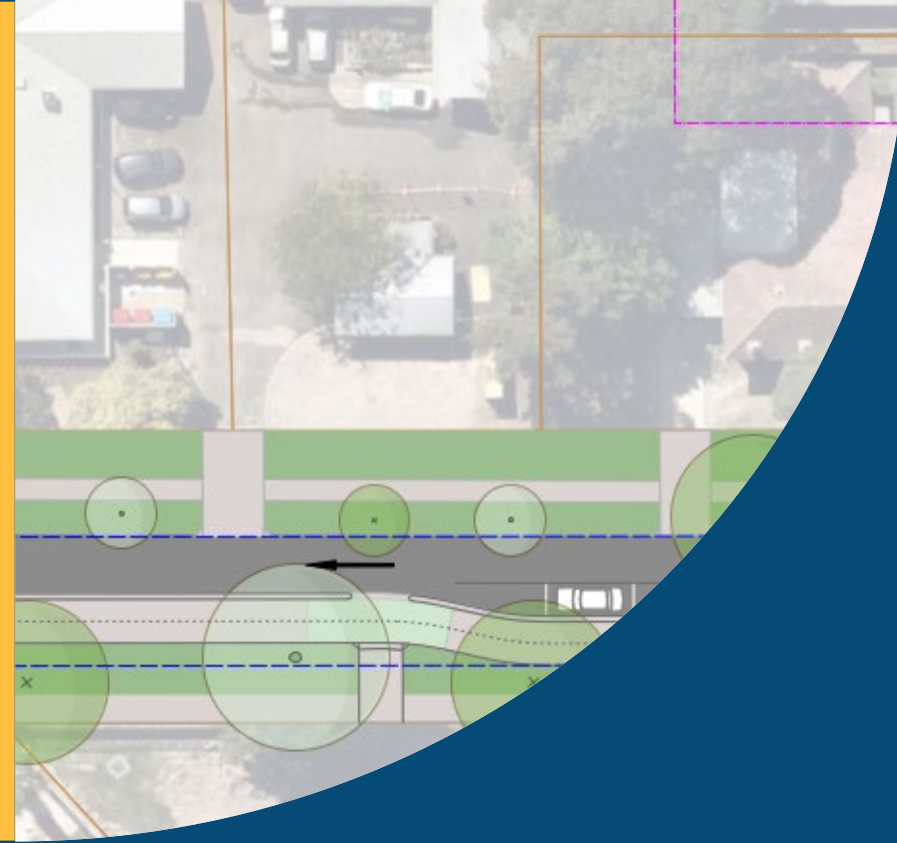


Kleins Road Corridor Study – Fleet Street Traffic Circulation Review

City of Parramatta

Version 2.1
June 2025





Quality Assurance

Project Details

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Crossley have based this Report on information received or obtained on the basis that such information is accurate and complete. The information contained in this Report has not been subject to an audit.



Table of Contents

Executive Summary.....	04	3.2.5 Emergency Vehicle Access for WSLHD.....	35
1. Introduction	06	3.2.6 Waste Vehicle Access.....	35
1.1 Background	06	3.2.7 Summary of Accessibility Impact.....	35
1.2 Purpose	06	3.3 Traffic Impact.....	37
1.3 Report Layout	06	3.3.1 Estimated Traffic Redistributed.....	37
2. Existing Conditions	08	3.3.2 Estimated Traffic Impact.....	37
2.1 Existing Conditions	09	4. Alternative Options.....	38
2.1.1 Traffic Volumes.....	09	4.1 Option Development.....	39
2.1.2 Traffic Circulation Restrictions.....	10	4.1.1 Option 1 - Permitting right turn at traffic signals of Fleet Street / Factory Street / New Street	39
2.1.3 Parking.....	11	4.1.2 Option 2 - Change in one-way direction to southbound + change in intersection operation at Fennell Street.....	40
2.2 Developments to Consider	14	4.1.3 Option 3 - Provision of an open cul-de-sac head at the intersection of Fleet Street / Greenup Drive	41
2.2.1 Parramatta North Precinct	14	4.1.4 Option 4 - Provision of a roundabout at the intersection of Fleet Street / Greenup Drive and at Dunlop Street / New Street	42
2.2.2 Western Sydney Local Health District (WSLHD) Cumberland Hospital	14	4.2 Options Assessment.....	45
3. Current Proposed Design.....	16	4.3 Next Steps.....	49
3.1 Overview.....	17		
3.1.1 Active Transport.....	17		
3.1.2 Traffic Circulation.....	17		
3.1.3 Parking.....	17		
3.1.4 Greening.....	17		
3.2 Accessibility Impact.....	18		
3.2.1 Routes from the north to affected properties.....	19		
3.2.2 Routes from affected properties to the north.....	23		
3.2.3 Routes from the south to affected properties.....	27		
3.2.4 Routes from affected properties to the south.....	31		

Executive Summary





PURPOSE

In 2024, WSP delivered the original Corridor Study, identifying a primary alignment along Kleins Road, along with the conversion of Fleet Street to a one-way arrangement. As part of this work, a concept design was developed and presented to the community through a consultation process to gather feedback and inform the final design direction.

The majority of respondents expressed support for the project. However, the consultations highlighted some concerns, particularly around local parking loss, property access and existing traffic queueing challenges at the intersection with Cumberland Highway. These concerns prompted Council to defer sections of the corridor alignment, triggering a need for targeted investigations into viable alternatives and necessary adjustments

SCOPE OF WORKS

Crossley Transport Planning has been engaged to conduct targeted investigations in the form of a feasibility assessment and review of the current proposed design for **Stage 2 of the Kleins Road Pedestrian and Cyclist Corridor**. In this feasibility assessment, key tasks include:

- Reviewing and investigating local access and circulation in North Parramatta in response to the proposed one-way northbound operation of Fleet Street between Fennell Street and Greenup Drive.
- Identifying and acknowledging impact to all relevant properties.
- Developing and evaluating options to resolve accessibility issues for properties that are significantly affected against defined constraints, community concerns and practical considerations.

KEY FINDINGS

The traffic circulation review, feasibility assessment and review of the current proposed design developed by WSP resulted in the following key findings:

Accessibility Impact

Group	Driveway Location	Property Numbers Impacted	Level of Impact
1	Fleet Street (north of Greenup Drive)	4, 5, 6-8, 10-12, 14	Low Impact
	Fleet Street (south of Greenup Drive)	2A (Fennell St), 2B (Fennell St), 2A (Fleet St), 2B (Fleet St)	Medium Impact
2	Factory Street (southern side)	1-3, 14, 55	High Impact
	Factory Street (northern side)	2-6	None
3	O’Connell Street (south of Factory Street)	31, 33, 37, 39, 41, 43, 45, 49, 53	Medium Impact
	O’Connell Street (north of Factory Street)	57, 59, 63, 65, 67, 69	Low Impact
4	New Street	2A, 2-4, 6, 10-12, 14	Low Impact

- Western Sydney District’s Cumberland Hospital (WSLHD) is accessed via Greenup Drive. As a result, non-emergency trips, such as patient transfers, staff commutes, and visitor access would be affected by the proposed one-way operation of Fleet Street and would be required to detour.
- Waste collection routes and arrangements for properties located along Fennell Street, Fleet Street and the WSLHD will be impacted and require further investigation.

Traffic Impact

- The anticipated redistribution of traffic does not introduce new traffic to O’Connell Street. Instead, these vehicles were already using the corridor and are simply being redirected to enter from a different location.
- For the intersection at Dunlop Street / O’Connell Street, the western approach is projected to experience a queue of approximately 5 vehicles in the left turn lane and 2 vehicles in the right turn lane per cycle. While this volume can be held within the existing formal delineated queue storage along Dunlop Street and New Street, the left-turn queue may extend along the unmarked section of New Street, occasionally obstructing access to the right-turn lane. (Note: this can be managed by extending length of ‘No Stopping’ zone)
- The redistribution of traffic is not expected to require adjustments to signal timings to increase green time for vehicles approaching from Dunlop Street and will have minimal impact on current intersection operations.
- For the intersection at Factory Street and New Street, the queue length is expected to increase by an additional 4.5 vehicles along Fleet Street on top of existing queues. With 150 metres of informal capacity along Fleet Street, there is sufficient queue storage capacity to accommodate any redistributed traffic and the intersection does not require adjustments to signal timings to increase green time for these vehicles.

RECOMMENDATIONS

- Option 4 was found to be the most preferred option based on assessment of risk, cost/constructability, improvements to accessibility and impact on network performance.
- Option 4 includes the construction of roundabouts at the intersections of Greenup Drive / Fleet Street and Dunlop Street / New Street. This would enable affected properties to travel southbound towards the Parramatta CBD safely and efficiently by enabling U-turns at the roundabouts and turning right onto O’Connell Street via a signalised intersection instead of turning across multiple lanes of traffic at the unsignalised intersection with Fennell Street. No adjustments to existing signal timings are required and it enables future resilience with the planned new access road extension of Dunlop Street to service new housing within the Parramatta North Precinct.

Group	Driveway Location	Property Numbers Impacted	Level of Impact with Option 4
1	Fleet Street (north of Greenup Drive)	4, 5, 6-8, 10-12, 14	Low Impact
	Fleet Street (south of Greenup Drive)	2A (Fennell St), 2B (Fennell St), 2A (Fleet St), 2B (Fleet St)	Medium Impact
2	Factory Street (southern side)	1-3, 14, 55	Low Impact
	Factory Street (northern side)	2-6	None
3	O’Connell Street (south of Factory Street)	31, 33, 37, 39, 41, 43, 45, 49, 53	Low Impact
	O’Connell Street (north of Factory Street)	57, 59, 63, 65, 67, 69	None
4	New Street	2A, 2-4, 6, 10-12, 14	Low Impact

- Swept path analysis is recommended to investigate turning movements for the largest design vehicles at the roundabout intersection upgrade locations.

1.

Introduction



1.1 BACKGROUND

The Kleins Road Pedestrian and Cyclist Corridor project is a strategically significant initiative (funded as part of the Transport for NSW Get NSW Active program) designed to deliver active transport infrastructure within Parramatta City Council's growing community. Originally identified through TfNSW's Strategic Cycleway Corridors, the route was reinforced by the City of Parramatta Bike Plan 2024, providing an integrated active transport route from Parramatta North to Northmead to connect key destinations including schools, shops, and regional pathways.

In 2024, WSP delivered the original Corridor Study, identifying a primary alignment along Kleins Road. As part of this work, a concept design was developed and presented to the community through a consultation process to gather feedback and inform the final design direction. The majority of respondents expressed support for the project. However, the consultations highlighted some concerns, particularly around local parking loss, property access and existing traffic queueing challenges at the intersection with Cumberland Highway.

These concerns prompted Council to defer sections of the corridor alignment, triggering a need for targeted investigations into viable alternatives and necessary adjustments. These sections of corridor are visualised in **Figure 1-1** and have been split into the following stages:

1. Stage 1 – Kleins Road (Darling Mills Creek to Northmead Avenue)
2. Stage 2 – Fleet Street (Fennell Street to Factory Street)
3. Stage 3 – Kleins Road (Northmead Avenue to Moxhams Road)

1.2 PURPOSE

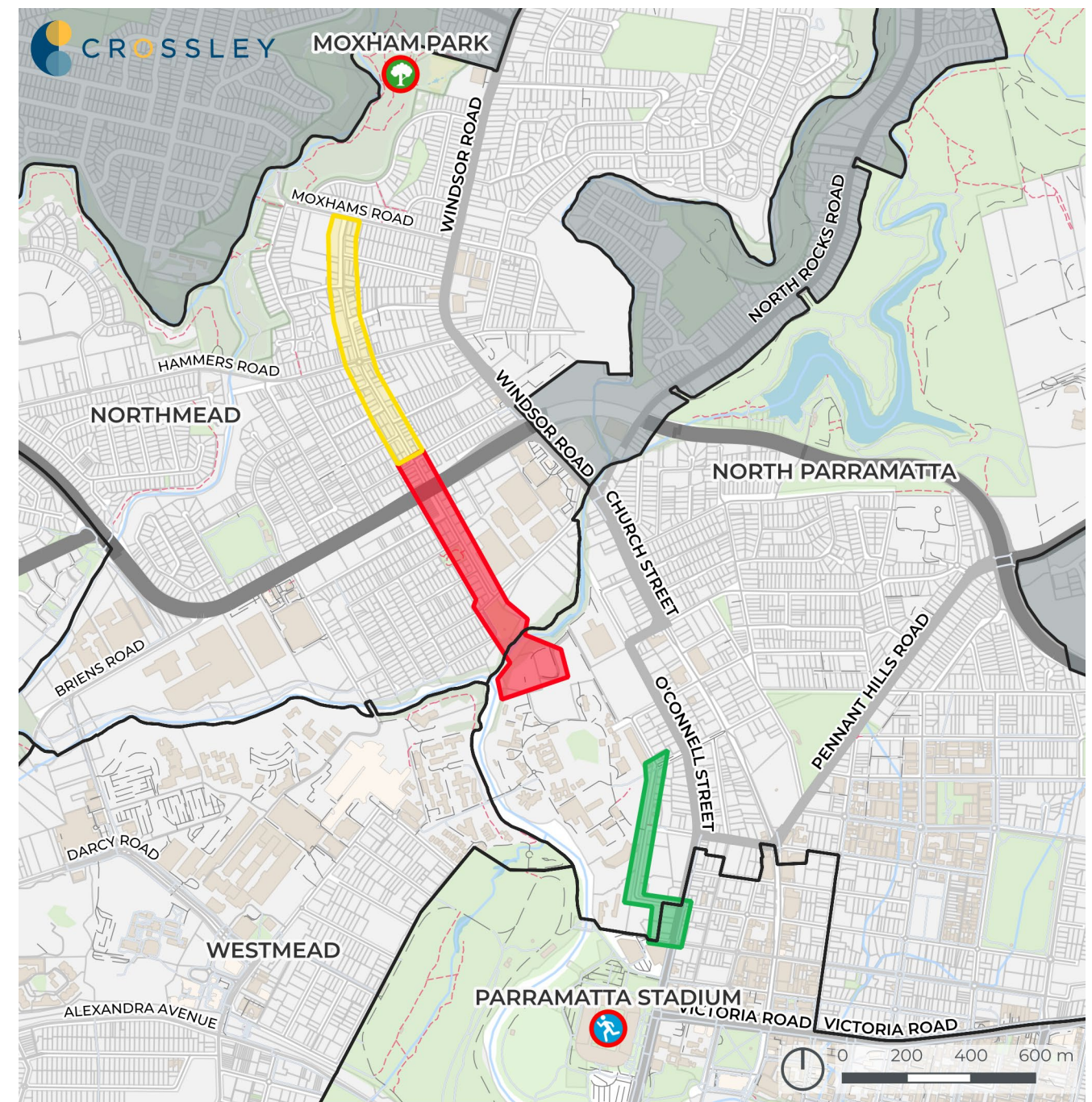
Crossley Transport Planning has been engaged to conduct targeted investigations in the form of a feasibility assessment and review of the current proposed design for **Stage 2 of the Kleins Road Pedestrian and Cyclist Corridor**. In this feasibility assessment, key tasks include:

- Reviewing and investigating local access and circulation in North Parramatta in response to the proposed one-way northbound operation of Fleet Street between Fennell Street and Greenup Drive.
- Identifying and acknowledging impact to all relevant properties.
- Developing and evaluating options to resolve accessibility issues for properties that are significantly affected against defined constraints, community concerns and practical considerations.
- Identifying any additional issues that have not been considered and opportunities that will directly inform revised concept designs.

1.3 REPORT LAYOUT

This report is structured around the following chapters:

- Chapter 1: Introduction
- Chapter 2: Existing Conditions
- Chapter 3: Current proposed design
- Chapter 4: Alternative Options



LEGEND

- Stage 1 - Kleins Road (Darling Mills Creek to Northmead Avenue)
- Stage 2 - Fleet Street (Fennell Street to Factory Street)
- Stage 3 - Kleins Road (Northmead Avenue to Moxhams Road)

Figure 1-1: Geographical scope of Kleins Road Pedestrian and Cyclist Corridor Study

2.

Existing Conditions





2.1 EXISTING CONDITIONS

2.1.1 Traffic Volumes

Fleet Street currently accommodates two-way vehicular traffic, one lane operating in each direction with parallel parking on both sides of the road. Classified traffic counts were conducted on Wednesday 6th November 2024 for the following intersections:

1. Fennell Street & O’Connell Street
2. Fleet Street & Factory Street
3. Dunlop Street & O’Connell Street

The classified traffic counts indicate that Fleet Street experiences low traffic volumes with peak congestion occurring during morning and evening commute times with approximately **231 vehicles in the AM peak hour and 150 vehicles in the PM peak hour**. There were no heavy vehicles recorded using the street.

