

Technical Design Note

Project: Huntlee development – Stage 1

Subject: DA Modification 20, Traffic Review and Intersection Assessment – HEX Link Road and northern access

Date: 16 December 2021

Attention: Glenn Swan

This letter report has been prepared to support DA Modification 20, the key aspects of this modification include the subdivision of super lots in the Town Centre and R2 zone (substage 14/15) in the south-western corner of Katherine's Landing, and also in substage 16 adjacent to the proposed retirement site.

The proposed subdivisions create individual residential allotments in areas of the site where they were previously expected, as such the additional residential lots is not increasing the overall dwelling yield within the Stage 1 development, as outlined in the Ethos Urban Statement of Environmental Effects.

Existing Road Network / Traffic Impacts

As outlined above, this modification does not propose to increase the total number of residential dwellings already approved within previous modifications of the Huntlee Stage 1 consent, and as such the previous traffic assessments including the original Hyder Traffic Assessment are still valid in terms of determining infrastructure upgrade requirements.

The subdivision of super lots within sub-stages 13, 14, 15 and 16 to create additional residential lots is consistent with previous forecasts of dwelling numbers and density, and therefore there is no intensification of traffic generation or changes to previous trip distribution assumptions.

Similarly, the subdivision of super lots within the Town Centre for residential lots does not intensify traffic generation or create impacts on intersections as the Town Centre was always expected to include residential development. The original Stage 1 Hyder Traffic Report included 300 residential dwellings within the Town Centre Stage 1 area as part of the assessment to determine the requirements for key intersections which are already constructed, or soon to be constructed in 2022. The Town Centre residential lots were envisaged to be within the mixed use zones identified within the original concept plan, rather than within the retail core or service commercial areas as illustrated on the following page in Figure 1.

The proposed town centre residential lots will access Wine Country Drive at either the existing roundabout at the northern end of Wine Country Drive, or the recently constructed signalised intersection which currently serves as the main entrance to the Town Centre. A TfNSW Works Authorisation Deed (WAD) has been issued for the existing roundabout which will see this intersection upgraded in 2022. These existing intersections will ensure sufficient capacity exists for traffic generation from the proposed residential lots, which has already been taken into account within the DA approved traffic study.

The key collector roads that will take traffic from the residential area remain as per the current approved DA and these important collector roads will distribute traffic from the proposed residential lots and wider Town Centre,



Modification 20 has not altered the road hierarchy and key collector road routes on which the original traffic study was based.

In addition, the intersection of Wine Country Drive and Triton Boulevard is also due to be upgraded into a signalised 4-way intersection, with a WAD already entered into with TfNSW, this intersection will be completed in 2022 also which will provide a third major intersection and access point into the Town Centre which could be used in the future by the Town Centre residential area, these access points are highlighted below in Figure 2.

With ultimately two signalised intersections and a major roundabout as potential access points, the traffic arrangements for the proposed residential lots are more than sufficiently catered for, and are as per expected within the original DA approved traffic impact assessment. Modification 20 does not create any additional impacts not already considered in the original Development Consent, and intersection upgrades are being rolled out in line with lot construction and intersection capacity requirements.

