

Granville High Pedestrian Activity Area

Final Report

City of Parramatta

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1. INTRODUCTION

1.1 Background

Bitzios Consulting has been engaged by City of Parramatta Council (Council) to undertake High Pedestrian Activity Area (HPAA) assessments within the Granville town centre. The investigations aim to support Council's application to Transport for NSW (TfNSW) to reduce the posted speed limit in these areas for the purpose of increasing pedestrian safety and amenity.

1.2 Study Areas

The extents of the proposed HPAA is listed below and in Figure 1.1.

- Bold Street, north of the rail bridge
- Bridge Street
- Cowper Street
- Good Street, south of Parramatta Road
- Rowell Street
- East Street.



Figure 1.1: Granville Study Area

1.3 NSW Speed Zoning Guidelines

1.3.1 Review and Implementation

Guidelines for implementing speed zones are found in TfNSW's *NSW Speed Zoning Guidelines Version 4 (Speed Zoning Guidelines, 2011)* and the process for reviewing and implementing speed zones is shown in Figure 1.2. This HPAA study considers Step 1 to Step 6 of the review process.

1.3.2 40km/h Speed Limit Categories

In NSW, 40km/h speed limits are permitted in:

- High Pedestrian Activity Areas
- Local Traffic Areas
- School zones (prescribed times)
- School bus black spots.

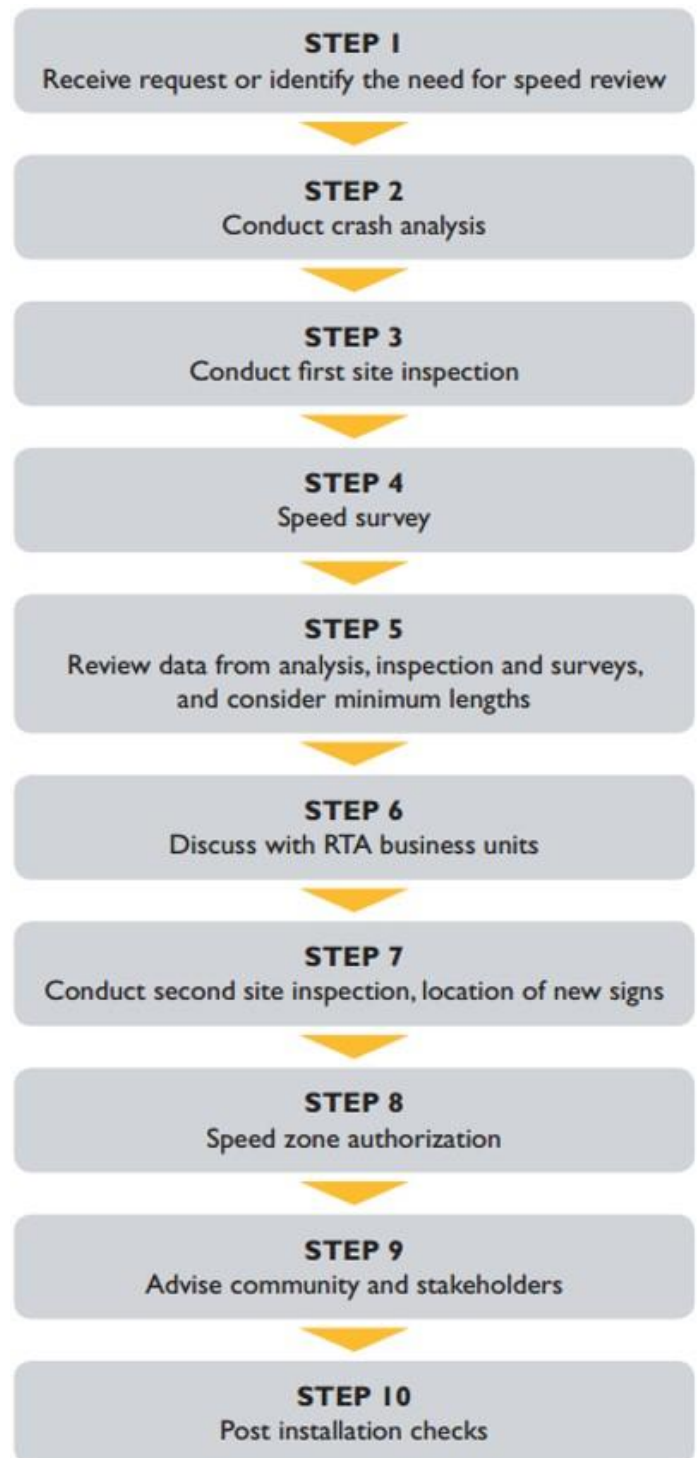
The speed limits within the Granville town centre are proposed to be designated 40km/h speed limits under the 'High Pedestrian Activity Area' category.

1.3.3 Effectiveness of 40km/h Speed Limits

In 2018, the NSW Centre for Road Safety conducted an evaluation on the effectiveness of 40km/h speed limits, including HPAA's. Key findings from the evaluation include that:

- There have been statistically significant reductions in crashes following implementation of 40km/h HPAA's
- Reduced casualties in HPAA's occurred for road users generally, not just for pedestrians
- It is likely that expanded coverage of 40km/h HPAA's would generate further road safety benefits
- There are high levels of community support for 40km/h zones

Low speed zones achieve broader community benefits, as well as safety benefits.

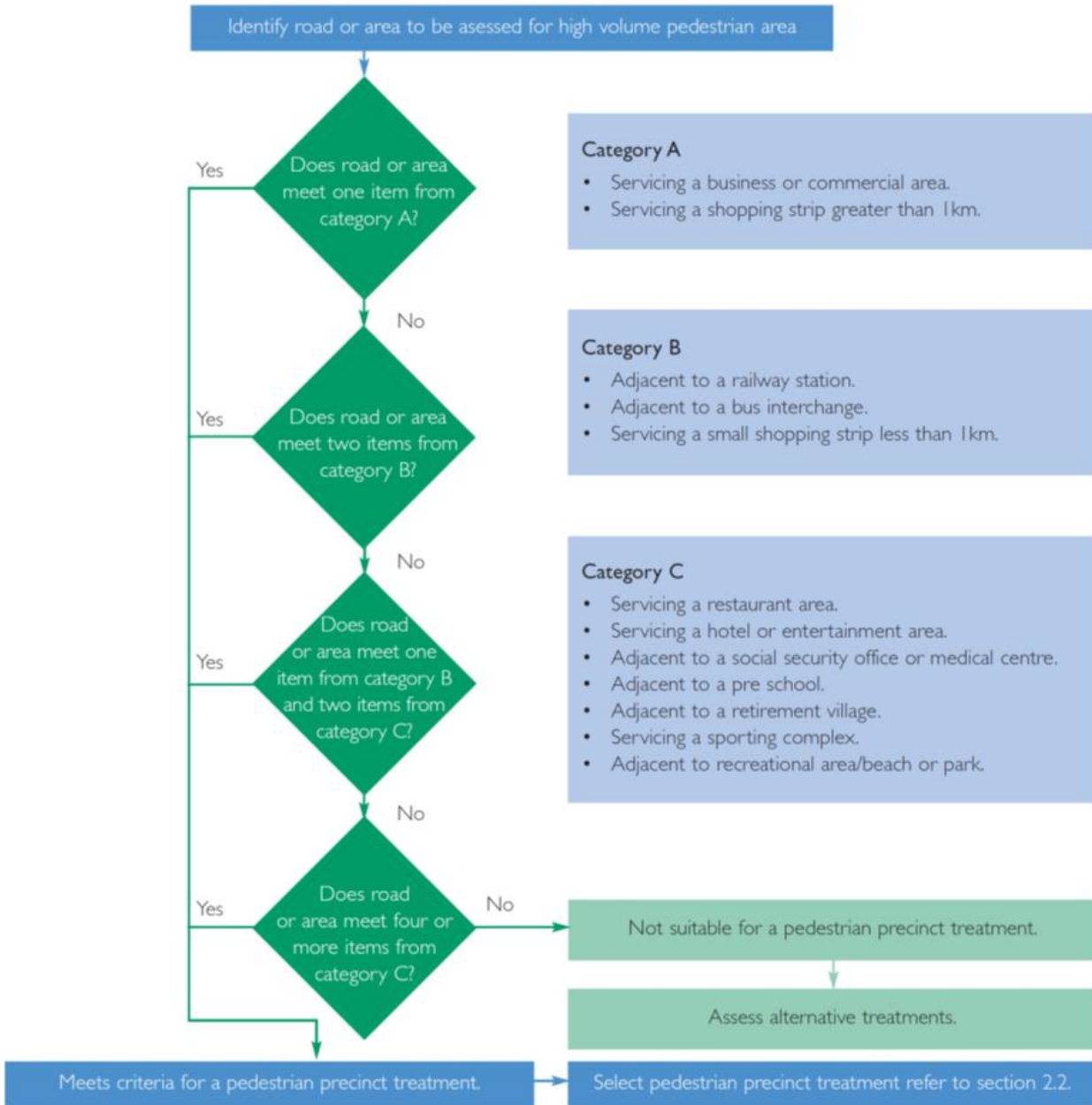


Source: NSW Speed Zoning Guidelines (Transport for NSW, 2011), Figure 2.4

Figure 1.2: Speed Zone Review Process

1.4 Criteria for Implementing 40km/h HPAA

For the implementation of a 40km/h speed limit under a HPAA, the section of road or area under consideration must satisfy specific criteria contained in TfNSW's *40 km/h Speed Limits in High Volume Pedestrian Areas (2005)* (the HPAA guidelines). The process is shown in Figure 1.3 and suggests the HPAA designation could be suitable in areas such as commercial or business areas, shopping strips, dining precincts, medical centres and social services, recreation areas or sporting complexes, entertainment / hotel areas, and transport hubs / interchanges.



Source: *40 km/h speed limits in high volume pedestrian areas (Transport for NSW, 2005), Figure 1*

Figure 1.3: Qualifying Criteria and Treatments for High Pedestrian Activity Areas

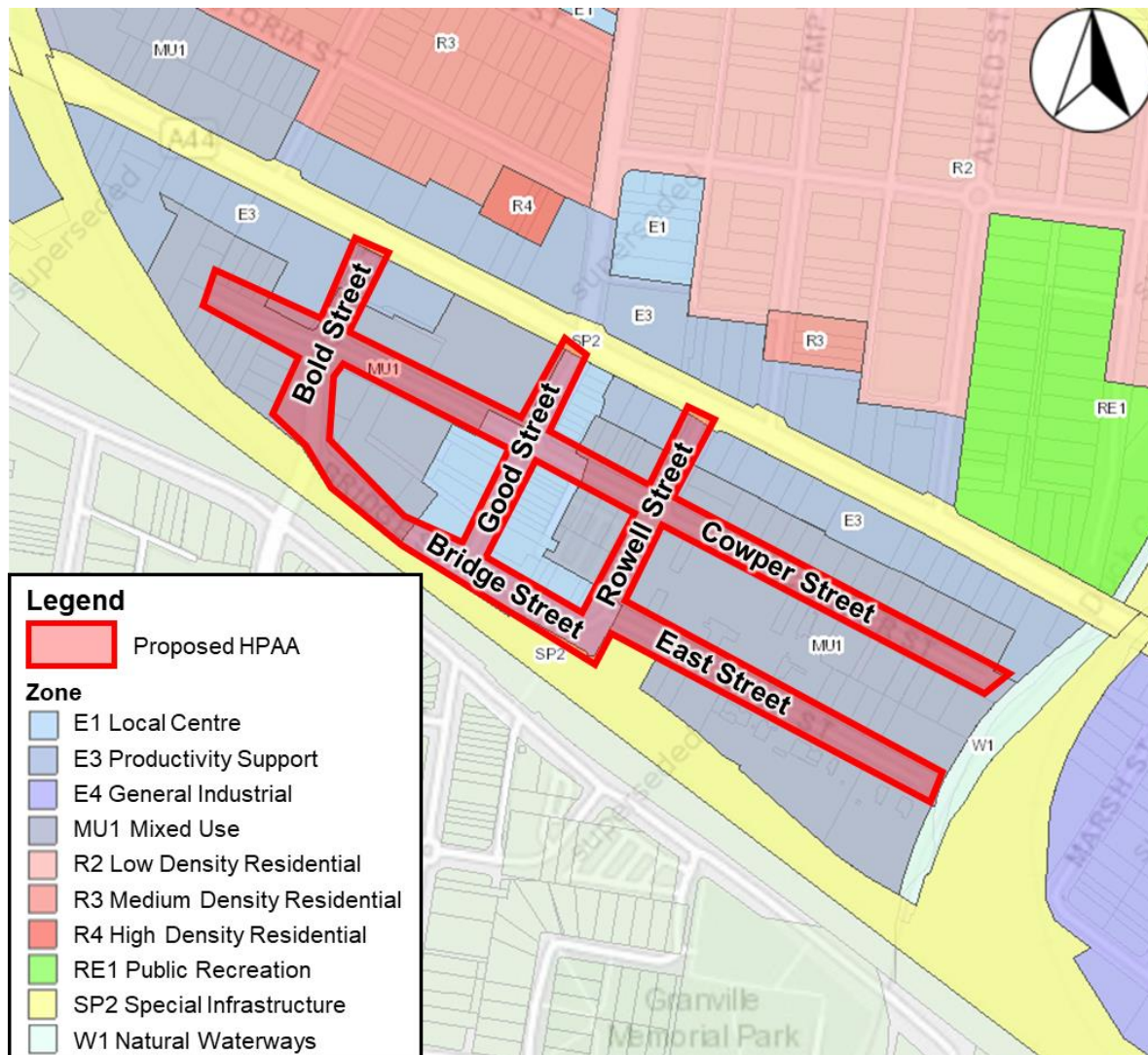
2. EXISTING CONDITIONS

2.1 Land Uses

Granville primarily consists of:

- Local centre along Good Street made up of both dining and retail premises
- Mixed use developments consisting of high-density residential developments and retail premises.

The land use definitions of the Granville study area under the Parramatta Local Environmental Plan 2023 are shown in Figure 2.1.



Source: ePlanning Historical Viewer (NSW Government)

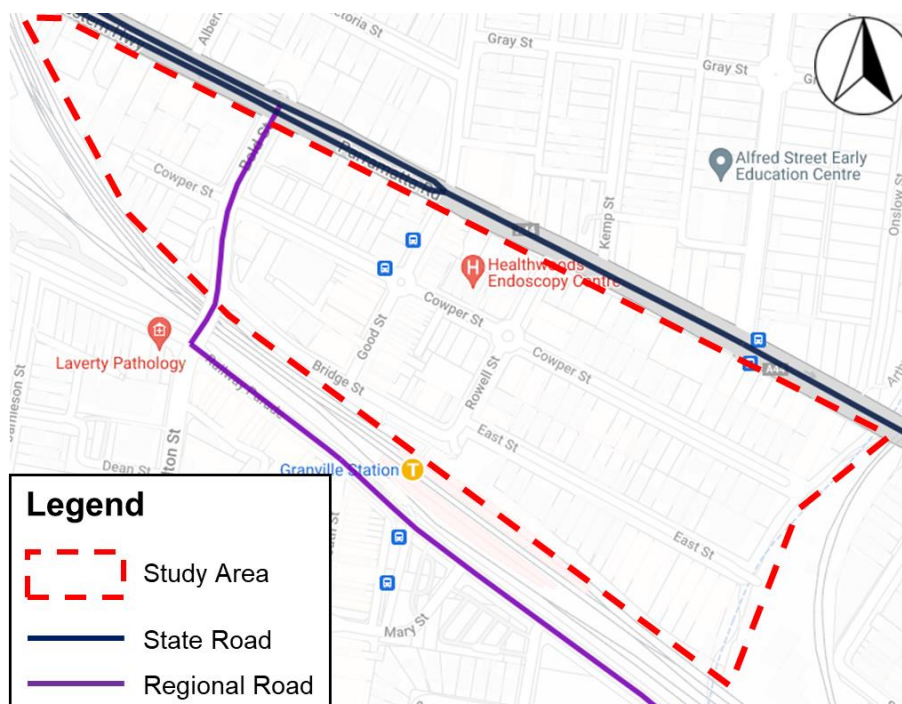
Figure 2.1: Granville Land Zoning Map

2.2 Road Network

Characteristics and key features of the Granville road network is summarised in Table 2.1. Road classifications are shown in Figure 2.2.

