



Memo

To: Willoughby City Council

From: Sharath Mahendran, Hayley Cavanagh and Ody Murlianto

Subject: **Hampden Road and Herbert Street Cycleway – Punch Street Intersection Traffic Management Plan**

Our ref: PS209600-PAM-MEM-TMP

Date: 22 July 2026

1. Introduction

The Hampden Road and Herbert Street Cycleway will deliver a dedicated north–south separated bicycle path, primarily along the eastern side of Herbert Street and Hampden Road. This new facility will create a continuous cycling link between Chatswood and St Leonards, promoting sustainable travel in the area.

As part of the project, Punch Street is proposed to be closed at Hampden Road and Herbert Street and transformed into the Punch Street Public Domain featuring seating, shade, and cyclist-friendly amenities, which will ensure strong placemaking outcomes. Punch Street also provides a link to the Gore Hill Freeway Cycleway. By removing traffic movements, the closure of Punch Street will enable a stronger, safer connection between the new and existing cycleways.

This closure is expected to impact the local road network, particularly Cleg Street, which would absorb the traffic movements previously turning into and out of Punch Street. This would also impact access arrangements for people travelling to and from Punch Street.

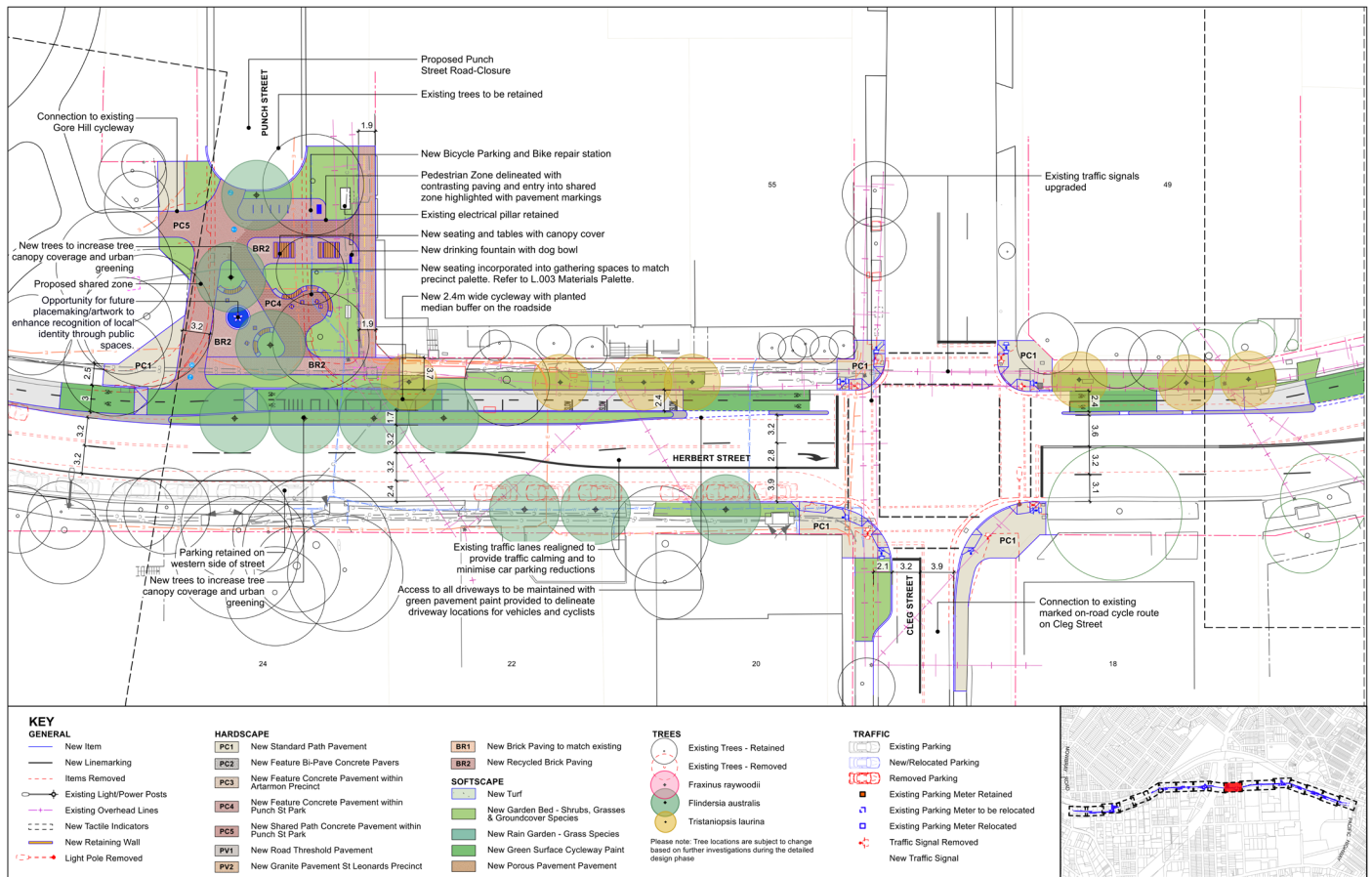
2. Purpose

The purpose of this Traffic Management Plan is to assess the impacts of the Punch Street closure on road network performance and access for walking, cycling, public transport and driving. This responds to Condition 3 of the Transport for NSW Authorisation and Delegation Instrument (TfNSW, 2025), which requires council to prepare a detailed report where a proposal *restricts or prohibits passage along a road of any persons, vehicles, or animals* for more than six months.

Level 27, 680 George Street
Sydney NSW 2000
GPO Box 5394
Sydney NSW 2001

Tel: +61 2 9272 5100
Fax: +61 2 9272 5101
www.wsp.com

WSP acknowledges that every project we work on takes place on First Peoples lands. We recognise Aboriginal and Torres Strait Islander Peoples as the first scientists and engineers and pay our respects to Elders past and present.



