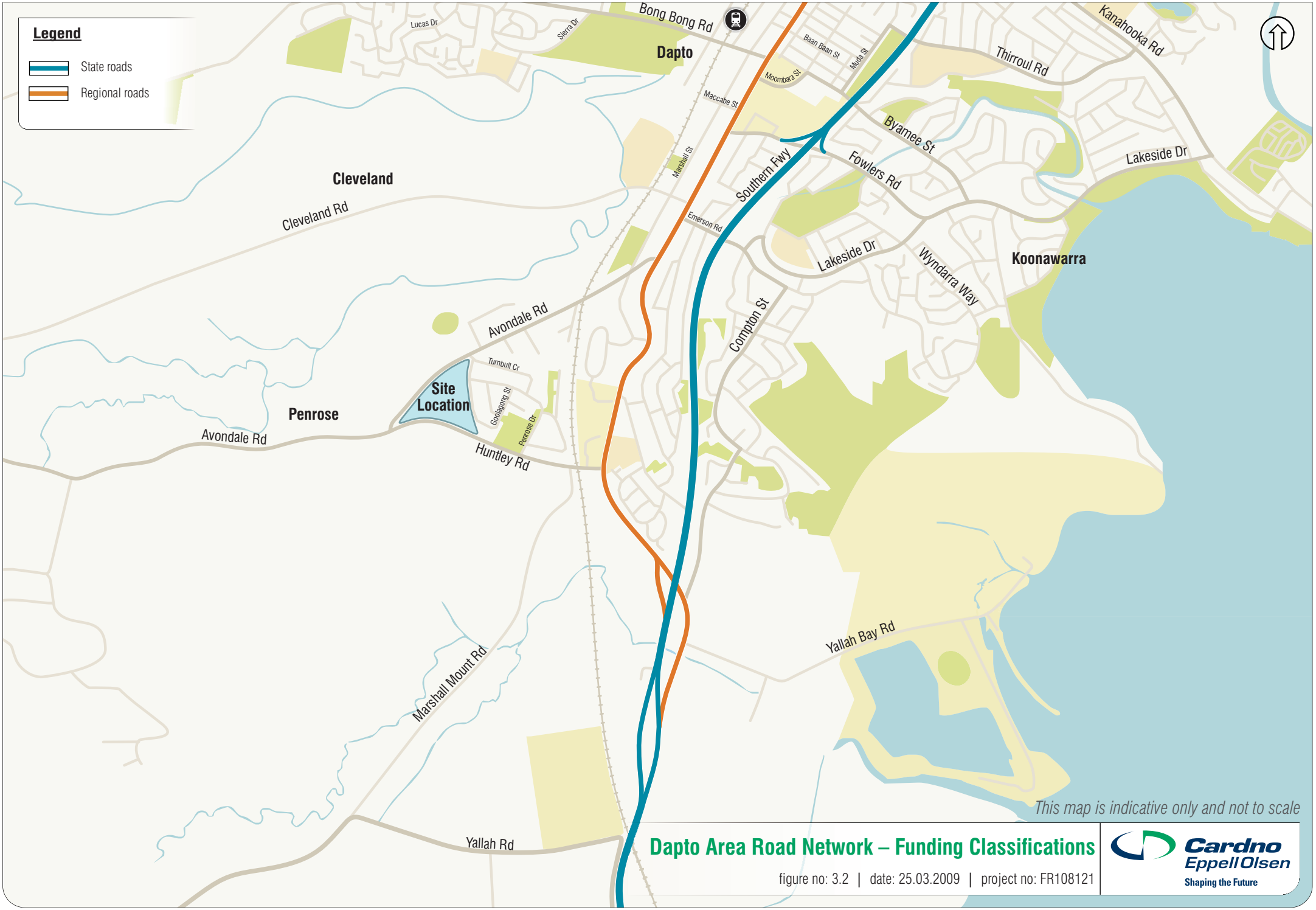

Dapto Area Road Network – Funding Classifications

figure no: 3.2 | date: 25.03.2009 | project no: FR108121

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Functional Classification

The functional role or performance of individual roads can be appraised according to the classification of that road within an overall road hierarchy. Changes to traffic flows on the road can then be assessed within the context of the road hierarchy.

