

3. Existing conditions

This section provides a description of the existing road network surrounding the site.

3.1 Road hierarchy

Roads within NSW are categorised in the following two ways:

- by classification (ownership)
- by the function that they perform.

3.1.1 Road classification

Roads are classified (as defined by the *Roads Act 1993*) based on their importance to the movement of people and goods within NSW (as a primary means of communication).

The classification of a road allows Roads and Maritime Services (Roads and Maritime) to exercise authority of all or part of the road. Classified roads include main roads, state highways, tourist roads, secondary roads, tollways, freeways and transitways.

For management purposes, Roads and Maritime has three administrative classes of roads. These are:

- **State roads** – major arterial links through NSW and within major urban areas. They are principle traffic carrying roads and are fully controlled by Roads and Maritime, with maintenance fully funded by Roads and Maritime. State roads include all tollways, freeways and transitways; and all or part of a main road, tourist road or state highway.
- **Regional roads** – roads of secondary importance between state roads and local roads which, with state roads, provide the main connections to and between smaller towns and perform a sub arterial function in major urban areas. Regional roads are the responsibility of councils for maintenance funding, though Roads and Maritime funds some maintenance based on traffic and infrastructure. Traffic management on regional roads is controlled under delegations to local government from Roads and Maritime. Regional roads may contain all or part of a main road, secondary road, tourist road or state highway; or other roads as determined by Roads and Maritime.
- **Local roads** – the remainder of the council controlled roads. Local roads are the responsibility of councils for maintenance funding. Roads and Maritime may fund some maintenance and improvements based on specific programs (eg urban bus routes, road safety programs). Traffic management on local roads is controlled under delegations to local government from Roads and Maritime.

3.1.2 Functional hierarchy

Functional road classification involves the relative balance of the mobility and access functions. Roads and Maritime defines four levels in a typical functional road hierarchy, ranking from high mobility and low accessibility, to high accessibility and low mobility. These road classes are as follows:

- **Arterial roads** – generally controlled by Roads and Maritime, typically no limit in flow and designed to carry vehicles long distance between regional centres.
- **Sub arterial roads** – can be managed by either Roads and Maritime or local council. Their operating capacity typically ranges between 10,000 and 20,000 vehicles per day, and their aim is to carry through traffic between specific areas in a sub region, or provide connectivity from arterial road routes (regional links).

- **Collector roads** – provide connectivity between local roads and the arterial road network and typically carry between 2,000 and 10,000 vehicles per day.
- **Local roads** – provide direct access to properties and the collector road system and typically carry between 500 and 4,000 vehicles per day.

The surrounding road network is shown on Figure 3.1.

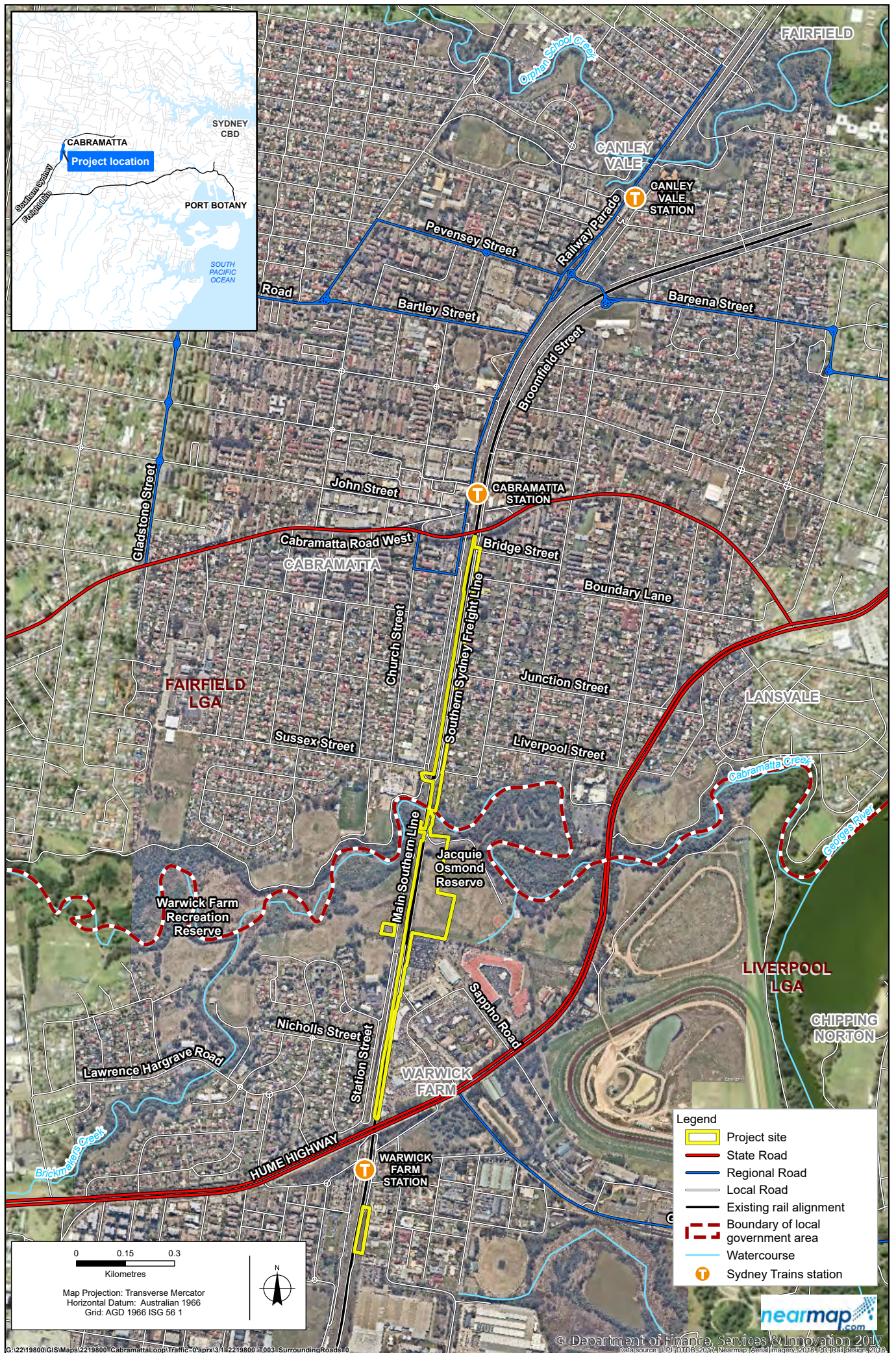


Figure 3.1 Surrounding road network

3.2 Existing road network

The key arterial road that links to and from connector roads to the site is the Hume Highway. The Hume Highway allows the entry and exit of traffic to the site at a number of locations, primarily at Cabramatta Road East and Mannix Parade. Key local roads within the study area that are adjacent to the works sites include Broomfield Street, Junction Street, Liverpool Street, Mannix Parade and Sappho Road.

The roads within the study area are described in more detail in the sections below.

3.2.1 Hume Highway

Hume Highway functions as an arterial road, and is the key link for construction traffic to move in and out from the site.

The key features of the Hume Highway within proximity of the site are outlined in Table 3.1.

