Traffix Group

Integrated Transport Assessment - Addendum

Merrimu Precinct Structure Plan

Prepared for
Bacchus Marsh Developments Pty Ltd

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G23398R-03A

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1 Executive Summary

Traffix Group has been engaged by Stamoulis Property Group to prepare an Integrated Transport Assessment to inform the preparation of the Merrimu Precinct Structure Plan (PSP).

Traffix Group prepared an Integrated Transport Assessment (ITA) (Ref G23398R-02B) for the Merrimu PSP dated 4 March 2025 which sets out transport engineering assessments based on staged delivery of in the order of 6,420 households.

Following consultation with Council, the Department of Transport and Planning (DTP) and the Victorian Planning Authority (VPA), additional traffic modelling was undertaken using the Victorian Integrated Transport Model (VITM), which is a comprehensive, state-wide strategic transport model owned and maintained by DTP.

The VITM modelling is based on a revised yield of 7,825 households.

This addendum ITA report addresses the VITM modelling outputs and updated yields and includes a comparison of the VITM modelling with the Traffix Group ITA (March 2025).

Key findings are as follows:

- having regard to the traffic generation rates extrapolated from the VITM model, the development staging analysis set out in the Traffix Group ITA (2025) is fit-for-purpose, particularly in relation to the intersection modelling (SIDRA) for Stages 1 to 5 where the dwelling yields have not changed,
- most of the road and intersection designs set out in the Traffix Group ITA (2025) remain appropriate based on the updated VITM modelling and yields,
- intersection IN-04 will carry more traffic based on the VITM modelling and Buckleys Road will require additional lanes or duplication between IN-04 and the ELR,
- the ELR project should include a connection between RD-03 and the ELR to reduce congestion and traffic impacts on Buckleys Road and the town centre (including IN-04),
- intersection IN-09 (Flanagans Drive/Bacchus Marsh Road) will require a change to the lane configuration on Flanagans Drive (convert one left-turn lane to a right-turn lane) when the Bacchus Marsh Road/Western Freeway/ELR interchange is constructed and the west leg of IN-09 will need to be duplicated between the freeway interchange and IN-09 to accommodate the 2056 VITM Project Case volumes,
- intersection IN-10 (Bences Road/Diggers Rest-Coimadai Road) will operate within acceptable limits under its existing Give-Way controlled T-intersection configuration under the 2056 full build-out scenario both with and without the ELR, and
- under the 2056 Reference Case (without any development within the Merrimu precinct), Gisborne Road has a V/C ratio of 0.97 north of Holts Lane which indicates that Gisborne Road will reach capacity and will require intervention, either in the form of upgrade on Gisborne Road or by constructing the ELR to remove some of the traffic from the Bacchus Marsh town centre.

2 Background

Traffix Group has been engaged by Stamoulis Property Group to prepare an Integrated Transport Assessment (ITA) to inform the preparation of the Merrimu Precinct Structure Plan (PSP).

The Traffix Group ITA (Ref G23398R-02B) dated 4 March 2025 sets out transport engineering assessments based on staged delivery of in the order of **6,420 households** within high amenity compact urban neighbourhood centred around walkable village centres, schools and an extensive network of open space, walking and cycling facilities to support active travel.

The Traffix Group ITA (March 2025) addresses delivery of the internal PSP network and external connections independent of the future Bacchus Marsh Eastern Link Road (ELR). Notably, the purpose of the report was to demonstrate that there was capacity to build the Merrimu PSP in advance of the ELR.

Following completion of the Traffix Group ITA (March 2025), consultation was undertaken with Council, DTP and VPA.

A key outcome of the consultation was a request to:

- undertake VITM modelling,
- provide VITM modelling output in the form of volume-to-capacity (V/C) ratios,
- analyse the ultimate 2056 scenario incorporating the ELR and other future development areas including Parwan and Cobblebank, and
- include development at standard densities within the Long Forest Estate area.

In order to address the additional transport modelling requests, Clarity Consult were engaged to undertake a Strategic Transport Modelling Assessment (STMA) of the Merrimu PSP.

The Clarity STMA is based on a revised yield of **7,825 households**, an increase of 1,405 households, and includes the ELR.

This addendum ITA report addresses the VITM modelling outputs and updated yields and includes a comparison of the VITM modelling with the Traffix Group ITA (March 2025).

3 Summary of Changes

The significant changes to the underlying assumptions which have been included in the Clarity VITM modelling which were not included in the original Traffix Group ITA (2025) are as follows:

- 1,405 additional residential lots within the PSP area overall with significant development in the Long Forest precinct (Stage 7) as well as some additional lots in the O'Connell Road area (Stage 6),
- a 2056 "ultimate" design year with the assumption that the ELR will be built by that time,
- no east-west connection to the ELR north of Buckleys Road in the ultimate (with ELR) case, although the link is included in the "no ELR" case and is assumed to be in place in the interim prior to the construction of the ELR, and
- the addition of a secondary school (four schools total within the PSP, comprising two government primary schools, a non-government P-9 and a government secondary school).

Table 1 below sets out a comparison of the dwelling yield assumptions in the Traffix Group ITA (2025) (previous) and the Clarity VITM modelling (updated).

Table 1: Dwelling Yield Assumptions

Development Stage	Estimated Dwellings (Cumulative) (Previous)	Estimated Dwellings (Cumulative) (Updated)
Stage 1	1,030 dwellings	1,030 dwellings
Stage 2	2,198 dwellings	2,198 dwellings
Stage 3	2,850 dwellings	2,850 dwellings
Stage 4	4,863 dwellings	4,863 dwellings
Stage 5	6,072 dwellings	6,072 dwellings
Stage 6	6,350 dwellings	6,480 dwellings (1)
Stage 7 (Long Forest)	6,420 dwellings	7,825 dwellings (2)

Note (1): 130 additional dwellings included in Stage 6
Note (2): 1,275 additional dwellings included in Stage 7 (Long Forest)

Table 1 shows no change to the dwelling yield assumptions for the first five development stages (6,072 lots), with the increased dwelling yields occurring in the later stages only (Stage 6 and 7).

Figure 1 shows the indicative PSP road layout, including the key road network within Long Forest Estate (Stage 7), which includes connection of the two existing dead-ends of Condor Drive, connecting Long Forest Estate to the broader road network via Streeton Drive and Flanagans Drive.

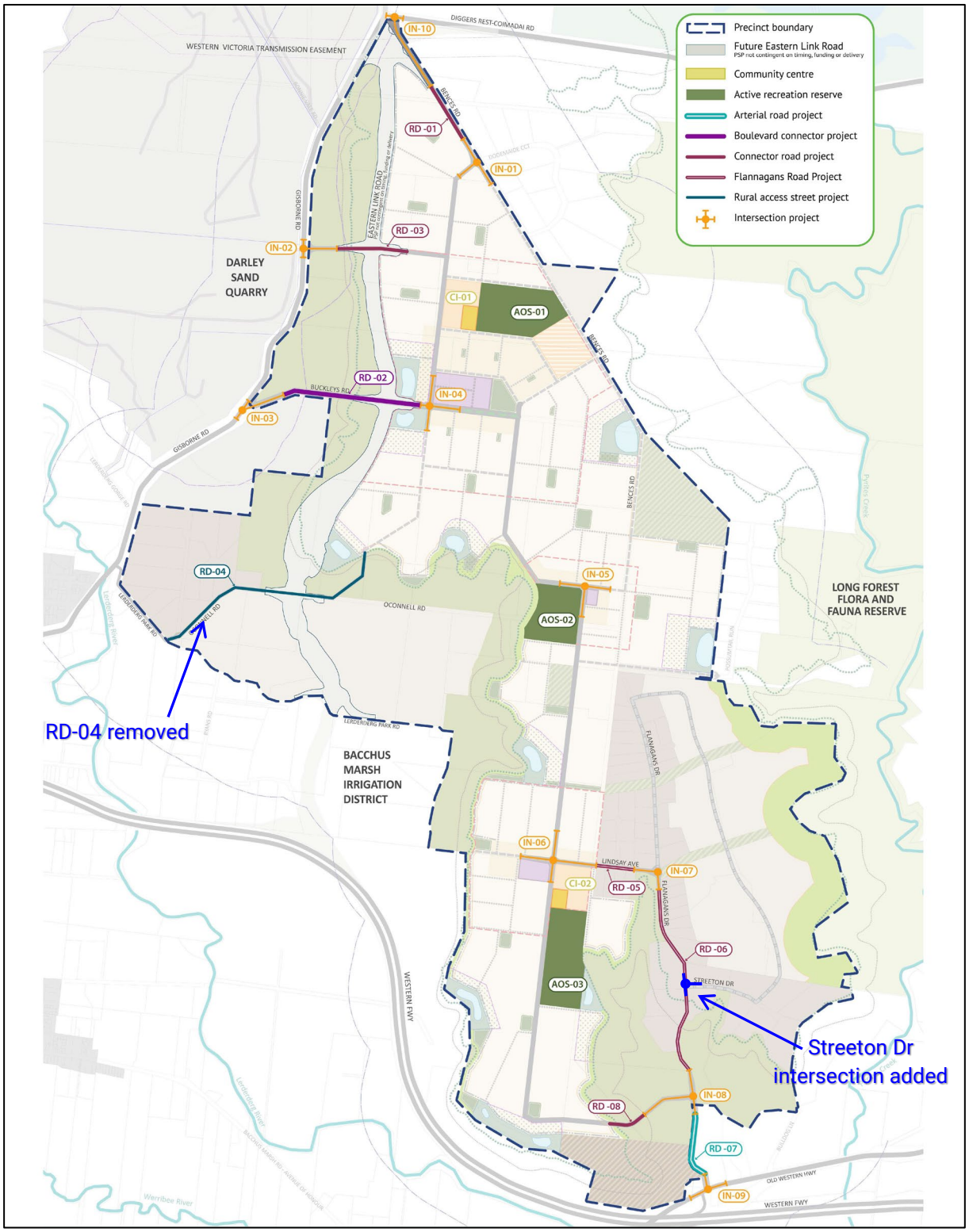


Figure 1: PSP Road Layout Including Road & Intersection Projects

4 VITM Model Review

Clarity Consult were engaged to undertake a Strategic Transport Modelling Assessment (STMA) of the Merrimu PSP.

