

# **Yarralumla Strategic Traffic Assessment**

## **April 2017**

### **Context**

This is an assessment of traffic volumes, flow, parking and active travel, in the suburb of Yarralumla. A comprehensive analysis has been undertaken to identify the major issues within the suburb and to understand the underlying factors that are driving them. The aim is to see how these could be addressed to improve vehicle and pedestrian access to, and movement within the suburb, as well as the safety of travel by car and active travel.

### **Executive Summary**

There is constrained access to the suburb of Yarralumla; very high traffic volumes are generated by vehicles whose origin and destination is outside Yarralumla; roads are overcapacity for their size; and the major intersections to access the suburb are at capacity or failure. This combination of factors has created major “choke” points impeding access to the suburb and traffic flow through it, as well as generating pedestrian and vehicle safety issues. These issues are compounded by the absence of pedestrian crossings, traffic calming measures or signalisation of major intersections.

The width of the roads in Yarralumla do not meet the present standards set out in the Estate Development Code 2013 in relation to their function and number of vehicles per day (vpd). Yarralumla roads are equivalent to Access B classification, or below, designed to carry up to 1000 vpd. However, many roads in Yarralumla are already carrying traffic volumes of a minor collector road (1001-3000 vpd) or major collector road (3001- 6000 vpd) including Weston, Bentham/Loftus, Schlich and Alexandrina, or an arterial road (6001 plus vpd) Dudley, Novar, Hopetoun. This traffic volume is above their safe capacity, impedes access and traffic flow, and has resulted in vehicle and pedestrian safety issues.

The location of Lake Burley Griffin, Government House and Dunrossil Drive preclude access to Yarralumla from the north and west. Access to the suburb is, thus, limited to the south and the east from two major arterial road intersections on Adelaide Avenue and one intersection with the Cotter Road. These take all traffic into Novar Street directly or via Dudley and Weston Streets into Novar Street. These intersections are the Dudley/Novar/Kent/Adelaide Avenue on ramp intersection; the intersection at Dudley Street/Cotter Road; and the intersection of Hopetoun Circuit/Weston/Adelaide Avenue

on/off ramps. Each of these intersections carry arterial road traffic volumes of 6910 vpd (2015) at Hopetoun Circuit and Dudley Street 9626 vpd (2015). The volume of traffic now using Dudley Street is nearly at the same level as Lady Denman Drive on the western bound of Yarralumla, which carries 10559 vpd (2015), the arterial road connecting the Cotter Road to the northern side of the lake and the Tuggeranong Parkway. There is also the adjacent Kent Street/Denison Street/Adelaide Avenue off ramp which is in Deakin which carries 12267 vpd (2015). These intersections are already at capacity or failure, according to assessments by AECOM (2016) and Cardno (2016).

Access to the suburb from the east is from Commonwealth Avenue to Alexandrina Drive via the Coronation Drive/Flynn Drive/Alexandrina Drive intersection. This access is not direct but along the long, narrow, winding Alexandrina Drive that follows the lake shore. This road, at 5.8 metres wide, should carry 300 vpd by current standards, but is carrying four times that volume at 1917 vpd (2012). Coronation Drive carries a total of 4326 vpd (2012) to and from Commonwealth Avenue and connects traffic from State Circle going to the Parliamentary Triangle or the embassy belt that comprises the eastern side of Yarralumla. This intersection is performing satisfactorily.

A very high proportion of traffic is not generated by residents but originates from outside the suburb and its destination is outside Yarralumla. This traffic is predominantly that travelling from the Cotter Road via Yarralumla to access west Deakin, or rat running through Yarralumla from the Cotter Road to avoid the intersection failure at the Adelaide Avenue on and off ramps at Kent Street and Hopetoun Circuit. Intersection counts show over 60% of traffic on Dudley Street is travelling from the Cotter Road to west Deakin not Yarralumla.

There is also a high proportion of visitor traffic travelling to the more than 24 major destinations that are mainly in the north west of the suburb. This includes for example the Royal Canberra Golf Course, the lake foreshore, and the Yarralumla Primary School which has a highly regarded Italian school and attracts 80% of its students from other suburbs.

The constrained connectivity of the suburb has resulted in just two streets, namely Novar Street and Weston Street carrying 80% of the traffic volume to the major destinations in Yarralumla. These streets are already carrying traffic volumes that exceed their capacity. Novar Street is at arterial road levels of more than 7000 vpd (2015) on weekends which is over 40% more traffic than on a weekday (5327 vpd (2014)). Weston Street carries between 2500 and 3000 vpd (2015).

The volume of traffic on Dudley Street has increased by 18% from 2012 to 2015, and that on Novar Street by 15% between 2014 and 2015. These increases have been in the absence of any increase in the number of dwellings or number of residents in the suburb. This is exceptionally high as the standard used to model growth in traffic volumes is 2% per annum. This 15% coincided with the completion of the Stage 1 duplication of the Cotter Road and the Equinox Business Centre in West Deakin becoming fully operational. Weston Street traffic has similarly increased by 15% since the previous traffic count.

Bentham Street (Loftus Street) is a prime destination in Yarralumla being the location of the Yarralumla Shops (a commercial business and shopping centre), the Royal Canberra Golf

Course and the Yarralumla Primary School. But whilst Bentham Street runs from west to east and intersects with Novar Street and Hopetoun Circuit it does not provide connectivity in the suburb as its use by though traffic is effectively blocked by the on--street parking at the shopping centre which causes a bottleneck and backup impedes traffic flow along the main access road for the suburb, Novar Street.

Yarralumla has a good supply of footpath infrastructure however the ability of pedestrians to safely use these footpaths is severely constrained. The absence of pedestrian crossings in Yarralumla, and given that Novar Street, Hopetoun Circuit (south end), Kent Street and Dudley Street all carry arterial road levels of traffic makes it near impossible to cross these roads at peak times. This is putting at risk pedestrians, significantly including the children, going to the Grammar School, the Primary School, the two Child care centres and the Yarralumla Shops.

These connectivity issues, intersection failure, and vehicle and pedestrian safety issues will be exacerbated by currently scheduled developments and the increasing number of destinations on the lake foreshore. These developments include the Cotter road duplication, the completion of further suburbs in Molonglo, the redevelopment of the exiting Deakin Commercial area on Kent Street, and the additions of Equinox 2 Complex at the junction of Kent Street and Strickland Crescent and the Canberra Brickworks Development. New destinations on the lake foreshore include the proposed maze in Weston Park and in 2017 a new café and expansion of rowing facilities at Yarralumla Bay.

The traffic flow and pedestrian and vehicle safety issues need to be addressed through a long-term Yarralumla Traffic Strategy based on a set of key principles. An outline of such an approach is presented with some possible measures for consideration. These measures are not recommendations but provide the basis for discussion and other approaches may emerge.

Going forward it would be possible to implement a number of initiatives individually or in combination over the next ten years. Some approaches could be implemented in the short term and at relatively low cost, such as pedestrian crossings and traffic calming measures, whilst others require a longer-term planning and funding horizon.

*Section left intentionally blank*

## **Yarralumla Traffic Strategy**

The traffic flow, pedestrian and vehicle safety issues need to be addressed through a long-term strategy based on key principles and consideration given to implementing a number of approaches, individually or in combination, over the next few years. Some could be implemented in the short term and at relatively low cost, such as pedestrian crossings and traffic calming measures, whilst others require a longer-term planning and funding horizon.