Table 3.1 Hume Highway key features

Feature	Description
Carriageway	<ul style="list-style-type: none">Divided by central concrete median with predominantly three lanes in each direction (with some sections that provide two lane directional travel)A right turning lane is provided at the Cabramatta Road East intersection eastern approach, at Liverpool Street intersection north eastern approach, at the Sappho Road intersection north eastern approach and at the Mannix Road intersection eastern approach.
Parking	<ul style="list-style-type: none">No parking is permitted on either side of the Hume Highway
Speed limit	<ul style="list-style-type: none">Signposted 70 km/h.
Pedestrian facilities	<ul style="list-style-type: none">Concrete footpaths are provided on each side of the Hume Highway
Bicycle facilities	<ul style="list-style-type: none">Small section of shared path exists on the southern side of Hume Highway between Governor Macquarie Drive and just north of Sappho Road.
Public transport	<ul style="list-style-type: none">Warwick Farm Railway Station is located on the southern side of the Hume Highway.Bus route 904 services the Hume Highway.Stops are spaced approximately 200 – 400 m apart (at built up locations)Access stairs to Warwick Farm Station are located on the southern side of the Hume Highway railway bridge crossing
Load limits	<ul style="list-style-type: none">No identified load limit

3.2.2 Broomfield Street

Broomfield Street functions as a collector road that runs adjacent to the eastern side of the T2/T5 railway line. It is a key road utilised by commuters to access Cabramatta Rail Station and for residents and business owners to access local businesses near the station. On street parking is provided for the use of residents and commuters.

The key features of Broomfield Street within the proximity of the site are outlined in Table 3.2.

Table 3.2 Broomfield Street key features

Feature	Description
Carriageway	<ul style="list-style-type: none"> Divided by broken line with one lane in each direction south of Cabramatta Station. Divided by continuous solid line with one lane in each direction north of Cabramatta Station. A right turning lane is provided at the Broomfield Street/Cabramatta Road East intersection southern approach.
Parking	<ul style="list-style-type: none"> 30° parking on the western side and south of Boundary Lane for about 200 m. 30° parking on the western side and north of Longfield Street for about 200 m. 2P parallel parking is provided on the western side within 300 m of Cabramatta Station. Three accessible parking bays on the western side within 50 m of Cabramatta Station. 1P parallel parking is provided on the eastern side within 100 m of Cabramatta Station. 1/2P parallel parking is provided on the eastern side directly adjacent to Cabramatta Station.
Taxi zone	<ul style="list-style-type: none"> Two taxi zone spaces on the western side, immediately north of the station.
Kiss and ride	<ul style="list-style-type: none"> Two kiss and ride spaces located on the western side, just north of the station.
Speed limit	<ul style="list-style-type: none"> Signposted 50 km/h. Signposted 40 km/h within 200 m of the town centre.
Pedestrian facilities	<ul style="list-style-type: none"> Shared path is provided on the western side south of Cabramatta Station. Footpath is provided on the eastern side.
Bicycle facilities	<ul style="list-style-type: none"> Shared path is provided on the western side south of Cabramatta Station. Painted bicycle symbols on road about 150 m north of Cabramatta Station. Five formal bike racks adjacent to the station.
Public transport	<ul style="list-style-type: none"> Cabramatta Railway Station is located on the western side of Broomfield Street. Bus route S1 services Broomfield Street. One stop is located adjacent to Cabramatta Station on the western side of Broomfield Street. One stop is located outside of Cabravale Leisure Centre (to the west) on the eastern side of Broomfield Street.
Load limits	<ul style="list-style-type: none"> No identified load limit.

3.2.3 Cabramatta Road East

Cabramatta Road East is a sub arterial road forming part of Cabramatta Road, positioned east of the T2/T5 railway line. Cabramatta Road East provides a link between the Cabramatta town centre, the Cabramatta Rail Station (located east of the town centre) and the Hume Highway (to the east).

The key features of Cabramatta Road East within the proximity of the site are outlined in Table 3.3.

Table 3.3 Cabramatta Road East Street key features

Feature	Description
Carriageway	<ul style="list-style-type: none"> Divided by double solid line with two lanes in each direction. Turning lanes are provided at the intersections of Cabramatta Road East/Cumberland Street and Cabramatta Road/Lovoni Street.
Parking	<ul style="list-style-type: none"> No Stopping on the northern and southern side from Cabramatta Station to Cabramatta Road East/Cumberland Street. No Parking 3:00 pm to 7:00 pm on the northern side east of the Cabramatta Road East/Cumberland Street intersection. No Parking on the southern side between Cabramatta Road East/Cumberland Street and Cabramatta Road East/Levuka Street. No Stopping on the southern side from Cabramatta Road East/Levuka Street eastwards.
Taxi zone	<ul style="list-style-type: none"> No Taxi Zone.
Kiss and ride	<ul style="list-style-type: none"> One kiss and ride space located on the southern side, just east of the station.
Speed limit	<ul style="list-style-type: none"> Signposted School Zone 40 km/h 8:00 am – 9:30 am and 2:30 pm – 4:00 pm during school days beginning 100 m from Cabramatta Public School. 60 km/h signposted speed limit.
Pedestrian facilities	<ul style="list-style-type: none"> Footpaths provided on both sides of the road.
Bicycle facilities	<ul style="list-style-type: none"> No designated bicycle facilities.
Public transport	<ul style="list-style-type: none"> Cabramatta Station is located to the western end. Bus stop shelter is provided on the southern side outside of Cabramatta Public School.
Load limits	<ul style="list-style-type: none"> No identified load limit.

3.2.4 First Avenue

First Avenue is a local no-through road providing access to Canley Vale Station and a residential area to the north of the train line. First Avenue has one lane running in each direction.

The key features of First Avenue within the proximity of the site are outlined in Table 3.4.

Table 3.4 First Avenue key features

Feature	Description
Carriageway	<ul style="list-style-type: none"> Divided by double solid line with one lane in each direction approaching Bareena Street/First Avenue T-intersection. No lines dividing the lanes within vicinity to Canley Vale Station.
Parking	<ul style="list-style-type: none"> No Stopping 140 m north of Bareena Street/First Avenue T-intersection on the western and eastern side. 90° parking provided outside of Canley Vale Station on the western side. 2P 8:30 am – 6:00 pm parallel parking provided outside of Canley Vale Station on the northern side.
Taxi zone	<ul style="list-style-type: none"> No Taxi Zone.
Kiss and ride	<ul style="list-style-type: none"> One kiss and ride space located on the eastern side, just south of the station

Feature	Description
Speed limit	<ul style="list-style-type: none"> • Signposted School Zone 40 km/h 8:00 am – 9:30 am and 2:30 pm – 4:00 pm during school days beginning about 60 m from Pal Buddhist School. • 50 km/h signposted speed limit.
Pedestrian facilities	<ul style="list-style-type: none"> • Footpath available on the western side, becoming a shared path on approach to Canley Vale Station access although becomes truncated thereafter. • No designated footpaths on the eastern side.
Bicycle facilities	<ul style="list-style-type: none"> • Bike racks are provided outside of Canley Vale Station. • Shared path provided on approach to Canley Vale Station.
Public transport	<ul style="list-style-type: none"> • Canley Vale Station located to the northwest of the street.
Load limits	<ul style="list-style-type: none"> • No identified load limit.

3.2.5 Mannix Parade

Mannix Parade is a local road intersecting the Hume Highway in the south and Lawrence Hargrave Road in the north. It provides access to the residential area of Warwick Farm.

The key features of Mannix Parade within the proximity of the site are outlined in Table 3.5.