Source: SMM Urban Design Analysis and Concept Design Report, 2026

Figure 2.1 Concept design for Punch Street closure

3. Methodology

3.1 Scope of works

This study will assess the impact of the closure of Punch Street on the street network. To assess this, this study investigates how the closure of Punch Street will impact:

- Intersection performance at Cleg Street which would absorb the current turning movements in and out of Punch Street.
- Access to properties on and around Punch Street.
- Public and active transport access.

3.2 Data collection

In 2024, surveys were conducted along the corridor at key intersections such as Cleg Street / Herbert Street, which were anticipated to be completely re-designed as part of this core scope. This data was collected for seven days between Wednesday 29th May to Tuesday 4th of June 2024. Analysis of these survey results indicated that the peak in traffic volumes in this study area is experienced on Thursday 30th of May 2024, with the AM peak between 8:15-9:15am and the PM peak between 4:45-5:45pm.

However, the original survey did not include the Punch Street / Hampden Road / Herbert Street intersection. To address this gap, additional surveys were conducted by Trans Traffic Survey on Thursday, 6 November 2025, during the same peak periods (8:15–9:15 am and 4:45–5:45 pm) to align with the previously observed traffic peaks. For this study, turning movement data from this recent Punch Street survey has been combined with the earlier Cleg Street survey to assess the potential impact of the proposed changes on intersection performance.

3.3 SIDRA modelling and analysis

Intersection modelling to assess the impact of the proposed cycleway design was undertaken in SIDRA Intersection 9.1 (v6.228). SIDRA is an industry-recognised traffic engineering software and is suitable to assess the measurable intersection performance metrics relevant for the project including Level of Service (LOS), queue length and degree of saturation (volume/capacity). These metrics are outlined in Appendix A.

Access to Punch Street from Hampden Road and Herbert Street will be permanently removed, altering how vehicles access parking and businesses on this street in the future. Given the limited alternative access opportunities (refer to Section 5.3), for the purposes of this assessment it has been assumed that all movements turning into and out of Punch Street would be absorbed by the intersection of Cleg Street / Hampden Road / Herbert Street. To evaluate the impact of this on intersection performance, modelling was undertaken at Cleg Street / Herbert Street, for the morning and evening peaks on Thursday, using the combined data from the previous survey at Cleg Street in May 2024 and the recent survey from Punch Street in November 2025 (refer to Section 3.2). The modelling scenarios used to investigate this are listed below, assessed as per TfNSW's performance criteria included in Appendix A:

- AM and PM peak – existing demand and layout
- AM and PM peak – redistributed demand and proposed layout

4. Existing Conditions

4.1 Punch Street

Punch Street is currently a two-way local undivided road running east-west which measures approximately 200 metres long and has a speed limit of 50 km/h. It connects to Herbert Street at a priority-controlled intersection. The southern frontage has industrial warehouses, offices and retail with 13 driveways that lead to dedicated onsite parking and loading docks.

There are a total of 98 parking spaces available on Punch Street. The northern frontage of Punch Street has 90 degree angled parking bays – cars can also parallel park on the south side of Punch Street. There are a few car parking spaces signposted for people with disability and motorbike parking. A few spaces are timed 3P parking – the remainder are unrestricted.

The northern frontage also has the Gore Hill Cycleway and reserve – both ends of Punch Street link to the cycleway. The Gore Hill Cycleway runs mostly parallel to the Gore Hill Freeway, from Naremburn to Lane Cove.

There is only a footpath on the south side of Punch Street. No public transport routes run on Punch Street, however NightRide buses pass through the Punch Street / Hampden Road / Herbert Street intersection.

4.2 Cleg Street

Cleg Street is currently a two-way street which measures approximately 500 metres long. Cleg Street commences at a cul-de-sac just short of Reserve Road. It runs north-easterly to a signalised intersection with Herbert Street. All pedestrian movements are permitted at this intersection. Parking is not permitted on all approaches in the immediate vicinity (~50 m) of this intersection.

Cleg Street is undivided and unmarked. Cleg Street provides access to industrial warehouses, offices and recreational properties (including a swim school and gym). Properties are mostly 2-3 storeys with driveways, some parking, and loading docks. In addition, both sides of the road have parallel parking. Other than two small 3P zones and one small no stopping zone, parking is unrestricted.

Cleg Street terminates at a T-intersection with Lambs Road, from which traffic may turn left to access Punch Street. No public transport routes run on Cleg Street.