### ***Principles***

1. Facilitate most direct access and exit for vehicles travelling to and from destinations in Yarralumla along streets suitable for safely carrying that quantum of traffic flow.
2. Aim for more even traffic flows in the suburb.
3. Improve vehicle and pedestrian safety through traffic calming measures, pedestrian crossings and ensuring residents vehicles can safely enter and exit their dwellings.
4. Reduce unnecessary traffic and minimise rat running by eliminating major intersection failure.
5. Avoid future gridlocked Novar Street and Dudley Streets.
6. Parking, including event parking, should not impact on the amenity of the suburb for residents or occur on the tree lined nature strips.

### ***Some approaches that could be considered improve traffic flows and reduce congestion***

1. Upgrade Alexandrina Drive to Minor Collector or Major Collector level.
2. Upgrade Novar Street/Adelaide Avenue east bound on ramp to be a dedicated slip road.
3. Signalise Kent Street/Dudley Street/Novar Street Adelaide Avenue intersections.
4. Signalise Hopetoun Circuit/Adelaide Avenue intersections.
5. On/off ramp to connect Adelaide Avenue/Cotter Road to Denison Street
6. Connect Denman Street to Dudley Street in front of the Uniting Church.
7. Install bollards in the centre of Hampton Circuit at the junction with Hopetoun Circuit to prevent U turns (No U Turn sign is already in place and ineffective).
8. Traffic calming measures in Weston Street (W) and (E); Guilfoyle Street and Novar Street.
9. Pedestrian crossings for Novar, Weston, Bentham Streets and Hopetoun Circuit - a minimum of two per street.
10. Commercial vehicle weight restrictions or exclusion from Weston Street and Guilfoyle Street at a minimum and possibly elsewhere.
11. Provide sufficient Canberra Brickworks development connectivity and onsite parking to avoid channelling all Brickworks traffic along Dudley Street and Novar Street and avoid street side event parking in residential areas.
12. Formalise on street parking, set aside resident only parking, and provide additional off street sealed parking bays.
13. Provide off street parking to replace on street parking at the Yarralumla shops and business centre in Bentham Street to improve through traffic. Off street parking could be a facility with basement and ground floor parking and possibly also a first floor.

# Yarralumla Strategic Traffic Assessment - Analysis

## Introduction

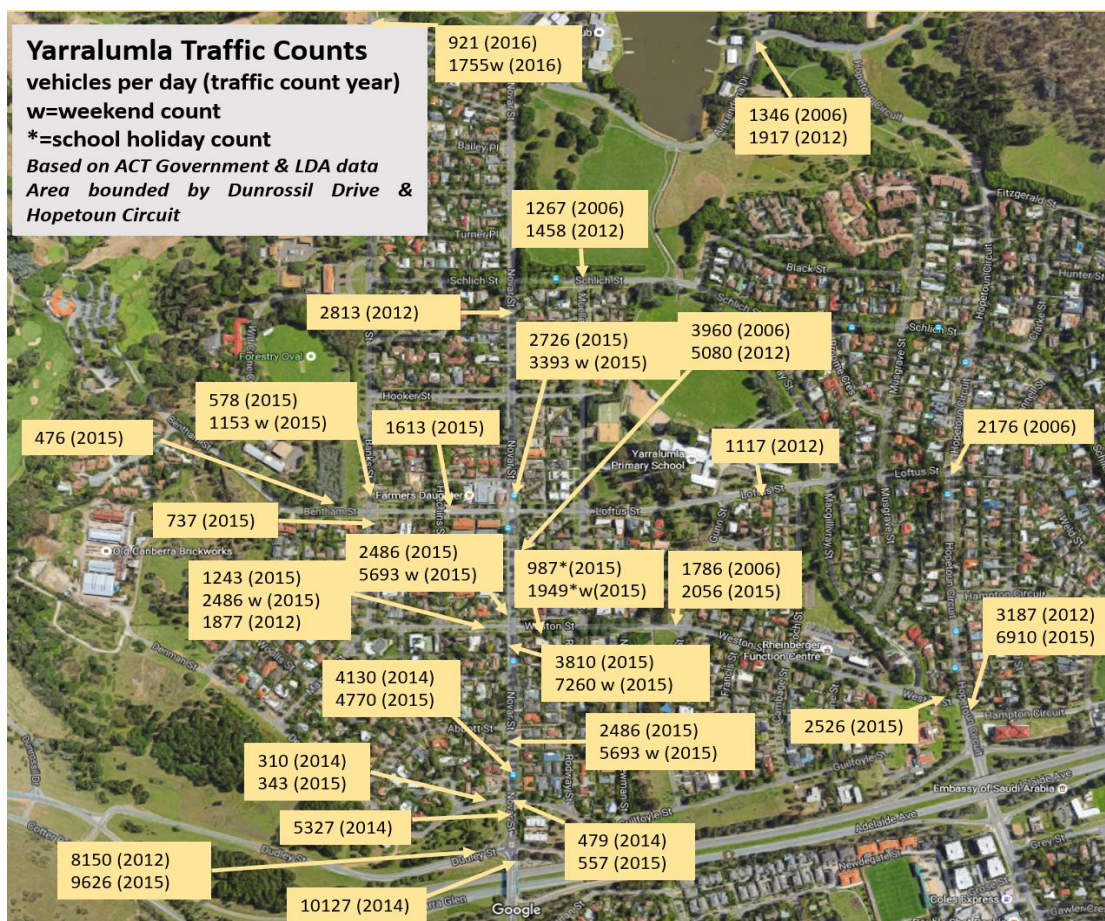
This is an assessment of the traffic issues in the suburb of Yarralumla. It is based on the most recent traffic data available. Each issue is underpinned by an analysis of traffic flows and observations and this is presented with a comprehensive series of maps, diagrams, tables and photographs. A Reference list is also provided.

## Suburb profile

Yarralumla has a population of 2922 and 1307 dwellings and comprises 75% separate houses; over 22% semi-detached town houses; and 2.6% apartments (ABS 2011). The volume of traffic movement generated by Yarralumla residents per day is around 10,456 as calculated by applying the methodology of the Estate Development Code (2013).

## Traffic Volumes

A compilation of the most recent traffic volume information is provided in the diagram below. This has been sourced from ACT Government tube counts; intersection analyses from the AECOM (2016) and Cardno (2016) reports with associated vpd calculations; and traffic studies previously provided by the LDA as part of the 2010 to 2015 Canberra Brickworks proposals.





## Road Hierarchy

An assessment of the road hierarchy in Yarralumla based on the road width requirements of the Estate Development Code (2013) shows there are no arterial, major collector or minor collector standard roads. The majority of roads are Access B standard which should carry up to 1000 vpd, with the western end of Dudley Street and Alexandrina Drive being at Access A standard for less than 300 vpd.

