

Consultant Traffic Engineers

ABN 67 093 665 680

204 Young Street

Unley SA 5061

P: 08 8271 5999

E: mail@philweaver.com.au

File: 22-183

1 February 2022

Ms Sarah Lowe
Consultant
URPS

By email: slowe@urps.com.au

Dear Ms Lowe,

PROPOSED CODE AMENDMENT (REZONING) – 52 & 66 HILLIER ROAD, HILLIER – TRAFFIC ASSESSMENT

We refer to our recent discussions with respect to the proposed amendment to the zoning of the subject allotments from *'Rural'* to *'Residential Park'*.

As requested, we have undertaken the following review of the traffic related aspects of the potential land use anticipated by the proposed Code Amendment.

1. EXISTING SITUATION

The subject land is located on the northern side of Hillier Road, Hillier, approximately 500m west of Jack Copper Drive and 1km east of Elliot Road.

The subject land is currently located within a *Rural Zone*.

The subject site currently accommodates two detached dwellings with associated outbuildings, but is predominantly undeveloped.

The subject site has a frontage of approximately 248.4m to Hillier Road, and an overall area of approximately 23 hectares. The site is bordered by adjoining allotments to the east and west, and the Gawler River to the north.

There are four existing vehicular access points on Hillier Road associated with the subject land, including two associated with each allotment in the form of a dwelling access point and a secondary land access point.

Hillier Road is a two-lane two-way local collector roadway under the care and control of the Town of Gawler. The sealed width of this roadway is approximately 6m with the opposing traffic lanes separated by single broken (standard) dividing lines. Gravel shoulders of approximately 3m to 4m in width are provided on each side of this roadway adjacent to the subject site. Hillier Road is horizontally and vertically linear adjacent to the subject site, with a posted speed limit of 60km/h.

Traffic volume data on Hillier Road has been provided by the Town of Gawler from a survey undertaken over a week in late May 2018, adjacent to No. 36 Hillier Road (Hillier Park Residential Village). This survey identified that Hillier Road carries approximately 663 vehicles per day, with an average (mean) speed of 63km/h and an 85th percentile speed of 75km/h. The maximum peak hour volume recorded in any one-hour period during this survey was 89 vehicles (5.00pm to 6.00pm on a Wednesday).

At the time of the above survey, the Hillier Park Residential Village accommodated approximately 300 dwellings. The capacity of this village has since increased to approximately 380 dwellings. There has otherwise been minimal notable development accessed from Hillier Road since 2018.

In the most recent five-year reporting period (2016 to 2020 inclusive), there have been no recorded road crashes on Hillier Road within approximately 500m of the subject site. At the intersection of Hillier Road with Jack Cooper Drive, there have been only two recorded road crashes during the same period, including a 'rear-end' and a 'hit fixed object' crash, both of which resulted in property damage only.

The subject site and adjacent locality identified in the 'Area Affected' map prepared by URPS, as reproduced in *Figure 1* below.