Table 2.1: Existing Road Characteristics

Road Name	Classification	Speed Limit(s)	Features
Bold Street	Regional Road	60km/h	Three northbound travel lanes Two southbound travel lanes Parking not permitted on Bold Street Left-in left-out arrangement at Bridge Street Northbound left turn bus lane
Bridge Street	Local Road	50km/h	One travel lane and one parking lane per direction Roundabout with marked splitter islands at Good Street Raised combined pedestrian and cyclist crossing between Good Street and Rowell Street
Cowper Street	Local Road	50km/h	One travel lane and one parking lane per direction No through road west of Bold Street and east of Rowell Street Roundabout with marked splitter islands at Good Street Low profile roundabout with refuge splitter islands at Rowell Street
Good Street	Local Road	50km/h	Two travel lanes per direction north of Cowper Street One southbound travel lane and two parking lanes (south of Cowper Street)
Rowell Street	Local Road	50km/h	One travel lane with one parking lane on all approaches and departures
East Street	Local Road	50km/h	One travel lane and one parking lane per direction No through road



Source: NSW Road Network Classifications Map (Transport for NSW)

Figure 2.2: Granville Road Classifications

2.3 School Zones

There are no school zones within the study area.

2.4 Public Transport

2.4.1 Buses

Bold Street, Cowper Street and Good Street in Granville are serviced by three public bus routes and seven school bus routes. Public bus routes and service frequencies are summarised in Table 2.2 and Table 2.3.

Table 2.2: Granville Public Bus Services

Route No.	Route Description	Direction	Service Frequency
906	Fairfield to Parramatta	Both directions	<ul style="list-style-type: none"> ▪ 30 mins (Monday to Friday peak) ▪ 60 mins (Monday to Saturday off-peak)
M91	Hurstville to Parramatta via Padstow & Chester Hill	Both directions	<ul style="list-style-type: none"> ▪ 10 mins (Monday to Friday peak) ▪ 15 mins (Monday to Friday off-peak) ▪ 20 mins (weekends and public holidays)
N60	Fairfield to City Town Hall via Strathfield (Night Service)	Both directions	<ul style="list-style-type: none"> ▪ 60 mins (Sunday to Thursday nights) ▪ 30 mins (Friday and Saturday nights)

Source: transportnsw.info

Table 2.3: Granville School Bus Services

Route No.	Route Description	Service Frequency	
		AM Peak	PM Peak
S423	Granville Station to Our Lady of Mercy College	1	-
S426	Normanby St before Tangerine St, Fairfield East to Our Lady of Lebanon	1	-
S427	Macathur Girls HS to Granville Station	-	1
S428	Our Lady of Lebanon to Normansby St before Tangerine St, Fairfield East	-	1
S429	Rawson Rd after Excelsior St, Guildford to Our Lady of Lebanon	1	-
S434	Our Lady of Lebanon to Excelsior St after Adam St, Guildford	-	1
S435	Donald St at Orchardleigh St, Guildford to Our Lady of Lebanon	1	-
S436	Our Lady of Lebanon to Excelsior St at Farnell St, Merrylands	-	1
S438	Our Lady of Lebanon to Broughton St after South Pde, Old Guildford	-	1

Source: transportnsw.info

2.4.2 Trains

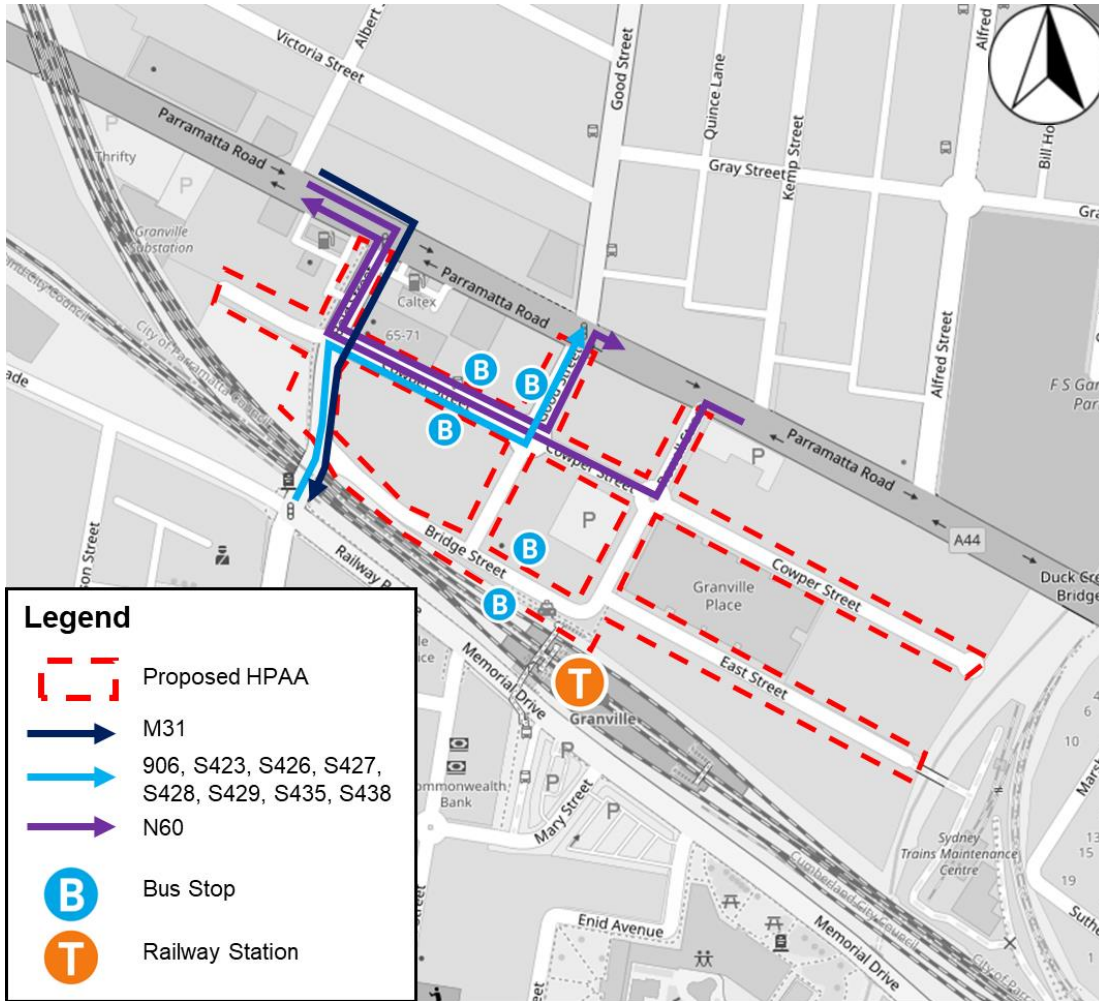
Granville Station is serviced by two rail lines as summarised in Table 2.4.

Table 2.4: Granville Train Services

Line	Line Description	Service Frequency
T1 North Shore & Western Line	Berowra to Emu Plains or Richmond via Gordon and City	<ul style="list-style-type: none"> ▪ 15 mins (early and late Monday to Friday, weekends and public holidays)
T2 Inner West & Leppington Line	Parramatta or Leppington to City	<ul style="list-style-type: none"> ▪ 5-9 mins (Monday to Friday peak) ▪ 3-15 mins (Monday to Friday off-peak) ▪ 15 mins (weekends and public holidays)

Source: transportnsw.info

The locations of bus routes and stops and railway stations in the study area are shown in Figure 2.3.



Sources: transportnsw.info / OpenStreetMap

Figure 2.3: Granville Public Transport Routes and Stops

2.5 Active Transport

2.5.1 Walking

Formal footpaths are provided on both sides of all roads within the study area.

2.5.2 Cycling

The following cycling routes are currently located within the study area (see Figure 2.4):

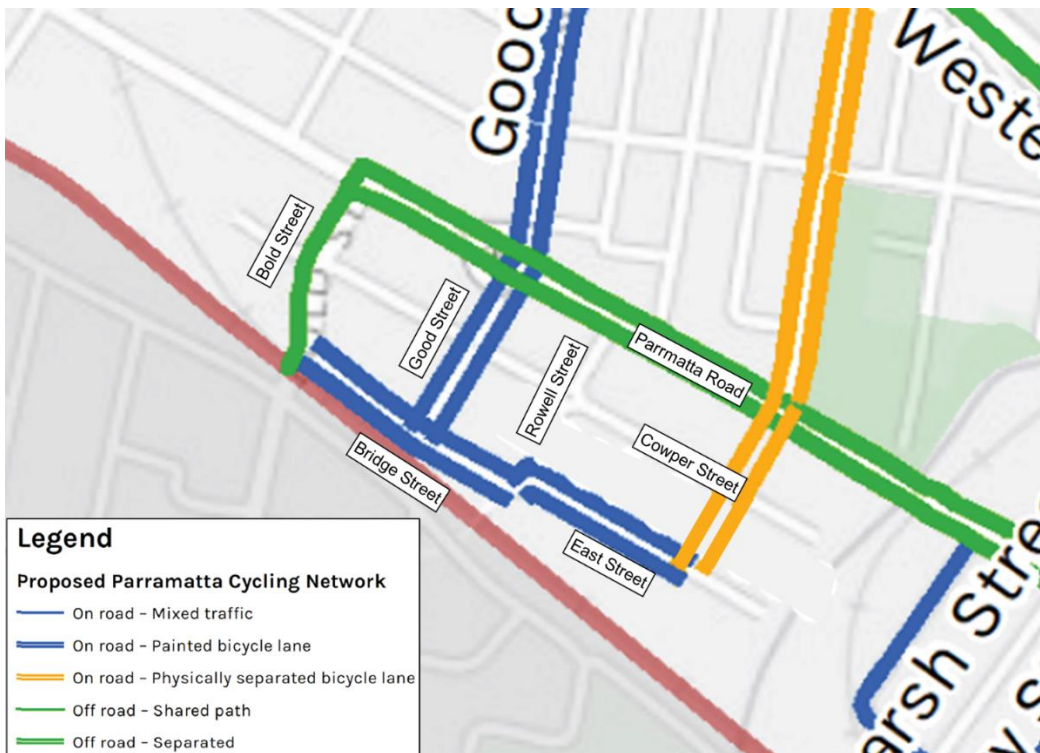
- A shared path along the western side of Bold Street north of Railway Parade
- A shared path along the eastern side of Bold Street between Railway Parade and Bridge Street
- On-road mixed traffic route for vehicles and cyclists along Bridge Street and Good Street.



Source: Cycleway Finder (Transport for NSW)

Figure 2.4: Granville Cycling Routes

In 2017, the City of Parramatta released the Parramatta Bike Plan. This proposed a number of future cycle routes throughout the Parramatta LGA. The proposal is to include on-road painted bicycle lanes along Bridge Street, Good Street and East Street. Off-road, separated cycleways are proposed to be provided along Bold Street and Parramatta Road. The Granville proposed routes from this plan are shown in Figure 2.5.



Adapted from Parramatta Bike Plan (2017)

Figure 2.5: Granville Proposed Cycle Routes

3. CRASH DATA ANALYSIS

3.1 Overview

The *Speed Zoning Guidelines (2011)* recommend analysing a minimum of three years of crash data for roads under review. For this assessment, crash data between October 2017 and September 2022 was sourced from TfNSW, representing five years of data.

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

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

3.2 Crash and Casualty History

Figure 3.1 presents the number of crashes per year. 8 crashes were recorded in the study area, resulting in 7 casualties. Additionally:

- Crashes were highest in 2019 and 2021, with 3 crashes each, resulting in 3 casualties in 2019 and 1 casualty in 2021
- 2020 showed a drop to 1 crash, most likely due to COVID which reduced vehicular activity in the area.

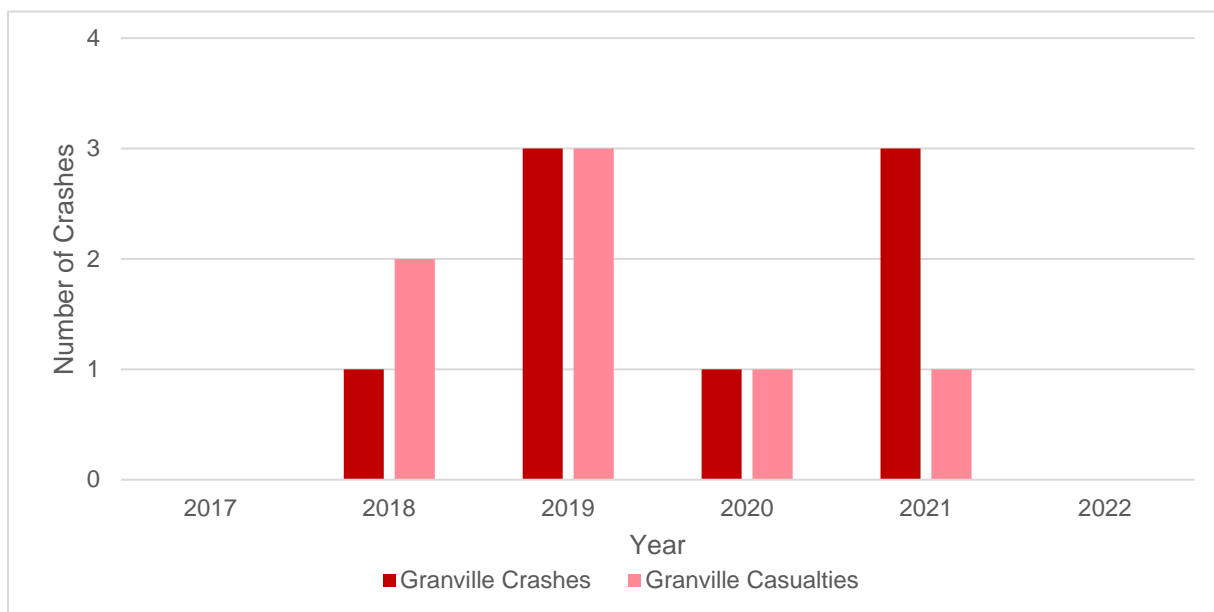


Figure 3.1: Annual Crashes and Casualty Crashes (October 2017-September 2022)

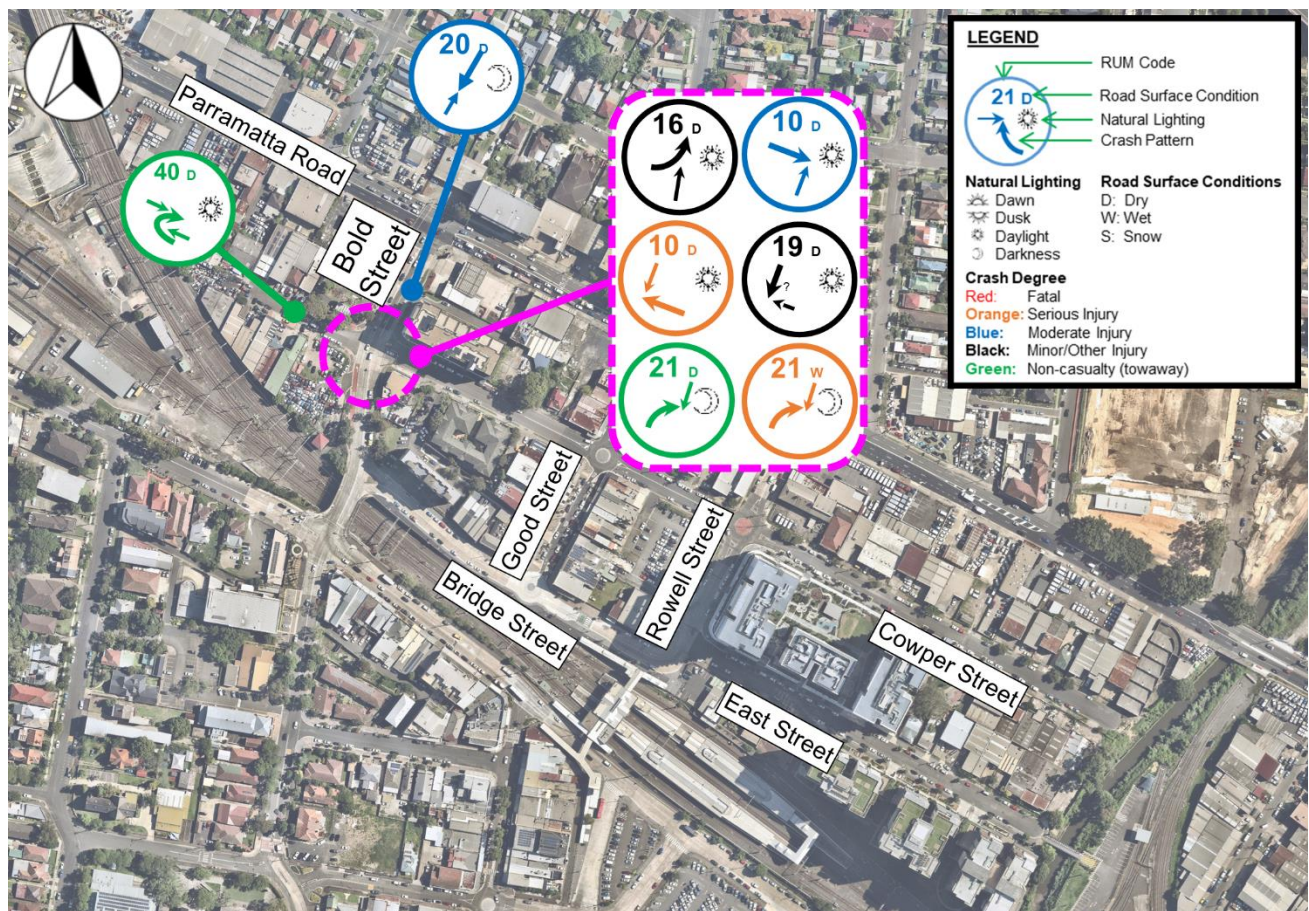
3.3 Crash Locations

Figure 3.2 presents the locations of crashes in Granville by injury level and shows:

- 2 (25%) crashes resulting in a serious injury
- 4 (50%) crashes each resulting in a moderate or minor injury
- 2 (25%) crashes resulting in a tow-away.