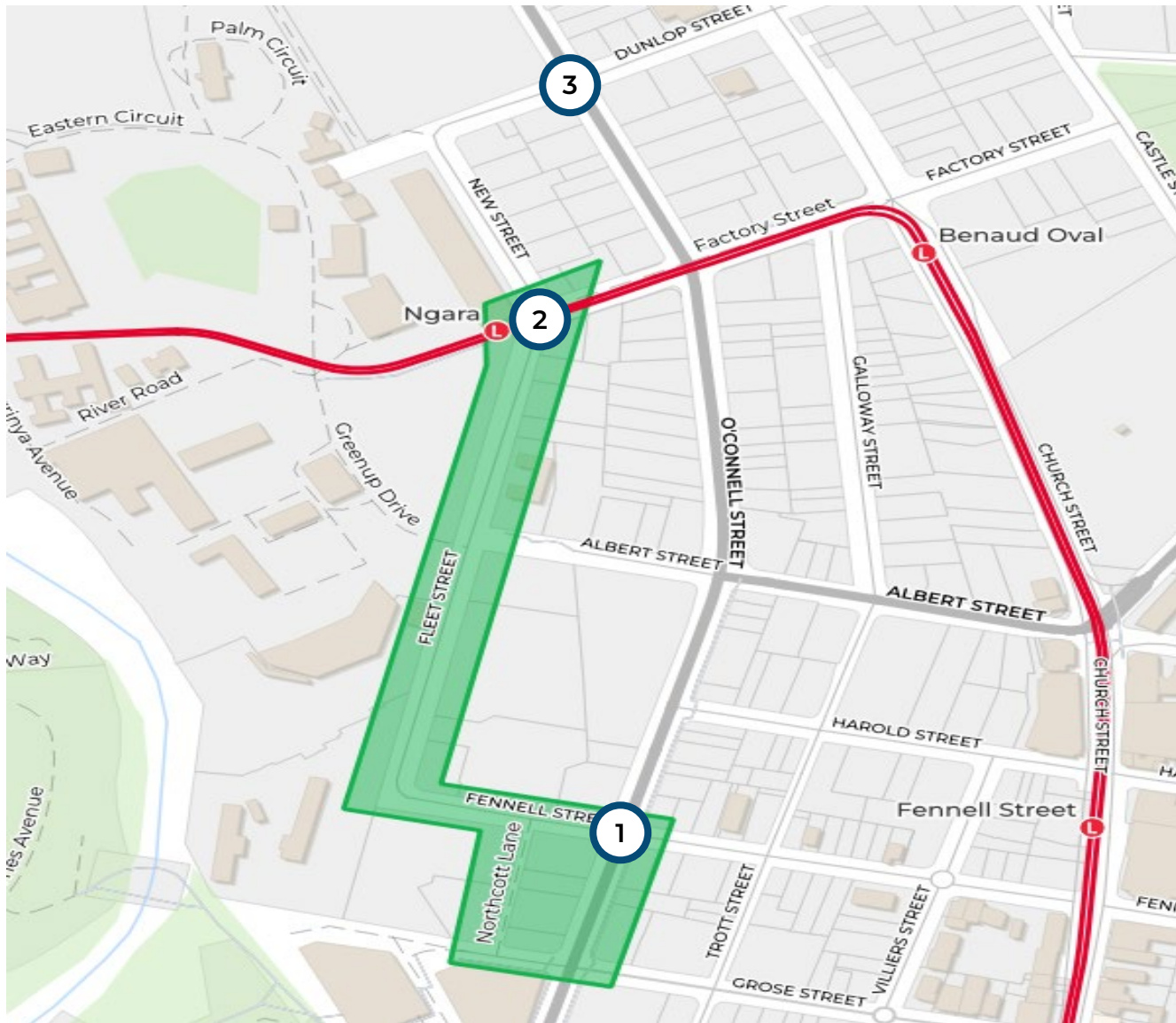


Figure 2-1: Location of traffic counters

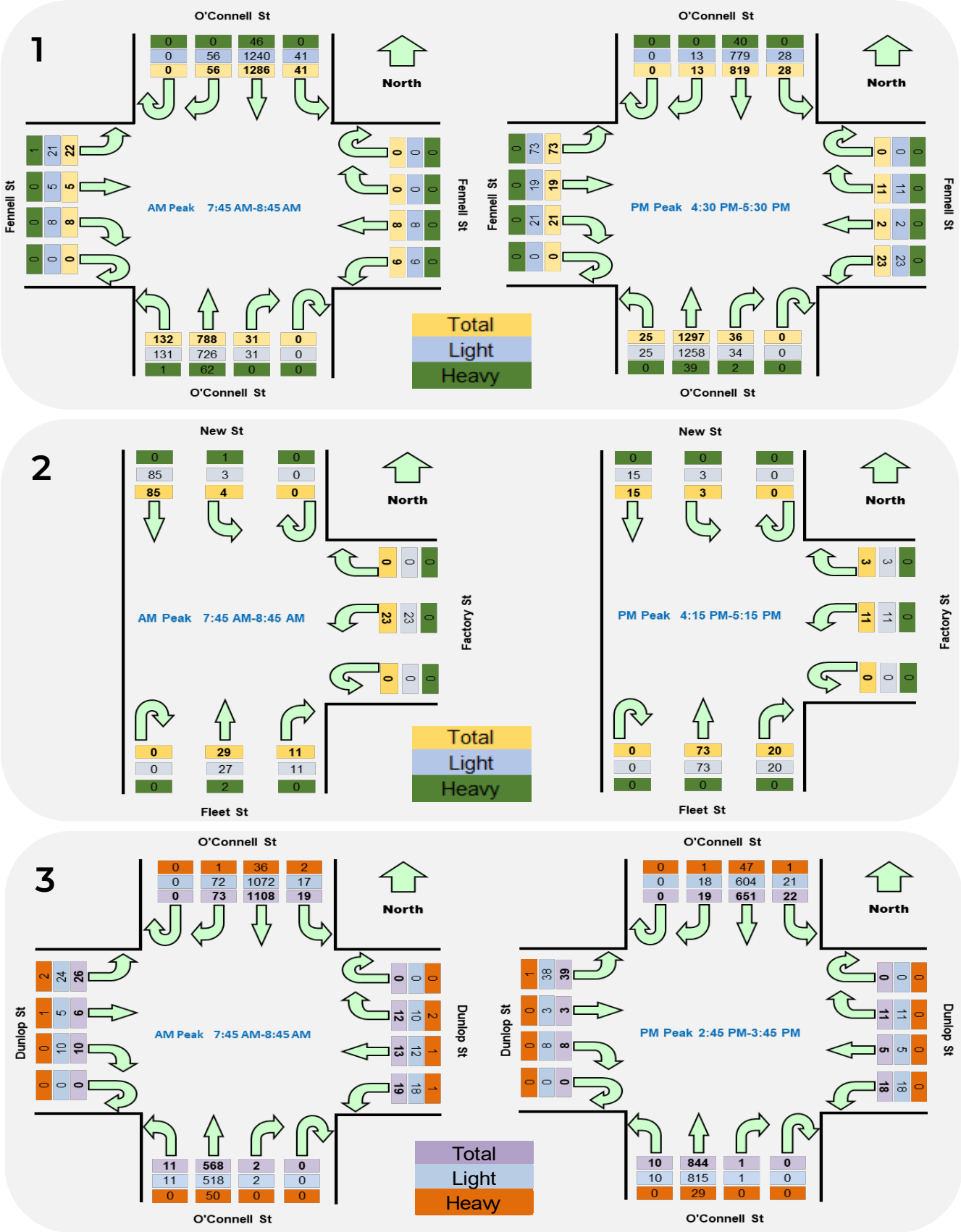


Figure 2-2: Existing traffic volumes (Source: Trans Traffic Survey, 2024)

2.1.2 Traffic Circulation Restrictions

As a result of the Parramatta Light Rail, there are many traffic circulation restrictions in operation as illustrated in **Figure 2-3** and detailed as follows:

Factory Street:

- No right turn from Factory Street onto New Street and O'Connell Street.
- Factory Street operates as a one-way westbound road between Church Street and Castle Street.

O'Connell Street:

- No right turn from O'Connell Street onto Dunlop Street (except buses).
- No right turn from O'Connell Street onto Factory Street.
- No right turn from O'Connell Street onto Albert Street (for southbound traffic only).

Church Street:

- No left or right turn from Church Street onto Factory Street (for southbound traffic only).
- No right turn from Church Street onto Factory Street (for northbound traffic only).
- No right turn from Church Street onto Albert Street (for southbound traffic only).
- No right turn from Church Street onto Dunlop Street (except buses, for northbound traffic only).
- No right turn from Church Street onto Pennant Hills Road (for northbound traffic only).

Dunlop Street:

- No right turn from Dunlop Street onto Church Street.
- No left turn from Dunlop Street onto O'Connell Street (except vehicles under 9 metres).

Fleet Street:

- No left turn from Fleet Street onto Factory Street (except construction vehicles, for northbound traffic only).

New Street:

- No right turn from New Street onto Factory Street (for southbound traffic only).

Signalised crossing over light rail line:

- Permitted for all vehicles at Warringa Avenue
- Emergency vehicles permitted only at Eastern Circuit

River Road:

- No left turn from River Road onto Warringa Avenue



Figure 2-3: Traffic circulation restrictions

2.1.3 Parking

Figure 2-4 illustrates the current on-street parking restrictions within the Stage 2 study area, covering Fennell Street, Fleet Street, New Street and Dunlop Street.

Across the corridor, five distinct types of parking restrictions are in place. The most common restriction is “4P 8am-6pm Mon to Fri – Permit Holders Excepted”, which allows four-hour parking for the general public during weekdays while granting extended access to local permit holders. “No Parking” and “No Stopping” zones are primarily located at intersections, driveways (such as the Parramatta Correctional Centre), and sharp road bends to maintain clear access and safety.

A single dedicated accessible parking space is available on the northern side of Dunlop Street.

Parking along New Street was observed to have a low utilisation rate, with capacity to accommodate additional vehicles. These spaces generally serve properties directly fronting the street.

On Fleet Street (between Factory Street and Greenup Drive), parking consists mostly of parallel spaces on both sides, with some angled (90-degree) parking on the western side. This area was observed to experience moderate to high usage.

Fleet Street between Greenup Drive and Fennell Street consists of parallel parking on only the western side of the road with medium to high usage observed. This section mainly supports visitors to Marian Residential Care and ParraGirls (a heritage and advocacy organisation).

Parking along Fennell Street was observed to be moderately used and Northcott Drive has a “No Parking” restriction along its entire stretch.



Figure 2-5: On-street parking along Dunlop Street

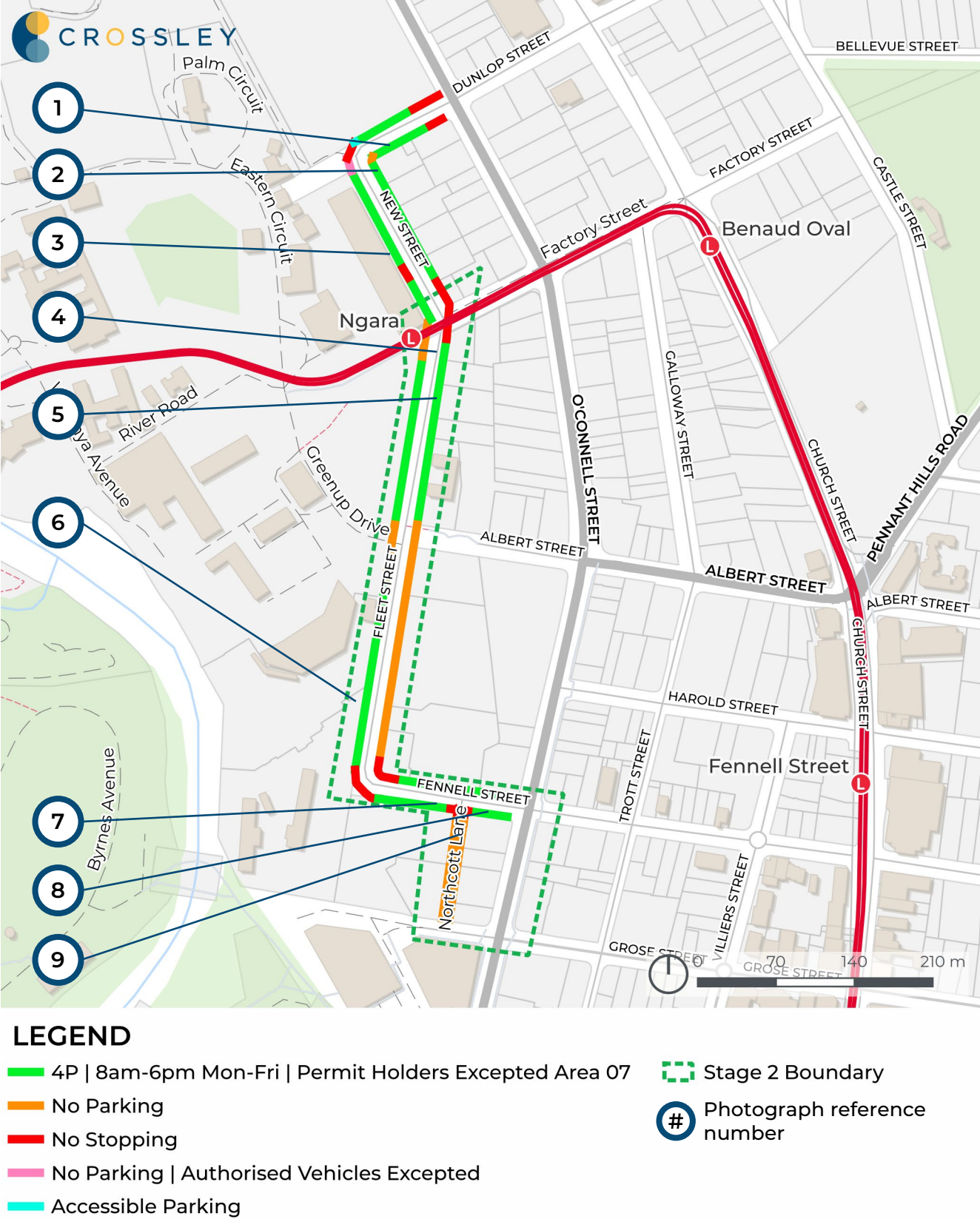


Figure 2-4: Existing parking restrictions along Stage 2 Boundary



Figure 2-6: On-street parking along New Street #1



Figure 2-8: On-street parking along Fleet Street (South of Factory St) #1



Figure 2-7: On-street parking along New Street #2



Figure 2-9: On-street parking along Fleet Street (South of Factory St) #2



Figure 2-10: On-street parking along Fleet Street (South of Greenup Drive)



Figure 2-12: On-street parking along Fennell Street (east of Northcott Lane)



Figure 2-11: On-street parking along Fennell Street (west of Northcott Lane)

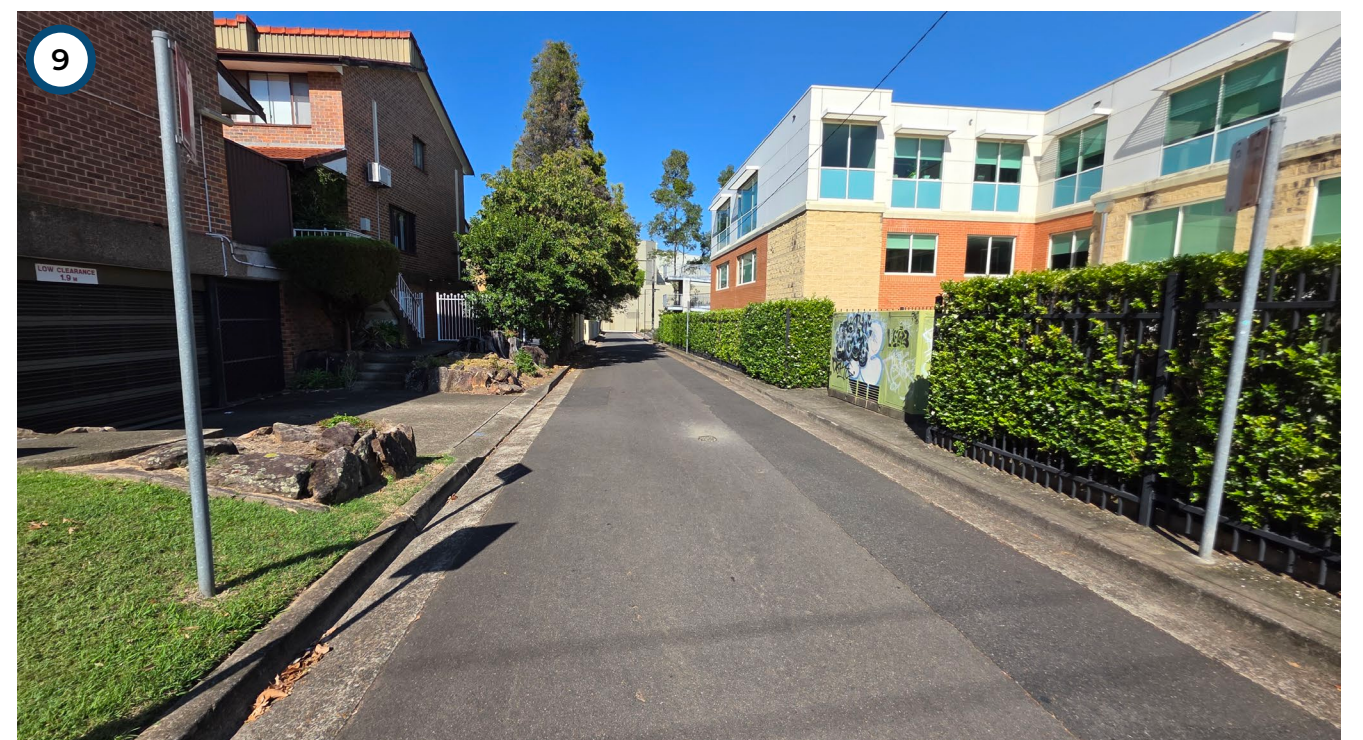


Figure 2-13: "No Parking" along Northcott Lane

2.2 DEVELOPMENTS TO CONSIDER

2.2.1 Parramatta North Precinct

A major urban renewal initiative has been proposed to develop the Parramatta North Precinct to help achieve the NSW Government's vision for the Westmead Health and Innovation District.

The Parramatta North Precinct covers an area of 42-hectares and will be split into 10 sub-precincts comprising a variety of land uses including high-density residential, retail and mixed uses (including commercial / enterprise / research, education, and health uses).

The precinct is expected to include 2,000 residential units,, 282,004 square metres GFA of mixed-use and 17,375 square metres GFA of retail uses which will support up to 12,000 jobs and 25,000 future university students.

Proposed key pedestrian and cycling connections are illustrated in **Figure 2-14**.

Future vehicular access to this precinct is planned and expected to occur via Board Street whilst other accesses further south include Greenup Drive and Dunlop Street along the western border of the decommissioned Parramatta Gaol, which both interface with Fleet Street.

As a result, the proposed access points at Greenup Drive and Dunlop Street need to be considered in conjunction with any proposed arrangement for Fleet Street.

2.2.2 Western Sydney Local Health District (WSLHD) Cumberland Hospital

The Western Sydney Local Health District Cumberland Hospital is located within the Parramatta North Precinct with buildings scattered around Fleet Street and Greenup Drive.

Emergency vehicle access for the hospital is important to consider when converting part of Fleet Street to a one-way configuration.

Emergency vehicles are allowed to cross the light rail tracks at the intersection of Greenup Drive, Eastern Circuit and River Road.

The layout of buildings, parking provision, boom gate locations and the light rail are visualised overleaf in **Figure 2-15**.



Figure 2-14: Parramatta North Precinct boundary, proposed active transport connections and proposed access point at Dunlop Street.

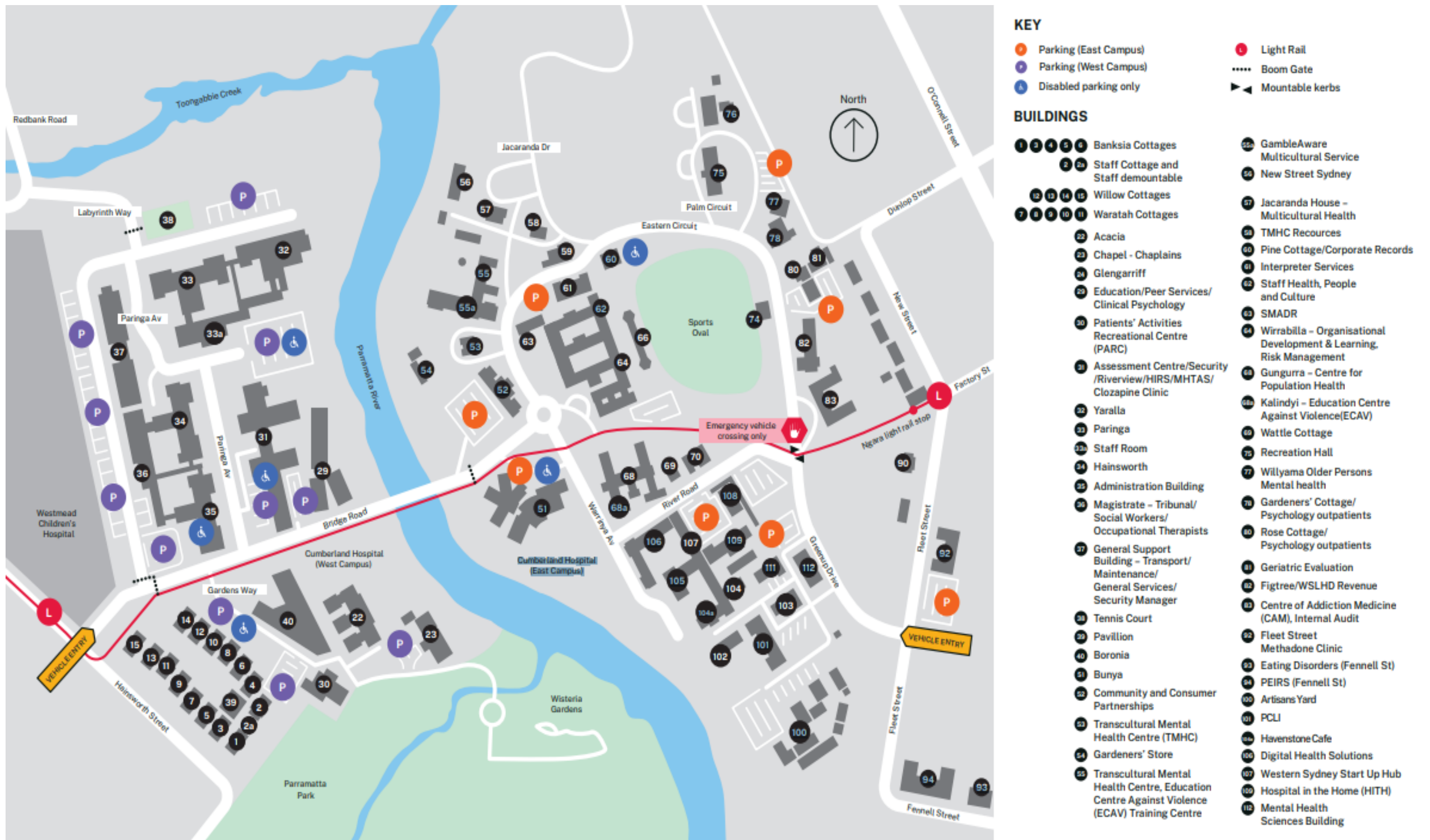


Figure 2-15: Map of WSLHD Cumberland Hospital buildings and internal road network layout

3.

Current Proposed Design





3.1 OVERVIEW

3.1.1 Active Transport

A bi-directional cycleway is proposed along the western side of Fleet Street. The cycleway will continue north and terminate at the intersection of Greenup Drive and Fleet Street.

A future path is proposed to connect the south-western side of the bi-directional cycleway on Fleet Street to Button's Bridge through the development of the Parramatta North site and Eels Place. In the interim, access to Eels Place will be re-directed via Fennell Street and a contraflow lane on Northcott Lane.