The STMA included:

- a review and validation of the VITM 2018 reference year model,
- forecasting future traffic conditions without the Merrimu PSP (Reference Case),
- future full build-out conditions in the ultimate 2056 horizon year (Project Case), and
- a project case (full build-out) without the Eastern Link Road (ELR).

The modelling takes into account broader development and land use assumptions including development in Bacchus Marsh, Maddingley, Parwan, Cobblebank and Melton.

A review of the STMA outputs is provided below.

4.1 Peak Flow Factor

The STMA outputs are expressed as:

- AM Peak: 2-hour period (7am – 9am)
- PM Peak: 3-hour period (3pm – 6pm)
- Daily: (24-hour)

In order to compare the STMA outputs with the Traffix Group Integrated Transport Assessment (ITA) (2025), a Peak Flow Factor (PFF) is applied to convert AM 2-hour and PM 3-hour volumes to one-hour peak volumes.

In order to determine typical PFFs localised to the Merrimu/Bacchus Marsh area, the recorded weekday peak traffic count data for the case study site at Stonehill Drive, Maddingley has been reviewed, and the following PFFs were identified:

- AM Peak: 0.57
- PM Peak: 0.38

These PFFs are consistent with current practice and are appropriate to apply to the STMA outputs to identify the one-hour peak volumes.

4.2 Traffic Generation Rates Comparison

Table 2 below sets out a comparison of the traffic generation rates adopted for the purposes of the Traffix Group ITA with those extrapolated from the Clarity STMA output.

Notably, the traffic volume inputs and outputs of zone connector for Long Forest (Stage 7) have been extracted from the model to establish the underlying traffic generation rates which the Clarity STMA output is using in the 2056 Project Case.

The Long Forest zone connector is a purely residential catchment and does not include any jobs, schools or other non-residential uses and is therefore an appropriate basis for comparing traffic generation rates between the Traffix Group and Clarity traffic modelling.

The Long Forest (Stage 7) catchment incorporates an assumed total of 1,345 lots in the ultimate, inclusive of existing dwellings and ultimate full build-out dwellings.

Peak flow factors of 0.57 and 0.38 have been adopted to derive peak one-hour volumes in the AM and PM peak hours respectively.

Table 2: Traffic Generation Rates Comparison

	Traffix Group ITA	Clarity STMA
Daily Traffic Generation Rate	7 trips per dwelling per day	7.91 trips per dwelling per day
AM Peak Hour	0.67 trips per dwelling per day (1)	0.60 trips per dwelling per day
PM Peak Hour	0.7 trips per dwelling per day (1)	0.71 trips per dwelling per day

Note (1): These are the "standard density dwelling" rates adopted in the Traffix Group analysis. Lower rates were adopted for medium density development. The lower rates cannot be directly compared because areas with medium density development are mixed with other uses (shops/jobs/schools) in the relevant zone connectors in the STMA model.

Table 2 shows that while the daily traffic generation rates for standard density residential development in the Clarity VITM model are approximately 13% higher than the rates adopted in the Traffix Group ITA (2025), the critical peak hour traffic generation rates adopted in the Traffix Group ITA (2025) are comparable to the VITM model, notably:

- the AM peak hour traffic generation rate extrapolated from the model is lower than the rate adopted in the Traffix Group ITA (2025), and
- the PM peak hour traffic generation rate adopted in the Traffix Group ITA (2025) is within 1% of the rate extrapolated from the VITM model.

Accordingly, the development staging analysis set out in the Traffix Group ITA (2025) is fit-for-purpose, particularly in relation to the intersection modelling (SIDRA) for Stages 1 to 5, where the dwelling yields have not changed.

For Stages 6 and 7, the yields have changed and the ELR is likely to be complete. The Clarity VITM model shows the impacts on the broader transport network under the full build-out ultimate scenario.

4.3 Midblock Daily Traffic Volumes Comparison

Table 3 below shows a comparison between the Traffix Group ITA (2025) spreadsheet modelling outputs (full build-out, no ELR) and the two Clarity VITM modelling scenarios, i.e. one with the ELR and one without.

It is noted that the Traffix Group ITA (2025) was based on 6,420 households, while the Clarity VITM model is based on 7,825 households. The Traffix Group spreadsheet model has not been updated for the additional dwelling yield because the VITM model outputs have been relied upon in the updated analysis presented in this addendum ITA report.

Table 3: Midblock Daily Traffic Volumes Comparison

Location	Traffix Group ITA (2025)	Clarity VITM Project Case (No ELR) (1)	Clarity VITM Project Case (With ELR) (1)
RD-01 (Bences Road)	8,600vpd	3,400vpd	3,700vpd
RD-02 (Buckleys Road between IN-03 and ELR)	5,000vpd	13,900vpd	5,800vpd
RD-02 (Buckleys Road between ELR and IN-04)	5,000vpd	13,900vpd	21,500vpd
Buckleys Road east of IN-04	8,500vpd	13,900vpd	14,900vpd
RD-03 (Northern E-W Connector)	3,000vpd	4,200vpd	N/A (removed)
RD-04 (Oconnell Road)	2,000vpd	2,300vpd	2,500vpd
RD-05 (Lindsay Ave)	11,900vpd	10,900vpd	9,300vpd
RD-06 (Flanagans Drive between IN-07 and IN-08)	11,900vpd	14,900vpd	14,200vpd
RD-07 (Flanagans Drive between IN-08 and IN-09)	18,300vpd	23,400vpd	22,600vpd
RD-08 (Escarpment Connector)	6,500vpd	8,500vpd	8,400vpd
N-S Connector north of IN-04	10,700vpd	7,600vpd	7,300vpd
N-S Connector between IN-05 and IN-06	12,600vpd	13,100vpd	10,700vpd
N-S Connector south of IN-06	4,000vpd	4,300vpd	3,300vpd

Note (1): The Project Case (both No ELR With ELR cases) include an additional 1,405 dwellings compared to the Traffix Group ITA.

4.3.1 No ELR Modelling Comparison

When comparing the Traffix Group ITA spreadsheet modelling outputs (no ELR) with the 2056 VITM model "no ELR" scenario, the following is noted:

- Volumes between the two models are similar on RD-04 (Oconnell Road), RD-05 (Lindsay Avenue), the north-south connector between IN-05 and IN-06 and the north-south connector south of IN-06.
- Traffic volumes are significantly lower in the VITM model than in the Traffix Group spreadsheet model on both Bences Road and on the north-south connector north of IN-04. The VITM modelled volumes are lower on these roads because:
  - the VITM model uses zone connectors which simplify the traffic distribution. Notably, an entire development stage is represented by a zone connector into IN-04, whereas in practice, some of that traffic will enter the road network to the north of IN-04, and
  - under the VITM model more traffic is directed towards Gisborne Road (south) and less towards Diggers Rest-Coimadai Road via Bences Road. Notably, the VITM model only considers midblock traffic capacity and does not address whether the existing intersections on Gisborne Road can accommodate the traffic. The Traffix Group model included a travel time analysis which determined that for northern parts of the PSP, travel towards the northern and western suburbs of Melbourne will be faster via Diggers Rest-Coimadai Road, particularly in the interim before the ELR is constructed.
- Traffic volumes are higher in the VITM model than in the Traffix Group spreadsheet model on RD-02 (Buckleys Road), and RD-06/RD-07 (Flanagans Drive). The differences are due to:
  - the increase in assumed development within the Long Forest Estate (Stage 7) under the VITM model compared with the Traffix Group ITA spreadsheet modelling, with the additional traffic generated by Long Forest Estate primarily exiting the Merrimu PSP area via Flanagans Drive, and
  - the redistribution of traffic to Buckleys Road towards Gisborne Road to head towards the freeway instead of via Bences Road and Diggers Rest-Coimadai Road.

4.3.2 VITM Model Daily Volume Outputs Comparison (Ultimate, with ELR)

When comparing the Traffix Group ITA spreadsheet modelling outputs (no ELR) with the 2056 VITM model "with ELR" scenario, the following is noted:

- RD-01 (Bences Road has lower volumes in the ultimate compared to the Traffix Group ITA spreadsheet modelling outputs. The proposed road classification and cross-section recommended in the Traffix Group ITA (2025) is appropriate.
- RD-02 (Buckleys Road) has volumes within the same order of magnitude between Gisborne Road and the ELR under the VITM model compared with the Traffix Group ITA spreadsheet model.
- RD-02 (Buckleys Road) will carry substantially higher volumes between the ELR and IN-04 under the VITM modelled "ELR" scenario. Notably, in the order of 21,500vpd are anticipated, compared to only 5,000vpd under the Traffix Group spreadsheet model. This significant difference is primarily due to the assumption that in the VITM model, the northern east-west connection to ELR will be removed (extending from the quarry entrance), which essentially directs all PSP traffic to access the ELR at a single point (Buckleys Road). Additional differences are due to:
  - the Traffix Group model not including the ELR,