6 crashes occurring at the Bold Street/Cowper Street 4-leg priority intersection, including:

- 4 crashes involving vehicles travelling from an adjacent direction
- 2 'right through' crashes
- 3 crashes resulting in a serious injury.



Adapted from Nearmap

Figure 3.2: Granville Crash Locations

3.4 Crash Injury Level

Table 3.1 summarises the annual number and percentages of crash injury level within Granville.

Table 3.1: Crash Injury Level

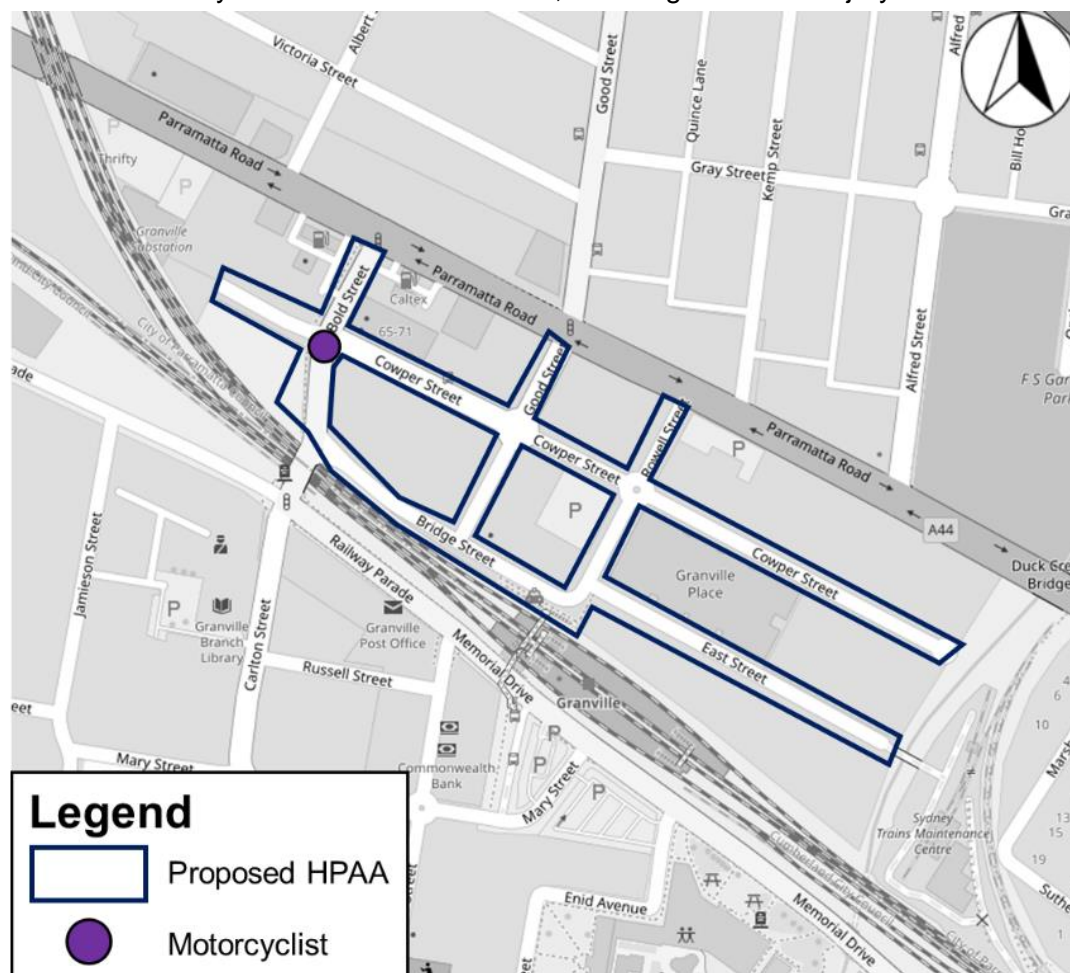
Crash Degree	Number	Percentage
Fatal	0	0%
Serious Injury	2	25%
Moderate Injury	2	25%
Minor/Other injury	2	25%
Non-casualty (towaway)	2	25%

No fatalities were recorded within the data set.

3.5 Vulnerable Road Users

Vulnerable road users (VRUs) include pedestrians, cyclists and motorcyclists. Figure 3.3 presents crashes involving VRUs within Granville. Of the 8 crashes recorded, 1 (12.5%) crash involved VRUs, as follows:

- 1 'right through' crash involved a motorcyclist in 2021 at Bold Street/Cowper Street, Granville, in wet and rainy conditions and darkness, resulting in serious injury



Adapted from OpenStreetMap

Figure 3.3: Granville Crashes Involving Vulnerable Road Users

3.6 Casualty Crash Rates

Typical urban casualty rates from the *Speed Zoning Guidelines (2011)* are shown in

Table 3.2, measured in casualties per kilometre per year. The applicable ‘benchmark’ casualty rates for this study are circled in red.

Table 3.2: Typical Urban Casualty Rates

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

NOTE:

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

Source: *NSW Speed Zoning Guidelines (Transport for NSW, 2011), Table 3.1*

Table 3.3 summarises the number of casualty related crashes per year and calculated casualty crash rate for each section of road within the study area. The casualty crash rates are highlighted in red if they exceed the relevant typical rates shown in

Table 3.2.

Table 3.3: Crash Summary and Casualty Rates

Road Name	Length (km)	Casualties*							Crash Rate (per year)	Crash Rate (per km per year)
		2017	2018	2019	2020	2021	2022	Total		
Granville										
Bold Street	0.166	0	1	3	1	2	0	7	1.400	8.434
Bridge Street	0.242	0	0	0	0	0	0	0	0.000	0.000
Cowper Street	0.270	0	0	0	0	1	0	1	0.200	0.741
Good Street	0.160	0	0	0	0	0	0	0	0.000	0.000
Rowell Street	0.156	0	0	0	0	0	0	0	0.000	0.000
East Street	0.252	0	0	0	0	0	0	0	0.000	0.000
Total		0	1	3	1	3	0	8	-	-

*Based on the “Street of crash” field in the crash records, even if crashes occurred at an intersection.

Key observations from Table 3.3 are that:

- Each street which recorded crashes exceeded the applicable threshold crash casualty rate
- Bold Street presented the highest crash rate within the study area at 8.434 casualty crashes per km per year. It is important to note that 6 of the 8 crashes occurred at the Cowper Street intersection.

While the casualty rate is relatively high for the identified streets in the study area, it is noted that the thresholds are not ideal for application to short lengths of road.

4. TRAFFIC DATA ANALYSIS

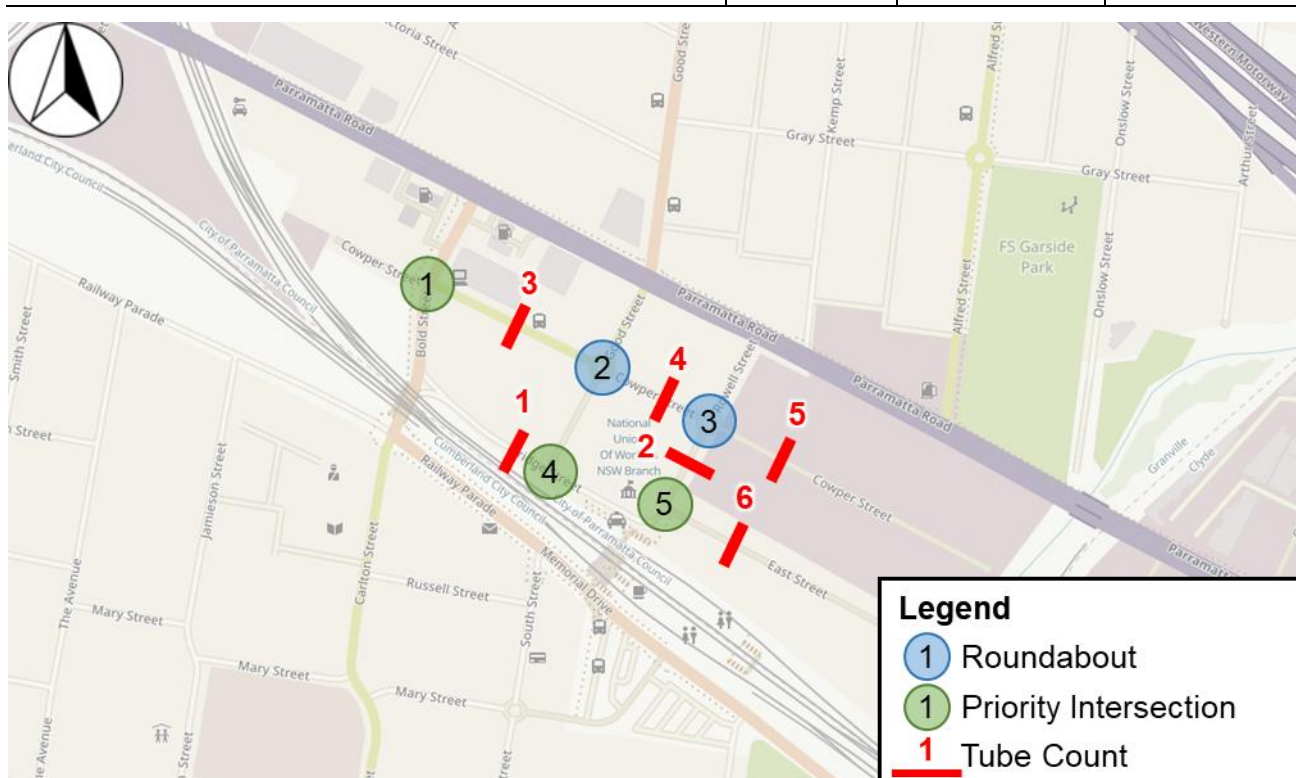
4.1 Traffic Survey

Bitzios Consulting engaged Matrix Traffic and Transport Data to undertake intersection counts and automatic tube counts. The survey details are provided in Table 4.1 and survey locations are shown in Figure 4.1.

The traffic volume and speed survey data are provided in **Appendix A**.

Table 4.1: Traffic Survey Details

Survey Locations	Survey Date(s)	Survey Times (Interval)	Survey Classifications
Intersection counts			
Bold Street / Cowper Street Good Street / Cowper Street Rowell Street / Cowper Street Bridge Street / Good Street Rowell Street / East Street	Tuesday 7 March 2023	6-10am (15 mins) 2-6pm (15 mins)	Light Vehicles Heavy Vehicles Buses Cyclists Pedestrians
Automatic tube counts			
Bridge Street, between Bold Street and Good Street Rowell Street, between East Street and Cowper Street Cowper Street, between Bold Street and Good Street Cowper Street, between Rowell Street and Good Street Cowper Street, east of Rowell Street East Street, east of Rowell Street	Tuesday 7 to Monday 13 March 2023	24 hours/day (hourly)	Volume – Austroads Speed – Total



Adapted from OpenStreetMap

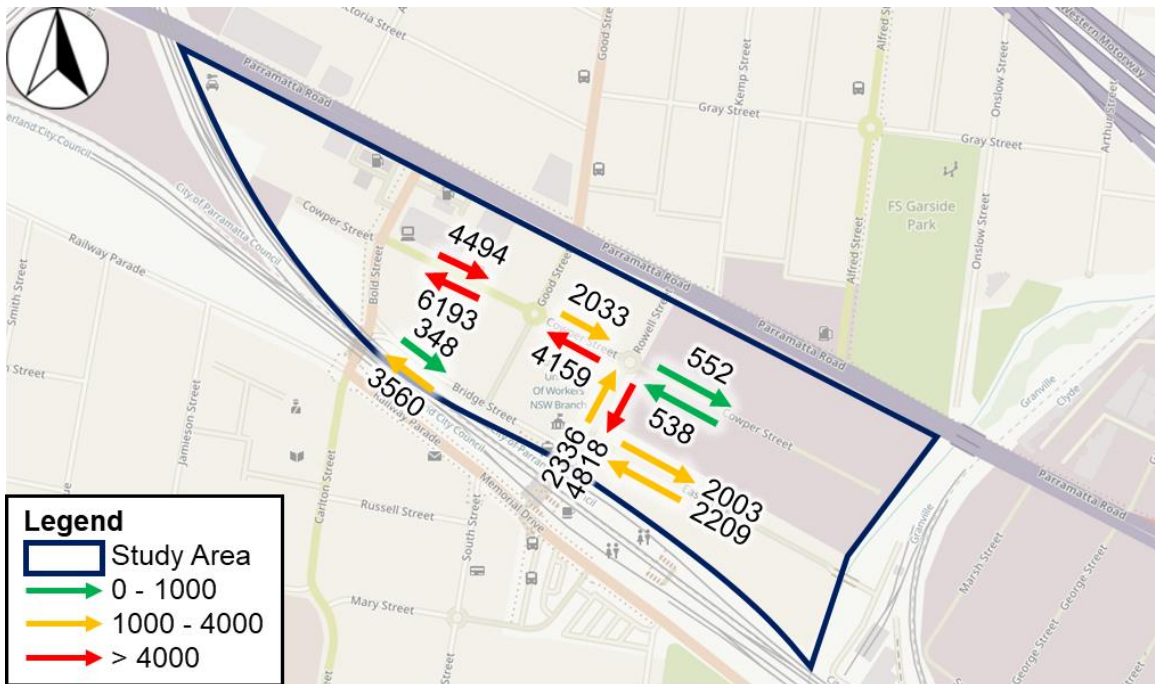
Figure 4.1: Granville Traffic Survey Locations

4.2 Traffic Volumes

The Average Daily Traffic (ADT) and heavy vehicle composition by traffic direction at tube count location was analysed. Vehicle composition was classified in accordance with the following Austroads vehicle classification system:

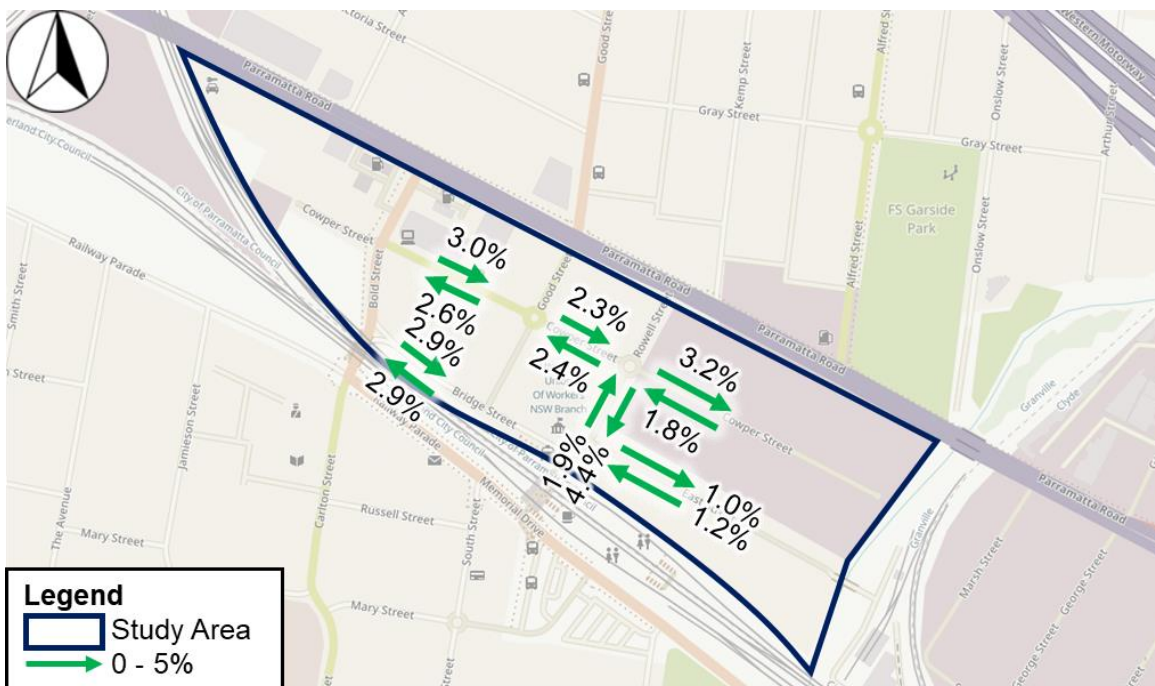
- **Classes 1 and 2 – Light vehicles:** representing cars, utes, vans, motorcycles, bicycles etc.
- **Classes 3 to 12 – Heavy vehicles:** representing trucks and buses.

