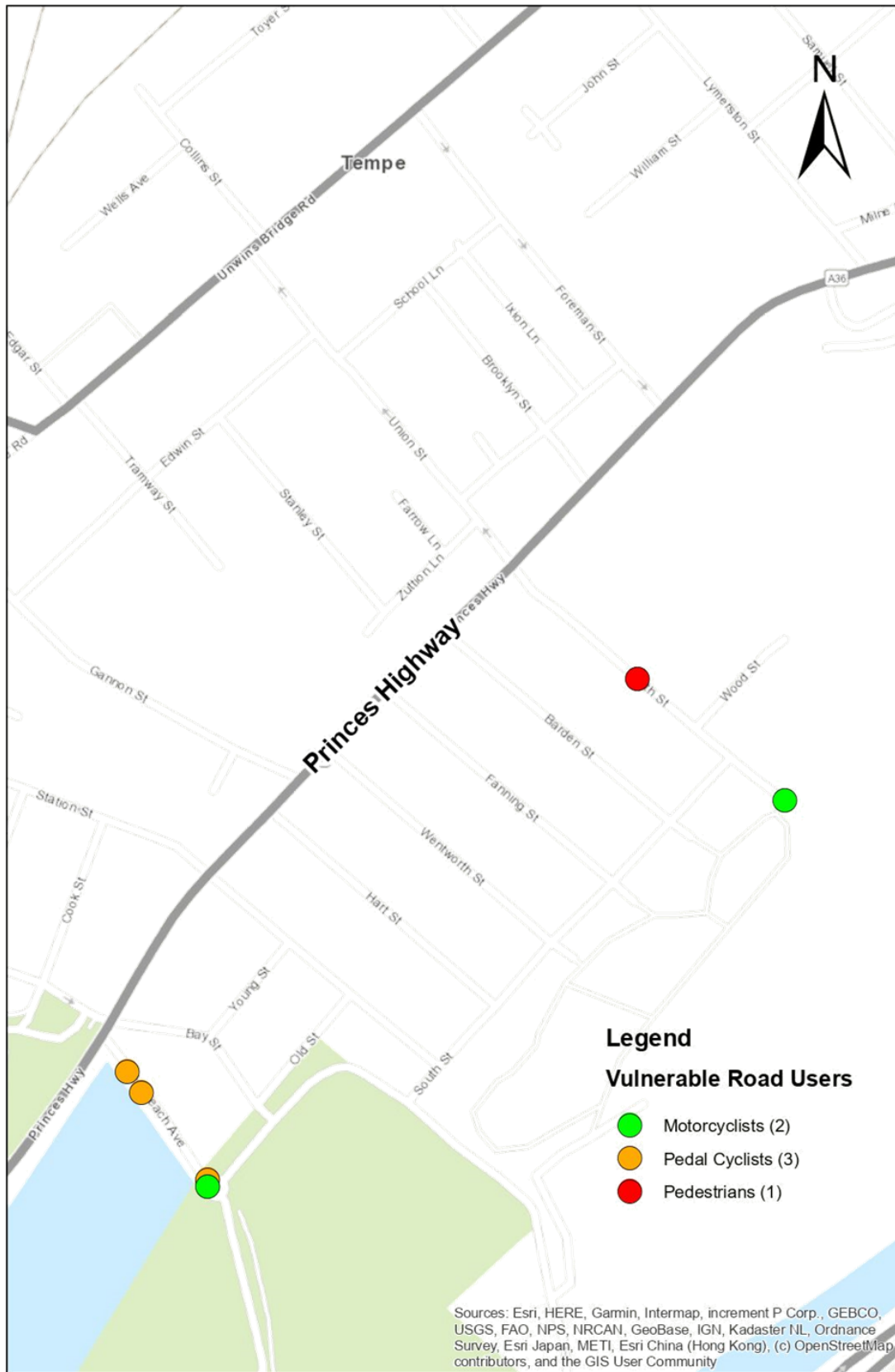


Appendix A: Crash Data Maps

Item 5

Attachment 1



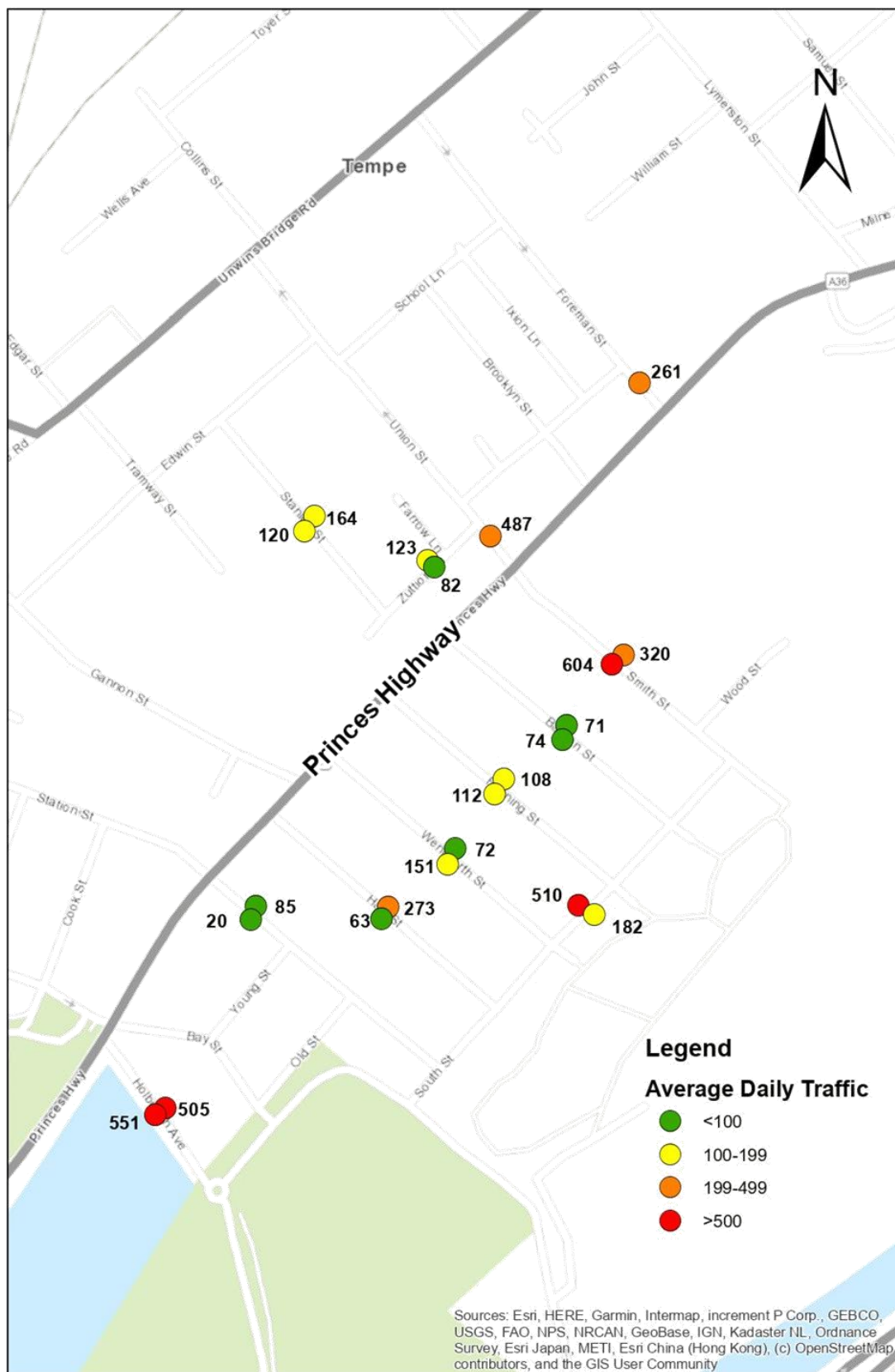


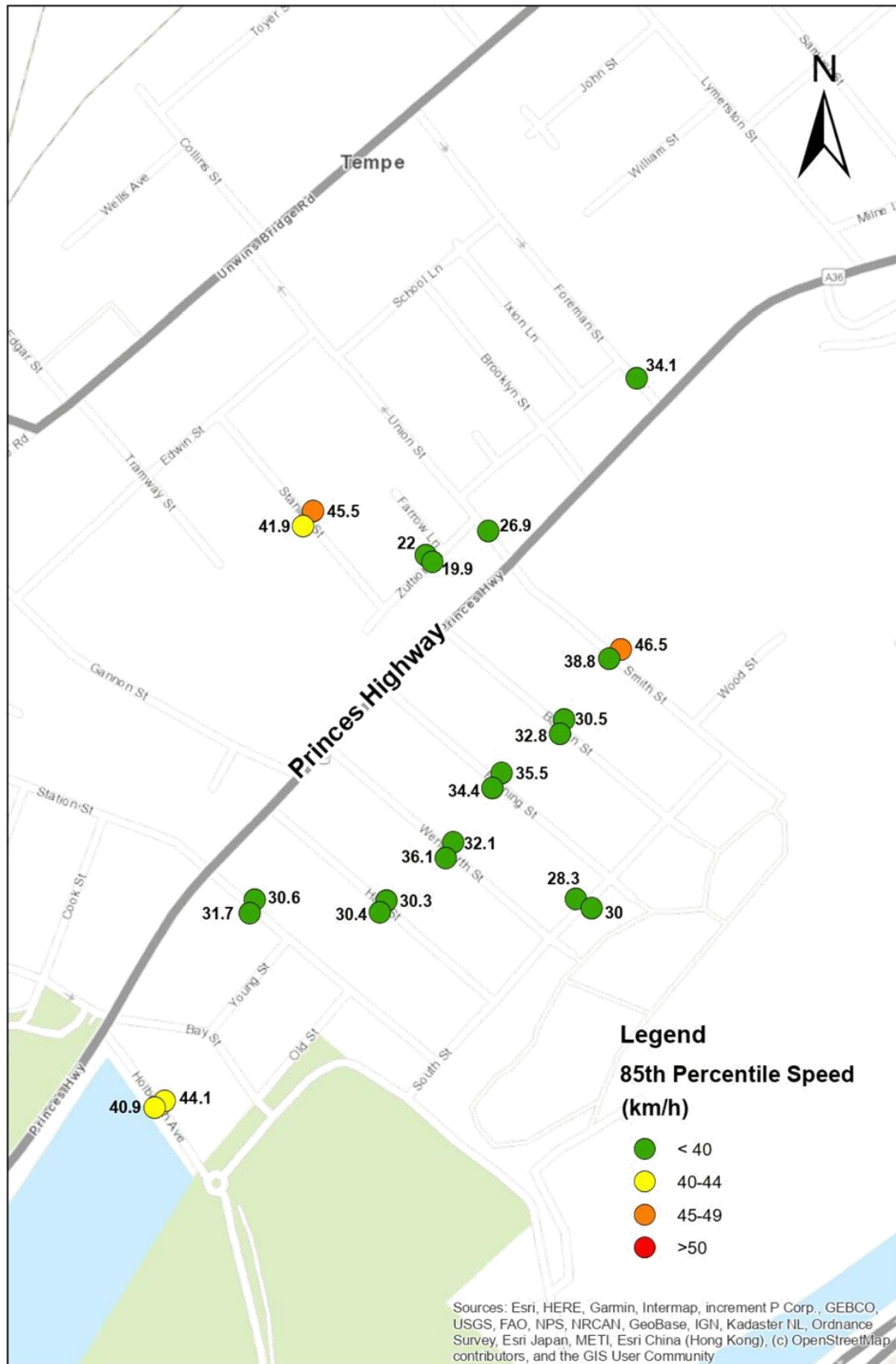


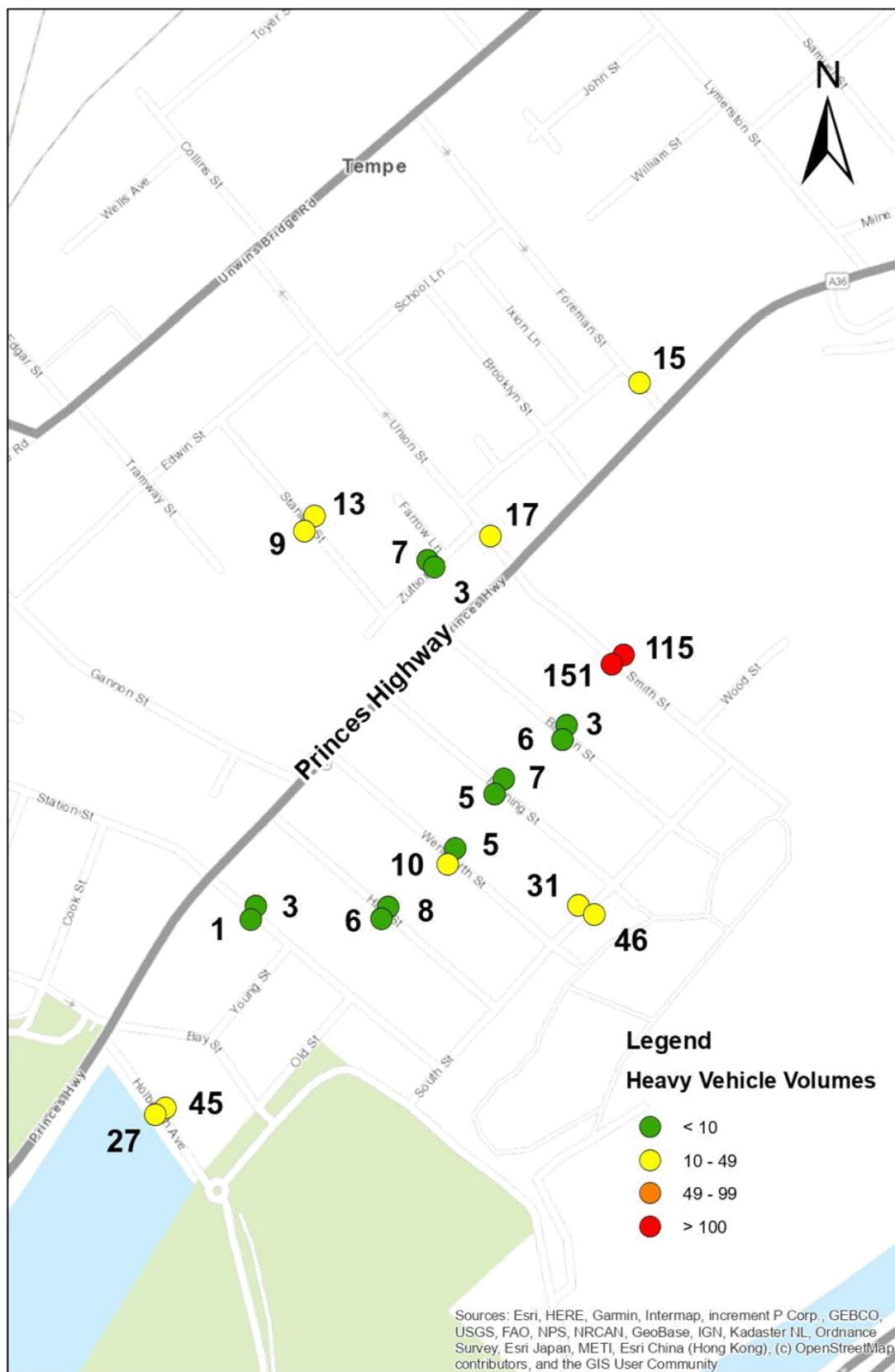
Appendix B: Tube Count & Parking Data Maps

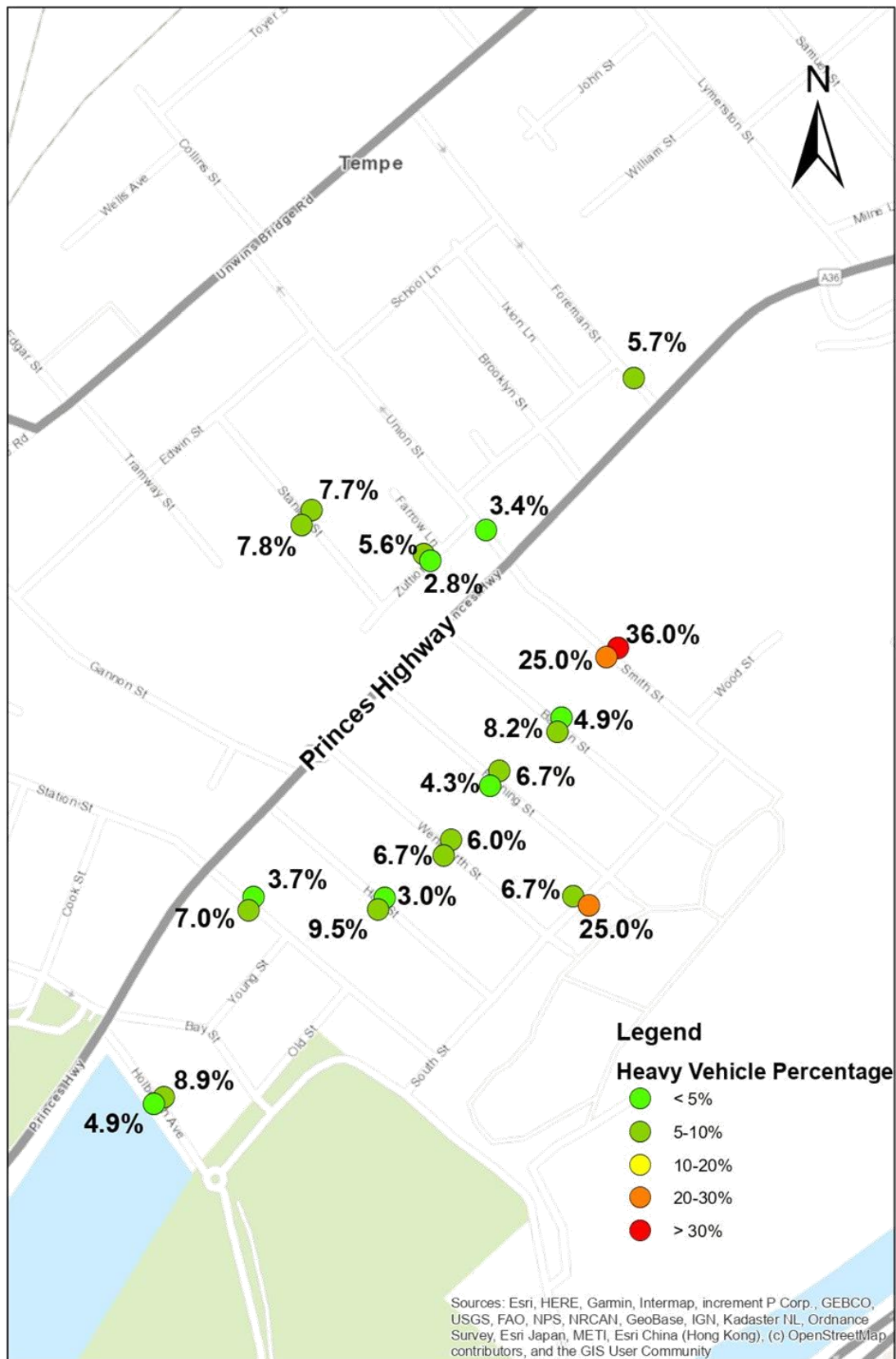
Item 5

Attachment 1















Appendix C: Site Audit Data and Maps

Item 5

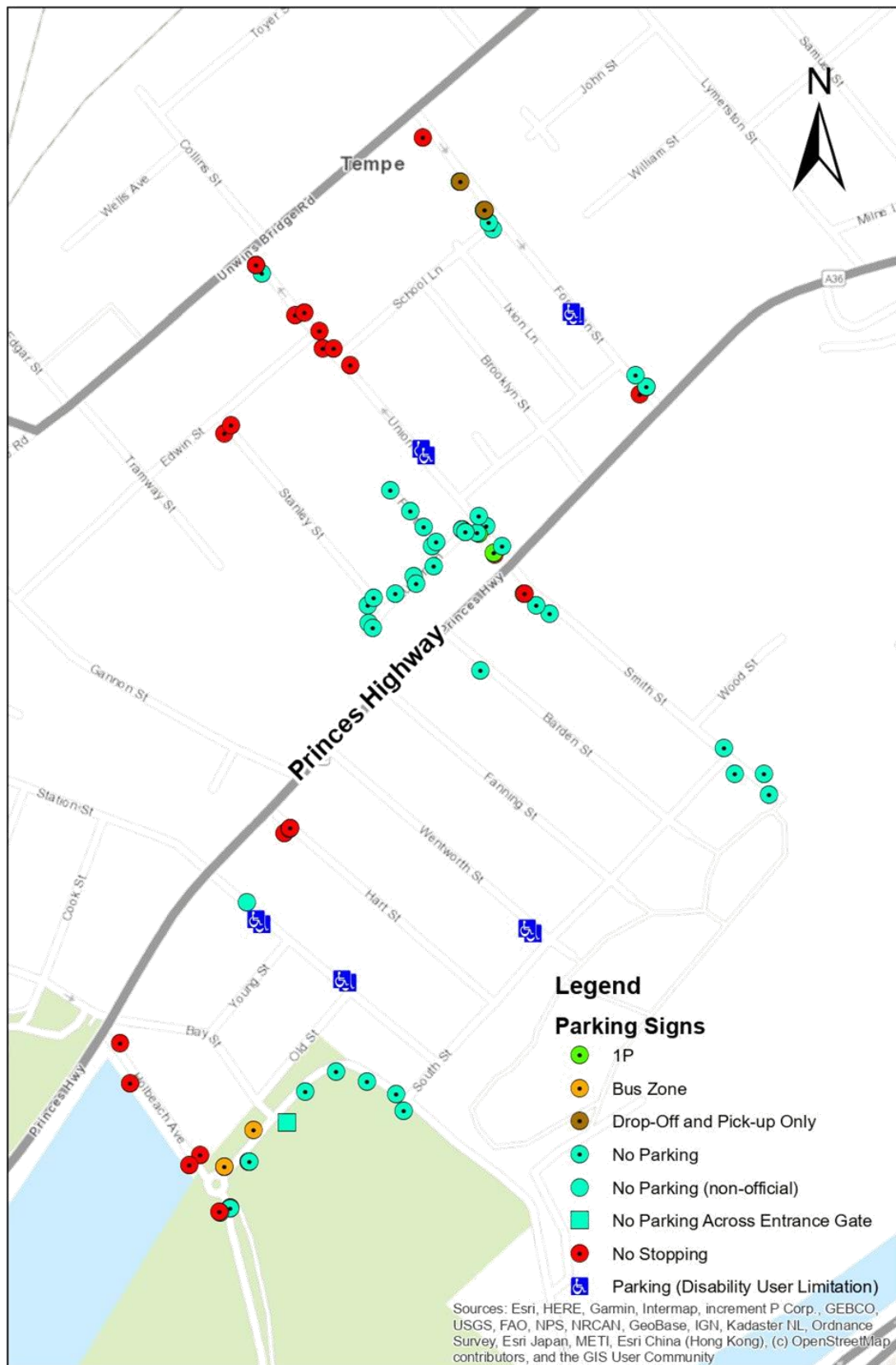
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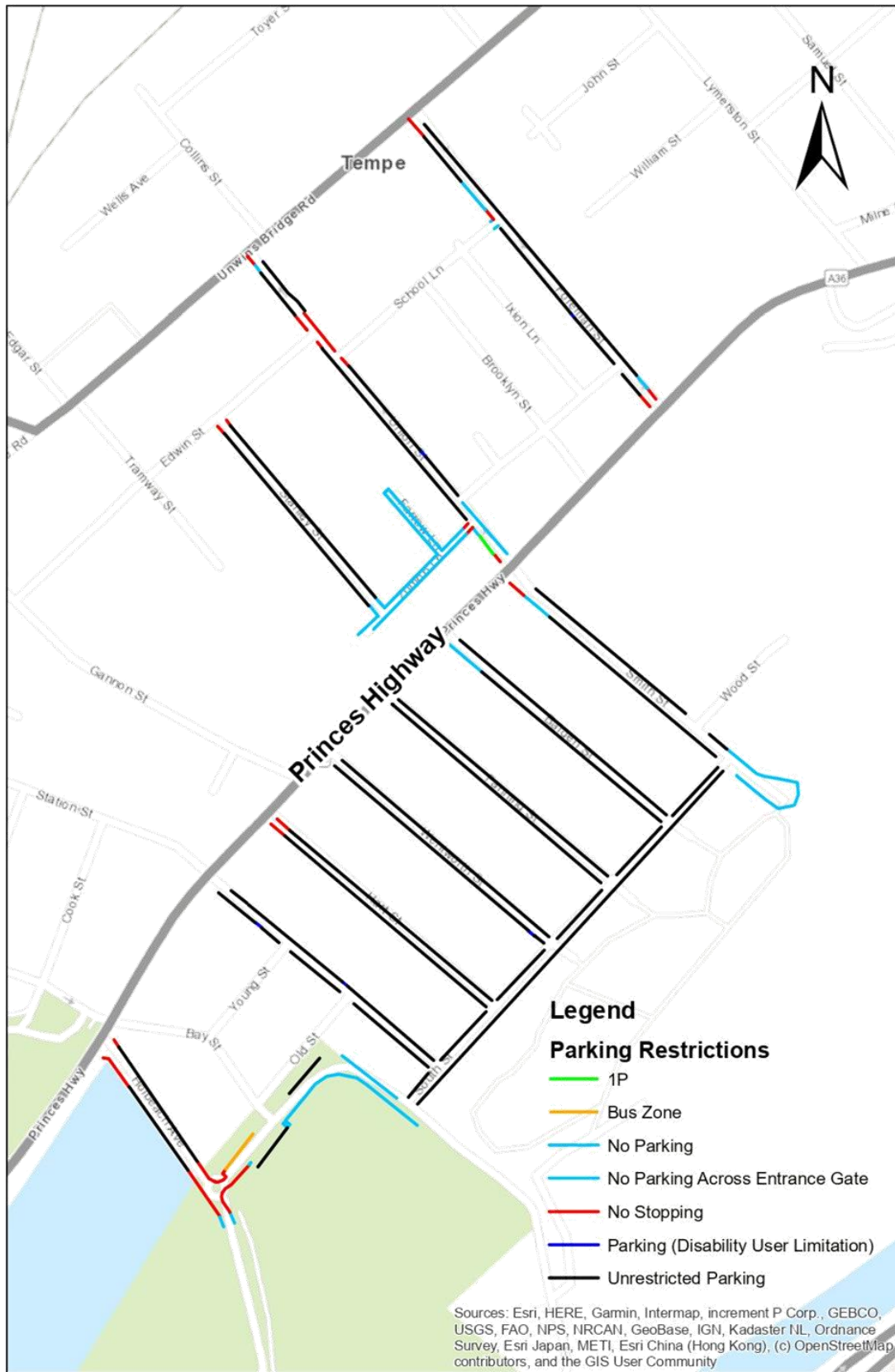
P4533 Tempe South LATM Study