  - the Traffix Group model assuming a higher proportion of eastbound traffic will use Diggers Rest-Coimadai Road with less using the Western Freeway based on travel time data,
  - the Clarity VITM model including 1,405 additional dwellings, and
  - the Clarity VITM model calculating a higher daily traffic generation rate per dwelling.
- RD-02 and associated intersection (IN-04) may need to be re-designed if the VITM modelling outputs are adopted.
- RD-03 connection to ELR is removed in the VITM model in the 2056 Project Case.
- RD-05 (Lindsay Avenue) has slightly lower volumes in the VITM model compared with the Traffix Group ITA spreadsheet modelling outputs. The proposed cross-section set out in the Traffix Group ITA (2025) is appropriate. Similarly, the IN-06 intersection design is also appropriate and will accommodate the full build-out traffic volumes.
- RD-06 (Flanagans Drive between IN-07 and IN-08) will carry 14,200vpd under the VITM model compared with 11,900vpd under the Traffix Group spreadsheet model. While these volumes are higher, primarily due to the additional lots in Long Forest Estate, they remain within the capacity of a two-lane two-way limited access road. It is noted that while the volumes are within the range for an arterial road, the recommended connector road classification should remain as the ELR will provide the primary arterial road function and through traffic will be discouraged from travelling through the Merrimu precinct.
- RD-07 (Flanagans Drive between IN-08 and IN-09) will carry 22,600vpd under the ultimate VITM model (with ELR) compared with 18,300vpd under the Traffix Group spreadsheet model. While these volumes have increased, they remain well within the capacity of a four-lane divided secondary arterial and no changes to the road cross-section are required.
- RD-08 (Escarpment Connector) will carry up to 8,400vpd under the VITM model compared with 6,500vpd under the Traffix Group spreadsheet model. These volumes remain within the capacity of the limited access connector road cross-section set out in the Traffix Group ITA (2025) and no changes are required as a result.
- The north-south connector road north of IN-04 has reduced volumes under the VITM model compared with the Traffix Group ITA spreadsheet modelling outputs. The proposed road classification and cross-section recommended in the Traffix Group ITA (2025) is appropriate.
- The north-south connector between IN-05 and IN-06 has reduced volumes under the VITM model compared with the Traffix Group ITA spreadsheet modelling outputs. The proposed road classification and cross-section recommended in the Traffix Group ITA (2025) is appropriate.
- The north-south connector south of IN-06 has slightly reduced volumes under the VITM model compared with the Traffix Group ITA spreadsheet modelling outputs. The proposed road classification and cross-section recommended in the Traffix Group ITA (2025) is appropriate.

4.4 Volume to Capacity (V/C) Ratio Plots

The V/C ratio plots are set out in the Clarity STMA report, with detailed V/C ratios included in the table at Appendix A to the Clarity report. The key outputs are summarised as follows:

- Under the 2056 Reference Case (without any development within the Merrimu precinct), key roads near Bacchus Marsh Town Centre are nearing capacity in both the AM and PM road network peak periods with a V/C ratio of 0.8 – 1, including:
  - Gisborne Road has a V/C ratio of 0.97 north of Holts Lane. This indicates that even in the absence of the Merrimu development, Gisborne Road will reach capacity and will require intervention, either in the form of upgrades on Gisborne Road or by constructing the ELR to remove some of the traffic from the Bacchus Marsh town centre.
  - Bacchus Marsh Road west of Woolpack Drive has a V/C ratio of 0.81. This indicates that even in the absence of the Merrimu development, this section of Bacchus Marsh Road will be nearing capacity.
- Under the 2056 Project Case AM Peak (with Merrimu PSP full build-out):
  - The Western Freeway (eastbound) experiences a minor increase in congestion, with the V/C ratio increasing from 0.71 (reference case) to 0.82 (project case). The vehicle speeds are not significantly affected.
  - There is some minor mid-block congestion at the freeway interchange near Flanagans Drive.
  - There is an increase in congestion on the already congested Bacchus March town centre.
  - Within the PSP area, a V/C ratio of 0.93 is shown on Buckleys Road between IN-04 and the ELR access, and a V/C ratio of 0.83 is shown on Flanagans Drive between IN-07 and IN-08.
- Under the 2056 Project Case PM Peak (with Merrimu PSP full build-out):
  - The Western Freeway (westbound) experiences a minor increase in congestion, with the V/C ratio increasing from 0.77 (reference case) to 0.87 (project case). The vehicle speeds fall from 94km/h to 83km/h demonstrating that traffic performance is impacted, but that reasonable freeway traffic speeds can still be maintained.
  - There is some minor mid-block congestion at the freeway interchange near Flanagans Drive.
  - Within the PSP area, a V/C ratio of 0.94 is shown on Buckleys Road between the ELR and IN-04, and a V/C ratio of 0.83 is shown on Flanagans Drive between IN-07 and IN-08.
- Under the 2056 No ELR Case AM Peak (with Merrimu PSP full build-out):
  - There are significant impacts to congestion on the section of Gisborne Road which connects the PSP (from Buckleys Road) to the Western Freeway interchange with the V/C ratio exceeding one (1.09 north of Holts Lane).
  - There is further deterioration in performance of roads in the already congested Bacchus Marsh Town Centre.

  - There is major congestion on the Bacchus Marsh Road and Woolpack Road route with the V/C ratio exceeding one (1.07 east of Flanagans Drive and 1.03 east of Woolpack Road).
- Under the 2056 No ELR Case PM Peak (with Merrimu PSP full build-out):
  - There are significant impacts to congestion on the section of Gisborne Road which connects the PSP (from Buckleys Road) to the Western Freeway interchange with the V/C ratio exceeding one (1.02 north of Holts Lane).
  - There is further deterioration in performance of roads in the already congested Bacchus Marsh Town Centre.
  - There is major congestion on the Bacchus Marsh Road and Woolpack Road route with the V/C ratio exceeding one (1.02 east of Flanagans Drive).
  - Within the PSP area, the V/C ratio exceeds 0.8 on the internal north-south connector between IN-05 and IN-06 (0.88) as well as on Flanagans Drive (northbound) between IN-07 and IN-08 (0.88).

The V/C ratio analysis identifies that without the ELR, traffic demand on Gisborne Road and Bacchus Marsh Road will exceed capacity under full build-out of the PSP and would experience significant congestion particularly during the AM peak period.

It is noted that the VITM model assumes full build-out of the Merrimu PSP as well as the future planned Parwan Employment Precinct, with the resulting congestion on the existing arterial road network being a combined result of both developments.

5 Intersection and Road Project Changes

Table 3 indicates that a number of internal roads may carry higher traffic volumes at full build-out than was assumed in the Traffix Group ITA (2025). Accordingly, affected intersections have been re-tested using SIDRA analysis based on the VITM model outputs as set out below.

5.1 IN-03 (Gisborne Road/Buckleys Road)

The Traffix Group ITA (2025) assumed a two-way peak hour volume in the order of 454vph on Buckleys Road during the road network PM peak hour, while the ultimate Project Case 2056 (with ELR) VITM model identifies a two-way daily volume in the order of 707vph.

The 2056 (no ELR) VITM model indicates a higher two-way daily volume in the order of 1,864vph on Buckleys Road with full build-out of the Merrimu PSP without the ELR.

The V/C ratios in the VITM model show that there will be other impacts further south on Gisborne Road in the event that the ELR is not constructed by 2056 taking into account the cumulative impacts of the PSP as well as other development precincts in the broader area.

For the purpose of providing a robust analysis, the Gisborne Road/Buckleys Road intersection (IN-03) has been tested with the higher Buckleys Road and Gisborne Road volumes as per the VITM model output for 2056 under both scenarios (“with ELR” and “no ELR”).

The design volumes are shown in Figure 2 below.

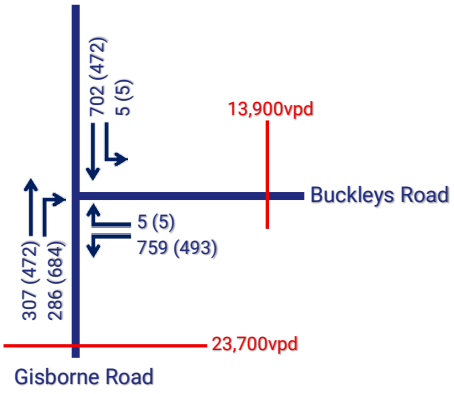


Figure 2A: AM (PM) Peak Hour Design IN-03 Volumes No ELR

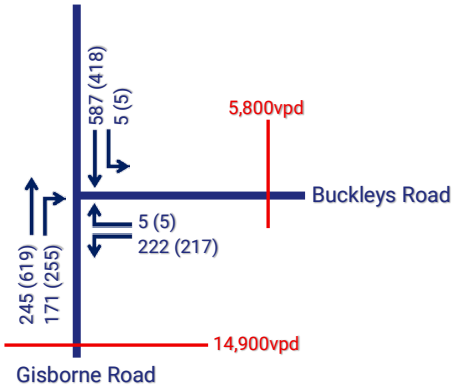


Figure 2B: AM(PM) Peak Hour Design IN-03 Volumes With ELR

It is noted that in addition to high volumes on Buckleys Road, the 2056 full build-out "no ELR" scenario shows 23,700vpd on Gisborne Road immediately south of Buckleys Road, which exceeds the capacity of a two-lane two-way road. This suggests that in the absence of interventions further to the south on Gisborne Road (i.e. duplication and augmentation of intersections), more east-bound traffic is likely to utilise Diggers Rest-Coimadai Road than the VITM "no ELR" model is showing, to avoid congestion, as addressed in the Traffix Group ITA (2025).

Based on the design volumes in Figure 2B, a Give Way controlled T-intersection arrangement as identified in the Traffix Group ITA (2025) will operate within acceptable limits with a DOS of 0.387 in the AM peak and 0.316 in the PM peak at full build-out (2056) with the ELR in place.

Based on the "no ELR" 2056 full build-out volumes shown in Figure 2A, the Give Way controlled intersection will fail in the AM peak hour. The intersection has also been tested for the "no ELR" scenario with VITM model volumes as a roundabout, with the layout shown in Figure 3 below.

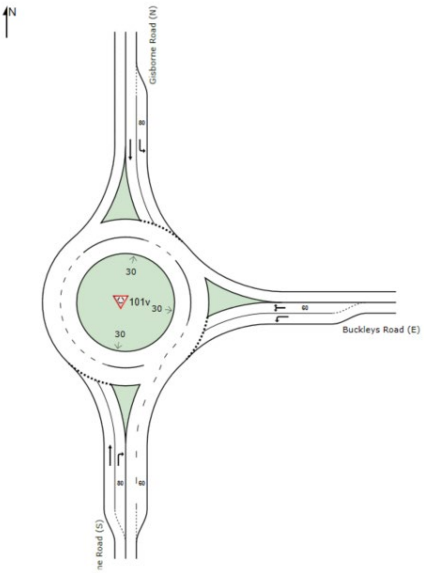


Figure 3: IN-03 Alternative Roundabout Layout

The SIDRA output for the Figure 2 design volumes and Figure 3 layout is set out in Table 4 below.