Figure 4.2, Figure 4.3 and Table 4.2 show the ADT and heavy vehicle composition in Granville.



Adapted from OpenStreetMap

Figure 4.2: Average Daily Traffic



Adapted from OpenStreetMap

Figure 4.3: Heavy Vehicle Composition

Table 4.2: Average Daily Traffic and Heavy Vehicle Composition Summary

Location	Average Daily Traffic	Heavy Vehicle %
Bridge Street, between Bold Street and Good Street	348 (eastbound)	2.9% (eastbound)
	3,560 (westbound)	2.9% (westbound)
Rowell Street, between East Street and Cowper Street	2,336 (northbound)	1.9% (northbound)
	4,818 (southbound)	4.4% (southbound)
Cowper Street, between Bold Street and Good Street	4,494 (eastbound)	3.0% (eastbound)
	6,193 (westbound)	2.6% (westbound)
Cowper Street, between Rowell Street and Good Street	2,033 (eastbound)	2.3% (eastbound)
	4,159 (westbound)	2.4% (westbound)
Cowper Street, east of Rowell Street	552 (eastbound)	3.2% (eastbound)
	538 (westbound)	1.8% (westbound)
East Street, east of Rowell Street	2,003 (eastbound)	1.0% (eastbound)
	2,209 (westbound)	1.2% (westbound)

4.3 Traffic Speeds

The 85th percentile (85%ile) vehicle speeds in each direction at each tube count location was analysed to determine the suitability of reducing the speed limit to 40km/h on each road surveyed.

For this analysis, locations which recorded 85%ile speeds of 40km/h or under were judged to be capable of maintaining a 40km/h speed limit if drivers were informed of the speed limit via signage. The streets which recorded 85%ile vehicle speeds more than 40km/h would be expected to require additional measures to achieve a self-regulating 40km/h speed environment.

The 85%ile speeds at each location is shown in Figure 4.4. Table 4.3 lists the 85%ile vehicle speeds, the posted speed limit of that road and whether the 85%ile speed exceeds 40km/h.



Adapted from OpenStreetMap

Figure 4.4: Granville 85th Percentile Speeds

Table 4.3: 85th Percentile Speeds Summary

Location	85th Percentile Speed	Posted Speed Limit	Greater than 40km/h?
1. Bridge Street, between Bold Street and Good Street	27.9km/h (eastbound) 33.2km/h (westbound)	50km/h	No
2. Rowell Street, between East Street and Cowper Street	28.9km/h (northbound) 31.9km/h (southbound)		No
3. Cowper Street, between Bold Street and Good Street	37.4km/h (eastbound) 37.2km/h (westbound)		No
4. Cowper Street, between Rowell Street and Good Street	33.6km/h (eastbound) 31.3km/h (westbound)		No
5. Cowper Street, east of Rowell Street	33.7km/h (eastbound) 33.5km/h (westbound)		No
6. East Street, east of Rowell Street	32.3km/h (eastbound) 33.5km/h (Westbound)		No

All recorded 85%ile speeds are below the posted speed limit of 50km/h and below 40km/h. This shows that the existing road arrangement is able to achieve a self-regulating 40km/h.

4.4 Pedestrian Volumes

Table 4.4 presents the peak and average hourly bi-directional pedestrian volumes at each surveyed intersection leg.

Table 4.4: Peak and Average Hourly Pedestrian Volumes

Intersection	Leg	Peak	Average
1. Bold Street / Cowper Street	North	5	1
	East	8	4
	South	2	1
	West	50	10
2. Good Street / Cowper Street	North	4	1
	East	85	52
	South	53	33
	West	60	38
3. Rowell Street / Cowper Street	North	2	1
	East	31	17
	South	34	18
	West	29	17
4. Bridge Street / Good Street	North	69	38
	East	4	1
	West	11	5
5. Rowell Street / East Street	North	4	1
	East	167	109
	South	10	3

Figure 4.5 shows the total bi-directional pedestrian volumes at each surveyed intersection leg in the study area during the AM and PM peak hour.



Adapted from Nearmap

Figure 4.5: Granville AM and PM Peak Pedestrian Crossing Movements

5. SITE INSPECTION

Site inspections were undertaken on 19 January 2023 to gain an understanding of current conditions and the road environments within the study area. Surrounding land uses, existing traffic management devices and traffic / pedestrian behaviours were observed and recorded. Weather conditions during the site inspection was fine and dry.

The majority of observed pedestrian movements were between Granville Station and to East Street, either to residential dwellings or to Granville Place shopping area. Pedestrian activity was also observed to restaurants and shops along Good Street, between Cowper Street and Bridge Street. On the northern side of Cowper Street, most businesses were commercial or industrial and saw significantly less pedestrian attraction.

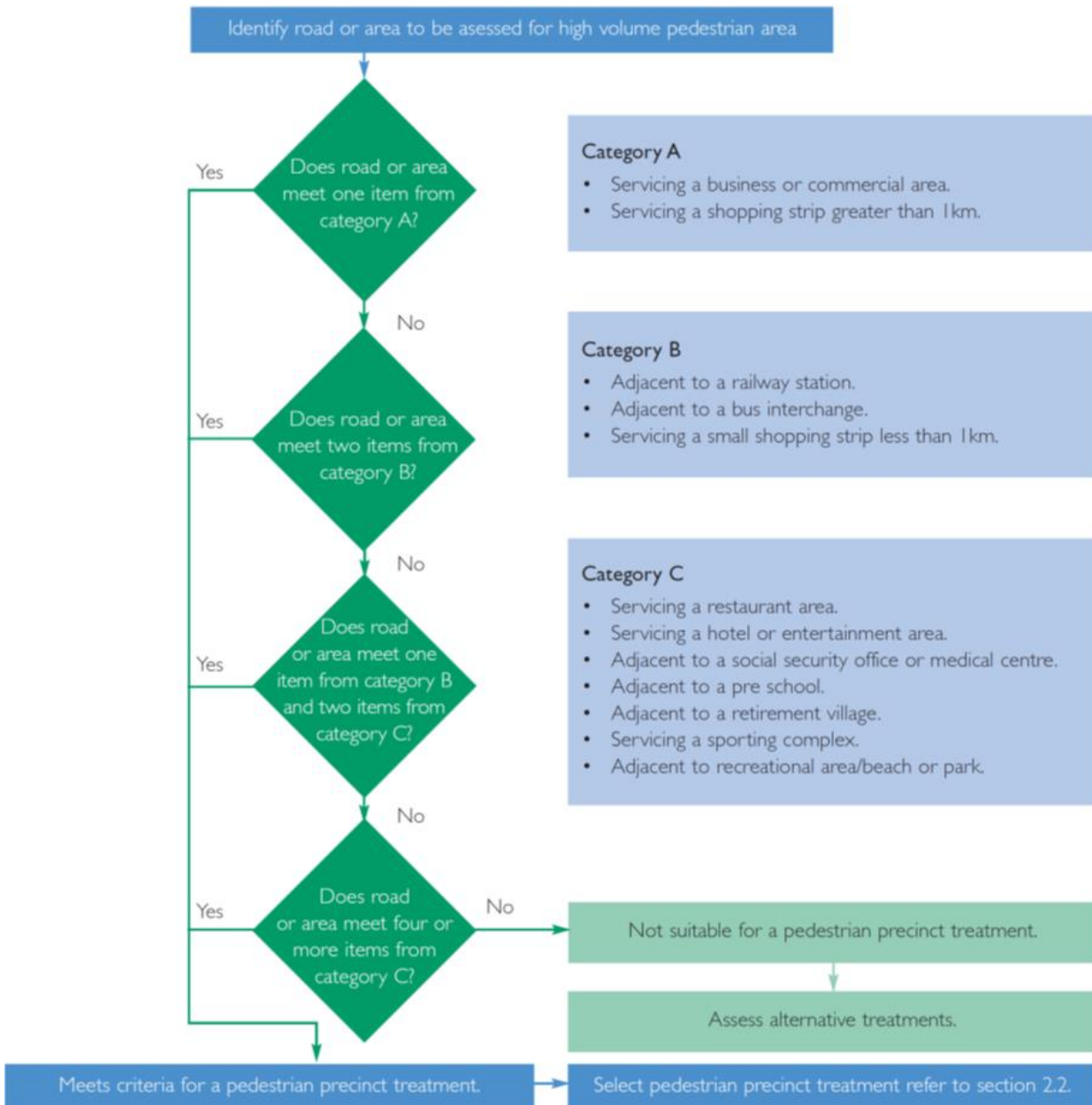
Existing LATM devices in the study area were identified as:

- Raised pedestrian/cyclist crossing on Bridge Street outside Granville Station
- Pedestrian refuges at roundabouts
- Painted islands and medians.

6. HPAA CRITERIA ASSESSMENT

6.1 Criteria for Implementing 40km/h HPAA

For the implementation of a 40km/h speed limit under a HPAA, the section of road or area under consideration must satisfy specific criteria contained in TfNSW's *40 km/h Speed Limits in High Volume Pedestrian Areas (2005)* (the HPAA guidelines). The process is shown in Figure 6.1 and suggests the HPAA designation could be suitable in areas such as commercial or business areas, shopping strips, dining precincts, medical centres and social services, recreation areas or sporting complexes, entertainment / hotel areas and transport hubs / interchanges.



Source: *40 km/h speed limits in high volume pedestrian areas (Transport for NSW, 2005), Figure 1*

Figure 6.1: Qualifying Criteria and Treatments for High Pedestrian Activity Areas

6.2 HPAA Assessment

To convert a street or area to a 40km/h HPAA, the criteria presented in TfNSW's HPAA guidelines and shown in Figure 6.1, need to be met. The warrants assessment for the Granville study area is presented in Table 6.1.

Table 6.1: HPAA Criteria Assessment

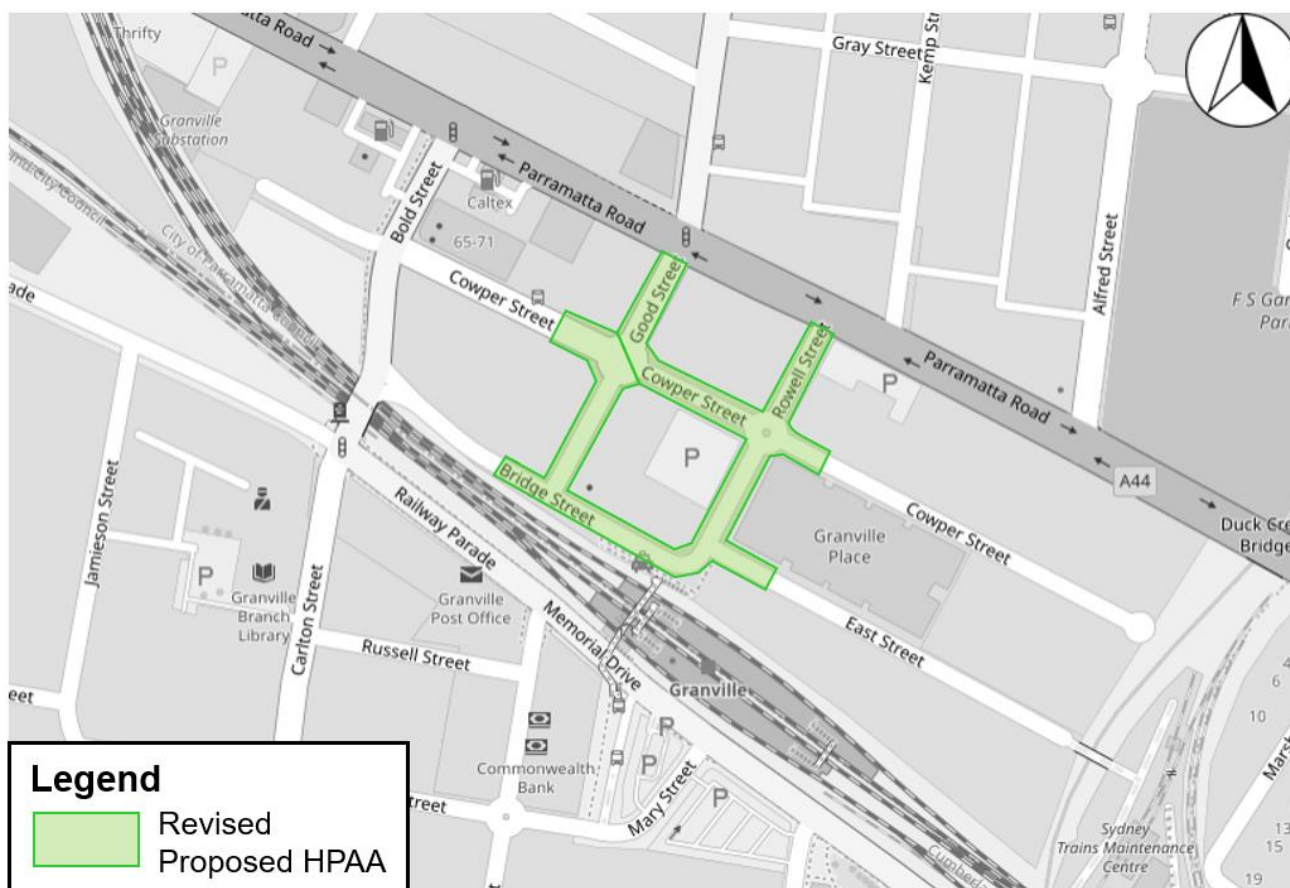
Road Name	Road Section	Category A	Category B	Category C	Criteria Satisfied?
Cowper Street	West of Bold Street	▪ None	▪ None	▪ None	No
	Between Bold Street and Good Street	▪ None	▪ None	▪ None	No
	Between Good Street and Rowell Street	▪ Servicing a business or commercial area	▪ Services a shopping strip less than 1 km	▪ Servicing a restaurant area	Yes
	East of Rowell Street	▪ None	▪ None	▪ None	No
Bold Street	Between Parramatta Road and Cowper Street	▪ None	▪ None	▪ None	No
	Between Cowper Street and Bridge Street	▪ None	▪ None	▪ None	No
Good Street	Between Parramatta Road and Bridge Street	▪ Servicing a business or commercial area	▪ Services a shopping strip less than 1 km ▪ Adjacent to a railway station	▪ Servicing a restaurant area ▪ Servicing a hotel or entertainment area	Yes
Rowell Street	Between Parramatta Road and East Street	▪ Servicing a business or commercial area	▪ Adjacent to a railway station	▪ Servicing a restaurant area ▪ Adjacent to a social security office or medical centre	Yes
East Street	Entire section	▪ Servicing a business or commercial area	▪ Adjacent to a railway station	▪ Servicing a restaurant area	Yes
Bridge Street	Between Bold Street and Good Street	▪ Servicing a business or commercial area	▪ Adjacent to a railway station	▪ Servicing a hotel or entertainment area	Yes
	Between Good Street and Rowell Street	▪ Servicing a business or commercial area	▪ Adjacent to a railway station	▪ None	Yes

As shown in the above table, much of the study area does not align with the threshold criteria in the HPAA guidelines. Although some parts of the study area do not strictly meet the HPAA guideline requirements, they are recommended to be included in the HPAA area, as reasoned below.

