

ADVICE REGARDING CHANGE IN VEHICLE ACCESS ARRANGEMENTS ALONG THE EXTENT OF THE THE APPIN ROAD UPGRADE AT APPIN ROAD, GILEAD

Existing Appin Road

- 1 Appin Road is presently a two-lane, two-way rural road between Rosemeadow and Appin, with a typical speed limit of 80km/h.
- 2 The existing carriageway is narrow, provides narrow paved shoulders on both sides with significant trees within 3 – 4 metres of the traffic flow lanes on both sides of the road.
- 3 The approximate peak hour volumes between 2015 and 2031 along Appin Road are shown in **Table 1**, noting that the volumes have been taken from the Traffic Modelling Study Appin Road Mount Gilead report by Cardno.

TABLE 1: APPROXIMATE TRAFFIC VOLUMES

Peak Hour	2015		2021		2026		2031	
	NB	SB	NB	SB	NB	SB	NB	SB
AM	713	470	833	726	1165	804	1329	857
PM	400	1102	590	1312	832	1498	951	1620

- 4 The TfNSW Traffic Volume Viewer indicates that the AADT (Annual Average Daily Traffic) volume on Appin Road is approximately 10,500 vehicles in 2023, noting that data affected by COVID has been excluded.
- 5 Based on the estimated traffic volumes provided in **Table 1**, by 2031 the midblock performance of Appin Road is likely to reach a level of service of E based on the two-way two-lane road capacities provided in Table 4.5 of the RTA Guide to Traffic Generating Developments (capacity adjusted for speed).
- 6 Appin Road is a classified State Main Road (No. 177) and is an approved 26m B-Double Route under the NHVR scheme.

Safety of Driveways

- 7 To provide for an indication of the existing safety of driveways providing direct access to and from Appin Road from the adjoining land parcels, the historical traffic flows along Appin Road have been extracted from the TfNSW Traffic Viewer and used to consider the estimated delays at the driveways.
- 8 To examine the performance of turns into and out of property access points, simple testing has been undertaken in SIDRA Intersection 9.0 to test the performance of left and right turns from driveways using the 2021 and 2026 traffic volumes provided in **Table 1**. The results of this modelling are summarised in **Table 2**.

TABLE 2: RESULTS OF SIDRA MODEL OF DRIVEWAY

Turn	2021 Volumes, Existing Geometry (2-lane, 2-way)				2026 Volumes, Existing Geometry (2-lane, 2-way)				2026 Volumes, Future Geometry (4-lane, 2-way)			
	AM		PM		AM		PM		AM		PM	
	Avg Delay	Level of Service	Avg Delay	Level of Service	Avg Delay	Level of Service	Avg Delay	Level of Service	Avg Delay	Level of Service	Avg Delay	Level of Service
Left Turn	4.1	A	23.6	B	5.1	A	103.7	F	2.0	A	8.3	A
Right Turn	29.7	C	100.8	F	134.9	F	299.5	F	175.3	F	237.2	F

- 9 The results of the modelling indicate that by 2026, without the upgrade works, both left and right turns out of a driveway will reach a Level of Service of “F” during the PM peak hour. Generally, this indicates that the turning movement will be unsafe as drivers will accept lower than acceptable gaps between traffic.
- 10 It is noted that the modelling was based on a light vehicle (car) making turns out of the driveway, the results would be significantly worse for a heavy vehicle, which requires a much larger gap in traffic to turn into.
- 11 It is notable that the upgrade to provide two southbound lanes will significantly reduce delays for the left turn movements from driveway onto Appin Road.
- 12 Considering the above, the existing property access points which allow for right and left turns are already unsafe. The safety of these driveways will be further reduced as traffic volumes increase along Appin Road.
- 13 It is difficult to construct a treatment which allows for safe right turns into a private property access point whilst physically restricting a right turn out of that access point. Whilst regulatory signage can be provided to restrict right turn movements, this requires enforcement and is undesirable if there is an alternative route available.

Appin Road Upgrade

- 14 The southern section of the upgrade of Appin Road includes the installation of a raised concrete median to form a divided carriageway, with two traffic flow lanes to be provided in both directions.
- 15 The upgraded form of Appin Road will significantly improve safety for all road users and, based on the crash reduction factors provided in the Austroads Road Safety Engineering Risk Assessment Part 6 document, will lower crash risk by approximately 85% along lengths with both a raised median and widened shoulders.
- 16 Construction of signalised intersections will act to lower speeds and provide for protected turns, further improving road safety compared to the existing Appin Road for all road users.
- 17 In terms of road capacity, the upgrade to two lanes per direction will improve the level of service for all road users from a level of service of E to C in both directions (for the peak flow direction) in the year 2031.
- 18 Vehicle access to and from the land to the west of Appin Road will be facilitated by the new signalised intersections. This land to the west of Appin Road will be subdivided into residential lots with access provided by new local roads.

- 19 To the east of Appin Road, property access to the rural allotments will remain direct to and from Appin Road, though the construction of a concrete median island in Appin Road will restrict the existing access driveways to the east of Appin Road to left-in / left-out movements only.
- 20 Approach and departure movements to the land on the east of Appin Road will be restricted such that vehicles can only arrive from the north and depart to the south.
- 21 The intended road structure of the partially approved Figtree Hill estate has been examined, with the view to determining whether the internal roads could be used to facilitate turning movements for drivers approaching or departing the land to the east of Appin Road from the south to the north respectively.
- 22 Both roads internal to the subdivision which extend to the west from signalised intersections with Appin Road have road reserve widths of 26m, facilitating divided carriageways with 7m widths.
- 23 Internal intersections along both of these roads with other collector roads within the subdivision will accommodate roundabouts with a circulating radius of approximately 17 to 19m.
- 24 Subject to appropriate approval under the NHVR heavy vehicle routes scheme, these roads will provide adequate facilities for vehicles up to 26m in length to undertake turning movements to achieve a displaced u-turn and travel in the opposite direction along Appin Road.

Conclusions and Recommendations

- 25 Through the application of basic performance modelling in SIDRA 9, it is clear that use of the existing property access points for unrestricted turning movements to and from Appin Road is presently undesirable from a safety perspective and will become a more severe road safety issue as traffic volumes increase.
- 26 The design of the Figtree Hill estate includes roads with sufficient road reserve dimensions to provide for roads and roundabout controlled intersections which could be used for displaced u-turn manoeuvres by vehicles up to 26m in length. This would replace and supersede the existing ability to undertake right turns to and from Appin Road to the land to the east of Appin Road.
- 27 Use of these roads by heavy vehicles of greater than 19m in length would be subject to approval under the NHVR scheme, which can be applied for once the roads are completed.
- 28 It is expected that the number of heavy vehicles undertaking these manoeuvres will be low, though the conversion of the Copperfield Drive / Appin Road roundabout to traffic signals may result in use by some heavy vehicles other than those related to the land to the east of Appin Road.



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