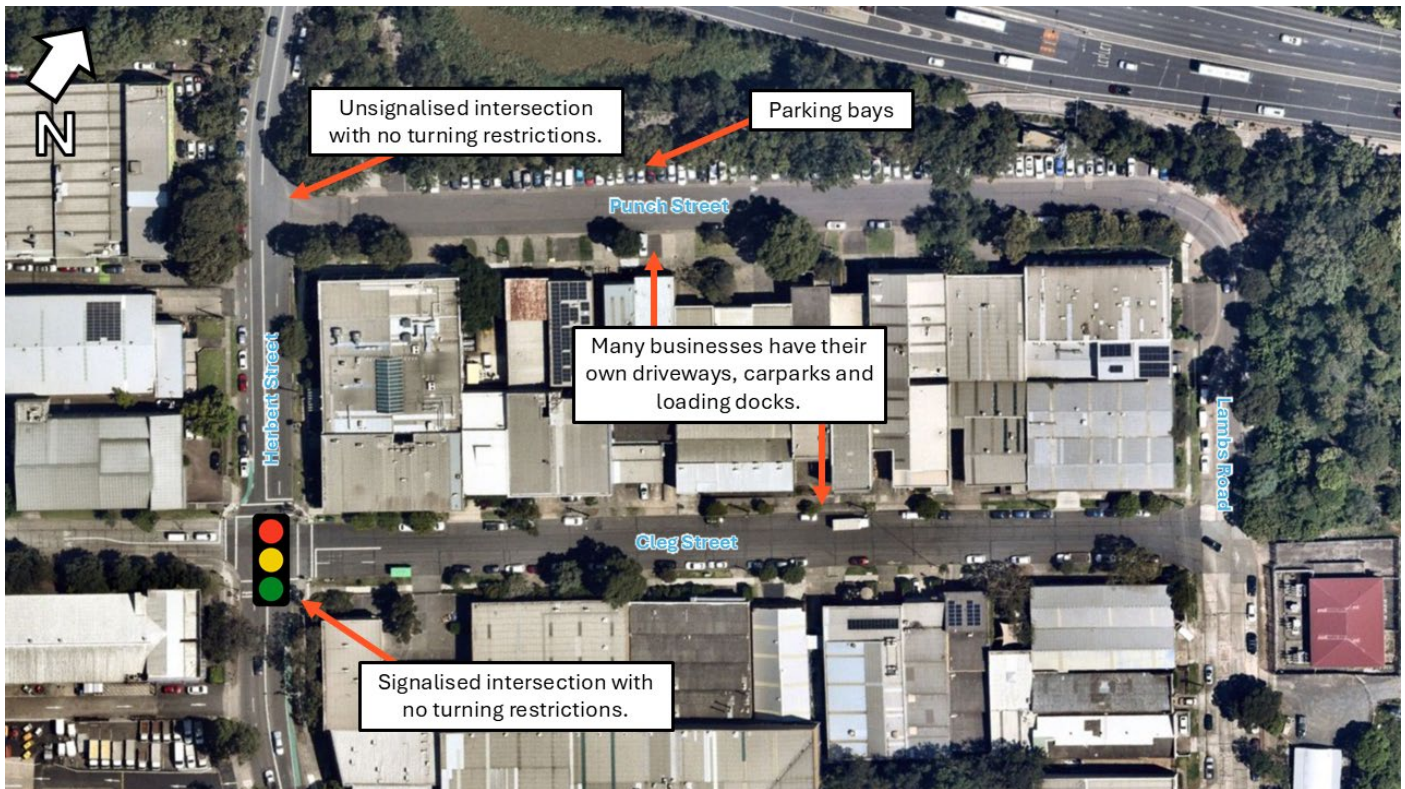


Figure 4.1 Existing context along Punch Street and Cleg Street

4.3 Intersection configuration, demand and performance

The key intersections being examined as part of this study include Punch Street / Hampden Road / Herbert Street and Cleg Street / Herbert Street.

Punch Street / Hampden Road / Herbert Street

This is a priority controlled, T-intersection, with the priority movement running north-south on Hampden Road / Herbert Street. There are no turn bans at this intersection, however the highest traffic volumes are experienced north-south along Hampden Road / Herbert Street, with a total intersection volume of 938 vehicles observed during the AM peak and 955 vehicles during the PM peak (refer to Figure 4.2 and Figure 4.3). Property access is slightly offset from the intersection, with the closest driveway approximately 20 metres to the east of the intersection on the southern side of Punch Street. A driveway is located just south of the intersection, directly opposite the Punch Street approach, providing access to a private business. There are no crossing facilities for pedestrians or cyclists at this intersection, with the expectation that they give way to general traffic.

Cleg Street / Herbert Street

The intersection of Cleg Street / Herbert Street is signalised, with two phases (A and B), operating separately for north-south and east-west movements respectively. Each approach consists of two lanes, accommodating combined through and turning movements, as no dedicated turning lanes are currently provided. Similarly to Punch Street / Hampden Road / Herbert Street, the heaviest demand is experienced in the north-south, with a total intersection volume of 1,274 vehicles observed during the AM peak and 1,064 vehicles observed during the PM peak. Property access is well offset from the intersection on all but the north approach, where there is a driveway to a private business immediately on the northbound side of Herbert Street. Pedestrian crossings are provided on all four legs of the intersection. North-south movements operate during Phase A, while east-west movements occur during Phase B. Each crossing connects seamlessly to the adjoining street footpaths.

Under existing conditions, intersection performance at Herbert Street Cleg Street is satisfactory, operating at LOS B and LOS A in the AM and PM peaks respectively (refer to Table 4.1).

Table 4.1 Cleg Street/Herbert Street intersection performance output

Scenario	DoS	Worst delay and approach	LOS	Worst 95 th Percentile Queue (m) and approach
AM peak existing conditions	0.452	29.1 sec (Cleg Street [W])	B	76.9 m (Herbert Street [N])
PM peak existing conditions	0.343	29.4 sec (Cleg Street [W])	A	46.5 m (Herbert Street [N])