Through Granville, Parramatta Road is 60km/h and the existing speed limit within most of the Granville study area is 50km/h. If a 40km/h HPAA was proposed, then vehicles using the route Parramatta Road - Rowell Street - Bridge Street, experience three different speed limits within an 80-metre distance of each other. For consistency purposes, it would be logical to include all of Rowell Street and Good Street within the 40km/h HPAA area.

Transport for NSW reviewed the proposed HPAA area and provided a number of comments. The result of implementing these comments is that the HPAA area will not extend to the full length of East and Cowper Streets, as well as not continuing as far to the west along Bridge Street.

The proposed Granville HPAA streets have been nominated in Figure 6.2



Adapted from OpenStreetMap

Figure 6.2: Granville Revised Proposed HPAA

7. TRAFFIC MANAGEMENT DEVICES

7.1 Overview

The implementation of a 40km/h speed limit needs to consider both the physical control and the self-enforcement methods to create the lower speed environment. Some road attributes can inadvertently lead drivers to travel at speeds more than the speed limit if not controlled. These attributes include long and straight sections and wide roadways. For successful implementation, the 40km/h speed zone must be able to self-enforce and self-regulate the speed limit.

A review and assessment of the relevant streets was undertaken to appraise the existing road environment and to identify if the installation of additional traffic management infrastructure is required to reinforce the 40km/h speed environment.

7.2 Relevant Guidelines

As part of the development of various road treatments in this stage of the speed limit review, the following documents have been reviewed and referred to for the selection and design of appropriate road treatments across the study area:

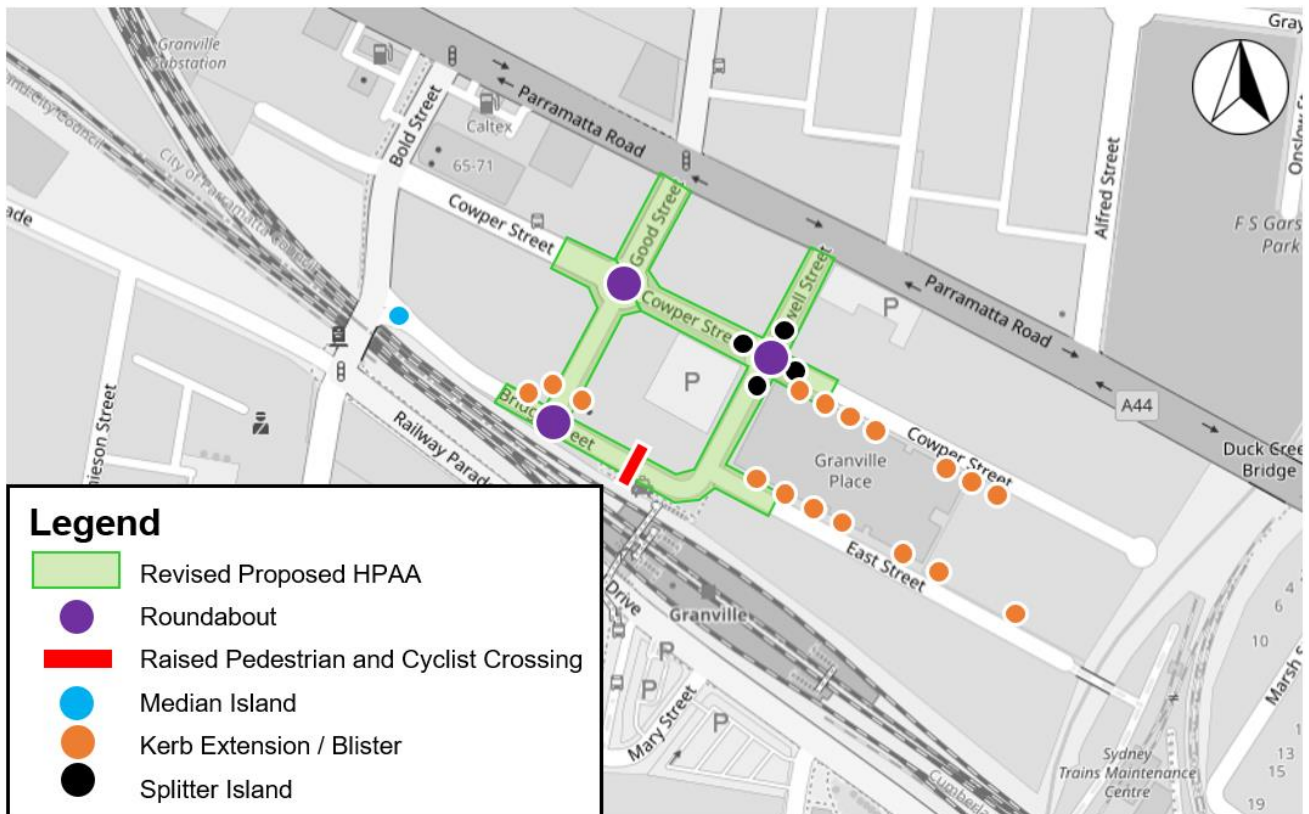
- NSW Speed Zoning Guidelines Version 4 (Transport for NSW, 2011)
- 40 km/h speed limits in high volume pedestrian areas (Transport for NSW, 2005)
- Relevant TfNSW Technical Directions
- Austroads Guide to Traffic Management Part 8: Local Area Traffic Management
- Australian Standard AS1742 MUTCD Part 2: Traffic Control Devices for General Use
- Australian Standard AS1742 MUTCD Part 4: Speed Controls
- Australian Standard AS1742 MUTCD Part 10: Pedestrian control and protection
- Australian Standard AS1742 MUTCD Part 13: Local Area Traffic Management.

7.3 Existing LATM Devices

A number of Local Area Traffic Management (LATM) devices are already in use within the Granville study area, including:

- Roundabouts and splitter islands
- Flat-top humps and cushions
- Raised pedestrian and shared pedestrian/bicycle crossings
- Raised and marked median islands and blisters
- Kerb extensions and blisters.

The locations of existing LATM devices within the Granville study area are shown in Figure 7.1 and respectively. The 26 existing LATM were identified.



Adapted from OpenStreetMap

Figure 7.1: Existing LATM Devices and Locations in Granville

7.4 Preliminary Investigation

7.4.1 Pedestrian Crossing Assessment

The Transport for NSW Pedestrian Crossing Guideline (TS 00043 1.0) includes criteria for the installation of a pedestrian crossing as follows:

- In two separate one-hour periods in a typical day, greater than or equal to 20 pedestrian crossing movements. Children, elderly and mobility impaired pedestrians count as two pedestrians for the purpose of this calculation.

The Guideline provides a number of other conditions for use of pedestrian crossings on Main Streets and Local Streets, such as

- **Main Streets** (such as Granville along Cowper Street):
 - The speed limit is $\leq 50\text{km/h}$
 - Pedestrian crossings should be located as close as possible to major attractors or where high proportion of vulnerable pedestrians might be expected
 - The suggested spacing between crossing points is 40m to 100m
 - Raised pedestrian crossings should be used to manage speed and pedestrian prioritisation.
 - Raised threshold gateway treatments are always preferred at entrance points to the zone; however, if these are not feasible, painted threshold treatments are deemed sufficient.
- **Local Streets** (such as Granville south of Cowper Street)
 - The speed limit is $\leq 50\text{km/h}$, preferably 30km/h .
 - Non-arterial road
 - Unless the street space is shared, continuous footpaths should be used at intersections wherever possible

- Pedestrian crossings should be used sparingly, generally only on key walking routes or close to significant attractors – the road environment should be designed and managed to make it easy for pedestrians to move freely
- The suggested spacing between crossing points is 100m to 200m.
- Local area traffic management schemes and alternate treatments should be taken into account where possible, for example, road narrowing, pedestrian refuges.

The installation of pedestrian crossings is proposed at the following locations:

- Rowell Street / Cowper Street – eastern leg
- Cowper Street / Good Street – eastern leg
- Rowell Street / East Street – eastern leg.

Table 7.1 summarises the results of the pedestrian crossing warrants assessment at the proposed locations in Granville.

Table 7.1: Pedestrian Crossing Warrants Assessment

Criteria	Rowell Street / Cowper Street – eastern leg	Cowper Street / Good Street – eastern leg	Rowell Street / East Street – northern leg.	Rowell Street / East Street – eastern leg.
Street type	Local Street	Main Street	Main Street	Main Street
Pedestrian volumes	> 20 per hour	> 20 per hour	> 20 per hour (projected)*	> 20 per hour
Distance to other crossing	N/A	110m	60m	N/A

* Specific pedestrian volumes were not available at this location, however, site visit observations indicated significant desire for pedestrians to cross at this location. Presently, there are no pedestrian crossing facilities at this location.

The above locations have parked vehicles obscuring sightlines of pedestrians approaching the roadway. Parking restrictions and kerb extensions are needed in conjunction with the pedestrian crossings to improve sight distances to and from pedestrians crossing the roadway.

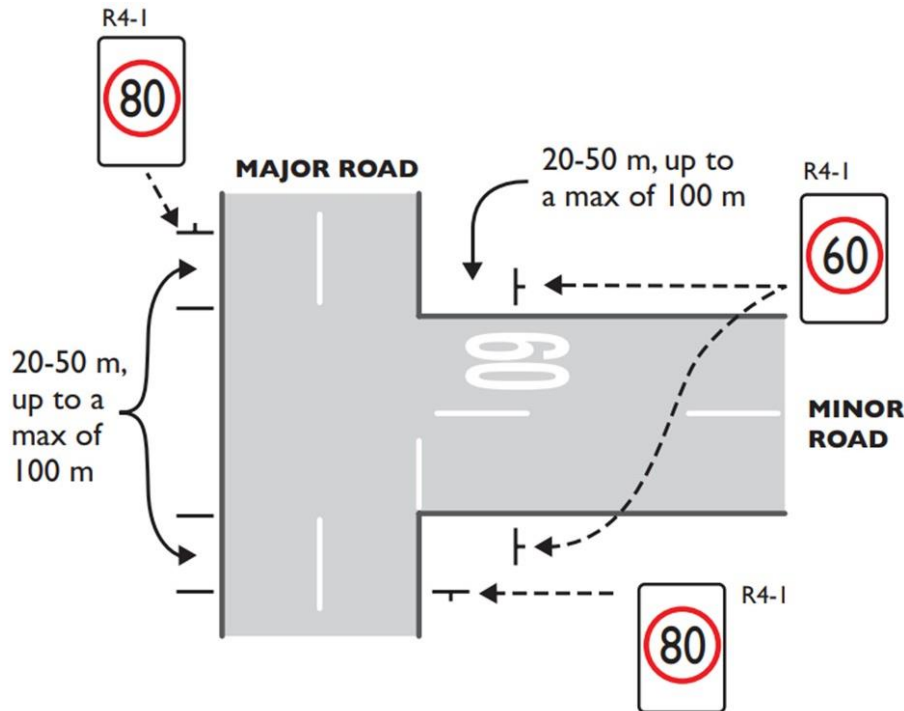
7.5 Traffic Management Devices

7.5.1 Signage

The *Speed Zoning Guidelines (2011)* outlines signage requirements and locations. The relevant guidelines used for this assessment are outlined as follows:

- At any change in speed limit, two speed limit signs are to be installed, ideally on both sides of the carriageway
- For urban environments (which comprises the study area):
 - the vertical clearance between the ground and the base of a sign should ideally be at minimum 2.5m
 - the lateral clearance between the edge line of the travel lane and the nearest edge of the sign should ideally be at minimum 0.6m
 - the lateral clearance between the centre of the left (kerbside) travel lane and the edge of the sign should ideally not exceed 6.6m.
- Speed limit signs at intersections of major and minor roads should be:
 - On the major road, located 20-50m up to a maximum of 100m before and after the edge of the minor road
 - On the minor road, located 20-50m up to a maximum of 100m before and after the edge of the major road
 - See Figure 7.2 below for a diagram of these sign locations.

- For a 40km/h zone, the suggested spacing for repeater signs is 300m for the first sign and 500m for subsequent signs
- The minimum separation between speed limit signs and other signs is 50m for a 40km/h zone
- Road pavement marking should be located at the point of change in speed zone area, centrally located in each lane adjacent to the speed limit sign
- Any exceptions to the clearances (potentially necessary due to site constraints) are subject to approval by the Regional Manager.



Source: NSW Speed Zoning Guidelines Version 4 (Transport for NSW, 2011), Figure 3.12

Figure 7.2: Typical Positioning of Speed Signs at Intersections

7.5.2 LATM Devices

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

Austrroads Guide to Traffic Management Part 8: Local Area Traffic Management provides a toolkit and selection system, which outlines the relative use of different LATM devices based on previous research and practice in Australia and New Zealand. The Austrroads Toolkit is shown in Table 7.2.

Table 7.2 LATM Toolkit

Measure		Reduce speeds	Reduce traffic volume	Reduce crash risk	Increase pedestrian safety	Increase bicycle safety
Vertical deflection devices (Section 8.2)	Road humps	✓	✓	✓	-	-
	Road cushions	✓	✓	✓	-	✓
	Flat-top road humps	✓	✓	✓	-	✓
	Wombat crossings	✓	✓	✓	✓	✓
	Raised pavements	✓	✓	✓	-	✓
Horizontal deflection devices (Section 8.3)	Lane narrowings/kerb extensions	✓	-	-	✓	-
	Slow points	✓	✓	-	-	-
	Centre blister islands	✓	✓	-	✓	-
	Driveway links	✓	✓	-	✓	✓
	Mid-block median treatments	✓	-	✓	✓	✓
	Roundabouts	✓	✓	✓	-	-
Diversion devices (Section 8.4)	Full road closure	-	✓	✓	✓	✓
	Half road closure	-	✓	✓	✓	✓
	Diagonal road closure	-	✓	✓	✓	✓
	Modified T-intersection	✓	✓	✓	✓	✓
	Left-in/left-out islands	-	✓	✓	✓	-
Signs, linemarking and other treatments (Section 8.5)	Speed limit signs	✓	-	✓	✓	✓
	Prohibited traffic movement signs	-	✓	✓	-	✓
	One-way (street) signs	-	✓	✓	✓	-
	Give-way signs	✓	✓	✓	✓	✓
	Stop signs	✓	✓	✓	✓	✓
	Shared zones	✓	✓	-	✓	✓
	School zones	✓	-	✓	✓	✓
	Threshold treatments	✓	✓	✓	-	✓
	Tactile surface treatments	✓	-	-	-	-
	Bicycle facilities	-	-	✓	-	✓
	Bus facilities	-	✓	-	-	-

Source: Austroads Guide to Traffic Management Part 8, Table 8.1

Based on the toolkit presented in Table 7.2, site observations and pedestrian survey data, the following LATM devices may be appropriate to be implemented as part of the HPAA:

- Wombat crossing
- Kerb extensions
- One-way signs
- Threshold treatments
- Tactile service treatments.

8. RECOMMENDED TREATMENTS

8.1 Treatment Selection

As outlined in Section 7.1, the road environment must be able to self-regulate the speed limit if a 40km/h speed limit is implemented. In addition to signage and pavement markings denoting the speed limit, traffic calming devices are required along Rowell Street, and East Street to support the self-enforcing speed environment.