A wombat crossing facility is proposed at the intersection of Fleet Street and Greenup Drive to help pedestrians and cyclists access a facility proposed along the northern side of Greenup Drive. This facility will be used to connect to existing and future planned developments within the Parramatta North Precinct.

3.1.2 Traffic Circulation

Fleet Street, between Fennell Street and Greenup Drive will be converted to a one-way northbound roadway.

Therefore, vehicles will no longer be able to travel southbound along this section of Fleet Street. Vehicles will have to find alternative routes entering and exiting the street.

Vehicles approaching the one-way section of Fleet Street from the north are forced to turn right into the Parramatta North Precinct.

3.1.3 Parking

On-street parking along Fleet Street is mostly retained, except for a short section on the western side of the road where there are two existing mature trees. Parking and road space is reallocated to retain the mature trees and accommodate the bi-directional cycleway. This change will result in the loss of approximately 6 car parking spaces.

3.1.4 Greening

A total of 12 new trees are proposed on the western side of Fleet Street, following the bi-directional cycleway to provide more shade for pedestrians and cyclists. Another 2 trees are proposed on the eastern side of Fleet Street as part of public domain works.

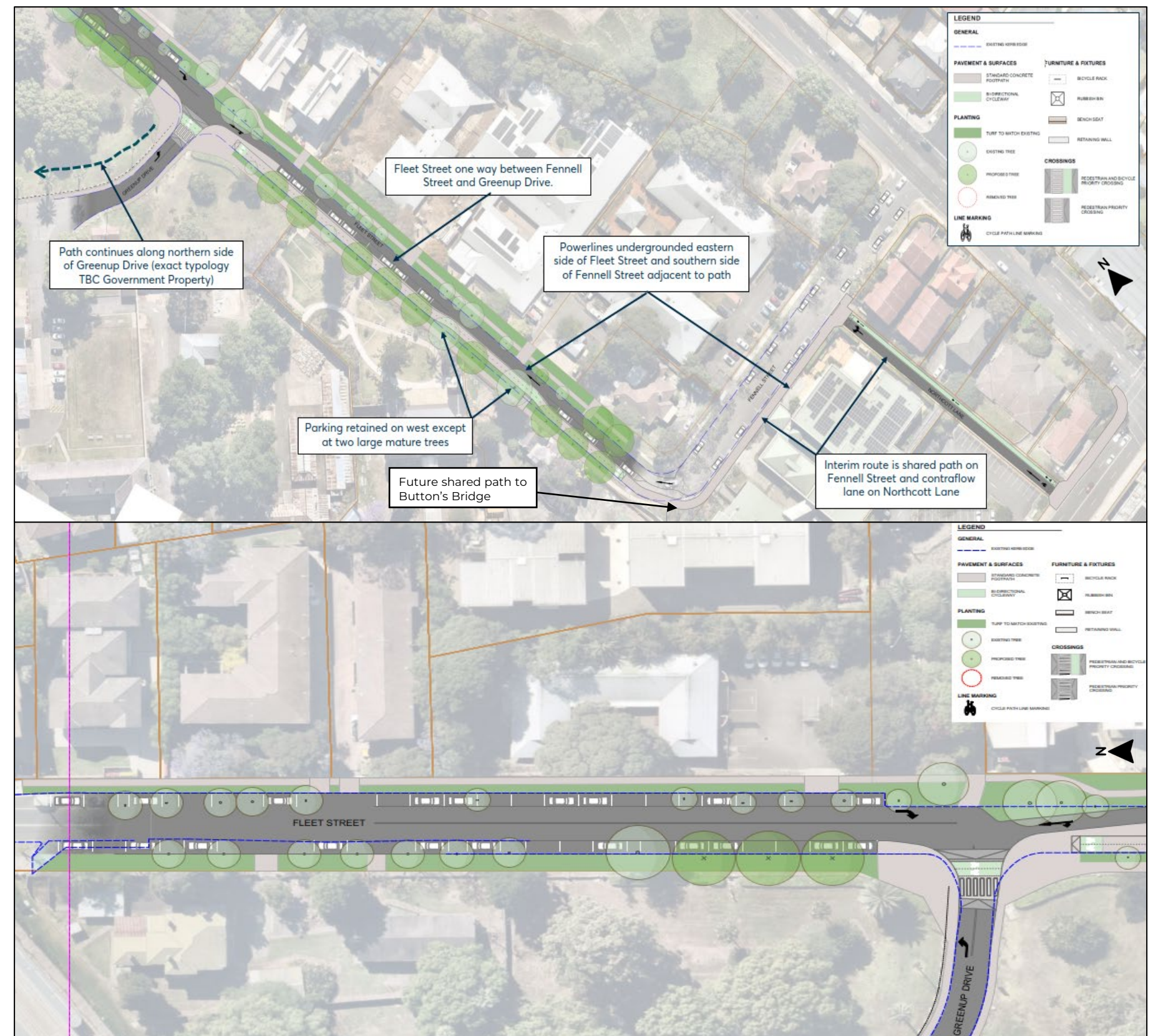


Figure 3-1: Current proposed design plans for Fleet Street
(Source: WSP, dated 17/04/24)

3.2 ACCESSIBILITY IMPACT

The one-way conversion of Fleet Street from Greenup Drive to Fennell Street to only permit north-bound traffic will impact a total of 32 properties to differing degrees and result in a change of traffic circulation. **Table 2-1** identifies the properties affected which have been separated into four main groups according to the location of their driveway and their similarity in accessibility impact.

Table 2-1: Properties affected

Group	Driveway Location	Property Numbers Impacted
1	Fleet Street (north of Greenup Drive)	4, 5, 6-8, 10-12 14 – Contains driveway access on both Fleet St and Factory St
	Fleet Street (south of Greenup Drive)	2A (Fleet St), 2B (Fleet St) 2A (Fennell St), 2B (Fennell St) – Contains driveway access on both Fleet St and Fennell St. Only driveways located on Fleet St are affected.
2	Factory Street (southern side)	1-3, 55 14 – Contains driveway access on both Fleet St and Factory St
	Factory Street (northern side)	2-6
3	O'Connell Street (south of Factory Street)	31, 33, 37, 39, 41, 43, 45, 49, 53
	O'Connell Street (north of Factory Street)	57, 59, 63, 65, 67, 69
4	New Street	2A, 2-4, 6, 10-12, 14

It is important to note that property no. 14 has driveway access to both Factory Street and Fleet Street. Meanwhile properties no. 2A and 2B have driveway access to both Fennell Street and Fleet Street.

This section examines how residents will access their properties, specifically those predicted to be directly impacted by the one-way conversion of Fleet Street. It focuses on the implications for travel northbound to and from Northmead, and southbound to and from the Parramatta CBD based on existing and proposed traffic circulation restrictions associated with the current proposed design.



Figure 3-2: Location of properties impacted

3.2.1 Routes from the north to affected properties

Group 2

- No change to access for properties in this group.

Figure 3-4 illustrates the expected access routes.



Figure 3-4: Access routes from the north to the affected properties

3.2.1 Routes from the north to affected properties

Group 3

South of Factory Street:

- Following the proposed one-way conversion of Fleet Street, southbound vehicle access from Fleet Street to O'Connell Street (via a left turn) is no longer permitted for properties south of Factory Street.
- Vehicles can still access their property via Castle Street.
- The Castle Street route involves turning right onto Factory Street, left onto Galloway Street, right onto Albert, and then right onto O'Connell Street. This route was already available prior to the proposed changes and remains unaffected. Comparing to the original Fleet Street route, it includes **3 additional turning movements**.

North of Factory Street:

- No change to access for properties north of Factory Street.

Figure 3-5 illustrates the expected access routes.

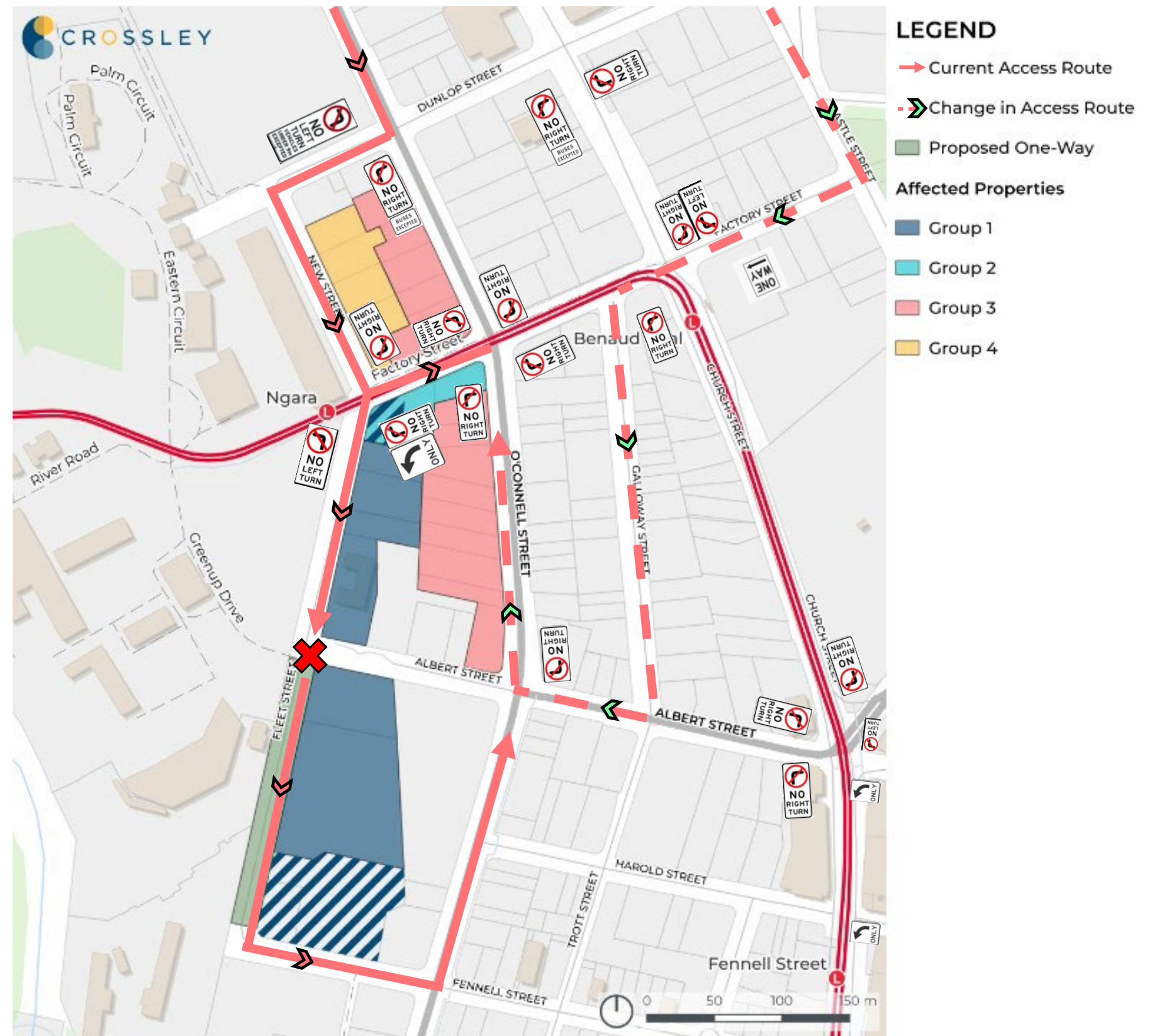


Figure 3-5: Access routes from the north to the affected properties

3.2.1 Routes from the north to affected properties

Group 4

- No change to access for properties in this group.

Figure 3-6 illustrates the expected access routes.



Figure 3-6: Access routes from the north to the affected properties

3.2.2 Routes from affected properties to the North

With the current proposed design, the change in access routes from affected properties to the north as a result of the proposed one-way conversion of Fleet Street include:

Group 1

- No change to access for properties in this group.

Figure 3-7 illustrates the expected access routes.

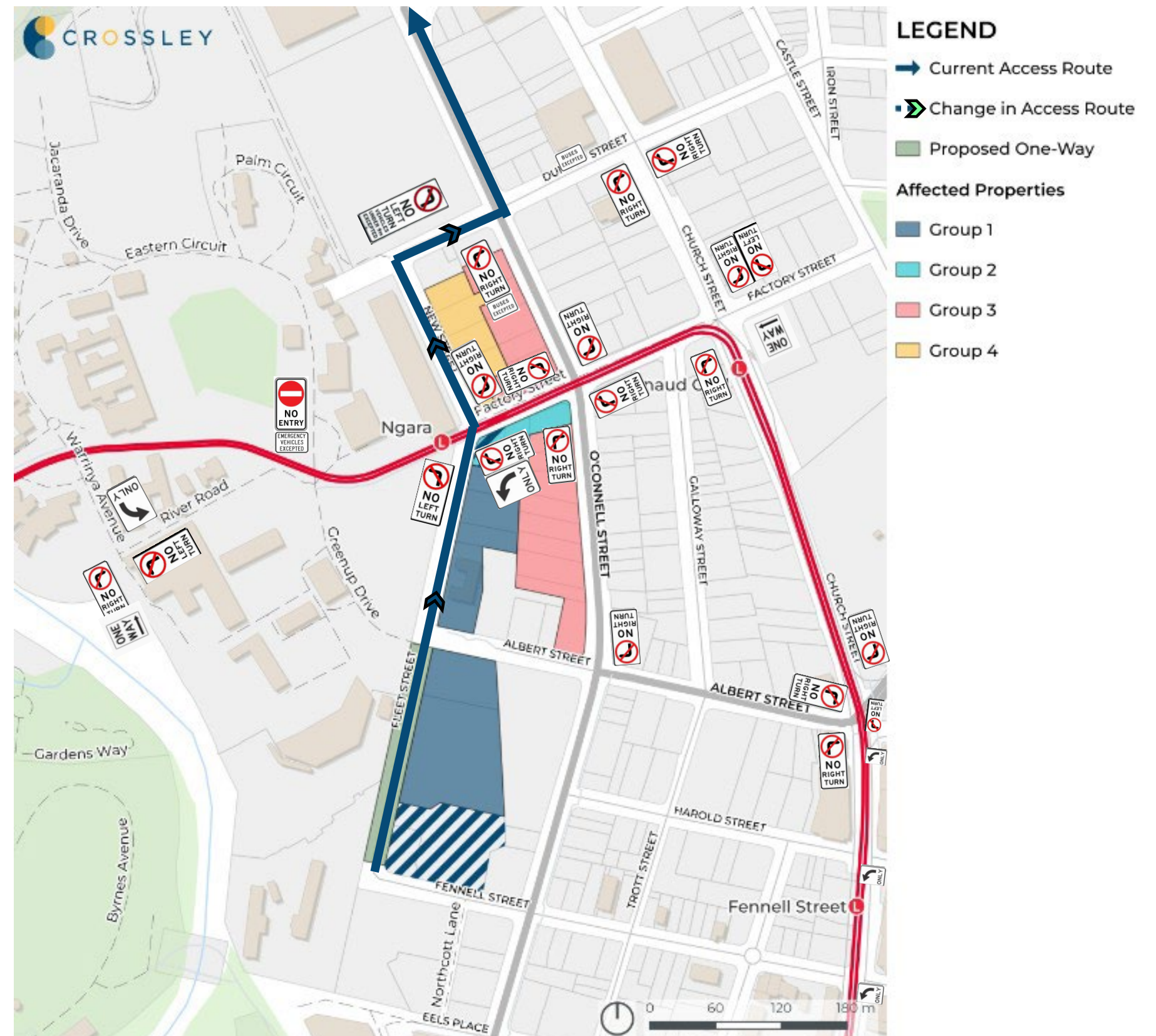


Figure 3-7: Access routes from the affected properties to the north



3.2.2 Routes from affected properties to the North

Group 2

- Vehicles travelling to the north are no longer able to travel southbound along Fleet Street, continue onto Fennell Street and turn left onto O'Connell Street.

Instead, vehicles must turn right onto Greenup Drive, turn left at River Road and cross the light rail line to complete a U-turn at the roundabout intersection of Warinya Avenue. After the U-turn, vehicles must cross the light rail line a second time, turn left onto Fleet Street, continue onto Dunlop Street and then turn left to travel north. This results in a circuitous route with a deviation of up to **550m and 6 extra turns**.

Figure 3-8 illustrates the expected access routes.

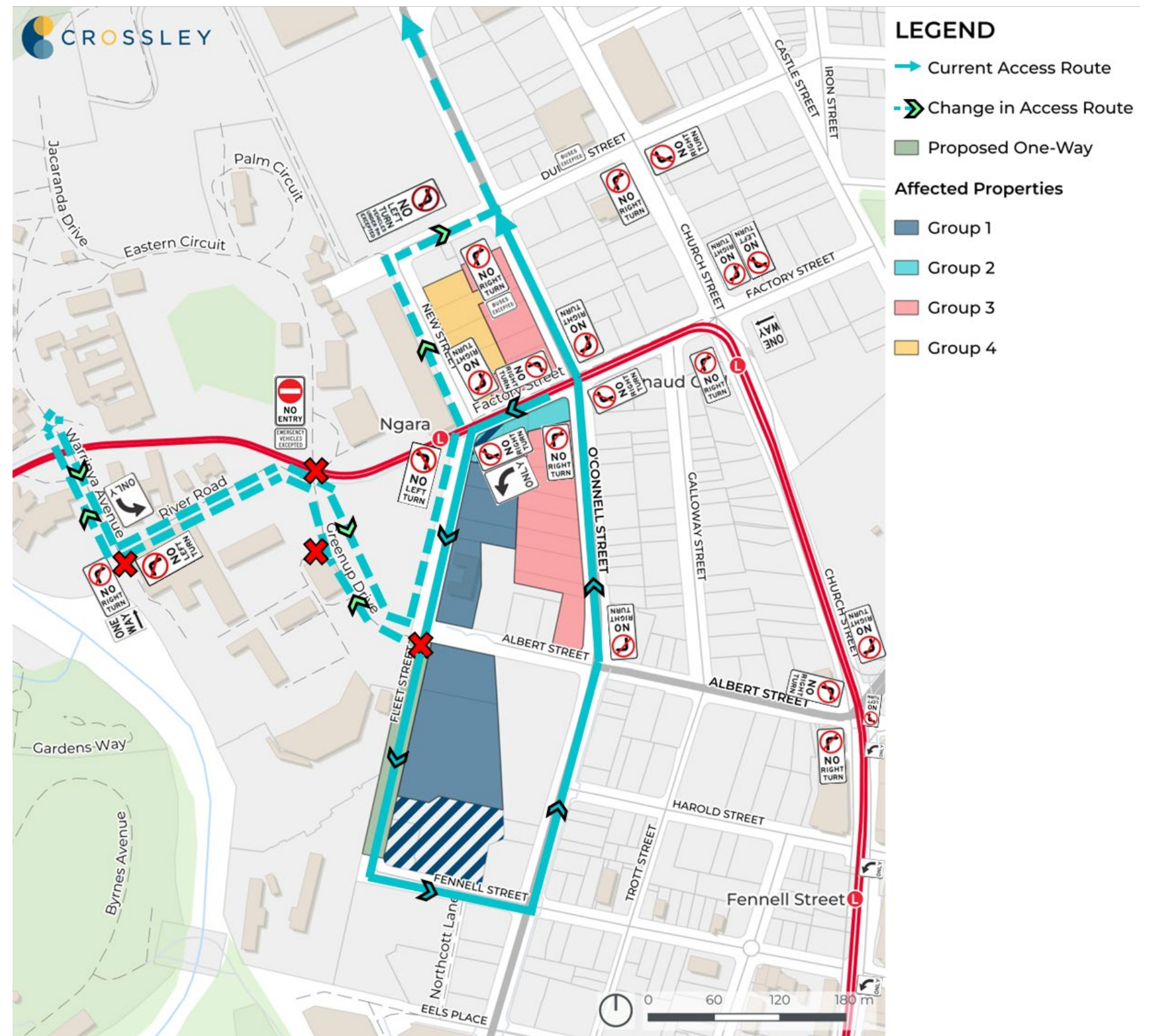


Figure 3-8: Access routes from the affected properties to the north

3.2.2 Routes from affected properties to the North

Group 3

- No change to access for properties in this group

Figure 3-9 illustrates the expected access routes.