Table 4: Gisborne Road/Buckleys Road (IN-03) Ultimate (no ELR) with VITM Volume Outputs – SIDRA

Approach	DOS		Average Delay		95th Percentile Queue	
	AM	PM	AM	PM	AM	PM
Gisborne Road (S)	0.199	0.408	6.3 sec	6.9 sec	10.8m	26.1m
Buckleys Road (E)	0.865	0.452	25.3 sec	7.2 sec	124.2m	25.2m
Gisborne Road (N)	0.622	0.577	14.0 sec	13.3 sec	42.0m	40.8m

Table 4 indicates that the Gisborne Road/Buckleys Road intersection will operate within acceptable limits as a roundabout-controlled intersection, based on the ultimate full build-out PSP volumes and no ELR.

However, it is noted that there would be significant downstream capacity issues on Gisborne Road to the south under this scenario, but these would be alleviated by the construction of the ELR prior to 2056.

With the ELR in place, the Buckleys Road/Gisborne Road intersection operates well within acceptable limits as a standard Give Way controlled intersection with auxiliary turn lanes under the full build-out 2056 volumes as per the VITM outputs.

Accordingly, the analysis shows that a roundabout is not required at the Gisborne Road/ Buckleys Road intersection unless the ELR is not built, in which case additional works will also be required downstream on Gisborne Road.

5.2 IN-04 (Buckleys Road/North-South Connector)

The 2056 VITM outputs show a high volume of traffic on Buckleys Road between IN-04 and the ELR. The peak hour design volumes for IN-04 based on the 2056 Project Case (with ELR) VITM model outputs are shown in Figure 4 below. Figure 5 shows the previously adopted IN-04 signalised intersection layout as set out in the Traffix Group ITA (2025).

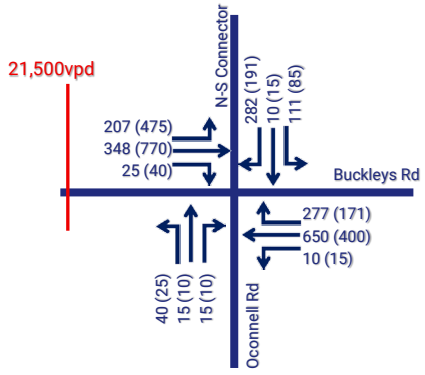


Figure 4: IN-04 Design AM (PM) Peak Hour Volumes

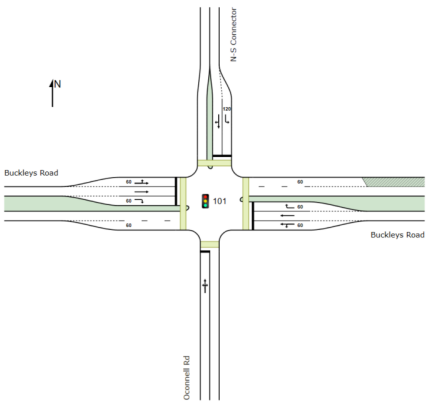


Figure 5: IN-04 Adopted Intersection Layout (Previous)

The layout shown in Figure 5 is not sufficient to accommodate the ultimate full build-out PSP volumes with the ELR in place based on the design volumes in Figure 4 which have been derived from the VITM model.

Figure 6 below shows an augmented layout for IN-04.

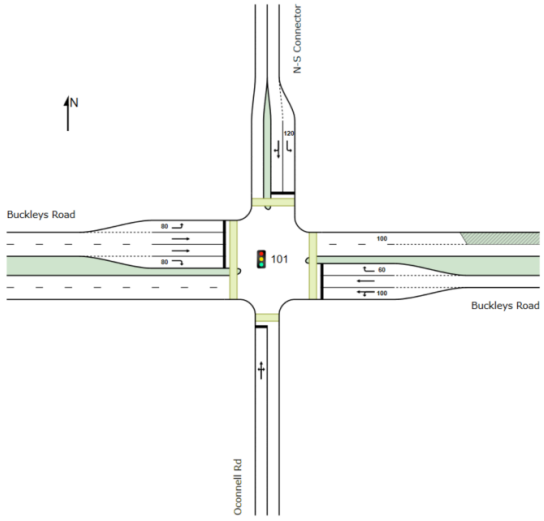


Figure 6: IN-04 Augmented Intersection Layout

The augmented layout shown in Figure 5 includes duplication of Buckleys Road between the ELR and IN-04 to accommodate a two-way daily volume in the order of 21,500vpd on the western leg as shown in the VITM Project Case output.

The SIDRA output in Table 5 below is based on the Figure 4 design volumes and the Figure 6 layout.

Table 5: Buckleys Road/Connector (IN-04) Ultimate – SIDRA Output

Approach	DOS		Average Delay		95th Percentile Queue	
	AM	PM	AM	PM	AM	PM
Oconnell Road Extn.	0.239	0.154	51.7 sec	50.8 sec	27.0m	17.0m
Buckleys Road (E)	0.878	0.860	63.3 sec	42.0 sec	169.6m	85.2m
N-S Connector (N)	0.892	0.760	64.3 sec	59.7 sec	148.6m	94.0m
Buckleys Road (W)	0.537	0.912	45.3 sec	56.4 sec	89.3m	246.9m

Table 5 indicates that even with an augmented intersection layout with duplication of Buckleys Road between IN-04 and the ELR, there will be congestion at IN-04, with delays potentially extending back to the ELR based on the 2056 Project Case VITM outputs (with ELR).

Notably, the 2056 Project Case VITM model provides only a single connection to the ELR from the entire Merrimu PSP area, in accordance with the most recent DTP design for ELR, while the Traffix Group ITA (2025) assumed two east-west connections to the ELR, one at Buckleys Road and one to the north, intersecting Gisborne Road directly opposite the existing quarry entrance.

By having a second connection to the ELR directly opposite the quarry entrance, quarry trucks can get directly onto the ELR without turning onto Gisborne Road, and the Merrimu PSP traffic accessing the ELR can be spread across two access points which reduces the pressure on Buckleys Road.

Notably, the analysis indicates that the second connection to the ELR from the Merrimu PSP area is an important aspect of the PSP so as to ensure that the town centre functions without excessive traffic congestion or excessively wide traffic corridors.

5.3 IN-07 (Flanagans Drive/Lindsay Avenue)

Intersection IN-07 will carry more traffic than originally modelled by Traffix Group primarily due to the proposed conventional density development of Long Forest (Stage 7) which was not included in the original modelling.

The VITM model has a zone connector which distributes all of the Long Forest traffic directly into intersection IN-07. In practice, the traffic will be distributed more broadly across the network and not concentrated at IN-07. Notably, the Long Forest Estate will have connections to Flanagans Drive via Condor Drive as well as potentially via extensions of Davies Court and Drysdale Court, both of which terminate at the Long Forest boundary currently. It will also have a connection to Streeton Drive which intersects Flanagans Drive south of IN-07.

A connection to Possumtail Run to the north would reduce the traffic impacts of the Long Forest Estate on IN-07. However, for the purpose of undertaking a conservative analysis, it is assumed that all of the traffic generated by Stage 7 will access the network via either IN-07 or Streeton Drive.

Notably, a 50/50 split has been adopted for distributing the traffic from Long Forest (Stage 7) to Flanagans Drive and Streeton Drive.

Figure 7 below shows the peak hour design volumes for IN-07 based on the 2056 Project Case (with ELR) VITM model AM and PM peak hour outputs. The adopted layout for SIDRA modelling purposes is consistent with Traffix Group Drawing G23398-01-15 which is a Give-Way controlled intersection with priority on the west (Lindsay Avenue) and south (Flanagans Drive) legs with AUL and CHR turn treatments.

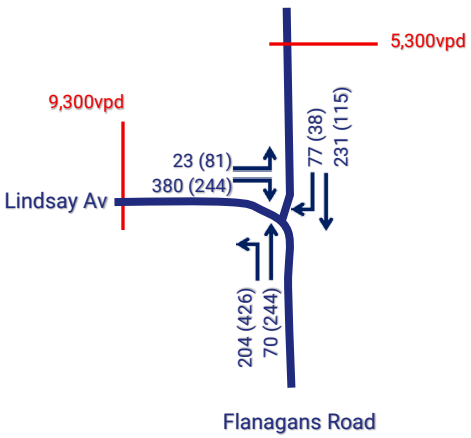


Figure 7: IN-07 Design AM (PM) Peak Hour Volumes

The SIDRA output for the Figure 7 design volumes is set out in Table 6 below.

Table 6: Flanagans Drive/Lindsay Ave (IN-07) Ultimate SIDRA with VITM Volume Outputs

Approach	DOS		Average Delay		95th Percentile Queue	
	AM	PM	AM	PM	AM	PM
Flanagans Drive (S)	0.145	0.427	5.5 sec	5.8 sec	4.1m	19.5m
Flanagans Drive (N)	0.614	0.336	15.6 sec	12.4 sec	34.7m	12.0m
Lindsay Avenue (W)	0.222	0.142	5.6 sec	5.6 sec	0.0m	0.0m

Table 6 indicates that the Flanagans Drive/Lindsay Avenue intersection will operate well within acceptable limits during both the AM and the PM peak hours.

The analysis indicates that the existing intersection design for IN-07 (Give-Way control) remains suitable.

5.4 Flanagans Drive/Streeton Drive

Figure 8 below shows the peak hour design volumes for the Flanagans Drive/Streeton Drive intersection based on the 2056 Project Case (with ELR) VITM model AM and PM peak hour outputs and assuming 50% of Long Forest traffic accesses the road network via Streeton Drive.

Figure 9 below shows the intersection layout adopted for the purpose of the SIDRA analysis for the Flanagans Drive/Streeton Drive intersection. Notably, a Give-Way controlled intersection has been tested, with a dedicated right-turn lane on the south approach to facilitate northbound traffic on Flanagans Drive turning right into Streeton Drive without obstructing through traffic.