A detailed assessment of the LATM devices outlined in the Austroads Toolkit was undertaken and consideration has also been given to the road environment within the study area to determine potential treatments and locations.

Appropriate treatment types were initially selected based on their purposes, specifically to:



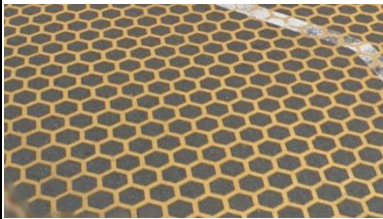
- Slow traffic
- Provide for pedestrian safety and crossing points where necessary.


Attention was also given to existing treatments in the surrounding environment and, when possible, preference was given to devices that were already in place near the area, to ensure greater legibility for drivers.

8.2 Signage and Pavement Markings

The proposed signage and marking treatments to supplement the 40km/h HPAAs are presented in Table 8.1.

Table 8.1: HPAAs Speed Limit Signage and Markings

Item	Illustration	Sign Type	Sign No.	Use
1		High Pedestrian Activity Area (40)	R4-236	<ul style="list-style-type: none"> ▪ On the entries to the High Pedestrian Activity Area ▪ Used on the road network or area.
		Speed Limit Pavement Marking (40)	-	
		Threshold Treatment	-	

Item	Illustration	Sign Type	Sign No.	Use
		End 40 Area	R4-11	<ul style="list-style-type: none"> At end of the High Pedestrian Activity Area onto a road with a speed limit other than 40km/h.

In accordance with TfNSW's HPAA guidelines, the following signage treatments are proposed:

- Install entry/exit treatment at the boundary of the HPAA. The entry/exit treatment consists of:
 - 40km/h speed limit High Pedestrian Activity Area (R4-236) sign
 - 40km/h speed limit pavement markings
 - Pavement surface / threshold treatments at the start/end of each to provide a visual contrast between the existing road conditions and the HPAA
 - End 40 Area (R4-11) sign in the outbound direction.

The proposed signage, and threshold treatment locations, are shown in Figure 8.1.



Aerial image sourced from Nearmap

Figure 8.1: Granville Signage and Threshold Treatments

8.3 LATM Treatment Options

To support the HPAA area and reinforce compliance, the following threshold treatments are options for to be used within the study:

- Raised pedestrian crossing
- Continuous footpath
- Lane narrowing / kerb extensions
- Median treatment.

The advantages and disadvantages of the proposed signage and threshold treatments are described in Table 8.2.

Table 8.2: Proposed Signage and Threshold Treatments

Treatments	Advantages	Disadvantages
Raised pedestrian crossing	<ul style="list-style-type: none"> ▪ Effective at slowing vehicles speeds when used in conjunction with a median or kerb side treatment ▪ Provides pedestrians with a priority crossing area ▪ Clearly defined pedestrian crossing areas. 	<ul style="list-style-type: none"> ▪ Traffic noise level may increase ▪ Impact on vehicle passenger comfort ▪ Specific design requirements when used on bus routes
Continuous footpath	<ul style="list-style-type: none"> ▪ Effective at slowing vehicles speeds when used in conjunction with a median or kerb side treatment ▪ Provides pedestrians with a priority crossing area ▪ Clearly defined pedestrian crossing areas. 	<ul style="list-style-type: none"> ▪ Traffic noise level may increase ▪ Impact on vehicle passenger comfort ▪ Only suitable at low vehicle volumes ▪ Not suitable for heavy vehicle routes.
Lane narrowing / kerb extensions	<ul style="list-style-type: none"> ▪ Reduces available road width and slows vehicles down ▪ Expands available kerbside area ▪ Provides opportunity for landscaping and streetscaping improvements ▪ Provides a shorter crossing distance (if combined with a crossing point) ▪ Encourages pedestrians to cross at these locations (if combined with crossing point). 	<ul style="list-style-type: none"> ▪ Reduces available kerbside parking ▪ May impact vehicle movements if placed close to driveways or intersections ▪ Bus friendly designs may not be effective at reducing vehicle speeds due to limited lane reduction.
Raised median treatment	<ul style="list-style-type: none"> ▪ Reinforces the reduced available road width ▪ Assists in reducing traffic speeds when used in conjunction with speed cushions ▪ Provides opportunity to provide a pedestrian refuge / crossing point. 	<ul style="list-style-type: none"> ▪ Relatively high cost ▪ May impact access to adjacent driveways and parking spaces if not located appropriately.

8.4 Summary of All Treatments

The proposed map of treatments to support a 40km/h HPAA for Granville are shown in Figure 8.2.



Aerial image sourced from Nearmap

Figure 8.2: Granville Recommended Treatments

Raised pedestrian crossings are recommended to be installed at key pedestrian movements within the HPAA area:

- Cowper Street / Good Street: Eastern leg
 - Provide safer crossing option between existing 40km/h area and Parramatta Road
 - Slow vehicle speeds and discourage rat-running
- Cowper Street / Rowell Street: Eastern leg
 - Slow vehicle speeds mostly at left and through movements into Cowper Street east
 - Provide gateway/entry treatment to residential/local area
 - Provide safer crossing option for pedestrians across Cowper Street, linking Granville Place to side streets for pedestrians
- Rowell Street / East Street: Northern and eastern legs
 - Reduce vehicle speeds at movement from Rowell Street to East Street
 - Provide safer pedestrian crossing area, where pedestrians have priority
 - Further encourage pedestrian trips in the area
 - Reduce overall vehicle movements along Bridge Street.

Raised pedestrian crossings have high visibility to drivers, while also slowing vehicle speeds around corners, which was observed to be a recurring localised issue at specific locations in the study area.

The pedestrian crossings would be supported by kerb extensions at key locations to reduce crossing distance for pedestrians, as well as narrowing the roadway, further reducing vehicle speeds.

Pedestrian refuges are proposed at crossing points where a pedestrian crossing is not considered appropriate or warranted. These will be supported by kerb ramps where appropriate.

Concept plans for these proposals are shown in **Appendix B**.

9. CONCLUSIONS

A 40km/h HPAA is proposed to be implemented within the study area of Granville in accordance with TfNSW Guidelines. The HPAA is proposed to include the following sections of roads within Granville:

- Bridge Street
- East Street
- Cowper Street
- Rowell Street
- Good Street.

An assessment of the 40km/h HPAA guidelines indicated that the proposed area associated with Granville is suitable for an HPAA treatment.

A detailed assessment of LATM was undertaken to consider the control and enforcement methods to reinforce a 40km/h road environment. The assessment considered the Austroads requirements, combined with the existing road environment and existing LATM devices within the study area. Whenever possible, preference was given to devices already in place near the area, to ensure greater legibility for drivers.

Based on the range of potential LATM devices and the existing road environment, a number of treatments are proposed. These include:

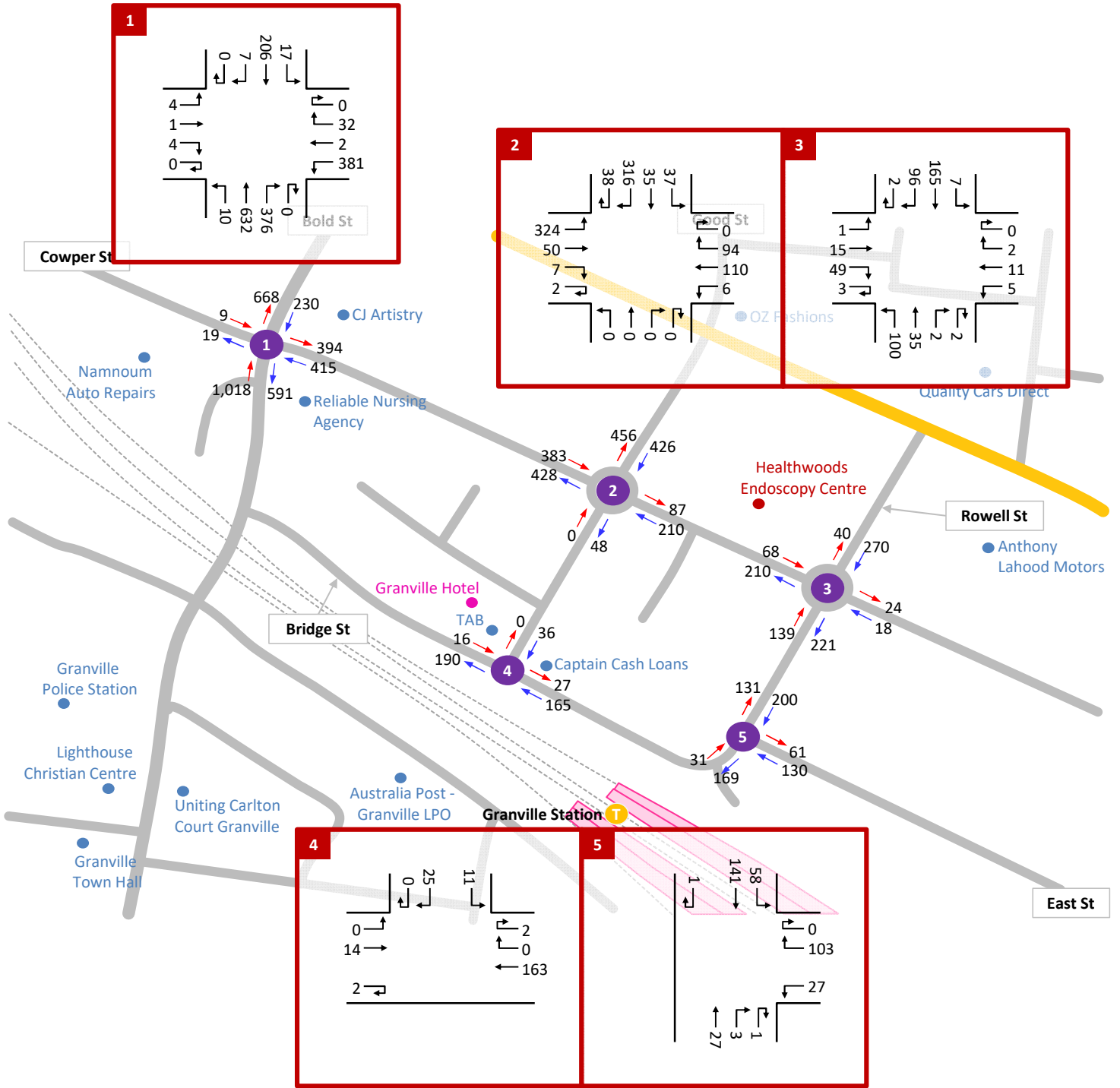
- Signs
- Kerb extensions
- Wombat crossings
- Pedestrian refuges
- Pavement and line marking.

The LATM devices proposed follow State and National guidelines and are intended to create a self-enforcing 40km/h speed limit and to improve the safety of pedestrians.