Figure 1 – Masterplan Extract

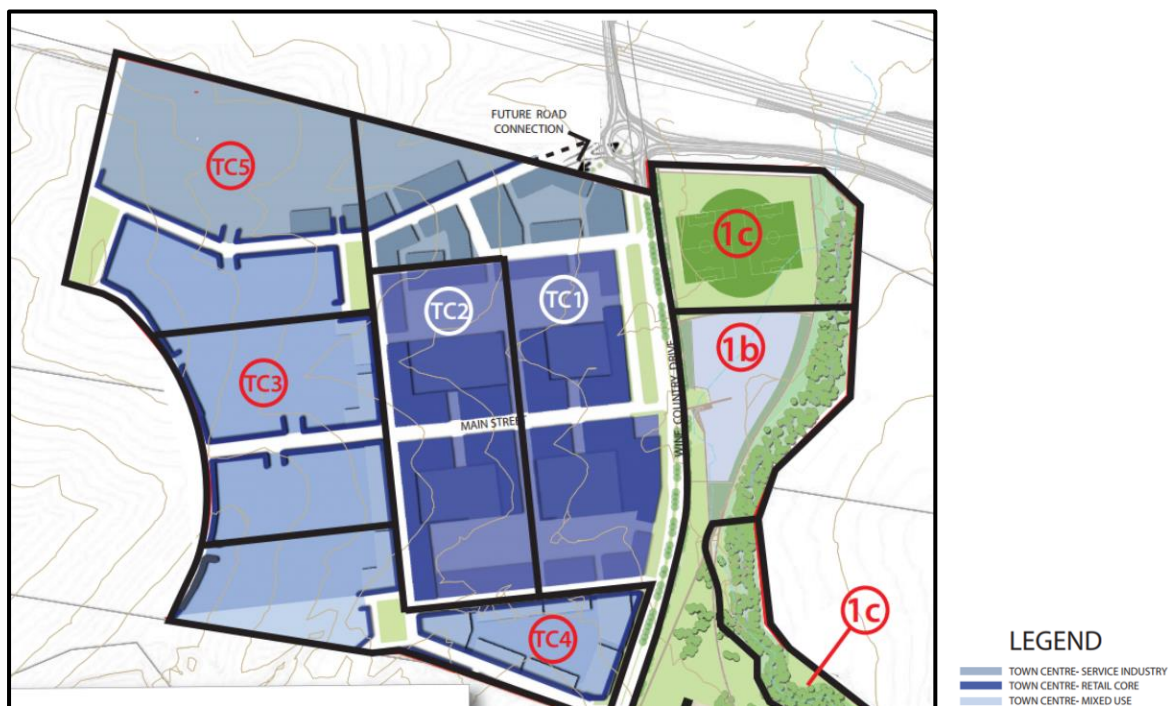
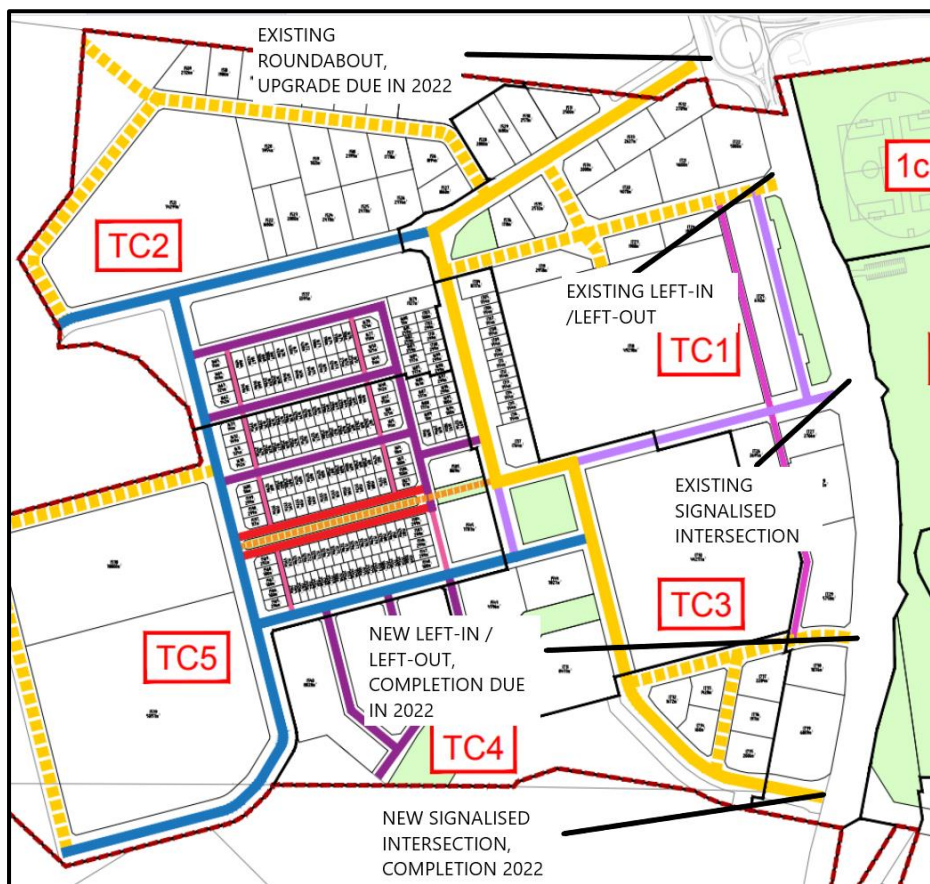


Figure 2 – Town Centre Intersection Locations



Proposed New Internal Road Network

All new internal public roads proposed under this DA modification will be designed and constructed in accordance with the Huntlee DCP and Cessnock City Council Engineering Requirements.