### Yarralumla Road Hierarchy classified by Estate Development Code 2013 standard



Estate Development Code 2013			
Road Hierarchy Classification	Nature Strip m	Carriageway m	Vehicles per day
Arterial			6000+
Major Collector	6.25	10	3001 - 6000
Minor Collector	6.25	10	1001 - 3000
Access B	6.25	7	301 - 1000
Access A	5.5	5.5	0 - 300
Rear Lane	1.5	5.5	0 - 160

However, many roads in Yarralumla are already carrying traffic volumes of a minor collector road (1001-3000 vpd) or major collector road (3001- 6000 vpd) including Weston, Bentham/Loftus, Schlich and Alexandrina, or an arterial road (6001 plus vpd) Dudley, Novar, Hopetoun (see table below). This traffic volume is above their safe capacity, impedes access and traffic flow, and has resulted in vehicle and pedestrian safety issues

## **Profile of Yarralumla Streets**

Yarralumla Streets - width and traffic							
Street	Carriageway width m	VPD	VPD weekend	Traffic Count Year	Equivalent classification on width	Equivalent Classification on VPD	AECOM (2016)
Dudley (E)	11.00	8150		2012	Access B	Arterial	Major Collector
Dudley (W)	6.00	8150		2012	Access A	Arterial	Major Collector
Hopetoun (S)	9.00	6910		2014	Access B	Arterial	Major Collector
Novar	9.20	5327	7260	2014	Access B	Major Collector/Arterial	Major Collector
Weston (E)	9.20	2526		2015	Access B	Minor Collector	Minor Collector
Hopetoun (mid/lake)	6.40	2176		2006	Access A	Minor Collector	Major Collector
Alexandrina	5.80	1917		2012	Access A	Minor Collector	Major Collector
Weston (W)	7.40	1877	2486	2012	Access B	Minor Collector	Minor Collector
Bentham (Shops)	7.40	1613		2015	Access B	Minor Collector	
Schlich	8.80	1267		2006	Access B	Minor Collector	Minor Collector
Loftus	7.20	1262		2015	Access B	Minor Collector	
Banks	9.00	737	1153	2015	Access B	Access B	
Kintore (E)	8.80	557		2015	Access B	Access B	

### **Major Intersections and Access to Yarralumla**

Access to Yarralumla is constrained as it can only be accessed from the east or the south. The northern bound of the suburb is the foreshore of Lake Burley Griffin and the west is the grounds of Government House and hence there is no access from these directions.

The major arterial road intersections for access to Yarralumla from the south are two intersections on Adelaide Avenue and one intersection with the Cotter Road close to the junction with Lady Denman Drive that connects to the northern side of the lake and the Tuggeranong Parkway. These take all traffic into Novar Street directly or via Dudley and Weston Streets into Novar Street. These intersections are the Dudley/Novar/Kent/Adelaide Avenue on ramp intersection; the intersection at Dudley Street/Cotter Road; and the intersection of Hopetoun Circuit/Weston/Adelaide Avenue on/off ramps. There is also the major Kent Street/Adelaide Avenue off ramp intersection which is in Deakin and connects directly to Novar Street via the Kent Street Bridge over Adelaide Avenue.

Each of these intersections carry arterial road traffic volumes of between 6910 and 9626 vpd (2015). The adjacent Kent Street/Adelaide Avenue off ramp which is in Deakin carries 12267 vpd (2014). These intersections are already at capacity or failure, according to assessments by AECOM (2016) and Cardno (2016). This is causing bottlenecks for access to the suburb and rat running by non-Yarralumla traffic.

Yarralumla key streets & intersections (shown in yellow)



Access to the suburb from the east is via the Coronation Drive (Alexandrina Avenue)/Commonwealth Avenue intersection. This access is not direct but along the long, narrow, winding Alexandrina Drive (via Coronation Drive) that follows the lake shore. This road, at 5.8 metres wide, should carry 300 vpd by current standards, but is carrying four times that volume. The most recent data shows Coronation Drive carries a total of 4326 vpd (2012) to and from Commonwealth Avenue and connects traffic from State Circle going to the Parliamentary Triangle or the embassy section that comprises the eastern side of Yarralumla. Current volumes would be even higher.

Traffic Counts for Eastern Yarralumla & Lady Denman Drive			
Street	between	Year	vpd
Lady Denman Dr	Cotter Rd/Molonglo Br	2015	10559
Coronation Drive	Foster/Flynn	2012	4326
Flynn	Coronation/Kaye	2012	1989
Empire Circuit	Arkana/Turrana	2012	427
Foster	Coronation/Flynn	2012	1615
Perth	Darwin/Moonah	2012	975

The intersections of Weston/Novar Streets; and Bentley/Novar Streets are the key intersections within the suburb because together they connect to Adelaide Avenue, the lake foreshore and the Yarralumla Shops.

### Traffic Origin and Destination

A very high proportion of traffic in the suburb of Yarralumla is not generated by residents but originates from outside the suburb and its destination is outside Yarralumla. This traffic



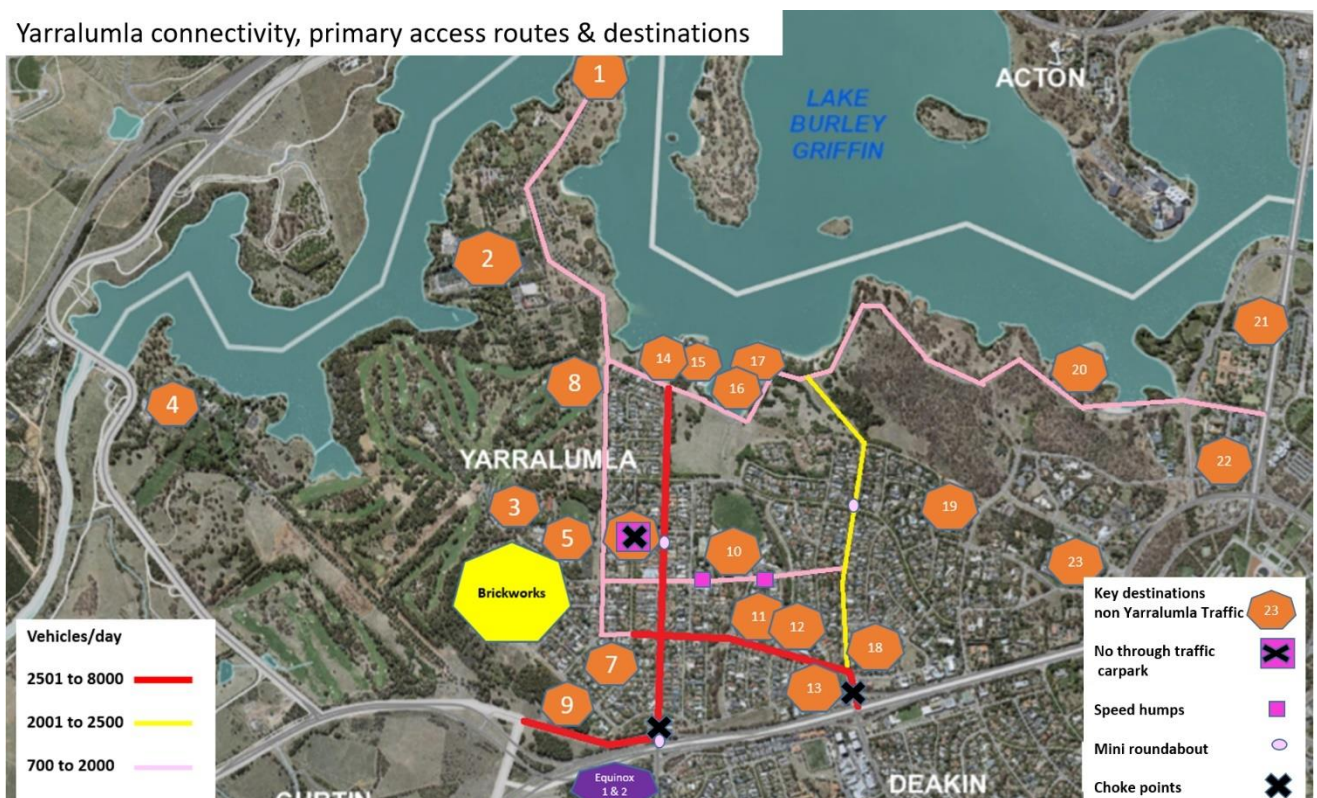
is predominantly that travelling via Yarralumla to access west Deakin, or rat running through Yarralumla from the Cotter Road to avoid the intersection failure at the Adelaide Avenue on and off ramps at Kent Street and Hopetoun Circuit. Dudley Street, which is not a residential Street, and carries 9626 vpd (2015) is a good example. Intersection counts show that over 60% of this traffic on Dudley Street is travelling from the Cotter Road then turns into west Deakin at the Novar Street mini roundabout, not Yarralumla. Also 40% of the eastbound arterial Cotter Road traffic does not join Adelaide Avenue but turns into Dudley Street.