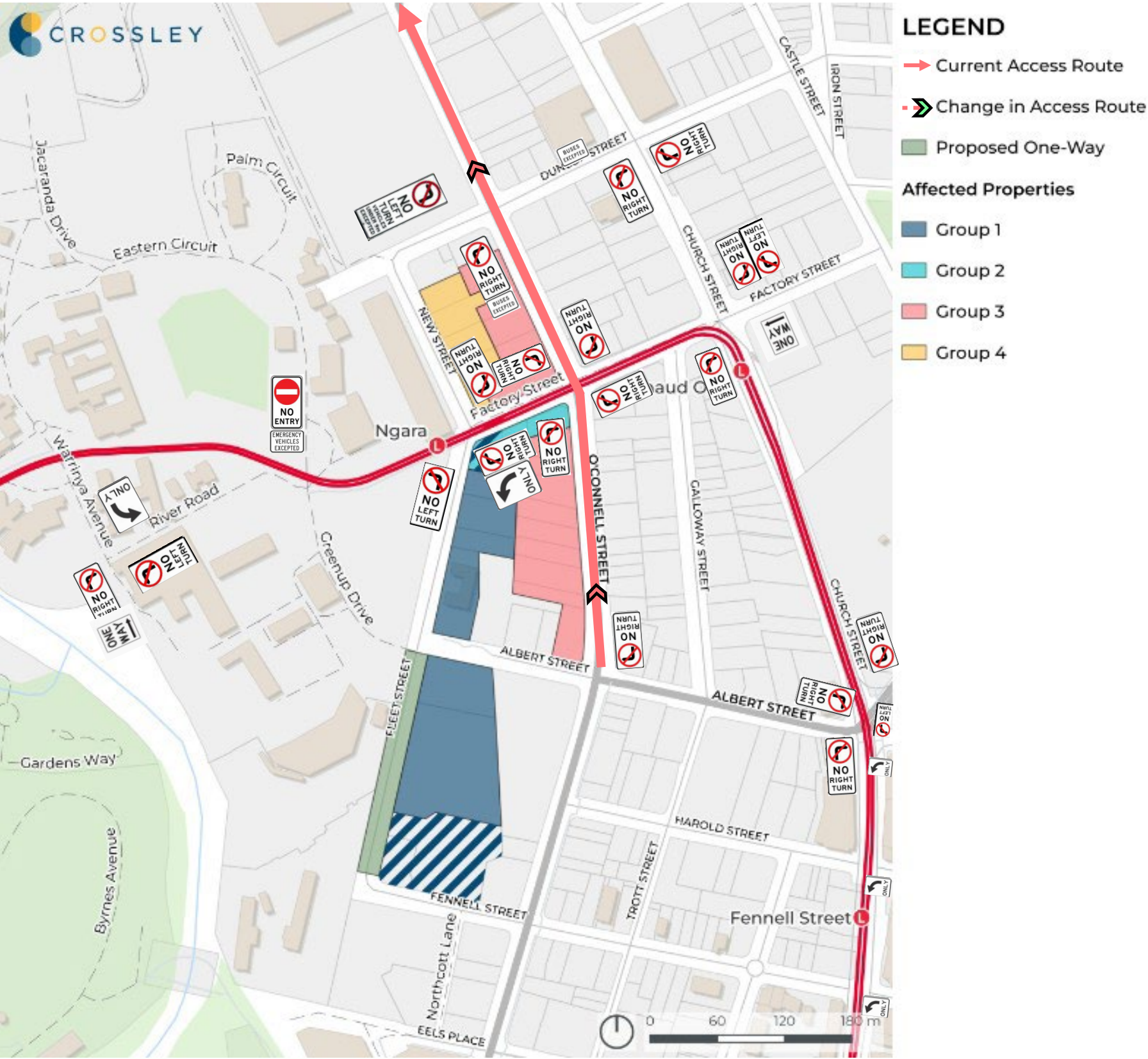


Figure 3-9: Access routes from the affected properties to the north

3.2.2 Routes from affected properties to the North

Group 4

- No change to access for properties in this group.

Figure 3-10 illustrates the expected access routes.

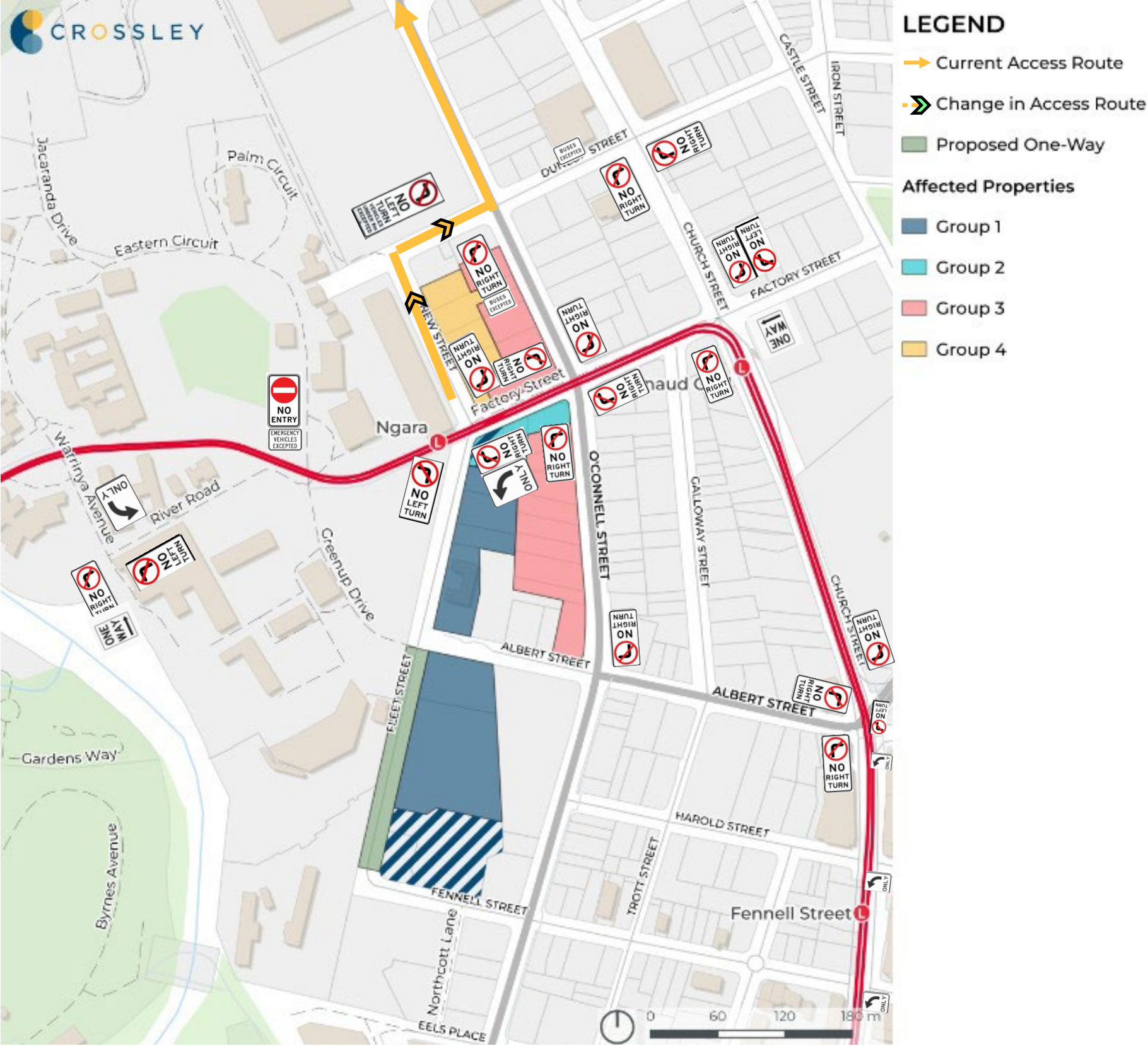


Figure 3-10: Access routes from the affected properties to the north

3.2.3 Routes from the south to affected properties

With the current proposed design, there is no change in access routes from the south to affected properties as a result of the proposed one-way conversion of Fleet Street.

Group 1

- No change to access for properties in this group.

Figure 3-11 illustrates the expected access routes.



Figure 3-11: Access routes from the south to the affected properties

3.2.3 Routes from the south to affected properties

Group 2

- No change to access for properties in this group.

Figure 3-12 illustrates the expected access routes.



Figure 3-12: Access routes from the south to the affected properties

3.2.3 Routes from the south to affected properties

Group 3

- No change to access for properties in this group.

Figure 3-13 illustrates the expected access routes.

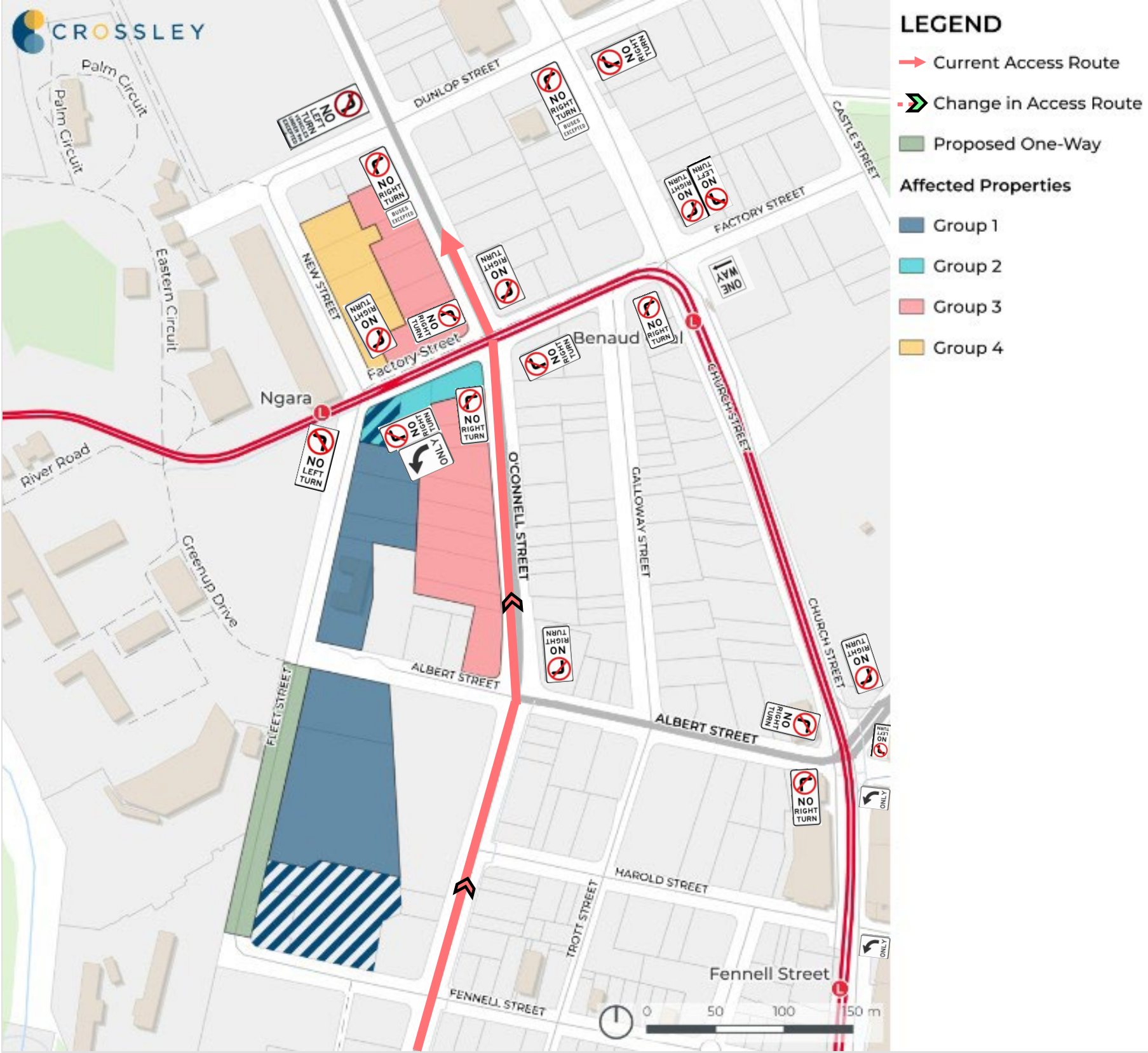


Figure 3-13: Access routes from the south to the affected properties

3.2.3 Routes from the south to affected properties

Group 4

- No change to access for properties in this group.

Figure 3-14 illustrates the expected access routes.

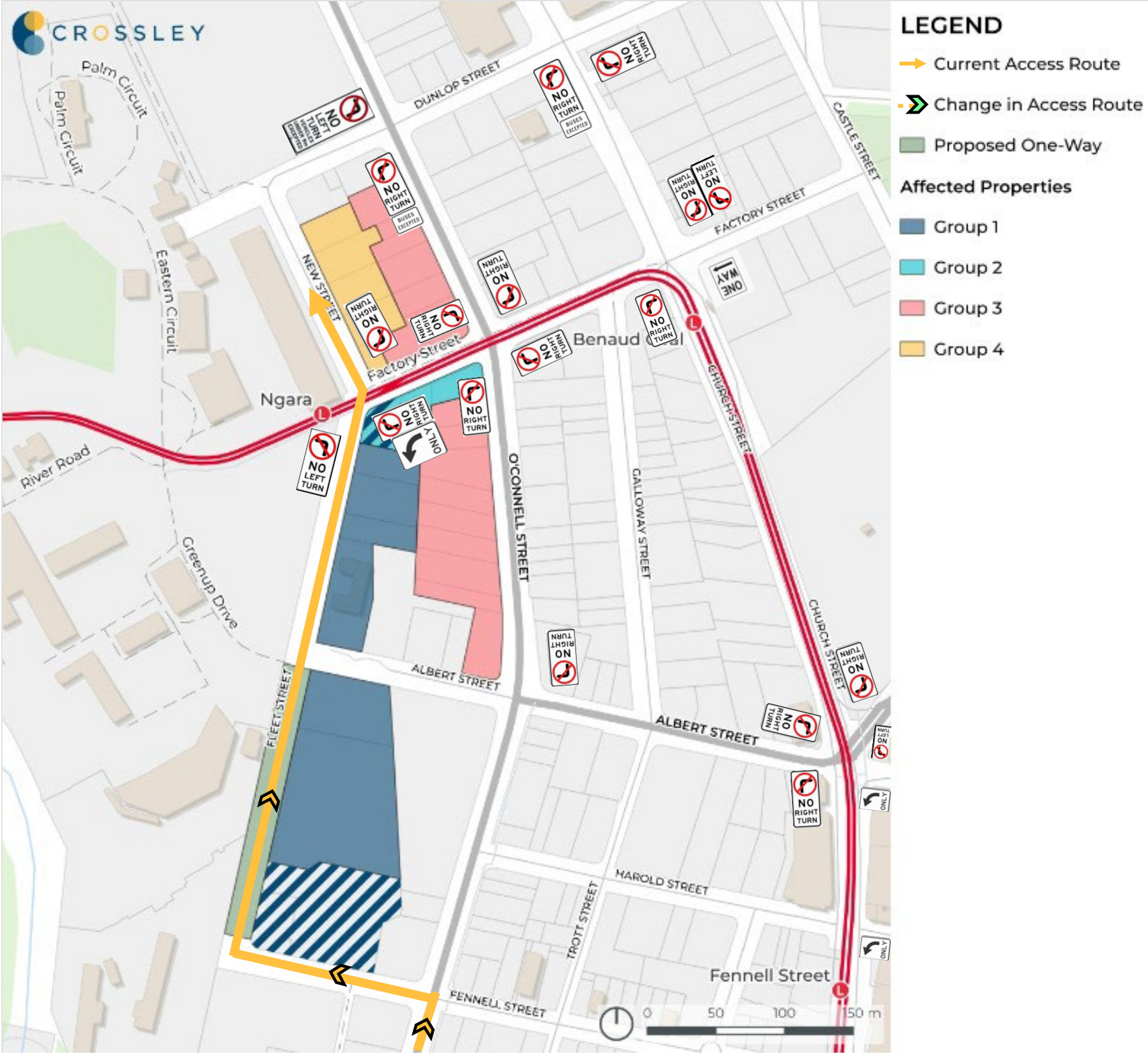


Figure 3-14: Access routes from the south to the affected properties

3.2.4 Routes from the affected properties to the south (Parramatta CBD)

With the current proposed design, vehicles are no longer able to travel southbound along Fleet Street onto Fennell Street to turn right onto O'Connell Street.

As a result, the change in access routes to the south towards Parramatta CBD for affected properties is as follows:

Group 1

North of Greenup Drive

- Vehicles on Fleet Street must instead continue north onto New Street and Dunlop Street to turn right onto O'Connell Street. This is a detour of up to **700m**.
- Alternatively, vehicles can turn right from Fleet Street onto Factory Street and turn right onto Church Street to travel towards Parramatta CBD. This is a detour of up to **800m** to access Parramatta CBD.

South of Greenup Drive

- The two properties directly fronting Fennell Street have two access driveways, located on both Fleet Street and Fennell Street
- Vehicles on Fleet Street must instead continue north onto New Street and Dunlop Street to turn right onto O'Connell Street. This is a detour of up to **1100m**.
- Alternatively, vehicles can turn right from Fleet Street onto Factory Street and turn right onto Church Street to travel towards Parramatta CBD. This is a detour of up to **1100m** to access Parramatta CBD.

Figure 3-15 illustrates the expected access routes with dashed lines.

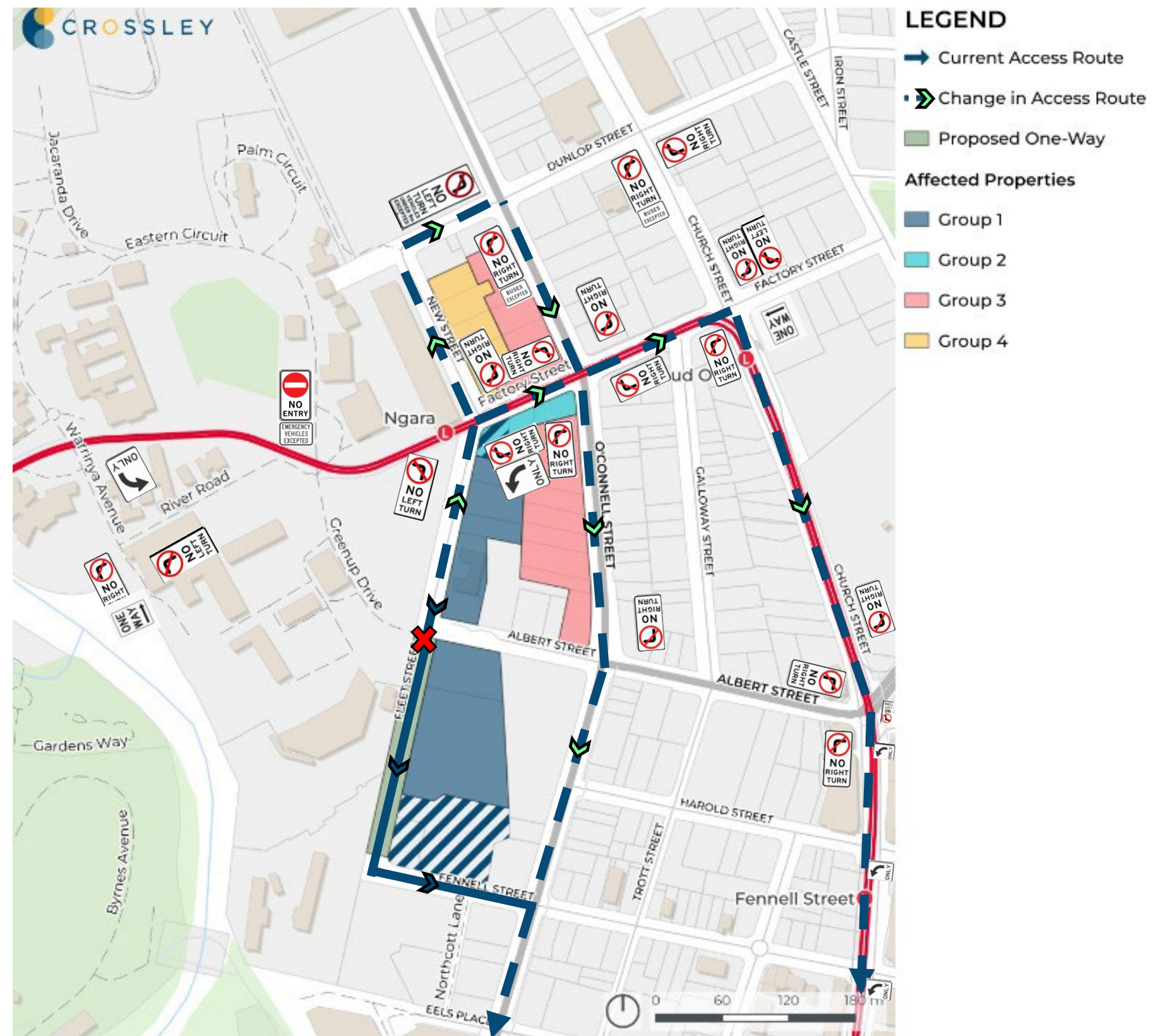


Figure 3-15: Access routes from the affected properties to the south



3.2.4 Routes from the affected properties to the south (Parramatta CBD)

Group 2

- For properties on the southern side of Factory Street, vehicles must turn right onto Greenup Drive, turn left at River Road and cross the light rail line to complete a U-turn at the roundabout intersection of Warinya Avenue. After the U-turn, vehicles must cross the light rail line a second time, turn left onto Fleet Street and continue onto Dunlop Street or Factory Street to travel towards the CBD.
- This results in a circuitous route with a detour of approximately **1800m** to the Parramatta CBD.