Appendix A: Traffic Volume and Speed Data

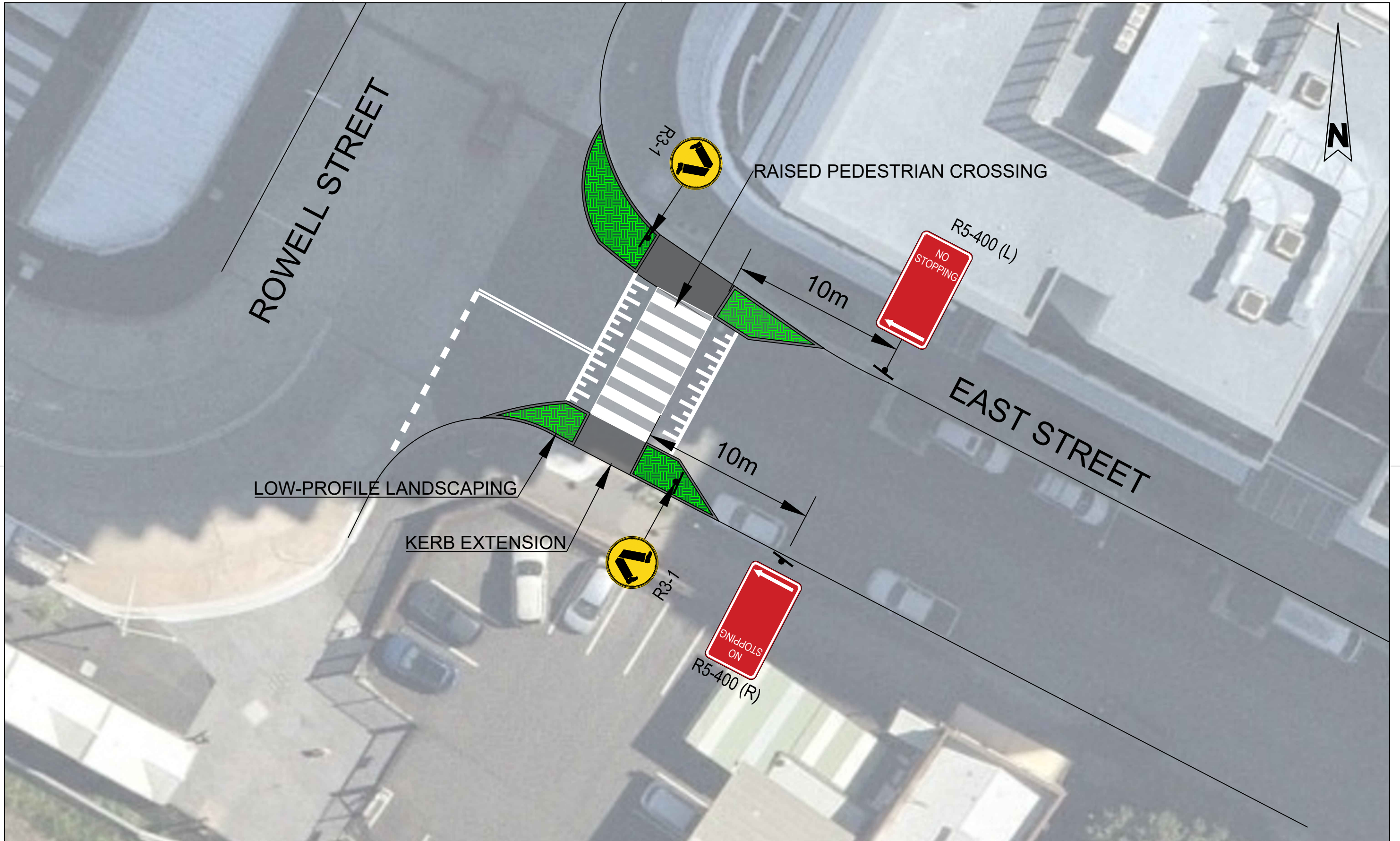


AM Peak: 8:00 - 9:00 AM



Appendix B: Concept Plans





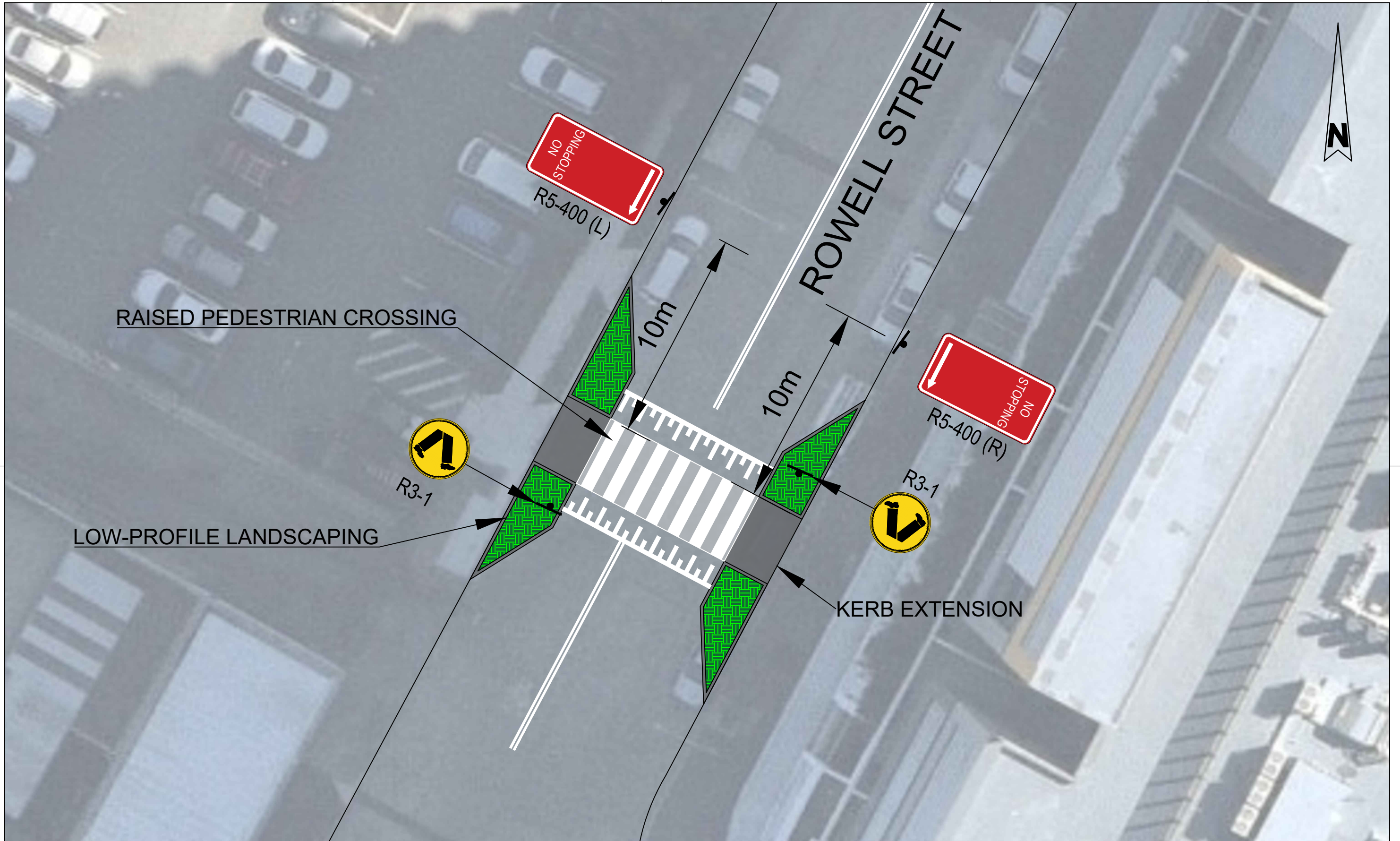
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REVISIONS			
Issue	Revisions/Descriptions	Drawn	Date
001	INITIAL CONCEPT	S.D	21.04.2023
002	UPDATE CONCEPT	M.H	26.04.2023
003	UPDATE CONCEPT	M.H	12.05.2023
004	MINOR CHANGES	M.H	16.05.2023
005	REDUCE HPAA AREA	M.H	26.06.2023

Project	GRANVILLE
Title	ROWELL STREET / EAST STREET

Design	M.H	Drawn	M.H	Checked	D.B
CONCEPT ONLY					
Project Number	P5961	Sheet Number	1	Issue	005

Date	26.06.2023
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RAISED PEDESTRIAN CROSSING

LOW-PROFILE LANDSCAPING

KERB EXTENSION



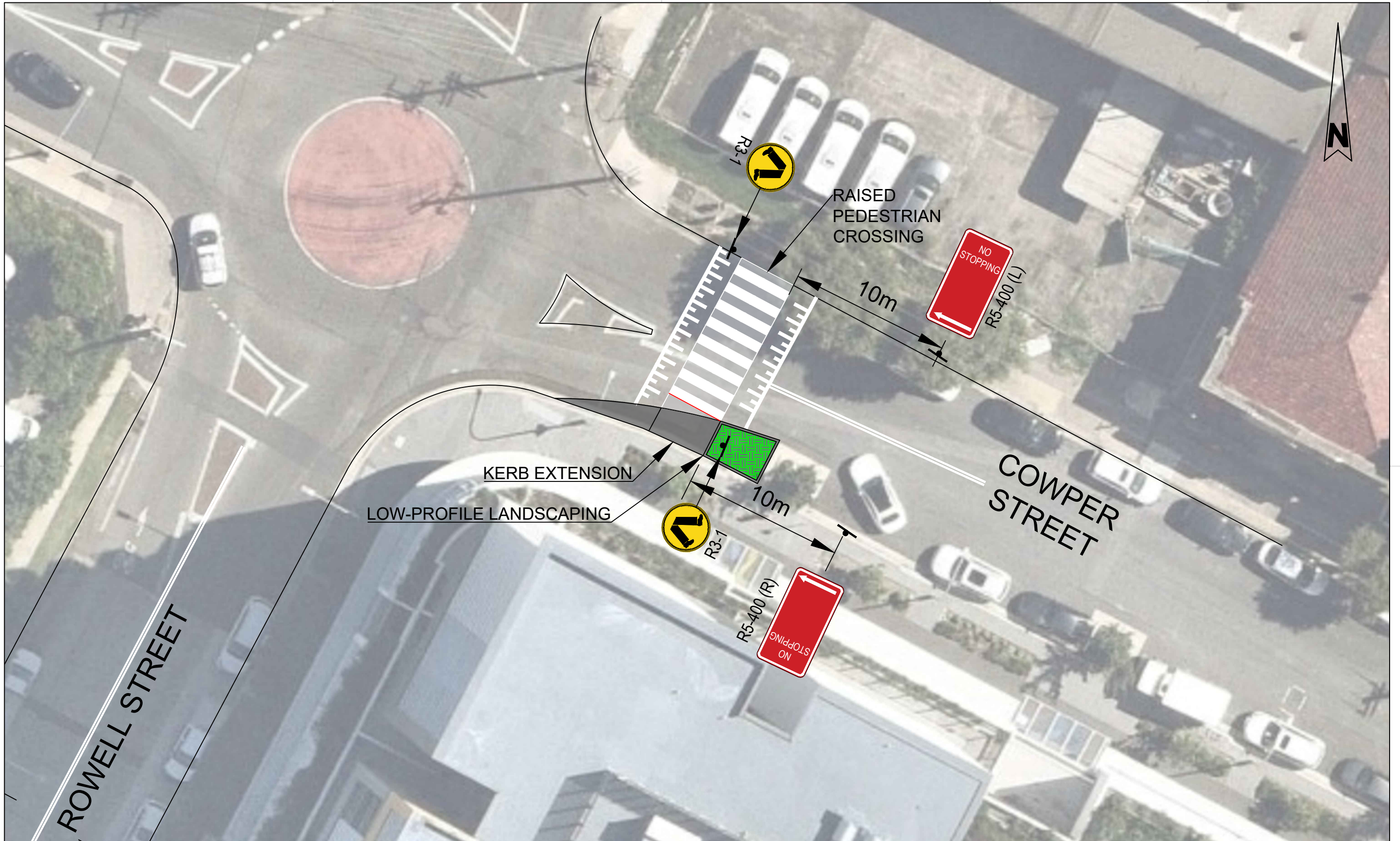
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005	REDUCE HPAA AREA	M.H	26.06.2023

Project	GRANVILLE
Title	ROWELL STREET

Design	M.H	Drawn	M.H	Checked	D.B
CONCEPT ONLY					
Project Number	P5961	Sheet Number	2	Issue	005

Date	26.06.2023
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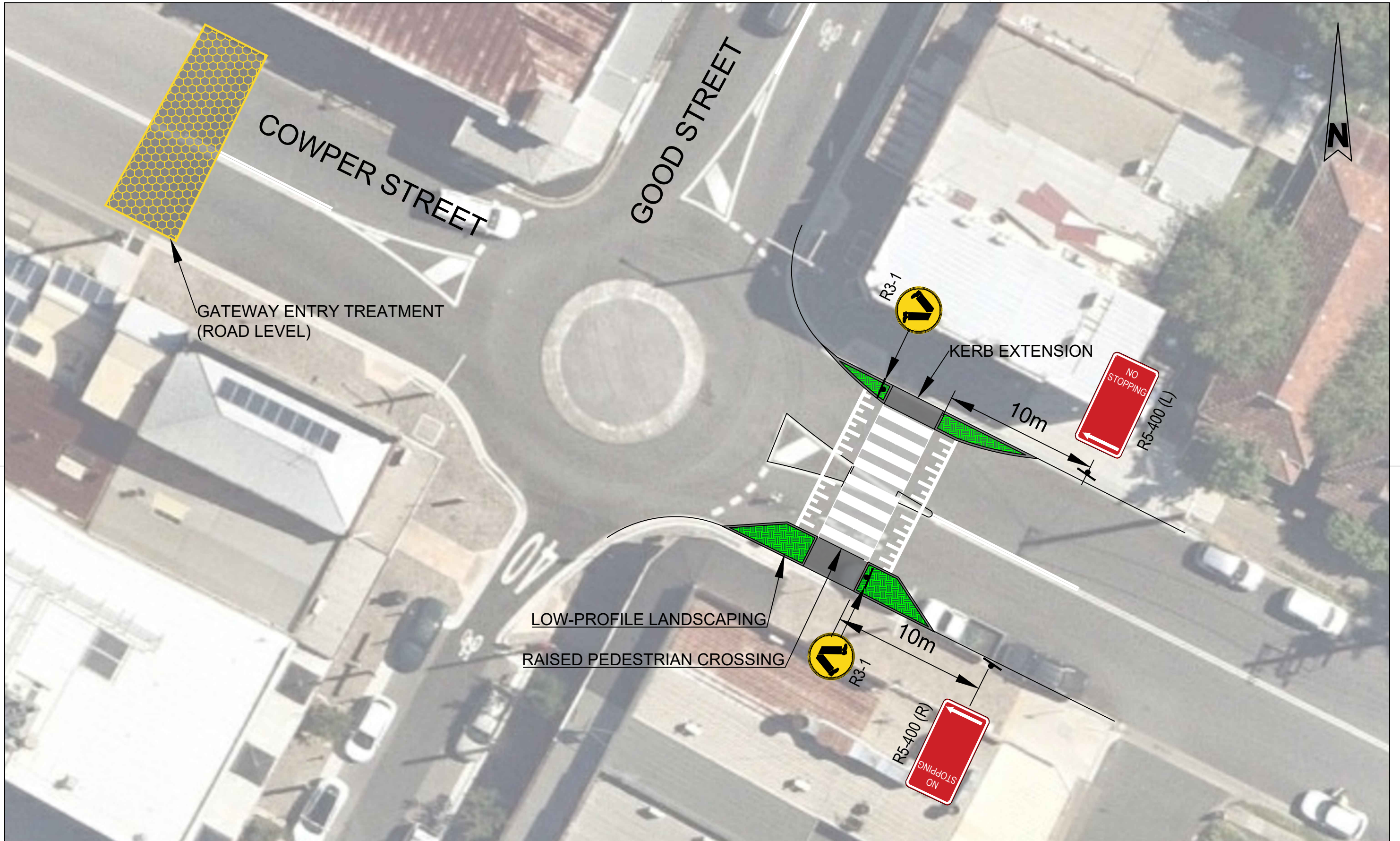
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REVISIONS		Drawn	Date
Issue	Revisions/Descriptions		
001	INITIAL CONCEPT	S.D	21.04.2023
002	UPDATE CONCEPT	M.H	26.04.2023
003	UPDATE CONCEPT	M.H	12.05.2023
004	MINOR CHANGES	M.H	16.05.2023
005	REDUCE HPAА AREA	M.H	26.06.2023

Project	GRANVILLE
Title	ROWELL STREET / EAST STREET

Design	M.H	Drawn	M.H	Checked	D.B
CONCEPT ONLY					
Project Number	P5961	Sheet Number	3	Issue	005

Date	26.06.2023
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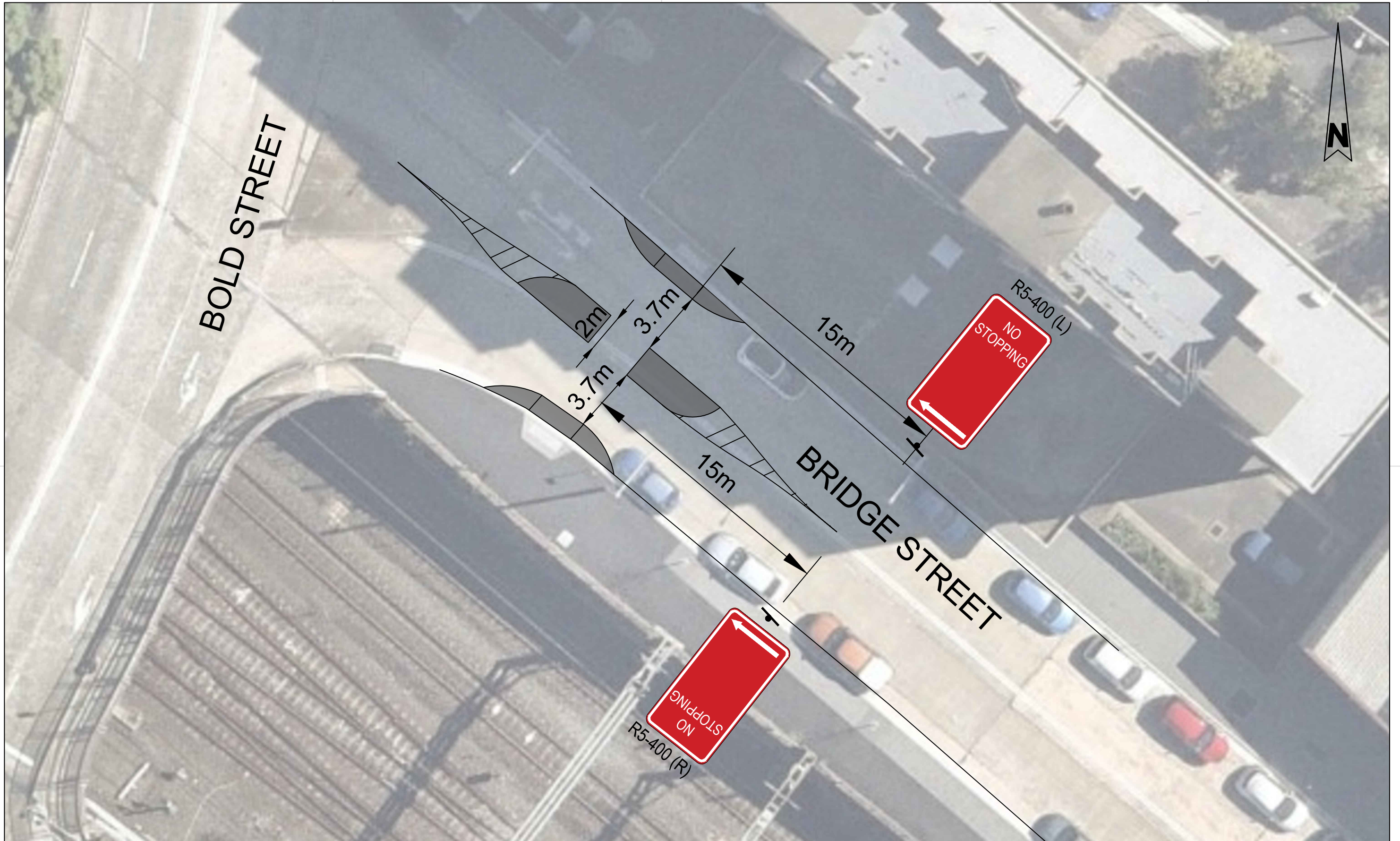
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REVISIONS		Drawn	Date
Issue	Revisions/Descriptions		
001	INITIAL CONCEPT	S.D	21.04.2023
002	UPDATE CONCEPT	M.H	26.04.2023
003	UPDATE CONCEPT	M.H	12.05.2023
004	MINOR CHANGES	M.H	16.05.2023
005	REDUCE HPAA AREA	M.H	26.06.2023

Project	GRANVILLE
Title	COWPER STREET / GOOD STREET

Design	M.H	Drawn	M.H	Checked	D.B
CONCEPT ONLY					
Project Number	P5961	Sheet Number	4	Issue	005

Date	26.06.2023
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REVISIONS		Drawn	Date
Issue	Revisions/Descriptions		
001	INITIAL CONCEPT	S.D	21.04.2023
002	UPDATE CONCEPT	M.H	26.04.2023
003	UPDATE CONCEPT	M.H	12.05.2023
004	MINOR CHANGES	M.H	16.05.2023
005	REDUCE HPAA AREA	M.H	26.06.2023