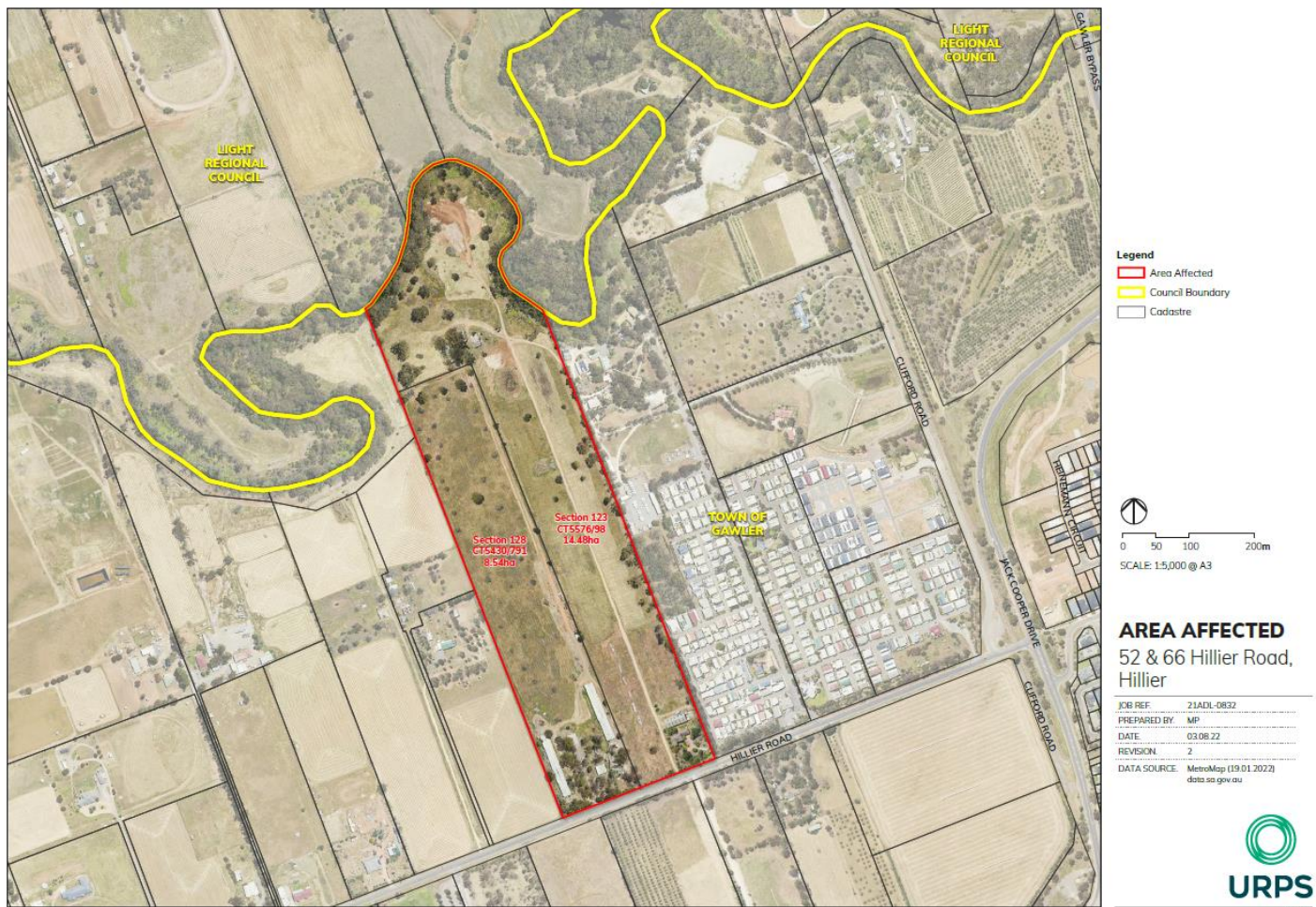


Figure 1: Subject site and surrounding locality

A more detailed image of Hillier Road along the frontage of the subject site is provided in *Figure 2* below. *Figures 3 and 4* provide images of views looking westbound along the length of Hillier Road adjacent to the subject site, and an image across Hillier Road towards the central existing access point associated with No. 52 Hillier Road, respectively.



Figure 2: Aerial imagery of the Hillier Road frontage to the subject site



Figures 3 and 4: Photos taken along and across Hillier Road adjacent to the subject site

2. PROPOSED CODE AMENDMENT (REZONING)

The proposed Code Amendment involves rezoning of the subject land from *Rural* to *Residential Park*.

The subject Code Amendment proposal does not contemplate nor warrant detailed site plans, however it is understood that the subject site could accommodate of the order of 400 residential allotments together with a significant portion of reserve at the northern end of the site in the locality of the Gawler River.

The residential park would provide additional opportunities for affordable accommodation in the locality for persons over 50 years of age.

An example of the anticipated nature and density of the subject land is available from the Hillier Park Residential Village located to the immediate east of the subject land. This existing development is located within a *Residential Park Zone*, i.e., the zoning which is proposed for the subject land. The Hillier Park Residential Village website identifies that there are over 450 people over 50 years of age living within this adjoining facility, the majority of whom are retired and in their late 60's or early 70's.

It is anticipated that future development on the subject site would be accessed via a single two-way vehicular access point to Hillier Road, and that there would be no internal road linkages to the existing Hillier Park Residential Village located to the immediate east of the subject land.

It is also anticipated that the Gawler on-demand bus service, which is currently available to Hillier Park Residential Village, could also be available to future residents on the subject land in order to provide alternative transport opportunities to use of private cars.