The RTA published guidelines for the classifications of roads in a functional system in their document *Functional Classification of Roads*. The objectives of these guidelines can be summarised as:

- In planning terms – the classification of streets and development of an operational hierarchy is seen as an essential component of structural planning at the neighbourhood level; and
- In operational terms – the concept of functional classification is seen as an endeavour to match the class of road to its use and to the environmental needs of the community.

The RTA document classifies roads according to the role they fulfil and the appropriate volume of traffic that they should convey:

- Arterial Road - is typically a main road carry in excess of 15,000 vehicles per day and over 1,500 vehicles per hour in the peak period. They predominantly carry traffic from one region to another, forming principal avenues of communication for metropolitan traffic movements.
- Sub-Arterial Road – is typically a secondary road carrying between 5,000 and 20,000 vehicles per day and over 500 and 2,000 vehicles per hour in the peak period. They predominantly carry traffic from one sub-region to another forming secondary inter-regional transport links.
- Collector Road – is typically a minor road carrying between 2,000 and 10,000 vehicles per day and over 250 and 1,000 vehicles per hour in the peak period. They provide a link between local areas and regional road carrying low traffic volumes. At volumes greater than 5,000 vehicles per day, residential amenity begins to decline noticeably.
- Local Road – is typically a local street carrying less than 2,000 vehicles per day and 250 vehicles per hour in the peak period. They provide immediate access to individual houses and carry low traffic volumes.

Table 3.1 provides details of the characteristics of different functional classifications of roads. The table shows that there is considerable overlap between the functions of the various classes of roads.

Table 3.1 Functional Classification of Roads - Parameters

Factor/ Measure of Effectiveness	Arterial/ Freeway	Sub-Arterial	Collector	Local
Vehicle Speed / Operating Speed				
	70-110km/h	60-80km/h	40-60km/h	40km/h (or less)
Traffic Volume (AADT)				
· Residential Area	No Limit	< 20,000	< 5,000	< 2,000
· Other Area	No Limit	< 20,000	< 10,000	< 4,000
Intersection Spacing				
	Approximately 1km	Approximately 0.5km	-	-
Road Geometry				
· Number of Lanes	4 or more	2 or more	2 or more	1 or more
· Medians	✔	As needed	no	no
· Minimum Carriageway Width	13m	7m	7m	4m
Heavy Vehicle Load Restrictions				
	None	Preferably none	Yes, if residential	Yes, if residential
Traffic Management				
· Intersection Control				
· Lane and Separation Lines	✔	✔	✔	✔
· Property Access	Minimised	Minimised	✔	✔
Control of Turning Vehicle mid-block access	Median controlled	Maybe control	no	no
· Right Turn Bays	✔	Preferred	no	no
· Road Closures	none	none	possible	✔
· LATM devices	-	-	✔	✔
· SATM devices	-	✔	-	-
Interconnections	sub-arterial	arterial / collector	sub-arterial / local	collector
Parking				
· Peak Period	no	no	✔	✔
· Off Peak	no	✔	✔	✔
· Period Parking	no	maybe	✔	✔
· Unrestricted	no	no	maybe	✔
· Parallel Parking	no	no	maybe	✔
Pedestrian Crossings				
	Grade Separated or Signals	Signals or Refuge	Marked Crossing, Children's Crossing or Refuge	Marked Crossing, Children's Crossing or Refuge
Bus and Transit Lanes				
	✔	✔	✔	-

Sources:
"Functional Classification of Roads", Roads and Traffic Authority of New South Wales
"Road Design Guide", Roads and Traffic Authority of New South Wales