Table 3.5 Mannix Parade key features

Feature	Description
Carriageway	<ul style="list-style-type: none"> • Divided by double solid line with one lane in each direction. • Right turning lane is provided at the Hume Highway/Mannix Parade T-intersection.
Parking	<ul style="list-style-type: none"> • No Stopping on either side. • Access to local businesses car park is provided.
Taxi zone	<ul style="list-style-type: none"> • No Taxi Zone.
Kiss and ride	<ul style="list-style-type: none"> • No kiss and ride facility.
Speed limit	<ul style="list-style-type: none"> • Default 50 km/h.
Pedestrian facilities	<ul style="list-style-type: none"> • Footpath available on either side.
Bicycle facilities	<ul style="list-style-type: none"> • No dedicated bicycle facilities.
Public transport	<ul style="list-style-type: none"> • Bus stop located on the eastern side servicing Route 823.
Load limits	<ul style="list-style-type: none"> • No identified load limit.

3.2.6 Liverpool Street

Liverpool Street is a local road, located about 100 metres to the east of the project. To the east, it forms a priority controlled intersection with Hume Highway. To the west, it provides connectivity to Broomfield Street via National Street and Sussex Street. The land use along Liverpool Street is primarily residential in nature.

The key features of Liverpool Street within the proximity of the site are outlined in Table 3.6.

Table 3.6 Liverpool Street key features

Feature	Description
Carriageway	<ul style="list-style-type: none"> Default one lane in each direction with painted broken line followed by double continuous lines within 100 m of the T-intersection with National Street. Double solid line within 50 m of the T-intersection with Hume Highway.
Parking	<ul style="list-style-type: none"> No restrictions to on-street parking.
Taxi zone	<ul style="list-style-type: none"> No Taxi Zone.
Kiss and ride	<ul style="list-style-type: none"> No kiss and ride facility.
Speed limit	<ul style="list-style-type: none"> Default speed limit of 50 km/h.
Pedestrian facilities	<ul style="list-style-type: none"> Dedicated footpath is provided on the south side of the street.
Bicycle facilities	<ul style="list-style-type: none"> No dedicated cycling facilities.
Public transport	<ul style="list-style-type: none"> No dedicated public transport facilities.
Load limits	<ul style="list-style-type: none"> No identified load limit.

3.2.7 Junction Street

Junction Street is a local road running in an east–west direction. It directly links Broomfield Street to the Hume Highway. The land use along Junction Street is primarily residential in nature.

The key features of Junction Street within the proximity of the site are outlined in Table 3.7.

Table 3.7 Junction Street key features

Feature	Description
Carriageway	<ul style="list-style-type: none"> Default one lane in each direction. Separated by double solid line within 25 m of Broomfield Street/Junction Street intersection.
Parking	<ul style="list-style-type: none"> No restrictions to on-street parking.
Taxi zone	<ul style="list-style-type: none"> No Taxi Zone.
Kiss and ride	<ul style="list-style-type: none"> No kiss and ride facility.
Speed limit	<ul style="list-style-type: none"> Default speed limit of 50 km/h.
Pedestrian facilities	<ul style="list-style-type: none"> Dedicated footpath is provided on the south side of the street.
Bicycle facilities	<ul style="list-style-type: none"> No dedicated cycling facilities.
Public transport	<ul style="list-style-type: none"> No dedicated public transport facilities.
Load limits	<ul style="list-style-type: none"> No identified load limit.

3.3 Existing freight routes

The Roads and Maritime Services Restricted Access Vehicle Map identifies the following approved freight routes to accommodate vehicles up to the size of a 26 m B-Double as shown in Figure 3.2.

- Hume Highway
- Cabramatta Road East

Access to the site is to utilise such approved road network minimising impact to the local road network. Heavy vehicle access routes are defined in section 4.1.6.



Figure 3.2 Existing freight routes

3.4 Performance of existing road network

This section provides an understanding of current traffic volumes, traffic characteristics and operational performance of key intersections.

3.4.1 Peak hour traffic volumes

Traffic surveys were undertaken during periods indicated below to capture and determine the peak hour period and key intersections on the major road network.

GHD engaged Matrix Traffic and Transport Data Pty Ltd to undertake intersection traffic turning counts on 23 October 2018. Traffic surveys are generally taken for a three hour period to capture the peak hour morning and evening traffic counts. The surveys for this assessment were undertaken during the following time periods which are based on an understanding of typical peak traffic periods on urban roads in Sydney:

- Weekday AM peak (three hours): 6:30 am to 9:30 am
- Weekday PM peak (three hours): 3:30 pm to 6:30 pm.

An intersection survey at Sappho Road/Hume Highway intersection was also carried out by Matrix Traffic and Transport Data Pty Ltd on 22 and 24 November 2018 during the following time periods:

- Weekday AM peak (three hours): 6:30 am to 9:30 am
- Weekday PM peak (three hours): 3:30 pm to 6:30 pm
- Saturday peak (three hours) 11:30 am to 2:30 pm.

Sappho Road/Hume Highway intersection provides access and egress to car sales establishments and Hometown Warwick Farm, which may have more vehicle movements (when compared to other intersections) during the Saturday period.

Intersection turning count surveys were performed at intersections within the immediate vicinity of the site, which included the following intersections, as illustrated on Figure 3.3.

- Hume Highway and Mannix Parade
- Lawrence Hargrave Road and Nicholls Street
- Lawrence Hargrave Road and Mannix Parade
- Hume Highway and Junction Street
- Hume Highway and Liverpool Street
- Broomfield Street and Cabramatta Road East
- Hume Highway and Cabramatta Road East
- Sappho Road and Hume Highway.

The above intersections were selected for survey and review following consideration of the potential project impacts including:

- major road network and intersections along the construction haulage routes
- road classifications and hierarchy (including traffic volumes)
- major intersections and their controlled form (e.g. signalled, roundabout, priority)
- peak traffic periods.