Figure 3-16 illustrates the expected access routes with dashed lines.

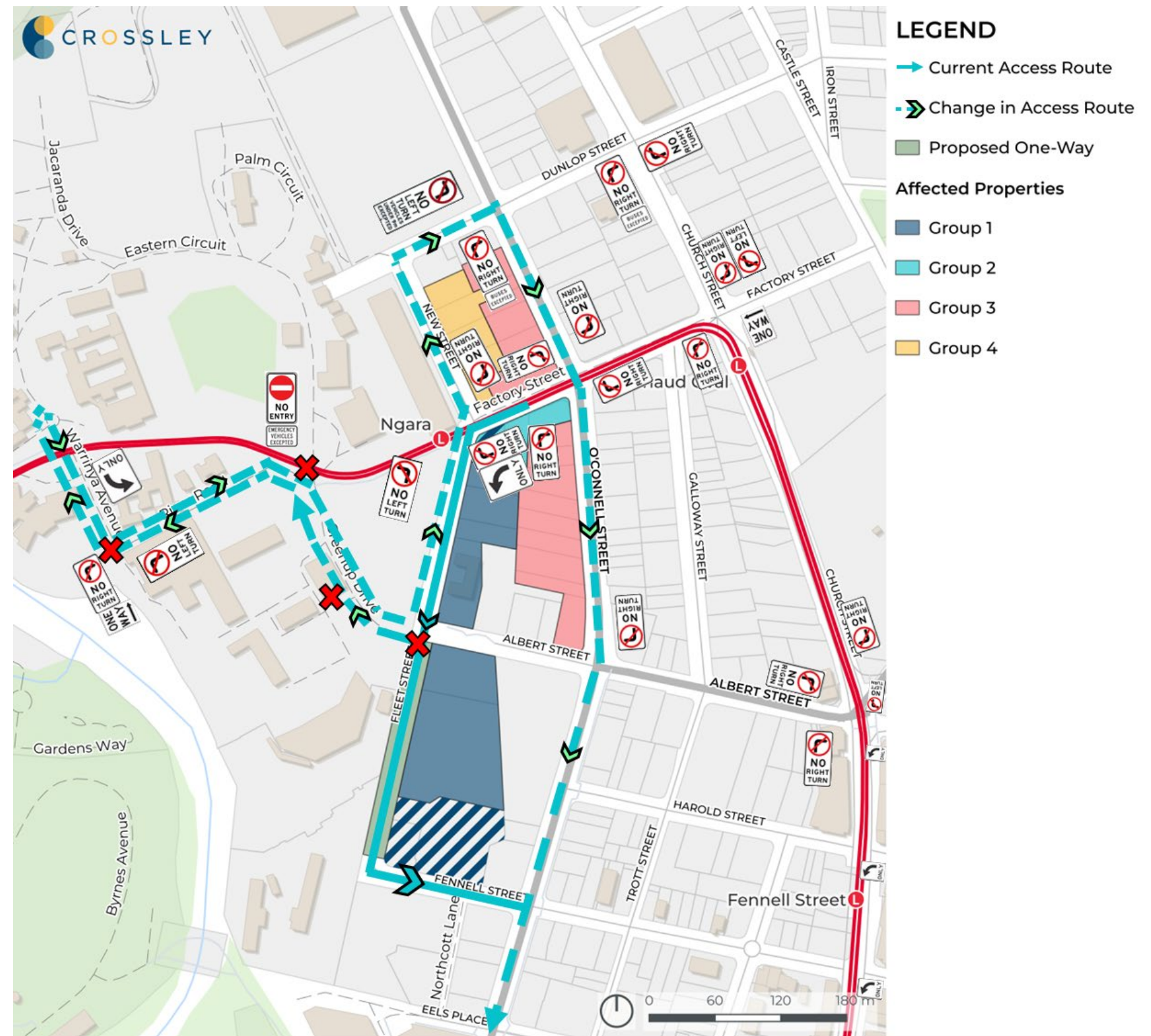


Figure 3-16: Access routes from the affected properties to the south

3.2.4 Routes from the affected properties to the south (Parramatta CBD)

With the current proposed design, vehicles are no longer able to travel southbound along Fleet Street onto Fennell Street to turn right onto O'Connell Street.

As a result, the change in access routes to the south towards Parramatta CBD for affected properties is as follows:

Group 3

South of Factory Street

- Vehicles must turn left onto Dunlop Street to loop around onto Factory Street and turn right onto Church Street to travel southbound. This presents a detour of up to **1000m** to access the CBD.
- Vehicles can now only able to access the Great Western Highway via Castle Street and Pennant Hills Road. This presents a detour of up to **1000m**.

North of Factory Street

- Vehicles must turn left onto Dunlop Street to loop around onto Factory Street and turn right onto Church Street to travel southbound. This presents a detour of up to **800m** to access the CBD.
- Vehicles are now only able to access the Great Western Highway via Castle Street and Pennant Hills Road. This presents a detour of up to **800m**.

Figure 3-17 illustrates the expected access routes with dashed lines.

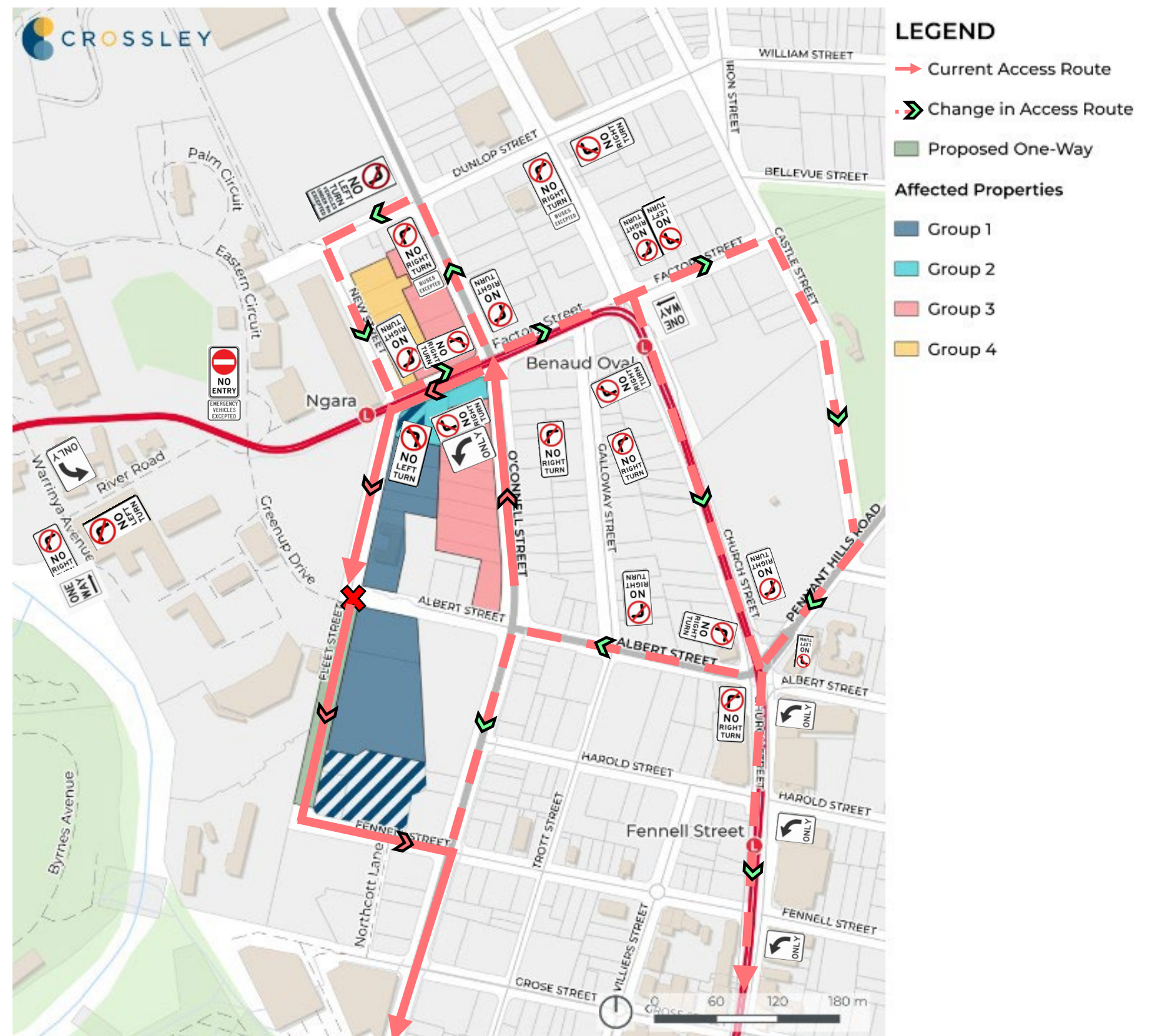


Figure 3-17: Access routes from the affected properties to the south

3.2.4 Routes from the affected properties to the south (Parramatta CBD)

Group 4

- Vehicles must travel northbound along New Street and turn right onto O'Connell Street instead of travelling southbound towards Fleet Street.
- This is a minor detour of up to **200m** but ensures the right turn onto O'Connell Street is at a signalised intersection.

Figure 3-18 illustrates the expected access routes with dashed lines.

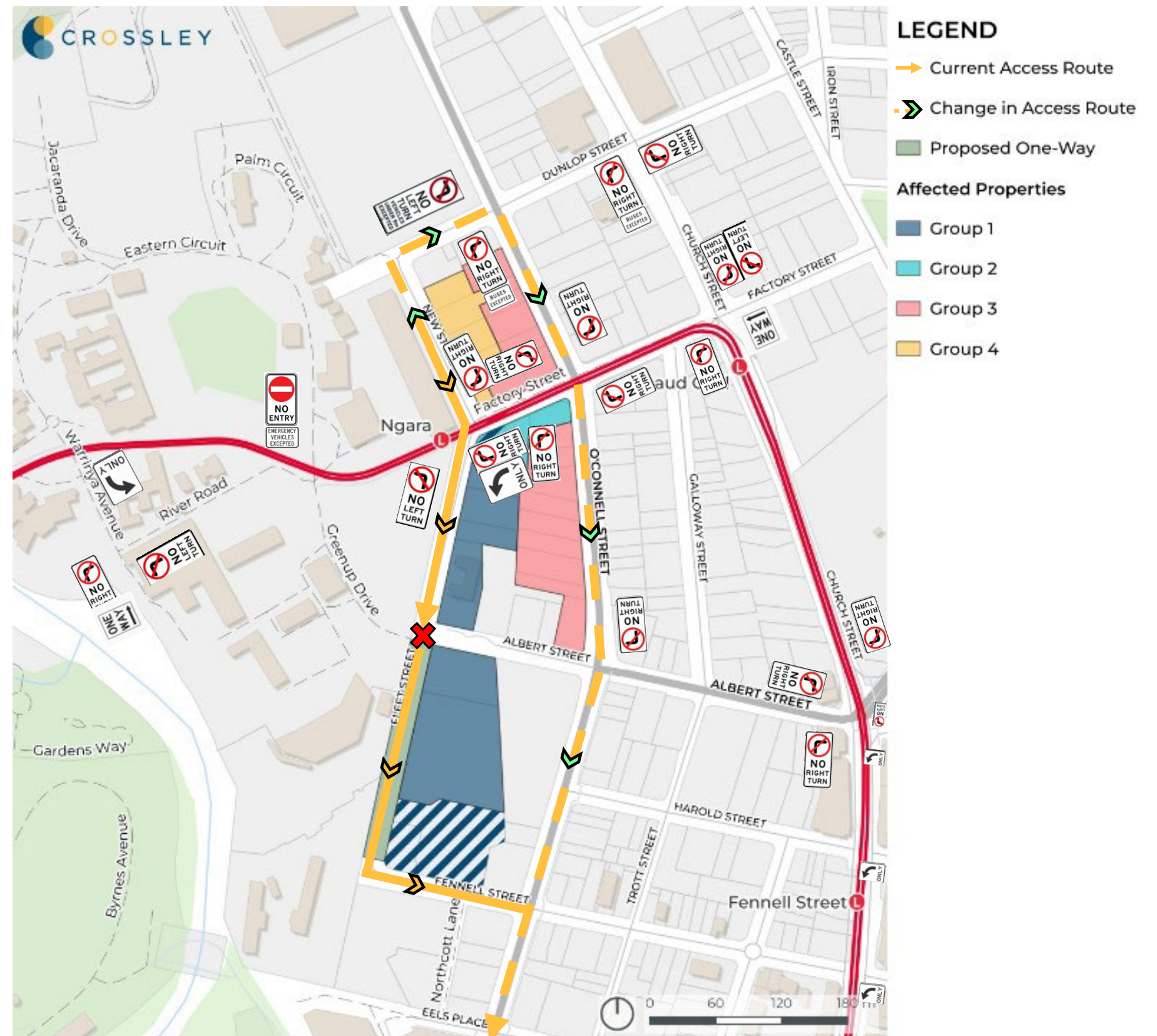


Figure 3-18: Access routes from the affected properties to the south



3.2.5 Emergency Vehicle Access for WSLHD

Western Sydney District's Cumberland Hospital is accessed via Greenup Drive. Emergency vehicles responding to a call with lights and sirens activated, are exempt from the one-way restriction and turning bans. As a result, only non-emergency trips, such as patient transfers, staff commutes, and visitor access, would be affected by the proposed changes and would be required to detour via the same routes identified for Group 1.

3.2.6 Waste Vehicle Access

Depending on the largest waste design vehicle and the routes, the one-way conversion of Fleet Street may impact waste collection for properties located along Fennell Street, Fleet Street and the WSLHD.

The largest waste vehicle currently in operation by City of Parramatta in the North Parramatta area is approximately 10.7 metres in length (see **Figure 3-7**).

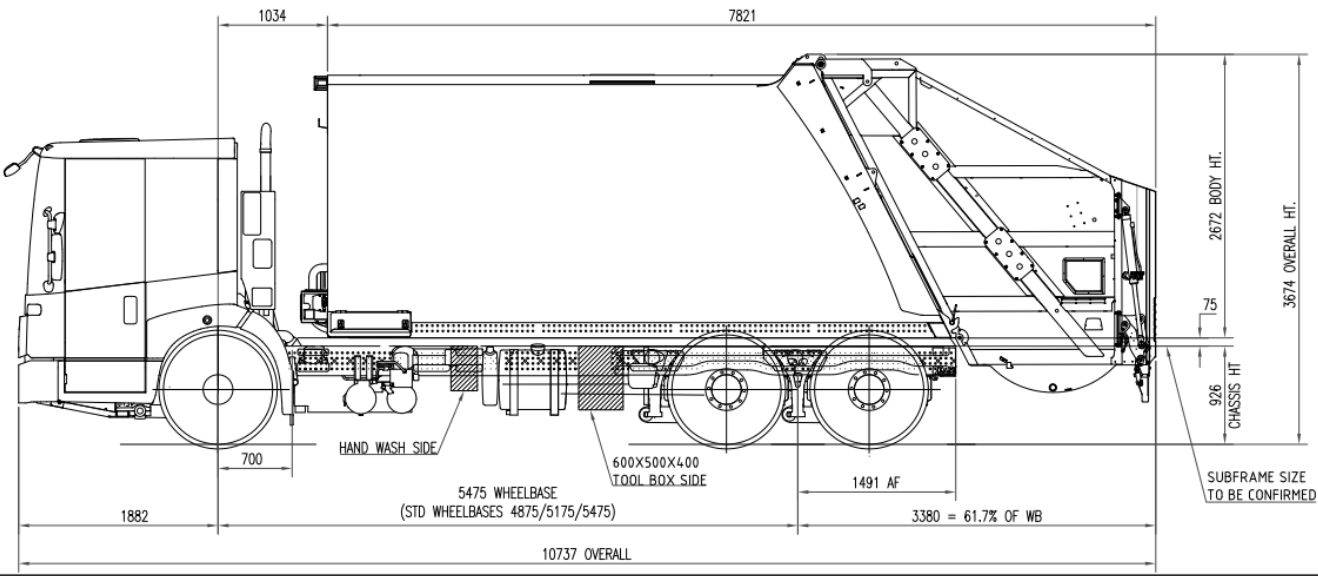


Figure 3-7: Access routes for emergency vehicles, WSLHD vehicles and waste collection vehicles

Whilst there are properties located on both sides of Fleet Street, waste collection would have to occur on the western side of the street with the northbound one-way configuration. This requires properties located on the eastern side of the street to position their waste bin(s) on the opposite side of the street; and retrieve it after waste collection.

Waste collection typically occurs at a weekly frequency in the morning, outside of the traffic peak period and hence the changed waste collection operations will not impact traffic conditions. Existing traffic count surveys also indicate low traffic volumes during this period.

3.2.7 Summary of Accessibility Impact

Each movement for each property group has been classified as a major or minor detour depending on the additional distance or turns required to reach the Parramatta CBD. The following assumptions were made:

- Any detours equal to or below 500 metres and/or detours with 4 or less additional turns are considered as minor.
- Any detours above 500 metres and/or requires more than 4 additional turns are considered as major.
- If there are no alternative access routes, it is immediately categorised as 'High Impact'.

Consequently, the level of accessibility for each property group can be determined from the number of major and minor detours as outlined in **Table 3-2**.

Table 3-2: Level of accessibility impact matrix

Level of Accessibility Impact					
Number of minor detours (by direction)	Number of major detours (by direction)				
	0	1	2	3	4
0	None	Low Impact	High Impact	High Impact	High Impact
1	Low Impact	Medium Impact	High Impact	High Impact	-
2	Low Impact	Medium Impact	High Impact	-	-
3	Medium Impact	Medium Impact	-	-	-
4	Medium Impact	-	-	-	-

Table 3-3 overleaf summarises the accessibility impact for each group of properties.

Overall, the impacts of the current proposed design are low to medium for most properties, but mitigation measures are required to reduce the impact for the small number of properties with a high impact. Solutions to resolve properties experiencing high levels of accessibility impact are investigated in Chapter 4.



Table 2-2: Level of accessibility impact for affected properties

Group	Driveway Location	Property Numbers Impacted	Access Impacted by Detour (Yes / No)				Level of Impact
			From North	To North	From South	To South	
1	Fleet Street (north of Greenup Drive)	4, 5, 6-8, 10-12, 14	No	No	No	Yes, Major detour (up to 800m to Parramatta CBD)	Low Impact
	Fleet Street (south of Greenup Drive)	2A (Fennell St), 2B (Fennell St), 2A (Fleet St), 2B (Fleet St)	Yes, Minor detour (up to 450m)	No	No	Yes, Major detour (up to 1.1km to Parramatta CBD)	Medium Impact
2	Factory Street (southern side)	1-3, 14, 55	No	Yes, Major detour (up to 550m and 6 extra turns). Includes the turn from New Street onto Dunlop Street	No	Yes, Major detour (up to 1.8km to Parramatta CBD)	High Impact
	Factory Street (northern side)	2-6	No	No	No	No	None
3	O'Connell Street (south of Factory Street)	31, 33, 37, 39, 41, 43, 45, 49, 53	Yes, Minor detour (Castle St route is an alternative route with 3 additional turns)	No	No	Yes, Major detour (up to additional 1km to Parramatta CBD via Church St and to Great Western Highway via Castle St / Pennant Hills Rd)	Medium Impact
	O'Connell Street (north of Factory Street)	57, 59, 63, 65, 67, 69	No	No	No	Yes, Major detour (up to additional 800m to Parramatta CBD via Church St and to Great Western Highway via Castle St / Pennant Hills Rd)	Low Impact
4	New Street	2A, 2-4, 6, 10-12, 14	No	No	No	Yes, Minor detour (up to 200m) but ensures the right turn onto O'Connell Street is at signalised intersection	Low Impact



3.3 TRAFFIC IMPACT

3.3.1 Estimated Traffic Redistributed

The proposed one-way northbound conversion of Fleet Street is expected to result in several changes to local traffic patterns and circulation. Traffic redistribution effects are determined by analysing existing traffic counts during the AM and PM peak hours with the following assumptions:

- It is assumed that the maximum number of vehicles being re-directed to the signalised intersection at Dunlop Street / O'Connell Street is represented by the number of vehicles recorded approaching the western leg of the priority-controlled intersection at Fennell Street / O'Connell Street (indicated in red). During the AM and PM peak hours, 35 and 113 vehicles were recorded approaching this leg respectively.
- However, some traffic using the western leg comes from properties with direct driveway access on Fennell Street, such as Lilian Wells Nursing Home and Northcott Parramatta. Access to these sites remain unchanged. Site visits and aerial imagery indicates Lilian Wells has 22 off-street parking spaces, whilst Northcott has 5 spaces for vans. Additional trips may also be associated with Northcott's underground car park and its porte-cochere for pick-up and drop-off. Based on an 80% occupancy observed, it is estimated approximately 22 vehicle trips can be attributed to these sites and should be excluded from redistributed traffic. During the AM peak, arrivals are more spread out, so only 11 vehicles were excluded. In contrast, during the PM peak – when the centres close – nearly all vehicles depart, so 17 trips were excluded.
- It is assumed that all vehicles recorded turning into Fennell Street at the priority-controlled intersection of Fennell Street / O'Connell Street are permitted and will continue to do so with the current proposed design.