There is also a high proportion of visitor traffic travelling to the more than 24 major destinations for Canberrans more broadly that are mainly in the north west of the suburb. These destinations are primarily in the north and west of the suburb and include cultural, heritage, commercial, business, community, recreational facilities and the lake foreshore. This includes for example the Royal Canberra Golf Course, the lake foreshore, and the Yarralumla Primary School whose Italian school attracts 80% of its students from other suburbs.

Notably such visitor traffic results in traffic volumes that can be even higher on weekends than weekdays. Novar Street, for example, has more than 7000 vpd (2015) on weekends which is over 40% more traffic than on a weekday of 5327 vpd (2014). Similarly, Weston Park Road carries nearly twice as many vehicles on weekends at 1755 vpd compared to 921 on weekdays.

The section of the suburb to the east of Empire Circuit is however primarily an embassy and government belt with few domestic residences with access from Commonwealth Avenue via Coronation Drive and directly off State Circle.

Yarralumla connectivity, primary access routes & destinations



<b>Yarralumla Destinations</b>		
1	Weston Park	Weston Park
2	Heritage Nursery & Café & Yarralumla Nursery	Weston Park
3	Royal Canberra Golf Course	Bentham Street
4	Government House	Dunrossil Drive
5	CSIRO Forestry	Banks Street
6	Yarralumla Shops & Business Centre	Bentham Street
7	St Nicholas Pre-School	Weston Street (W)
8	Dog Park	Banks Street
9	Uniting Church	Denman Street
10	Yarralumla Primary School	Bentham Street
11	St Peter Chanel's Church	Weston Street (E)
12	Learning Tree Child Care	Macgillivray Street
13	Saudi Arabia Embassy	Weston Street (E)
14	AIS & ADFA Rowing Centres	Alexandrina Drive
15	Water Police	Alexandrina Drive
16	YMCA Aquatic Centre	Alexandrina Drive
17	Canberra Girls Grammar & Sea Scouts Rowing Centres	Alexandrina Drive
18	Sri Lanka Embassy	Hopetoun Circuit
19	Canberra Mosque	Empire Circuit
20	Canberra Yacht Club	Alexandrina Drive
21	Albert Hall	Commonwealth Ave
22	Embassies	Commonwealth Ave
23	Embassies	Forster Circuit
24	Canberra Brickworks	Denman Street

## **Connectivity and Traffic Flows within Yarralumla**

This section details the impact on traffic flows within Yarralumla of the constraints on access to the suburb and the high proportion of traffic that is not local on traffic flows.

Access to and exit from the suburb is overwhelmingly through Novar, Dudley and Weston Streets from Adelaide Avenue and the Cotter arterial roads, which are on the southern boundary of the suburb. Novar Street is accessed from the Kent Street Bridge at Adelaide Avenue and from the Cotter Road at Dudley Street, and connects directly to the lake foreshore. Novar Street is the closest through street to the major destinations in the west of the suburb.

A very high proportion of traffic in the suburb is not generated by residents, but has both its origin and destination outside Yarralumla. This traffic is predominantly that travelling via Yarralumla to access west Deakin, rat running through Yarralumla from the Cotter Road to avoid the intersection failure at the Adelaide Avenue on and off ramps at Kent Street and Hopetoun Circuit. There is also significant visitor traffic, from outside Yarralumla, travelling to the more than 24 major destinations that are mainly in the north west of the suburb.

This constrained connectivity to the suburb has resulted in just two streets, namely Novar Street and Weston Street carrying 80% of the traffic volume to the major destinations in Yarralumla. These streets are already carrying traffic volumes that exceed their capacity. Novar Street is at arterial road levels of more than 7000 vpd (2015) on weekends.

Banks Street which runs parallel to Novar Street and is closer, but does not have this connectivity to the major arterial roads to the south, carries 80% less traffic. Both roads have similar widths (Banks Street 9.0 and Novar 9.2 metres) however Novar Street has between 5000 and 7500 vehicle movements per day the upper bound is at arterial road traffic volume on an Access B standard road.

Weston Street is the other access point from Adelaide Avenue at the Hopetoun Circuit junction with traffic continuing along Weston Street to connect with Novar Street, rather than down Hopetoun Circuit towards the lake foreshore. Hopetoun Circuit to the north of the Weston Street junction carries 60% less traffic than the section of Hopetoun between Weston Street and Adelaide Avenue which has over 6000 vehicles and is at arterial road volume. Weston Street has 2500 to 3000 vehicle movements per day.

### **Weston Street at Intersection with Hopetoun**



Weston Street (E) intersection with Hopetoun Circuit

Traffic volume for Novar and Weston Streets is 27% higher on weekends than week days. Traffic volume in Novar Street increased by 15% between 2014 and 2015 although there has been no increase in the number of dwellings or number of residents in the suburb during this period. This increase does, however, coincide with the completion of the Stage 1 duplication of the Cotter Road and the Equinox Business Centre in West Deakin becoming fully operational.

The other access point to Yarralumla is from the junction of Commonwealth Avenue, Coronation Avenue and Alexandrina Drive which follows a circuitous route along the lake foreshore terminating at the end of the Weston Park peninsula. Alexandrina Drive only connects to the residential part of the suburb at the Hopetoun Circuit, Novar Street and Banks Street junctions. This road was not built to carry major traffic loads as it is only 5.8 metres wide, that is an Access A road in the Estate Development Code (2013), that is for 300 vpd and is already carrying 1917 vpd (2012).



## Intersection Failure and Bottlenecks

The assessments by AECOM (2016) and Cardno (2016) of the intersections at Novar, Dudley, Kent Street, Kent Street and Adelaide Avenue Off Ramp and Adelaide Avenue and Hopetoun Circuit, Weston Street, Adelaide Avenue that provide this access to Yarralumla placed their performance at or close to failure. Thus, the two main access points to Yarralumla, namely Novar Street from Adelaide Avenue and Cotter Road and Hopetoun Circuit/Weston Street from Adelaide Avenue are “choke” points with the intersections at or over capacity at AM and PM peak and high arterial road level traffic volumes.