Updated plans submitted with the DA modification show the proposed new road hierarchy and road reserve widths which are consistent with the DCP and road network already constructed.

Review of Consent Condition E7(a) (ix) and (xi)

Huntlee is currently progressing the design and construction of an interim intersection at the northern access road / HEX Link Road access location, this is currently expected to be delivered around mid 2022. Huntlee is also progressing the signalisation of Triton Blvd/Wine Country Drive and the provision of an additional circulating lane at the Wine Country Drive/HEX Link Rd roundabout, with both upgrades also to be delivered in 2022.

These upgrades will provide significant capacity and efficiency improvements to traffic movements from and into the Huntlee Development. With these works progressing, it is prudent to review the required timing for the next major road upgrades, being the next stage of the northern access road intersection, and the widening of the HEX link road to two lanes in each direction, currently required to be completed prior to 1500 lots being delivered (Condition E7(a) (ix) and (xi)).

The following assessment reviews the capacity of the HEX Link Road to accommodate more than the 1500 lots currently allowed within the existing DA consent conditions.

This intersection has been assessed as part of the original traffic model completed for the project by Hyder (Huntlee New Town Stage 2 Preferred Project report -Traffic Modelling Volume 1 July 2012)) with the ultimate intersection layout shown below. This layout allows for the full development of the Huntlee site.

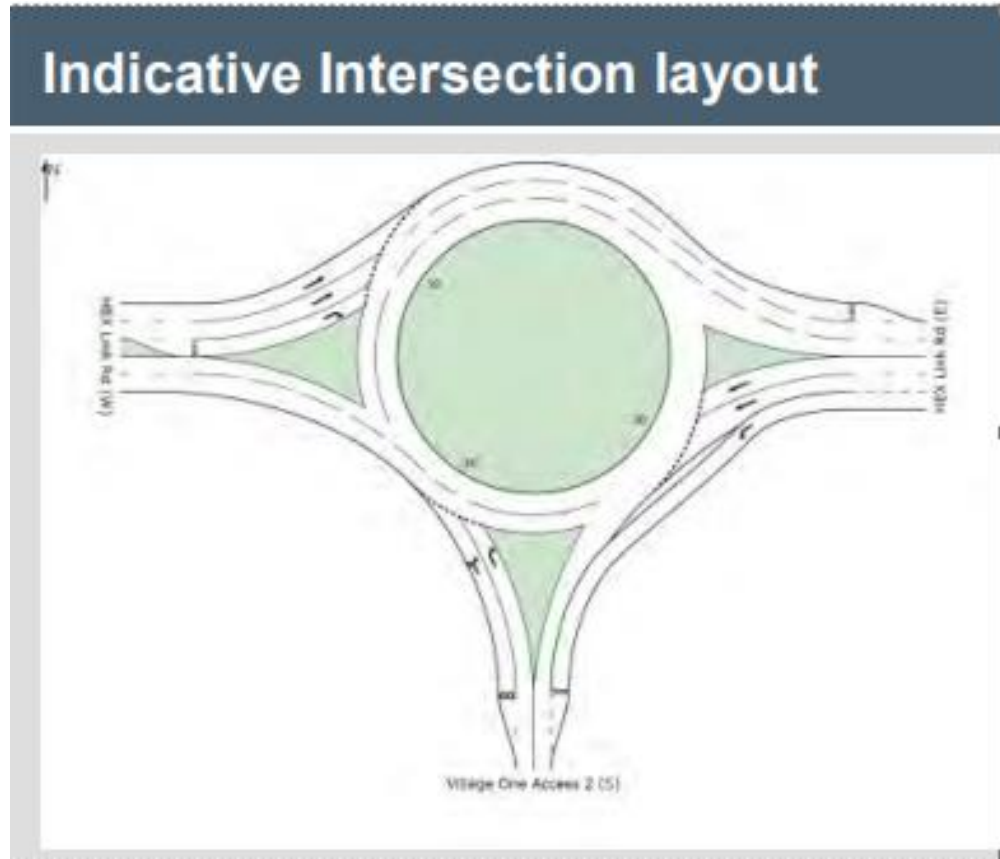


Figure 3 – Indicative layout for the roundabout controlled intersection of HEX link road and northern access road