Parking Signs - Site Audit

Number	Street	Direction of Traffic	Condition	Restrictions	Time_1	Day_1	Time_2	Day_2	Direction of Arrow	Obstruction	Sign Code	x	y	Other
001	Barden Street	Northbound	Faded	No Parking					Right		R5-40 (LR)	151 162	-33 9242	
001	Farrow Lane	Northbound	Good	No Parking					Both		R5-40 (LR)	151 162	-33 9233	
101	Farrow Lane	Northbound	Good	No Parking					Both		R5-40 (LR)	151 162	-33 9233	
102	Farrow Lane	Northbound	Good	No Parking					Both		R5-40 (LR)	151 162	-33 9231	
104	Farrow Lane	Southbound	Good	No Parking					Right		R5-40 (R)	151 161	-33 9229	
103	Farrow Lane	Northbound	Good	No Parking					Both		R5-40 (LR)	151 161	-33 9223	
001	Foreman Street	Southbound	Good	No Stopping					Left		R5-400 (L)	151 164	-33 9221	
002	Foreman Street	Southbound	Good	No Stopping					Right		R5-400 (R)	151 164	-33 9221	
003	Foreman Street	Southbound	Good	No Parking					Left		R5-40 (L)	151 164	-33 9221	
004	Foreman Street	Southbound	Good	No Parking					Right		R5-40 (R)	151 164	-33 9221	
005	Foreman Street	Southbound	Good	Parking (Disability User Limitation)					Right		R5-1-3 (R)	151 163	-33 9215	
006	Foreman Street	Southbound	Good	Parking (Disability User Limitation)					Left		R5-1-3 (L)	151 163	-33 9215	
008	Foreman Street	Southbound	Good	No Stopping					Left		R5-400 (L)	151 162	-33 9207	
009	Foreman Street	Southbound	Faded	No Parking	8am - 930am	School Days	230pm - 4pm	School Days	Right		R5-41 (R)	151 162	-33 9207	
010	Foreman Street	Southbound	Good	Drop-Off and Pick-up Only	8am - 930am	School Days	230pm - 4pm	School Days	Left		R5-41 (L)	151 162	-33 9207	Tag Plate
011	Foreman Street	Southbound	Faded	No Parking	8am - 930am	School Days	230pm - 4pm	School Days	Left		R5-41 (L)	151 162	-33 9205	Tag Plate
012	Foreman Street	Southbound	Good	Drop-Off and Pick-up Only	8am - 930am	School Days	230pm - 4pm	School Days	Left		R5-41 (L)	151 162	-33 9205	Tag Plate
013	Foreman Street	Southbound	Good	No Stopping					Right		R5-400 (R)	151 162	-33 9202	
001	Hart Street	Northbound	Good	No Stopping					Right		R5-400 (R)	151 16	-33 9255	
002	Hart Street	Southbound	Good	No Stopping					Left		R5-400 (L)	151 16	-33 9254	
003	Hart Street	Southbound	Good	No Stopping					Left		R5-400 (L)	151 16	-33 9254	Sign on wall
001	Holbeach Avenue	Southbound	Good	No Stopping					Left		R5-400 (L)	151 159	-33 927	
002	Holbeach Avenue	Southbound	Good	No Stopping					Left		R5-400 (L)	151 16	-33 9283	
003	Holbeach Avenue	Southbound	Good	No Parking					Right		R5-40 (R)	151 16	-33 9283	
004	Holbeach Avenue	Northbound	Good	No Parking					Left		R5-40 (L)	151 16	-33 9283	
005	Holbeach Avenue	Northbound	Good	No Stopping					Right		R5-400 (R)	151 16	-33 9283	
006	Holbeach Avenue	Southbound	Damaged	No Stopping					Right		R5-400 (R)	151 16	-33 9279	Signpost fallen
007	Holbeach Avenue	Northbound	Good	No Stopping					Left		R5-400 (L)	151 159	-33 928	
008	Holbeach Avenue	Northbound	Good	No Stopping					Right		R5-400 (R)	151 159	-33 9274	
019	Holbeach Avenue	Northbound	Good	No Parking					Both		R5-40 (LR)	151 161	-33 9276	
009	Holbeach Avenue	Eastbound	Good	No Stopping					Left		R5-400 (L)	151 16	-33 928	
010	Holbeach Avenue	Eastbound	Good	Bus Zone					Right		R5-20	151 16	-33 928	
011	Holbeach Avenue	Eastbound	Good	Bus Zone					Left		R5-20	151 16	-33 9277	
012	Holbeach Avenue	Westbound	Good	No Stopping					Right		R5-400 (R)	151 16	-33 9279	
013	Holbeach Avenue	Westbound	Good	No Parking					Left		R5-40 (L)	151 16	-33 9279	
014	Holbeach Avenue	Eastbound	Vandalised/Graffitied	No Parking Across Entrance Gate					Both		Custom	151 16	-33 9276	Located on Entrance Gate, No Arrows
015	Holbeach Avenue	Eastbound	Good	No Parking					Both		R5-40 (LR)	151 161	-33 9274	
016	Holbeach Avenue	Westbound	Good	No Parking					Both		R5-40 (LR)	151 161	-33 9273	
017	Holbeach Avenue	Westbound	Good	No Parking					Both		R5-40 (LR)	151 161	-33 9273	
018	Holbeach Avenue	Southbound	Good	No Parking					Both		R5-40 (LR)	151 161	-33 9274	
001	School Lane	Westbound	Good	No Parking					Left		R5-40 (L)	151 162	-33 9209	
002	School Lane	Eastbound	Good	No Parking					Right		R5-40 (R)	151 162	-33 9208	
001	Smith Street	Northbound	Good	No Parking					Left		R5-40 (L)	151 164	-33 925	
002	Smith Street	Northbound	Vandalised/Graffitied	No Parking					Both		R5-40 (LR)	151 165	-33 9252	
003	Smith Street	Southbound	Good	No Parking					Both		R5-40 (LR)	151 165	-33 925	
004	Smith Street	Southbound	Good	No Parking					Right		R5-40 (R)	151 164	-33 9248	
005	Smith Street	Northbound	Faded	No Parking					Right	Tree	R5-40 (R)	151 163	-33 9238	
007	Smith Street	Northbound	Faded	No Parking					Both		R5-40 (LR)	151 163	-33 9237	
008	Smith Street	Northbound	Faded	No Parking					Left		R5-40 (L)	151 162	-33 9236	
009	Smith Street	Northbound	Good	No Stopping					Right		R5-400 (R)	151 163	-33 9236	
001	Stanley Street	Northbound	Good	No Parking					Left		R5-40 (L)	151 161	-33 9237	
002	Stanley Street	Northbound	Good	No Stopping					Right		R5-400 (R)	151 16	-33 9224	
003	Stanley Street	Southbound	Good	No Stopping					Left		R5-400 (L)	151 16	-33 9224	
004	Stanley Street	Southbound	Vandalised/Graffitied	No Parking					Right		R5-40 (R)	151 161	-33 9237	
001	Station Street	Southbound	Good	Parking (Disability User Limitation)					Left		R5-1-3 (L)	151 161	-33 9266	
002	Station Street	Southbound	Good	Parking (Disability User Limitation)					Right		R5-1-3 (R)	151 161	-33 9266	
003	Station Street	Northbound	Good	Parking (Disability User Limitation)					Right		R5-1-3 (R)	151 16	-33 9261	
004	Station Street	Northbound	Good	Parking (Disability User Limitation)					Left		R5-1-3 (L)	151 16	-33 9261	
005	Station Street	Southbound	Good	No Parking (non-official)							Not an official sign	151 16	-33 926	Resident Parking Only Keep Driveway Clear
001	Union Street	Northbound	Vandalised/Graffitied	No Stopping					Left		R5-400 (L)	151 162	-33 9233	
002	Union Street	Northbound	Good	1P	830am - 6pm	Mon-Fri	830am - 1230pm	Sat	Right		R5-1-1 (R)	151 162	-33 9233	
003	Union Street	Northbound	Good	No Parking					Both		R5-40 (LR)	151 162	-33 9233	
004	Union Street	Northbound	Vandalised/Graffitied	No Parking					Both		R5-40 (LR)	151 162	-33 9231	
005	Union Street	Northbound	Good	1P	830am - 6pm	Mon-Fri	830am - 1230pm	Sat	Left		R5-1-1 (L)	151 162	-33 9232	
006	Union Street	Northbound	Faded	No Parking					Right		R5-40 (R)	151 162	-33 9232	
007	Union Street	Northbound	Damaged	No Parking					Both		R5-40 (LR)	151 162	-33 9231	
008	Union Street	Northbound	Faded	No Stopping					Right		R5-400 (R)	151 161	-33 9218	
009	Union Street	Northbound	Good	No Stopping					Left		R5-400 (L)	151 16	-33 9215	
010	Union Street	Northbound	Good	No Parking					Right		R5-40 (R)	151 16	-33 9212	
011	Union Street	Northbound	Good	No Parking					Left		R5-40 (L)	151 16	-33 9212	
012	Union Street	Northbound	Good	No Stopping					Right		R5-400 (R)	151 16	-33 9212	
013	Union Street	Northbound	Good	No Stopping					Right		R5-400 (R)	151 161	-33 9215	

Number	Street	Direction of Traffic	Condition	Restrictions	Time_1	Day_1	Time_2	Day_2	Direction of Arrow	Obstruction	Sign Code	x	y	Other
014	Union Street	Northbound	Good	No Stopping					Both		R5-400 (L,R)	151.161	-33.9217	
016	Union Street	Northbound	Good	No Stopping					Left		R5-400 (L)	151.161	-33.9219	
015	Union Street	Northbound	Good	No Stopping					Both		R5-400 (L,R)	151.161	-33.9218	
017	Union Street	Northbound	Good	Parking (Disability User Limitation)					Right		R5-1-3 (R)	151.162	-33.9225	
018	Union Street	Northbound	Faded	Parking (Disability User Limitation)					Left		R5-1-3 (L)	151.162	-33.9226	
001	Wentworth Street	Northbound	Good	Parking (Disability User Limitation)					Right		R5-1-3 (R)	151.163	-33.9262	
002	Wentworth Street	Northbound	Good	Parking (Disability User Limitation)					Left		R5-1-3 (L)	151.163	-33.9262	
001	Zutition Lane	Eastbound	Good	No Stopping					Right		R5-400 (R)	151.162	-33.9232	
002	Zutition Lane	Eastbound	Good	No Parking					Left		R5-40 (L)	151.162	-33.9232	
003	Zutition Lane	Westbound	Faded	No Stopping					Left		R5-400 (L)	151.162	-33.9232	
004	Zutition Lane	Westbound	Faded	No Parking					Right		R5-40 (R)	151.162	-33.9232	
005	Zutition Lane	Westbound	Faded	No Parking					Both		R5-40 (LR)	151.162	-33.9234	
006	Zutition Lane	Eastbound	Good	No Parking					Both		R5-40 (LR)	151.161	-33.9235	
007	Zutition Lane	Westbound	Good	No Parking					Both		R5-40 (LR)	151.162	-33.9236	
008	Zutition Lane	Eastbound	Good	No Parking					Both		R5-40 (LR)	151.161	-33.9236	
009	Zutition Lane	Eastbound	Good	No Parking					Both		R5-40 (LR)	151.161	-33.9239	
010	Zutition Lane	Westbound	Good	No Parking					Left		R5-40 (L)	151.161	-33.9239	Sign on wall





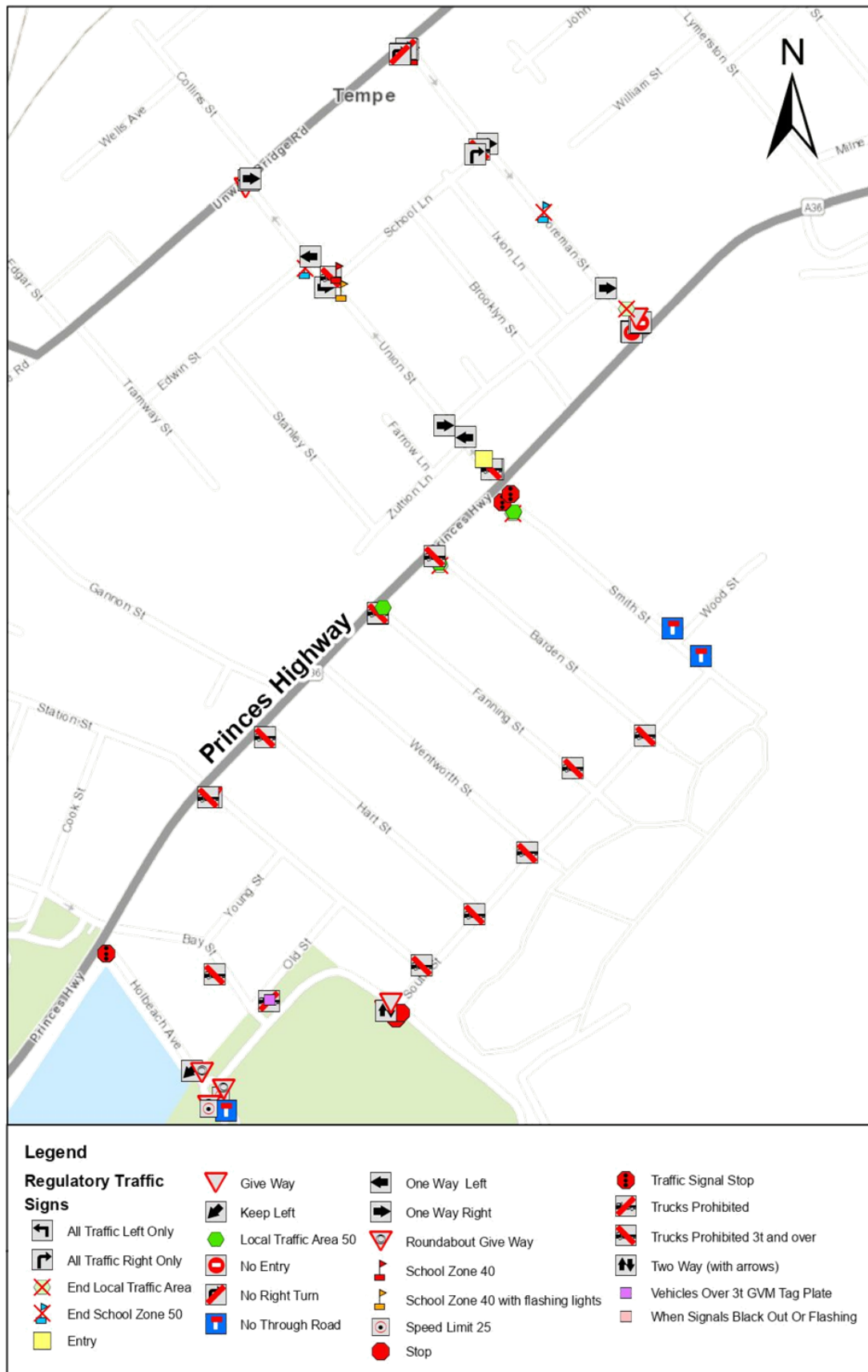
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Traffic Signs - Site Audit

Street	Sign	Direction	Condition	Obstruction	Code	x	y	Comments
Barden Street	Trucks Prohibited 3t and over	Northbound	Good		R6-222	151.164	-33.925	
Barden Street	End Local Traffic Area	Northbound	Vandalised/Graffitied		R4-241	151.162	-33.924	
Barden Street	Local Traffic Area 50	Southbound	Vandalised/Graffitied		R4-240 (50 km/h)	151.162	-33.924	
Barden Street	Trucks Prohibited 3t and over	Southbound	Vandalised/Graffitied		R6-222	151.162	-33.924	
Bay Street	Trucks Prohibited 3t and over	Northbound	Good		R6-222	151.160	-33.927	
Brooklyn Lane	One Way Right	Eastbound	Faded		R2-2 (R)	151.163	-33.922	At Foreman Street
Brooklyn Lane	One Way Right	Westbound	Vandalised/Graffitied		R2-2 (R)	151.162	-33.923	At Union Street
Edwin Street	Speed Hump	Eastbound	Good		W5-10	151.160	-33.922	
Edwin Street	15 km/h Tag Plate	Eastbound	Vandalised/Graffitied		W8-2	151.160	-33.922	
Edwin Street	Speed Hump Ahead	Westbound	Good		W3-4	151.161	-33.922	
Edwin Street	End School Zone 50	Westbound	Good		R4-231	151.161	-33.922	
Edwin Street	One Way Left	Eastbound	Good		R2-2 (L)	151.161	-33.922	At Union Street
Edwin Street	Pedestrian Crossing Left	Eastbound	Good		W6-2-1	151.161	-33.922	
Fanning Street	Trucks Prohibited 3t and over	Northbound	Good		R6-222	151.163	-33.926	
Fanning Street	All Traffic Left Only	Northbound	Good		R2-14	151.161	-33.924	
Fanning Street	Trucks Prohibited 3t and over	Southbound	Good		R6-222	151.161	-33.924	
Fanning Street	Local Traffic Area 50	Southbound	Faded		R4-240 (50 km/h)	151.161	-33.924	
Foreman Street	No Entry	Northbound	Good		R2-4n	151.164	-33.922	
Foreman Street	No Entry	Northbound	Good		R2-4n	151.164	-33.922	
Foreman Street	Give Way	Southbound	Good		R1-2	151.164	-33.922	
Foreman Street	Hazard Warning Marker	Southbound	Vandalised/Graffitied		T5-5	151.164	-33.922	
Foreman Street	Hazard Warning Marker	Southbound	Vandalised/Graffitied		T5-5	151.164	-33.922	
Foreman Street	End Local Traffic Area	Southbound	Good		R4-241	151.164	-33.922	
Foreman Street	Speed Hump	Southbound	Good		W5-10	151.163	-33.922	
Foreman Street	15 km/h Tag Plate	Southbound	Good		W8-2	151.163	-33.922	
Foreman Street	End School Zone 50	Southbound	Good		R4-231	151.163	-33.921	Sign facing perpendicular to road
Foreman Street	Speed Hump	Southbound	Faded		W5-10	151.163	-33.921	
Foreman Street	15 km/h Tag Plate	Southbound	Faded		W8-2	151.163	-33.921	
Foreman Street	Speed Hump	Southbound	Good		W5-10	151.162	-33.920	
Foreman Street	15 km/h Tag Plate	Southbound	Good		W8-2	151.162	-33.920	Sign loose/slanted
Foreman Street	Speed Hump Ahead	Southbound	Damaged		W3-4	151.162	-33.920	
Foreman Street	School Zone 40	Southbound	Good		R4-230	151.162	-33.920	Signpost bent
Foreman Street	Speed Hump	Southbound	Good		W5-10	151.162	-33.920	
Foreman Street	25 km/h Tag Plate	Southbound	Good		W8-2	151.162	-33.920	
Foreman Street	Speed Hump	Southbound	Good		W5-10	151.161	-33.920	
Foreman Street	25 km/h Tag Plate	Southbound	Good		W8-2	151.161	-33.920	
Foreman Street	Trucks Prohibited 3t and over	Southbound	Good		R6-222	151.161	-33.920	
Hart Street	Trucks Prohibited 3t and over	Southbound	Damaged		R6-222	151.160	-33.925	
Hart Street	Trucks Prohibited 3t and over	Northbound	Good		R6-222	151.162	-33.927	
Holbeach Avenue	Roundabout Warning	Southbound	Good		W2-7	151.159	-33.927	
Holbeach Avenue	Pedestrian Warning	Southbound	Good		W6-1	151.159	-33.927	Pairs with "Refuse Island" Tag Plate
Holbeach Avenue	Refuge Island Tag Plate	Southbound	Good		W8-211	151.159	-33.928	Pairs with "Pedestrian" Warning Symbol Sign
Holbeach Avenue	Keep Left	Southbound	Good		R2-3	151.160	-33.928	On Pedestrian Refuge
Holbeach Avenue	Roundabout Give Way	Southbound	Good		R1-13	151.160	-33.928	
Holbeach Avenue	Speed Limit 25	Southbound	Good		R4-1	151.160	-33.928	
Holbeach Avenue	Roundabout Give Way	Northbound	Good		R1-13	151.160	-33.928	
Holbeach Avenue	No Through Road	Southbound	Good		G9-18	151.160	-33.928	
Holbeach Avenue	Hazard Warning Marker	Northbound	Vandalised/Graffitied		T5-5	151.160	-33.928	
Holbeach Avenue	Speed Limit 25	Southbound	Good	Tree	R4-1	151.160	-33.928	
Holbeach Avenue	Traffic Signal Stop	Northbound	Good		R1-4n	151.159	-33.927	
Holbeach Avenue	Stop	Northbound	Good		R1-1	151.161	-33.928	
Holbeach Avenue	Stop	Northbound	Good		R1-1	151.161	-33.928	
Holbeach Avenue	Roundabout Give Way	Westbound	Good		R1-13	151.160	-33.928	
Holbeach Avenue	Roundabout Warning	Westbound	Good		W2-7	151.161	-33.927	
Holbeach Avenue	Give Way	Southbound	Faded		R1-2	151.161	-33.928	
Holbeach Avenue	Two Way (with arrows)	Northbound	Good		R2-223	151.161	-33.928	
Holbeach Avenue	Give Way	Southbound	Good		R1-2	151.161	-33.927	Signpost slanted

Street	Sign	Direction	Condition	Obstruction	Code	x	y	Comments
Old Street	Trucks Prohibited	Eastbound	Good		R6-10-2	151.160	-33.927	Pairs with "Vehicles over 3t GVM" Sign
Old Street	Vehicles Over 3t GVM Tag Plate	Eastbound	Good	"Trucks Prohibited" Sign	R9-221	151.160	-33.927	Pairs with "Trucks Prohibited" Sign
Princes Highway	One Way Left	Eastbound	Faded		R2-2 (L)	151.162	-33.923	At Union Street
Princes Highway	One Way Left	Westbound	Good		R2-2 (L)	151.164	-33.922	At Foreman Street
Princes Highway	One Way Right	Eastbound	Vandalised/Graffitied		R2-2 (R)	151.164	-33.922	At Foreman Street
School Lane	One Way Right	Westbound	Good		R2-2 (R)	151.161	-33.922	At Union Street, signpost slanted
School Lane	One Way Right	Eastbound	Good		R2-2 (R)	151.162	-33.921	At Foreman Street
School Lane	Trucks Prohibited 3t and over	Westbound	Good		R6-222	151.162	-33.921	
School Lane	School Zone 40	Westbound	Faded		R4-230	151.162	-33.921	
School Lane	All Traffic Right Only	Eastbound	Vandalised/Graffitied		R2-14	151.162	-33.921	
School Lane	Trucks Prohibited 3t and over	Eastbound	Good		R6-222	151.161	-33.922	
School Lane	School Zone 40	Eastbound	Good	Obstructed by trees	R4-230	151.161	-33.922	
Smith Street	No Through Road	Southbound	Good		G9-18	151.164	-33.925	
Smith Street	End Local Traffic Area	Northbound	Good		R4-241	151.163	-33.924	
Smith Street	Local Traffic Area 50	Southbound	Vandalised/Graffitied		R4-240 (50 km/h)	151.163	-33.924	
Smith Street	Traffic Signal Stop	Northbound	Good		R1-4n	151.162	-33.924	
Smith Street	Traffic Signal Stop	Northbound	Good		R1-4n	151.162	-33.923	Pairs with "When Signals Black Out Or Flashing" Sign
Smith Street	When Signals Black Out Or Flashing Tag Plate	Northbound	Good		R9-201	151.162	-33.923	Pairs with Traffic Signal Stop Sign
South Street	Speed Hump Ahead	Eastbound	Good		W3-4	151.161	-33.927	
South Street	10 km/h Tag Plate	Eastbound	Good		W8-2	151.162	-33.927	Attached high up on an electric pole
South Street	Speed Hump	Westbound	Good		W5-10	151.162	-33.927	
South Street	15 km/h Tag Plate	Westbound	Good		W8-2	151.162	-33.927	
South Street	Speed Hump Ahead	Eastbound	Good		W3-4	151.162	-33.926	
South Street	Speed Hump	Eastbound	Good		W5-10	151.163	-33.926	
South Street	15 km/h Tag Plate	Eastbound	Good		W8-2	151.163	-33.926	
South Street	Speed Hump	Westbound	Good	Tree	W5-10	151.163	-33.926	
South Street	15 km/h Tag Plate	Westbound	Good	Tree	W8-2	151.163	-33.926	
South Street	Speed Hump	Eastbound	Faded		W5-10	151.164	-33.925	
South Street	15 km/h Tag Plate	Eastbound	Faded		W8-2	151.164	-33.925	
South Street	Speed Hump	Westbound	Faded		W5-10	151.164	-33.925	Also slightly bent
South Street	15 km/h Tag Plate	Westbound	Faded		W8-2	151.164	-33.925	
South Street	Speed Hump Ahead	Westbound	Vandalised/Graffitied		W3-4	151.164	-33.925	
Station Street	Trucks Prohibited 3t and over	Northbound	Faded		R6-222	151.162	-33.927	
Station Street	All Traffic Left Only	Northbound	Good		R2-14	151.160	-33.926	
Station Street	Give Way	Northbound	Damaged	All Traffic Left Only' sign	R1-2	151.160	-33.926	
Station Street	Trucks Prohibited 3t and over	Southbound	Vandalised/Graffitied		R6-222	151.160	-33.926	

Street	Sign	Direction	Condition	Obstruction	Code	x	y	Comments
Union Street	Trucks Prohibited 3t and over	Northbound	Good		R6-222	151.162	-33.923	
Union Street	Entry	Northbound	Vandalised/Graffitied		Custom	151.162	-33.923	Into Private Property (No. 669 Princes Highway), Sign on wall
Union Street	Speed Hump	Northbound	Good	Tree	W5-10	151.162	-33.923	
Union Street	15 km/h Tag Plate	Northbound	Faded		W8-2	151.162	-33.923	
Union Street	Children Crossing	Northbound	Damaged		W6-3	151.162	-33.923	Pairs with "School" Warning Sign
Union Street	School Tag Plate	Northbound	Damaged		W8-14	151.162	-33.923	Pairs with "Children Crossing" Symbol Sign
Union Street	Pedestrian Crossing Ahead	Northbound	Good		W6-2	151.161	-33.922	
Union Street	Pedestrian Crossing Ahead	Northbound	Good		W6-2	151.161	-33.922	
Union Street	Speed Hump Ahead	Northbound	Good		W3-4	151.161	-33.922	
Union Street	Hazard Warning Marker	Northbound	Good		T5-5	151.161	-33.922	
Union Street	Hazard Warning Marker	Northbound	Vandalised/Graffitied		T5-5	151.161	-33.922	
Union Street	Speed Hump	Northbound	Good		W5-10	151.161	-33.922	
Union Street	25 km/h Tag Plate	Northbound	Good		W8-2	151.161	-33.922	
Union Street	Pedestrian Crossing	Southbound	Good		R3-1	151.161	-33.922	Facing the wrong way (facing north)
Union Street	Hazard Warning Marker	Northbound	Good		T5-5	151.160	-33.921	
Union Street	Speed Hump	Northbound	Good		W5-10	151.160	-33.921	
Union Street	Pedestrian Warning	Northbound	Good		W6-1	151.160	-33.921	
Union Street	10 km/h Tag Plate	Northbound	Good		W8-2	151.160	-33.921	
Union Street	Give Way	Northbound	Good		R1-2	151.160	-33.921	
Union Street	Hazard Warning Marker	Northbound	Good		T5-5	151.160	-33.921	
Union Street	Speed Hump	Northbound	Good		W5-10	151.160	-33.921	
Union Street	Pedestrian Warning	Northbound	Good		W6-1	151.160	-33.921	
Union Street	10 km/h Tag Plate	Northbound	Good		W8-2	151.160	-33.921	
Union Street	Pedestrian Crossing	Northbound	Good		R3-1	151.161	-33.922	
Union Street	Speed Hump	Northbound	Good		W5-10	151.161	-33.922	
Union Street	25 km/h Tag Plate	Northbound	Vandalised/Graffitied		W8-2	151.161	-33.922	
Union Street	Hazard Warning Marker	Northbound	Good		T5-5	151.161	-33.922	
Union Street	School Zone 40 with flashing lights	Northbound	Good		R4-230-1	151.161	-33.922	
Unwins Bridge Road	One Way Left	Eastbound	Good		R2-2 (L)	151.160	-33.921	At Union Street
Unwins Bridge Road	One Way Right	Westbound	Faded		R2-2 (R)	151.160	-33.921	At Union Street
Unwins Bridge Road	One Way Right	Eastbound	Good		R2-2 (R)	151.162	-33.920	At Foreman Street
Unwins Bridge Road	No Right Turn	Eastbound	Good		R2-6	151.162	-33.920	
Unwins Bridge Road	One Way Left	Westbound	Good		R2-2 (L)	151.161	-33.920	At Foreman Street
Unwins Bridge Road	No Right Turn	Eastbound	Good		R2-6	151.161	-33.920	
Wentworth Street	Trucks Prohibited 3t and over	Northbound	Faded		R6-222	151.163	-33.926	
Wood Street	No Through Road	Eastbound	Good		G9-18	151.164	-33.925	
Zutton Lane	One Way Left	Eastbound	Good		R2-2 (L)	151.162	-33.923	At Union Street