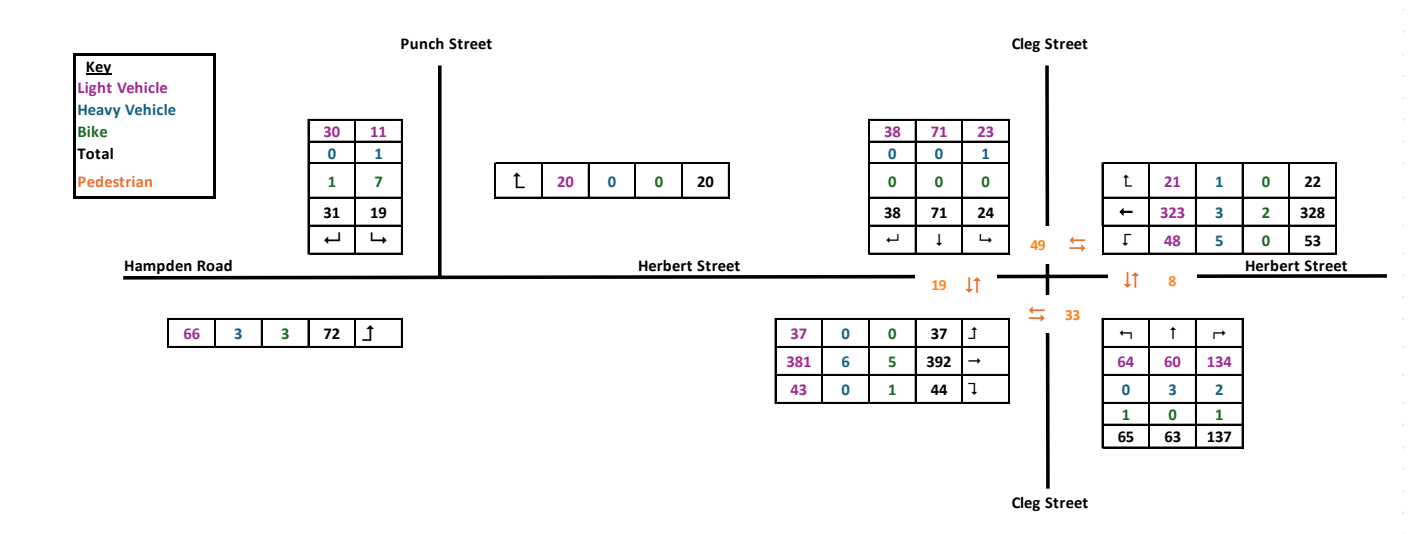


Figure 4.2 Weekday AM Peak (8:15am-9:15am) demand

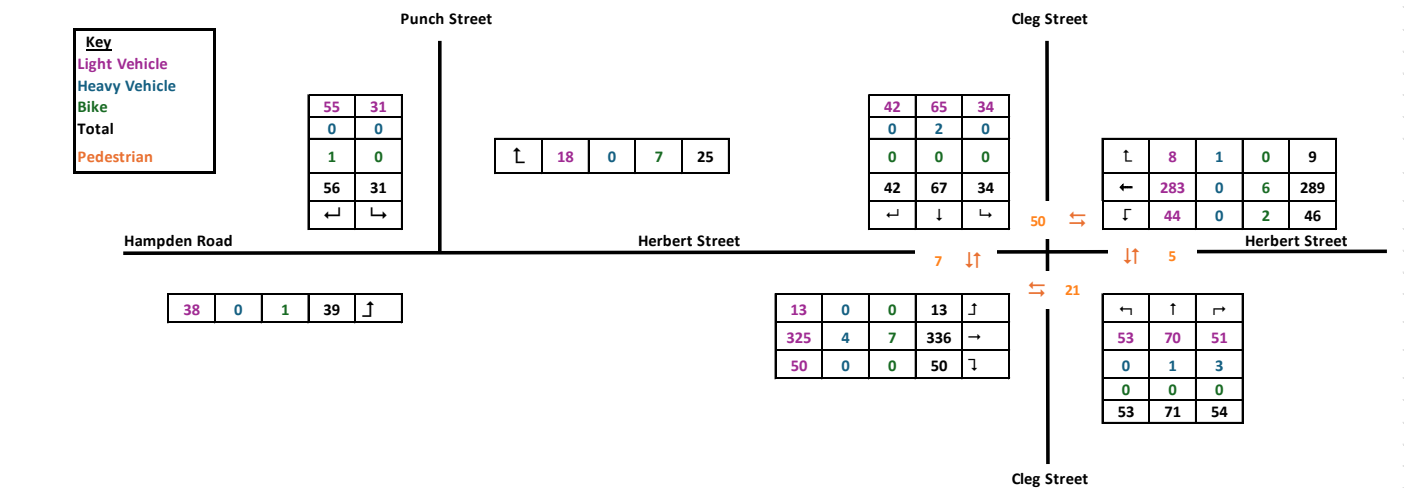


Figure 4.3 Weekday PM Peak (4:45pm-5:45pm) demand

5. Proposal and impact assessment

The proposal involves closing Punch Street at its junction with Hampden Road and Herbert Street and redeveloping it as the Punch Street Public Domain. This change will eliminate all traffic movements into and out of Punch Street. This is part of an effort to improve safety and enhance placemaking along the proposed Hampden Road and Herbert Street Cycleway corridor.