Table 3.2 Suitability for Provision of Right Turn Movements

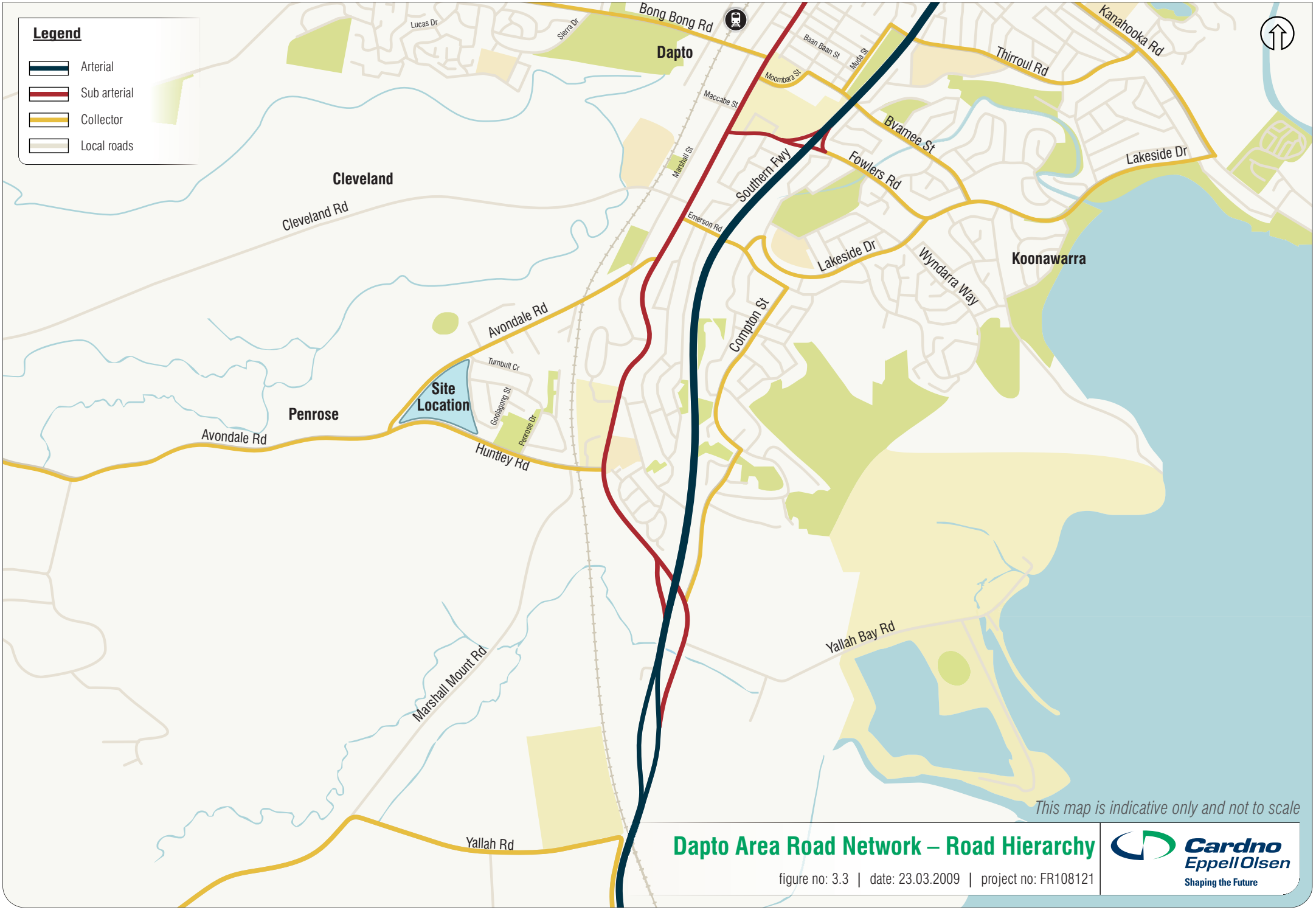
		Right Turn To			
		Arterial/ Freeway	Sub-Arterial	Collector	Local
Right Turn From	Arterial/Freeway	Yes	Yes	Possible	No
	Sub-Arterial	Yes	Yes	Yes	Possible
	Collector	Possible	Yes	Yes	Yes
	Local	No	Possible	Yes	Yes

Source: "Road Design Guide", Roads and Traffic Authority of New South Wales

In the Huntley area the functional road hierarchy is as follows:

- Arterial Roads:
  - Southern (F6) Freeway.
- Sub-arterial roads:
  - Princes Highway; and
  - Fowlers Road, between the Southern Freeway and Princes Highway.
- Collector Roads:
  - Fowlers Road, east of the Southern Freeway;
  - Lakeside Drive;
  - Emerson Road;
  - Byamee Street;
  - Moombarra Street;
  - Compton Street, between Emerson Road and Cormack Avenue;
  - Cormack Avenue;
  - Yallah Road;
  - Avondale Road; and
  - Huntley Road.