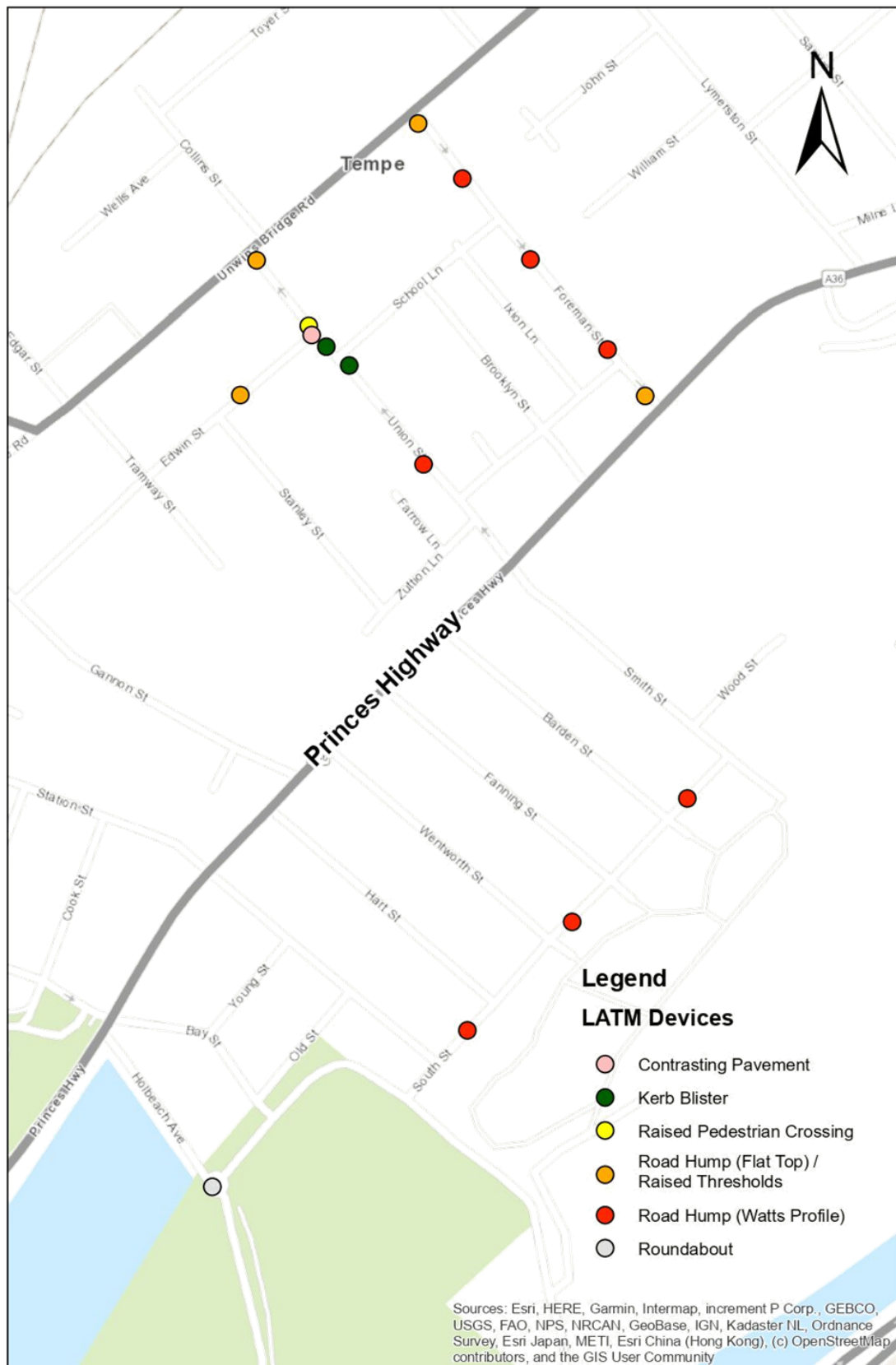




P4533 Tempe South LATM Study

LATM Devices - Site Audit

Type	Street	Comments	x	y
Road Hump (Flat Top)	Edwin Street	On Edwin Street east of Stanley Street	151.16	-33.9221
Contrasting Pavement	Edwin Street	Contrasting Pavement	151.161	-33.9217
Road Hump (Flat Top)	Foreman Street	With kerb blisters and contrasting pavement	151.164	-33.9221
Road Hump (Watts Profile)	Foreman Street	Parking over hump	151.163	-33.9218
Road Hump (Watts Profile)	Foreman Street	Parking over hump	151.163	-33.9211
Road Hump (Watts Profile)	Foreman Street	Parking over hump	151.162	-33.9205
Road Hump (Flat Top)	Foreman Street	With kerb blisters and contrasting pavement	151.162	-33.9201
Roundabout	Holbeach Avenue	With kerb blister at Holbeach Avenue northbound approach	151.16	-33.9281
Road Hump (Watts Profile)	South Street	Parking over hump	151.162	-33.927
Road Hump (Watts Profile)	South Street	Faded line marking	151.163	-33.9261
Road Hump (Watts Profile)	South Street	Parking over hump	151.164	-33.9252
Road Hump (Watts Profile)	Union Street	Parking over hump	151.162	-33.9227
Kerb Blister	Union Street	A pair of kerb blisters with contrasting pavement	151.161	-33.9218
Raised Pedestrian Crossing	Union Street	Also recorded as Ped facility	151.161	-33.9216
Road Hump (Flat Top)	Union Street	With kerb blisters	151.16	-33.9211
Kerb Blister	Union Street	Only one at eastern Side of Union Street	151.161	-33.9219



P4533 Tempe South LATM Study

Pedestrian Facilities - Site Audit

Street	Type	Comments	Objectid	x	y
Barden Street	Kerb Ramp		13	151.162	-33.924
Collins Street	Pedestrian Refuge		41	151.16	-33.9209
Collins Street	Kerb Ramp		42	151.16	-33.921
Collins Street	Kerb Ramp		49	151.16	-33.9209
Edwin Street	Kerb Ramp		29	151.161	-33.9217
Edwin Street	Kerb Ramp		31	151.161	-33.9217
Fanning Street	Kerb Ramp		11	151.161	-33.9244
Foreman Street	Kerb Ramp		32	151.164	-33.9222
Foreman Street	Kerb Ramp		38	151.161	-33.9201
Foreman Street	Kerb Ramp		50	151.162	-33.92
Foreman Street	Kerb Ramp		51	151.164	-33.9222
Hart Street	Kerb Ramp		23	151.16	-33.9253
Hart Street	Kerb Ramp		24	151.16	-33.9254
Hart Street	Kerb Ramp	No footpath connectivity from northern side of South Street	27	151.162	-33.9268
Hart Street	Kerb Ramp	No footpath connectivity onto northern side of South Street	28	151.162	-33.9267
Holbeach Avenue	Signalised Pedestrian Crossing		2	151.159	-33.927
Holbeach Avenue	Pedestrian Refuge	In conjunction with Roundabout	3	151.16	-33.928
Holbeach Avenue	Kerb Ramp		6	151.16	-33.9281
Holbeach Avenue	Kerb Ramp		7	151.16	-33.9281
Holbeach Avenue	Kerb Ramp		8	151.16	-33.928
Holbeach Avenue	Kerb Ramp	Stormwater drain located on kerb ramp	9	151.16	-33.9281
Holbeach Avenue	Kerb Ramp	No footpath western side of Holbeach Avenue	10	151.16	-33.928
Holbeach Avenue	Kerb Ramp		52	151.159	-33.927
Holbeach Avenue	Kerb Ramp		53	151.159	-33.927
Princes Highway	Signalised Pedestrian Crossing		4	151.159	-33.927
Princes Highway	Signalised Pedestrian Crossing		12	151.161	-33.9243
Princes Highway	Signalised Pedestrian Crossing		18	151.162	-33.9235
Princes Highway	Kerb Ramp		22	151.162	-33.9235
Princes Highway	Signalised Pedestrian Crossing		25	151.162	-33.9234
Princes Highway	Kerb Ramp		26	151.163	-33.9234
Princes Highway	Kerb Ramp		47	151.162	-33.9233
Princes Highway	Kerb Ramp		48	151.162	-33.9234
Princes Highway	Kerb Ramp		54	151.159	-33.927
Smith Street	Signalised Pedestrian Crossing		20	151.162	-33.9235
Smith Street	Kerb Ramp		21	151.162	-33.9235

Street	Type	Comments	Objectid	x	y
Smith Street	Kerb Ramp		45	151.162	-33.9235
South Street	Kerb Ramp	Only connectivity to southern side of South Street	30	151.162	-33.9272
Stanley Street	Kerb Ramp	no connectivity to Eastern Side	14	151.16	-33.9224
Union Street	Signalised Pedestrian Crossing		5	151.162	-33.9233
Union Street	Pedestrian Crossing	Raised. Also recorded as LATM	34	151.161	-33.9216
Union Street	Kerb Ramp		37	151.161	-33.9218
Union Street	Kerb Ramp		39	151.161	-33.9218
Union Street	Continuous Footpath	Corresponding road hump recorded as LATM	43	151.16	-33.9211
Union Street	Kerb Ramp		44	151.162	-33.9234
Union Street	Kerb Ramp		46	151.162	-33.9233
Unwins Bridge Road	Signalised Pedestrian Crossing	With pedestrian fencing	40	151.161	-33.9204
Wentworth Street	Kerb Ramp	No connectivity	33	151.163	-33.9263
Wentworth Street	Kerb Ramp		35	151.161	-33.9249
Wentworth Street	Kerb Ramp		36	151.161	-33.9249
Zutton Lane	Kerb Ramp	No connectivity to other side as there are no footpaths on Zutton Lane	16	151.161	-33.9237
Zutton Lane	Kerb Ramp		17	151.162	-33.9231
Zutton Lane	Kerb Ramp		19	151.162	-33.9231

P4533 Tempe South LATM Study

Cycling Facilities - Site Audit

Type	Street	Comments	x	y
Route Wayfinding	Holbeach Avenue	"Route L13 Sydenham Green"	151.159	-33.927
Shared Path	Holbeach Avenue	Princes Highway to Roundabout western side, sticker on southbound sign	151.159	-33.9276
Bike On Ramp	Holbeach Avenue	Connects to Shared Path for bikes northbound	151.159	-33.9273
Route Wayfinding	Holbeach Avenue	Left Arrow	151.16	-33.9281
Route Wayfinding	Holbeach Avenue	Left Arrow	151.161	-33.9276
Route Wayfinding	Holbeach Avenue	Right Arrow	151.16	-33.9281
Signalised Shared Crossing	Princes Highway		151.162	-33.9234
Cycle Direction	Smith Street	"Use Path", onto path at Princes Highway, shared crossing	151.162	-33.9236
Signalised Shared Crossing	Smith Street		151.162	-33.9235
Bicycle Symbol Linemarking	South Street	Faded	151.161	-33.9274
Route Wayfinding	South Street	Left Arrow and Right Arrow	151.164	-33.925

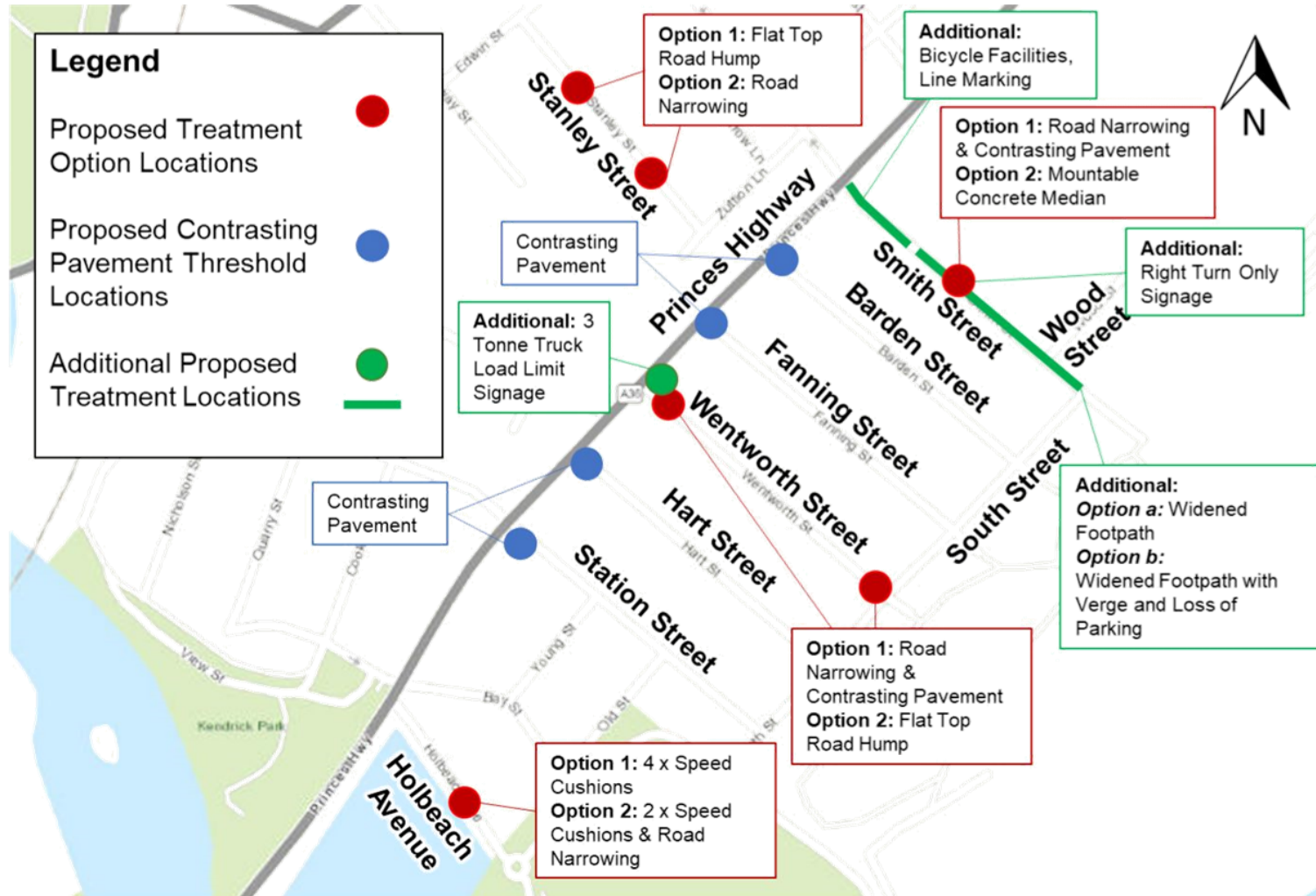


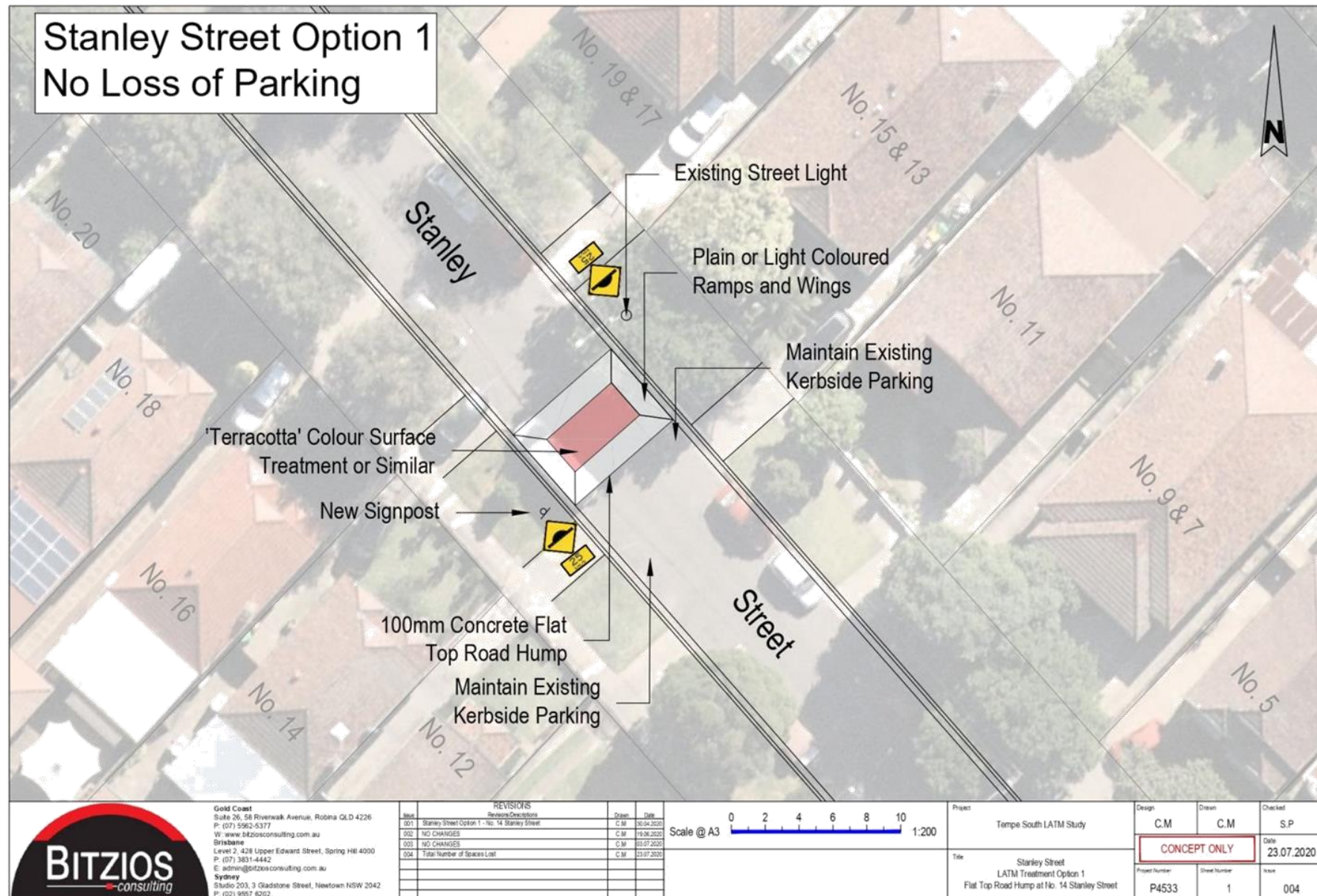


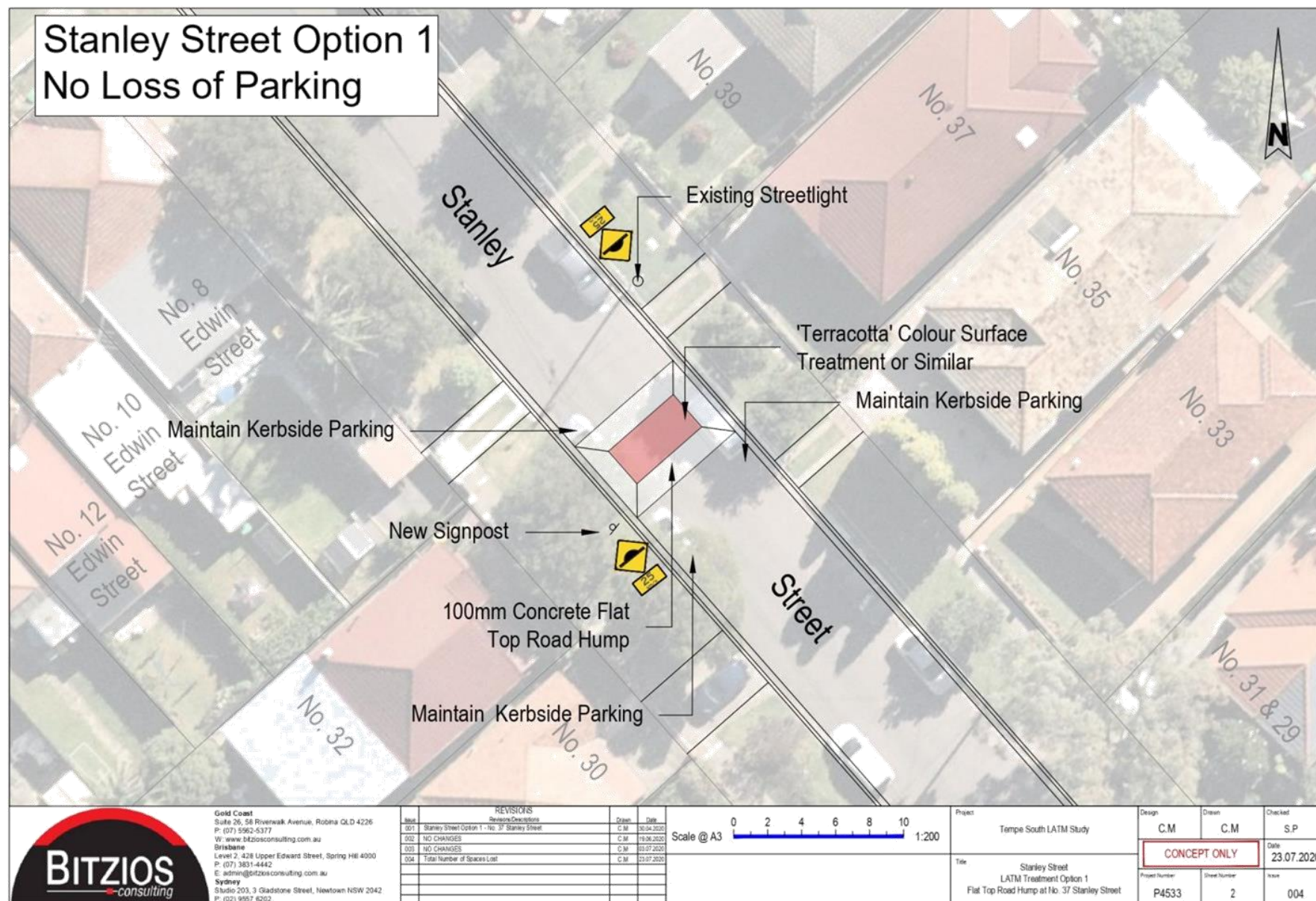
Appendix D: LATM Treatment Concept Designs