3. TRAFFIC ASSESSMENT

3.1 Vehicular Trip Generation

The *'Guide to Traffic Generating Developments'* report produced by the (former) Roads and Traffic Authority of NSW identifies housing for aged persons of the order of:

- 1 to 2 daily vehicle trips per dwelling, including
- 0.1 to 0.2 evening peak hour vehicle trips per dwelling.

This standard identifies that resident-funded facilities, such as that proposed, typically reflect the upper bounds of the above ranges.

On the above basis, the subject land with a forecast future capacity for up to 400 allotments is anticipated to generate up to 800 daily vehicle trips including 80 evening peak hour vehicle trips.

While such rates are notably lower than standard residential developments (9 daily vehicle trips including 0.85 weekday peak hour vehicle trips), they are considered realistic based on the traffic data available on Hillier Road which included existing volumes of traffic associated with the Hillier Park Residential Village adjacent to the subject site.

For example, there were approximately 300 dwellings within the Hillier Park Residential Village at the time of the 2018 traffic survey, which identified an AADT volume of 663 vehicles per day on Hillier Road.

Assuming the vast majority of trips associated with the above village were captured by this survey due to these traffic movements generated largely to and from the east (300 dwellings * 2 daily vehicle trips per dwelling * 90% of trips captured in this direction = 540 trips), together with relatively low volumes associated with external traffic in the locality travelling further to the west due to only low levels of development in this locality (~123 trips remaining), the survey data suggests that such traffic volume estimates of 2 daily vehicle trips including 0.2 evening peak hour vehicle trips per dwelling would be appropriate.

It is anticipated that the proposed land use as a residential park would occur in a staged manner, with incremental growth of the site towards 400 dwellings occurring over the medium-to-long term. As such, it is anticipated that traffic volumes would correspondingly increase over an extended period of time rather than all at once.

As a result of the future land use on-site there could be a resultant traffic volume on Hillier Road of the order of approximately ~1,400 vehicles per day. Such volumes would remain well within the capacity of a typical minor collector road (up to 3,000 vehicles per day).

3.2 Traffic Distribution

Based on the anticipated user-profile of the potential longer-term use of the subject site as a residential park and the location of the site in relation to infrastructure and services in the wider locality, it is forecast that approximately 90% of traffic movements generated by the proposed land use would occur to and from the east, i.e., towards Gawler. Consequently, only a minority of traffic would be anticipated to occur to and from the west with these trips associated with localities such as Angle Vale and Adelaide via the Northern Expressway.

Upon completion of the potential residential village development, this would equate to additional traffic movements on Hillier Road of approximately 72 peak hour vehicle trips to and from the east, and 8 peak hour vehicle trips to and from the west.

Based on typical residential distributions of approximately 75% departure / 25% arrival distributions in the morning peak hour, and 33% departure / 67% arrival distributions in the evening peak hour period, the resultant forecast am (pm) peak hour traffic movements to and from the site are identified in *Figure 5* below.