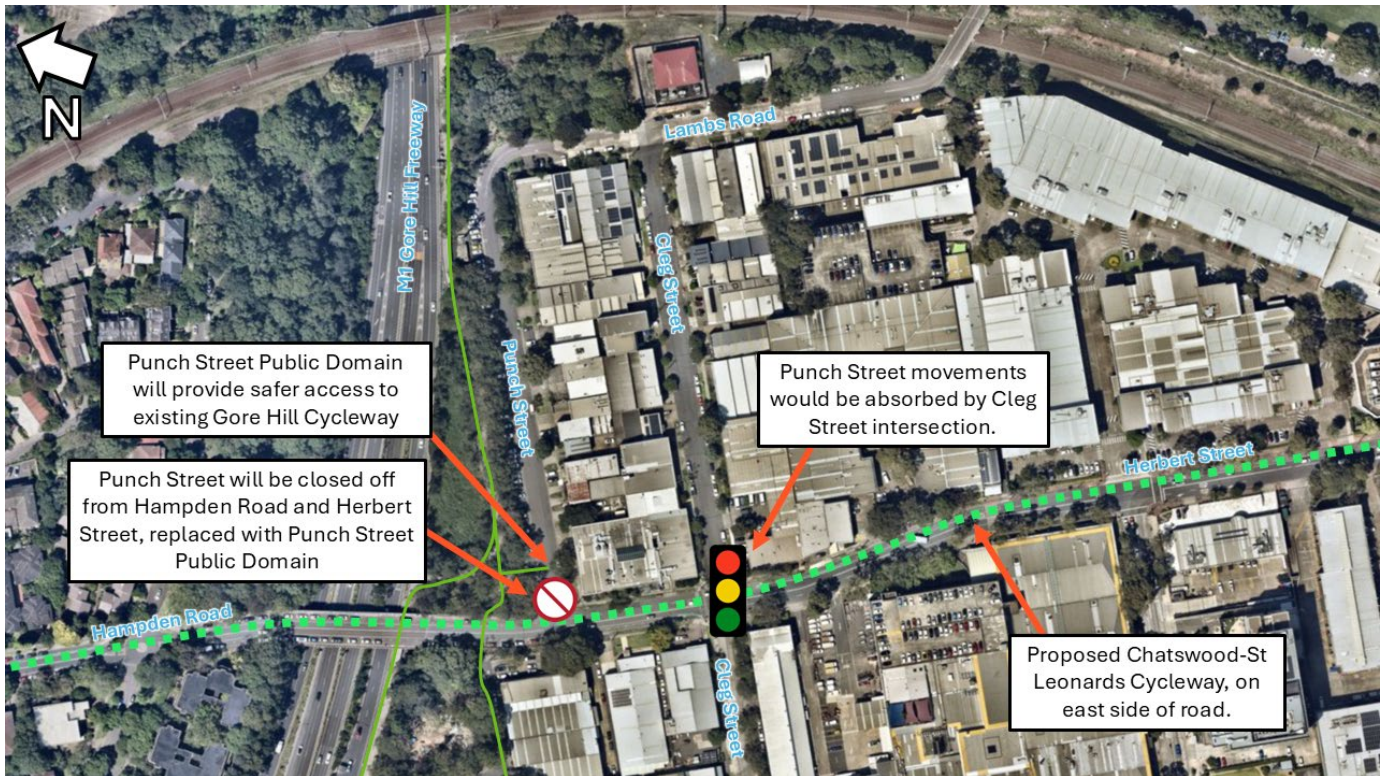


Figure 5.1 Context map of proposed changes to road network associated with the Chatswood-St Leonards Cycleway.

5.1 Impact on pedestrians

Closing Punch Street will reduce conflicts between cars and pedestrians crossing Punch Street on the east side of Hampden Road/Herbert Street, improving safety for pedestrians. Wider footpaths around the Punch Street Public Domain will create more space for walking, which will enhance comfort. This will encourage more journeys by foot, supporting sustainable journeys. The Punch Street Public Domain will provide seating, tables, greenery and a water fountain, making it a pleasant space for people to rest and meet with one another. This supports placemaking goals as part of the Hampden Road and Herbert Street Cycleway project.

Existing pedestrian crossings at the Cleg Street / Herbert Street intersection will be maintained at all legs. While changes to signal timings at this intersection may eventually be considered, as per Section 5.3.2, this has not formed part of the current assessment, and no changes are currently proposed.

5.2 Impact on cyclists

The closure will reduce conflicts between cars and cyclists on the proposed cycleway, by removing the need for the cycleway to cross traffic on Punch Street. This will improve safety for cyclists. The closure will provide space for a median buffer on the roadside of the cycleway which will also support cyclist safety.

Additionally, the Punch Street Public Domain creates space for a more direct connection between the proposed cycleway and the Gore Hill cycleway. A shared path and wide turning space will connect the two cycleways. This stronger interface will encourage more cyclists to use both paths, expanding routing options for cyclists and promoting sustainable journeys.

The Punch Street Public Domain provides a convenient resting space for cyclists. In addition, the space created allows for bicycle parking and a bike repair station to be installed.

5.3 Impact on vehicles

5.3.1 Trip redistribution

Closing Punch Street will require a redistribution of vehicle trips within the local road network. Trips that currently enter and exit Punch Street from the Punch Street / Hampden Road / Herbert Street intersection will be redistributed to the Cleg Street / Herbert Street intersection. The only alternate access to Punch Street is a circuitous route via Francis Street and Lambs Road, which is unsuitable for heavy vehicles servicing the industrial land use, given the 3-tonne load limit on the railway crossing on Lambs Road (refer to Figure 5.2). It is considered unlikely that any traffic redistributes via this route, and so it has not been modelled (see Section 5.3.2).

A cul-de-sac will be provided adjacent to the Punch Street Public Domain, to allow cars to perform a U-Turn. No driveways will be blocked by this project. There will be the loss of motorbike parking and an accessible parking space with this proposal – this will need to be offset by reallocating one standard parking space, or otherwise. A separate parking study is being conducted for the entire Hampden Road and Herbert Street Cycleway, to ascertain the most suitable response.

The closure of Punch Street results in the Cleg Street / Herbert Street intersection receiving more entering and exiting traffic. The intersection with the redistributed trip volumes are modelled in Section 5.3.2.

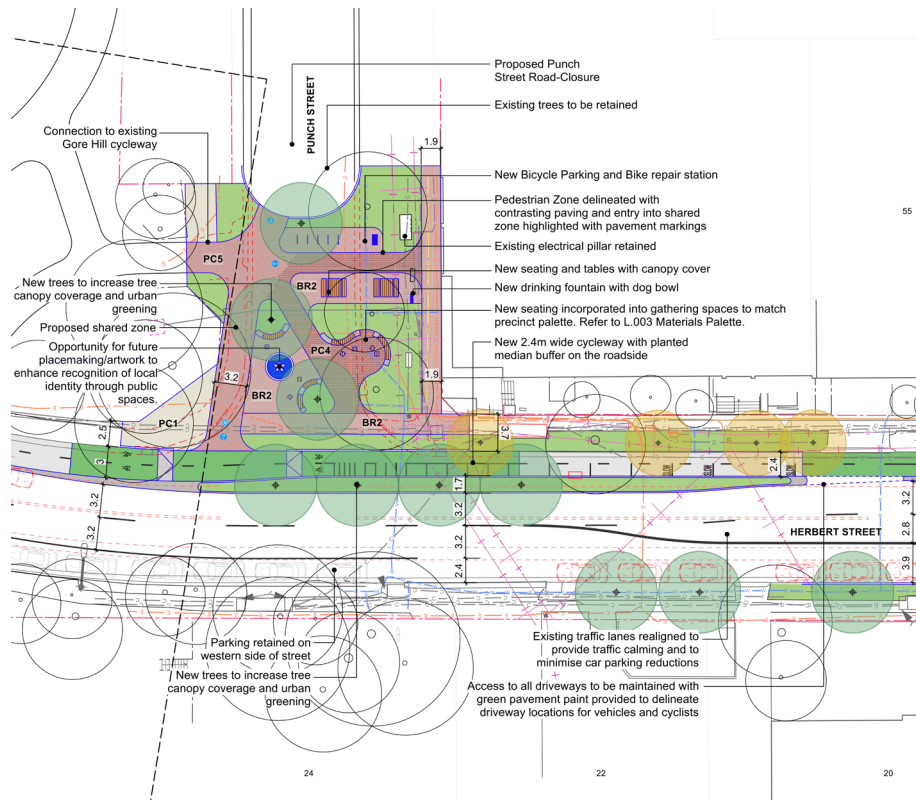


Figure 5.2 Map showing new primary and secondary access routes into Punch Street

5.3.2 Proposed intersection configuration, demand and performance

Punch Street / Hampden Road / Herbert Street

Punch Street will now end at a dead-end cul-de-sac, with through movements no longer allowed to and from Herbert Street. The leftmost left-through lane of the Herbert Street north approach will be removed, to make way for the cycleway. The proposed layout, as per Figure 5.3, will support the cycleway by removing conflicts between cyclists and Punch Street traffic, ensuring cyclist safety.