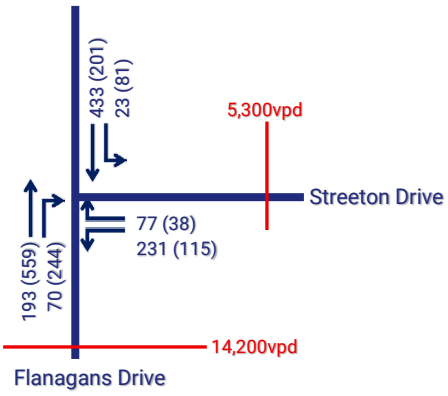


Figure 8: Streeton Dr Design AM (PM) Peak Hour Volumes

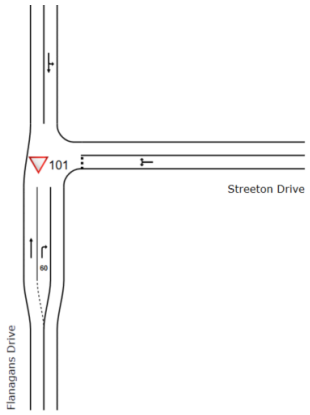


Figure 9: Streeton Dr Adopted Intersection Layout

The SIDRA output for the Figure 8 design volumes is set out in Table 7 below.

Table 7: Flanagans Drive/Streeton Drive Ultimate SIDRA with VITM Volume Outputs

Approach	DOS		Average Delay		95th Percentile Queue	
	AM	PM	AM	PM	AM	PM
Flanagans Drive (S)	0.107	0.310	2.0 sec	2.1 sec	2.0m	6.6m
Streeton Drive (E)	0.424	0.255	10.6 sec	10.5 sec	17.5m	7.3m
Flanagans Drive (N)	0.253	0.158	0.4 sec	1.6 sec	0.0m	0.0m

Table 7 indicates that the Flanagans Drive/Streeton Drive intersection will operate well within acceptable limits during both the AM and the PM peak hours as a Give-Way controlled intersection with a chanelised right-turn lane on the south approach to facilitate right turns into Streeton Drive without obstructing through traffic flow on Flanagans Drive (northbound).

5.5 IN-08 (Flanagans Drive/Escarpment Connector)

Intersection IN-08 (signalised) will carry more traffic than originally modelled by Traffix Group primarily due to the proposed conventional density development of Long Forest (Stage 7) which was not included in the original modelling, and accordingly the SIDRA analysis has been undertaken based on the ultimate 2056 Project Case VITM model outputs.

The peak hour design volumes for IN-08 based on the 2056 Project Case (with ELR) VITM model outputs are set out in Figure 10 below. The previously adopted signalised intersection layout is shown in Figure 11.

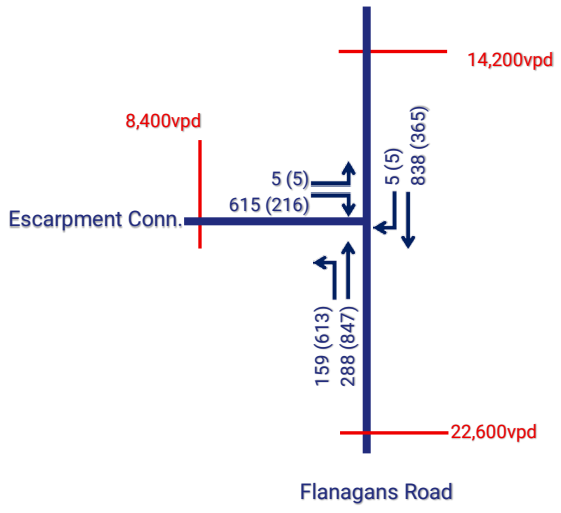


Figure 10: IN-08 Design AM (PM) Peak Hour Volumes

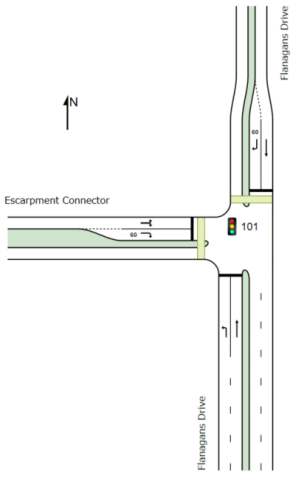


Figure 11: IN-04 Adopted Intersection Layout (Previous)

The SIDRA output for the Figure 10 design volumes and Figure 11 intersection layout is set out in Table 8 below.

Table 8: Flanagans Drive/Escarpment Connector (IN-08) Ultimate SIDRA with VITM Volume Outputs

Approach	DOS		Average Delay		95th Percentile Queue	
	AM	PM	AM	PM	AM	PM
Flanagans Drive (S)	0.250	0.618	10.2 sec	8.1 sec	45.4m	141.9m
Flanagans Drive (N)	0.732	0.266	19.8 sec	4.3 sec	207.9m	40.8m
Escarpment Connector	0.713	0.489	43.9 sec	50.8 sec	107.0m	39.0m

Table 8 indicates that intersection IN-08 (Flanagans Drive/Escarpment Connector) will operate well within acceptable limits during both the AM and the PM peak hours with a peak DOS of 0.732.

The analysis indicates that the existing intersection design for IN-08 remains suitable.

5.6 IN-09 (Flanagans Drive/Bacchus Marsh Road)

Intersection IN-09 will carry more daily traffic than originally modelled by Traffix Group primarily due to the proposed conventional density development of Long Forest (Stage 7) which was not included in the original modelling.

It is noted though that the Traffix Group model assumed a peak-to-daily ratio of 10%, while the VITM model is showing a greater peak spread, with a lesser proportion of daily traffic occurring during a single hour.

A comparison of the original "design" volumes adopted in the Traffix Group analysis and the 2056 Project Case VITM model outputs is shown in Table 9 below.

Table 9: Flanagans Drive/Bacchus Marsh Road (IN-09) Peak Hour Volume Comparison

Movement	Peak Hour	Traffix Group ITA	VITM Model Output	Difference
East Leg – Westbound	AM Peak	604vph	671vph	+11%
	PM Peak	878vph	953vph	+9%
East Leg – Eastbound	AM Peak	1,557vph	1,172vph	-25%
	PM Peak	1,214vph	960vph	-21%
North Leg – Southbound	AM Peak	1,234vph	1,454vph	+18%
	PM Peak	681vph	581vph	-15%
North Leg – Northbound	AM Peak	497vph	447vph	-10%
	PM Peak	1,141vph	1,461vph	+28%

Table 9 indicates that compared to the previously assessed "design volumes" addressed in the Traffix Group SIDRA analysis for IN-09, the VITM model output volumes are:

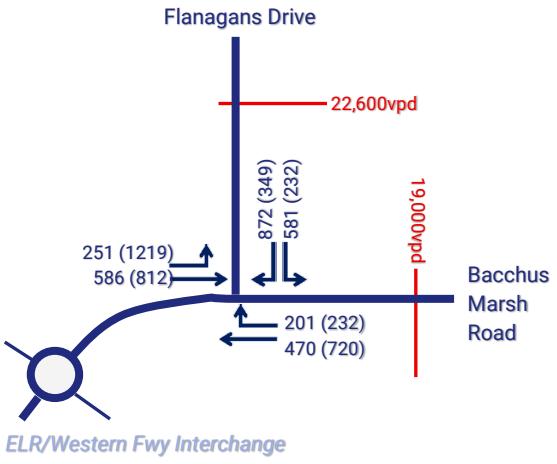
- approximately 10% higher on the east (Bacchus Marsh Road) leg in the westbound direction,

- significantly lower on the east leg in the eastbound direction,
- 18% higher in the southbound direction on Flanagans Drive in the AM peak and 10% lower in the northbound direction, with the overall two-way volume being approximately 10% higher, and
- 15% lower in the southbound direction on Flanagans Drive in the PM peak and 28% higher in the northbound direction, with the overall two-way volume being 12% higher in the VITM model with a different directional split.

The additional dwellings at Long Forest (Stage 7) have resulted in an increase to the traffic at IN-09 of in the order of 10%. In addition, the primary difference between the VITM model volumes and the Traffix Group ITA (2025) is a change of directional splits for traffic entering and exiting the PSP via Flanagans Drive. This is due to the Traffix Group ITA (2025) analysing the "no ELR" scenario, with a significant proportion of traffic turning left out of Flanagans Drive onto Bacchus Marsh Road to head towards the existing Western Freeway on-ramps at Hopetoun Park Road. Under the ultimate 2056 VITM modelled scenario, the ELR is assumed to be in place with a new full directional freeway interchange on Bacchus Marsh Road to the west of Flanagans Drive which will affect the directional split.

Figure 12 below shows the revised design turning movements for IN-09 based on the VITM model 2056 volumes with ELR in place.

Figure 13 shows the previously tested IN-09 intersection layout, which includes a slight relocation of the existing Western Freeway eastbound off-ramp to connect directly into the IN-09 signalised intersection.



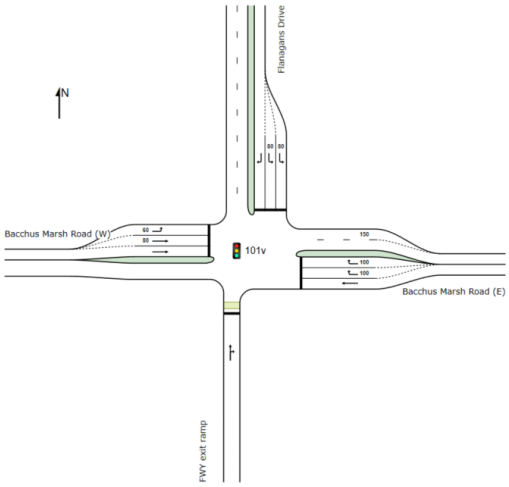


Figure 12: IN-09 Design AM (PM) Peak Hour Volumes *Figure 13: IN-09 Adopted Intersection Layout (Previous)*

In the ultimate, with the ELR in place, there is proposed to be a significant change to the way that Bacchus Marsh Road crosses the Western Freeway. A new full diamond interchange is proposed to connect the southern part of the ELR to the Western Freeway, with two large radius roundabouts providing access to the freeway interchanges. The southern roundabout will also connect in to Bacchus Marsh Road (west), with a grade separation of the westbound freeway on-ramp and Bacchus Marsh Road (west) currently envisaged.