Item 5

Attachment 1

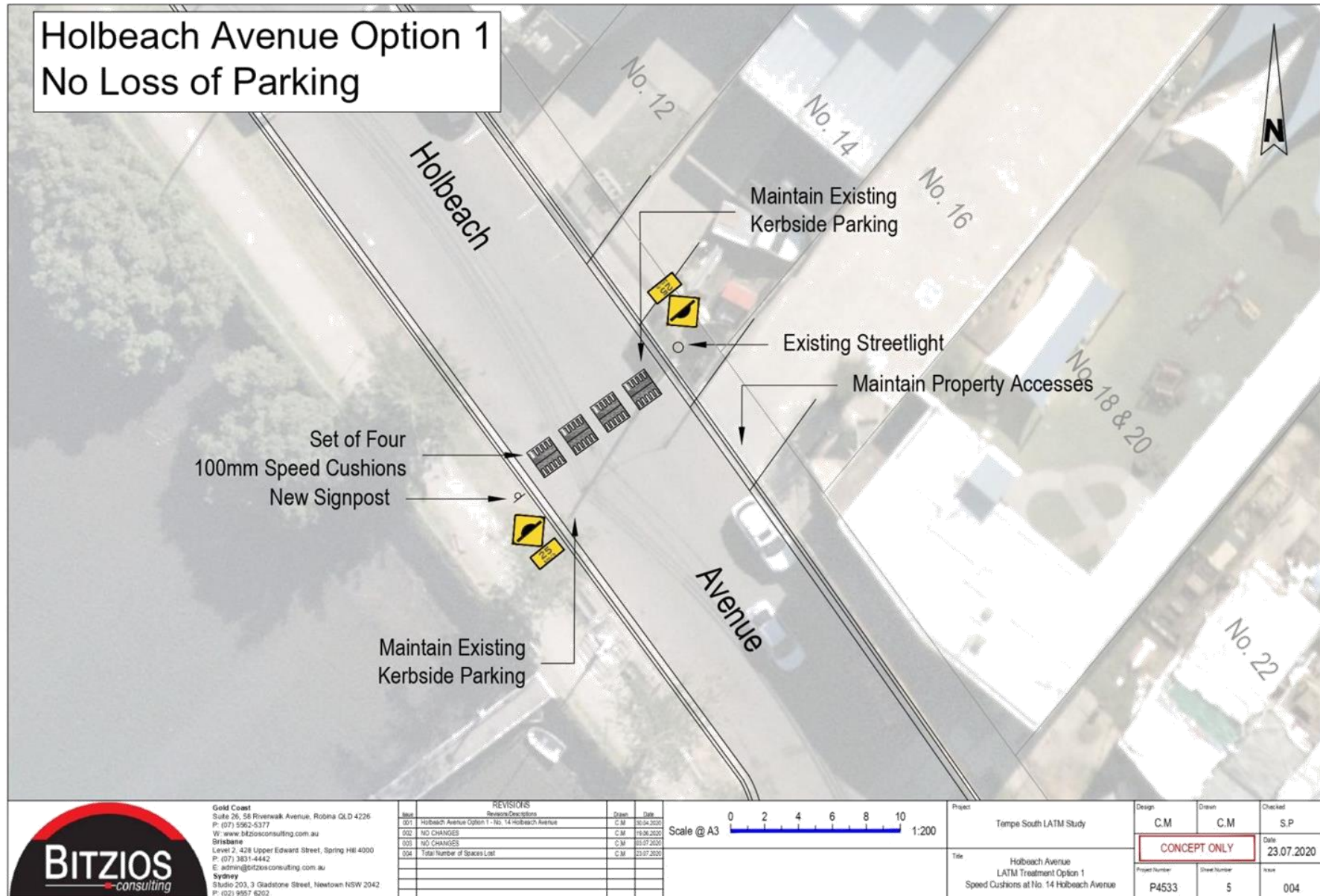


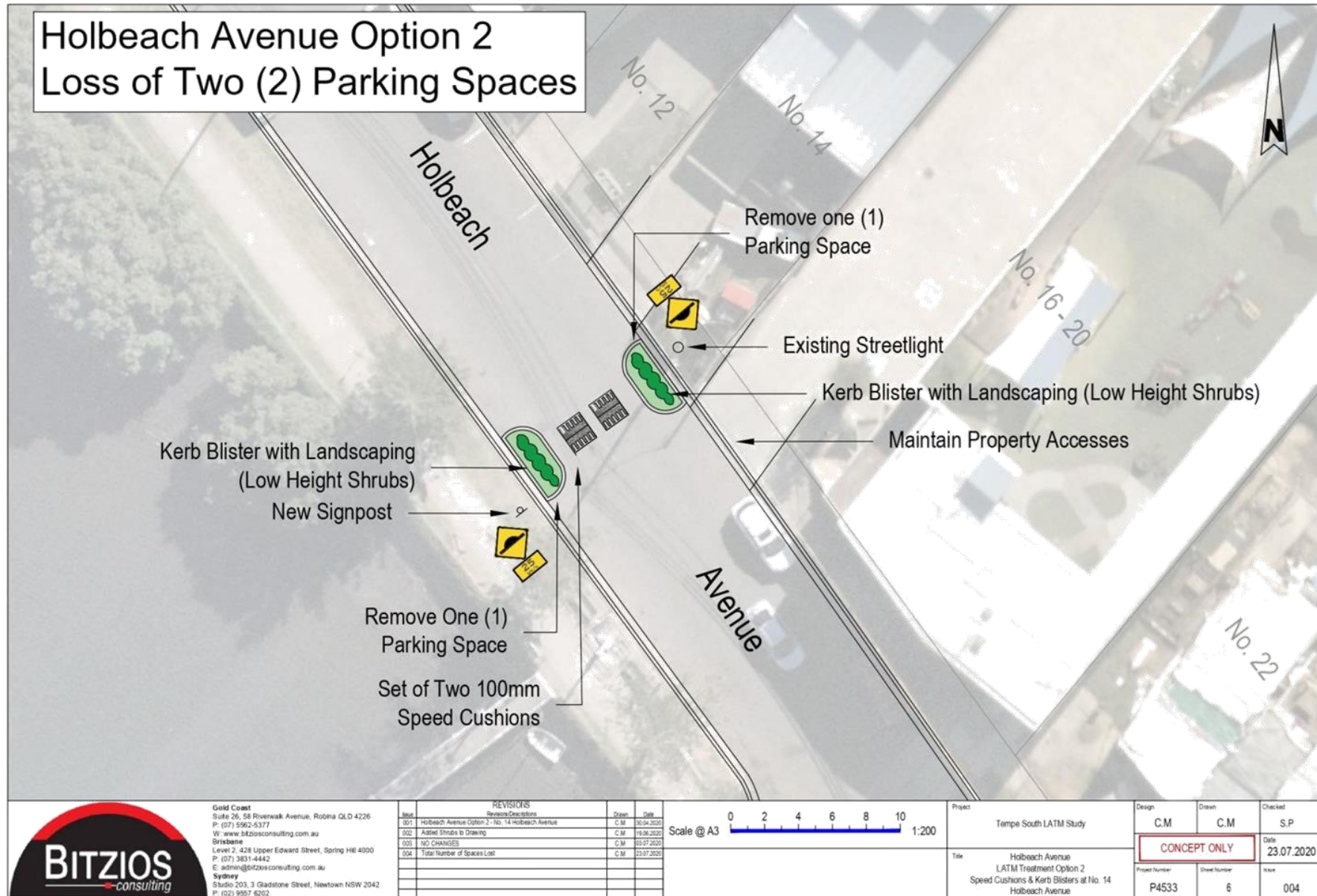


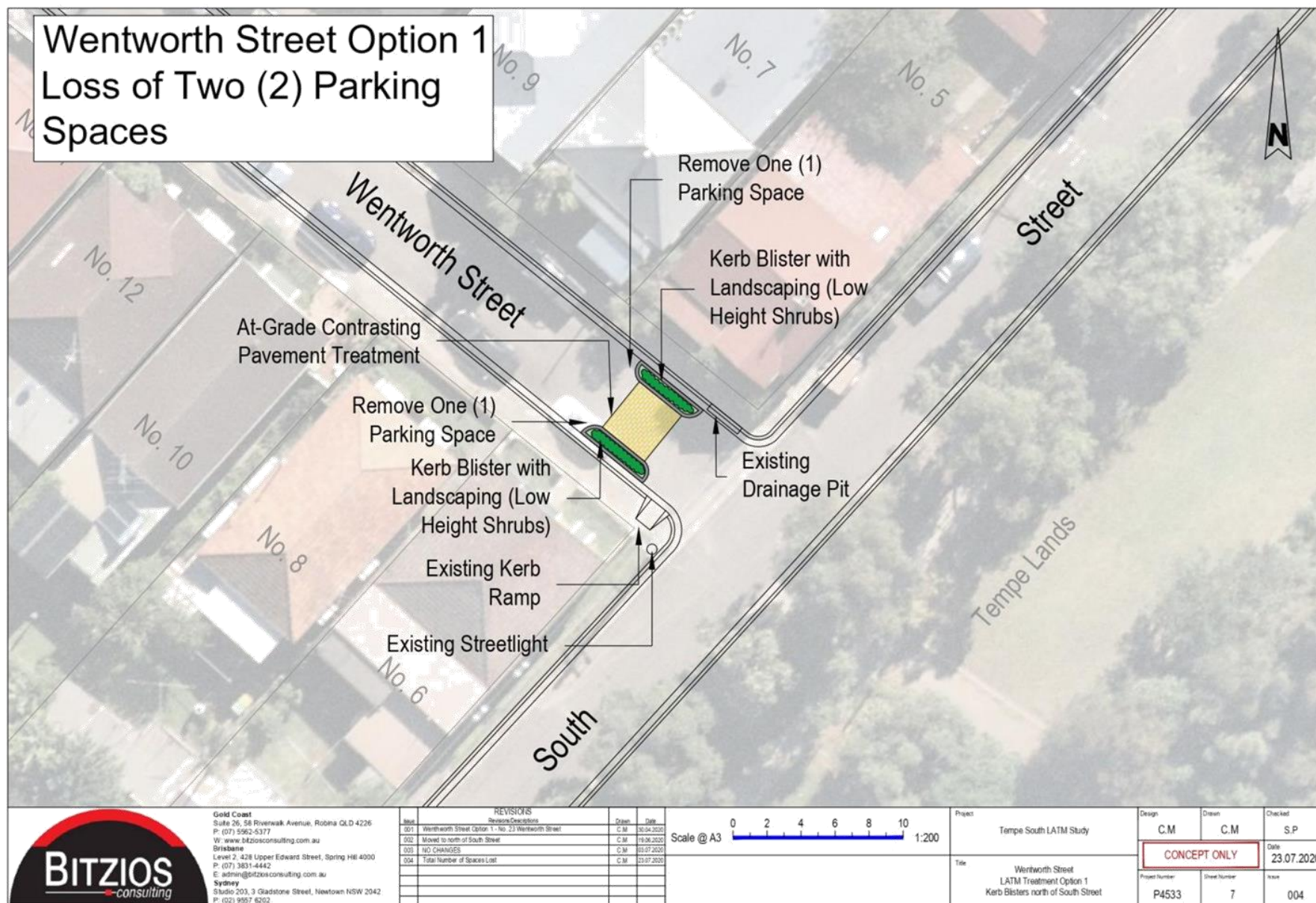




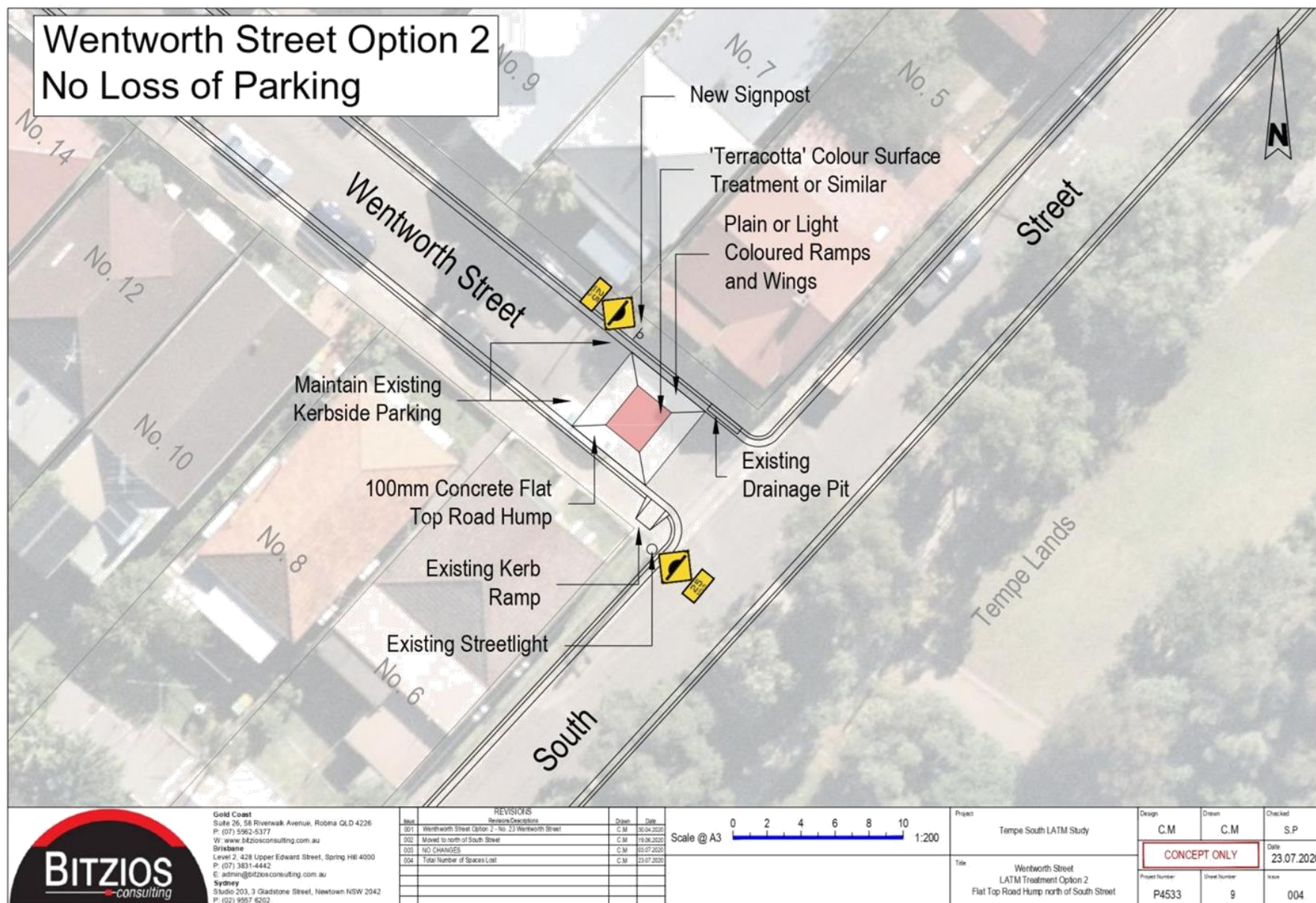


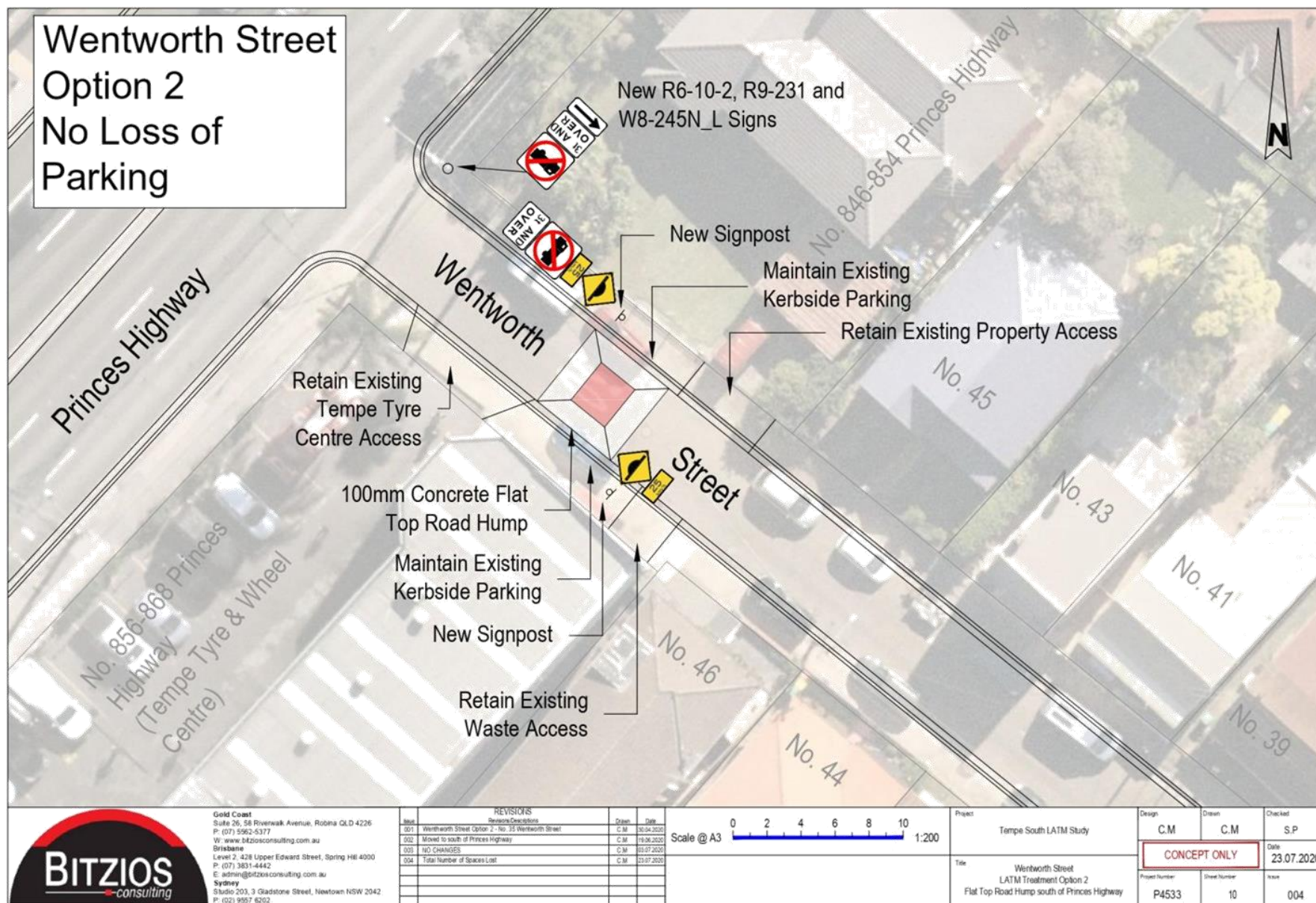


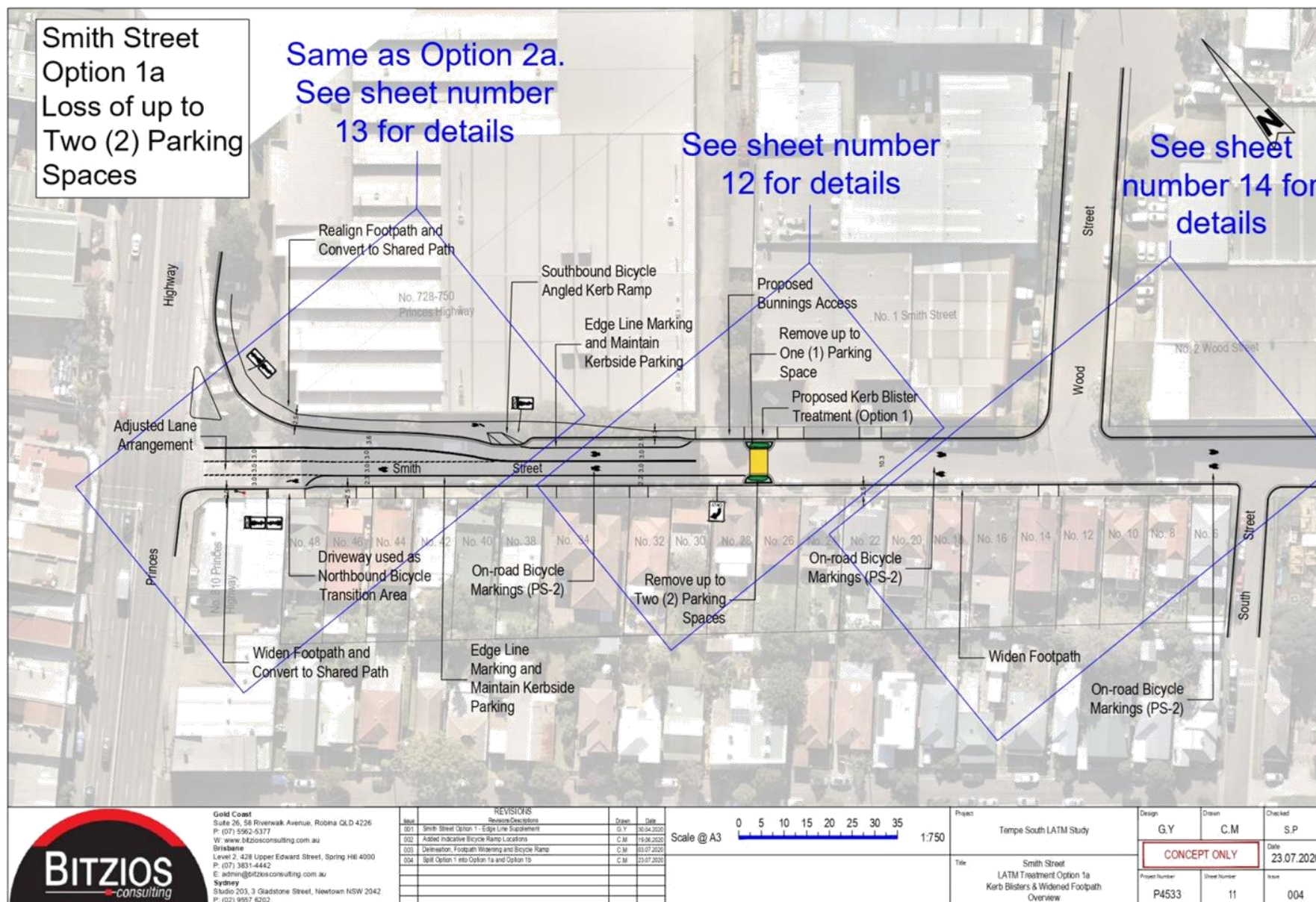


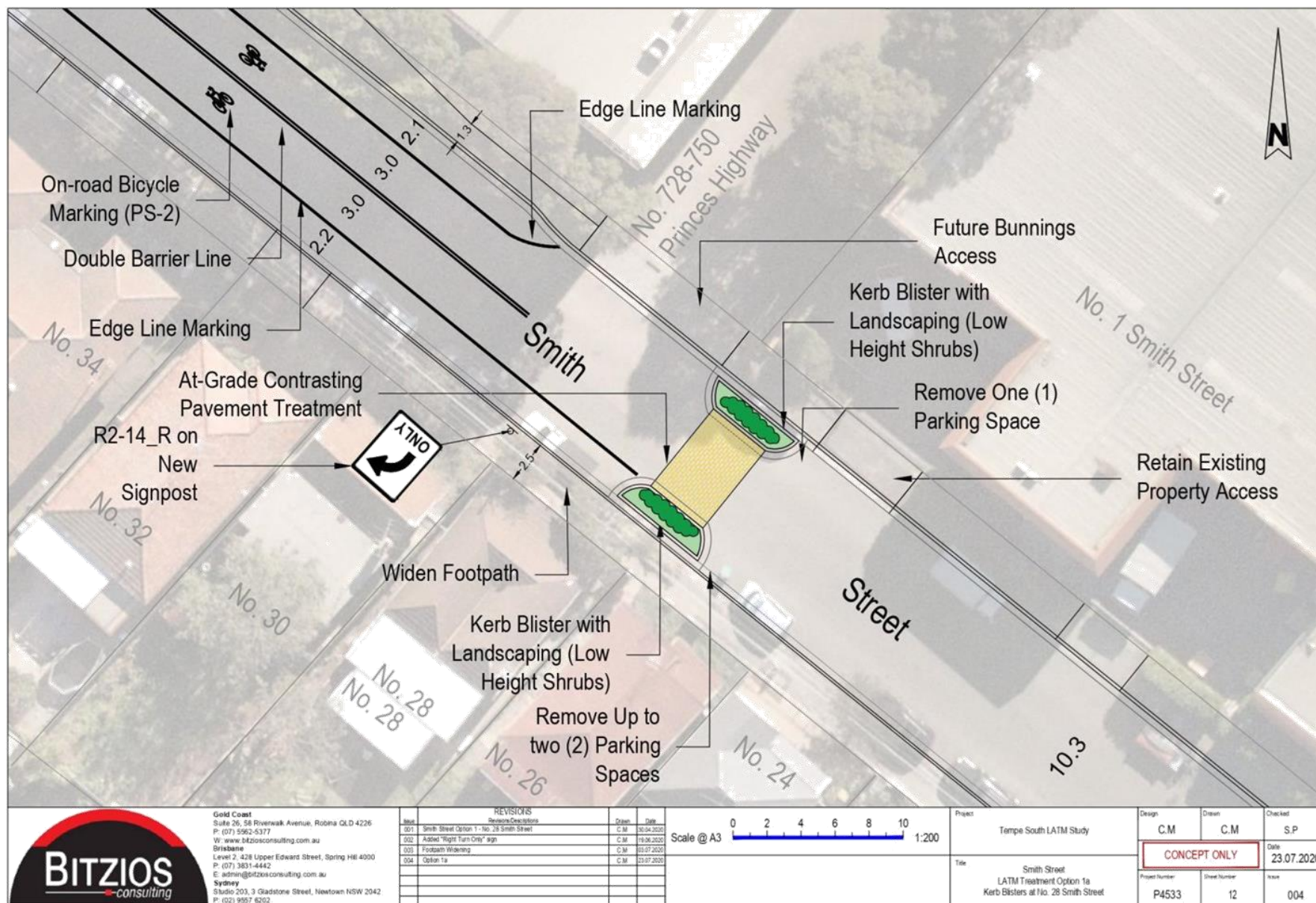


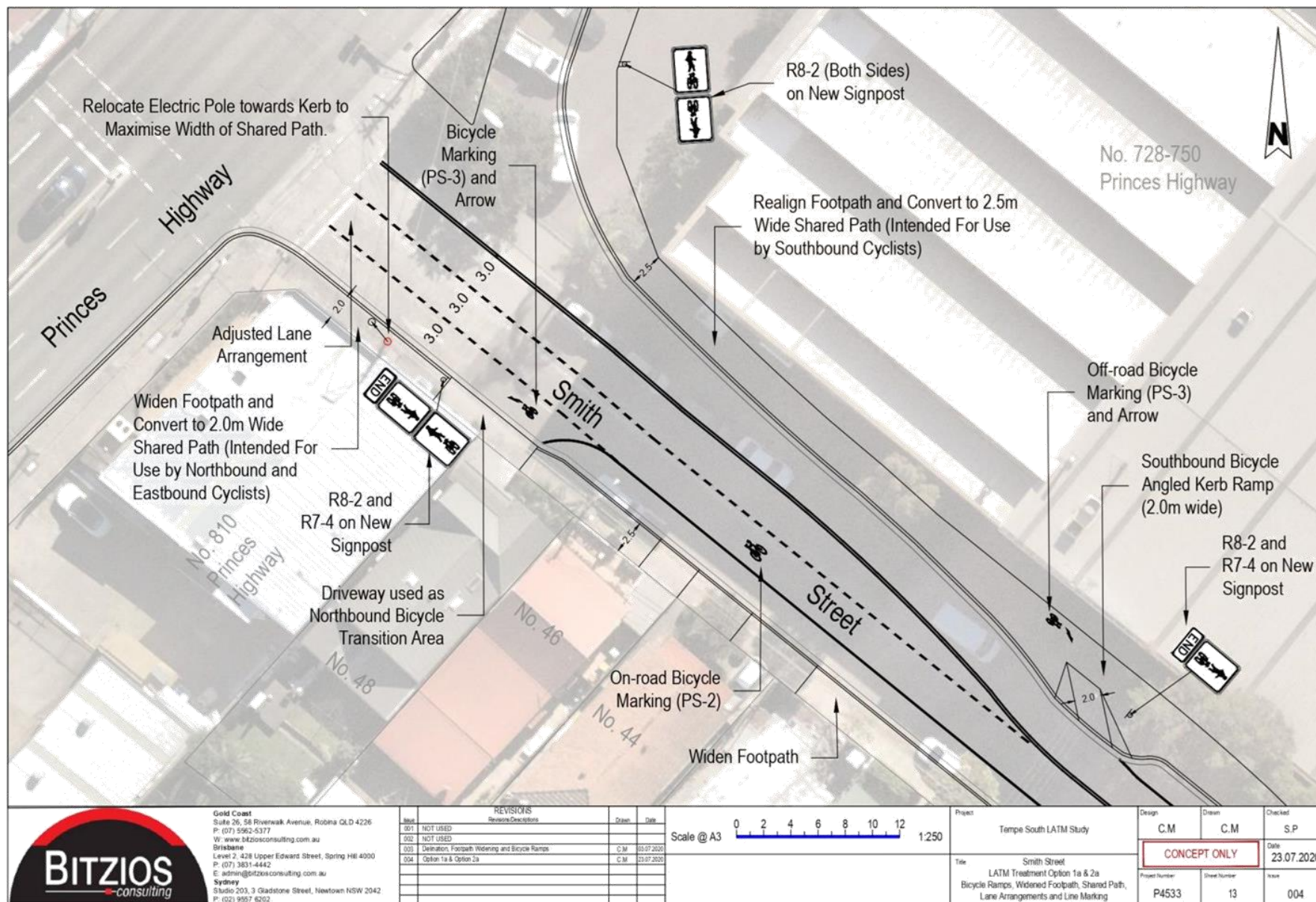


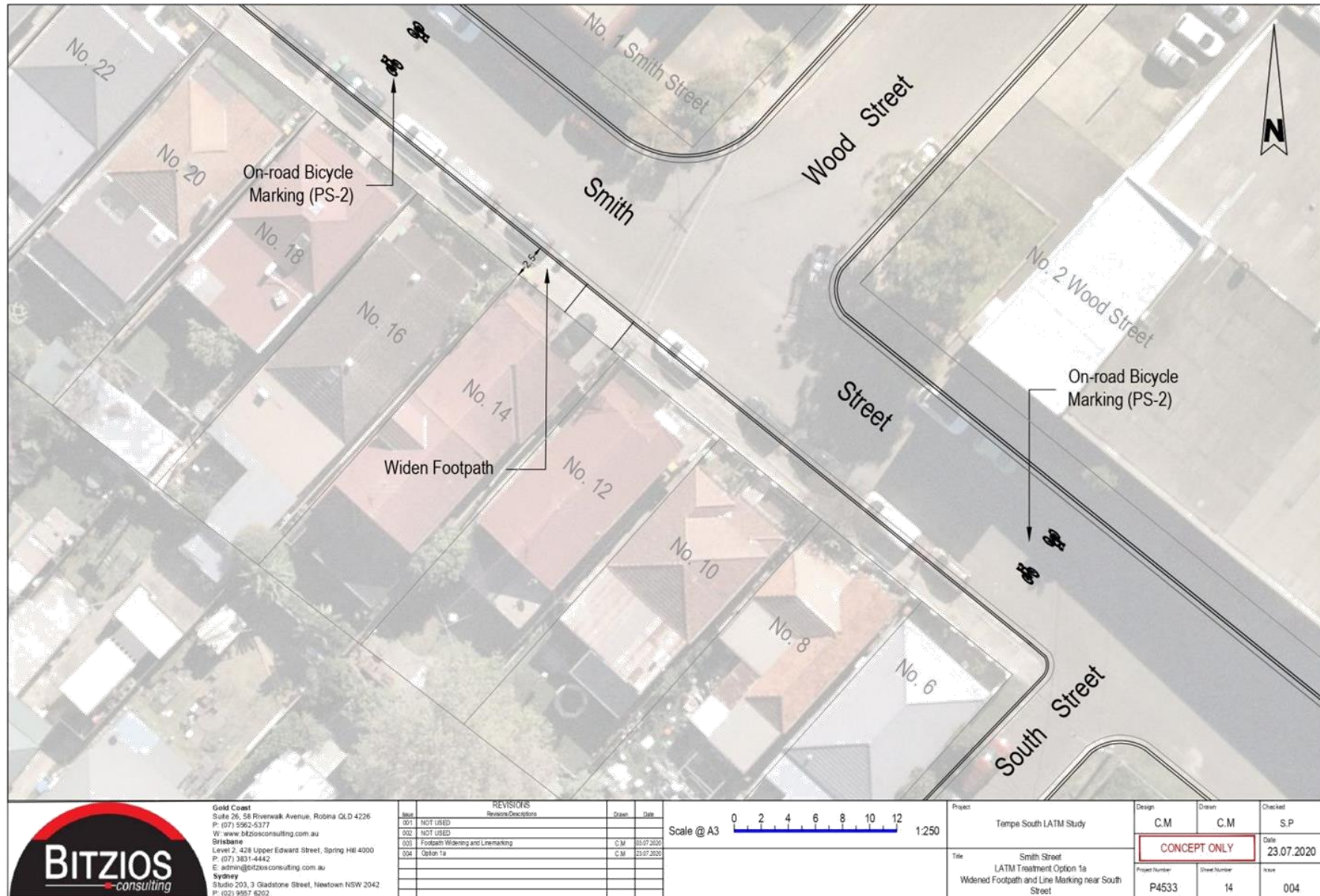


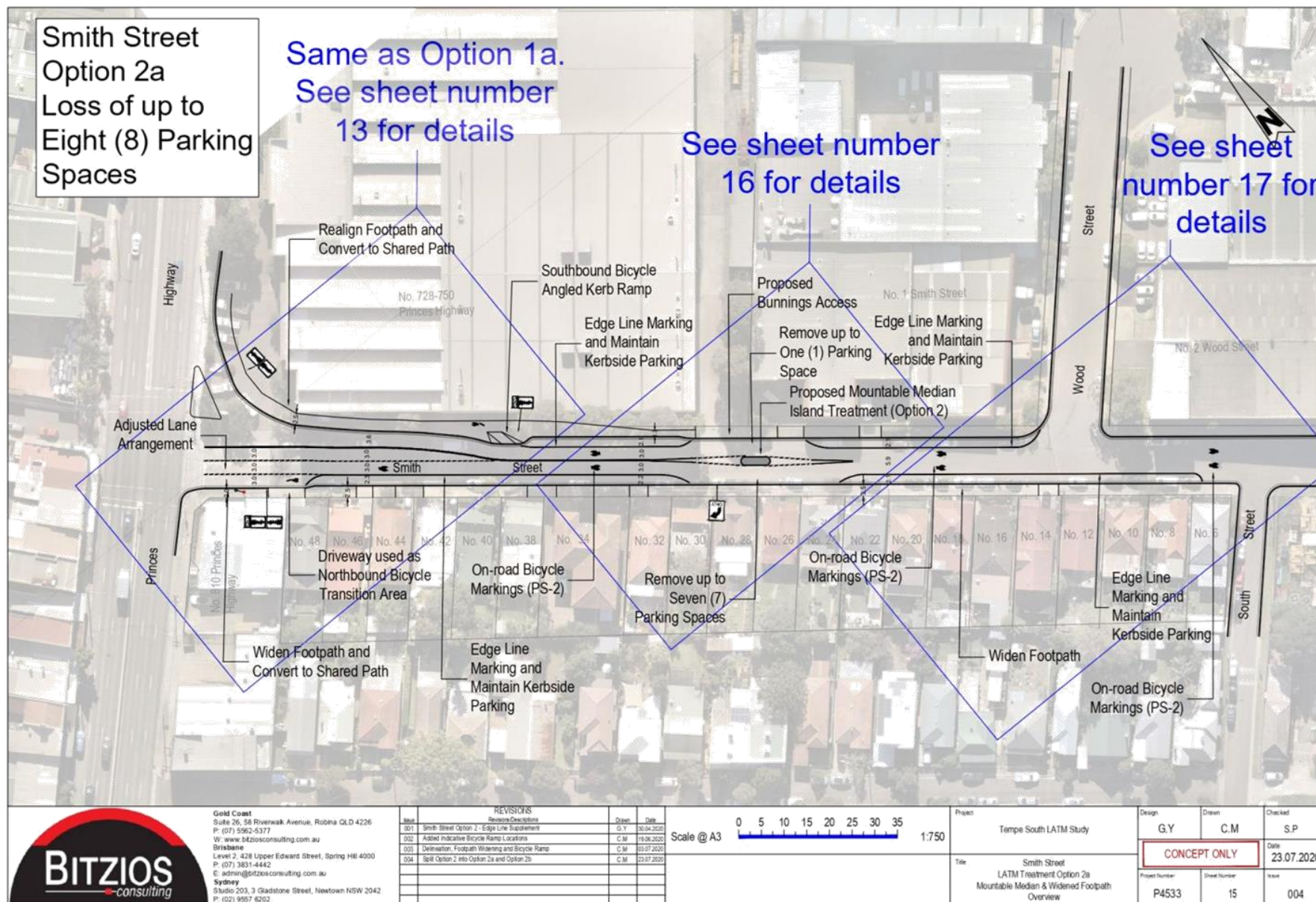


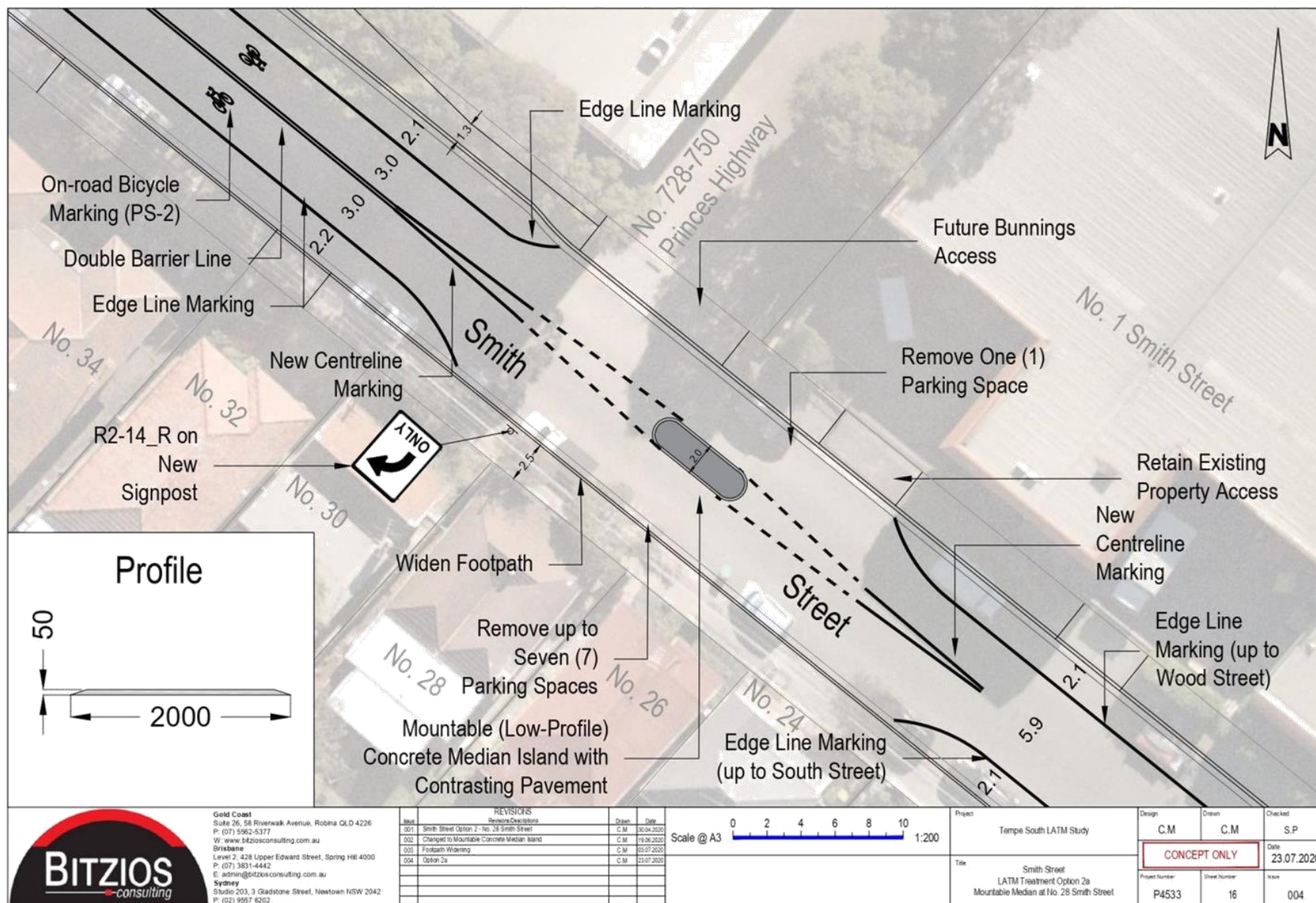


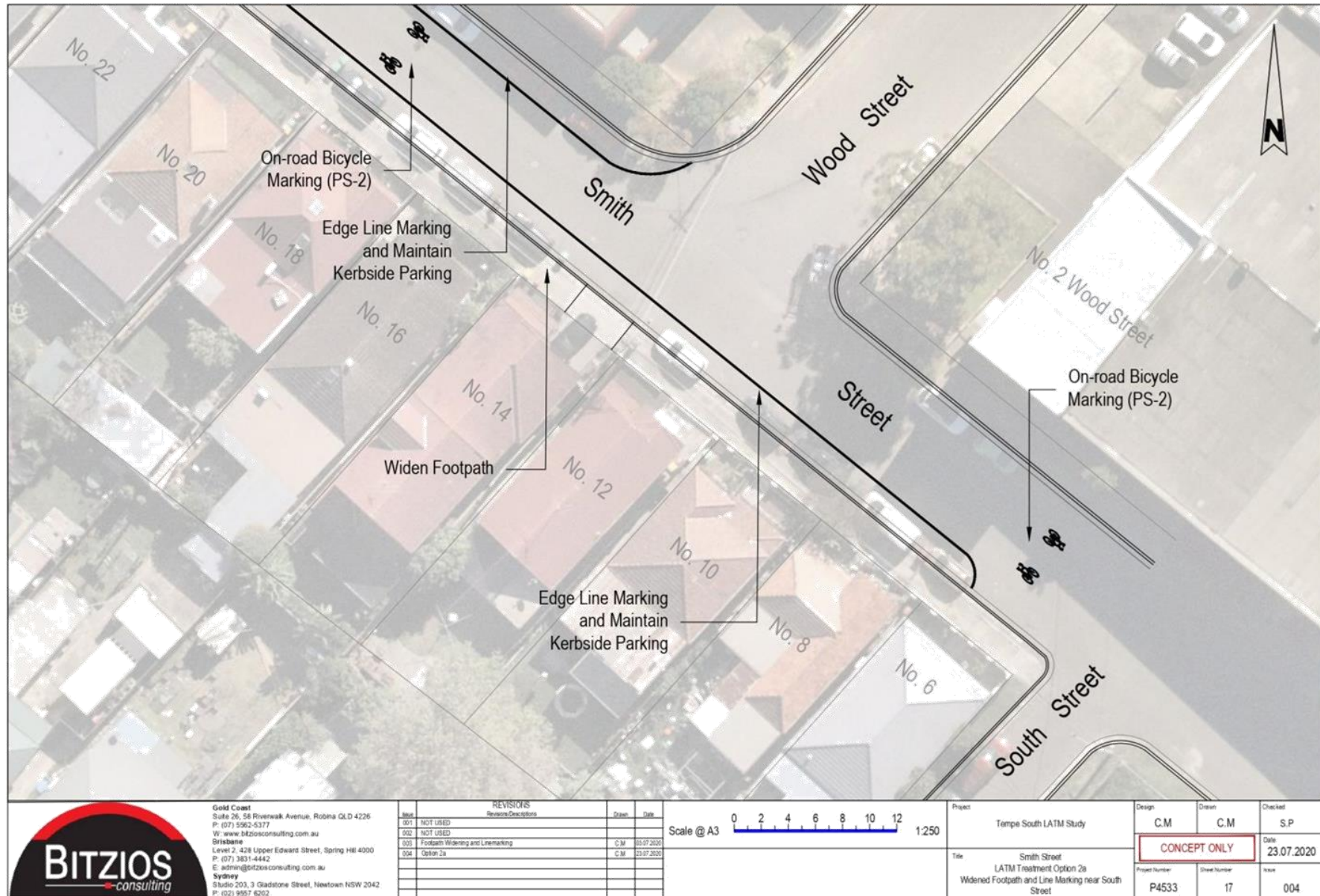


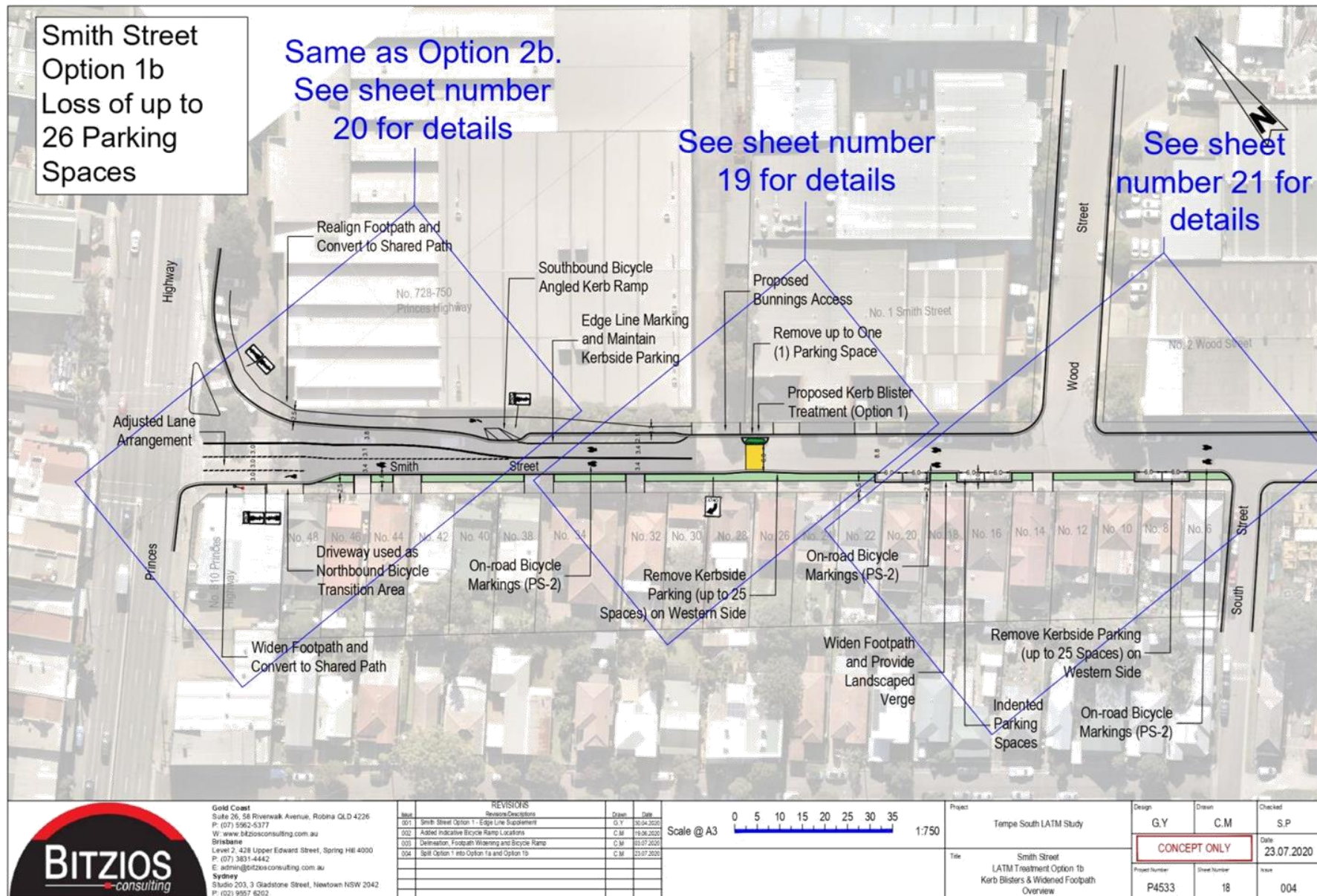


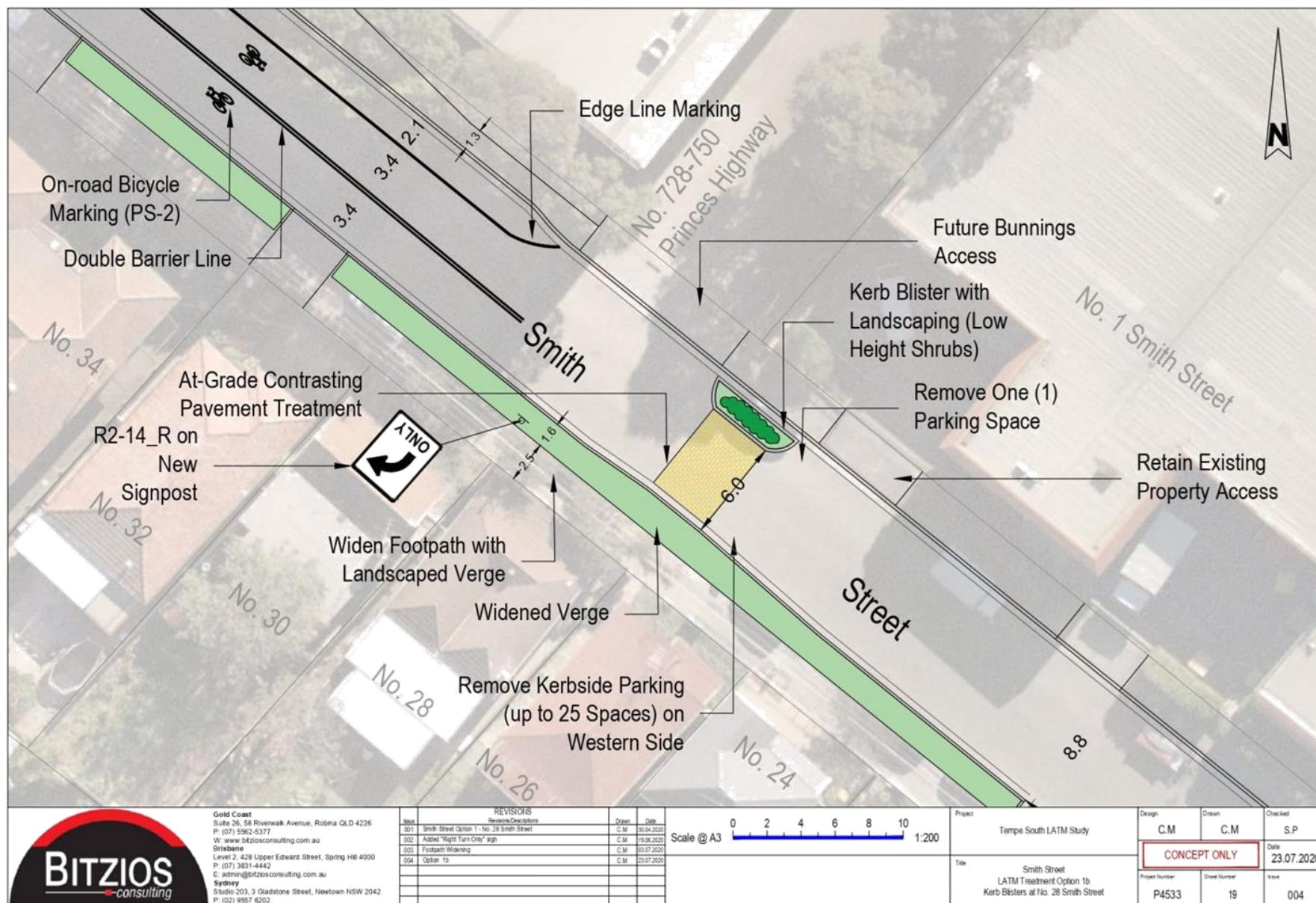


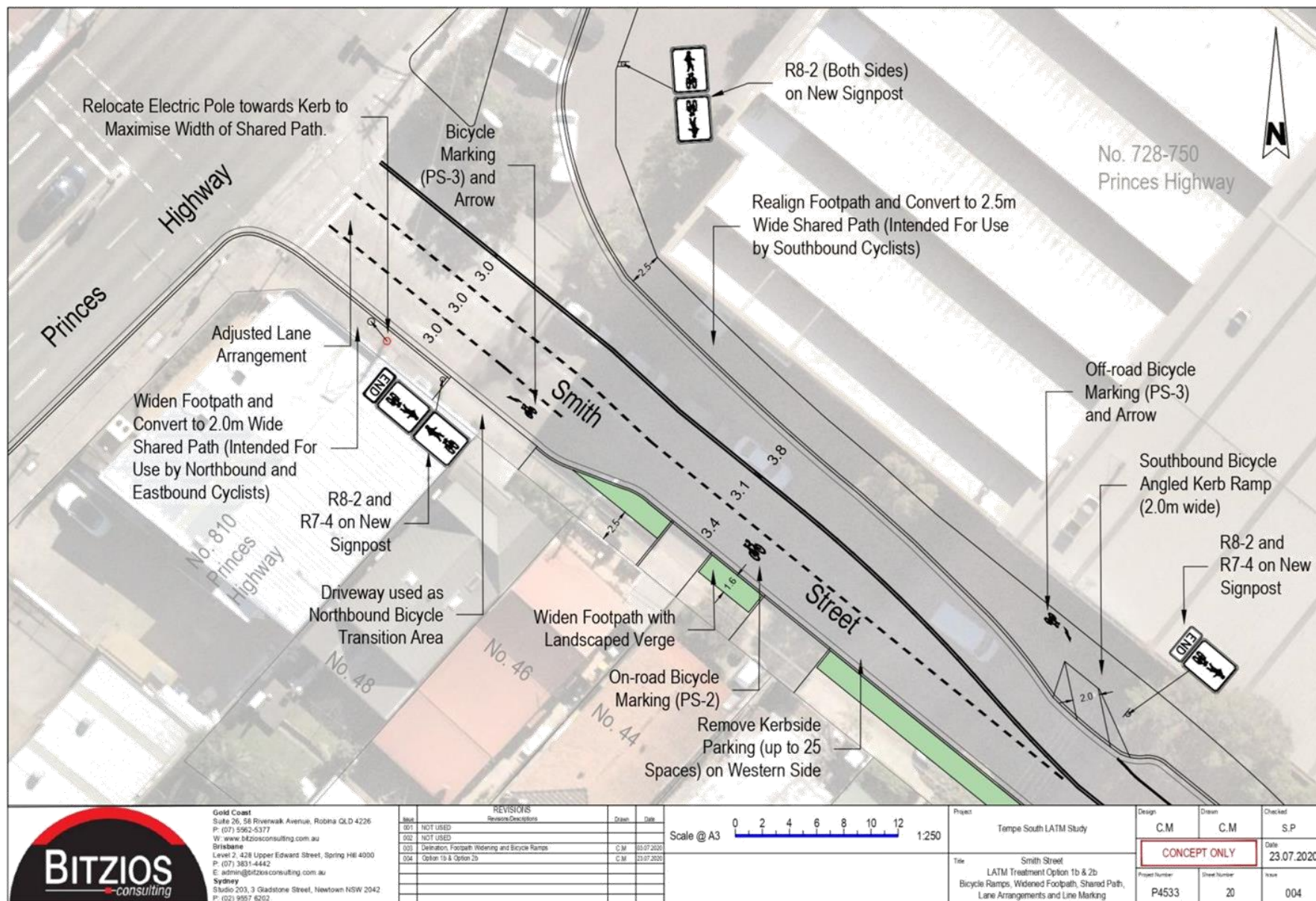


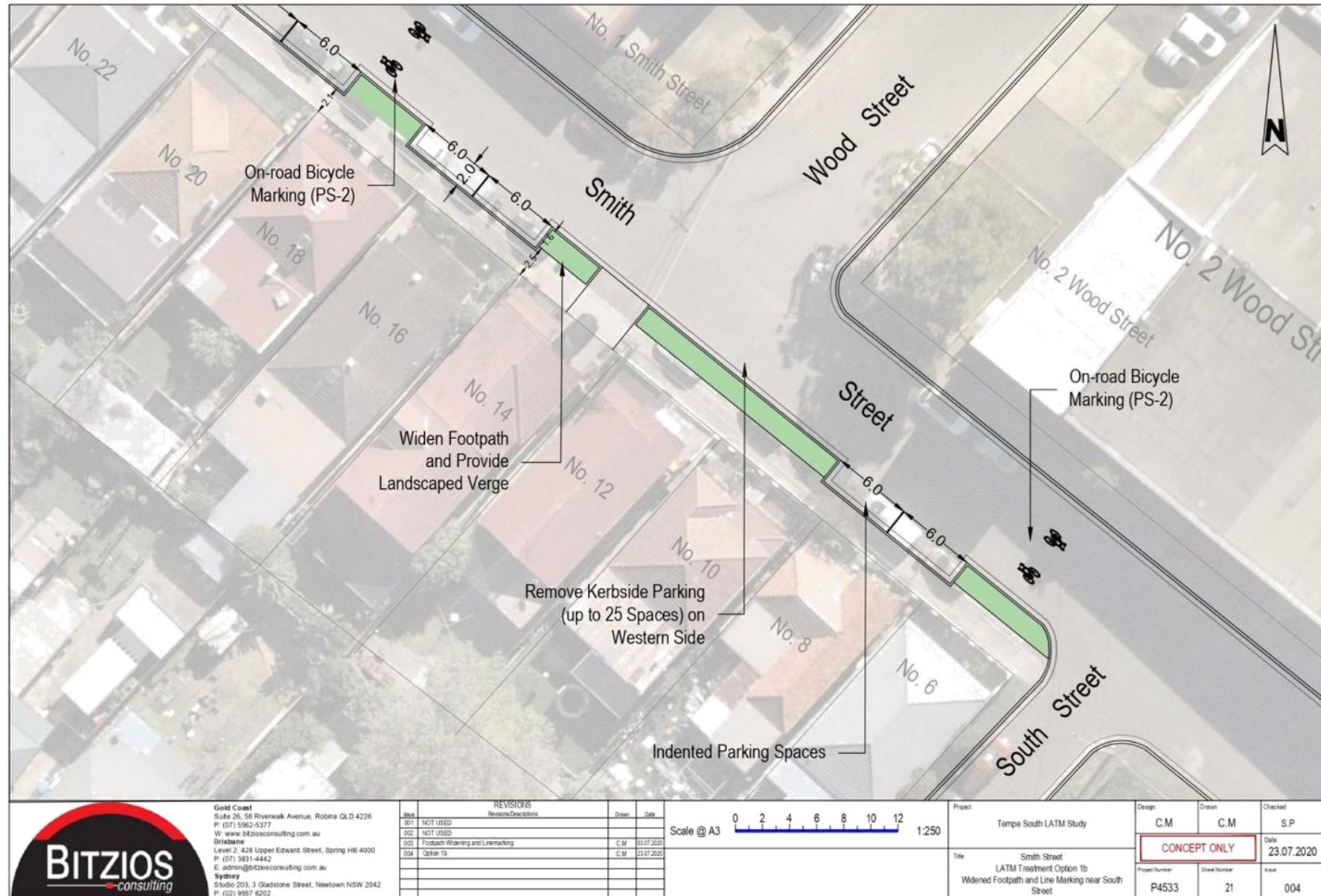


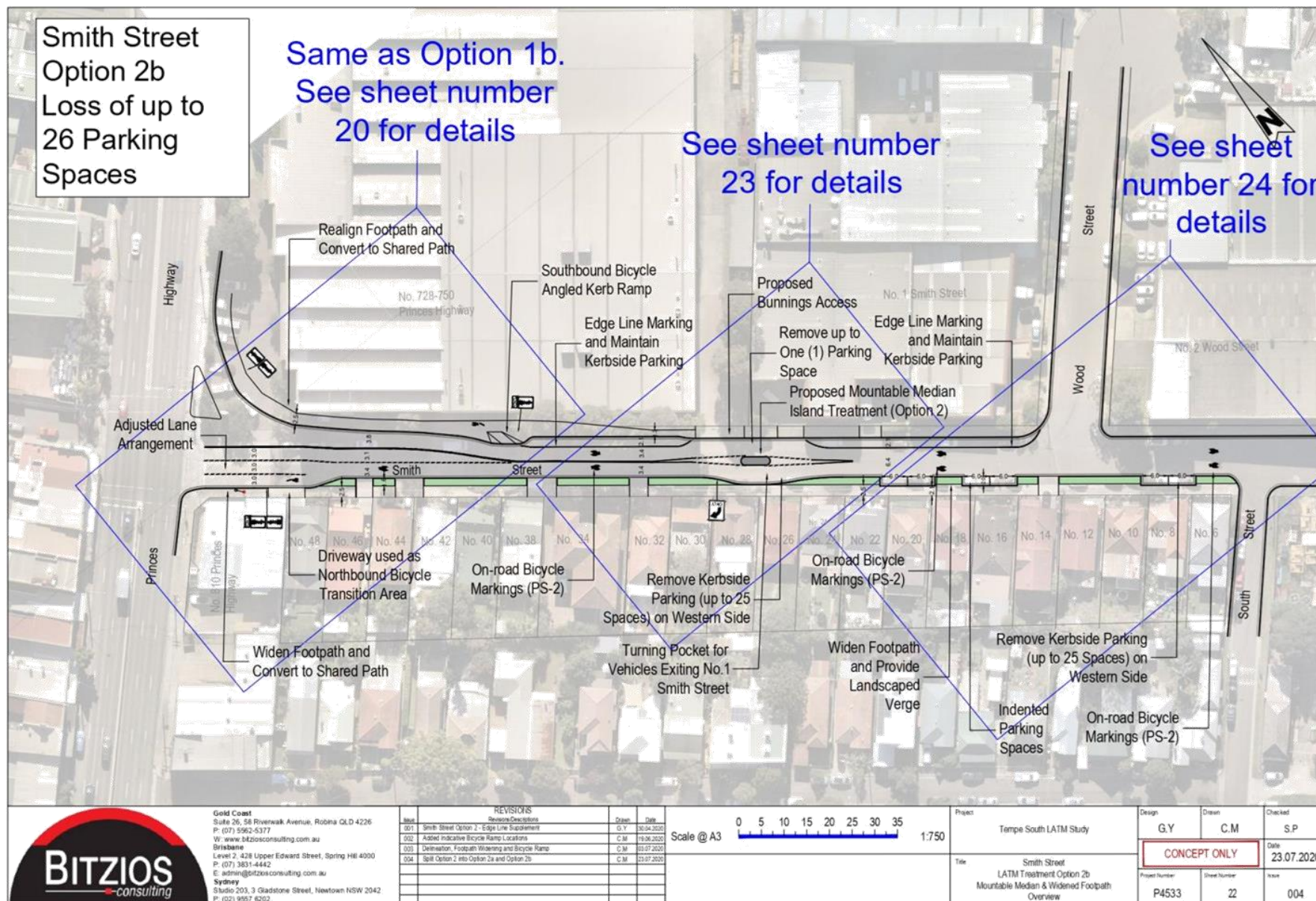


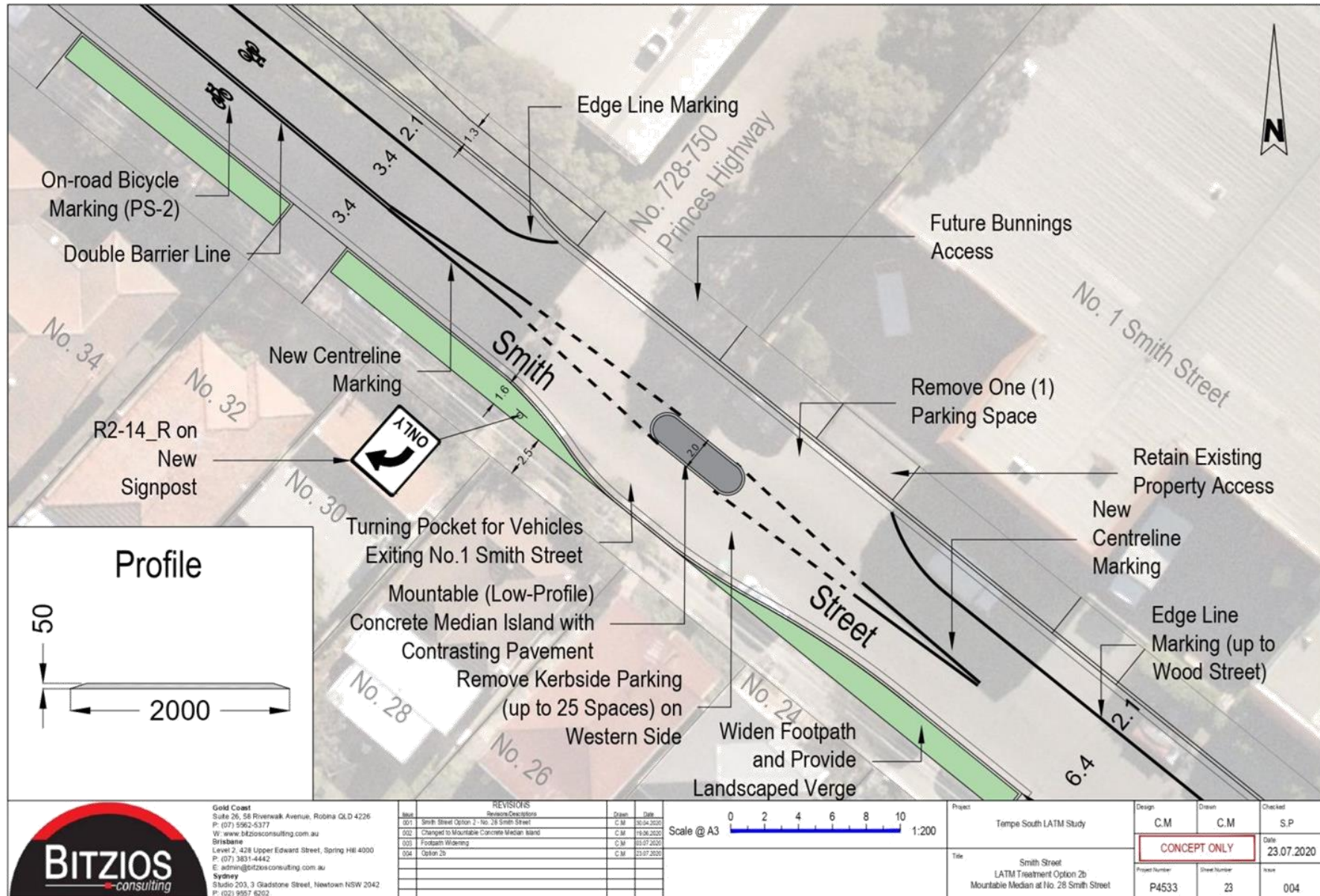




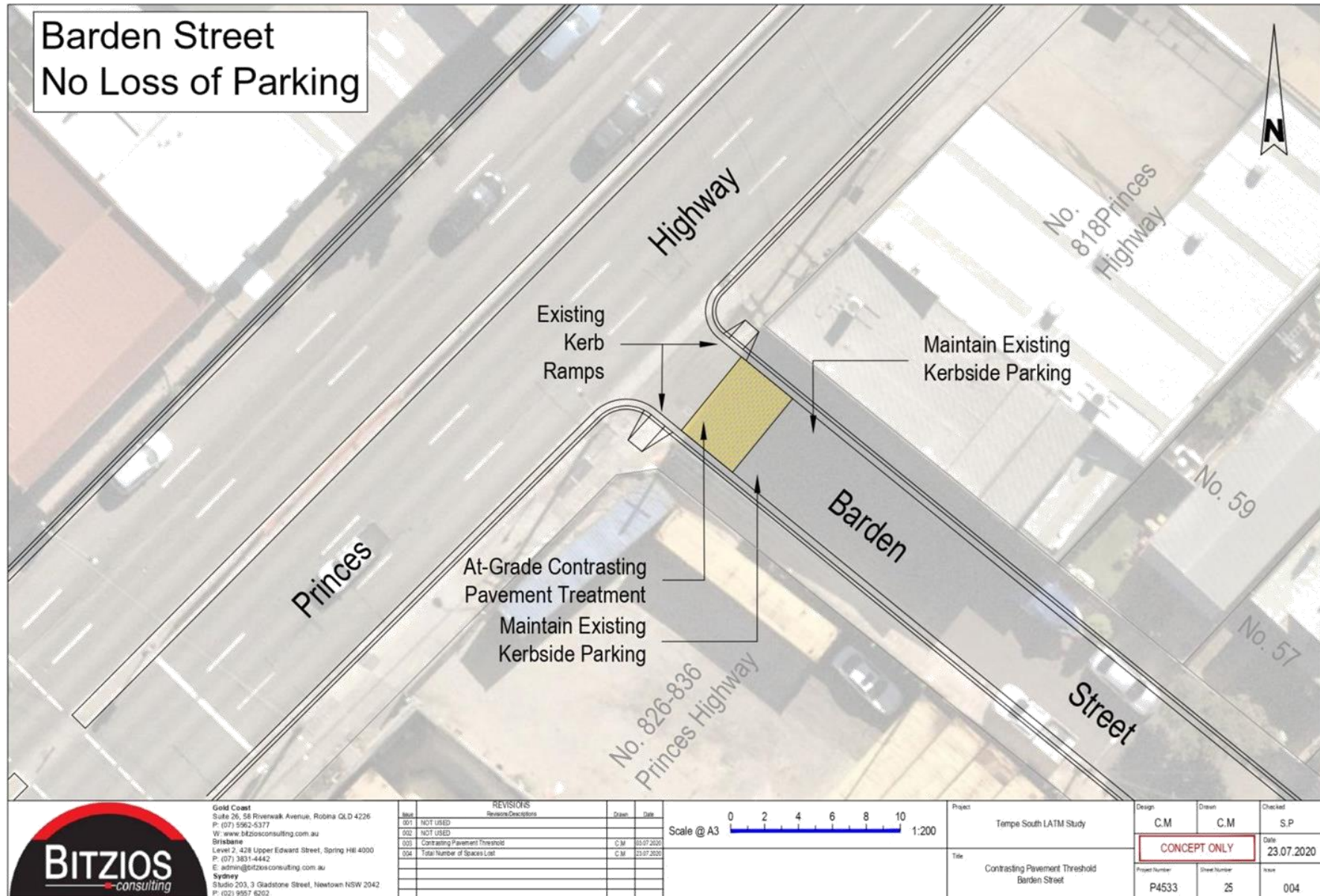


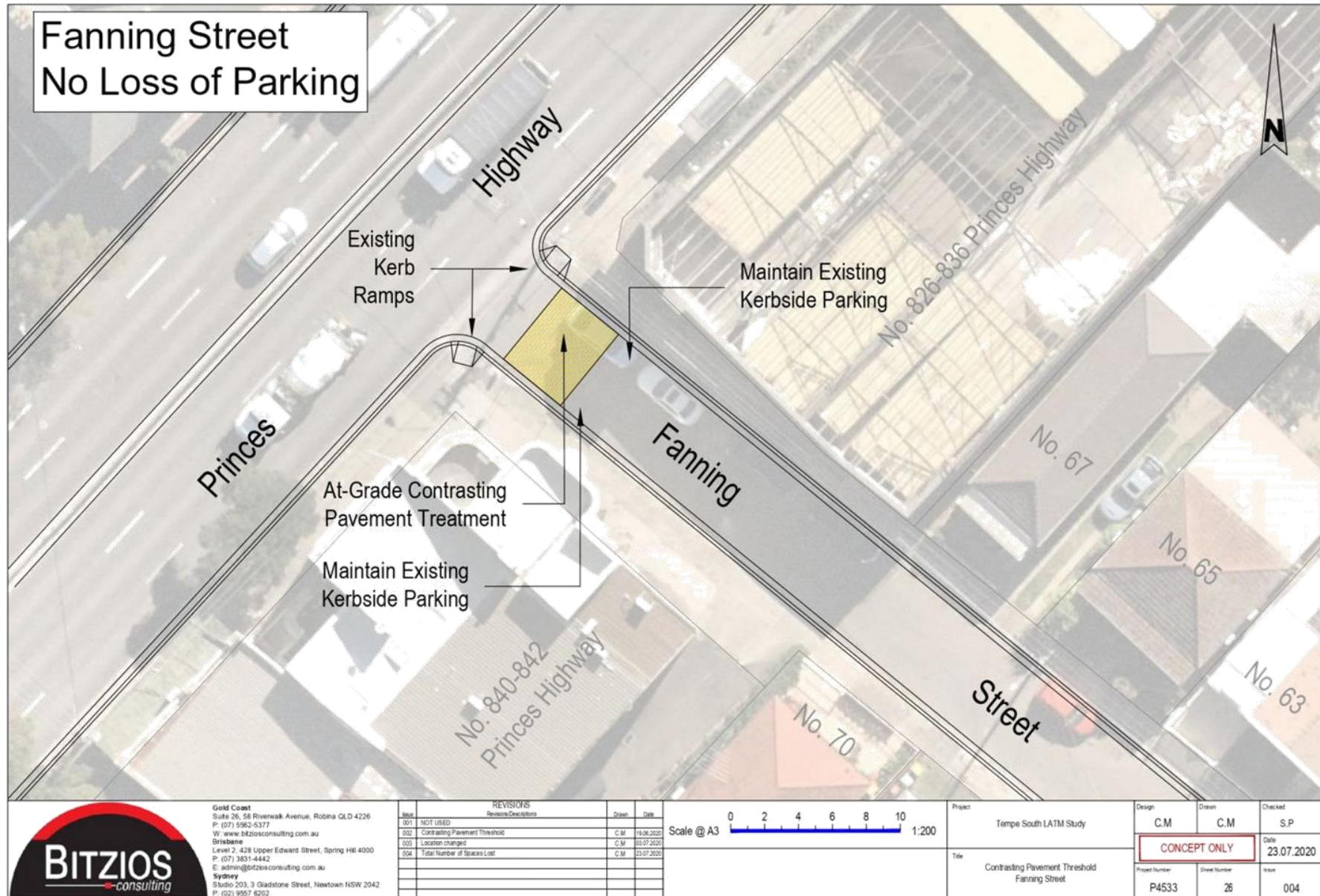


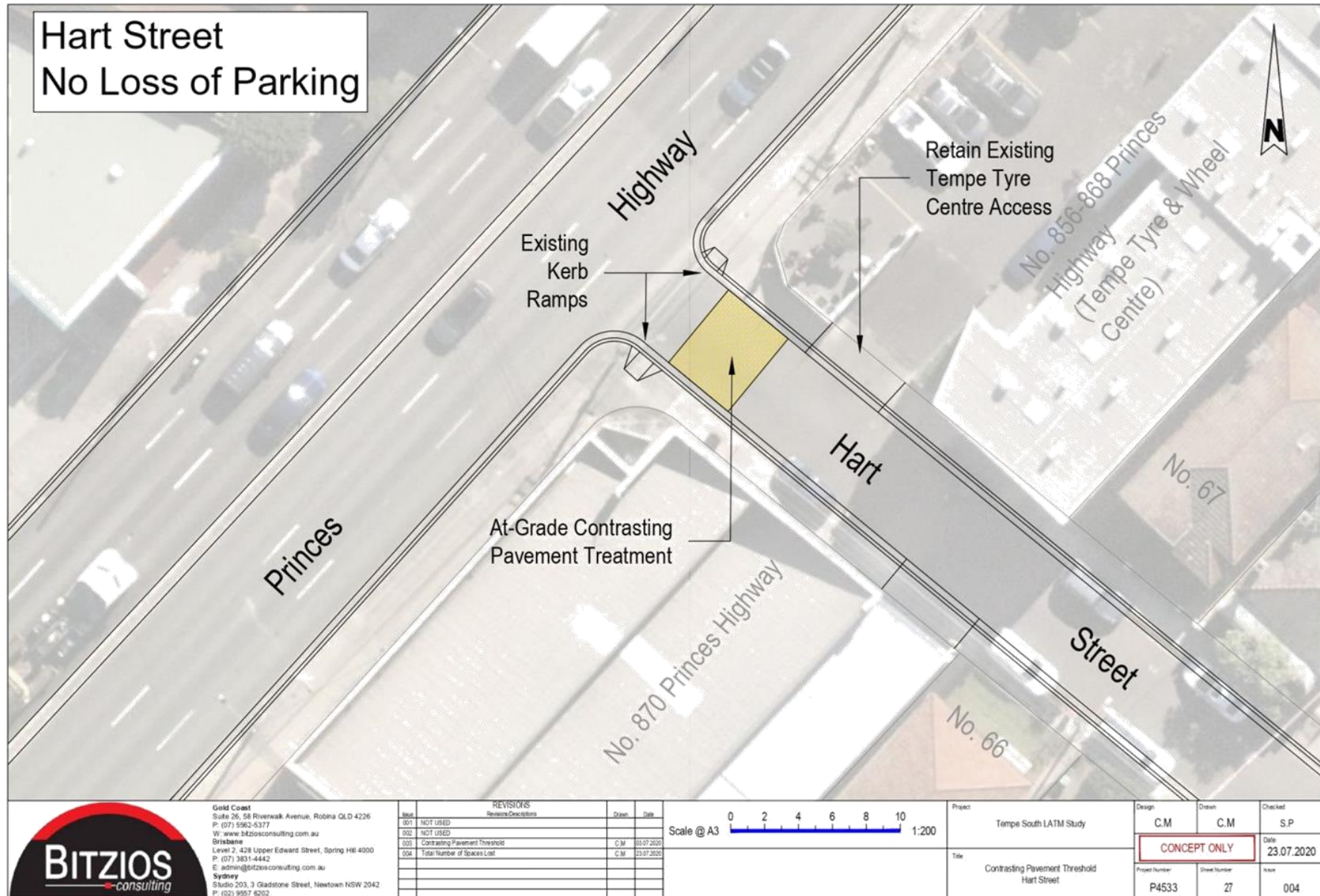


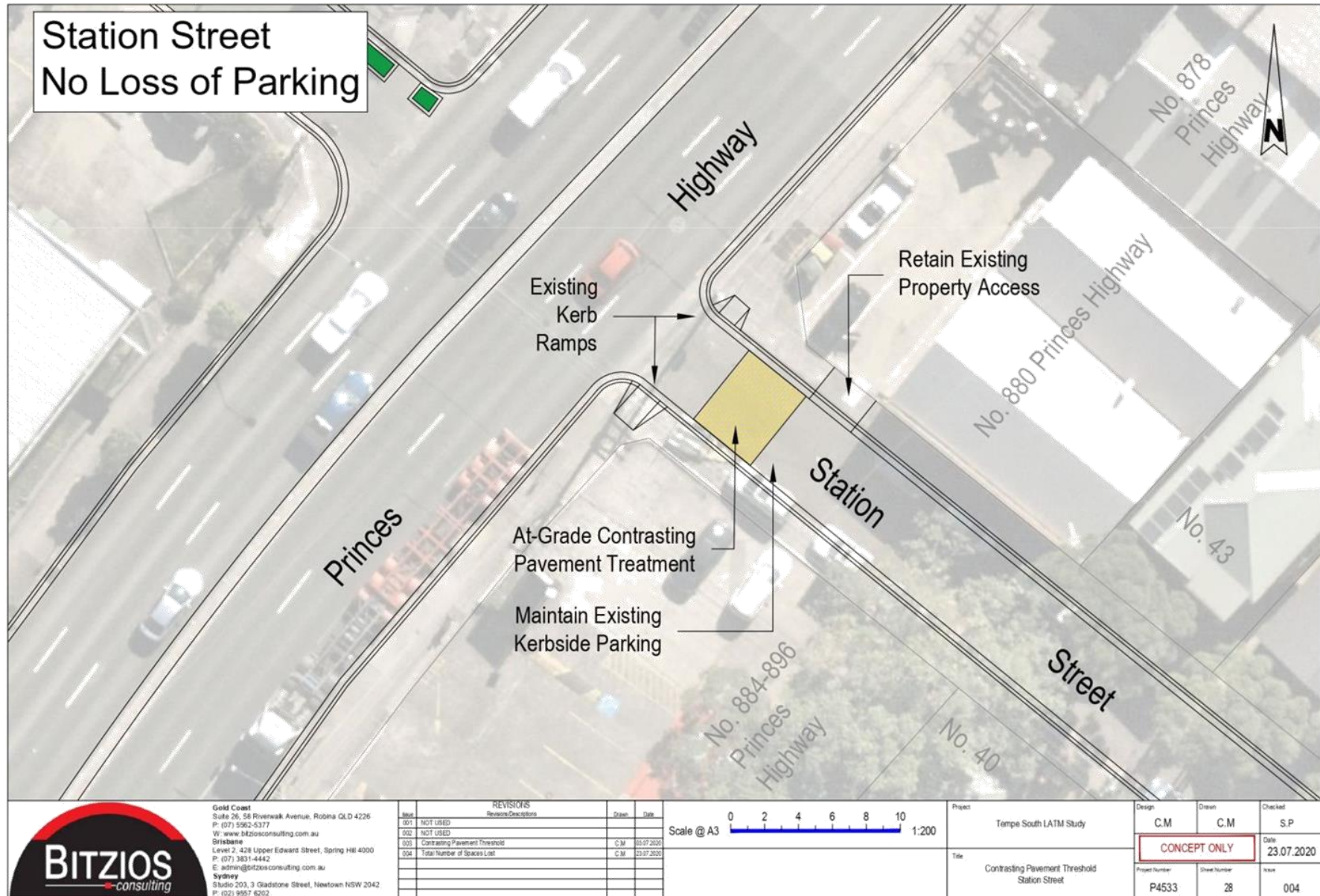












Item No: LTC0820 Item 6

Subject: NELSON STREET, ANNANDALE (AT THE CRESCENT) - PROPOSED EXISTING PEDESTRIAN/CYCLIST SHARED PATH REINSTALLATION (BALUDARRI-BALMAIN WARD/ BALMAIN ELECTORATE/ LEICHHARDT PAC)

Prepared By: Vinoth Srinivasan - Engineer - Traffic and Parking Services

Authorised By: Manod Wickramasinghe - Traffic and Transport Planning Manager

SUMMARY

Council has finalised a design plan for the proposed existing shared path reconstruction at the intersection of Nelson Street and The Crescent, Annandale to improve cyclist and pedestrian safety in the area.

RECOMMENDATION

THAT the detailed design plan (Design Plan No.10124) for the proposed existing shared path reconstruction and associated works, at the intersection of Nelson Street and The Crescent, Annandale be approved.

BACKGROUND & OTHER STAFF COMMENTS

Council officers received a request from Council's Bicycle Working Group to amend existing pedestrian/cyclist shared path, pavement symbols and line markings, at the intersection of Nelson Street and The Crescent, Annandale.

The detailed design plan shown in **Attachment 1** outlines the proposed works at the intersection of Nelson Street and The Crescent, Annandale and includes the following treatments:

- Reinstall existing shared path with associated signs, pavement symbols and line markings
- Install new asphalt footpath with duratherm surfacing with associated pavement symbols
- Reconstruct and widen existing kerb ramps with associated pavement symbols
- Resurface existing asphalt road and install new pavement symbols.