### Dudley Street/Novar Street Intersection AM Peak



### Dudley Street/Novar Street Intersection AM and PM Peak



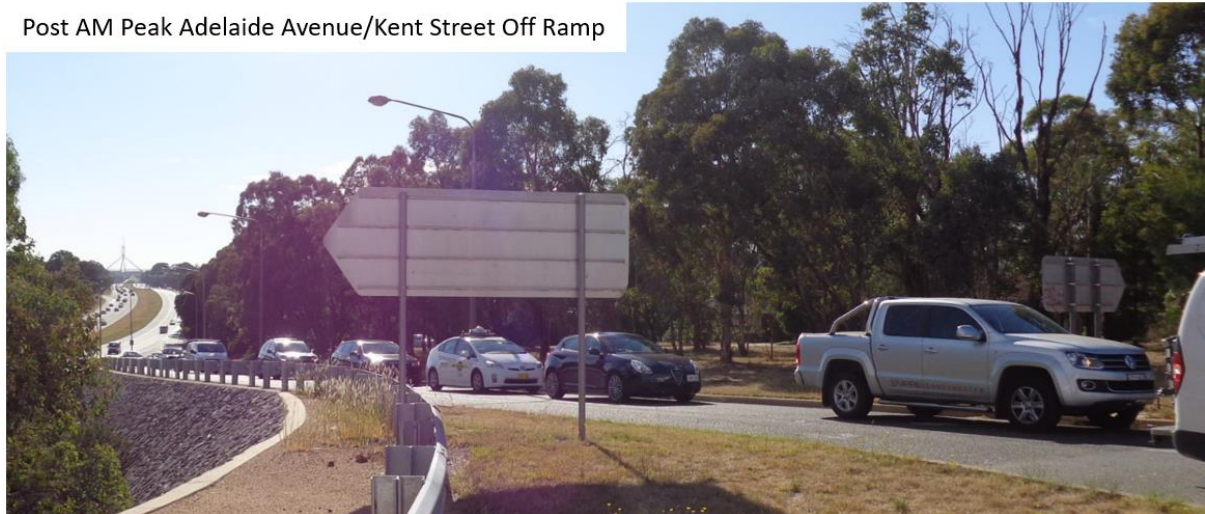


**Adelaide Avenue Off Ramp/Kent Street Intersection after AM Peak**

Post AM Peak Adelaide Avenue/Kent Street Off Ramp Intersection



Post AM Peak Adelaide Avenue/Kent Street Off Ramp



There is a further “choke” point at the junction of Novar Street and Bentham Street with intersection failure occurring at peak times. This is due to the back up of traffic on Novar Street as the configuration of vehicle parking at the Yarralumla Centre on Bentham Street between Novar and Hutchins Street often blocks access for destination traffic and precludes through traffic.

### **Bentham Street/ Novar Street Intersection**



Yarralumla Shops Bentham Street (looking east) to mini roundabout intersection with Novar Street

### **Bentham Street/ Novar Street Intersection**

Bentham/Novar Mini Roundabout



Thus, Novar Street is carrying arterial level traffic volumes but, at Access B standard, is three categories below the width required by the Estate Development Code (2013). It is also a bus route and has direct access from dwelling driveways to road and vehicles must reverse out into traffic – neither of these attributes is allowed under the Estate Development Code for Arterial; or Major Collector Roads.

The three “choke” points in Yarralumla, namely Novar Street from Adelaide Avenue and Cotter Road and Hopetoun Circuit/Weston Street from Adelaide Avenue, and the junction of Novar Street and Bentham Street, combined with the lack of connectivity, are channelling rat running through the suburb.

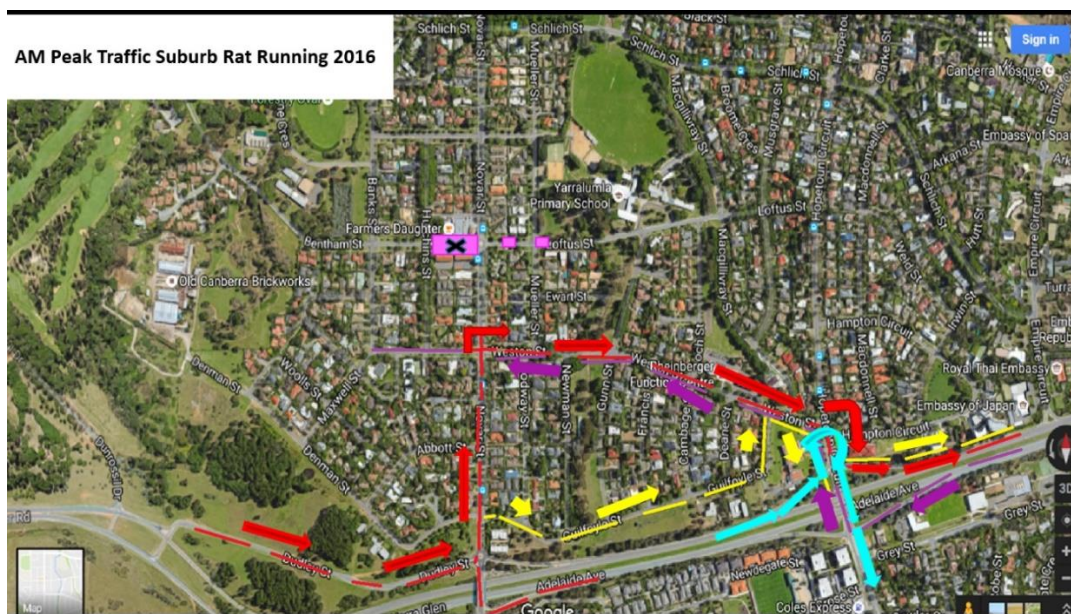
The intersection providing access to the main residential area of the suburb from the east is from Commonwealth Avenue to Alexandrina Drive via the Coronation Drive/Flynn



Drive/Alexandrina Drive intersection. This access is not direct but along the long, narrow, winding Alexandrina Drive that follows the lake shore. This road, at 5.8 metres wide, should carry 300 vpd by current standards, but is carrying four times that volume at 1917 vpd (2012).

The Coronation Drive/Commonwealth Avenue intersection also serves the primary function of connecting traffic from Commonwealth Avenue and State Circle going to the Parliamentary Triangle or the embassy belt of Yarralumla. Coronation Drive is not subject to long tail backs at peak times and is performing satisfactorily at present with 4326 vpd (2012).

## Rat Running Routes through Yarralumla



The volume of traffic on Dudley Street has increased by 18% from 2012 to 2015, and that on Novar Street by 15% between 2014 and 2015. At AM Peak up to 40% of vehicles heading east on the Cotter Road turn into Dudley Street, creating a tailback from the Novar Street/Dudley Street mini roundabout that runs the full 800 metre length of Dudley Street. The destination for 60% of these vehicles is to access Deakin via Novar and Kent Street. Another 20% of the Dudley Street vehicles use Dudley Street to access Adelaide Avenue via Novar, Weston Street (E) and Hopetoun Circuit, not Yarralumla. Increasingly Guilfoyle Street is also being used in addition to Weston Street. The Adelaide Avenue -Hopetoun Circuit junction provides a dedicated slip road onto Adelaide Avenue so vehicles are not required to merge with Adelaide Avenue Traffic. This route is taken because of the bottle neck as the Cotter Road traffic merges from two lanes to one to join Adelaide Avenue just after the Dudley Street junction. Most vehicles travelling north on Kent Street do not use the Novar Street east bound ramp onto Adelaide Avenue as this ramp has a very short filter on lane requiring traffic to merge with Adelaide Avenue traffic and so they also take this route along Weston and Guilfoyle Streets. Dudley Street is used by east bound traffic to access Deakin as there is no direct access from the Cotter Road and at AM peak it is very difficult to turn

south into Deakin from the Adelaide Avenue east bound off ramp due to the high traffic volumes on Hopetoun Circuit.