Source: SMM Urban Design Analysis and Concept Design Report, 2026

Figure 5.3 Concept design for Punch Street closure

Cleg Street / Herbert Street

The layout for the Cleg Street / Herbert Street intersection will only see minimal changes from its existing layout. The leftmost lane, which is currently a left-through lane, will be removed and replaced with the cycleway. All existing turn movements will be maintained. This is except for the left turn from the Cleg Street east approach onto Herbert Street, where heavy vehicles will be banned from turning.

The redistribution of traffic volumes is summarised in Figure 5.4 and Figure 5.5. For these figures, it has been assumed that all traffic movements associated with Punch Street will be absorbed accordingly into the Cleg Street intersection volumes – the primary access route, as highlighted in Figure 5.6. Left turns for heavy vehicles have been banned from Cleg Street westbound onto Herbert Street southbound. Any existing heavy vehicle movements onto Herbert Street southbound – from both Punch and Cleg Streets – are assumed to instead continue straight through the Cleg Street intersection.

With the closure of Punch Street, intersection performance metrics for Cleg Street / Herbert Street have changed, which are detailed in Table 5.1.

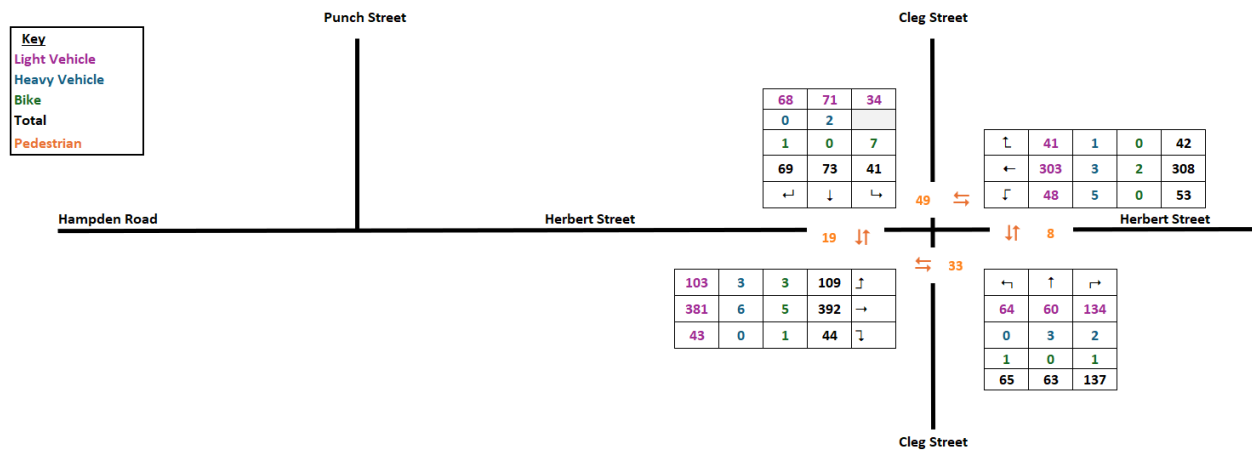


Figure 5.7 Future weekday AM Peak (8:15am-9:15am) demand

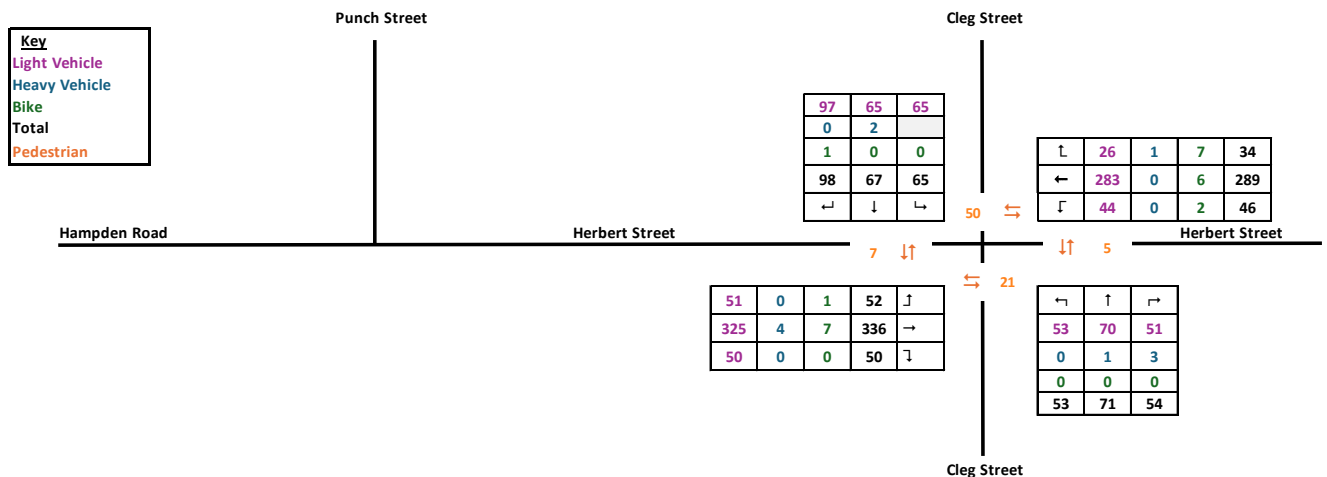


Figure 5.8 Future weekday PM Peak (4:45pm-5:45pm) demand

Table 5.2 Cleg Street/Herbert Street future intersection performance output

Scenario	DoS	Worst delay and approach	LOS	Worst 95 th Percentile Queue (m) and approach
AM peak existing conditions	0.452	29.1 sec (Cleg Street [W])	B	76.9 m (Herbert Street [N])
AM peak future conditions	0.877	59.8 sec (Cleg Street [E])	C	172.9 m (Herbert Street [N])
PM peak existing conditions	0.343	29.4 sec (Cleg Street [W])	A	46.5 m (Herbert Street [N])
PM peak future conditions	0.752	50.9 sec (Cleg Street [E])	C	107.4 m (Herbert Street [N])

Intersection performance metrics have degraded from existing conditions, but remain within acceptable ranges. While the degrees of saturation have increased, they remain below 0.90, which is indicative of satisfactory operation as per TfNSW guidelines. The longest forecasted queue is 172.9 metres on the Herbert Street north approach – no driveways or intersections will be affected as there are none on this approach within this distance.