The proposal will not result in the loss of any on-street parking spaces.

FINANCIAL IMPLICATIONS

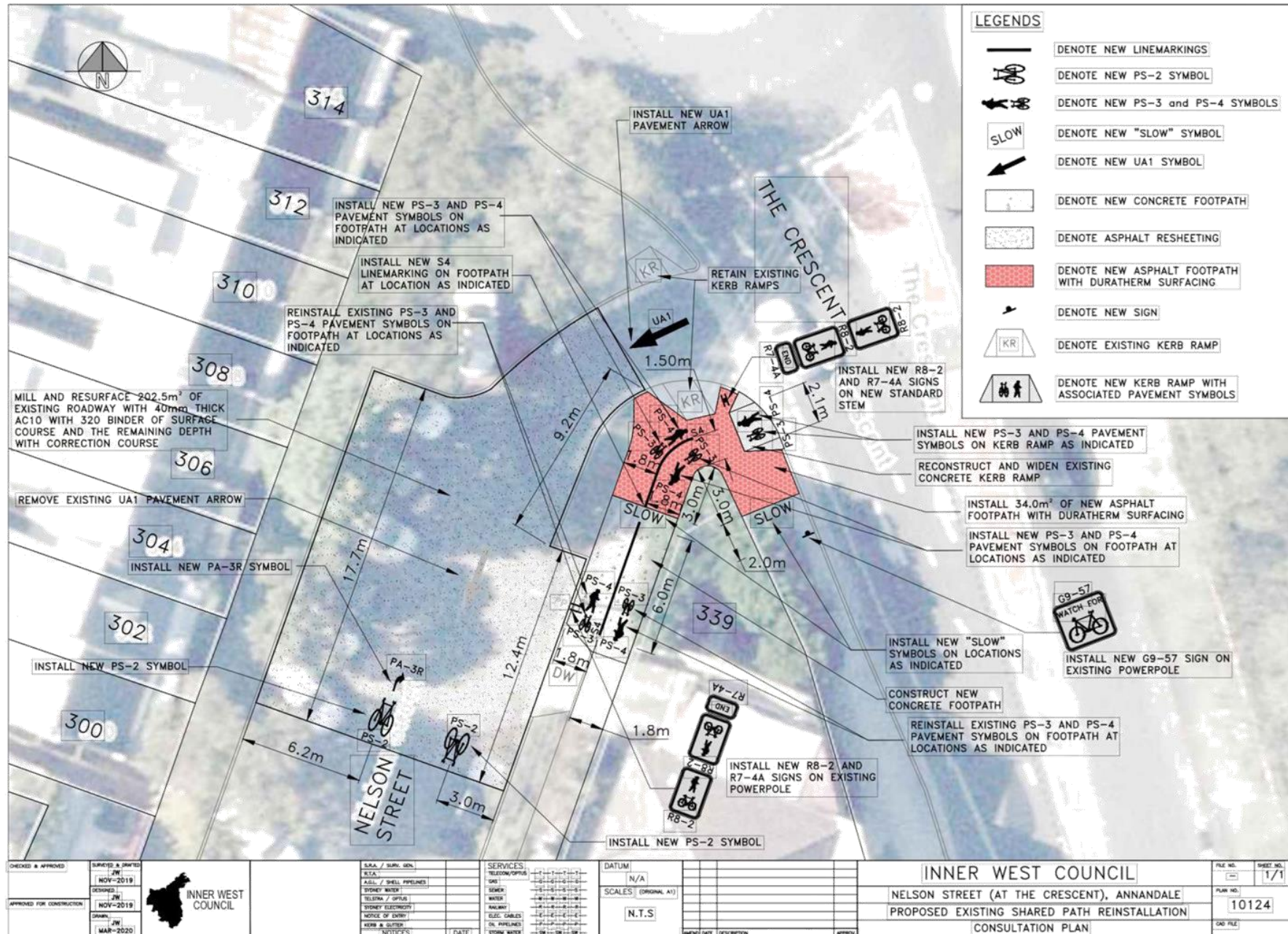
The proposed works have not yet been scheduled and will be reviewed for inclusion as part of a future works program.

PUBLIC CONSULTATION

A letter outlining the proposal was mailed out to the affected properties (12 properties) in Nelson Street and The Crescent, Annandale. One (1) response was received in support of the proposal.

ATTACHMENTS

1. [Download](#) Detailed Design Plan - Nelson St (At The Crescent), Annandale



Item No: LTC0820 Item 7

Subject: **ELSWICK STREET, LEICHHARDT - PROPOSED PEDESTRIAN (ZEBRA) CROSSING (GULGADYA-LEICHHARDT WARD/BALMAIN ELECTORATE/LEICHHARDT PAC)**

Prepared By: Vinoth Srinivasan - Engineer - Traffic and Parking Services

Authorised By: Manod Wickramasinghe - Traffic and Transport Planning Manager

SUMMARY

Council has finalised a design plan for the proposed raised pedestrian (zebra) crossing in Elswick Street, close to the intersection of Whiting Street, Leichhardt to improve pedestrian and motorist safety in the area.

RECOMMENDATION

THAT the detailed design plan (Design Plan No.10129) for the proposed raised pedestrian (zebra) crossing with associated signposting and line marking in Elswick Street, north of Whiting Street, Leichhardt be approved.

BACKGROUND & OTHER STAFF COMMENTS

As part of the 2020/2021 Traffic Facilities (LATM) Capital Works Program, Council is proposing to upgrade the existing pedestrian (zebra) crossing to a raised pedestrian (zebra) crossing in Elswick Street, close to the intersection of Whiting Street, Leichhardt. The existing crossing facility is adjacent to St Columba's Catholic Primary School and this project is expected to improve safety for pedestrians and students.

The detailed design plan shown in **Attachment 1** outlines the proposed works at Elswick Street, Leichhardt and includes the following treatments:

- Upgrading the existing at grade marked pedestrian (zebra) crossing to a raised pedestrian crossing;
- Installing associated pavement line marking and signage as required; and
- Reconstructing concrete footpath as required.

The proposal will not result in the loss of any on-street parking spaces.

FINANCIAL IMPLICATIONS

Funding of \$60,000 has been allocated to this project for construction in the 2020/2021 Capital Works Program.

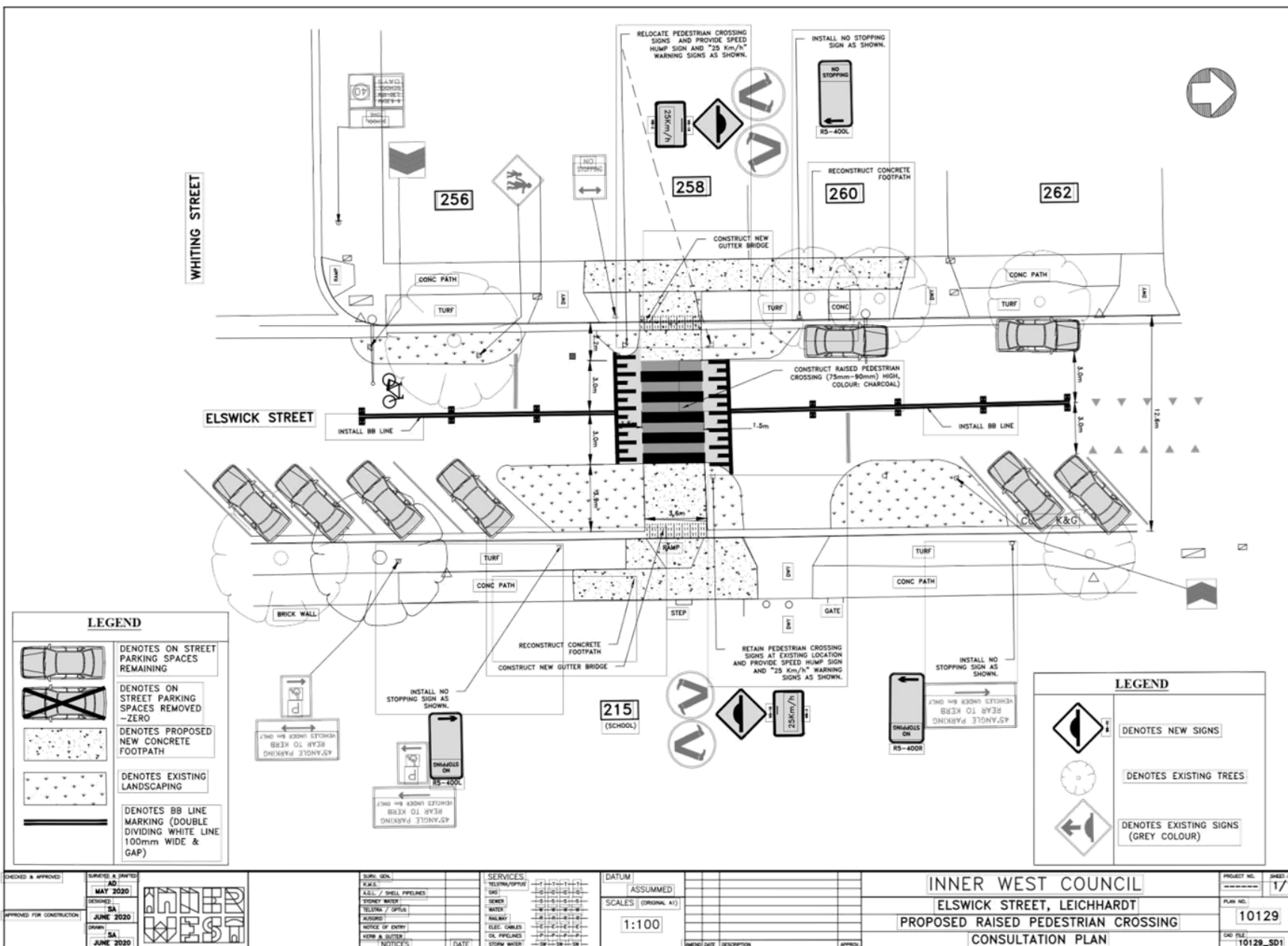
PUBLIC CONSULTATION