Figure 14 below shows the current proposed ELR/Western Freeway/Bacchus Marsh Road interchange in proximity to Flanagans Drive[1].

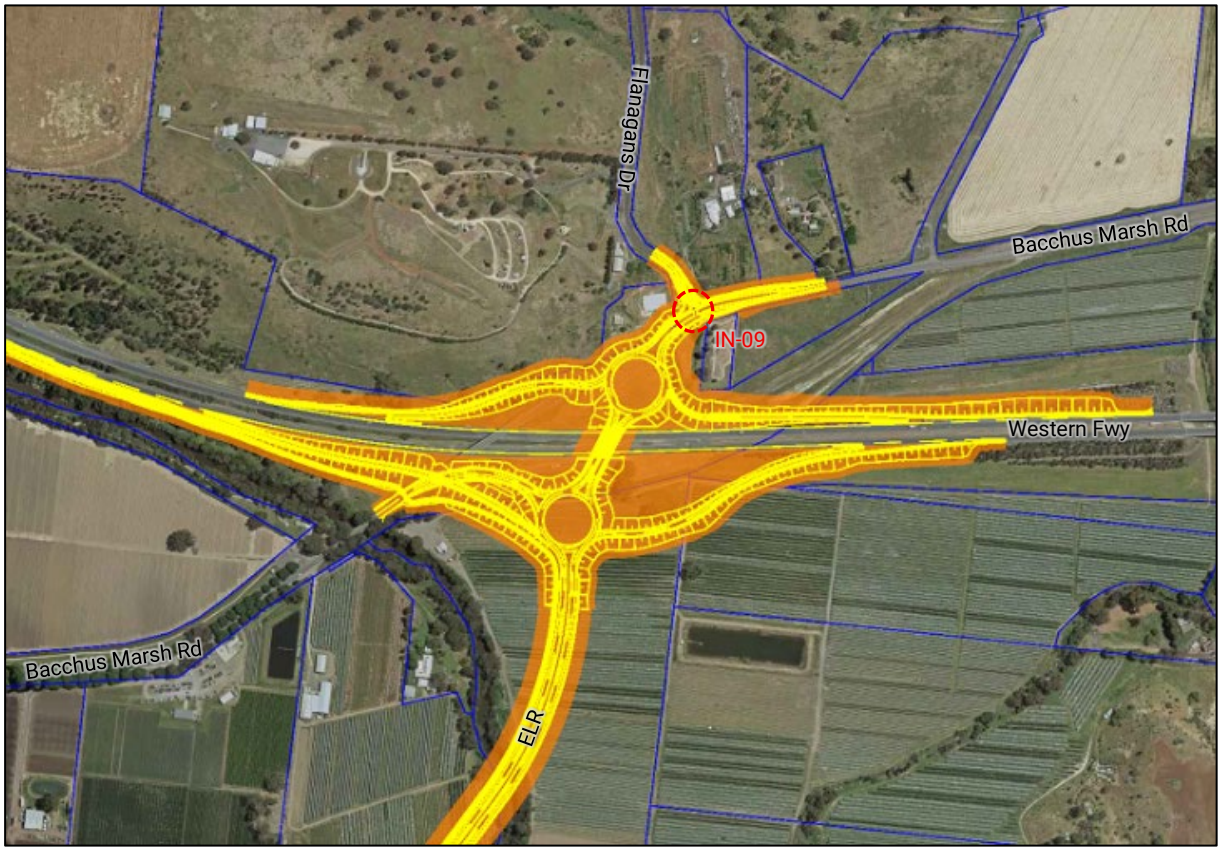


Figure 14: ELR/Western Freeway/Bacchus Marsh Road Interchange

Figure 14 shows that:

- Bacchus Marsh Road is likely to include a median separator between Flanagans Drive and the Western Freeway interchange,
- the existing Bacchus Marsh Road overpass will be removed and replaced with the new interchange,
- in order to access Bacchus Marsh town centre from Flanagans Drive, vehicles will turn right out of Flanagans Drive, take the second exit at the northern interchange roundabout and take the third exit at the southern interchange roundabout, passing under the westbound freeway on-ramp to access the existing western section of Bacchus Marsh Road south of the Western Freeway, and
- the Flanagans Drive/Bacchus Marsh Road intersection will revert to a T-intersection under this ultimate "with ELR" scenario.

Intersection IN-09 has been tested in SIDRA using the design volumes shown in Figure 12 and adopting the previous layout shown in Figure 13, but with the removal of the southern leg (freeway off-ramp).

[1] Source: https://transport.vic.gov.au/news-and-resources/projects/bacchus-marsh-eastern-link-road-planning-study

This layout operates with a Degree of Saturation (DOS) of 1.027 in the AM peak and 1.007 in the PM peak.

Notably, there are significant queues in the excess of 700m on the south-west leg in the PM peak under the current proposed intersection layout configuration due to the high volume of traffic expected to utilise the new interchange to access Flanagans Drive from Western Freeway.

There is insufficient space between Flanagans Drive and the proposed ELR/Western Freeway interchange to accommodate the queues, which will impact on the freeway interchange.

Accordingly, at such time that the ELR interchange is built, IN-09 will need to be upgraded to include two left-turn lanes into Flanagans Drive to minimise the queue lengths.

Additionally, it is recommended that one of the left-turn lanes on Flanagans Drive (north leg) be converted to a right-turn lane when the new freeway interchange is in place to cater to the expected change in distributions for vehicle accessing the Western Freeway (Melbourne-bound).

Figure 15 below shows the modified IN-09 layout.

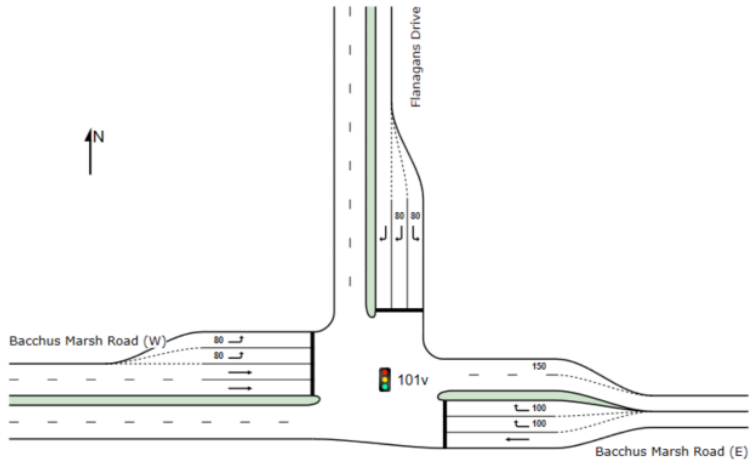


Figure 15: IN-09 Modified Intersection Layout (As Part of ELR Construction)

The number of lanes on the northern and eastern legs of IN-09 does not change between the interim (no ELR) and ultimate (with ELR) intersection configurations.

Additional land will be required on the west leg to facilitate additional lanes between Flanagans Drive and the ELR/Western Freeway/Bacchus Marsh Road interchange.

The SIDRA output for the Figure 12 design volumes and the Figure 15 layout is shown in Table 10 below.

Table 10: Flanagans Drive/Bacchus Marsh Road (IN-09) Ultimate SIDRA with VITM Volume Outputs

Approach	DOS		Average Delay		95th Percentile Queue	
	AM	PM	AM	PM	AM	PM
Bacchus Marsh Road (E)	0.719	0.595	35.6 sec	22.9 sec	181.3m	172.5m
Flanagans Drive (N)	0.769	0.593	30.3 sec	50.6 sec	199.1m	92.1m
Bacchus Marsh Road (W)	0.759	0.499	35.8 sec	15.2 sec	138.5m	131.8m

Importantly, the modified ultimate arrangement for IN-09 as shown in Figure 15 will provide sufficient capacity so that the queues from IN-09 will not impact on the proposed northern roundabout at the Western Freeway interchange.

5.7 IN-10 (Bences Road/Diggers Rest-Coimadai Road)

The Traffix Group ITA (2025) recommended a reverse priority T-intersection configuration for IN-10 to facilitate predominant traffic movements from Merrimu towards the east via Diggers Rest-Coimadai Road as an alternative to the Western Freeway to reduce impacts on the Gisborne Road interchange.

DTP has advised that a reverse priority T-intersection configuration is not preferred.

Accordingly, the IN-10 intersection has been re-tested in SIDRA based on both the “no ELR” and “with ELR” full build-out (2056) traffic volumes extracted from the VITM model

Figures 16A and 16B show the “no ELR” and “with ELR” full build-out (2056) design peak hour turning movements respectively.

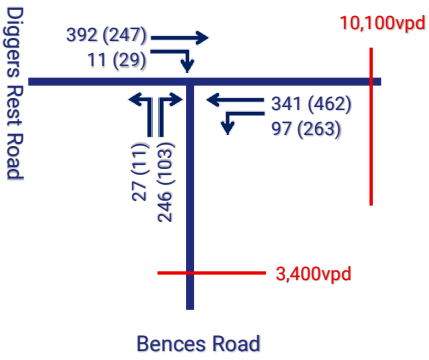


Figure 16A: AM (PM) Peak Hour Design IN-10 Volumes No ELR

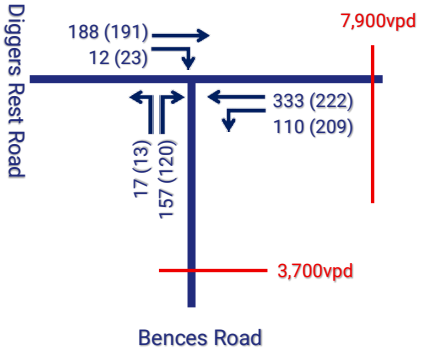


Figure 16B: AM(PM) Peak Hour Design IN-10 Volumes With ELR

The revised VITM design volumes for IN-10 shown in Figures 16A and 16B have been tested in SIDRA based on the existing Give-Way controlled T-intersection layout which includes a single approach lane on the southern and western approaches and a through and separate short left turn lane on the east approach (Diggers Rest-Coimadai Road).