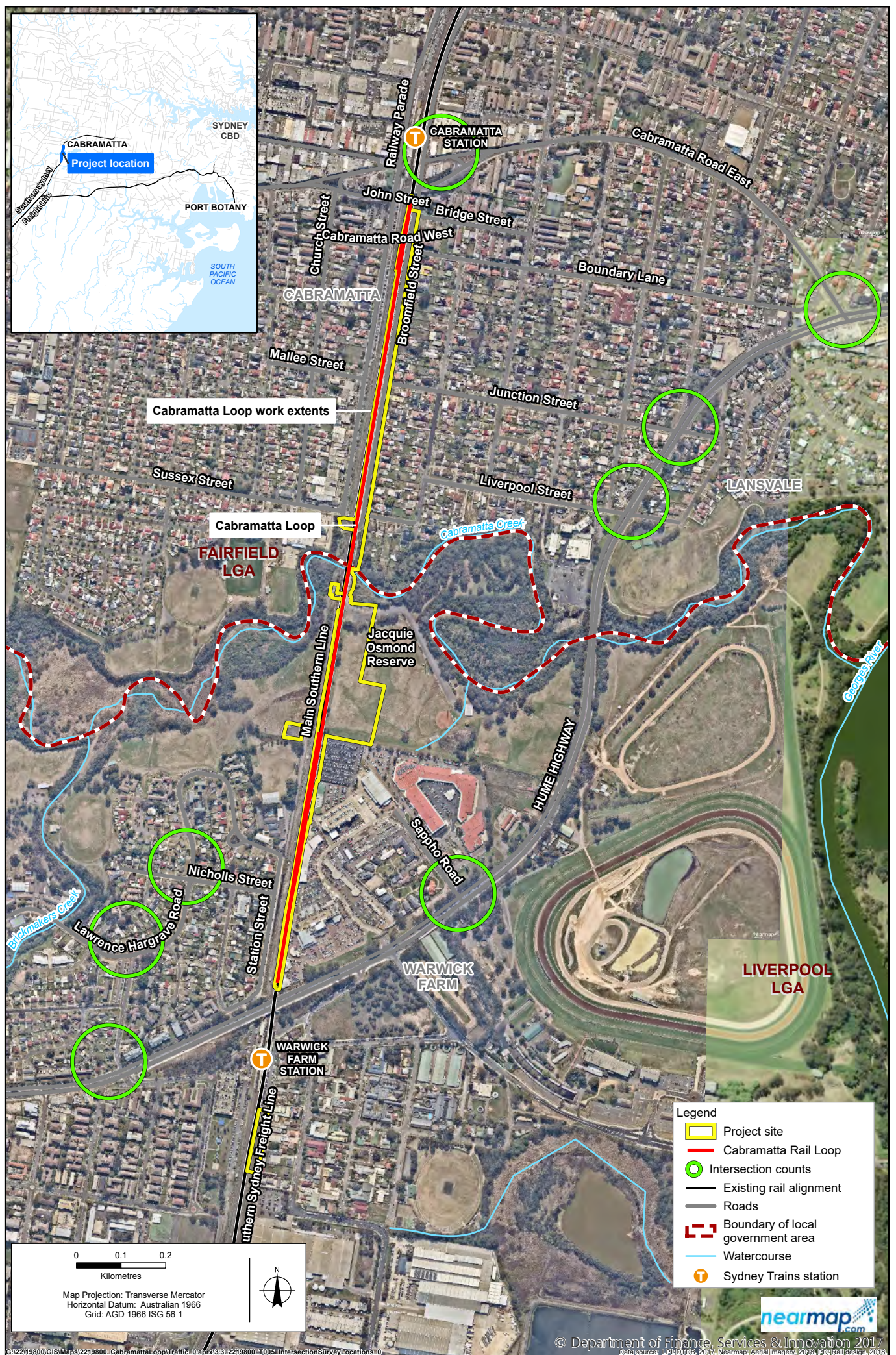


Figure 3.3 Intersection traffic surveys locations

Detailed traffic survey data is provided in Appendix A and was used to determine key peak hour periods during the AM, PM and Saturday periods. This data was analysed to determine existing intersection operational performance and during construction.

The traffic surveys undertaken indicated the following network peak hour periods adjacent to the subject site:

- weekday AM peak: 7:30 am to 8:30 am
- weekday PM peak: 16:30 pm to 17:30 pm
- Saturday peak: 12:30 pm to 13:30 pm.

These peak periods were adopted for assessment of impacts on the surrounding road network for worst-case scenario. Although, it should be acknowledged that peak arrival and departures of construction workers to and from the site is likely to occur outside the road network peak.

In addition, the classification of roads within a network can be used as an indication of the functional role each road plays with respect to the volume of traffic they should appropriately carry. Roads and Maritime has developed a set of road hierarchy classifications, detailed in Table 3.8, which indicate typical nominal average annual daily traffic (AADT) volumes for the various classes of roads.

Table 3.8 Functional classification of roads

Location	Traffic Volume (veh/d*)	Peak Hour Volume (veh/h*)
Motorway/freeway	>15,000	>5,600
Arterial road	>15,000	1,500 – 5,600
Sub arterial road	5,000 – 20,000	500 – 2,000
Collector road	2,000 – 10,000	200 – 1,000
Local road	<2,000	0 – 200

Source: NSW Roads and Maritime Service (formerly NSW RTA), *Road Design Guide and AMCORD*

*Note veh/d = vehicles per day, veh/h = vehicles per hour

Table 3.9 summarises the weekday peak hour traffic volumes obtained via the surveys, in the study area. Table 3.10 summarises the Saturday peak mid-block volumes in each direction on Sappho Road. Note that only Saturday peak volumes were taken for Sappho Road due to the influence that the car sales establishments may have on increased vehicle movements on this road when compared to other surrounding road networks.

Table 3.9 Mid-block traffic volumes (Weekday)

Location	Road classification	Direction	AM Peak Hour (veh/h)*	PM Peak Hour (veh/h)*
Hume Highway – between Mannix Road and Sappho Road	Arterial road	Eastbound	2,150	1,890
		Westbound	1,650	1,885
		Total	3,800	3,775
Cabramatta Road East	Sub arterial	Northbound	390	935
		Southbound	840	800
		Total	1,230	1,735
Broomfield Street	Local road	Northbound	135	140
		Southbound	150	160
		Total	285	300
Mannix Parade	Local road	Northbound	125	120
		Southbound	165	135
		Total	290	255
Lawrence Hargrave Road	Local road	Northbound	80	80
		Southbound	65	65
		Total	145	145
Sappho Road	Local road	Northbound	205	275
		Southbound	45	200
		Total	250	475

Table 3.10 Mid-block traffic volumes (Saturday)

Location	Road classification	Direction	Saturday Peak Hour (veh/h)*
Sappho Road	Local road	Northbound	205
		Southbound	465
		Total	670

Notes: (*) veh/h = vehicles per hour

The peak hour traffic volumes generally fall within the criteria provided in Table 3.8 for the relevant classification for the road network close to the subject site, based on the survey results outlined in Table 3.9 and Table 3.10.

Comparing the weekday AM and PM peak hour volumes at each location, volumes are typically similar, apart from Cabramatta Road East, where the PM peak has significantly higher volumes than the AM peak.

It can also be seen in Table 3.10 that the Saturday peak total volume at Sappho Road is higher than the weekday peak, which is assumed to be as a result of the high density commercial activities accessed via Sappho Road (ie car sales yards and retail establishments).

3.4.2 Heavy and light vehicle ratio

The average heavy vehicle percentage for major roads within the immediate vicinity of the site is outlined in Table 3.11, based on the traffic survey data. These roads are reported as they carry significant heavy vehicle volumes.

Table 3.11 Peak hour heavy vehicle ratio

Location	% Heavy Vehicles	
	AM	PM
Hume Highway	5%	4%
Cabramatta Road (East)	3%	3%
Broomfield Street	3%	1%

The data in Table 3.11 indicates that heavy vehicles constitute one per cent to five per cent of the overall traffic volumes.

3.4.3 Intersection performance

The performance of the existing road network is largely dependent on the operational performance of key intersections, which are critical capacity control points. SIDRA 8 intersection modelling software was used to assess the peak hour operational performance of the intersections within immediate proximity of the site.

The criteria for evaluating the operational performance of intersections is provided by the *Guide to Traffic Generating Developments* (Roads and Maritime Services, 2002) and are reproduced in Table 3.12. The criteria for evaluating the operational performance of intersections is based on a qualitative measure (ie Level of Service (LoS)), which is applied to each band of average vehicle delay.

Table 3.12 LoS criteria for intersections

Level of Service	Average Delay per Vehicle (seconds/veh)	Traffic Signals, Roundabouts	Give Way and Stop Signs
A	< 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Operating near capacity	Near capacity and accident study required
E	57 to 70	At capacity; at signals, incidents will cause excessive delays. Roundabouts require other control modes	At capacity, requires other control mode
F	> 70	Over capacity Unstable operation	Over capacity Unstable operation

Source: *Guide to Traffic Generating Developments* (Roads and Maritime Services, 2002)

Existing (base 2018) traffic models were developed using the AM and PM weekday peak hour surveyed data and the Saturday peak hour data at the Sappho Road/Hume Highway intersection as identified in section 3.3 above. Existing traffic flows at key intersections were analysed using SIDRA 8 as isolated intersections to obtain the current operating performance. As the analysed intersections were separated by a significant distance, it was not deemed necessary to model under network conditions. A summary of the results is outlined in Table 3.13 (Weekday) and Table 3.14 (Saturday) and detailed in Appendix B.