The configuration, complexity and traffic volumes at the Hopetoun Circuit/ Adelaide Avenue intersection is also driving dangerous rat running behaviour by traffic travelling east on Adelaide Avenue and wishing to exit at Hopetoun and turn right into Deakin. As there is intersection failure for the traffic on the exit ramp many vehicles now turn left and head north for a short distance along Hopetoun Circuit, then turn right into Hampton Circuit and immediately do a U turn next to the Sri Lankan Embassy back onto Hopetoun so that they can travel south into Deakin. The destinations of these vehicles include the Girls Grammar School.

It is notable that during school holidays weekday traffic volumes are 30% less on Novar Street and 60% less in Weston Street (E) however there is a significant increase in weekend traffic.

### **Hopetoun Circuit/ Adelaide Avenue problems**



AM Peak Traffic travelling west along Adelaide Avenue will also take the Hopetoun Circuit exit and travel west along Weston Street (E) then turn south along Novar Street to go over the Kent Street bridge to the Deakin business area that now includes the Equinox complex stage 1 (with Stage 2 scheduled shortly). This behaviour is driven by the intersection failure at peak times at the west bound exit ramp from Adelaide Avenue and Kent Street. Tail backs onto Adelaide Avenue are common at peak times.



## Visitor and Destination Traffic and Parking

The combination of the demands for resident, commercial, event, and visitor parking in Yarralumla has become problematic. In addition to residential traffic, the many business and recreational destinations in Yarralumla generate high volumes of private and commercial vehicle movements through the suburb.

The lake foreshore provides for many aquatic recreational activities and, as mentioned earlier, Weston Park has 1755 vpd (2016) on weekends. The Yarralumla Primary School is also a drawcard with its a highly regarded Italian school and attracts 80% of its students from other suburbs. The Royal Canberra Golf Club on the western side of Yarralumla has 1649 members and has high patronage of its regular national and international tournaments. Similarly, the Weston Park Heritage Nursery and Cafés are very popular and at mid-morning on a weekday have some 60 vehicles parked and 10 queued up waiting to park.

The parking at the Yarralumla Centre (Yarralumla Shops) in Bentham Street already precludes through traffic to destinations in Bentham such as the Royal Canberra Golf Course, and CSIRO Forestry in Banks Street. The Yarralumla Centre provides business facilities, restaurants and is the local shopping centre and is one block wide located on Bentham Street between Novar Street and Hutchins Street. This centre is a key destination in the suburb with parking constantly at capacity during week days and weekends.

This shopping centre section of Bentham Street that provides parking for 46 vehicles and has a high accident rate with 40 serious crashes of parking/reversing vehicles reported there in the period 2008 -2012. This on-road parking does not meet AS2980.5 for road width for 90-degree angle parking or a two-way 60-degree angle parking scheme. As a result, when entering or leaving parking vehicles block the whole road, precluding its use by any through traffic and causing back up in Novar Street.

The Royal Canberra Golf Club is at the dead end of Bentham Street and has only one entry and exit point for members and visitors. The current primary route taken to and from the Golf Club is Novar Street via Weston Street (W), Banks Street and Bentham Street (W) to avoid the Bentham Street/Yarralumla Shops chaos. This has resulted in Weston Street (W) carrying between 1243 vpd (2015) and 1877 vpd (2012) with 2486 vpd (2015) on weekends.

**Yarralumla Shops Bentham Street - road and parking congestion chaotic, accident prone, blocks Novar Street**



Yarralumla Shops Bentham Street (looking east) to mini roundabout intersection with Novar Street



Yarralumla Shops Bentham Street (looking west) at mini roundabout intersection with Novar Street



Yarralumla Shops Bentham Street (looking west) at mini roundabout intersection with Novar Street



Yarralumla Shops Bentham Street (looking west) at mini roundabout intersection with Novar Street



Yarralumla Shops Bentham at mini roundabout intersection with Novar Street mini roundabout intersection with Bentham Street looking north west



Yarralumla Shops Bentham Street (looking west) at mini roundabout intersection with Novar Street



Yarralumla Shops Bentham Street (looking west) at mini roundabout intersection with Novar Street



Apart from limited signed parking on Novar Street and Hutchins Street adjacent to the Centre parking is informal and there is considerable damage to nature strips and heritage trees due to overflow parking on the nature strips. The parking area for the Dog Park in Banks street is a cordoned off unsealed area that has become a dust bowl due to heavy use.

Informal nature strip parking is particularly the case for events at current Yarralumla destinations such as the recent open day at the Royal Canberra Golf Club, regular community use of the Uniting Church meeting rooms, regular services at St Peter Channel's Church. Adequate drop off parking is required at the Child Care Centres in Weston Street (W) and Macgillivray Street, and at the Yarralumla Primary School in Loftus Street. The

Canberra Brickworks development is expected to be a centre for events and as such provision of adequate onsite parking will be essential. Regardless of the levels of visitor parking provided in the Canberra Brickworks Precinct, increased pressure can be expected on surrounding streets, such as Bentham Street and Denman Street, from visitors who will park nearby and walk to the new facilities. This will exacerbate parking issues that are already evident in Bentham and Denman Streets, so adequate visitor parking within the Canberra Brickworks Precinct must be provided to ensure no deterioration of amenity.

**Parking Demand Uniting Church Denman Street**



**Parking Demand Royal Canberra Golf Course Bentham Street**





## Active Travel

Yarralumla is serviced by bus routes along Novar Street, Schlich Street and Hopetoun Circuit. There are no pedestrian crossings in the suburb. There is only one school crossing with two associated speed humps at the Yarralumla Primary School in Bentham Street. There are mini roundabouts at the junction of Novar and Dudley Street, Novar and Bentham Street and Hopetoun Circuit and Schlich Street. Tour coaches frequently get stuck on the Novar Street/Kent Street mini roundabout as their turning circle is too great. There are no traffic lights in the suburb.

Yarralumla has a good supply of footpath infrastructure along most streets however the ability of pedestrians to safely use these footpaths is severely constrained. The absence of pedestrian crossings in Yarralumla, and given that Novar Street, Hopetoun Circuit (south end), Kent Street and Dudley Street all carry arterial road levels of traffic makes it near impossible to cross these roads at peak times. This is putting at risk pedestrians, significantly including the children, going to the Yarralumla Primary School, the Grammar School, the two Child care centres and the Yarralumla Shops, and militates against people walking locally rather than driving.

## Canberra Brickworks Development

Redevelopment of the Canberra Brickworks site has been the subject of a series of proposals since the mid 1980's. As at April 2017 the LDA was assessing two proposals that had been the subject of a restricted tender process in 2016 and proposed development plans will be released later in 2017. This report and the estimates below are based on information that is already in the public domain. This will need to be updated when the new plans are released.