As a result, these circulation changes are expected to increase turning traffic at the signalised intersection of Dunlop Street / O'Connell Street and Fleet Street / Factory Street / New Street by:

• AM peak hour – 24 vehicles

• PM peak hour – 91 vehicles

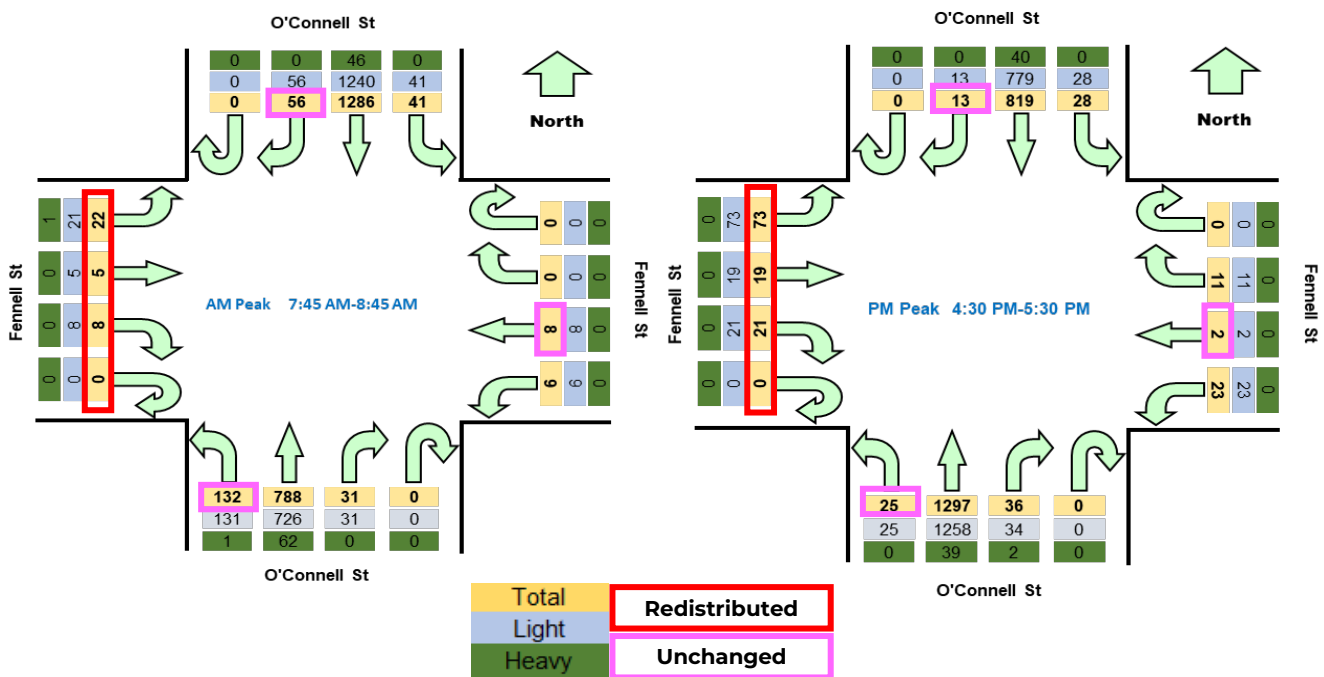


Figure 3-9: AM and PM peak hour traffic survey counts – O'Connell Street & Fennell Street (Source: Trans Traffic Survey, 2024)

3.3.2 Estimated Traffic Impact

In the absence of traffic models, a high-level queue analysis was used to explore the traffic impact of redistributed traffic associated with the 1-way conversion of Fleet Street.

Dunlop Street and O'Connell Street

At the signalised intersection of Dunlop Street and O'Connell Street, the western approach is configured with two separate lanes for left and right-turning traffic, each with lane markings extending back approximately 30 metres. This setup provides formal queueing space for around 5 vehicles per lane. Beyond this, the right-turn lane informally extends back along Dunlop Street with an informal queueing space of 45 metres before the road transitions into New Street, offering additional capacity if needed. In contrast, the left-turn lane has only 10 metres of informal queueing beyond the marked lane, constrained by adjacent on-street parking.

The existing traffic counts indicate 42 and 50 vehicles approaching the intersection from Dunlop Street respectively during the AM and PM peak hour. This makes the PM peak the critical period, with an average of 0.83 vehicles per minute across the peak hour. Typically, signalised intersections operate on cycle times lower than 180 seconds to balance wait times on all legs of the intersection. Assuming the intersection has a cycle time of 180 seconds, the average number of vehicles arriving collectively in both the left and right turn lanes per cycle is 2.5 vehicles. During the PM peak hour, 78% of vehicles turn left onto O'Connell Street, translating to an average of 2 vehicles in the left-turn lane and 0.5 in the right-turn lane per cycle.

A total of 91 vehicles will be redistributed from the Fennell Street intersection to Dunlop Street. This will result in an additional 4.5 vehicles arriving per cycle. Based on existing turning proportions at Fennell Street – where 65% of vehicles turn left during the PM peak – this adds an estimated 3 vehicles to the left-turn lane and 1.5 vehicles to the right-turn lane per cycle.

In total, the western approach at Dunlop Street is projected to experience a queue of approximately 5 vehicles in the left-turn lane and 2 vehicles in the right-turn lane per cycle. While this volume can be accommodated within the existing queue storage along Dunlop Street and New Street, the left-turn queue may extend into this informal area, occasionally obstructing access to the right-turn lane (Note: this can be managed by extending length of 'No Stopping' zone)

Along O'Connell Street, traffic volumes peak in the PM for northbound travel at 1,297 vehicles and in the AM for southbound movement at 1,286 vehicles. Given that a typical urban arterial lane has a mid-block capacity of around 900 vehicles per hour, O'Connell Street's two-lane configuration provides capacity of 1,800 vehicles per hour and the traffic volumes do not exceed the street's operating capacity. The anticipated redistribution of traffic does not introduce new traffic to O'Connell Street. Instead, these vehicles were already using the corridor and are simply being redirected to enter from a different location.

As such the redistribution of traffic is not expected to require adjustments to signal timings to increase green time for vehicles approaching from Dunlop Street and will have minimal impact on current intersection operations.

Factory Street and New Street

At the signalised intersection of Factory Street and New Street, the double solid lines between the single lanes in each direction extend for about 30 metres on the southern leg, indicating a formal queue space of about 5 vehicles. Extending beyond this to the intersection with Greenup Drive, informal capacity of about 150 metres is available along Fleet Street.

With an existing average arrival rate of about 1.5 vehicles per minute approaching the intersection and an assumed cycle time of 180 seconds, the queue length is expected to increase by an additional 4.5 vehicles on top of existing queues.

Based on this analysis, there is sufficient queue storage capacity to accommodate the redistributed traffic along Fleet Street and does not require adjustments to signal timings to increase green time for these vehicles.

4.

Alternative Options



4.1 OPTION DEVELOPMENT

These alternative options were developed to reduce the impacts on accessibility for properties affected, particularly those in Groups 2 and 3 who have had their access majorly impacted and are unable to travel southbound without undertaking a circuitous route with the current proposed design.

4.1.1 Option 1 – Permitting right turn at traffic signals

As part of the Parramatta Light Rail project, new traffic signals (TCS4985) have recently been installed at the intersection of Factory Street and Fleet Street. This upgrade aims to address potential safety conflicts between regular motor vehicle traffic and the newly introduced light rail services operating along Factory Street.

Currently, right-turn movements from Factory Street onto New Street are not permitted. This options proposes a modification to this restriction to enable this turning movement, thereby improving access for affected properties within Groups 2 and 3 located along Factory Street and O’Connell Street. Allowing right-turn access here would facilitate a subsequent right-turn onto O’Connell Street from Dunlop Street and enable southbound movement towards the Parramatta CBD.

To implement this change, existing regulatory signage would need to be removed, and new line markings introduced to help delineate and allow motorised vehicles to safely drive across the light rail tracks.

Whilst this option is expected to be relatively low in both cost and implementation time, it raises concerns regarding overall intersection performance. Permitting the right turn may reduce operational efficiency by diverting green signal time from other critical traffic and light rail movements.

With Transport for NSW’s objective of maximising light rail efficiency, they are unlikely to support this option, and the proposed right-turn movement is not recommended for further investigation unless no viable alternatives exist to address the accessibility issues.

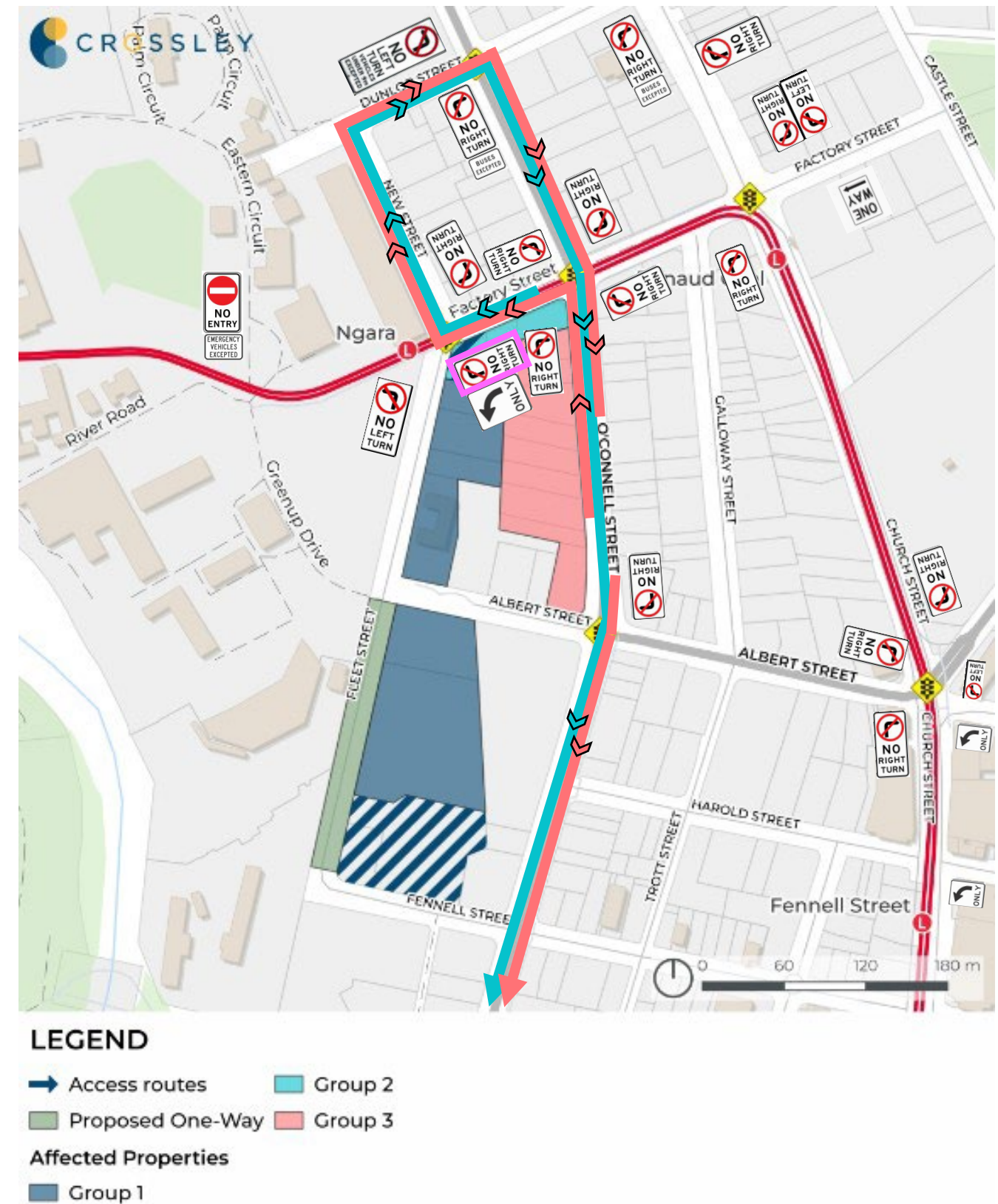


Figure 4-1: Option 1 – southbound access for properties in Group 2 and 3

4.1.2 Option 2 – Change in one-way direction to Southbound + change in intersection operation at Fennell Street

A change in one-way direction to southbound on Fleet Street would enable affected properties along O'Connell Street and Factory Street (Groups 2 and 3) to travel northbound or southbound via Fennell Street. Whilst this option would resolve accessibility issues for affected properties, it introduces new challenges at the intersection of Fennell Street and O'Connell Street. The intersection is currently unsignalised, requiring vehicles exiting Fennell Street to cross two lanes of northbound traffic to access the southbound lanes of O'Connell Street.

With traffic counts indicating over 1,000 vehicles travelling northbound during the AM peak hour, this results in limited safe gaps for right-turning vehicles, increasing the risk of unsafe behaviours and manoeuvres. Historic crash data reveals that 8 crashes have occurred at this intersection in the previous five-year period from 2015 to 2024. Of these crashes, 1 were attributed to this turning movement. The traffic counts also show more than 300 vehicles currently perform this right-turn movement every day. Redirecting Fleet Street traffic southbound would further increase demand, potentially exacerbating existing congestion and safety issues.

To mitigate the risk of crashes from occurring, the feasibility of converting the intersection to a multi-laned roundabout intersection, seagull intersection and signalised intersection was explored.

A. Feasibility of a multi-lane roundabout intersection

A two-lane roundabout intersection at Fennell Street would provide a traffic calming effect to reduce the speed of northbound and southbound vehicles along O'Connell Street and provide more opportunities for vehicles exiting Fennell Street to turn right.

However, this solution requires a minimum inscribed circle radius of 14 to 20 metres depending on the largest design vehicle size. There is insufficient space to accommodate a multi-laned roundabout without realigning the kerb or acquiring adjacent property to satisfy the required central island radius and circulating lane widths to facilitate the safe movement of vehicles through the intersection.

B. Feasibility of a seagull intersection

A seagull configuration could facilitate a safer, staged right-turn movement. However, this solution requires a minimum carriageway width of 14 to 20 metres, depending on the largest design vehicle. With over 100 heavy vehicles recorded using the street during the AM peak and a carriageway width of 14.5 metres, there is insufficient space to accommodate a seagull intersection without realigning the kerb or removal of a single traffic lane in each direction to allow for the necessary left-turn slip lanes, right-turn lanes, shoulders and medians.

Additionally, historic crash data from other intersections in New South Wales suggests that seagull intersections may not always yield safety improvements, further reducing the viability of this option. Consequently, this option is expected to require significant construction activities resulting in high costs and long implementation times.

C. Feasibility of a signalised intersection

Signalisation of the Fennell Street intersection would improve safety for right-turning vehicles at the expense of reduced traffic efficiency. Allocating green time to support the right-turn movement would reduce northbound and southbound capacity and flow on O'Connell Street. This option is expected to also require significant construction activities resulting in high costs and long implementation times. Given that there are traffic signals on either side of Fennell Street and relatively high traffic volumes recorded along O'Connell Street, it is unlikely to be supported by Transport for NSW as signalising this intersection would negatively impact overall network performance. In light of these priorities, the change in one-way direction to southbound along with the proposed signalised intersection at Fennell Street is not recommended for further investigation unless no viable alternatives exist to address the accessibility issues.

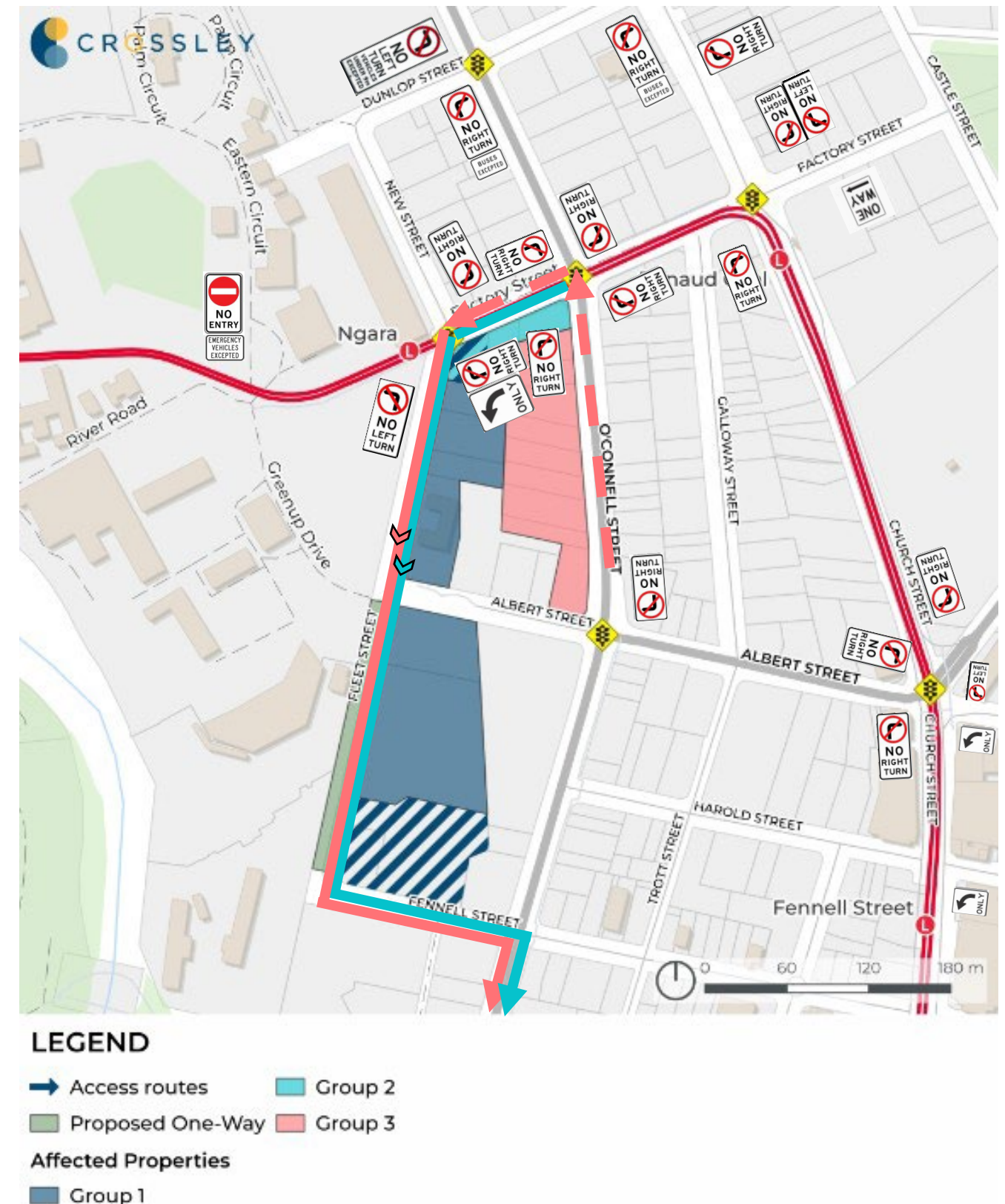


Figure 4-2: Option 2 – southbound access for properties in Group 2 and 3

4.1.3 Option 3 – Provision of an open cul-de-sac head at the intersection of Fleet Street / Greenup Drive

The provision of an open cul-de-sac head at the intersection of Fleet Street / Greenup Drive would enable affected properties along O'Connell Street and Factory Street (Groups 2 and 3) to travel southbound towards the Parramatta CBD via Dunlop Street by providing additional space for vehicles to perform a U-turn.