All other roads are local roads. The functional road classification (Road Hierarchy) in the Dapto area is represented in **Figure 3.3**.



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Environmental Capacity

The road hierarchy classifications detailed in **Figure 3.3** are based purely on road function and capacity. Within more sensitive land use zones, such as residential zones, a more appropriate classification would be based on the environmental capacity concept. The RTA Guide to Traffic Generating Developments (October 2002) gives the guidance on the environmental capacity of residential streets, as detailed in **Table 3.3** below.

Table 3.3 Environmental Capacity Performance Standards on Residential Streets

Road Class	Maximum Speed (kilometres/hour)	Maximum Peak Hour Volume (vehicle/hour)
Collector Street		
Environmental Goal	50	300
Maximum	50	500
Local Street		
Environmental Goal	50	200
Maximum	50	300

Source: RTA Guide to Traffic Generating Developments

3.2.2 Road Network Description

The major road network in the vicinity of the proposed development is comprised of the following.

Southern (F6) Freeway

The Southern (F6) Freeway is located approximately 1 km east of the development, running north-south and has a speed limit of 110 km/hr. The Freeway assumes the role of providing for through traffic between Sydney, Wollongong and points further south, bypassing the Princes Highway and Dapto Town Centre. In the study area, the Freeway is comprised of dual two-lane carriageways, separated by a wide, grassed median. Grade-separated crossings of the Freeway are provided at Martin Street (footbridge only), Emerson Road, Fowlers Road, Byamee Street, Harvey Street and Kanahooka Road. Access to/from the Freeway is provided via north-facing ramps at Fowlers Road and south-facing ramps at Princes Highway, Tallawarra (the southerm terminus of the freeway). Traffic between the sites and areas to the south must travel via Princes Highway to Yallah, as there are no south-facing ramps on the Freeway south of Northcliffe Drive at Berkeley. Similarly, traffic between Huntley and areas to the north must travel via Princes Highway and Fowlers Road, as there are no north-facing ramps at Tallawarra.

Photograph 3.1 Southern Freeway looking north from Fowlers Road

Princes Highway

Princes Highway, formerly part of the main inter-regional route between Sydney, Wollongong and points further south, the section of the Highway through the study area now functions as a sub-arterial route serving Dapto Town Centre. Through the study area, the Highway generally comprises of a four-lane undivided carriageway, narrowing to two lanes north of Kanahooka Road and south of Mount Brown Road. The speed limit through urban areas is 60 km/hr in vicinity of the site and increases to 80 km/hr south of Mt Browen Road at the edge of the built up area.

Photograph 3.2 Princes Highway looking south to Fowlers Road

Fowlers Road

Fowlers Road is located to the north of the subject site. It functions dually as a sub-arterial connection between Princes Highway, Dapto Town Centre and the Southern Freeway and as a collector road for the Koonawarra residential area. Fowlers Road is generally a four-lane undivided carriageway, except on the overbridge.

Photograph 3.3 Fowlers Road looking west at Southern Freeway overbridge

Avondale Road

Avondale Road is a collector road, running east-west between the Princes Highway and the small hamlet and coal mine at Avondale. Along the site frontage from Goolagang Street to Huntley Road it has a narrow 5 metre wide pavement with unsealed shoulders with a two-lane undivided carriageway. East of Goolagang Street, which is the present boundary of the residential area, it has a 12 metre wide pavement with kerb and gutter.

The speed limit along the frontage of the site includes both an 80 km/hr speed limit and a 50 km/hr speed limit. The 50 km/hr speed limit exists between Princes Highway and west of Goolalgong Street generally in the built up area. The 80 km/hr speed limit encompasses the rural area. A 5 tonne load limit also applies to this section of road.