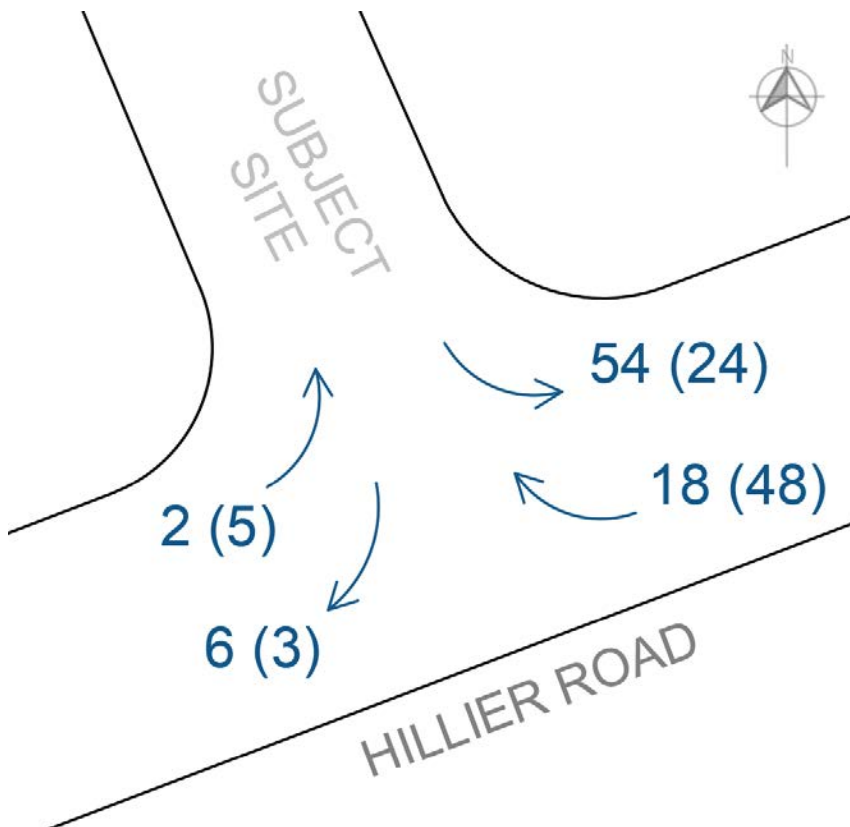


Figure 5: Forecast am (pm) traffic distributions associated with the potential future land use

3.3 Access Point Design

Based upon our assessment of the above traffic volumes and the requirements of relevant Austroads traffic engineering standards (including the *Guide to Traffic Management Part 6 Intersections Interchanges and Crossings Management*), we consider that channelised turning lane treatments would not be required on Hillier Road to service the potential access point associated with the future land use.

Figure 3 below identifies the 'warrants for turn treatments on major roads at unsignalised intersections' in relation to the forecast volumes associated with the subject site and the adjoining road network. In relation to Figure 3 the following inputs have been considered:

- A conservative design speed of between 70km/h and 100km/h given the 85th percentile speed surveyed was 75km/h, notwithstanding the 60km/h posted speed limit and 63km/h surveyed mean speed,
- A maximum Q_R (or Q_L) of 54 based on Figure 5, and
- $Q_M = Q_T + Q_L = 89$ (maximum surveyed volume in any one-hour period) + 5 (from Figure 5) = 94. This is notwithstanding that the existing volume of traffic directly adjacent to the subject site is anticipated to be significantly lower than the surveyed volume due to the location of the survey which would have captured traffic relating to the existing Hillier Park Residential Village that would not continue to travel to the west, past the subject site.