A letter outlining the proposal was distributed to the affected properties (34 properties) in Elswick Street, Leichhardt. One (1) response was received to date, in objection to the proposal. The main concerns are outlined below.

- Proposed raised pedestrian crossing will be directly in front of resident's property and concerns of noise generated from accelerating and decelerating vehicles has been raised.

ATTACHMENTS

1. [↓](#) Detailed Design Plan - Elswick Street, Leichhardt



Item No: LTC0820 Item 8

Subject: RAMSAY STREET/ALT STREET - PROPOSED UPGRADE OF EXISTING PEDESTRIAN REFUGE ISLAND (GULGADYA-LEICHHARDT WARD/SUMMER HILL ELECTORATE/BURWOOD PAC)

Prepared By: David Yu - Acting Coordinator Traffic Engineer Services (North)

Authorised By: Manod Wickramasinghe - Traffic and Transport Planning Manager

SUMMARY

As part of the Traffic Capital Works Program, Council has prepared a design plan for the upgrade of existing pedestrian refuge island in Ramsay Street near the intersection of O'Connor Street to a standard new refuge island and associated chevron line markings. The intention of the proposal is to improve road safety for pedestrians and motorists at the intersection.

Consultation was undertaken with owners and occupiers of properties in Ramsay Street and O'Connor Street regarding the proposal. A summary of the consultation results is presented in this report for consideration.

RECOMMENDATION

THAT the detailed design plan for the proposed upgrade of the existing refuge island and new adjacent kerb ramps and associated line markings in Ramsay Street near O'Connor Street, Haberfield (as per Plan No. 10128) be APPROVED.

BACKGROUND & OTHER STAFF COMMENTS

Council identified that the existing pedestrian refuge island in Ramsay Street near O'Connor Street is sub-standard and it is proposed to be upgraded to meet current standards.

The detailed design plan shown in **Attachment 1** outlines the proposed works at the intersection and includes the following treatments:

- Removing the existing pedestrian refuge island facility and constructing a new pedestrian refuge island facility to meet current TfNSW/RMS standards and specifications;
- Providing new chevron line markings which meet current TfNSW/RMS standards and guidelines to guide vehicles as they approach the new pedestrian refuge island facility;
- Reconstructing the existing kerb ramps and footpath to improve accessibility for pedestrians;

This proposal will not result in the loss of any on-street parking spaces.

FINANCIAL IMPLICATIONS

Funding of \$35,000 has been allocated to this project for construction in the 2020/21 capital works program.