The layout allows for the following characteristics:

- Generally, a 2 lane circulating roundabout
- A left turn slip lane for traffic westbound on the HEX to turn into the northern access road
- A single lane of travel per direction on the northern access road
- A three lane approach for the traffic eastbound on the HEX to allow for a dedicated right turn lane plus 2 through lanes

While the traffic modelling for the project has been reviewed and adopted for the progression of the development of Huntlee, it can be seen that the actual future traffic demands and travel patterns once Huntlee is fully developed could be different. Since the traffic modelling work has been completed, TfNSW has completed updated traffic surveys for residential development that indicate the traffic flows would be slightly lower than that predicted by Hyder. The extent of other facilities within the Huntlee development site could also change over time, which would then influence the extent of internal versus external trips. Work patterns have also changed since the original model which reduces the extent of traffic during the absolute peak, with peak spreading of traffic demands.

The recent work practice changes associated with Covid could also have a long lasting impact, as more people choose to work from home either part time or full time. With work trips typically accounting for around 20-30% of trips in the peaks, it can be seen that if people worked from home one day a week then on average peak hour traffic flows could reduce by around 20%.

Huntlee is also designed to support alternative transport modes, including walking and cycling. With the development of schools and retail / commercial employment land within Huntlee, these alternative forms of transport will be appealing and reduce traffic demands during the peak periods.

Prior to the provision of the roundabout at the intersection of the northern access road and the HEX link, the following approved work will be completed:

- A. Upgrade of the roundabout controlled intersection of Wine Country Drive and the HEX link road to allow for 2 circulating lanes with appropriate flaring on the approaches and on the departure lanes. This is scheduled to be open by the end of 2022.
- B. Provision of the left in / left out at the intersection of the northern access road and the HEX link with construction by end of June 2022.
- C. Traffic signal control shall be installed at the intersection of Triton Boulevard and Wine Country Drive

Taking these upgrades into account, the road network has been modelled to assess the capacity of the left in and left out intersection at the northern access onto the HEX link road. This intersection will allow for on-going development of the project by allowing for a secondary access to the Huntlee development, particularly the development in the north-east section of the overall footprint. Traffic from this area can enter Huntlee via a simple left turn in and then leaving, can turn left out and complete a U-turn at the roundabout of Wine Country Drive and the HEX link. With the upgrade of this roundabout to allow for the 2 circulating lanes, there is additional capacity available to satisfy these U-turn demands.

The network modelling previously completed by Seca Solution has shown that the upgrades approved (and to be constructed over the next 12 months) will allow for the site to develop to 1,500 lots.

An iterative process has determined that subject to the road upgrades shown above in points A, B and C, and based on traffic data collected by Seca Solution in 2020, that the Huntlee project can be developed to allow for an additional 450 lots, being 1,950 lots in total, prior to the provision of the roundabout control at the intersection of the HEX and the northern access road. The details of this are shown below.

The road network has been modelled with Sidra Network and the summary of the results is provided below.