The proposed Canberra Brickworks Development is also on the western side of the suburb adjacent to the Royal Canberra Golf Club, will be added to the destinations for visitors to the suburb. The development area is a CZ6 zone that provides for both commercial and residential development. Based on publicly available information the development will



include up to 380 residential dwellings. The commercial adaptive re-use of the Brickworks site and heritage buildings will provide up to 7500 m2 commercial space. This estimate of commercial space is based on the AR Marr 1986 proposal and the previous LDA proposals in 2010, 2014 and 2015.

Based on the above information it is estimated that the development will generate around 500 vehicle movements per day, weekdays and 670 a day on weekends from the commercial development and 2280 vehicle movements per day for the dwellings (Estate Development Code 2013; NSW Government TDT 2913/04a). In total this would be between 2780 and 2950 vehicle movements a day for the whole Canberra Brickworks development excluding traffic generated by events. The estimated parking requirement for the commercial component of the development is for a minimum of 400 to 500 parking spaces (Parking and Vehicular Access General Code ACTPLA 2012) with additional requirements for the Quarry Park and events. The dwellings are assumed to provide for residents and mandatory visitor parking.

Dudley Street already had arterial road traffic volumes of 9626 vpd (2015) and the intersection with Novar Street is at capacity. Thus, providing access to the Canberra Brickworks Development from Dudley Street without creating AM and PM peak gridlock would appear to be highly problematic.

### **Impact of Future Developments**

These connectivity issues and intersection failure, rat running and parking will be exacerbated by currently scheduled developments. These developments include the completion of Cotter Road Stage 2 duplication in 2017; the completion of further suburbs in Molonglo (Wright, Coombs and Denman Prospect are projected to have over 7650 residents by 2019); the construction, at the junction of Kent Street and Strickland Crescent, of the second stage of the Equinox Business Park (the first stage of the Equinox Business Park which became fully operational in 2013/14 has a Gross Floor Area of 25000 square metres and parking for 512 vehicles); and the redevelopment of the existing Deakin Commercial area on Kent Street. There are also increasing number of destination on the lake foreshore for example the proposed maze in Weston Park and expansion of rowing facilities. Then there is the addition of the Canberra Brickworks Development.

The Novar Street and Dudley Street bottlenecks will increase. In addition, there will be considerable safety issues arising from arterial level traffic volumes travelling along Novar Street which is an Access B level road. The community will not be able to safely cross the roads. Noise levels will also increase.

### **Next Steps**

The traffic flow and pedestrian and vehicle safety issues need to be addressed through a long-term Yarralumla Traffic Strategy based on a set of key principles. An outline of such an approach is presented next with some possible measures for consideration – these are not recommendations.

Going forward it would be possible to implement a number of initiatives individually or in combination over the next few years. Some approaches could be implemented in the short term and at relatively low cost, such as pedestrian crossings and traffic calming measures, whilst others require a longer-term planning and funding horizon.

## **Yarralumla Traffic Strategy**

The traffic flow, pedestrian and vehicle safety issues need to be addressed through a long-term strategy based on key principles and consideration given to implementing a number of approaches, individually or in combination, over the next few years. Some could be implemented in the short term and at relatively low cost, such as pedestrian crossings and traffic calming measures, whilst others require a longer-term planning and funding horizon.

### ***Principles***

1. Facilitate most direct access and exit for vehicles travelling to and from destinations in Yarralumla along streets suitable for safely carrying that quantum of traffic flow.
2. Aim for more even traffic flows in the suburb.
3. Improve vehicle and pedestrian safety through traffic calming measures, pedestrian crossings and ensuring residents vehicles can safely enter and exit their dwellings.
4. Reduce unnecessary traffic and minimise rat running by eliminating major intersection failure.
5. Avoid future gridlocked Novar Street and Dudley Streets.
6. Parking, including event parking, should not impact on the amenity of the suburb for residents or occur on the tree lined nature strips.

### ***Some approaches that could be considered improve traffic flows and reduce congestion***

1. Upgrade Alexandrina Drive to Minor Collector or Major Collector level.
2. Upgrade Novar Street/Adelaide Avenue east bound on ramp to be a dedicated slip road.
3. Signalise Kent Street/Dudley Street/Novar Street Adelaide Avenue intersections.
4. Signalise Hopetoun Circuit/Adelaide Avenue intersections.
5. On/off ramp to connect Adelaide Avenue/Cotter Road to Denison Street
6. Connect Denman Street to Dudley Street in front of the Uniting Church.
7. Install bollards in the centre of Hampton Circuit at the junction with Hopetoun Circuit to prevent U turns (No U Turn sign is already in place and ineffective).
8. Traffic calming measures in Weston Street (W) and (E); Guilfoyle and Novar Streets.
9. Pedestrian crossings for Novar, Weston, Bentham Streets and Hopetoun Circuit - a minimum of two per street.
10. Commercial vehicle weight restrictions or exclusion from Weston Street and Guilfoyle Street at a minimum and possibly elsewhere.
11. Provide sufficient Canberra Brickworks development connectivity and onsite parking to avoid channelling all Brickworks traffic along Dudley Street and Novar Street and avoid street side event parking in residential areas.
12. Formalise on street parking, set aside resident only parking, and provide additional off street sealed parking bays.
13. Provide off street parking to replace on street parking at the Yarralumla shops and business centre in Bentham Street to improve through traffic. Off street parking could be a facility with basement and ground floor parking and possibly also a first floor.

# Attachments

## Estate Development Code (2013) – Extract on Street Hierarchy

<b>Street hierarchy for estates in residential zones and CZ5 - Estate Development Code 2013</b>		
<b>Street type and function</b>	<b>Design speed (km/h)</b>	<b>Traffic volume (vehicles per day) <sup>(1)</sup></b>
<b>REAR LANE</b>	30	0-160 <sup>(2)</sup>
Rear lanes are narrow and short streets which have the primary function of providing rear vehicular access to blocks.		
<b>ACCESS STREETS</b>		
<b>Access Street A</b>	60	0-300
<b>Access Street B</b>	60	301-1000
Access streets are used where the residential environment is dominant, traffic is subservient, speed and traffic volumes are low and pedestrian and cycle movements are facilitated. Access streets are categorised as Access Street A or Access Street B according to traffic volumes. Access Street A generally collects traffic from rear lanes and connects to collector roads; they do not normally accommodate traffic from other streets.		
<b>COLLECTOR ROADS</b>		
<b>Minor collector</b>	60	1001-3000
A minor collector road collects and distributes traffic from access streets to major collector roads or direct to the external arterial road network. A reasonable level of residential amenity and safety is maintained by restricting vehicle speeds by means of street alignment, intersection design or by speed-control measures. Direct property access is allowed.		
<b>Major collector</b>	70	3001-6000
Major Collector Roads collect and distribute traffic within residential, industrial and commercial areas. They form the link between the primary network and the roads within local areas and should carry only traffic originating or terminating in the area. The volume of traffic carried is constrained by environmental objectives – safety and traffic noise – and reflects the limited area that they serve. Direct property access is still permissible but the access and egress arrangements should be such that vehicles can exit properties in a forward direction.		
<b>Notes supporting table 1A</b>		
1. To calculate the traffic volume apply a traffic generation rate of 8 vehicle movements per day per dwelling for single dwellings, a rate of 6 vehicles per day per dwelling for multi-unit developments, and a rate of 7 vehicles per day for blocks 360m <sup>2</sup> or smaller.		
2. 160 vehicles per day maximum at the intersection of rear lanes with access streets.		