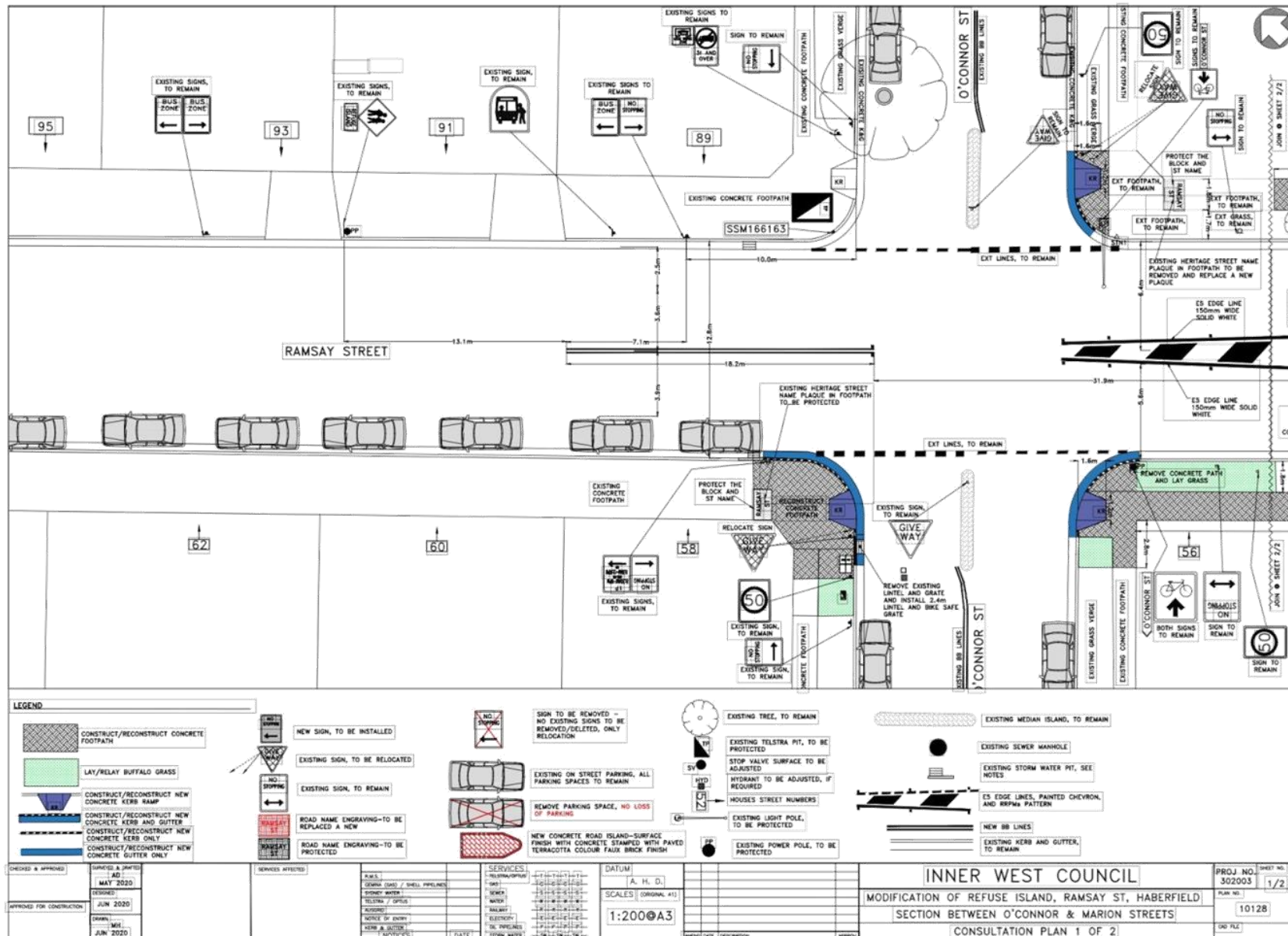
PUBLIC CONSULTATION

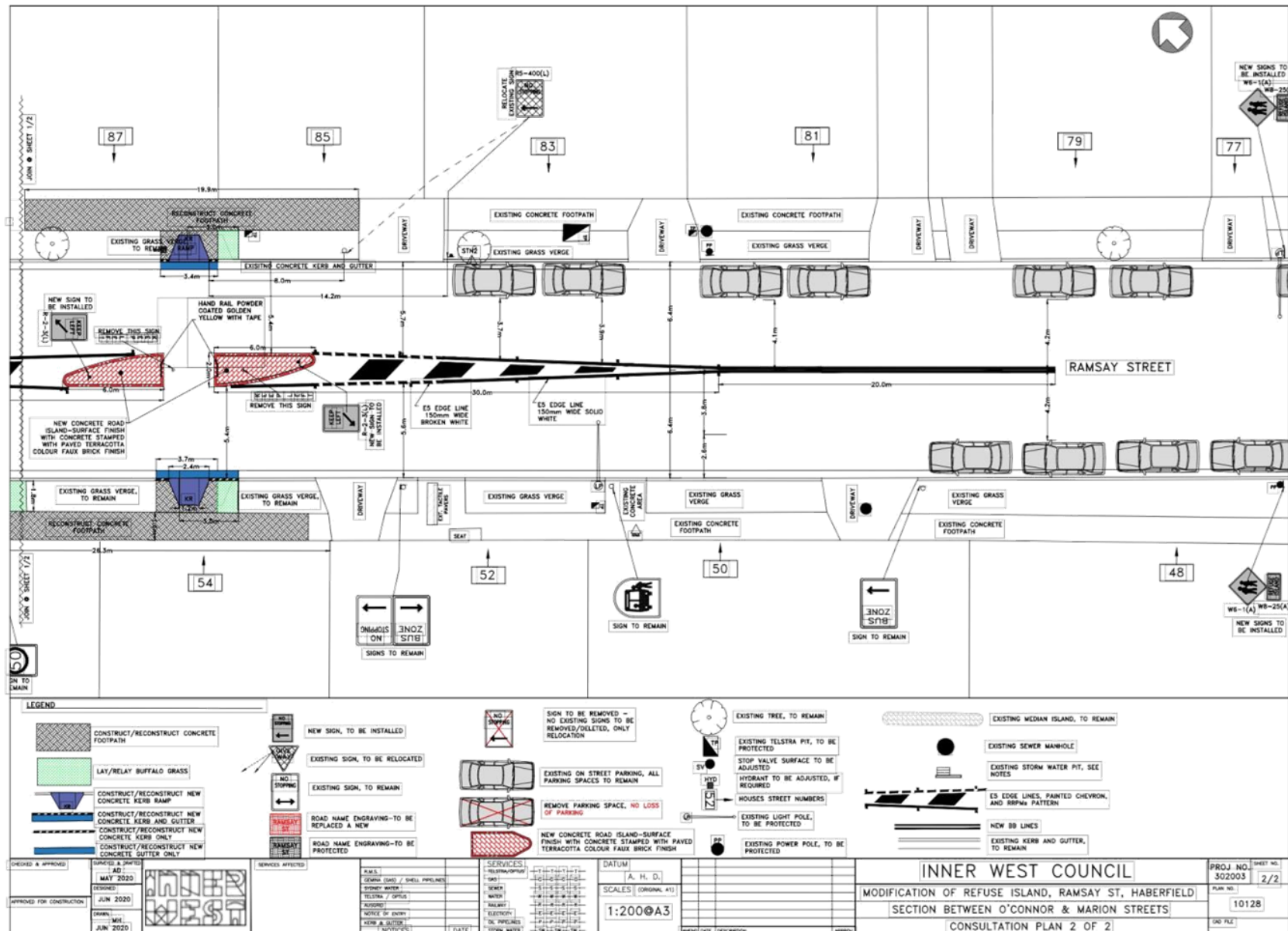
A letter outlining the proposal was mailed out to the affected properties (40 properties) in Ramsay Street and O'Connor Street, Haberfield, requesting residents' views regarding the proposal.

There was one response in objection to the proposal. The response was in objection to the existing 'No Stopping sign' on the northern side of Ramsay Street (in front of 85 Ramsay Street) being relocated to the south (on the other side of the driveway) would result in a loss of parking. However, it should be noted that it is illegal for a vehicle to park across a driveway and the proposal would not result in any loss of on-street parking spaces.

ATTACHMENTS

1. [↓](#) Detailed Design Pedestrian Refuge Island - Ramsay Street/O'Connor Street, Haberfield





Item No: LTC0820 Item 9

Subject: **HOLBEACH AVENUE, TEMPE – TEMPORARY FULL ROAD CLOSURES FOR MS SYDNEY TO THE GONG BIKE RIDE ON SUNDAY 1 NOVEMBER 2020 – (MIDJUBURI - MARRICKVILLE WARD/HEFFRON ELECTORATE/NEWTOWN LAC)**

Prepared By: Jennifer Adams - Engineer – Traffic and Parking Services

Authorised By: Manod Wickramasinghe - Traffic and Transport Planning Manager

SUMMARY

Council has received an application under Section 68 of the Local Government Act 1993 to use Holbeach Avenue and Tempe Recreation Reserve to hold the annual 'MS Sydney to the Gong Bike Ride' supported by Multiple Sclerosis (MS) Australia on Sunday, 1 November 2020. This event will necessitate the temporary full road closure of Holbeach Avenue, Tempe and southbound lane closures on Princes Highway from the car park entrance of IKEA to Cooks River along with closures (residents excepted) of South Street, Hart Street, Bay Street and Old Street, Tempe between 4am to 10am on Sunday, 1 November 2020.

It is recommended that the comments of the Local Traffic Committee be referred to Council's Development Assessment Section for consideration in determining the Development Application.

RECOMMENDATION

THAT:

1. **The proposed temporary full road closure of Holbeach Avenue, Tempe and southbound lane closures on Princes Highway from the car park entrance of IKEA to Cooks River along with closures (residents excepted) of South Street, Hart Street, Bay Street and Old Street, Tempe on Sunday, 1 November 2020 between the hours of 4:00am to 10:00am be supported as per the submitted TMP and TCPs (subject to TfNSW approval);**
2. **All residents and businesses in and around the affected area are to be notified of the temporary road closure in writing by the applicant in advance (at least 7 days prior to the event) with the applicant making reasonable provision for stakeholders; and**
3. **The occupation of the road carriageway must not occur until the road has been physically closed.**

BACKGROUND

Council has received an application under Section 68 of the Local Government Act 1993 to use Holbeach Avenue and Tempe Recreation Reserve to hold the annual 'MS Sydney to the Gong Bike Ride' supported by Multiple Sclerosis (MS) Australia on Sunday 1 November 2020.

The application is required to be referred to the Local Traffic Committee for consideration under State Environmental Planning Policy (Infrastructure) 2007.

This year will be the 39th year that this event will operate and due to the construction of the WestConnex project, previous year's start site at Sydney Park (City of Sydney Council) is no

longer available and subsequently Tempe Reserve has been successfully utilised as the start site since 2017.

The number of participant registrations for the 2018 Gong Bike Ride will remain capped at 10,000.

FINANCIAL IMPLICATIONS

Nil.

OFFICER COMMENTS

MS Australia will utilise the IKEA car park as a drop off zone and riders will ride down Princes Highway (southbound) to the starting location at Tempe Recreation Reserve. The traffic management company will put in an access lane along Princes Highway to keep riders safe while entering the event at Tempe Recreation Reserve where this location will be the start of the cycling course.

The event will start at Tempe Recreation Reserve, Tempe (see Figure below). On departing, cyclists will ride west on Holbeach Avenue and then turn left onto Princes Highway. Cyclists will then ride along the southbound lanes on Princes Highway as they make their way south over the Cooks River Bridge and beyond. The Traffic Control Plans for relevant Inner West locations are reproduced at the end of this report.

The applicant advised that support of the NSW Police and TfNSW will be sought and a detailed Traffic Management Plan has been forwarded to the TfNSW, NSW Police and relevant Councils and authorities.

NSW Police and the MS Australia Course Marshals will be at critical locations to ensure that participants and motorists follow all proposed traffic management measures. The event will be held on a Sunday morning where traffic volumes are expected to be lower than average.

It is proposed that the traffic control measures would be in place between 4:00am and no later than 10:00am as the event commences at 6:00am and is expected to be concluded by 9:00am. Affected residents and businesses will be allowed access at Police discretion.

A Traffic Management Plan will be submitted to Transport for New South Wales (TfNSW) for consideration and approval as well as a Road Occupancy License application will be submitted to the Transport Management Centre.

CONCLUSION

It is proposed that the following traffic related comments be forwarded to Council's Development Assessment section.

Based on the information presented in the applicant's submission to Council with regards to the proposed cycling event on Sunday 1 November 2020 with the inclusion of a temporary full road closure of Holbeach Avenue, Tempe, it is acknowledged that the event will be controlled by NSW Police and the MS Australia Course Marshals. Therefore, Council supports the temporary full road closure of Holbeach Avenue, Tempe during the course of the event subject to the applicant submitting a Traffic Management Plan to TfNSW for consideration and approval, a Road Occupancy License be obtained from the Transport Management Centre and advice of the proposed event being forwarded all affected properties and to the appropriate authorities including emergency services.



Location of start and relevant Traffic Control Plans (TCPs) and sections of TMP





The 39th Sydney to the Gong Bike Ride for Multiple Sclerosis 2020 TRAFFIC CONTROL PLANS

SECTOR A

- TCP 001 Princes Highway & IKEA Car Park TEMPE
- TCP 002 IKEA Car Park TEMPE
- TCP 003 Princes Highway & Gannon St TEMPE
- TCP 004 Princes Highway & Smith St TEMPE
- TCP 005 Princes Highway & Holbeach Ave TEMPE
- TCP 006A/B Holbeach Ave roundabout TEMPE
- TCP 007 South St & Station St TEMPE
- TCP 008 South St to Golf Driving Range TEMPE
- TCP 009 Tempe Reserve Car Park TEMPE
- TCP 10 Tempe Station to Tempe Reserve TEMPE
- TCP 11 Princes Highway & Brodie Spark Dr WOLLI CREEK
- TCP 12 Princes Highway & Gertrude St WOLLI CREEK
- TCP 13 Princes Highway & West Botany St WOLLI CREEK
- TCP 14 West Botany St & Marsh St ARNCLIFFE
- TCP 15 West Botany St & Wickham St ARNCLIFFE
- TCP 16 A West Botany St & Bestic St ROCKDALE
- TCP 16 B West Botany St & Bestic St ROCKDALE
- TCP 16 C West Botany St & Bestic St ROCKDALE
- TCP 17 Bestic St & Francis Ave KYEEMAGH
- TCP 18 Bestic St & Occupation Rd KYEEMAGH
- * TCP 19 Bestic St & General Holmes Dr KYEEMAGH
- TCP 20 General Holmes Dr & The Grand Parade BRIGHTON LE SANDS
- TCP 21 The Grand Parade & Bay St BRIGHTON LE SANDS
- TCP 22 The Grand Parade & President Ave MONTEREY
- TCP 23 The Grand Parade & Barton St MONTEREY
- TCP 24 The Grand Parade & Ramsgate Rd RAMSGATE Cut Off 0900

SECTOR B

- TCP 25 The Grand Parade & Sandringham St DOLLS POINT
- TCP 26 Sandringham St & Napoleon St SANS SOUCI
- TCP 27 Sandringham St & Rocky Point Rd SANS SOUCI
- TCP 28 Rocky Point Rd & Russell Ave SANS SOUCI
- TCP 29 Rocky Point Rd & Fontainebleau St SANS SOUCI
- TCP 30 Rocky Point Rd & Frasers Ave SANS SOUCI
- TCP 31 Taren Point Rd & Toorak Ave TAREN POINT
- TCP 32 Taren Point Rd & Box Rd CARINGBAH
- TCP 33 Taren Point Rd & Parraweena Rd CARINGBAH
- TCP 34 Taren Point Rd & Koonya Cct CARINGBAH
- TCP 35 Taren Point Rd & Captain Cook Dr CARINGBAH
- TCP 36 Taren Point Rd & Kingsway CARINGBAH
- TCP 37 Kingsway & Port Hacking Rd MIRANDA
- TCP 38 Kingsway & Jackson Ave MIRANDA
- TCP 39 Kingsway & Kiora Rd MIRANDA
- TCP 40 Kingsway & Wandella Rd MIRANDA
- TCP 41 Kingsway & Sylvania Rd MIRANDA
- TCP 42 Kingsway & Manchester Rd GYMEA
- TCP 43 Kingsway & Gympie Bay Rd MIRANDA
- TCP 44 Kingsway & Hotham Rd GYMEA
- TCP 45 Kingsway & Princes Highway KIRRAWEE
- TCP 46 Princes Highway & Oak Rd KIRRAWEE
- TCP 47 Princes Highway & Acacia Rd KIRRAWEE
- TCP 48 Acacia Rd & President Ave KIRRAWEE
- TCP 49 Acacia Rd & Minerva St KIRRAWEE

SECTOR C

- TCP 50 Princes Highway & Rawson Ave SUTHERLAND
- TCP 51 Princes Highway at Loftus Oval Rest Area LOFTUS Cut Off 1015
- TCP 52 A Princes Highway & Farnell Ave LOFTUS
- TCP 52 B Princes Highway & Farnell Ave LOFTUS
- TCP 53 Princes Highway & Old Bush Rd ENGADINE
- TCP 54 Princes Highway & Old Princes Highway ENGADINE
- TCP 55 Old Princes Highway & Cooper St ENGADINE
- TCP 56 Old Princes Highway & Princes Highway ENGADINE
- TCP 57 Princes Highway & Heathcote Rd HEATHCOTE
- TCP 58 Princes Highway & Oliver St HEATHCOTE Cut Off 1045
- TCP 59 Princes Highway & Jennings Rd HEATHCOTE

SECTOR D

- TCP 60 Princes Highway & Waterfall Off Ramp WATERFALL
- * TCP 61 Waterfall Off Ramp & McKell Ave WATERFALL Cut Off 1115
- TCP 62 McKell Ave outside Waterfall Public School WATERFALL Cut Off 1130
- TCP 63 Sir Bertram Stevens Dr & Garie Road ROYAL NP
- * TCP 64 A McKell Ave & Lady Wakehurst Dr RNP
- TCP 64 B McKell Ave & Lady Wakehurst Dr RNP

SECTOR E

- TCP 65 Lady Wakehurst Dr & Dornville Ave OTFORD
- TCP 66 Dornville Rd & Otford Rd OTFORD
- TCP 67 Lady Wakehurst Dr & Otford Rd OTFORD
- * TCP 68 Lady Wakehurst Dr at Lawrence Hargrave Lookout STANWELL TOPS Cut Off 01330
- TCP 69 Lawrence Hargrave Dr & Stonehaven Rd STANWELL TOPS
- TCP 70 Lawrence Hargrave Dr & Otford Rd STANWELL TOPS
- TCP 71 Lawrence Hargrave Dr & Chellow Dene Ave STANWELL PARK
- TCP 72 Lawrence Hargrave Dr & Station St STANWELL PARK
- TCP 73 Lawrence Hargrave Dr & The Grove AUSTINMER
- TCP 74 Lawrence Hargrave Dr & Henley Rd THIRROUL
- TCP 75 Lawrence Hargrave Dr & The Esplanade THIRROUL
- TCP 76 The Esplanade & Cliff Pde THIRROUL
- TCP 77 Surfers Pde, Craig St & Hamilton Rd THIRROUL
- TCP 78 Hamilton Rd and Bike Path THIRROUL

SECTOR F

- TCP 79 Bike Path & Blackall St BULLI
- TCP 80 Trinity Row & Godolphin St BULLI
- TCP 81 Farrell Rd & Carrington St BULLI
- TCP 82 Carrington St & Campbell St WOONONA
- * TCP 83 Carrington St & Park Rd WOONONA
- TCP 84 Beach Rd & Dorrigo Ave WOONONA
- TCP 85 Dorrigo Ave & Railway Pde WOONONA
- TCP 86 Railway Pde & Harriet Sparring Dr WOONONA
- TCP 87 Pioneer Dr & Charlotte Harrison Dr WOONONA
- TCP 88 Pioneer Dr & Bellambi La BELLAMBI
- TCP 89 Pioneer Rd & Rothery St BELLAMBI
- TCP 90 Pioneer Rd, Railway St & Murray St EAST CORRIMAL
- TCP 91 Pioneer Rd & Towradgi Rd TOWRADGI
- TCP 92 A Carters La & Elliotts Rd FAIRY MEADOWS
- TCP 92 B Carters La & Elliotts Rd FAIRY MEADOWS

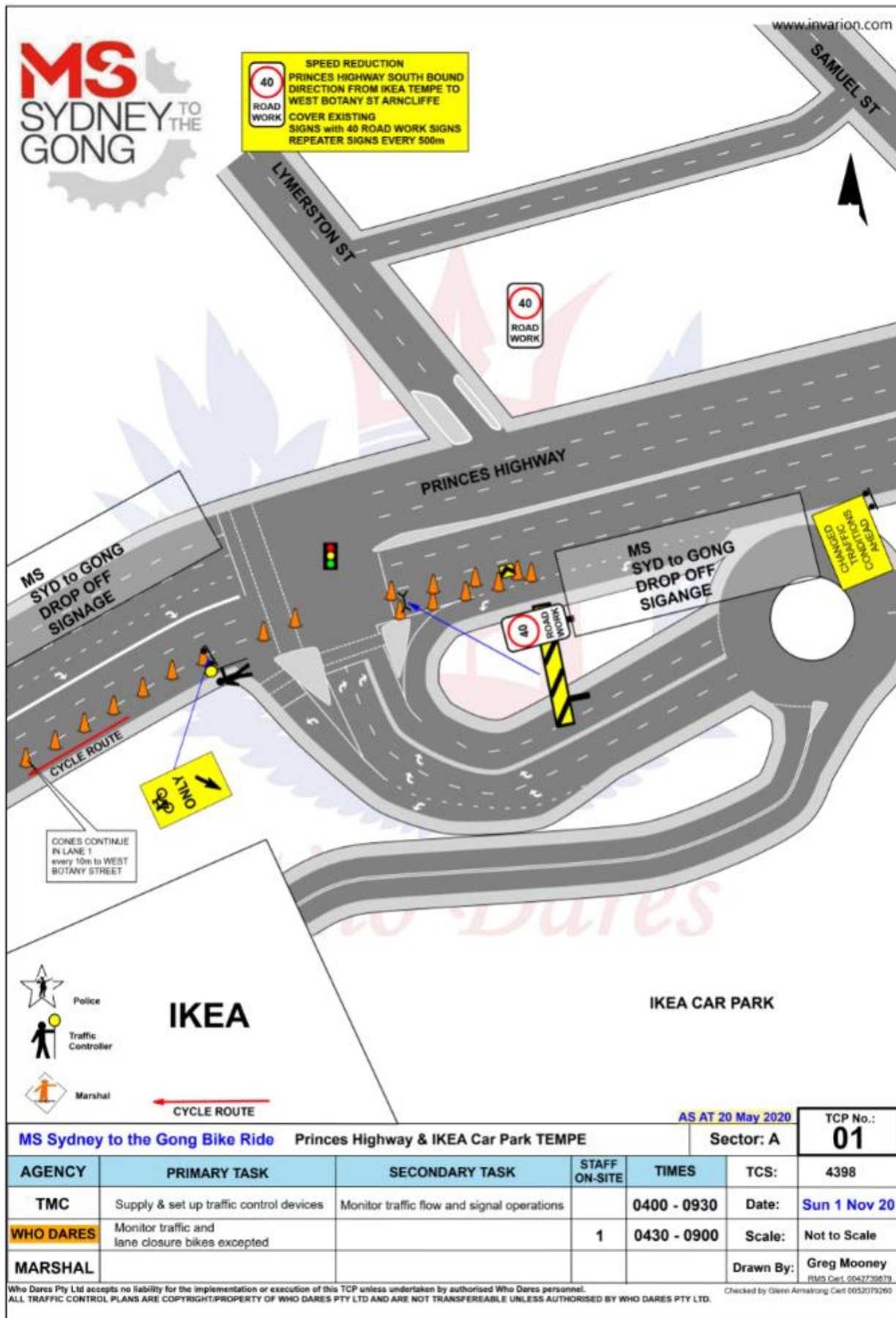
SECTOR G

- TCP 93 A George Hanley Dr & Kembla St NORTH WOLLONGONG
- TCP 93 B George Hanley Dr & Kembla St NORTH WOLLONGONG
- TCP 94 Kembla St & Bourke St NORTH WOLLONGONG
- TCP 95 Cliff Rd & Georges Place NORTH WOLLONGONG
- TCP 96 A Cliff Rd & Harbour St WOLLONGONG
- TCP 96 B Cliff Rd & Harbour St WOLLONGONG
- TCP 97 Corrimall St & Georges Pl WOLLONGONG
- TCP 98 A Cliff Rd & Marine Dr WOLLONGONG
- TCP 98 B Cliff Rd & Marine Dr WOLLONGONG
- TCP 98 C Cliff Rd & Marine Dr WOLLONGONG
- TCP 98 D Cliff Rd & Marine Dr WOLLONGONG
- TCP 99 Endeavour Dr Flagstaff Hill Park WOLLONGONG
- TCP 100 A Endeavour Dr & Boat Ramp WOLLONGONG
- TCP 100 B Endeavour Dr & Boat Ramp WOLLONGONG
- * TCP 101 A Crown St & Marine Dr WOLLONGONG
- TCP 101 B Crown St & Marine Dr WOLLONGONG
- TCP 102 Crown St & Harbour St WOLLONGONG
- TCP 103 Burrelli St & Corrimall St WOLLONGONG
- TCP 104 Burrelli St & Keira St WOLLONGONG
- TCP 105 Burrelli St & Station St WOLLONGONG
- TCP 105.1 Burrelli St & Station St WOLLONGONG
- TCP 106 Hinton St Robertson St & Old Court House Lane WOLLONGONG
- TCP 107 Elliotts Rd and Squires Way FAIRY MEADOW



NSW AMBULANCE STAGING AREA

AS AT 20 May 2020





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MS Sydney to the Gong Bike Ride KEA Car Park TEMPE

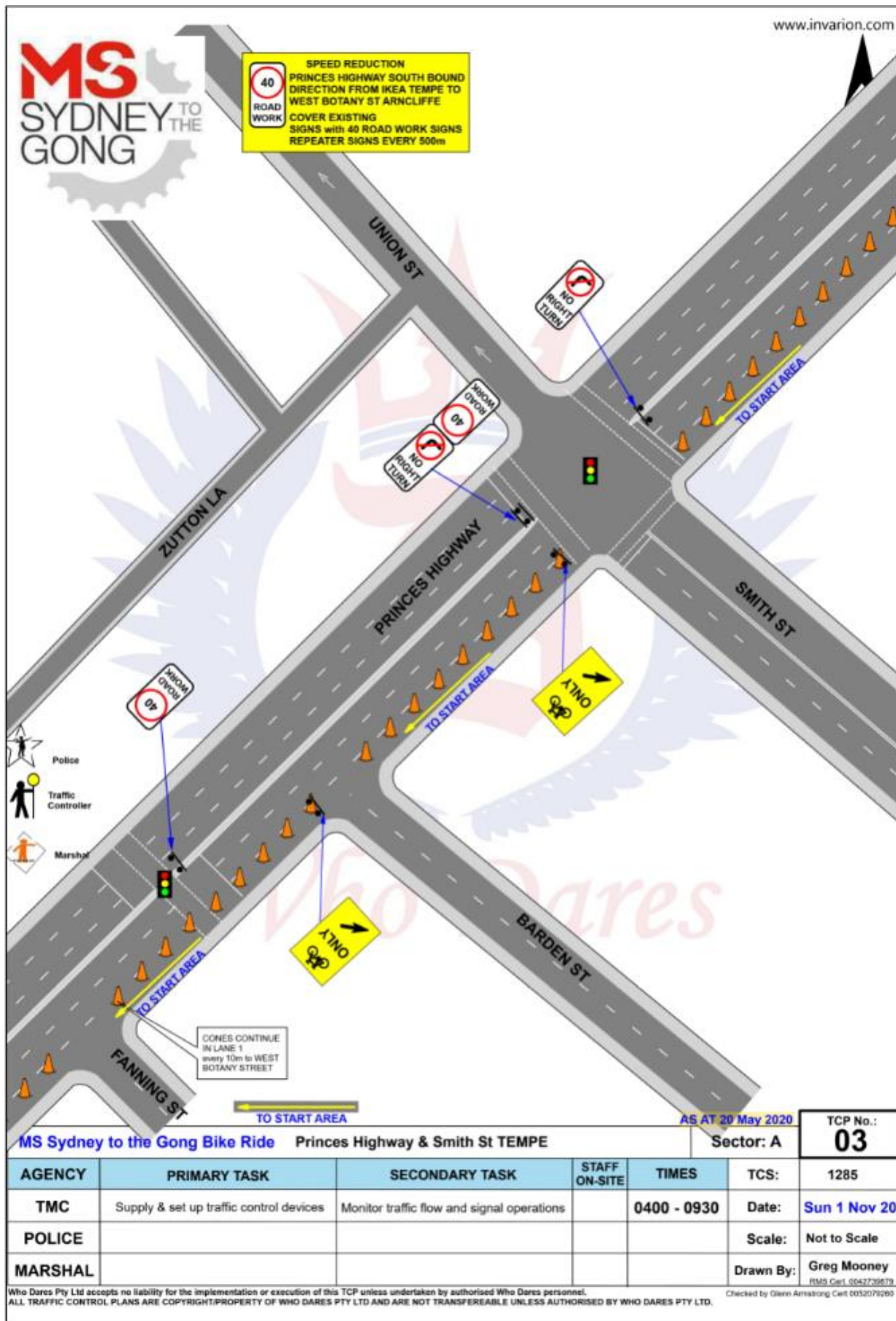
AGENCY	PRIMARY TASK	SECONDARY TASK	STAFF ON-SITE	TIMES	TCS:
TMC					Date: Sun 1 Nov 20
WHO DARES					Scale: Not to Scale
MARSHAL	TBC		TBC	0400 - 0930	Drawn By: Greg Mooney <small>RMS Cert. 0042728579</small>