Table 3.13 Existing intersection operations (Weekday)

Intersection	AM Peak				PM Peak			
	Average Delay* (s)	LoS	Control Type	Degree. of Saturation*	Average Delay* (s)	LoS	Control Type	Degree. of Saturation*
Site 1: Hume Highway/ Mannix Parade	25	B	Signal	0.882	30	C	Signal	0.929
Site 2: Lawrence Hargrave Road/ Nicholls Street	8	A	Roundabout	0.056	8	A	Roundabout	0.055
Site 3: Lawrence Hargrave Road/ Mannix Parade	7	A	Roundabout	0.098	7	A	Roundabout	0.082
Site 4: Hume Highway/Junction Street	8	A	Priority	0.36	7	A	Priority	0.485
Site 5: Hume Highway/ Liverpool Street	150+	F	Priority	1.0+	150+	F	Priority	1.0+
Site 6: Sappho Road/Hume Highway (Weekday)	8	A	Signal	0.534	13	A	Signal	0.523
Site 7: Broomfield Street/ Cabramatta Road East	13	A	Signal	0.222	12	A	Signal	0.242
Site 8: Hume Highway/ Cabramatta Road East	26	B	Signal	0.688	26	B	Signal	0.810

Table 3.14 Existing intersection operations (Saturday)

Intersection	Saturday Peak			
	Average Delay* (s)	LoS*	Control Type	Degree. of Saturation*
Site 6: Sappho Road/ Hume Highway	19	B	Signal	0.846

* Notes:

- The average delay for priority-controlled intersections is selected from the movement on the approach with the highest average delay.
- The level of service for priority-controlled intersections is based on the highest average delay per vehicle for the most critical movement.
- The degree of saturation (Degree of Saturation) is defined as the ratio of the arrival flow (demand) to the capacity of each approach.
- Average delay is given in seconds per vehicle.

Table 3.13 shows that each of the signalised intersections and roundabouts analysed currently operates with an acceptable LoS (ie better than LoS E) with spare capacity in both the weekday morning and evening peak periods. The right turn movement from Hume Highway into Liverpool Street at the priority controlled intersection was shown to operate at LoS F both in the morning and evening peak periods, with delays occurring in the minor roads which are require to give way to high traffic volumes on the Hume Highway.

Table 3.14 shows that the Sappho Road/Hume Highway intersection operates satisfactorily for the weekend peak hour (LoS B).

Detailed SIDRA results of these intersections are provided in Appendix B.

3.5 On and off street parking

Cabramatta Station area

Designated on street parking is typically provided on Broomfield Street, which is considered within typical walking distance (within 800 metres) to the Cabramatta Railway Station and to the town centre. The on street parking is provided for a number of users including commuters, business owners, residents and visitors to Cabramatta town centre. Parking is provided on both sides of Broomfield Street, with time restrictions for parking predominantly between Cabramatta Road East and Fisher Street. It is assumed that visitors and shoppers in Cabramatta are likely to use the time restricted parking for short stays, whereas the unrestricted parking spaces are likely utilised predominantly by commuters and residents.

Within the Cabramatta town centre via Dutton Lane (west of the station), off street parking is provided predominately to service local business activity associated with the town centre. Additionally on the eastern side of the station is a multi-story car parking facility accessed via Fisher Street and a small at grade car park accessed via Cumberland Street.

Canley Vale Station area

Canley Vale Station is predominately serviced by on street parking on First Avenue (east of the station). An off street car parking facility is also available west of the station to service the Canley Vale town centre and potential commuters.

Warwick Farm Station area

Warwick Farm Station is predominately serviced by a multi-storey off street parking facility on the western side of the station. This is supported by at grade parking areas on both the eastern and western sides adjacent to the station. Additionally there is angle on-street parking available in Hart Street on the western side of the station

Parking survey extent

Surveys of existing parking utilisation were undertaken to provide an understanding of the existing parking situation at the site and the impact that the proposal would likely have on the surrounding road network.

Parking utilisation surveys at the site were undertaken by Matrix Traffic and Transport Data Pty Ltd on Tuesday 23 October 2018 from 7:00 am to 7:00 pm. It was deemed suitable for this analysis to undertake a parking utilisation survey for one typical weekday to be representative of typical parking utilisation patterns seen on Broomfield Street (key area of project works). Details of the surveyed data and location map can be found in Figure 3.4.

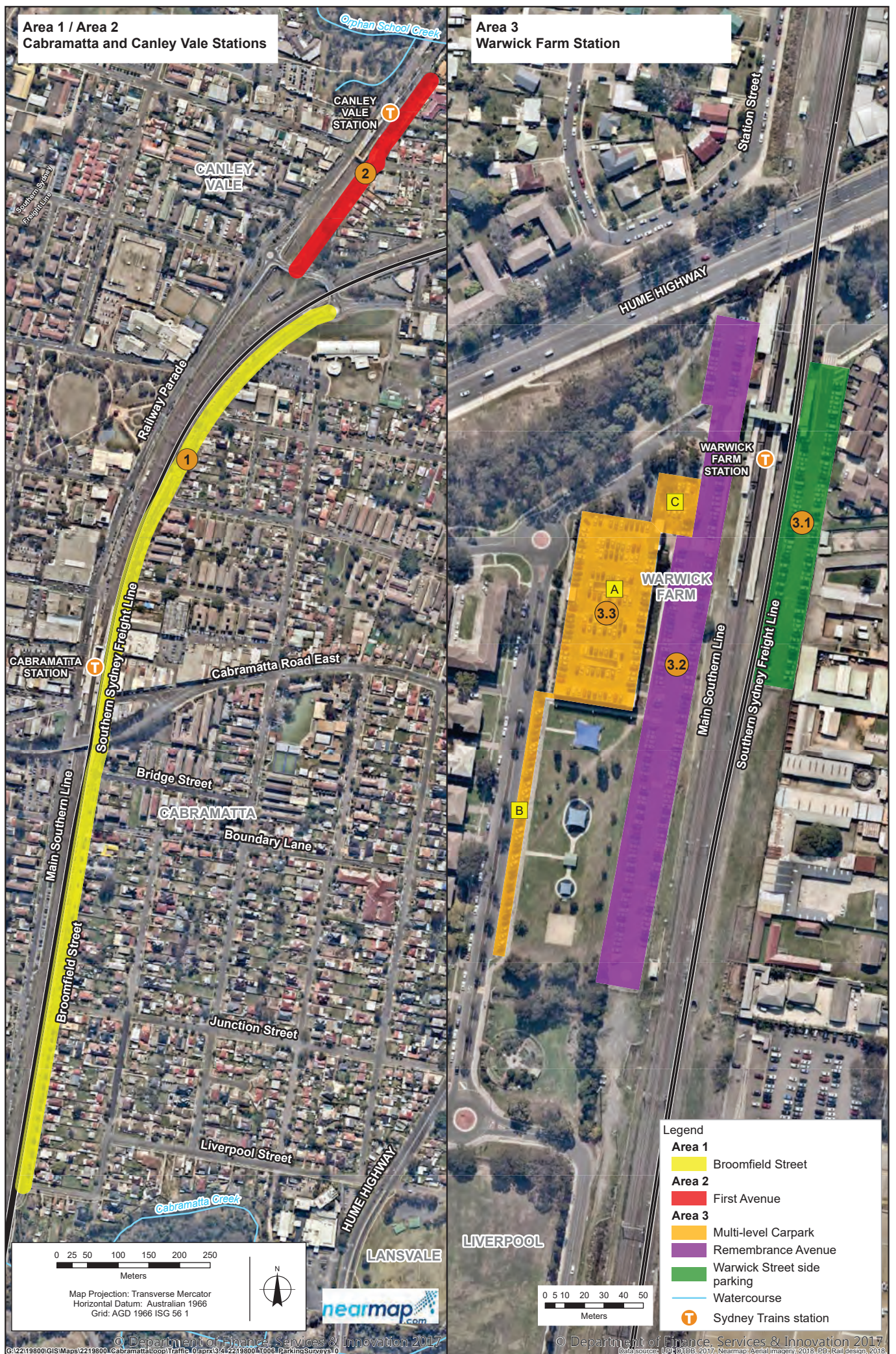


Figure 3.4 Parking survey extent

Broomfield Street is considered the key area to potentially be impacted during construction and therefore the analysis concentrates predominately on this area. Side roads were not included as part of this assessment as it does not form part of the area of impact associated with the construction of the project.