The SIDRA output is shown in Table 11 below for both the “no ELR” and “with ELR” scenarios.

Table 11: Bences Road/Diggers Rest-Coimadai Road (IN-10) Ultimate SIDRA with VITM Volume Outputs

Approach	DOS		Average Delay		95th Percentile Queue	
	AM	PM	AM	PM	AM	PM
No ELR 2056 Full Build-Out Scenario (Existing T-Intersection Layout)						
Bences Road (S)	0.705	0.338	22.7 sec	17.1 sec	36.0m	10.0m
Diggers Rest-Coimadai Rd (E)	0.190	0.257	1.3 sec	2.1 sec	0.0m	0.0m
Diggers Rest-Coimadai Rd (W)	0.232	0.191	0.4 sec	2.4 sec	1.1m	4.4m
With ELR 2056 Full Build-Out Scenario (Existing T-Intersection Layout)						
Bences Road (S)	0.326	0.226	11.7 sec	10.0 sec	10.9m	6.5m
Diggers Rest-Coimadai Rd (E)	0.186	0.124	1.4 sec	2.7 sec	0.0m	0.0m
Diggers Rest-Coimadai Rd (W)	0.120	0.134	0.7 sec	1.3 sec	1.1m	2.1m

Table 11 shows that the existing intersection configuration for IN-10 is suitable to accommodate full build-out of the PSP based on the VITM model outputs, and no intersection works are needed.

6 Staging & Triggers

The Traffix Group ITA (2025) addresses the staged delivery of the Merrimu PSP in the absence of the ELR.

The development staging analysis set out in the Traffix Group ITA (2025) is fit-for-purpose having regard to the traffic generation rates extrapolated from the VITM model, particularly in relation to the intersection modelling (SIDRA) for Stages 1 to 5, where the dwelling yields have not changed.

The VITM model “no ELR” 2056 full build-out scenario allocates more traffic to Gisborne Road than the Traffix Group ITA (2025) and less traffic to Diggers Rest-Coimadai Road.

However, the VITM model doesn’t take into account intersection capacities. In the absence of interventions on Gisborne Road, there will be significant congestion with a V/C ratio exceeding one on parts of Gisborne Road. Under these circumstances, it is likely that PSP traffic will seek alternative routes, including Diggers Rest-Coimadai Road, consistent with the assumptions in the Traffix Group ITA (2025).

If it is assumed that PSP development commences in 2028 and full build-out occurs by 2056, this corresponds to an average of approximately 280 lots per year. At that development rate, Stage 5 would be completed at around 2049.

It is noted that the ELR is in place in DTP’s VITM model by 2046.

Accordingly, beyond Stage 5 it is anticipated that the ELR will come online and provide two additional interchanges to the Western Freeway east of Gisborne Road which will reduce the traffic congestion on Gisborne Road.

It is noted that it is not within the scope of the PSP to upgrade the Western Freeway interchange at Gisborne Road.

The traffic analysis indicates that Long Forest Estate (Stage 7) cannot proceed until such time that the ELR is in place.

7 Conclusions

Having undertaken a review of the Clarity Strategic Modelling Transport Assessment (VITM), a comparison of the VITM model outputs to the Traffix Group ITA (2025) and revised detailed intersection analysis to reflect the VITM outputs, we are of the opinion that:

a) the daily traffic generation rates for standard density residential development in the Clarity VITM model are approximately 13% higher than the rates adopted in the Traffix Group ITA (2025),

b) the AM peak hour traffic generation rate extrapolated from the model is lower than the rate adopted in the Traffix Group ITA (2025),

c) the PM peak hour traffic generation rate adopted in the Traffix Group ITA (2025) is within 1% of the rate extrapolated from the VITM model.

d) having regard to the traffic generation rates extrapolated from the VITM model, the development staging analysis set out in the Traffix Group ITA (2025) is fit-for-purpose, particularly in relation to the intersection modelling (SIDRA) for Stages 1 to 5 where the dwelling yields have not changed,

e) under the VITM model more traffic is directed towards Gisborne Road (south) and less towards Diggers Rest-Coimadai Road via Bences Road,

f) the VITM model only considers midblock traffic capacity and does not address whether the existing intersections on Gisborne Road can accommodate the traffic,

g) the Traffix Group ITA (2025) model included a travel time analysis which determined that for northern parts of the PSP, travel towards the northern and western suburbs of Melbourne will be faster via Diggers Rest-Coimadai Road, particularly in the interim before the ELR is constructed,

h) most of the road and intersection designs set out in the Traffix Group ITA (2025) remain appropriate based on the updated VITM modelling and yields,

i) intersection IN-04 will carry more traffic based on the VITM modelling and Buckleys Road will require additional lanes or duplication between IN-04 and the ELR,

j) the ELR project should include a connection between RD-03 and the ELR to reduce congestion and traffic impacts on Buckleys Road and the town centre (including IN-04),

k) a channelised right turn lane should be provided on Flanagans Drive at Streeton Drive (on RD-06) as part of the Stage 7 (Long Forest) development stage,

l) intersection IN-09 (Flanagans Drive/Bacchus Marsh Road) will require a change to the lane configuration on Flanagans Drive (convert one left-turn lane to a right-turn lane) when the Bacchus Marsh Road/Western Freeway/ELR interchange is constructed and the west leg

of IN-09 will need to be duplicated between the freeway interchange and IN-09 to accommodate the 2056 VITM Project Case volumes, and

m) intersection IN-10 (Bences Road/Diggers Rest-Coimadai Road) will operate within acceptable limits under its existing Give-Way controlled T-intersection configuration under the 2056 full build-out scenario both with and without the ELR.

Appendix A

SIDRA Output

MOVEMENT SUMMARY

Site: 101 [IN-03 Gisborne Road/Buckleys Road - AM Peak (Give Way) - 2056 with ELR (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Gisborne Road/Buckleys Road
AM Peak (Give Way)
2056 With ELR - VITM Model Outputs
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Gisborne Road (S)															
2	T1	All MCs	258	10.0	258	10.0	0.141	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
3	R2	All MCs	180	2.0	180	2.0	0.279	10.5	LOS B	1.2	8.5	0.62	0.87	0.71	49.1
Approach			438	6.7	438	6.7	0.279	4.4	NA	1.2	8.5	0.26	0.36	0.29	55.0
East: Buckleys Road (E)															
4	L2	All MCs	234	2.0	234	2.0	0.387	11.5	LOS B	1.8	12.6	0.66	0.92	0.87	48.6
6	R2	All MCs	5	2.0	5	2.0	0.028	23.5	LOS C	0.1	0.6	0.83	0.93	0.83	41.9
Approach			239	2.0	239	2.0	0.387	11.8	LOS B	1.8	12.6	0.66	0.92	0.87	48.5
North: Gisborne Road (N)															
7	L2	All MCs	5	2.0	5	2.0	0.003	5.6	LOS A	0.0	0.0	0.00	0.58	0.00	52.8
8	T1	All MCs	618	10.0	618	10.0	0.337	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
Approach			623	9.9	623	9.9	0.337	0.2	NA	0.0	0.0	0.00	0.00	0.00	59.7
All Vehicles			1300	7.4	1300	7.4	0.387	3.7	NA	1.8	12.6	0.21	0.29	0.26	55.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [IN-03 Gisborne Road/Buckleys Road - PM Peak (Give Way) - 2056 with ELR (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Gisborne Road/Buckleys Road
PM Peak (Give Way)
2056 With ELR - VITM Model Outputs
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Gisborne Road (S)															
2	T1	All MCs	546	10.0	546	10.0	0.298	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
3	R2	All MCs	268	2.0	268	2.0	0.316	8.7	LOS A	1.5	10.8	0.56	0.78	0.63	50.4
Approach			815	7.4	815	7.4	0.316	2.9	NA	1.5	10.8	0.19	0.26	0.21	56.3
East: Buckleys Road (E)															
4	L2	All MCs	228	2.0	228	2.0	0.286	8.6	LOS A	1.2	8.5	0.53	0.76	0.57	50.6
6	R2	All MCs	5	2.0	5	2.0	0.040	31.3	LOS D	0.1	0.8	0.88	0.95	0.88	38.4
Approach			234	2.0	234	2.0	0.286	9.1	LOS A	1.2	8.5	0.54	0.77	0.58	50.2
North: Gisborne Road (N)															
7	L2	All MCs	5	2.0	5	2.0	0.003	5.6	LOS A	0.0	0.0	0.00	0.58	0.00	52.8
8	T1	All MCs	440	10.0	440	10.0	0.240	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach			445	9.9	445	9.9	0.240	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.8
All Vehicles			1494	7.3	1494	7.3	0.316	3.1	NA	1.5	10.8	0.18	0.26	0.20	56.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101v [IN-03 Gisborne Road/Buckleys Road - AM Peak - 2056 no ELR - Roundabout (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Gisborne Road/Buckleys Road
AM Peak (Roundabout)
2056 No ELR
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Gisborne Road (S)															
2	T1	All MCs	323	10.0	323	10.0	0.193	3.6	LOS A	1.4	10.8	0.06	0.33	0.06	55.6
3	R2	All MCs	301	2.0	301	2.0	0.199	9.2	LOS A	1.4	10.2	0.06	0.62	0.06	50.8
Approach			624	6.1	624	6.1	0.199	6.3	LOS A	1.4	10.8	0.06	0.47	0.06	53.2
East: Buckleys Road (E)															
4	L2	All MCs	799	2.0	799	2.0	0.875	25.3	LOS C	17.4	124.2	0.97	1.25	1.86	42.5
6	R2	All MCs	5	2.0	5	2.0	0.875	32.5	LOS C	17.4	124.2	1.00	1.36	2.10	40.7
Approach			804	2.0	804	2.0	0.875	25.3	LOS C	17.4	124.2	0.97	1.26	1.86	42.5
North: Gisborne Road (N)															
7	L2	All MCs	5	2.0	5	2.0	0.007	5.7	LOS A	0.0	0.2	0.44	0.49	0.44	53.8
8	T1	All MCs	739	10.0	739	10.0	0.622	14.1	LOS B	5.5	42.0	0.66	0.58	0.71	52.5
Approach			744	9.9	744	9.9	0.622	14.0	LOS B	5.5	42.0	0.66	0.58	0.70	52.5
All Vehicles			2173	5.9	2173	5.9	0.875	16.0	LOS B	17.4	124.2	0.60	0.80	0.95	48.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
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 (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101v [IN-03 Gisborne Road/Buckleys Road - PM Peak - 2056 no ELR - Roundabout (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Gisborne Road/Buckleys Road
PM Peak (Roundabout)
2056 No ELR
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Gisborne Road (S)															
2	T1	All MCs	497	10.0	497	10.0	0.348	3.6	LOS A	2.8	21.1	0.07	0.33	0.07	55.6
3	R2	All MCs	720	2.0	720	2.0	0.408	9.2	LOS A	3.7	26.1	0.07	0.61	0.07	50.8
Approach			1217	5.3	1217	5.3	0.408	6.9	LOS A	3.7	26.1	0.07	0.50	0.07	52.6
East: Buckleys Road (E)															
4	L2	All MCs	519	2.0	519	2.0	0.452	7.2	LOS A	3.5	25.2	0.78	0.67	0.78	52.4
6	R2	All MCs	5	2.0	5	2.0	0.452	12.3	LOS B	3.5	25.2	0.80	0.67	0.80	52.0
Approach			524	2.0	524	2.0	0.452	7.2	LOS A	3.5	25.2	0.78	0.67	0.78	52.4
North: Gisborne Road (N)															
7	L2	All MCs	5	2.0	5	2.0	0.009	9.1	LOS A	0.0	0.3	0.65	0.60	0.65	51.3
8	T1	All MCs	497	10.0	497	10.0	0.577	13.3	LOS B	5.4	40.8	0.85	0.83	1.09	50.1
Approach			502	9.9	502	9.9	0.577	13.3	LOS B	5.4	40.8	0.84	0.83	1.09	50.1
All Vehicles			2243	5.5	2243	5.5	0.577	8.4	LOS A	5.4	40.8	0.41	0.61	0.46	52.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
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 (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [IN-04 - Buckleys Rd/N-S Connector - AM Peak - alt. (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