The Level of Service has dropped to LOS C for both peaks – this means that while the ability to manoeuvre has declined, the intersection is still performing within the zone of stable flow. The modelled result does not indicate an over-capacity condition, and the intersection is expected to continue operating satisfactorily.

Post-implementation monitoring is advised, to assess the impacts of the project and confirm performance. If delays and queuing prove to be higher than forecast, signal timing adjustments and phase optimisation may be considered in consultation with TfNSW.

It should be noted that the model is conservative as it assumes all existing Punch Street movements will be transferred to Cleg Street. In practice, the Punch Street closure may lead to behavioural changes that reduce total movements, which could lead to better performance. With that said, recommendations have been made based on conservative modelling.

5.4 Impacts on heavy vehicles

Access arrangements for heavy vehicles will be impacted similarly to general traffic, accessing Cleg Street to enter / exit Punch Street. However, the proposed concept design requires a left turn ban for heavy vehicles (over 8.8 m long) at the Cleg Street East approach into Herbert Street South (as indicated in Figure 5.7 and Figure 5.8 and examined in more detail in the *Hampden Road and Herbert Street Cycleway: Traffic Impact Assessment*). Consequently, heavy vehicles that previously turned left from Punch Street onto Herbert Street southbound will now need to travel via the Cleg Street / Herbert Street intersection and navigate the local street network, using Waltham Street, Taylor Lane, Reserve Road, and Frederick Street, to reconnect with Herbert Street (as indicated in Figure 5.9).



Figure 5.9 Alternative access for Cleg Street left turn ban

This redirection will involve following a complex route, and it is expected to increase journey times for affected heavy vehicles by four minutes (according to Google Maps). However, as per Section 5.3.2, only seven heavy vehicles are forecast to perform this banned movement in the AM peak, and none in the PM peak. Accordingly, the redistribution of heavy vehicles onto new streets is expected to have minimal impacts on the traffic, road quality, safety and amenity of these streets.

5.5 Impacts to emergency access vehicles

Emergency vehicle access to properties on Punch Street will be maintained via the revised access arrangements from Cleg Street. The proposed closure does not restrict emergency service access to surrounding properties or the local road network.

5.6 Changes to signage

Permanent signage will be installed as per Figure 5.10, including shared path signage. Updates to wayfinding signage will be made to relevant cycling signs, such as the Gore Hill Cycleway. Existing signage will be removed where necessary, including No Stopping signs no longer on Punch Street.

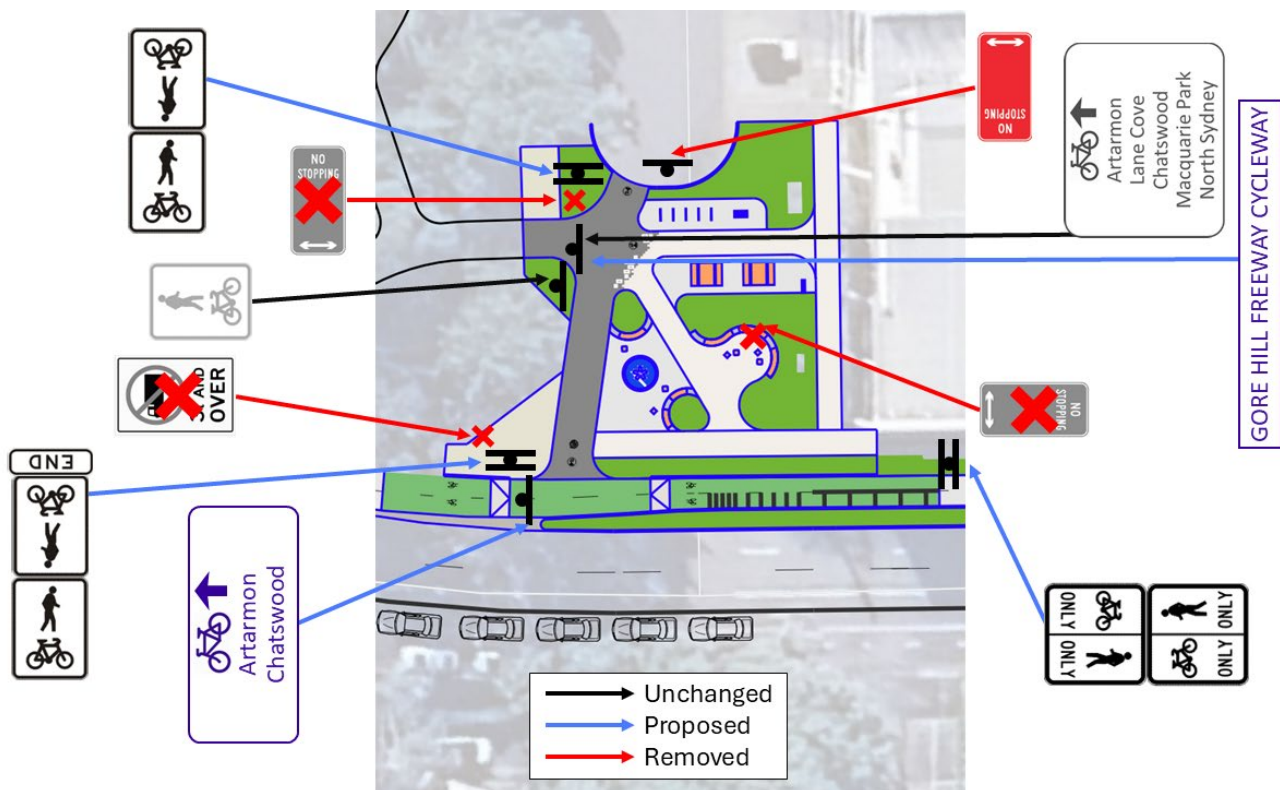


Figure 5.10 Map showing signage that will be installed, removed and remain unchanged at site