It was estimated that 379 parking spaces were available on Broomfield Street. A breakdown of the parking provisions is outlined in Table 3.15.

Table 3.15 Broomfield Street on-street parking provision breakdown

Side of Street	Between	Restrictions	Applicable Hours	Capacity	Utilisation
East	Cabramatta Rd & Fisher St	1/2 P	8:30 am - 18:00 pm	2	100%
		Loading Zone	-	2	100%
		1P	8:30 am - 18:00 pm	7	100%
		1P	8:30 am - 18:00 pm	6	100%
	Fisher St & Longfield St	No Restriction	-	14	100%
	Longfield St & Curtin St	No Restriction	-	14	100%
	Curtin St & Bareena St	No Restriction	-	11	73%
		Bus Zone	9:00 am - 15:00 pm (Mon-Fri)	4	-
			9:00 am - 18:00 pm (Sat-Sun)		
		No Restriction	-	10	0%
	Total North of Cabramatta Station			70	74%
	Sussex St & #170 Broomfield St	No Restriction	-	12	42%
	#170 Broomfield St & Junction St	No Restriction	-	22	9%
	Junction St & Boundary Ln	No Restriction	-	31	87%
	Bridge St & Cabramatta Rd	2P	8:30 am - 18:00 pm (Mon-Fri)	8	88%
		1/2 P	8:30 am - 18:00 pm	5	100%
	Total South of Cabramatta Station			78	58%
West	Bareena St & #170 Broomfield St	No Restriction	-	5	80%
		No Restriction	45 Angle Parking Rear to Kerb Under 6 m Vehicle	47	100%
		No Restriction	Parallel Parking	41	93%
		Taxi Zone	-	2	
		Mail Zone	-	1	
	Total North of Cabramatta Station			96	91%
	Bareena St & #170 Broomfield St	Disabled Parking	-	3	100%
		2P	8:30 am - 18:00 pm	9	100%
		No Restriction	Parallel Parking	15	100%
		No Restriction	45 Angle Parking Rear to Kerb Under 6 m Vehicle	41	100%

Side of Street	Between	Restrictions	Applicable Hours	Capacity	Utilisation
		No Restriction	-	53	43%
	#170 Broomfield St & Sussex St	No Restriction	-	14	14%
	Total South of Cabramatta Station			135	68%
Total Parking Provision Broomfield Street				379	72%

A summary of the percentage weekday parking utilisation for each car parking area is shown on Figure 3.5 (Broomfield Street) and Figure 3.6 (Warwick Farm and Canley Vale Stations).

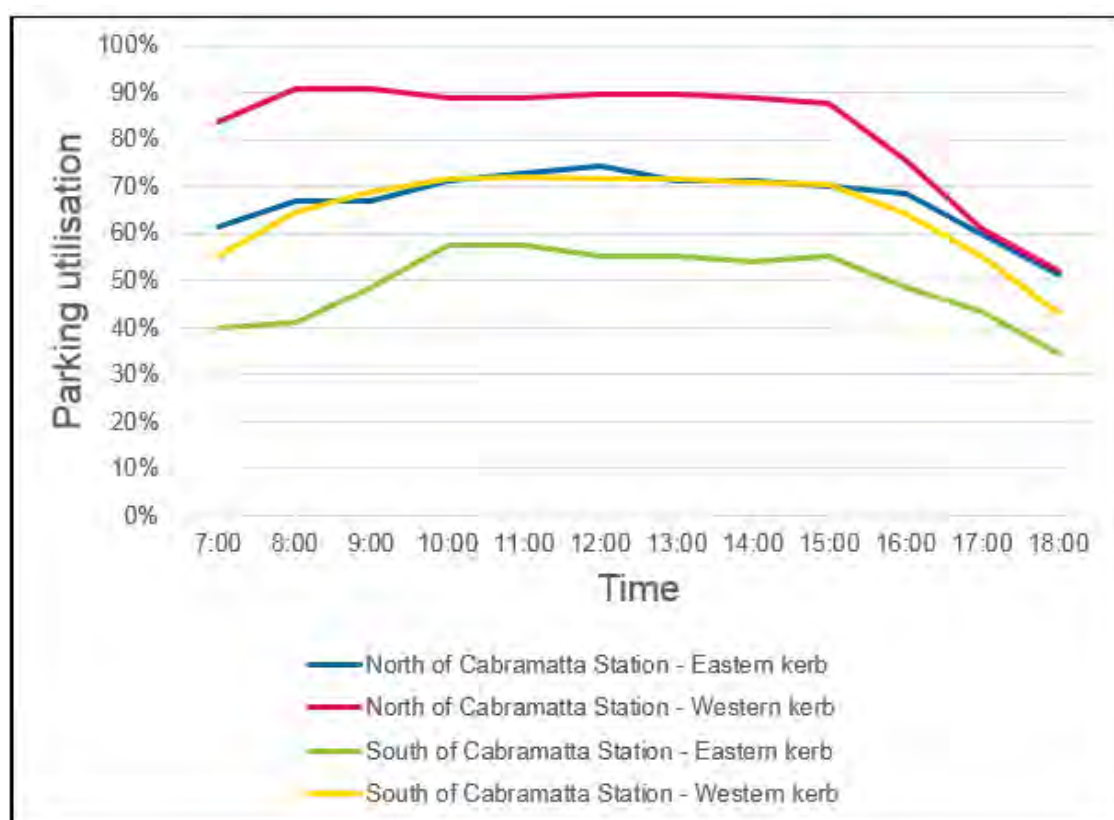


Figure 3.5 Broomfield Street parking utilisation

Figure 3.5 shows that parking utilisation on Broomfield Street typically reaches close to capacity north of Cabramatta Station on the western side between 8:00 am and 3:00 pm. Parking south of Cabramatta Station typically has spare capacity (76 spare spaces identified during the survey), particularly on the eastern side south of Junction Street, (as shown in Table 3.15) with peak utilisation at approximately 60 per cent. As parking south of Junction Street is still within 800 metres of Cabramatta Station, spare parking capacity is considered within acceptable walking distance to Cabramatta train station (refer to section 3.7 for further information regarding acceptable walking distances from stations).

Parking patterns observed shows that the majority of parking users within Broomfield Street are for commuter parking accessing Cabramatta Station (outside the period parking restriction areas), with an increase in parking demand prior to 9:00 am and a decrease in demand after 3:00 pm.

Parking utilisation surveys were also undertaken at Canley Vale Station and Warwick Farm Station to assess parking patterns in proximity to the compounds and work sites. Figure 3.6 shows the parking utilisation at Canley Vale Station and Warwick Farm Station.