Photograph 3.4 Avondale Road looking south west along the frontage of the site

Huntley Road

Huntley Road is a collector road, running east-west between the Princes Highway and Avondale Road. In the vicinity of the site it is generally a two-lane undivided carriageway. East of the site, it has a 10 metre wide pavement with kerb and gutter on the northern side. The line markings are also off-centre, to allow on-street parking along the northern side of the pavement. Along the southern boundary of the site, Huntley Road is a two-lane rural carriageway 5 metres wide, with unsealed shoulders. The speed limit along the frontage of the site is 80 km/hr. It reduces to 50 km/hr in the built up area between Penrose Street and Princes Highway

Photograph 3.5 Huntley Road looking east along the frontage of the site

Cleveland Road

Cleveland Road is a two way 2 lane carriageway with a 50km/hr speed limit. It intersects with Princes Highway at a 3-way signalised intersection. A railway crossing bridge with a maximum limit of 19 tonnes is located just west of Western Avenue. Cleveland Road along the Dapto High frontage has a school zone with a speed limit of 40km/hr from 8am – 9.30am & 2.30pm – 4pm during school days. The road extends to Avondale Road where it forms a priority controlled
t-junction, approximately 2.5 kilometres west of the proposed development.

Photograph 3.6 Cleveland Road looking north at Mullet Creek

Penrose Drive

Penrose Drive is a two way 2 lane local road with a 50km/hr speed limit. There are no line markings at the section between Huntley Road and Turnbull Crescent. Parking is allowed on both sides of the road. No footpath exists on either side of the carriageway. Penrose Drive joins Hartley Road at a priority controlled intersection with all movements permitted.

Goolagong Street

Goolagong Street is a two way 2 lane road with a 50 km/hr speed limit which runs along the eastern boundary of the site and loops back to Penrose Street.

Photograph 3.7 Goolagong Street looking south near Penrose Drive

Intersection Control

The form of intersection control at the junctions within the study area is noted below and shown in **Figure 3.4**:

- Signalised Intersections:
  - Princes Highway and Mount Brown Road;
  - Princes Highway and Emerson Road;
  - Princes Highway and Fowlers Road; and
  - Fowlers Road and Southern Freeway off-ramp.
- Roundabout Controlled Intersections:
  - Emerson Road and Beltana Avenue.
- All other intersections are sign controlled or operate as priority controlled t-junctions.