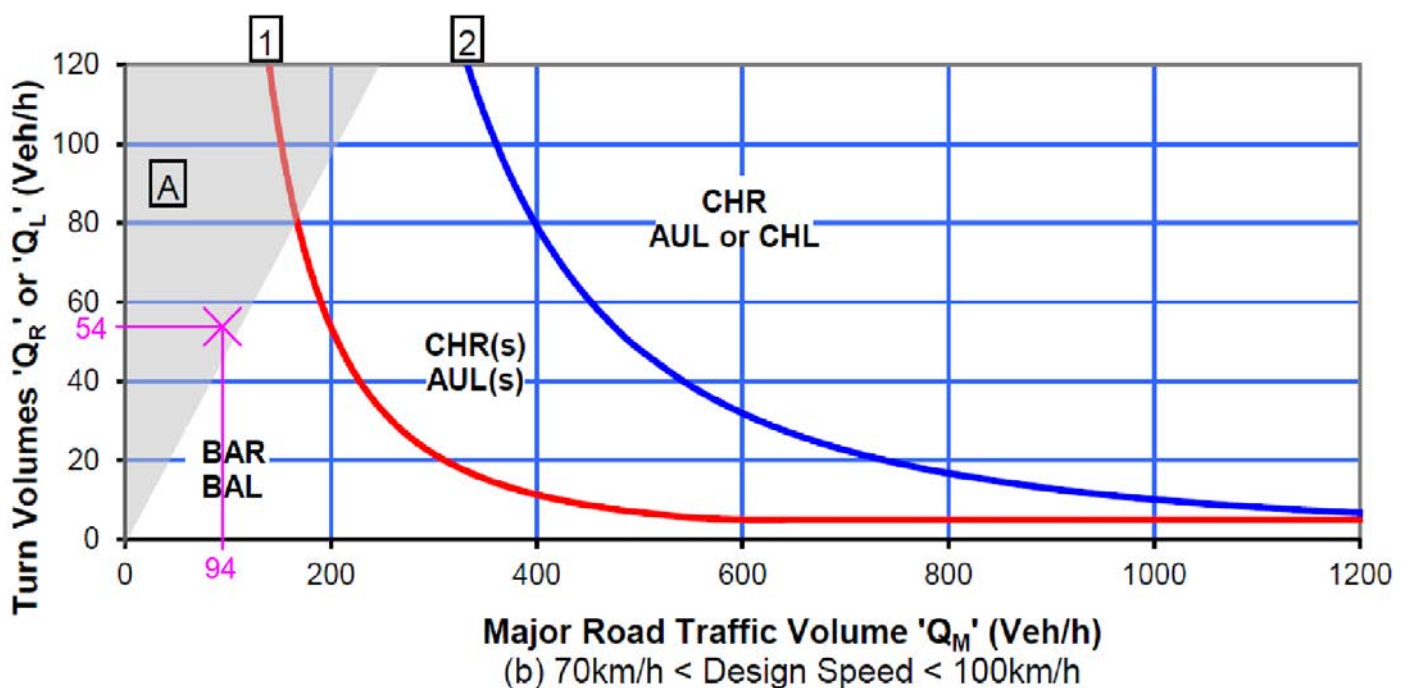


Figure 6: Warrant for turn treatments

Following a review of the forecast traffic volumes council staff have identified that provision of a formal BAL would not be necessary, however a formally sealed BAR treatment is required.

The geometric design of the proposed access point would be subject to future detailed design. Figure 7 below identifies an indicative access point at the centre of the site frontage, with an internal width of 8m and a BAR treatment on Hillier Road. This BAR treatment would require approximately 225m² of sealing on the southern side of Hillier Road opposite the subject site, as shown.

Figure 7 includes swept path diagrams of simultaneous 8.8m long Medium Rigid Vehicle (MRV) site entry and exit movements, i.e., a 'service' design vehicle, together with a 12.5m long Heavy Rigid Vehicle (HRV) utilising the BAR treatment to pass MRV's queueing to turn right into the subject site.



Figure 7: Indicative site access point location and arrangement with simultaneous MRV site accessibility

Figure 8 below identifies that the concept 8m wide access point would also permit site accessibility by HRV 'check vehicles', including left and right turn site entry and exit movements, utilising both lanes where required.



Figure 8: 12.5m HRV check vehicle movements

Based on the horizontally and vertically linear profile of Hillier Road, together with the existing wide road shoulders / verges, there is anticipated to be sufficient sight distance associated with a future access point servicing the subject land to meet Safe Intersection Sight Distance (SISD) requirements in both directions along this roadway associated with such an access point.

This is notwithstanding that such an assessment would normally be undertaken as part of a specific development application for a land division associated with the subject land.

A SIDRA assessment has identified a Level of Service of 'A' for all approaches of the potential future access point based on the conservative volumes identified in *Figures 5 and 6* above and a design with a single entry and a single exit lane, i.e., a similar layout to that provided for the adjoining Hillier Park Residential Village. The SIDRA movement summaries during both the am and pm peak hour periods are included as an appendix to this report.

3.4 Internal Arrangements

The internal road layout does not form part of the Code Amendment application. Any future development including a land division would be subject to a specific Development Application and the relevant provisions of the *Planning and Design Code*. However once again, the adjoining Hillier Park Residential Village can be used as a potential example of future design aspects such as:

- On-site car parking provisions for each dwelling together with parallel parking opportunities along internal roadways and dedicated car parking areas near community facilities at the front of the site,
- The primary internal roadway, which is anticipated to extend in a similar north-south manner to that of the Hillier Park Residential Village, should be sufficiently wide to accommodate service vehicles, and may require traffic calming devices such as road humps in the event that it has long horizontally linear stretches,
- Internal local / access roadways which should provide a minimum kerb-to-kerb width of 5.5m in order to maintain simultaneous two-way passenger vehicle access or one-way access past a parked vehicle, and
- Provision of loop roads, passing areas, and turnaround areas in order to accommodate the minimum requirements for fire appliances as identified in the *Hazards (Bushfire – General) Zone Overlay*.