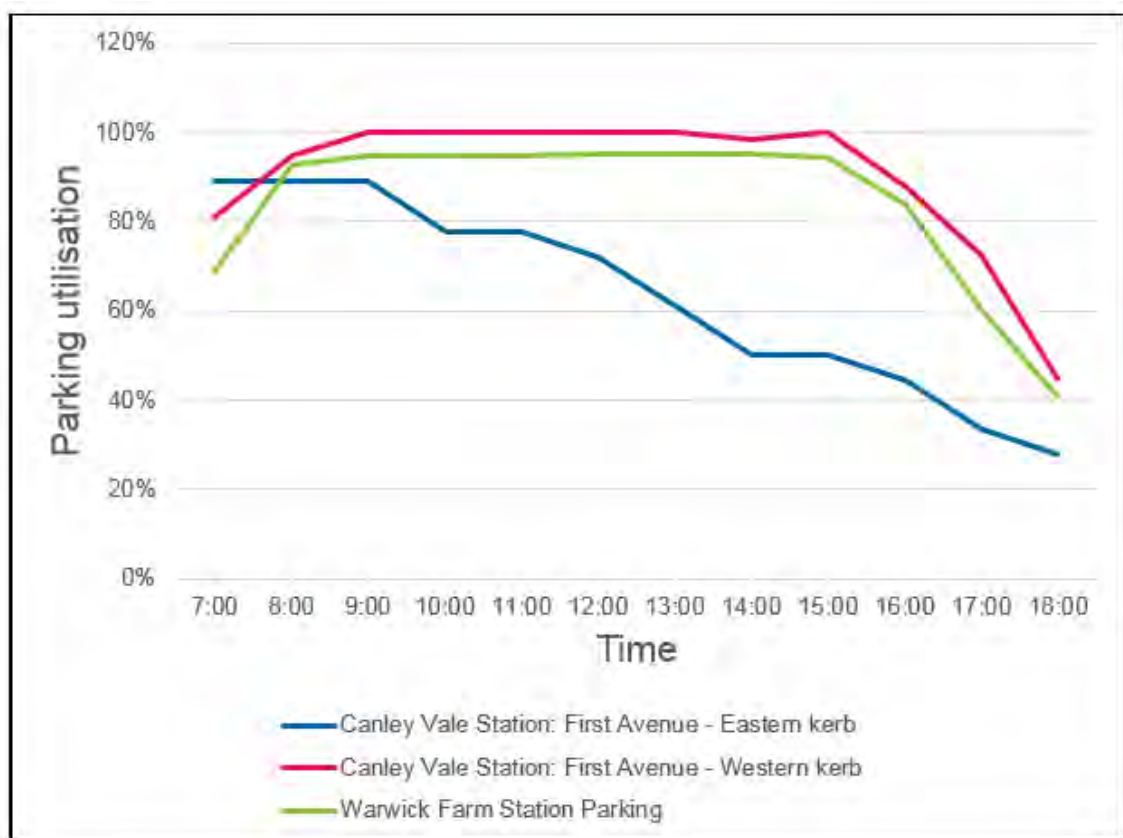


Figure 3.6 Stations parking utilisation

First Avenue on the western kerb and Warwick Farm Station follow a similar trend to Broomfield Street parking demands. The chart shows the parking utilisation is at capacity from 8:00 am to 3:00 pm. The maximum distance that commuters would need to walk from First Avenue to the station would be within 200 metres. This is an acceptable range to walk, should there be availability of commuter parking spaces.

In contrast, the parking utilisation at First Avenue on the eastern side shows a different pattern, where parking utilisation starts at approximately 90 per cent and steadily drops throughout the day. The assessment did not detail the type of users; however, this parking demand pattern is sometimes evident in locations where residents may leave during morning periods.

3.6 Crash data analysis

The objective of the crash data analysis is to determine whether there are road safety concerns in close proximity to the main work sites, and whether this would be an issue for additional construction traffic and shared road users. If significant road safety concerns are identified from the high level crash data analysis, these issues can be raised in this report and potential mitigation measures can be implemented to improve safety in proximity to the work sites.

A review of crash data provided from the website for Transport for NSW Centre for Road Safety has been undertaken by GHD. This is based on a five-year period (2013 – 2017) for roads directly adjacent to the site area as shown on Figure 3.7 where most construction activity will occur.

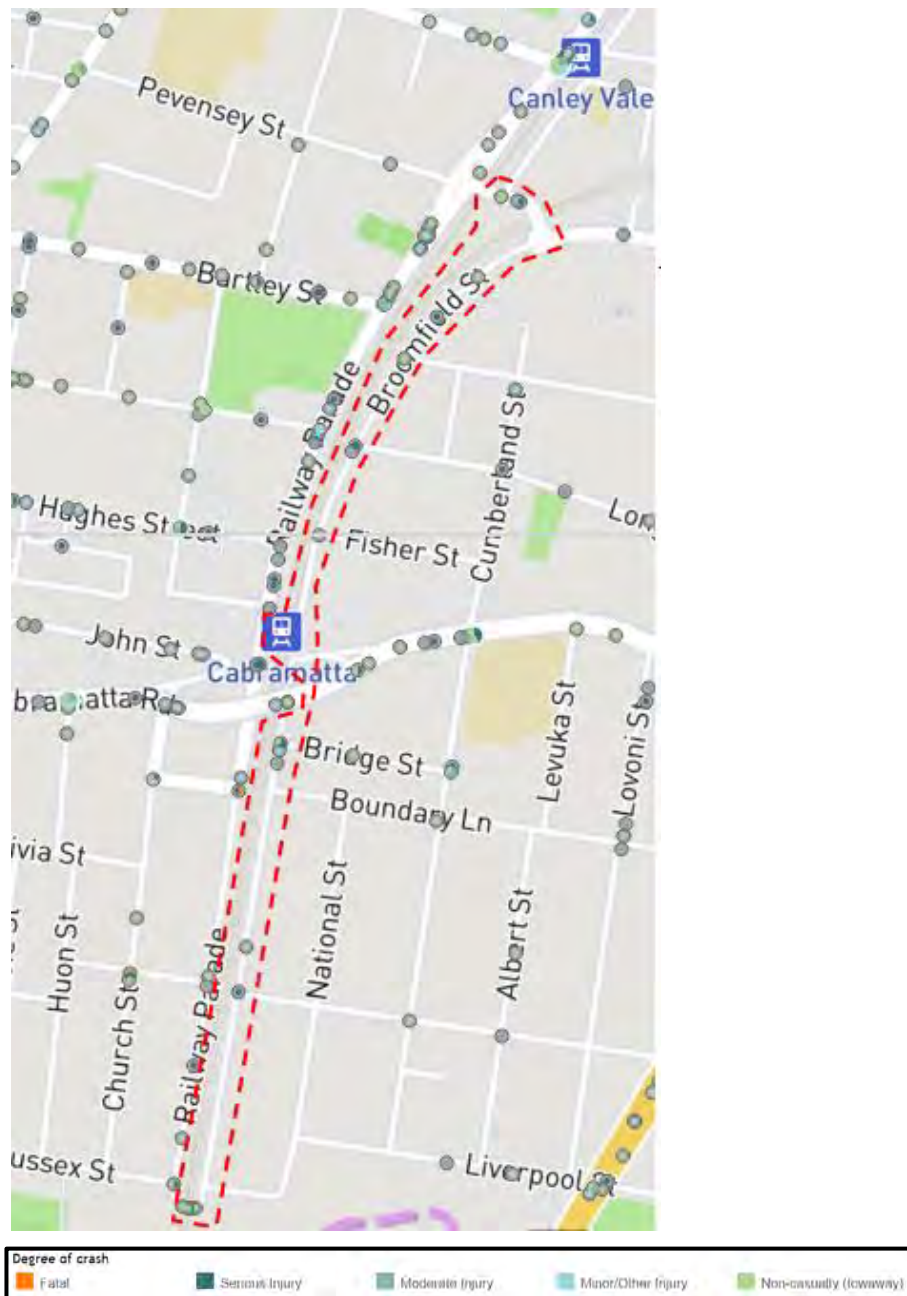


Figure 3.7 Locations of crashes (2013 – 2017)

Source: Transport for NSW Centre for Road Safety

(<https://roadsafety.transport.nsw.gov.au/statistics/interactivecrashstats/index.html>) – Modified by GHD

Figure 3.7 shows that crashes typically occur at intersections along Broomfield Street, particularly at Bridge Street and Longfield Street intersections.