5.7 Need for community engagement

Closing Punch Street will alter road and parking access arrangements and intersection performance at the intersection of Cleg Street / Herbert Street. These changes will affect local residents and businesses in the area, particularly businesses on Punch Street. Community engagement for this project will be guided by [Willoughby City Council's Community Engagement Policy](#) which commits to “actively seek views that are representative of the community to participate in decisions that affect them,” ensuring our process is inclusive, timely, and responsive to local needs.

Willoughby City Council will develop a Communication and Engagement Plan that will guide how the community is consulted, and how their concerns will be addressed. Engaging the community early will ensure that they understand changes to access and parking, staging of construction, and impacts to businesses and residents. This will also provide Willoughby City Council with the opportunity to communicate the project benefits and transport management strategies, providing assurance that the cycleway will be built with the community kept informed throughout delivery.

6. Mitigation Measures

The potential impacts and mitigation measures are summarised in Table 6.1 below.

Table 6.1 Mitigations and measures for management

Impact type	Measures
Traffic redistribution	It is expected that most vehicles that normally enter/exit Punch Street will re-route via Cleg Street to reach their destination. Modelling in SIDRA shows that despite some degradation in the performance of the Herbert Street / Cleg Street intersection, parameters are expected to remain acceptable. Post-implementation monitoring is advised, to assess the impacts of the project and confirm performance. If delays and queuing prove to be higher than forecast, signal timing adjustments and phase optimisation may be considered in consultation with TfNSW.
Changes to access arrangements	The closure of Punch Street will change access arrangements to properties on Punch Street. To manage impacts, affected residents and businesses would be notified of the access changes prior to construction. Community consultation will gather feedback regarding the proposed changes, helping to ensure new arrangements are sufficient. The effects of this change should be reviewed as part of ongoing monitoring.
Loss of parking	Two parking spaces will be lost as part of this closure. A detailed Parking Study is being undertaken separately to this report in relation to the entire Hampden Road and Herbert Street Cycleway. This study includes: — Comprehensive parking utilisation surveys across weekdays and weekends for the corridor, surrounding street network, and off-street parking areas. — Mitigation measures developed from reviewing existing parking availability and adjusting parking restrictions to support higher turnover where required. — Redesign of on-street parking on adjacent local streets to improve space efficiency and offset some of the parking loss by creating additional parking opportunities.

7. Conclusions & Recommendations

The study has undertaken an analysis on the issues and potential mitigation measures that should be considered for the closure of Punch Street. The findings of the study thus far are as follows:

- Closing Punch Street will shift most traffic movements to Cleg Street, which will become the primary access point for motorists who previously entered and exited Punch Street. Clear signage and communication will be necessary.
- Performance of the Herbert Street / Cleg Street intersection is expected to remain within acceptable limits, with only minor degradation in performance. If post-implementation monitoring identifies a materially significant delay, signal timing optimisation may be considered in consultation with TfNSW.
- Minor loss of parking is associated with construction of the Punch Street Public Domain, which will need to be offset appropriately
- Outcomes for pedestrians and cyclists will improve through the creation of the Punch Street Public Domain and a direct connection between the new cycleway and existing Gore Hill Cycleway. This will encourage sustainable journeys in the area.

Appendix A Intersection Performance Assessment Criteria

A.1 Level of Service

Level of Service (LoS) is a basic performance parameter used to describe the operation of an intersection. Levels of Service range from A (indicating good intersection operation) to F (indicating over-saturated conditions with long delays and queues). At signalised intersections, the LoS criteria are related to average intersection delay (seconds per vehicle). At priority controlled (give-way and stop controlled) and roundabout intersections, the LoS is based on the modelled delay (seconds per vehicle) for the most delayed movement. The Transport for NSW LoS criteria for intersections which has been followed is shown in Table A.1.

Table AA.1 Level of Service criteria for intersections

Level of Service	Average Delay (seconds per vehicle)	Traffic signals, roundabout	Give-way and stop signs
A	Less than 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Operating near capacity	Near capacity and accident study required
E	57 to 70	At capacity. At signals, incidents would cause excessive delays. Roundabouts require other control mode.	At capacity, requires other control mode
F	Greater than 70	Unsatisfactory with excessive queuing	Unsatisfactory with excessive queuing; requires other control mode

Source: *Guide to Traffic Generating Developments (Transport for NSW, 2002)*

A.2 Degree of Saturation

The Degree of Saturation (DoS) is the ratio of demand flow to capacity, and therefore has no unit. As it approaches 1.0, extensive queues and delays could be expected. For a satisfactory situation, DoS should be less than the nominated practical degree of saturation, usually 0.9. The intersection DoS is based on the movement with the highest value.

According to Austroads, in practice, the target degrees of saturation (known as practical degree of saturation) for signal, roundabout and priority-controlled intersections are 0.90, 0.85 and 0.80 respectively.

A.3 Average Vehicle Delay

This is the difference between interrupted and uninterrupted travel times through the intersection and is measured in seconds per vehicle. At signalised intersections, the average intersection delay is usually reported. At roundabouts and priority-controlled intersections, the average delay for the most delayed movement is usually reported.

A.4 Queue length

Queue length is measured in metres reflecting the number of vehicles waiting at the stop line and is usually quoted as the 95th percentile back of queue, which is the value below which 95 per cent of all observed queue lengths fall. It reflects the number of vehicles per traffic lane at the start of the green period, when traffic starts moving again after a red signal. The intersection queue length is usually taken from the movement with the longest queue length.