Estate Development Code 2013 - Street Network requirements – all estates except industrial zones						
Facility Type	Rear Lane	Shared use access street 'Woonerf' style	Access Street A	Access Street B	Minor Collector	Major Collector
Traffic volume range (vpd) (1)	0-160(3)	0-40	0-300	301 –1000	1001-3000	3001-6000
Design speed (km/h)	30	30	60	60	60	70
Minimum carriageway width (m) (2)	5.5 (5.0 where the lane is less than 60m in length)	3.5-3.7 (single lane)	5.5	7	10	10
Verge width (m)	minimum 1.5m	5.0	5.5	6.25	6.25	6.25
Minimum horizontal radius (to accommodate)	12.5m single unit truck					
On-street car Parking	Prohibited	Permitted only as indented spaces	Assumed on one side of the carriageway only	Assumed staggered on both side of the carriageway only	Assumed on both side of the carriageway only	Assumed on one side of the carriageway only
Kerb type	Flush or layback upright kerb adjacent to street lighting	Flush or layback upright kerb adjacent to street lighting	Layback or upright	Layback or upright	upright	upright
Maximum street longitudinal gradient	Maximum street longitudinal gradient	12.5%	12.5%	12%	12%	12%
Minimum shared path requirement	No shared path required	No shared path required	1.5 wide shared path on one side only	2.0m wide on one side only	2.5m wide shared path on both sides and aligned at least 1.5m away from the kerb	2.5m wide shared path on both sides and aligned at least 1.5m away from the kerb
Bus route Requirement	Not to be used as bus route	Not to be used as bus route	Not to be used as bus route	Not to be used as bus route	can be used as a bus route where in accordance with table 3	can be used as a bus route where in accordance with table 3
Street tree Requirement	No trees required and not to be planted unless sufficient space is provided	Street trees to be provided	Street trees to be provided	street trees to be provided	street trees to be provided	street trees to be provided
Intermittent street Lighting	Must be provided when length exceeds 60m					
Notes supporting Table A						
1	For residential and CZ5 zones - to calculate the traffic volume for streets apply a traffic generation rate of: 8 vehicle movements per day for single dwelling blocks larger than 360m2 7 vehicles per day for single dwelling blocks 360m2 or smaller 6 vehicles per day per dwelling for multi-unit developments					
2	The carriageway width is measured from kerb invert to kerb invert. The carriageway width measurement does not include any designated on-road car parking spaces, on-road cycle lanes, indented car parking bays or medians.					
3	Measured at the intersection of each leg with a higher order street.					



Yarralumla Streets - width and traffic							
Street	Carriageway width m	VPD	VPD weekend	Traffic Count Year	Equivalent classification on width	Equivalent Classification on VPD	AECOM (2016)
Dudley (E)	11.00	8150		2012	Access B	Arterial	Major Collector
Dudley (W)	6.00	8150		2012	Access A	Arterial	Major Collector
Hopetoun (S)	9.00	6910		2014	Access B	Arterial	Major Collector
Novar	9.20	5327	7260	2014	Access B	Major Collector/Arterial	Major Collector
Weston (E)	9.20	2526		2015	Access B	Minor Collector	Minor Collector
Hopetoun (mid/lake)	6.40	2176		2006	Access A	Minor Collector	Major Collector
Alexandrina	5.80	1917		2012	Access A	Minor Collector	Major Collector
Weston (W)	7.40	1877	2486	2012	Access B	Minor Collector	Minor Collector
Bentham (Shops)	7.40	1613		2015	Access B	Minor Collector	
Schlich	8.80	1267		2006	Access B	Minor Collector	Minor Collector
Loftus	7.20	1262		2015	Access B	Minor Collector	
Banks	9.00	737	1153	2015	Access B	Access B	
Kintore (E)	8.80	557		2015	Access B	Access B	
Bentham (W)	7.80	467		2015	Access B	Access B	
Kintore (W)	8.30	343		2015	Access B	Access B	
Abbott	7.40				Access B		
Denman	8.80				Access B		
Guilfoyle	7.00				Access B		
Hooker	8.80				Access B		
Hutchins	7.80				Access B		
Macgillvray	6.90				Access A		
Maxwell	9.00				Access B		
Mueller	8.70				Access B		
Musgrave	7.20				Access B		
Newman	7.30				Access B		
Rodway	7.30				Access B		
Schomburgk	6.60				Access A		
Woolls	6.10				Access A		

## References

- SMEC Transport Management Study 2013 undertaken for the LDA (SMEC 2013 a).
- SMEC (2011) Final Report – Options and Evaluation Canberra Brickworks and Environs Planning Strategy: Traffic, Transport + Infrastructure.
- AECOM (2012) Mint Interchange Pre-Feasibility Study Report.
- AECOM (2016) Canberra Brickworks Precinct ACT Site Investigation – Traffic, Transport and Carparking – for the Land Development Agency.
- ACT Government (2014). ACT Government Territory and Municipal Services TMS ID 790973 April 2014.
- ABS 2011 Census [www.censusdata.abs.gov.au](http://www.censusdata.abs.gov.au) accessed June 2014.
- ACT Government (2013). ACT Government Environment and Sustainable Development - Estate Development Code October 2013.
- ACT Government (2014). ACT Government Territory and Municipal Services TMS ID 790973 April 2014.
- ACTPLA (2012). Parking and Vehicular Access General Code.
- CARDNO (2016) Concept Design Report CBP Access Road and Dudley Street Upgrade for the Land Development Agency.
- LDA (2012). Canberra Brickworks and Environs Planning Strategy Questions and Answers as at 26 July 2012.
- LDA (2013). The Canberra Brickworks and Environs Planning and Development Strategy September 2013-prepared by Hill Thalys Architecture+ Urban Projects with Jane Irwin Architecture for the Land Development Agency September 2013.
- Land Development Agency (2015). Canberra Brickworks and Environs Planning and Development Strategy February 2015.
- Lovell Chen (2015). Conservation Development Strategy. Canberra Brickworks and Environs Planning and Development Strategy February 2015 - Attachment A.
- Lester Firth (1986). Lester Firth & Associates. Old Canberra Brickworks Conservation Plan.
- NSW Government (2013). Technical Direction for traffic safety and transport practitioners TDT 2013/04a August 2013.
- SGS (2015). Community services & retail analysis. Canberra Brickworks and Environs Planning and Development Strategy February 2015 - Attachment D.
- SMEC (2011). Final Report Canberra Brickworks and Environs Planning Strategy: Traffic, Transport + infrastructure.
- SMEC (2013). Final Report Canberra Brickworks and Environs Options & Evaluation Report Update for Land Development Agency 17 December 2013.
- SMEC (2015). Traffic, Transport & Infrastructure Report. Canberra Brickworks and Environs Planning and Development Strategy February 2015 - Attachment E.
- Yarralumla Residents Association (2014). Submission on Development Application (DA) 201425325.
- Yarralumla Residents Association (2014). Submission on Canberra Brickworks and Environs Planning and Development Strategy 2013 14 July 2014.