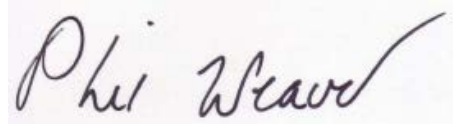
4. SUMMARY AND CONCLUSIONS

In summary, the proposed Code Amendment to the zoning of the subject land from 'Rural' to 'Residential Park' would enable the potential future development of the subject land to accommodate up to 400 affordable accommodation units typically for retired persons.

Based upon relevant traffic standards it is anticipated that such a potential land use would generate approximately one quarter of the traffic volumes per dwelling than generated by standard residential allotments. The above assessment has identified that the volumes of traffic forecast to be generated by the subject site are anticipated to remain within the capacity of Hillier Road.

Additionally, the future site access point design would likely require only a BAR treatment on Hillier Road in order to appropriately accommodate the future forecast volumes of traffic associated with the subject land given the linear horizontal and vertical alignments along this roadway.

Yours sincerely,



Phil Weaver
Phil Weaver and Associates Pty Ltd

Appendix A: SIDRA assessment – Forecast am and pm peak hour volumes accessing the subject land

MOVEMENT SUMMARY

Site: Hillier Road [AM]

Hillier Road
 Site Category: (None)
 Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total	HV %				Vehicles	Distance				
		veh/h	%	v/c	sec		veh	m				
East: Hillier (east)												
5	T1	23	0.0	0.024	0.1	LOS A	0.1	0.6	0.14	0.26	0.14	57.2
6	R2	19	0.0	0.024	5.6	LOS A	0.1	0.6	0.14	0.26	0.14	55.1
Approach		42	0.0	0.024	2.6	NA	0.1	0.6	0.14	0.26	0.14	56.2
North: Site Access Point												
7	L2	57	0.0	0.042	5.7	LOS A	0.2	1.2	0.15	0.54	0.15	53.1
9	R2	6	0.0	0.042	5.8	LOS A	0.2	1.2	0.15	0.54	0.15	52.6
Approach		63	0.0	0.042	5.7	LOS A	0.2	1.2	0.15	0.54	0.15	53.1
West: Hillier (west)												
10	L2	2	0.0	0.038	5.5	LOS A	0.0	0.0	0.00	0.02	0.00	58.2
11	T1	71	0.0	0.038	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	59.8
Approach		73	0.0	0.038	0.2	NA	0.0	0.0	0.00	0.02	0.00	59.8
All Vehicles		178	0.0	0.042	2.7	NA	0.2	1.2	0.09	0.26	0.09	56.4

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

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

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

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Project: Z:\22-183 - 52 Hillier Road, Hillier - Code Amendment\SIDRA\Preliminary Hillier.sip8

MOVEMENT SUMMARY

Site: Hillier Road [PM]

Hillier Road
 Site Category: (None)
 Giveaway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Hillier (east)												
5	T1	63	0.0	0.063	0.1	LOS A	0.2	1.7	0.09	0.26	0.09	57.4
6	R2	51	0.0	0.063	5.5	LOS A	0.2	1.7	0.09	0.26	0.09	55.3
Approach		114	0.0	0.063	2.5	NA	0.2	1.7	0.09	0.26	0.09	56.4
North: Site Access Point												
7	L2	25	0.0	0.019	5.6	LOS A	0.1	0.5	0.09	0.55	0.09	53.4
9	R2	3	0.0	0.019	5.9	LOS A	0.1	0.5	0.09	0.55	0.09	52.8
Approach		28	0.0	0.019	5.7	LOS A	0.1	0.5	0.09	0.55	0.09	53.3
West: Hillier (west)												
10	L2	5	0.0	0.019	5.5	LOS A	0.0	0.0	0.00	0.09	0.00	57.6
11	T1	32	0.0	0.019	0.0	LOS A	0.0	0.0	0.00	0.09	0.00	59.2
Approach		37	0.0	0.019	0.8	NA	0.0	0.0	0.00	0.09	0.00	59.0
All Vehicles		179	0.0	0.063	2.7	NA	0.2	1.7	0.07	0.27	0.07	56.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
 Vehicle movement LOS values are based on average delay per movement.
 Minor Road Approach LOS values are based on average delay for all vehicle movements.
 NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
 SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
 Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.