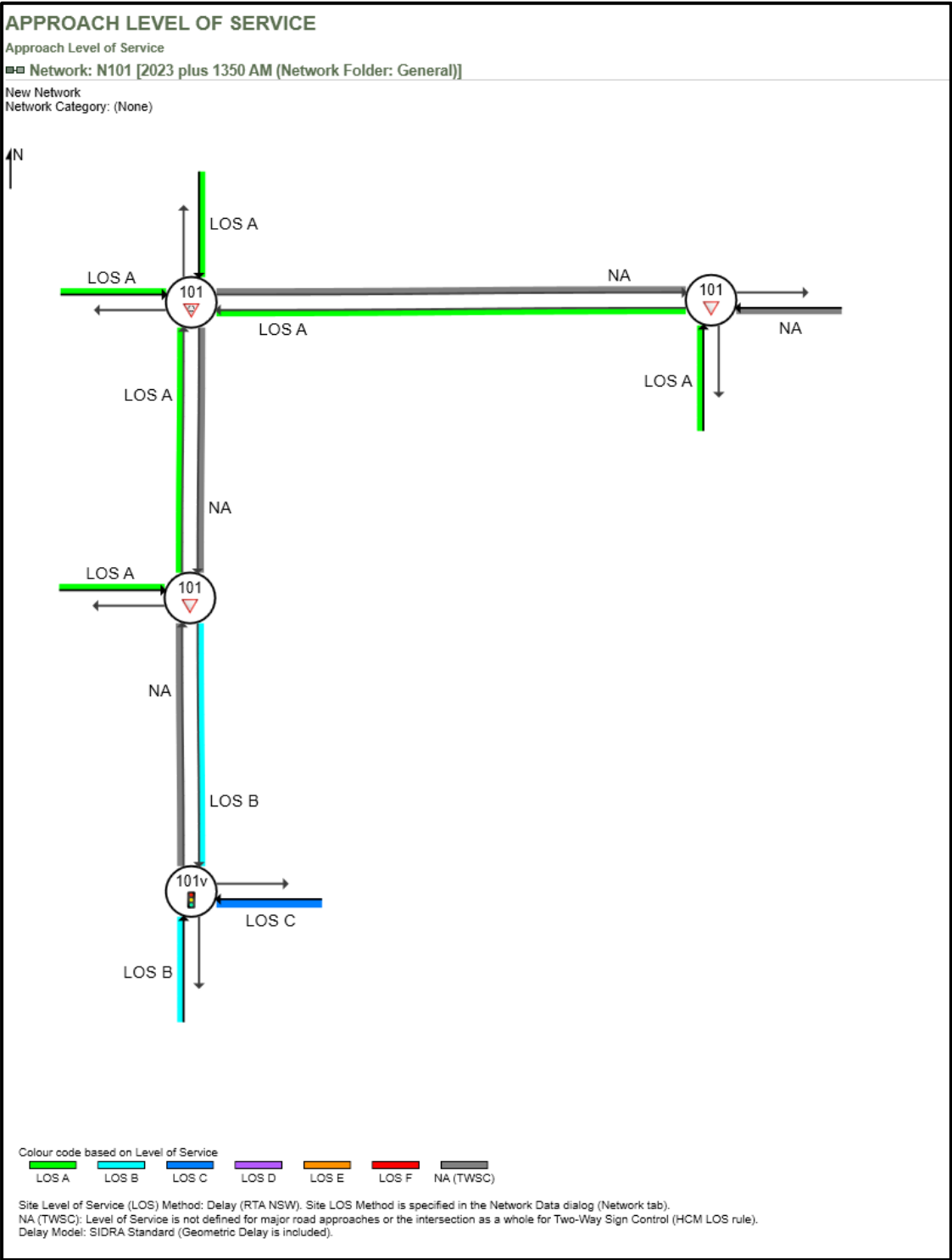


Figure 4 – AM peak 1950 lots being 2023 flows (600 lots) plus additional 1,350 lots