The design dimensions for cul-de-sacs vary based on the intended land use and requirements of local councils. For urban residential areas, the required kerb alignment and circulating radius of a cul-de-sac is similar to a roundabout with minor difference in cost and constructability.

The implementation of a cul-de-sac may require the following considerations:

- Additional carriageway space to accommodate minimum design dimensions
- Potential realignment of kerb to allow for additional road space. The stone wall on the eastern side of the road makes it difficult to realign the kerb.
- Removal of existing trees
- A traditional cul-de-sac enables vehicles to U-turn with no other approaches to feed traffic into the intersection. This presents important safety and priority conflicts between the U-turn movement and vehicles entering the open cul-de-sac intersection from Greenup Drive or the southern approach.

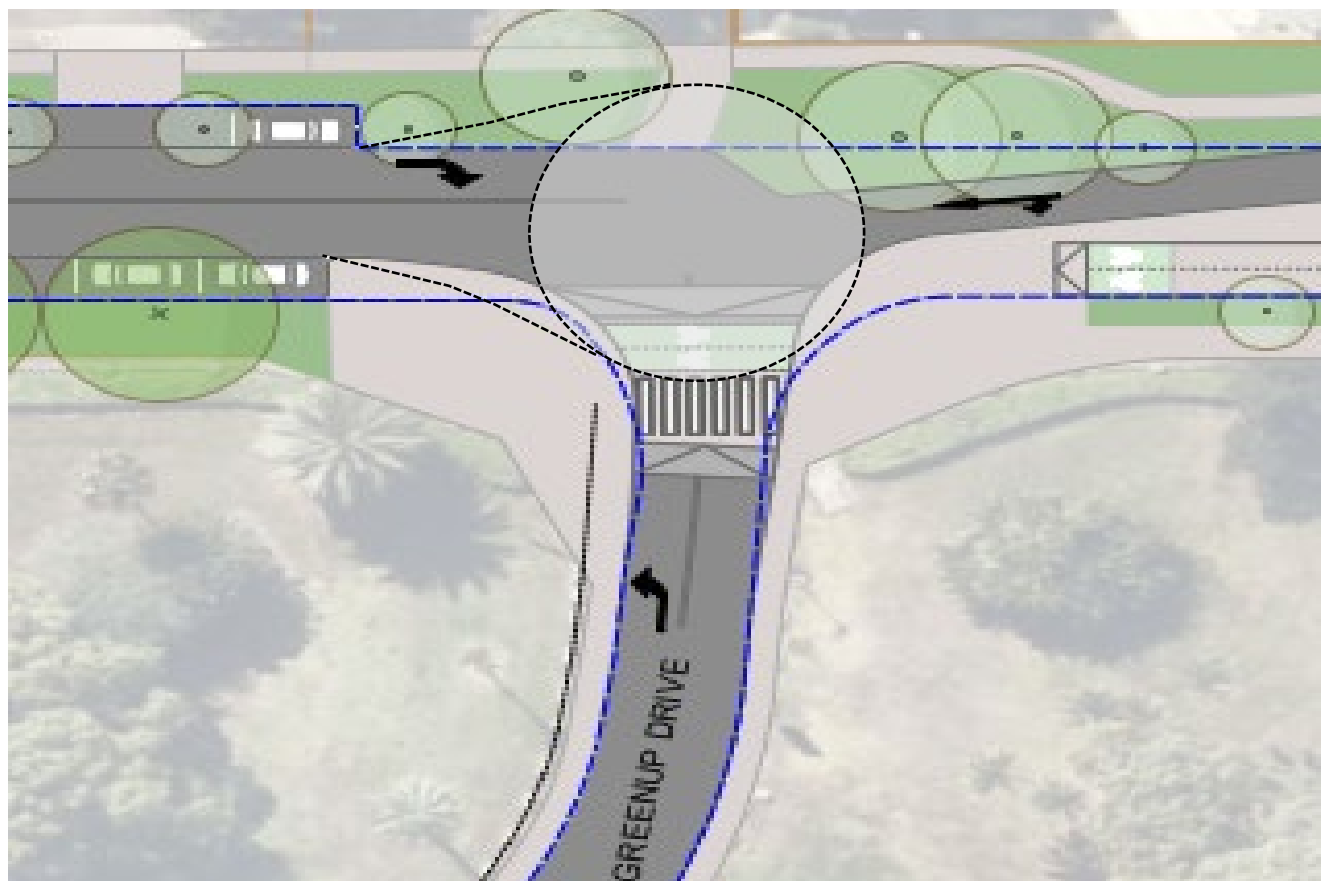


Figure 4-3: Potential open cul-de-sac intersection

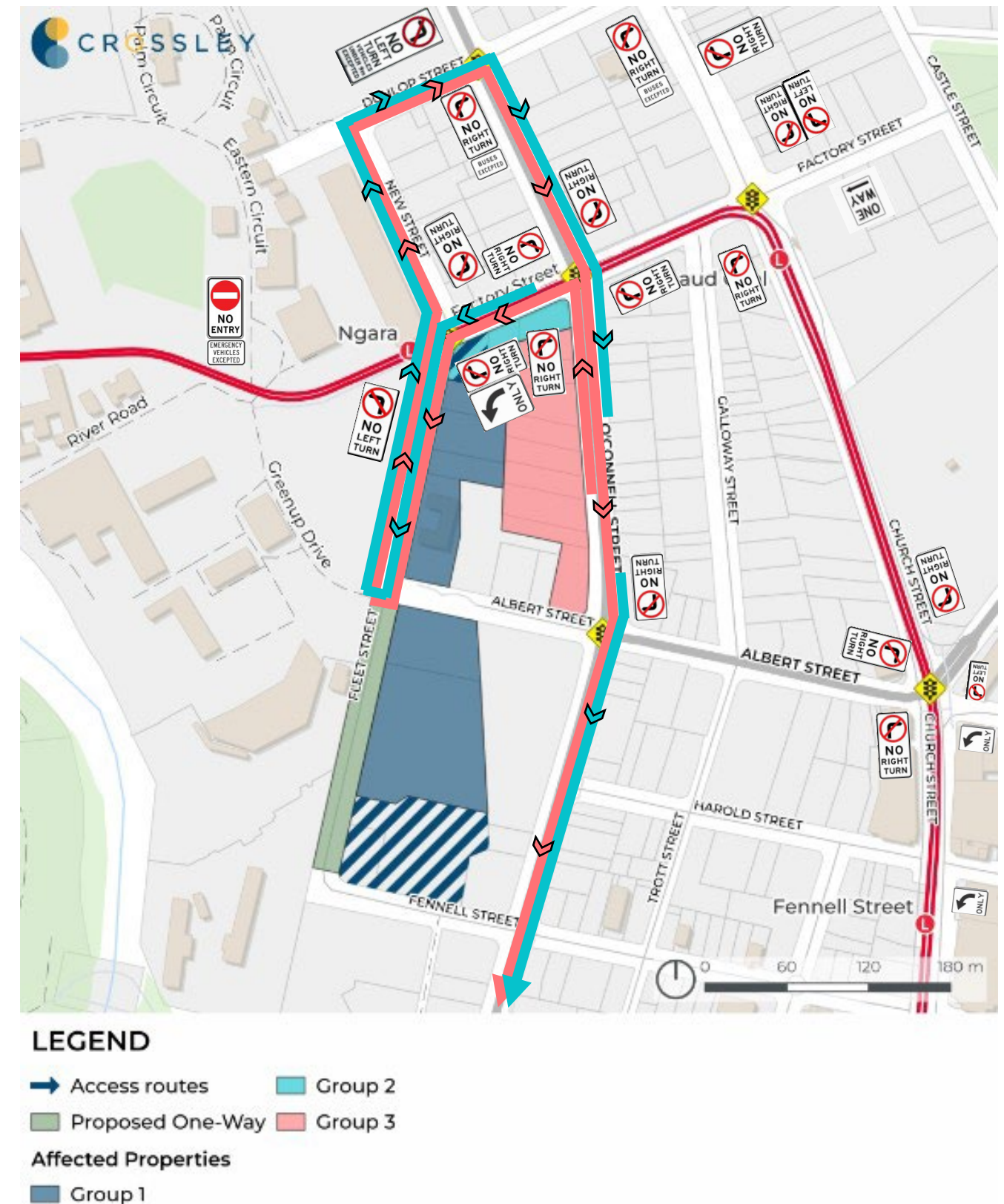


Figure 4-4: Option 3 – southbound access for properties in Group 2 and 3



4.1.4 Option 4 – Provision of a roundabout at the intersection of Fleet Street / Greenup Drive and at Dunlop Street / New Street

Roundabout at Fleet Street / Greenup Drive

Constructing a roundabout at the intersection of Fleet Street / Greenup Drive will enable affected properties in Group 2 and 3 to travel southbound along O’Connell Street by performing a U-turn at the roundabout and turning right at the intersection of Dunlop Street / O’Connell Street. This option also improves safety at the intersection by delineating right-of-way for vehicles approaching the intersection from different directions.

Table 4-1 outlines a summary of central island radius width of up to 8 metres and its associated circulating traffic lane widths for different design vehicles as recommended by Austroads.

Table 4-1: Central island radius and traffic circulating width of conventional roundabout
(Source: Guide to Road Design Part 4B: Roundabouts, Austroads 2023)

Design Vehicle	Central Island Radius (m)	Traffic Circulating Width (m)	Total Width
12.5m single unit truck	5	-	5m + circulating width
	6	-	6m + circulating width
	8	6.7	14.7m
19m semi-trailer	5	9.2	14.2m
	6	8.9	14.9m
	8	8.4	16.4m

Without any kerb realignment, the intersection of Fleet Street / Greenup Drive has a maximum radius of approximately 7 metres. The Austroads guidelines stipulates a minimum central island radius of 5 metres and if applied to the intersection, leaving 2 metres for circulating width. This indicates there is insufficient space for a standard roundabout.

Alternative emerging treatments involving mini-roundabouts are known to provide similar outcomes in constrained environments with a lower associated implementation cost. A mini-roundabout is a small roundabout with a solid painted circle or low traversable dome in the middle of the intersection.

For a single-lane approach on a mini roundabout, Austroads recommends the lane width at the give-way line should be between **3 to 4 metres** and with a central island diameter between **1 to 4 metres**. The mountable dome should not exceed 100mm and cars should be able to take the roundabout without the need to cross or override the white circle in the middle of the roundabout.

Figure 4-5 explores the feasibility of a mini-roundabout with a central island radius of 1-metre and 4 metres within the intersection space. The remaining space is allocated to the circulating widths of 6 metres and 3 metres respectively, providing adequate room for cars to turn within the intersection. Swept path analysis is recommended to confirm turning movements for specific design vehicles.

This option would also require a change in signage and line markings to accommodate the mini-roundabout and is unlikely to impact existing parking operations.

Table 4-2: Advantages and disadvantages of mini-roundabouts
(Source: Guide to Road Design Part 7: New and Emerging Treatments, Austroads, 2021)

Pros	Cons
• Alternative where cost and/or the road reserve restricts the use of other intersection treatments • Alternative to traditional roundabout allowing vehicles to traverse over the central island • Can improve the capacity of existing intersections where dominant movements cause delays to minor approaches • Can be an effective traffic-calming measure	• May be unsuitable for roads with high proportions of pedestrians and cyclists if not used in conjunction with other safety design elements. • Tend to be less visible than standard roundabouts, particularly if it is located on a crest.

Roundabout at Dunlop Street / New Street

Constructing a roundabout at the intersection of Dunlop Street / New Street will enable greater road network permeability by allowing affected properties on O’Connell Street (Group 3) located north of Factory Street to have a shorter southbound route to the Parramatta CBD.

Instead of completing a circuitous route via New Street, Factory Street and Church Street, vehicles are able to perform a U-turn at the roundabout and turn right directly onto O’Connell Street from Dunlop Street. This also enables future resilience with the planned new access road extension of Dunlop Street expected to service new housing within the Parramatta North Precinct.

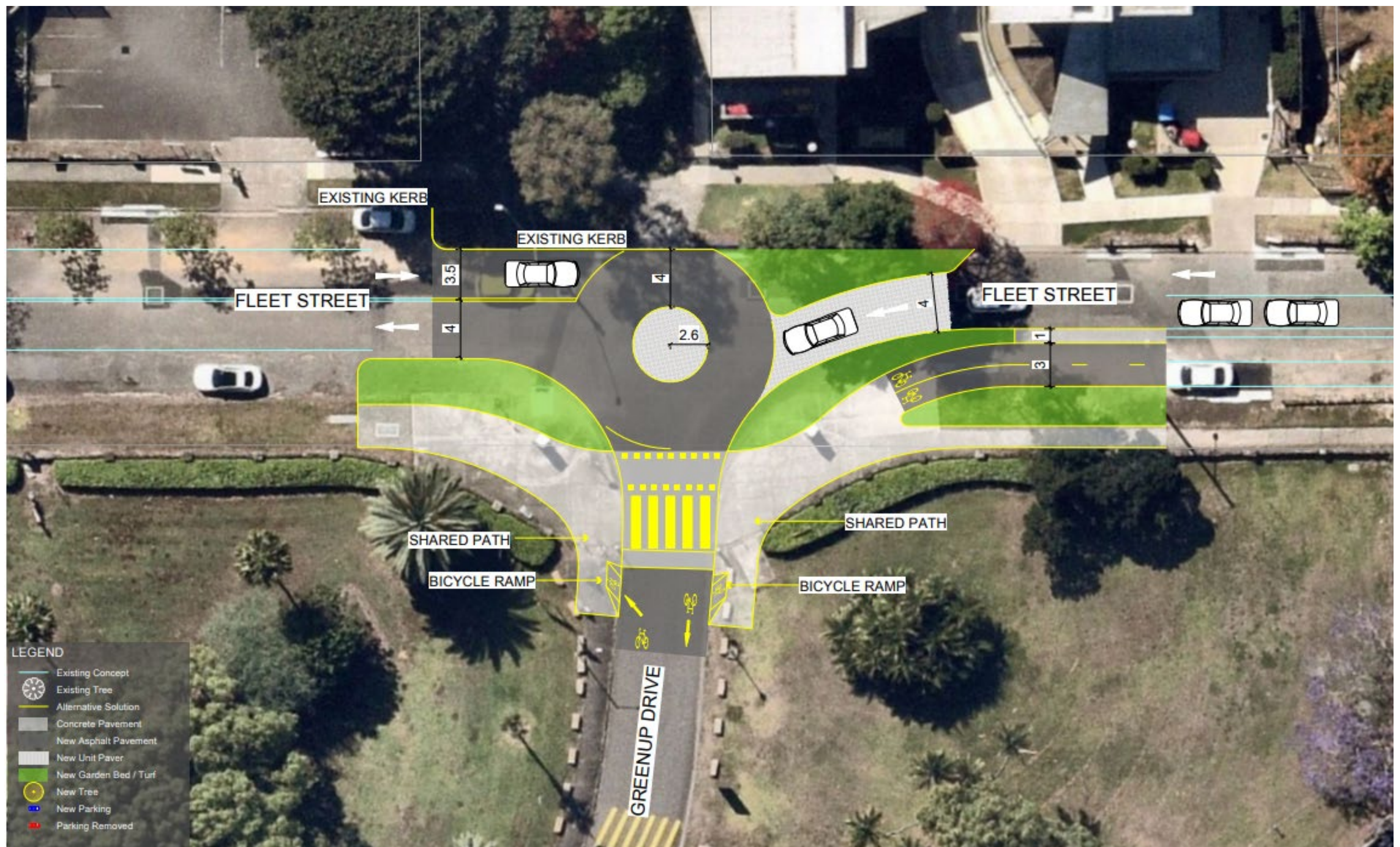


Figure 4-5: Potential mini-roundabout for Option 4 at Fleet Street and Greenup Drive (Source: SMM, 2025)

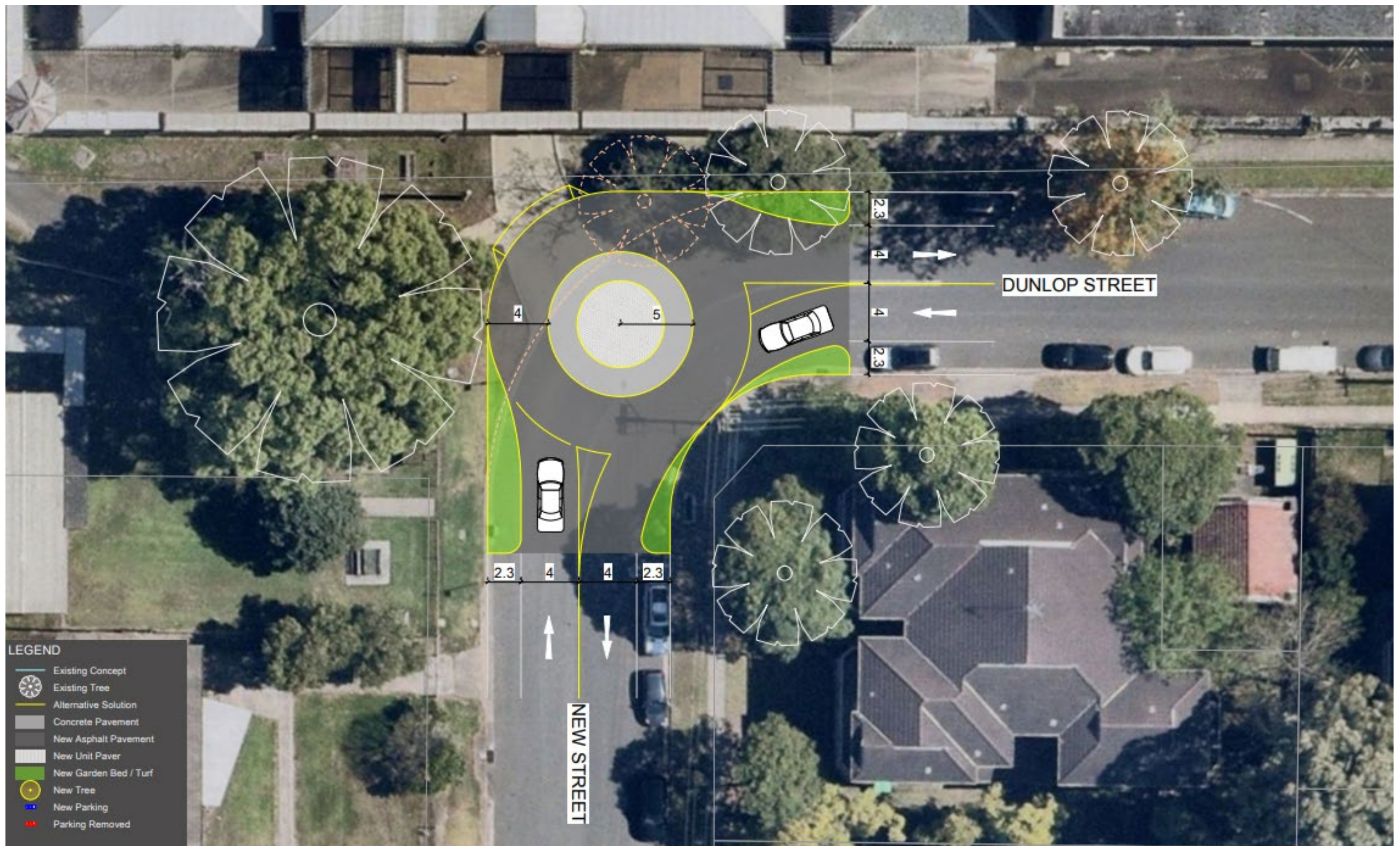


Figure 4-6: Potential roundabout for Option 4 at Dunlop Street and New Street (Source: SMM, 2025)



4.2 OPTIONS ASSESSMENT

The options developed were evaluated against four main criteria to determine the preferred option:

- Risk – Are there any commercial, safety or public-facing risks that may arise from the project?
- Cost / constructability – What is the level of cost by considering construction activities required to implement the option?
- Improvement to accessibility – Does the option resolve accessibility issues for those significantly impacted?

- Impact on network performance – How does the option impact network performance for different transport modes?