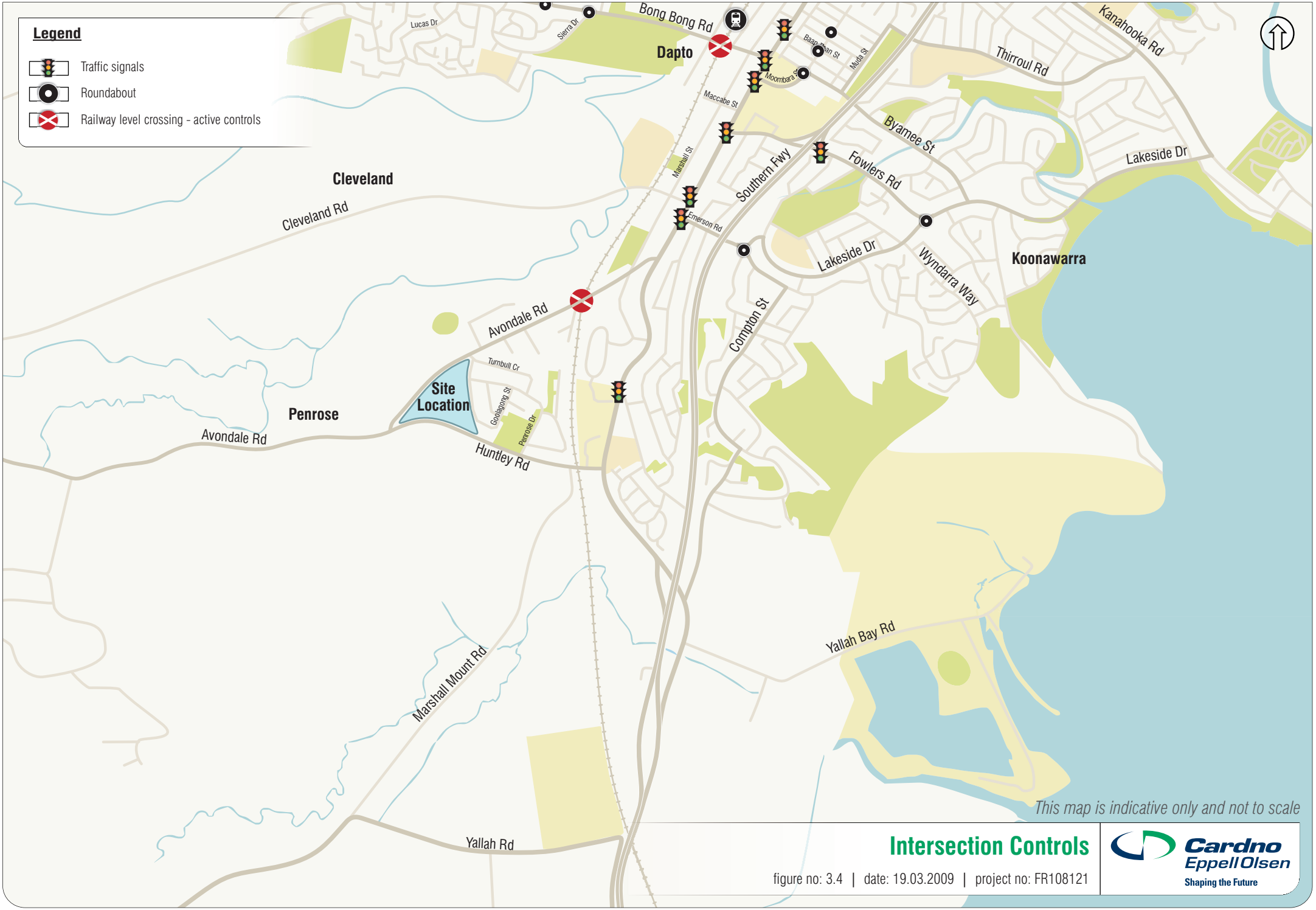
Of particular importance is the intersection of Huntley Road and Avondale Road on the south eastern edge of the site. It is currently a Stop controlled t-junction as detailed in the **Photograph 3.8** below. The current design is confusing to motorists as to their travel path when making a right turn from Huntley Road into Avondale Road.

Photograph 3.8 Intersection of Huntley Road and Avondale Road looking west

In addition an at-grade railway level crossing is located at Avondale Road, 400m west of Princes Highway (controlled by flashing lights).

Photograph 3.9 Railway Level Crossing in Avondale Road

More detailed intersection descriptions are provided in **Section 6** of this report.



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Access to the Site

The site is currently vacant land and there are no formally constructed access points. A gate, located adjacent to the eastern end of the cutting on Huntley Road, provides vehicular access to the site, e.g. for service vehicle tending to the overhead power lines of gas pipeline. **Photograph 3.10** refers to this location. An additional gate also facilitates vehicular access to the site, located adjacent to the intersection of Avondale and Huntley Roads.

Photograph 3.10 Current site access

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3.2.3 Existing Traffic Volumes

A variety of sources of traffic volume counts have been utilised in this study:

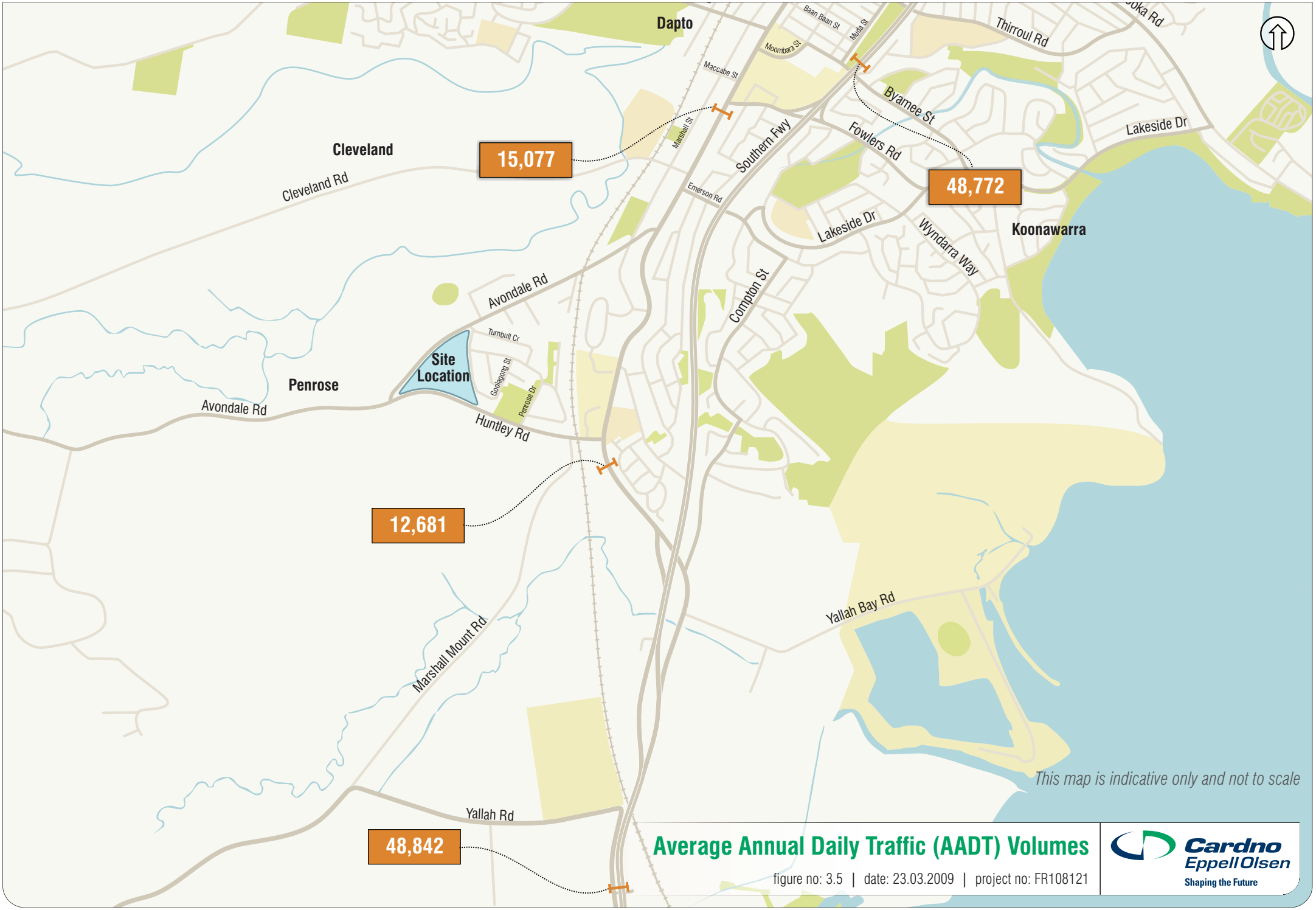
- Roads and Traffic Authority maintains a database of Annual Average Daily Traffic (AADT) volumes on key roads in New South Wales;
- TRACKS model as provided by Wollongong City Council, calibrated to 2008 traffic volumes; and
- midblock intersections as provided by Wollongong City Council for 2007.

The available daily traffic volumes are presented in **Figure 3.5**. The RTA published AADT volumes area provided in **Table 3.4** for key arterial roads in the study area. The peak hour traffic volumes are shown in **Figure 3.6** and **Figure 3.7**.

Table 3.4 Annual Average Daily Traffic (AADT) Volumes (vehicles per day)

	Years					
Location	**1994**	**1997**	**1998**	**2000**	**2003**	**2005**
Southern Freeway						
- at Mullet Creek	51,922	52,579	-	56,839	60,136	-
- 1.2km south of Kanahooka Road	-	40,264	38,023	43,142	46,477	48,772
- south of Fowlers Road	-	29,969	-	33,091	37,674	-
Princes Highway						
- north of Bong Bong Road	14,009	12,862	12,850	13,139	14,496	11,509
- south of Fowlers Road	-	-	15,019	16,400	17,829	15,077
- at Macquarie Rivulet bridge	37,781	40,752	41,873	44,635	48,648	48,842

Source: Roads and Traffic Authority of New South Wales, Average Annual Traffic Volume Data for Southern Region, 2006



Average Annual Daily Traffic (AADT) Volumes

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