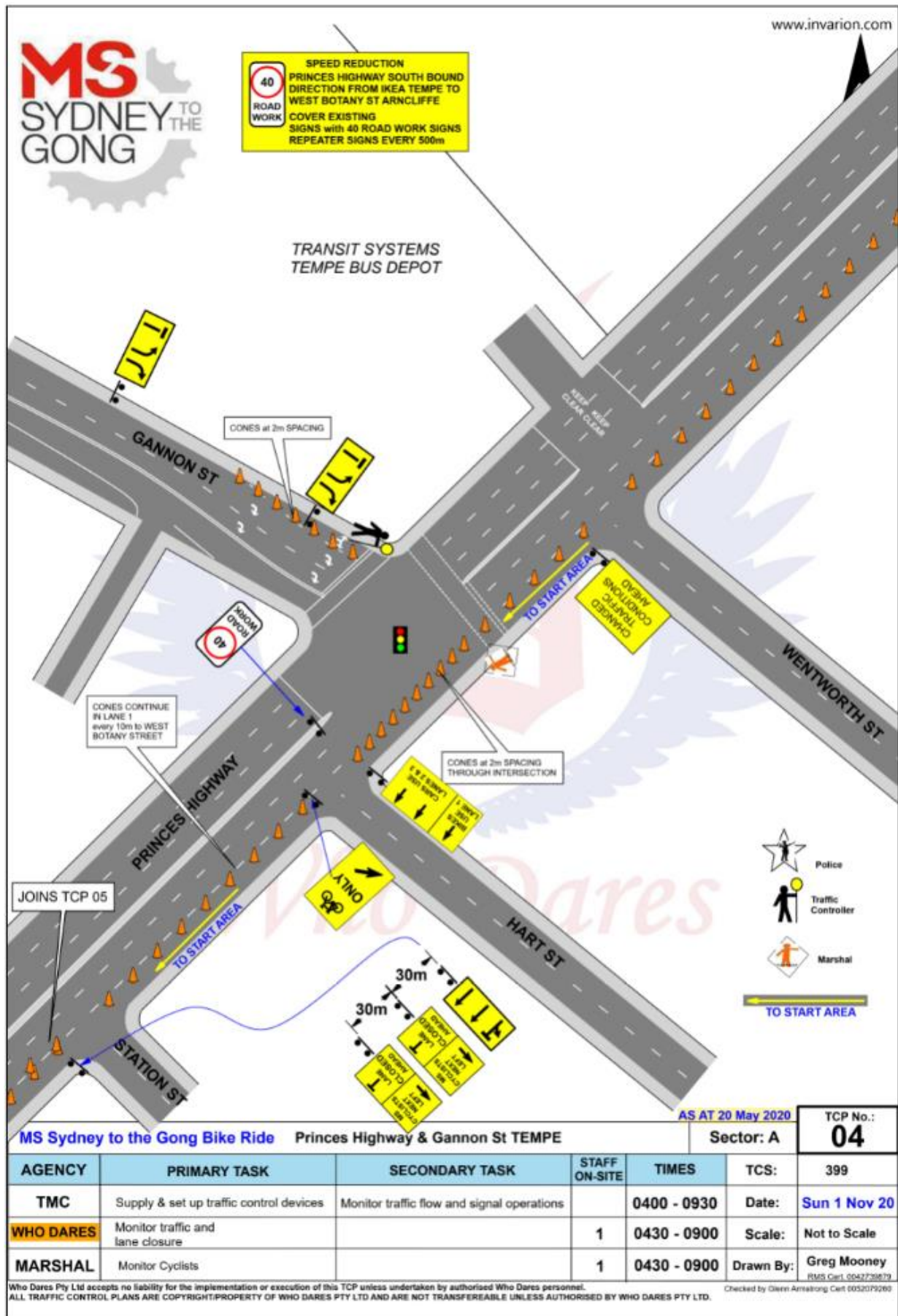
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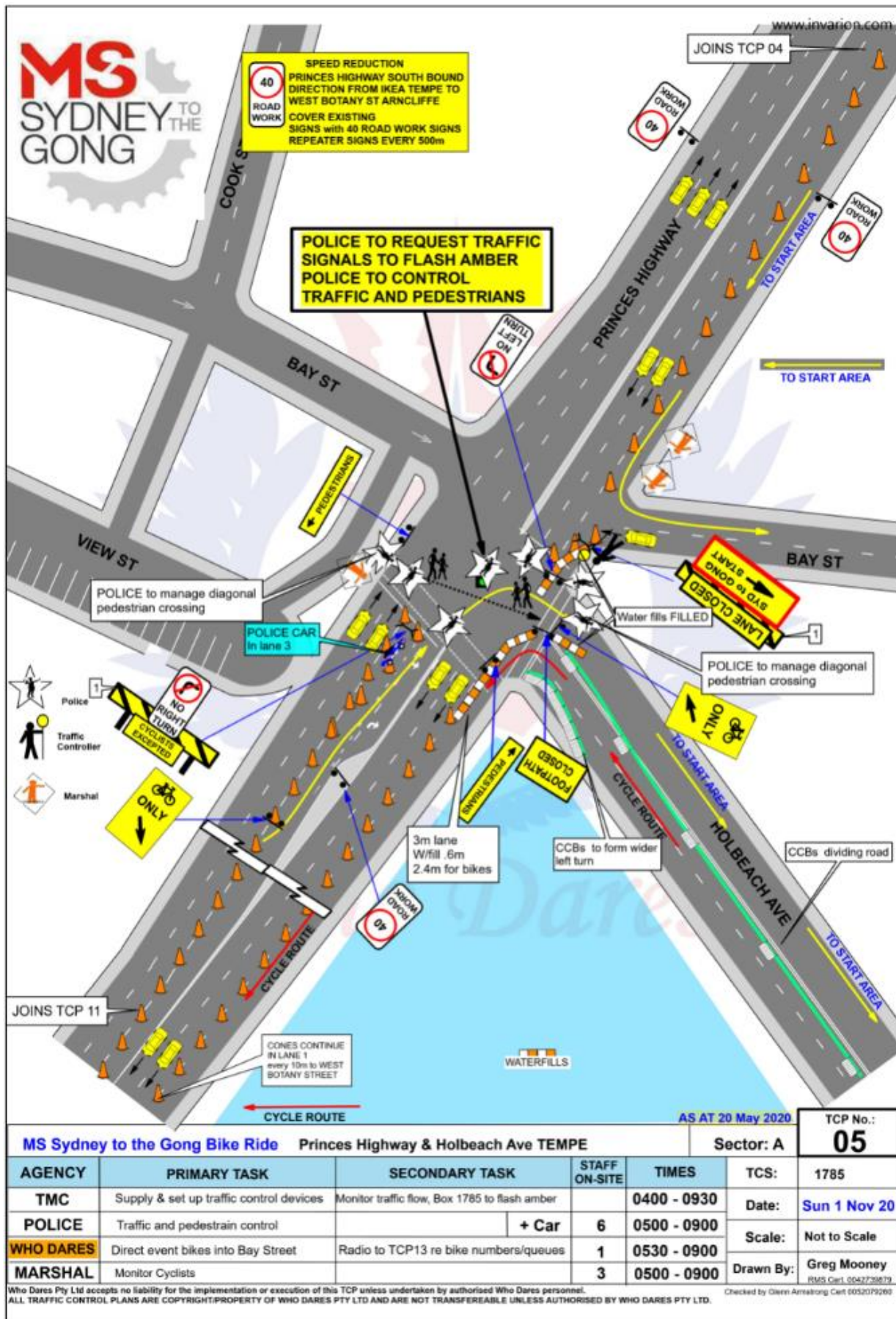
AS AT 20 May 2020

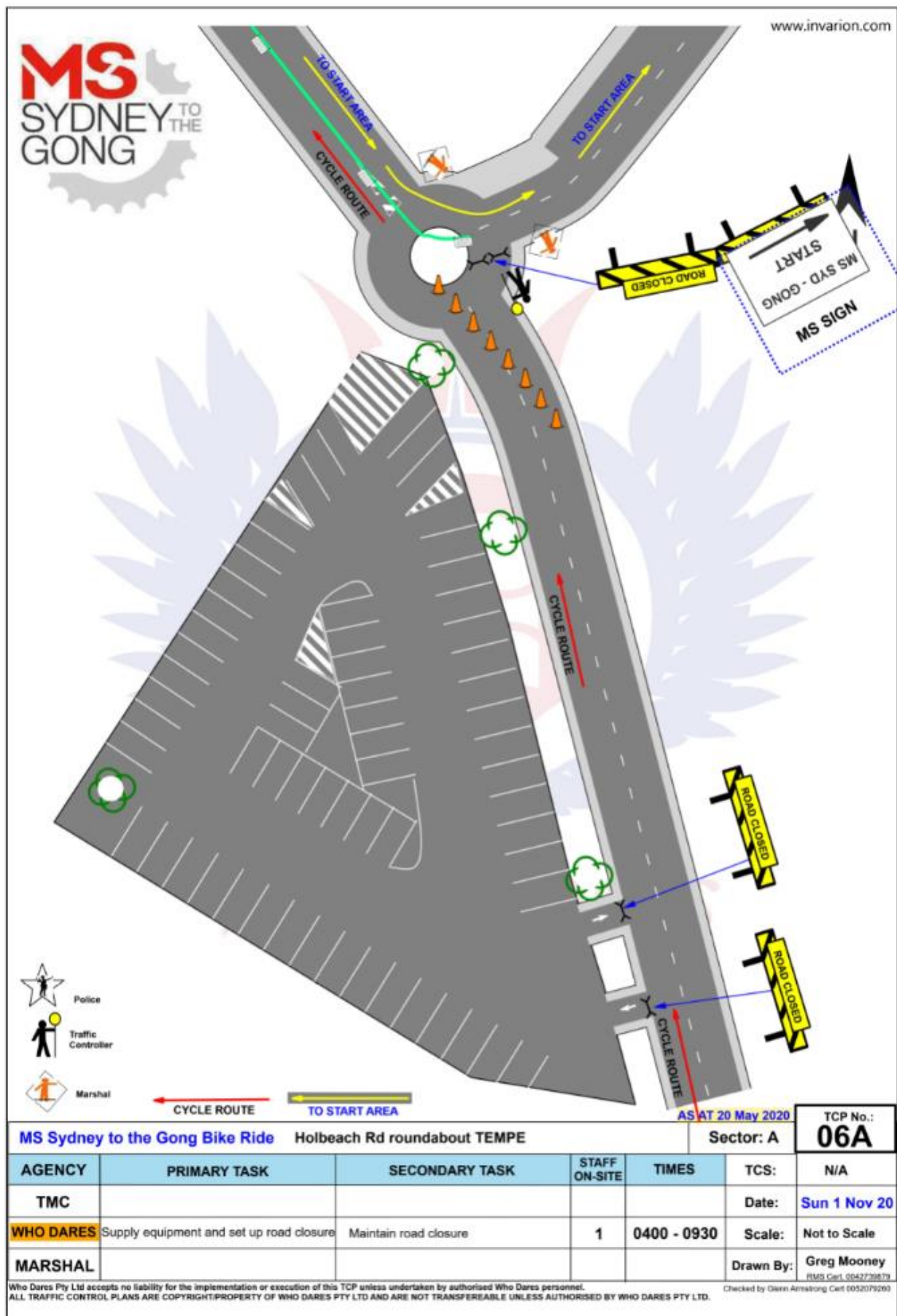
Sector: A	TCP No.: 02
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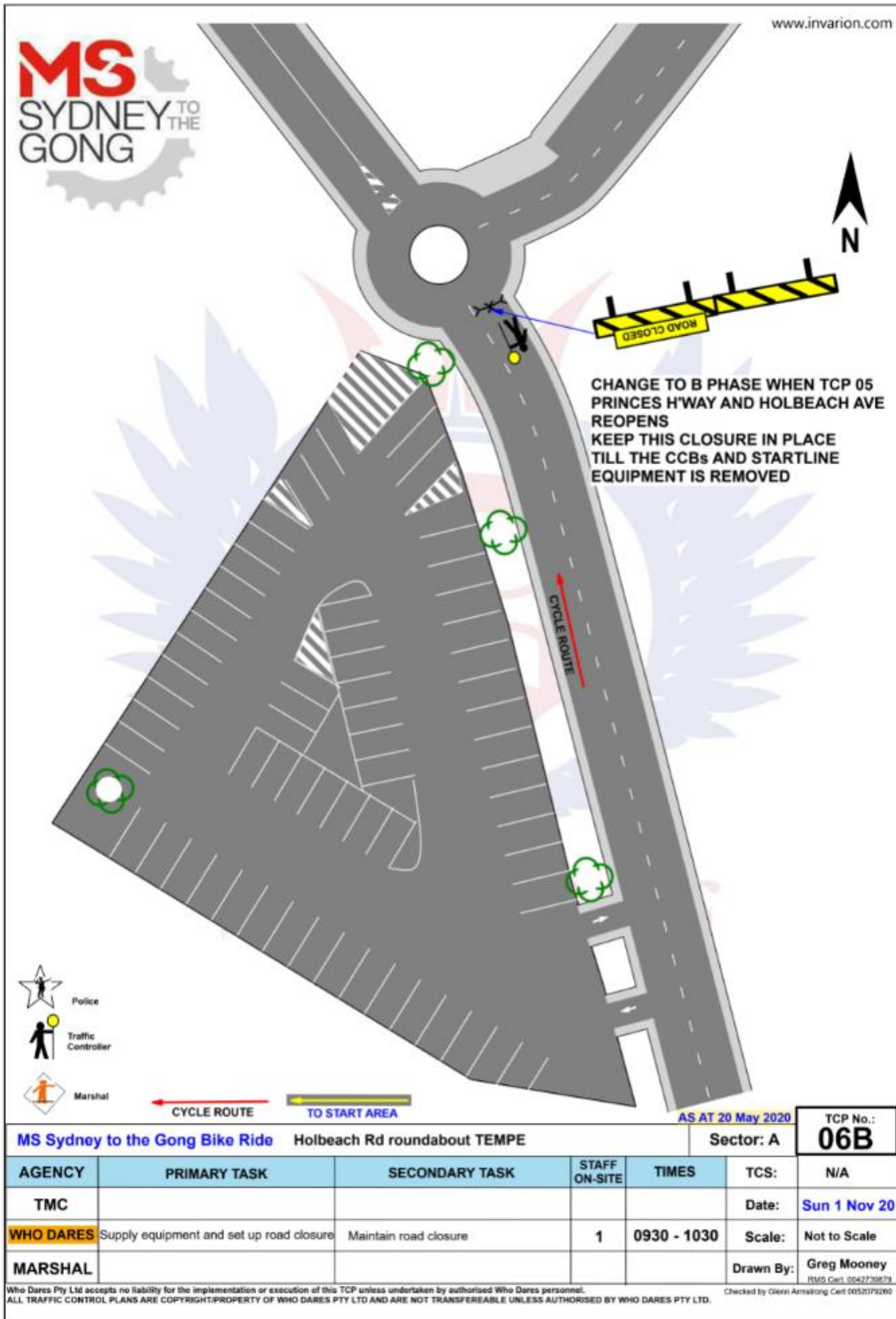
Checked by Glenn Amstrong Cert 6052079290

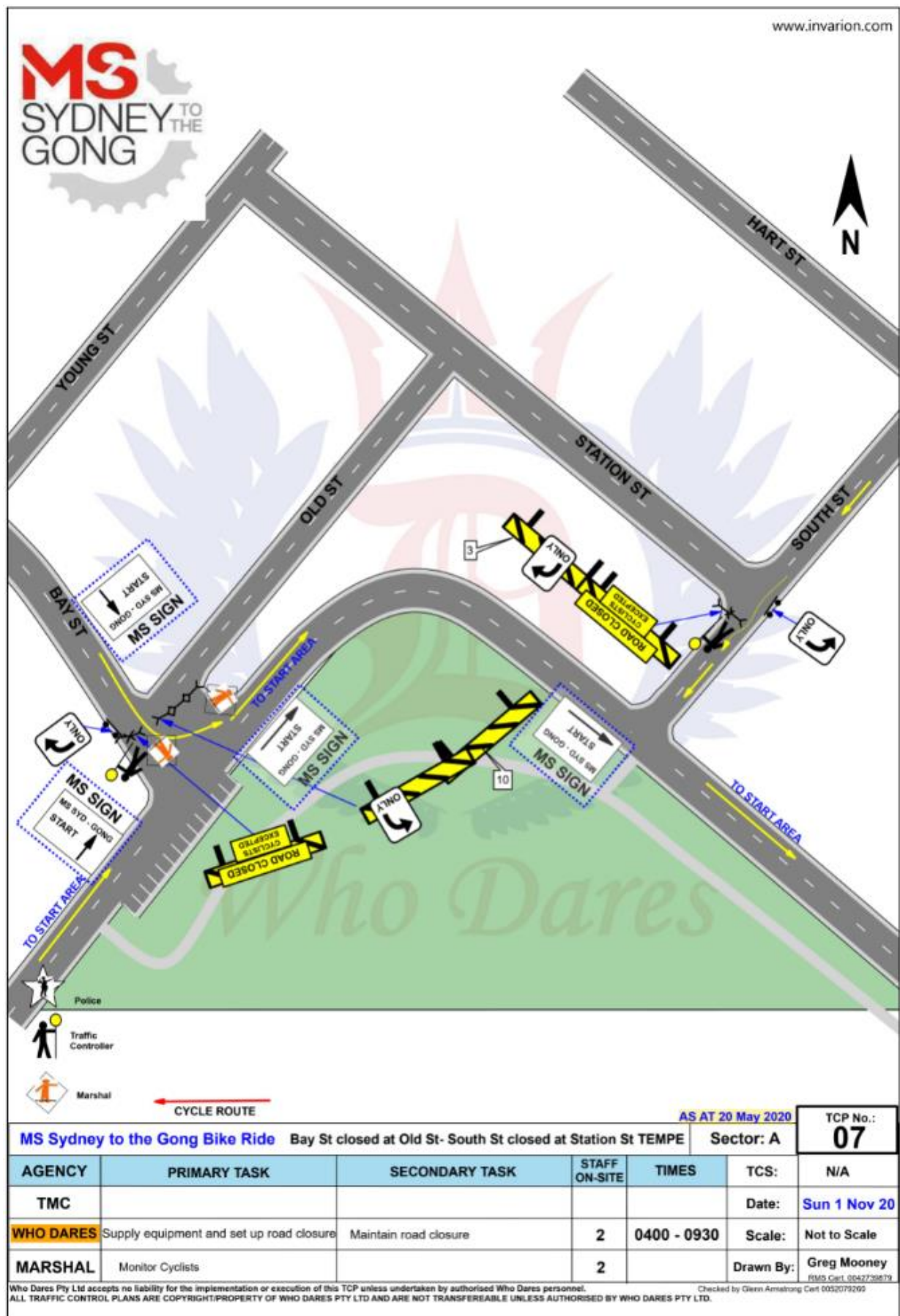


















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CYCLE ROUTE
AS AT 20 May 2020

TCP No.:
08

MS Sydney to the Gong Bike Ride				Tempe Recreation Reserve TEMPE		Sector: A	
AGENCY	PRIMARY TASK	SECONDARY TASK	STAFF ON-SITE	TIMES	TCS:		
TMC					Date:	Sun 1 Nov 20	
WHO DARES	Supply equipment and set up road closure	Maintain road closure	1	0400 - 0930	Scale:	Not to Scale	
MARSHAL					Drawn By:	Greg Mooney <small>RMS Cert. 0042738879</small>	


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Checked by Glenn Armstrong Cert 0052079209





START SITE LAYOUT (TBC)


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 Police

 Traffic Controller

 Marshal

 **CYCLE ROUTE**

AS AT 20 May 2020

TCP No.: **09**

MS Sydney to the Gong Bike Ride				Holbeach Ave Start Area Tempe Recreation Reserve TEMPE		Sector: A	09
AGENCY	PRIMARY TASK	SECONDARY TASK	STAFF ON-SITE	TIMES	TCS:	N/A	
TMC					Date:	Sun 1 Nov 20	
WHO DARES	Monitor traffic and lane closure bikes excepted		1	0500 - 0930	Scale:	Not to Scale	
MARSHAL					Drawn By:	Greg Mooney RMS Cert 0041739879	

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Checked by Glenn Armstrong Cert 0052079260

AS AT 20 May 2020						TCP No.: 10
MS Sydney to the Gong Bike Ride		Railway Stations to Tempe Recreation Reserve TEMPE			Sector: X	
AGENCY	PRIMARY TASK	SECONDARY TASK	STAFF ON-SITE	TIMES	TCS:	xxx
TMC					Date:	Sun 1 Nov 20
WHO DARES					Scale:	Not to Scale
MARSHAL	Monitor Cyclists		4	0500 - 0830	Drawn By:	Greg Mooney <small>0485 694 000/072000</small>



**Multiple Sclerosis Limited
39th MS Sydney to the Gong Ride**

Transport Management Plan

Sunday 1st November 2020

Who Dares

Version 20.1
20 May 2020

TRAFFIC PLANNERS
SAFETY CONSULTANTS

WHO DARES PTY LTD
SHED 8 / 1 CANAL ROAD
LEICHHARDT 2040
P.O. BOX 187
FIVE DOCK 2046

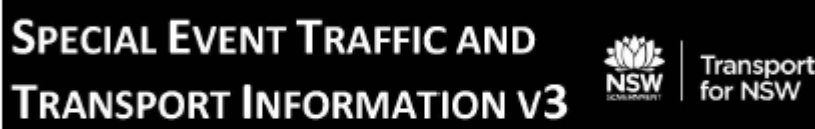
Ph 02 9569 9922
Fax 02 9569 9933

2020 MS SYDNEY TO THE GONG TMP

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ANNEX 6

SPECIAL EVENT TRAFFIC and TRANSPORT INFORMATION



MS SYDNEY TO THE GONG BIKE RIDE 2019

Date: Sunday 3 November 2019

Location: Tempe Recreational Park , Sydney to WA Lang Park, Wollongong

For 38 years, tens of thousands of cyclists have ridden the road in this bike ride from Sydney to Wollongong to raise funds for people living with multiple sclerosis.

Road closures, Lane Closures, Special Event Clearways and Speed Reductions will be in place along specific locations along the route from Sydney to Wollongong on Sunday 3 November 2019 for MS Sydney to the Gong Bike Ride

Police may restrict vehicle access along closed roads, including residents and businesses. Road and lane closures are found in four sectors along the route, with following times:

	Closures start from	Reopened by
Tempe – Sutherland	4am	10am
Sutherland - Waterfall	4am	11:30am
Royal National Park	5am	3pm
Wollongong	6am	4pm

The event has two separate start locations. The first is Tempe Recreation Reserve, Tempe, for the 82km full course route starting between 6am and 8.30am. The second is Cooper Street Reserve, Engadine for the 58km ride starting between 8am and 9am. The event finishes at WA Lang Park, Wollongong by 4pm.

Special Event Clearways will be in place from 4am to 3pm. Motorists, including RMS Mobility Pass Holders and motorcyclists are advised to check signs before parking as vehicles in special event clearways will be towed and fines apply.

Speed reductions and lane closures will also be in place along large sections of the route. Motorists are advised to exercise caution as cyclists will be sharing the road in some areas.

Patrons attending MS Sydney to the Gong Bike Ride are advised to use public transport as there will be very limited participant drop off areas at both start sites. For timetables, maps and trip planning visit www.transportnsw.info.

EVENT CONTACTS

Name: Bonnie Carr
Website: www.msongride.org.au
Contact Number: 0401 471 088

ROAD CLOSURES

Road closures affect both directions unless stated otherwise. Roads will be progressively reopened.

TEMPE TO BRIGHTON LE SANDS

FROM 4AM TO 10AM

TEMPE

Holbeach Avenue	Between Princes Highway and South Street (roundabout)
Tempe Recreational Reserve	Loop road and parking

ARNCLIFFE

West Botany Street	Between Princes Highway and Marsh Street	Southbound
--------------------	--	------------

KYEEMAGH

Bestic Street	Between Jacobson Avenue and General Holmes Drive	Eastbound
---------------	--	-----------

FROM 4AM TO 9:30AM

DOLLS POINT

Malua Street, Lane 1*	Between Sandringham Street and The Grand Parade	Northbound
-----------------------	---	------------

*Resident access to Sandringham Street and the Grand Parade via Napoleon Street

FROM 5:15AM TO 8AM

KYEEMAGH

Bestic Street*	Between West Botany Street and Francis Avenue	Eastbound
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* Closure will be implemented due to glare from rising sun

ROYAL NATIONAL PARK, WATERFALL

FROM 5AM TO 2PM

McKell Avenue	Between Kooraban Street and Sir Bertram Stevens Drive
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ROYAL NATIONAL PARK

FROM 5:30AM TO 2PM

Sir Bertram Stevens Drive	Between McKell Avenue and Garie Road
---------------------------	--------------------------------------

ROYAL NATIONAL PARK, OTFORD

Transport Management Centre | Major Events | Special Event Traffic & Transport Information

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FROM 9AM TO 4:30PM

Station Street	Between Auburn Street and Lowden Square	Westbound
Lowden Square	Between Station Street and Dean Street	Both directions

LANE CLOSURES

Lane closures will be progressively reopened following the event.

FROM 4AM TO 10AM

TEMPE TO WOLLI CREEK

Princes Highway, Lane 1 -	Between Ikea entry / exit and West Botany Road	Southbound
---------------------------	--	------------

BRIGHTON LE SANDS

The Grand Parade, Lane 1	Between Henson Street and President Avenue	Southbound
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SANS SOUCI TO TAREN POINT

Rocky Point Road, Lane 1	Between Fontainebleau Street and Taren Point Rd	Southbound
Taren Point Road, Lane 1	Between Rocky Point Road and Toorak Avenue	Southbound

FROM 5AM TO 9:30AM

ENGADINE

Cooper Street	Between Princes Highway and Old Princes Highway	Westbound
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FROM 4AM-11:30AM

KIRRAWEE, SUTHERLAND, LOFTUS, ENGADINE

Princes Highway, Lane 1	Between President Avenue (Kirrawee) and Farnell Avenue (Loftus)	Southbound
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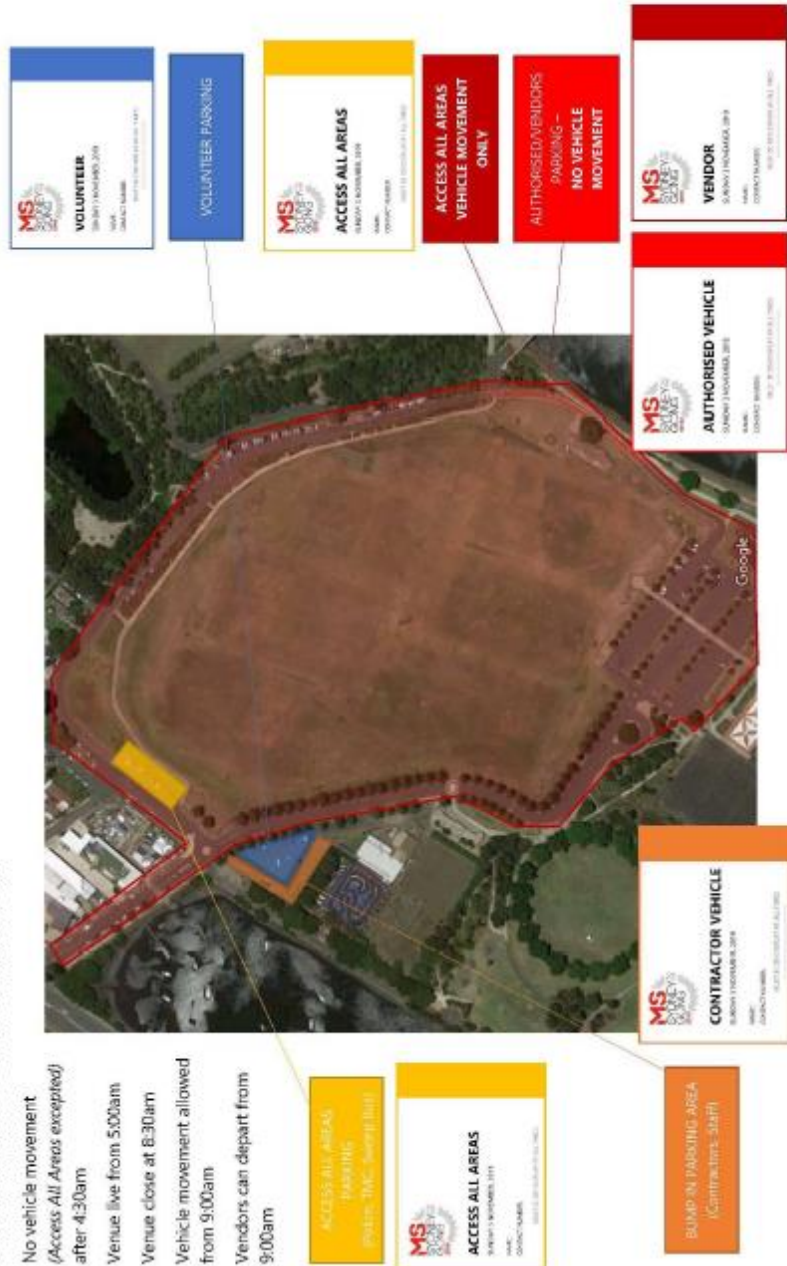
FROM 4AM-12:00PM

HEATHCOTE

Princes Highway, Lane 1	Between Heathcote Train Station carpark and Waterfall off ramp	Southbound
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TEMPE RECREATIONAL RESERVE PARKING PLAN

No vehicle movement
(Access All Areas excepted)
after 4:30am
Venue live from 5:00am
Venue close at 8:30am
Vehicle movement allowed
from 9:00am
Vendors can depart from
9:00am





2020 MS SYDNEY TO THE GONG TMP

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ATTACHMENTS

Nil.