The assessment is summarised in **Table 4-3**. The outcome of the assessment reveals **Option 4 to be the preferred option** to resolve the accessibility issues.

Table 4-3: Evaluation of options against criteria

Option	Risk	Cost / Constructability	Improvement to Accessibility	Impact on Network Performance
Current proposed design	Low Likely to have no concerns with TfNSW and other relevant external stakeholders	Low Requires minimal construction activities	Low Affected properties unable to travel southbound without crossing the light rail line or performing illegal u-turn mid-block and does not connect to future estate	Low Unlikely to significantly impact network performance
1	High External concerns likely to be raised by TfNSW and relevant stakeholders	Low Requires minimal construction activities	Medium Helps affected properties and increases network permeability slightly but does not connect to future estate	Medium May impact network performance
2	High External concerns likely to be raised by TfNSW and relevant stakeholders	High Requires significant construction activities or land acquisition	Low Helps affected properties but does not increase network permeability	High Will impact network performance significantly
3	Medium Likely to have no concerns with TfNSW and other relevant external stakeholders. Safety risk associated with operation of vehicles u-turning at cul-de-sac whilst traffic is fed into Fleet Street.	Medium Requires some construction activities	Low Helps affected properties but does not increase network permeability	Low Unlikely to significantly impact network performance
4	Low Likely to have no concerns with TfNSW and other relevant external stakeholders	Low Requires minimal construction activities	High Improves accessibility to affected properties and provides connection to future estate. Improves safety by directing people to a signalised right turn from Dunlop Street onto O'Connell Street instead of an unsignalised turn at Fennell Street	Low Unlikely to significantly impact network performance



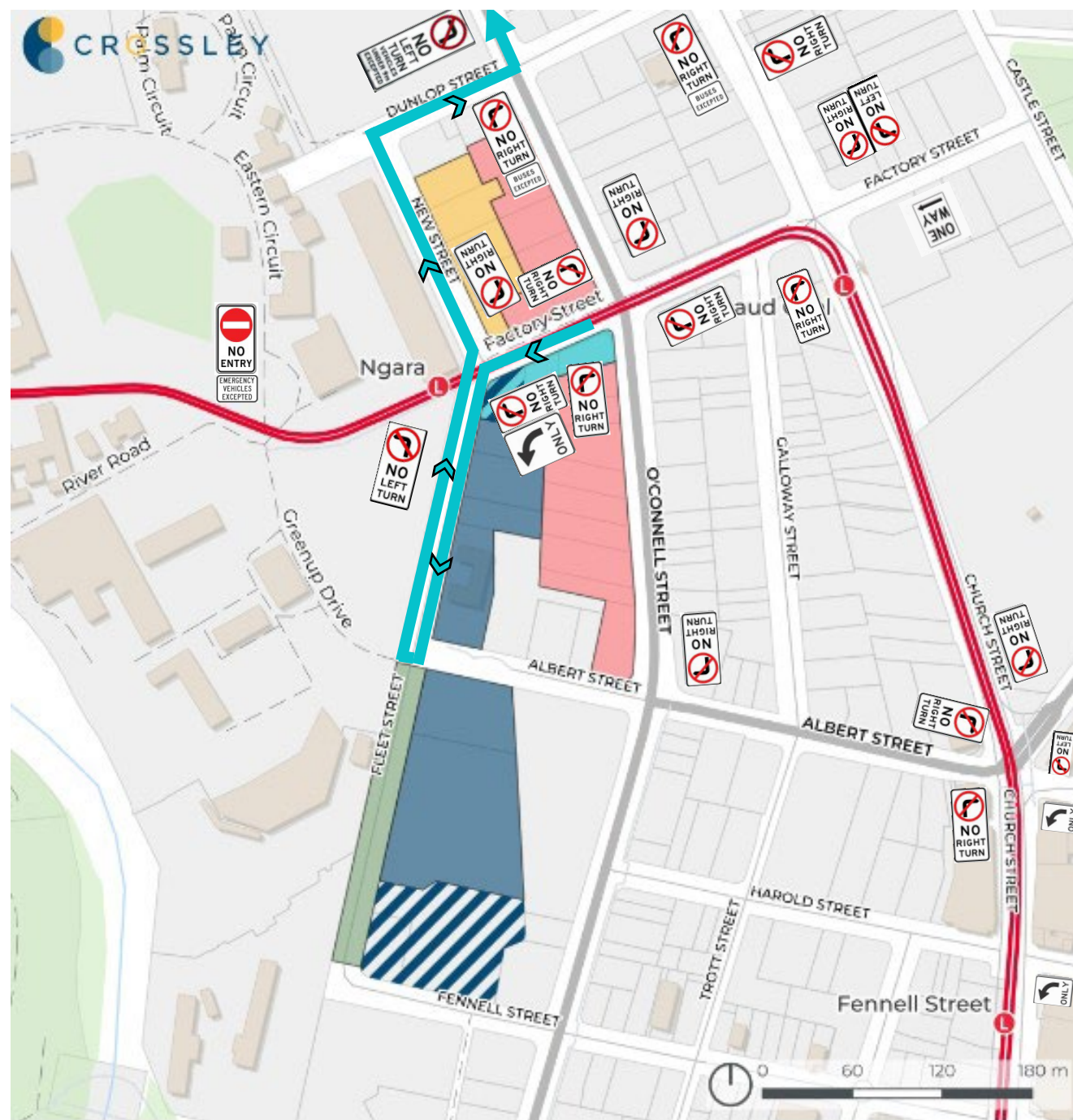
Option 4 would enable affected properties to travel southbound towards the Parramatta CBD safely and efficiently by enabling U-turns at the roundabouts and turning right onto O’Connell Street via a signalised intersection instead of turning across multiple lanes of traffic at the unsignalised intersection with Fennell Street. No adjustments to existing signal timings are required and it enables future resilience with the planned new access road extension of Dunlop Street to service new housing within the Parramatta North Precinct.

The level of accessibility impact for all property groups are now classified as ‘Low Impact’ with the exception of properties directly adjacent to the one-way section of Fleet Street.

Table 4-4 provides a summary of changes to accessibility impact for the affected properties after the implementation of **Option 4**.

Table 4-4: Change in level of accessibility impact for affected properties with the implementation of Option 4

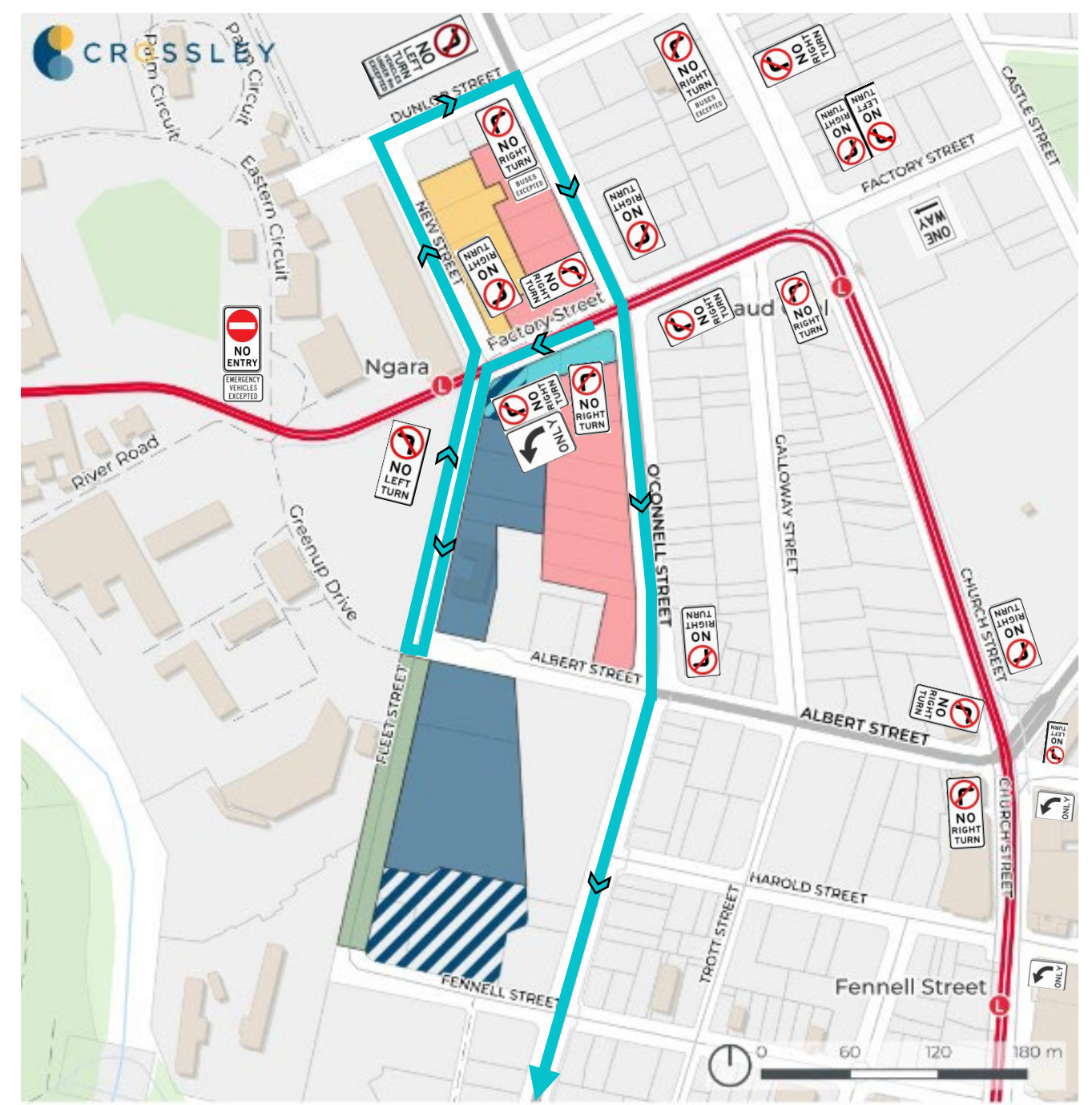
Group	Driveway Location	Property Numbers Impacted	Change in Impact with Option 4				New Level of Accessibility Impact with Option 4
			From North	To North	From South	To South	
1	Fleet Street (north of Greenup Drive)	4, 5, 6-8, 10-12, 14	None	None	None	No change. Yes, Major detour (up to 800m to Parramatta CBD)	Low Impact
	Fleet Street (south of Greenup Drive)	2A (Fennell St), 2B (Fennell St), 2A (Fleet St), 2B (Fleet St)	No change. Minor detour (up to 450m)	None	None	No change. Yes, Major detour (up to 1.1km to Parramatta CBD)	Medium Impact
2	Factory Street (southern side)	1-3, 14, 55	None	Distance of detour reduced by up to 1.2km compared to current proposed design. Improves access route from the existing conditions arrangement by up to 650m and is no longer a detour.	None	Distance of detour reduced from 1.8km to 1km to reach Parramatta CBD when compared against existing conditions arrangement Yes, still a major detour.	Low Impact
	Factory Street (northern side)	2-6	None	None	None	None	None
3	O’Connell Street (south of Factory Street)	31, 33, 37, 39, 41, 43, 45, 49, 53	No change. Minor detour (Castle St route is an alternative route with 3 additional turns)	None	None	Distance of detour reduced from 1000m to 200m to reach Parramatta CBD or Great Western Highway via U-turn at Dunlop St roundabout compared to current proposed design. However, still a minor detour.	Low Impact
	O’Connell Street (north of Factory Street)	57, 59, 63, 65, 67, 69	None	None	None	Distance of detour reduced by 800m to reach Parramatta CBD or Great Western Highway via U-turn at Dunlop St roundabout compared to current proposed design. Distance is the same as existing conditions arrangement. No longer a detour.	None
4	New Street	2A, 2-4, 6, 10-12, 14	None	None	None	No change. Yes, Minor detour (up to 200m) but ensures right turn onto O’Connell Street is at signalised intersection	Low Impact



LEGEND

- Access routes
- Group 2
- Proposed One-Way
- Group 3
- Affected Properties**
- Group 1

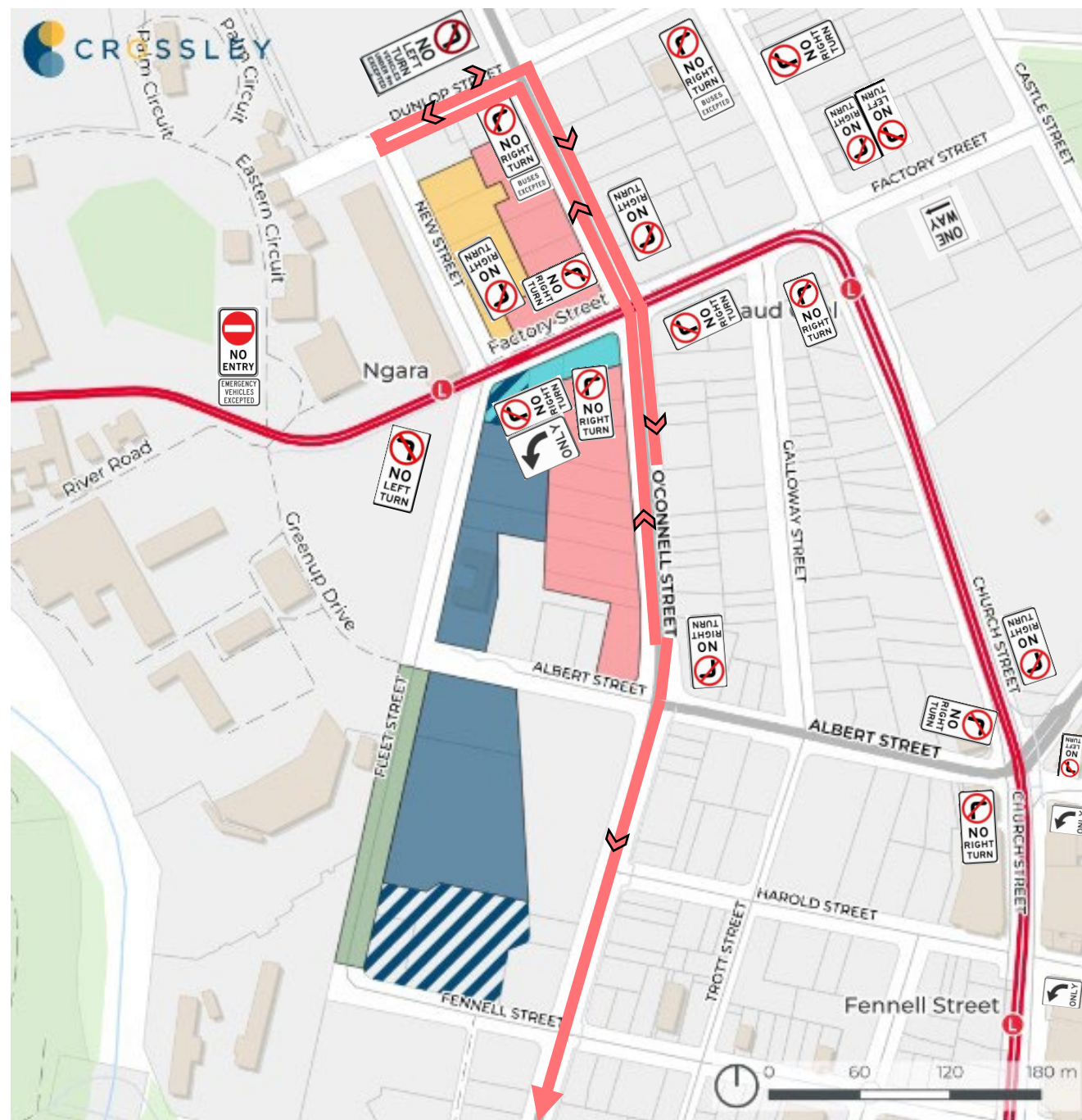
Figure 4-7: Option 4 – new northbound access for properties in Group 2



LEGEND

- Access routes
- Group 2
- Proposed One-Way
- Group 3
- Affected Properties**
- Group 1

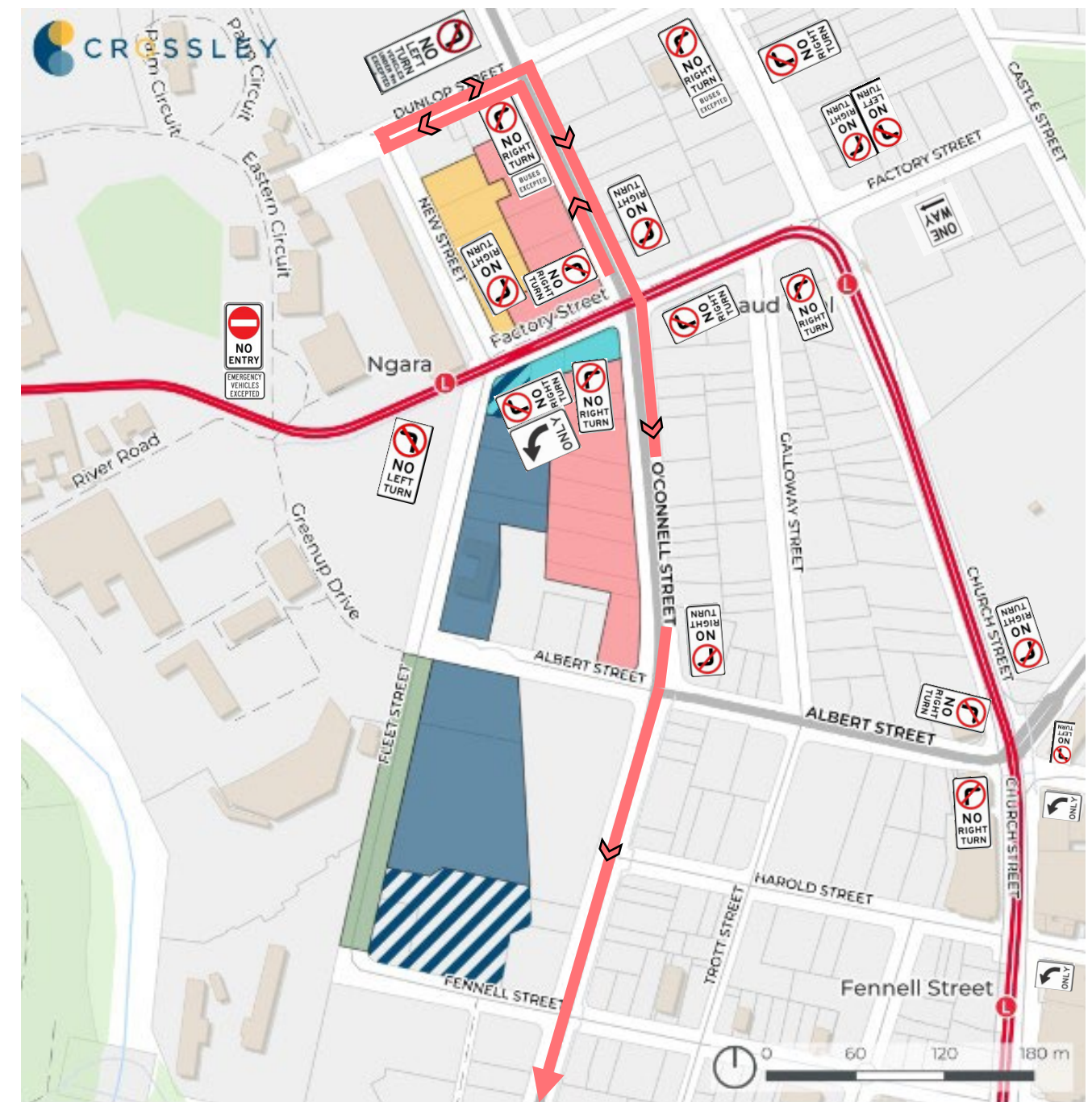
Figure 4-8: Option 4 – new southbound access for properties in Group 2



LEGEND

- Access routes
- Proposed One-Way
- Affected Properties
- Group 1
- Group 2
- Group 3

Figure 4-9: Option 4 – new southbound access for properties in Group 3 (south of Factory St)



LEGEND

- Access routes
- Proposed One-Way
- Affected Properties
- Group 1
- Group 2
- Group 3

Figure 4-10: Option 4 – new southbound access for properties in Group 3 (north of Factory St)



4.3 NEXT STEPS

Following the traffic circulation and local access review, the following items are recommended to be completed:

- Concept and detailed designs for the roundabout upgrades at Dunlop Street / O'Connell Street and Greenup Drive / Fleet Street.
- Swept path analysis to investigate turning movements for the largest design vehicles at the roundabout intersection upgrade locations.



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