A summary of the five-year crash data is presented on Figure 3.8 between 2013 and 2017. There were a total of 20 crashes on the roads assessed close to the worksites. The highest number of injury crashes recorded was at the Broomfield Street / Longfield Street intersection (three injuries).



Figure 3.8 Summary of crash data (2013–2017)

A summary of the predominant crash types recorded on Bareena Street, Broomfield Street and at intersections in the vicinity of the site is shown in Table 3.16. The crash data indicates that the most common crash type at these locations involved the following:

- leaving the carriageway to the left, right or into an object (9)
- crashes with pedestrians (3)
- travelling in same direction (2)
- rear end (1).

Table 3.16 Crash types at intersections (2013–2017)

Intersection	Predominant crash type	Number of crashes
Bareena Street mid-block (between First Avenue and Broomfield Street)	Off road into object	1
	Travelling in same direction (rear end)	1
Broomfield Street mid-block (north of Cabramatta Road East)	Off road into object	1
	Travelling in same direction	1
Broomfield Street/Curtin Street intersection	Off road to the right	1
Broomfield Street/Longfield Street intersection	Pedestrian nearside	2
	Off road into object	1
Broomfield Street/Fisher Street intersection	Travelling in same direction	1
Broomfield Street mid-block (south of Cabramatta Road East)	Off road into object	2
	Reversing	1
Broomfield Street/Bridge Street intersection	Off road into object	2
	Colliding into pedestrian stepping off footpath	1
Broomfield Street/Junction Street intersection	Colliding into vehicle on the right near side	1
Broomfield Street/Sussex Street	Other on path	3
	Off road into object	1

3.7 Public transport

In reviewing the site and its accessibility to public transport opportunity, the *NSW Planning Guidelines for Walking and Cycling* (2004) was referenced. This document outlines a recommended walkable distance for commuters of 400 metres (desirable) to 800 metres (maximum) to public transport and other local amenities, or a cycling distance of 1.5 kilometres.

Details of accessibility to public transport, walking and bicycle riding access is provided in the following sections.

3.7.1 Bus services

Four bus routes service within the study area as illustrated on Figure 3.9 to Figure 3.12 inclusive with the bus frequency outlined in Table 3.17. Bus stops are located along the key roads of the project. This includes routes and stops along Broomfield Street, Cabramatta Road East, Hume Highway and Mannix Parade.

In total there are five bus routes that run within the study area, one of which runs along Broomfield Street directly north of the project site. No bus routes run within the project site.

Table 3.17 Bus services

Route	Frequency	Coverage	Roads within study area with bus route
S1	Weekday: AM peak: 1 service/hour PM peak: 1 service/hour Weekend: No services	Lansvale to Cabramatta via Lansvale East Public School	<ul style="list-style-type: none"> Broomfield Street (north of Cabramatta station) Cabramatta Road between Broomfield Street and Cumberland Street
904	Weekday: AM peak: 2 services/hour PM peak: 2 services/hour Weekend: 1 service/hour	Fairfield to Lansvale and Liverpool via Carramar and Lansvale	<ul style="list-style-type: none"> Hume Highway between Mannix Pde and Cabramatta Road East
823	Weekday: AM peak: 2 services/hour PM peak: 2 services/hour Weekend: 1 service/hour	Warwick Farm to Liverpool	<ul style="list-style-type: none"> Mannix Parade Lawrence Hargrave Road
N50	NightRide buses replace train services between 12:00 am and 4:30 am	Liverpool to City Town Hall	<ul style="list-style-type: none"> Hume Highway

Source: Transport for NSW Bus Timetables 30th January 2019 (<https://transportnsw.info/routes/bus>)



Figure 3.9 Bus route S1



Figure 3.10 Bus route 904





Figure 3.12 Bus route N50

3.7.2 Train services

The project is located adjacent to the T2/T5 railway line, which services the following stations within proximity to the project:

- Canley Vale Station
- Cabramatta Station
- Warwick Farm Station.

The train frequency is outlined in Table 3.18.

Table 3.18 Train frequency

Route	Stop	Frequency (minutes)		Coverage
		Weekday	Weekend	
T2	Canley Vale	10	10	Inner West and Leppington Leppington to City
	Cabramatta	6-8	8	
	Warwick Farm	6-8	8	
T3	Cabramatta	10	30	Liverpool or Lidcombe to City via Bankstown
	Warwick Farm	10	30	
T5	Canley Vale	30	30	Cumberland Line Leppington to Richmond
	Cabramatta	30	30	
	Warwick Farm	30	30	

Source: Transport for NSW T2, T3 and T5 train Timetables 30th January 2019

3.8 Active transport

3.8.1 Walking network

The study area has generally good pedestrian infrastructure on both sides of the road (roads identified in section 3.2).

A shared pedestrian/cycleway that forms part of the Parramatta to Liverpool Rail Trail Cycleway is provided alongside the western side of Broomfield Street, joining Canley Vale Station with Warwick Farm adjacent to the rail corridor.

There are points of median refuge for pedestrians on:

- Broomfield Street just south of Longfield Street with kerb ramps
- First Avenue near the station with kerb ramps.

There are no designated footpaths on the eastern side of First Avenue.

Signalised pedestrian crossings at:

- Mannix Parade/Hume Highway
- Cabramatta Station and at Cabramatta Road East/Broomfield Street
- Sappho Road/Hume Highway.

3.8.2 Bicycle network

Figure 3.13 and Figure 3.14 illustrates the current cycleway network facilities within proximity of the works area, as outlined in Roads and Maritime's Cycleway Finder website. A shared pedestrian cycleway is provided on the western side of First Avenue (beginning at the Canley Vale Station access and ending at Longfield Street). Bike racks are provided outside Canley Vale Station.



Figure 3.13 Cycleways near Cabramatta Station and Canley Vale Station



Figure 3.14 Cycleways near Warwick Farm Station

A review of Liverpool City Council, Fairfield City Council and Transport for NSW's websites was undertaken to determine if there are any future planned works to active transport networks in proximity to the project site, however no future activities were identified.

3.9 Taxi and drop off facilities

3.9.1 Taxi

On the western side of Broomfield Street, there is a taxi rank with capacity for two standard sized vehicles (car), adjacent to Cabramatta Station. At the Warwick Farm Station Remembrance Avenue/Hart Street exit there is a designated taxi zone designed to accommodate a maxi taxi located adjacent to the station access.

3.9.2 Passenger pickup / drop off facilities

On the western side of Broomfield Street, immediately north of the taxi rank, there is a pickup and drop off area (commonly called "kiss and ride") with two car spaces serving Cabramatta Station. Also on the south kerb of Cabramatta Road East, there is a pickup and drop off area with one space serving Cabramatta Station.

Warwick Farm Station also has a designated five minute parking zone with 10 spaces on Remembrance Avenue, just east of Hart Street.