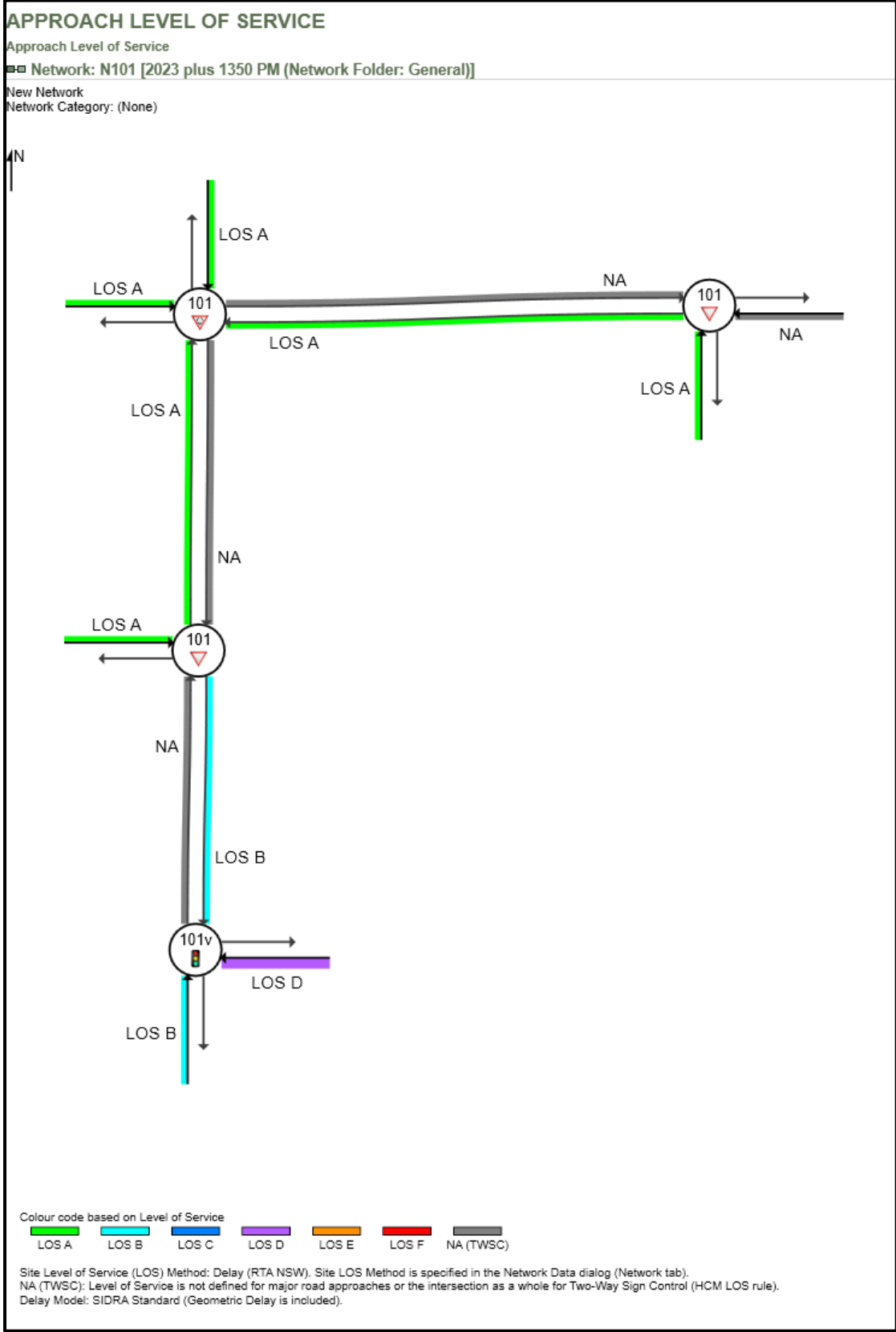


Figure 5 - PM peak 1950 lots being 2023 (600 lots) flows plus additional 1,350 lots

MOVEMENT SUMMARY

Site: 101 [WCD roundabout AM 2023+1350 (Site Folder: WCD roundabout 2020)]

New Site

Site Category: (None)