Project	GRANVILLE
Title	BRIDGE STREET / BOLD STREET

Design	M.H	Drawn	M.H	Checked	D.B
CONCEPT ONLY					
Project Number	P5961	Sheet Number	5	Issue	005

Date	26.06.2023
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ROWELL STREET

PARRAMATTA ROAD

GATEWAY ENTRY TREATMENT
(ROAD LEVEL)



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REVISIONS			
Issue	Revisions/Descriptions	Drawn	Date
001	INITIAL CONCEPT	S.D	21.04.2023
002	UPDATE CONCEPT	M.H	26.04.2023
003	UPDATE CONCEPT	M.H	12.05.2023
004	MINOR CHANGES	M.H	16.05.2023
005	REDUCE HPAA AREA	M.H	26.06.2023

Project	GRANVILLE
Title	COWPER STREET / BRIDGE STREET

Design	M.H	Drawn	M.H	Checked	D.B
CONCEPT ONLY					
Project Number	P5961	Sheet Number	7	Issue	005

Date	26.06.2023
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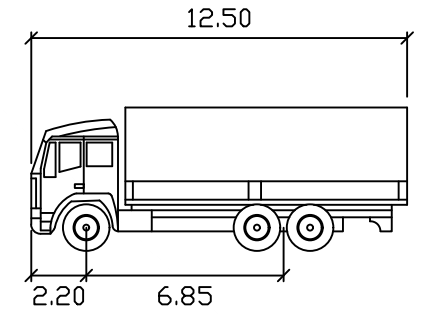
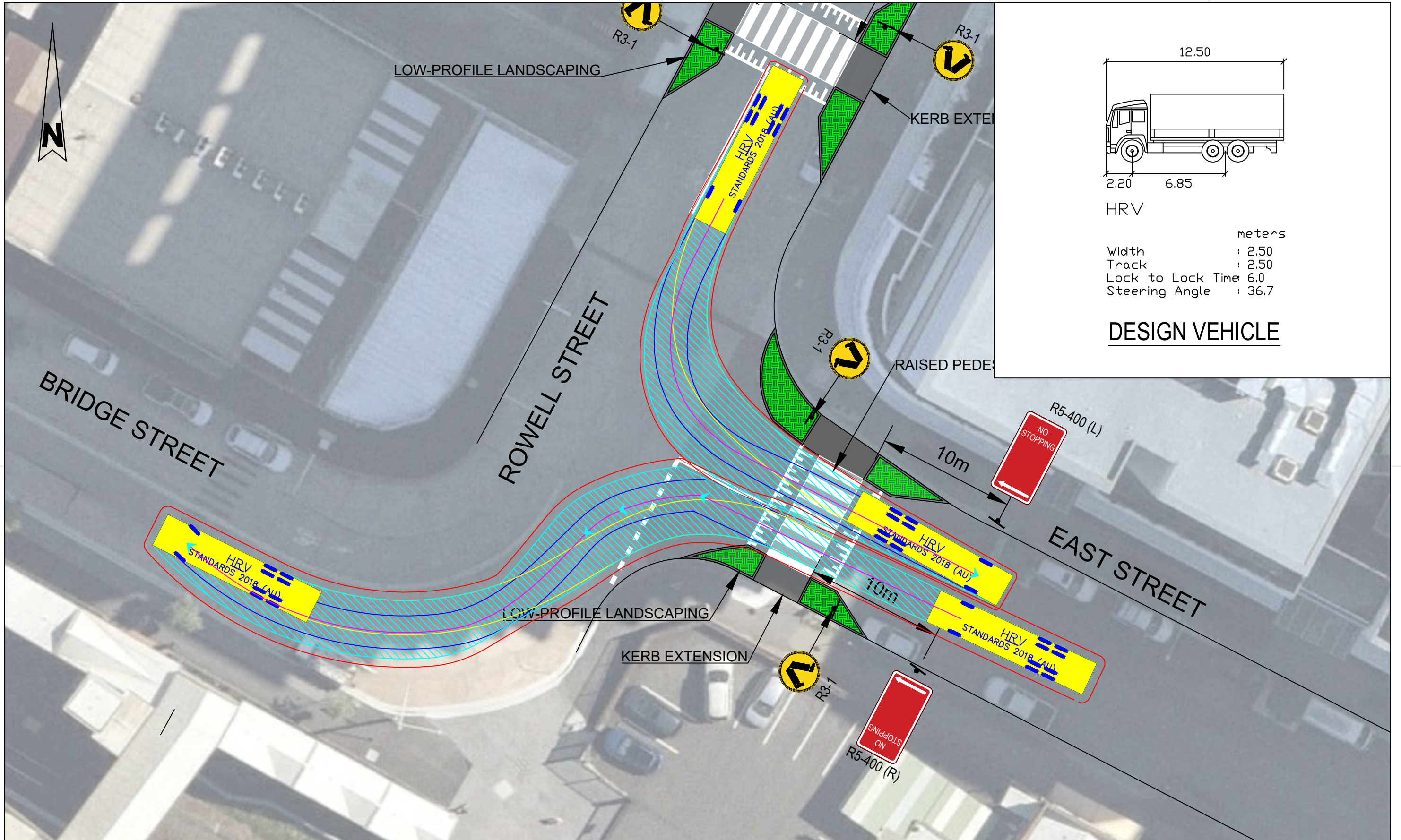
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Sydney
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004	MINOR CHANGES	M.H	16.05.2023
005	REDUCE HPAA AREA	M.H	26.06.2023

Project	GRANVILLE
Title	COWPER STREET / BRIDGE STREET

Design	M.H	Drawn	M.H	Checked	D.B
CONCEPT ONLY					
Project Number	P5961	Sheet Number	8	Issue	005

Date	26.06.2023
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HRV

Width : 2.50 meters
 Track : 2.50
 Lock to Lock Time : 6.0
 Steering Angle : 36.7

DESIGN VEHICLE



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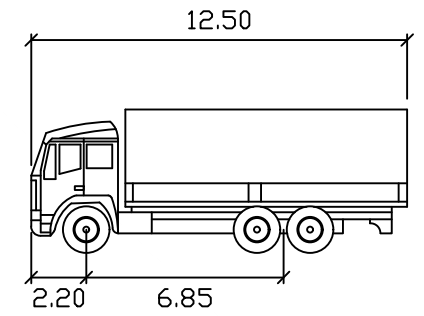
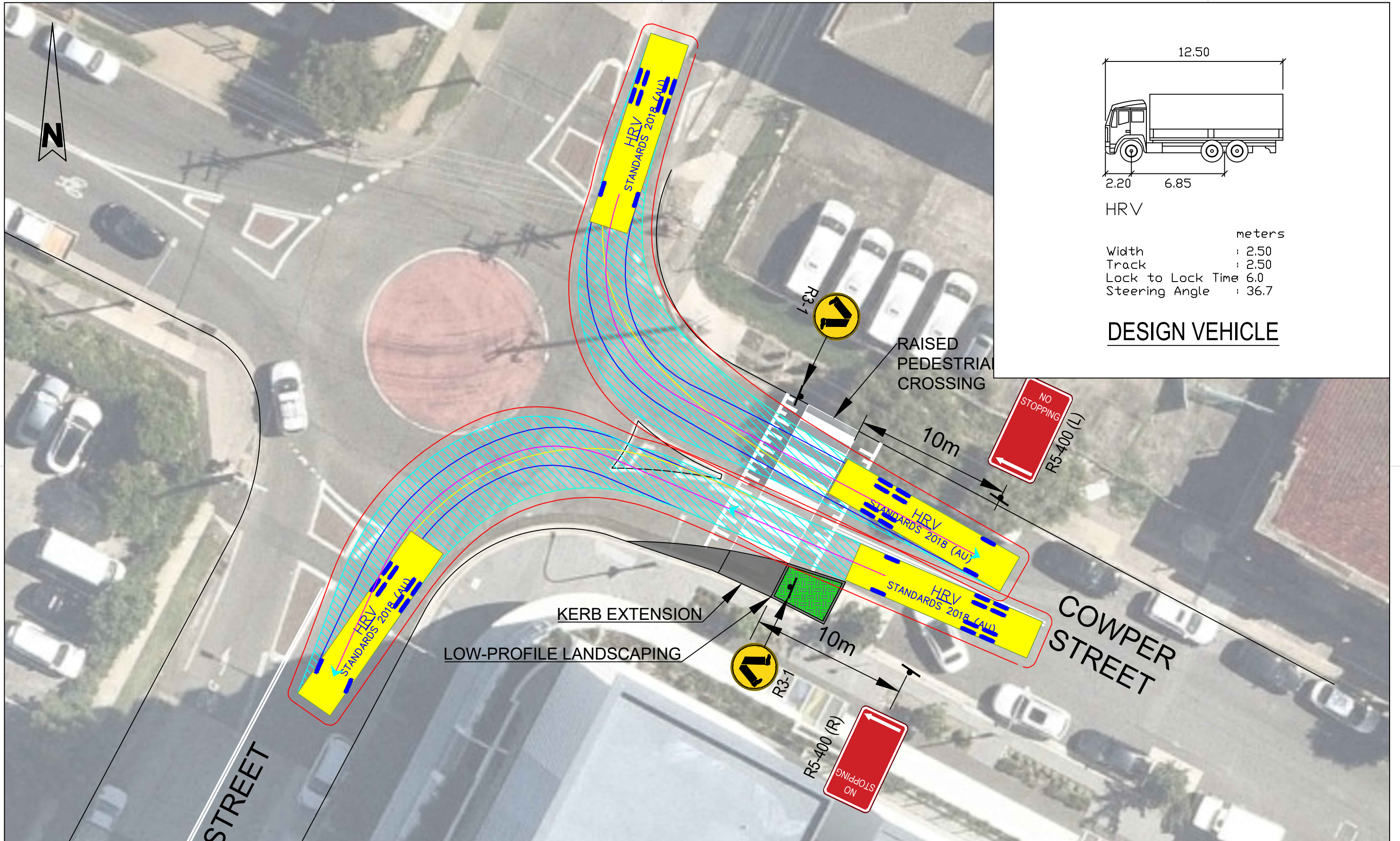
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REVISIONS		Drawn	Date
Issue	Revisions/Descriptions		
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003	UPDATE CONCEPT	M.H	12.05.2023
004	MINOR CHANGES	M.H	16.05.2023
005	REDUCE HPA A AREA	M.H	26.06.2023

Project	GRANVILLE
Title	ROWELL STREET / EAST STREET HRV SWEEP PATH

Design	M.H	Drawn	M.H	Checked	D.B	
CONCEPT ONLY					Date	26.06.2023
Project Number	P5961	Sheet Number	9	Issue	005	



HRV

Width : 2.50 meters
 Track : 2.50
 Lock to Lock Time : 6.0
 Steering Angle : 36.7

DESIGN VEHICLE

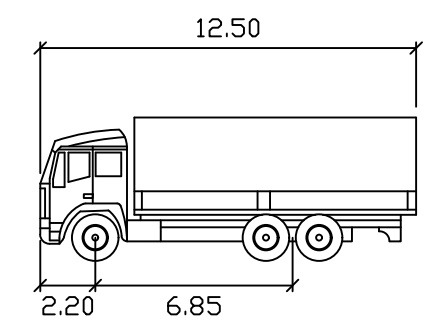
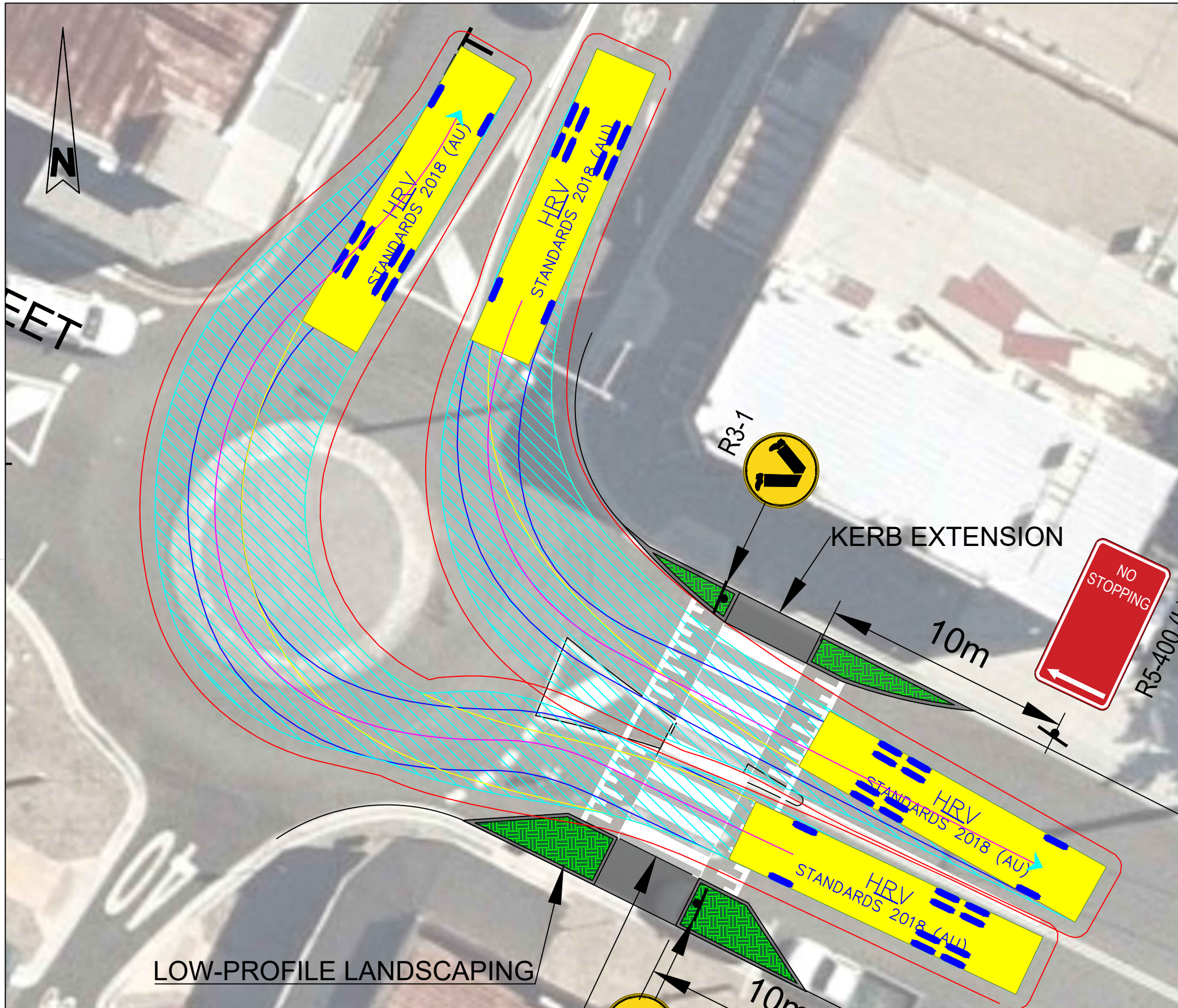


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REVISIONS		Drawn	Date
Issue	Revisions/Descriptions		
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002	UPDATE CONCEPT	M.H	26.04.2023
003	UPDATE CONCEPT	M.H	12.05.2023
004	MINOR CHANGES	M.H	16.05.2023
005	REDUCE HPAA AREA	M.H	26.06.2023

Project	GRANVILLE	
Title	COWPER STREET / ROWELL STREET HRV SWEEP PATH	

Design	M.H	Drawn	M.H	Checked	D.B
CONCEPT ONLY					
Project Number	P5961	Sheet Number	10	Date	26.06.2023
Issue					005



HRV

Width : 2.50 meters
 Track : 2.50
 Lock to Lock Time : 6.0
 Steering Angle : 36.7

DESIGN VEHICLE

LOW-PROFILE LANDSCAPING



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003	UPDATE CONCEPT	M.H	12.05.2023
004	MINOR CHANGES	M.H	16.05.2023
005	REDUCE HPAA AREA	M.H	26.06.2023

Project	GRANVILLE
Title	GOOD STREET / COWPER STREET HRV SWEPT PATH

Design	M.H	Drawn	M.H	Checked	D.B
CONCEPT ONLY					
Project Number	P5961	Sheet Number	11	Date	26.06.2023
				Issue	005

Project Number	P5961	Sheet Number	11	Date	26.06.2023
				Issue	005