Roundabout

Design Life Analysis (Final Year): Results for 3 years

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %	v/c	sec		[Veh. veh	Dist] m				km/h
South: WCD northbound														
1	L2	3	0	3	0.0	0.466	5.9	LOS A	3.7	26.7	0.79	0.75	0.79	39.5
2	T1	182	10	215	5.5	0.466	5.7	LOS A	3.7	26.7	0.79	0.75	0.79	43.7
3	R2	568	20	670	3.5	0.466	11.3	LOS A	3.7	26.7	0.79	0.81	0.82	43.7
Approach		753	30	887	4.0	0.466	9.9	LOS A	3.7	26.7	0.79	0.80	0.81	43.7
East: HEX link road														
4	L2	207	23	244	11.1	0.137	2.4	LOS A	0.0	0.0	0.00	0.34	0.00	47.7
5	T1	23	0	24	0.0	0.436	3.5	LOS A	3.1	21.4	0.52	0.68	0.52	47.2
6	R2	142	0	149	0.0	0.436	8.5	LOS A	3.1	21.4	0.52	0.68	0.52	48.0
6u	U	345	0	363	0.0	0.436	12.2	LOS A	3.1	21.4	0.52	0.68	0.52	51.9
Approach		717	23	781	3.5	0.436	8.1	LOS A	3.1	21.4	0.36	0.57	0.36	50.0
North: WCD southbound														
7	L2	80	2	84	2.5	0.542	9.9	LOS A	3.5	25.0	0.82	0.97	1.04	44.4
8	T1	168	7	198	4.2	0.542	9.9	LOS A	3.5	25.0	0.82	0.97	1.04	42.3
9	R2	34	0	36	0.0	0.542	14.3	LOS A	3.5	25.0	0.82	0.97	1.04	44.3
Approach		282	9	318	3.3	0.542	10.4	LOS A	3.5	25.0	0.82	0.97	1.04	43.3
West: Access road														
10	L2	12	0	13	0.0	0.020	7.1	LOS A	0.1	0.7	0.76	0.70	0.76	44.7
11	T1	5	0	5	0.0	0.016	8.1	LOS A	0.1	0.5	0.75	0.72	0.75	45.1
12	R2	2	0	2	0.0	0.016	12.8	LOS A	0.1	0.5	0.75	0.72	0.75	41.5
Approach		19	0	20	0.0	0.020	8.0	LOS A	0.1	0.7	0.75	0.71	0.75	44.6
All Vehicles		1771	62	2006	3.6	0.542	9.3	LOS A	3.7	26.7	0.63	0.74	0.67	46.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

 Site: 101 [WCD roundabout PM 2023+1350 (Site Folder: WCD roundabout 2020)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES [Total veh/h HV] veh/h		DEMAND FLOWS [Total veh/h HV] %		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. Dist] veh m		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: WCD northbound														
1	L2	1	0	1	0.0	0.219	3.9	LOS A	1.4	9.6	0.48	0.57	0.48	41.1
2	T1	115	1	121	0.9	0.219	3.6	LOS A	1.4	9.6	0.48	0.57	0.48	45.1
3	R2	390	9	411	2.3	0.219	8.8	LOS A	1.4	9.6	0.49	0.62	0.49	45.0
Approach		506	10	533	2.0	0.219	7.6	LOS A	1.4	9.6	0.49	0.61	0.49	45.1
East: HEX link road														
4	L2	641	4	675	0.6	0.303	2.6	LOS A	1.8	12.4	0.07	0.38	0.07	47.9
5	T1	78	0	82	0.0	0.303	3.6	LOS A	1.8	12.4	0.47	0.60	0.47	47.9
6	R2	56	1	59	1.8	0.303	8.6	LOS A	1.8	12.4	0.47	0.60	0.47	48.6
6u	U	116	0	122	0.0	0.303	12.2	LOS A	1.8	12.4	0.47	0.60	0.47	52.7
Approach		891	5	938	0.6	0.303	4.3	LOS A	1.8	12.4	0.18	0.44	0.18	48.8
North: WCD southbound														
7	L2	57	0	60	0.0	0.397	5.6	LOS A	2.0	14.1	0.61	0.68	0.63	46.3
8	T1	225	3	237	1.3	0.397	5.5	LOS A	2.0	14.1	0.61	0.68	0.63	45.5
9	R2	34	1	36	2.9	0.397	10.2	LOS A	2.0	14.1	0.61	0.68	0.63	46.8
Approach		316	4	333	1.3	0.397	6.0	LOS A	2.0	14.1	0.61	0.68	0.63	45.9
West: Access road														
10	L2	33	0	35	0.0	0.037	4.6	LOS A	0.2	1.1	0.51	0.58	0.51	46.1
11	T1	26	1	27	3.8	0.037	4.8	LOS A	0.2	1.1	0.53	0.58	0.53	47.0
12	R2	5	0	5	0.0	0.037	9.4	LOS A	0.1	1.1	0.53	0.58	0.53	44.7
Approach		64	1	67	1.6	0.037	5.1	LOS A	0.2	1.1	0.52	0.58	0.52	46.4
All Vehicles		1777	20	1871	1.1	0.397	5.6	LOS A	2.0	14.1	0.36	0.54	0.36	47.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

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HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Traffic flow diagrams