IN-04 - Buckleys/N-S Connector
AM Peak
Design (Ultimate)
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Oconnell Rd															
1	L2	All MCs	42	2.0	42	2.0	0.239	52.9	LOS D	3.8	27.0	0.91	0.75	0.91	31.7
2	T1	All MCs	16	2.0	16	2.0	*0.239	47.3	LOS D	3.8	27.0	0.91	0.75	0.91	32.5
3	R2	All MCs	16	2.0	16	2.0	0.239	52.9	LOS D	3.8	27.0	0.91	0.75	0.91	31.8
Approach			74	2.0	74	2.0	0.239	51.7	LOS D	3.8	27.0	0.91	0.75	0.91	31.9
East: Buckleys Road															
4	L2	All MCs	11	2.0	11	2.0	0.852	60.4	LOS E	23.2	169.6	1.00	0.99	1.16	30.8
5	T1	All MCs	684	5.0	684	5.0	*0.852	58.7	LOS E	23.2	169.6	1.00	0.99	1.17	31.4
6	R2	All MCs	292	5.0	292	5.0	*0.878	74.1	LOS E	19.0	139.0	1.00	0.98	1.25	28.1
Approach			986	5.0	986	5.0	0.878	63.3	LOS E	23.2	169.6	1.00	0.99	1.19	29.2
North: N-S Connector															
7	L2	All MCs	117	5.0	117	5.0	0.340	51.9	LOS D	6.0	43.7	0.91	0.78	0.91	31.8
8	T1	All MCs	11	2.0	11	2.0	*0.892	63.5	LOS E	20.4	148.6	1.00	1.01	1.27	28.3
9	R2	All MCs	297	5.0	297	5.0	0.892	69.2	LOS E	20.4	148.6	1.00	1.01	1.27	27.7
Approach			424	4.9	424	4.9	0.892	64.3	LOS E	20.4	148.6	0.98	0.94	1.17	28.7
West: Buckleys Road															
10	L2	All MCs	218	5.0	218	5.0	0.521	49.2	LOS D	11.2	82.1	0.92	0.82	0.92	32.4
11	T1	All MCs	366	5.0	366	5.0	0.537	42.9	LOS D	12.2	89.3	0.91	0.75	0.91	35.3
12	R2	All MCs	26	2.0	26	2.0	0.069	46.5	LOS D	1.2	8.8	0.83	0.71	0.83	33.2
Approach			611	4.9	611	4.9	0.537	45.3	LOS D	12.2	89.3	0.91	0.77	0.91	34.1
All Vehicles			2095	4.8	2095	4.8	0.892	57.8	LOS E	23.2	169.6	0.97	0.91	1.10	30.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options 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.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Oconnell Rd												
P1	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	208.1	200.0	0.96

MOVEMENT SUMMARY

Site: 101 [IN-04 - Buckleys Rd/N-S Connector - PM Peak - alt. (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

IN-04 - Buckleys/N-S Connector
PM Peak
Design (Ultimate)
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Oconnell Rd															
1	L2	All MCs	26	2.0	26	2.0	0.154	52.0	LOS D	2.4	17.0	0.89	0.72	0.89	32.0
2	T1	All MCs	11	2.0	11	2.0	*0.154	46.5	LOS D	2.4	17.0	0.89	0.72	0.89	32.8
3	R2	All MCs	11	2.0	11	2.0	0.154	52.1	LOS D	2.4	17.0	0.89	0.72	0.89	32.0
Approach			47	2.0	47	2.0	0.154	50.8	LOS D	2.4	17.0	0.89	0.72	0.89	32.2
East: Buckleys Road															
4	L2	All MCs	16	2.0	16	2.0	0.323	35.4	LOS D	9.2	67.0	0.77	0.66	0.77	38.9
5	T1	All MCs	421	5.0	421	5.0	0.323	29.8	LOS C	9.2	67.3	0.77	0.65	0.77	40.2
6	R2	All MCs	180	5.0	180	5.0	*0.860	71.2	LOS E	11.7	85.2	1.00	0.96	1.28	27.2
Approach			617	4.9	617	4.9	0.860	42.0	LOS D	11.7	85.2	0.84	0.74	0.92	35.2
North: N-S Connector															
7	L2	All MCs	89	5.0	89	5.0	0.315	56.3	LOS E	4.7	34.5	0.93	0.77	0.93	30.9
8	T1	All MCs	16	2.0	16	2.0	*0.760	55.8	LOS E	12.9	94.0	1.00	0.89	1.10	30.1
9	R2	All MCs	201	5.0	201	5.0	0.760	61.5	LOS E	12.9	94.0	1.00	0.89	1.10	29.5
Approach			306	4.8	306	4.8	0.760	59.7	LOS E	12.9	94.0	0.98	0.85	1.05	29.9
West: Buckleys Road															
10	L2	All MCs	500	5.0	500	5.0	*0.912	71.9	LOS E	33.8	246.9	1.00	1.00	1.24	29.0
11	T1	All MCs	811	5.0	811	5.0	0.785	46.2	LOS D	27.8	202.9	0.90	0.81	0.92	37.8
12	R2	All MCs	42	2.0	42	2.0	0.197	68.2	LOS E	2.3	16.3	0.94	0.74	0.94	29.9
Approach			1353	4.9	1353	4.9	0.912	56.4	LOS E	33.8	246.9	0.94	0.88	1.04	31.0
All Vehicles			2323	4.8	2323	4.8	0.912	52.9	LOS D	33.8	246.9	0.92	0.84	1.01	31.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options 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.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Oconnell Rd												
P1	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	208.1	200.0	0.96

MOVEMENT SUMMARY

Site: 101 [IN-07 - Lindsay Ave/Flanagans Dr - AM Peak (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

IN-07
AM Peak
Ultimate
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Flanagans Dr															
1	L2	All MCs	215	4.0	215	4.0	0.119	5.6	LOS A	0.0	0.0	0.00	0.58	0.00	52.7
2	T1	All MCs	74	2.0	74	2.0	0.145	5.2	LOS A	0.6	4.1	0.58	0.54	0.58	55.2
Approach			288	3.5	288	3.5	0.145	5.5	NA	0.6	4.1	0.15	0.57	0.15	53.3
North: Flanagans Dr															
8	T1	All MCs	243	2.0	243	2.0	0.614	13.9	LOS B	4.9	34.7	0.76	1.06	1.36	46.4
9	R2	All MCs	81	2.0	81	2.0	0.614	20.6	LOS C	4.9	34.7	0.76	1.06	1.36	46.0
Approach			324	2.0	324	2.0	0.614	15.6	LOS C	4.9	34.7	0.76	1.06	1.36	46.3
West: Lindsay Av															
10	L2	All MCs	24	2.0	24	2.0	0.013	5.6	LOS A	0.0	0.0	0.00	0.58	0.00	52.8
12	R2	All MCs	400	4.0	400	4.0	0.222	5.6	LOS A	0.0	0.0	0.00	0.59	0.00	52.5
Approach			424	3.9	424	3.9	0.222	5.6	NA	0.0	0.0	0.00	0.59	0.00	52.6
All Vehicles			1037	3.2	1037	3.2	0.614	8.7	NA	4.9	34.7	0.28	0.73	0.47	50.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [IN-07 - Lindsay Ave/Flanagans Dr - PM Peak (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

IN-07
PM Peak
Ultimate
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Flanagans Dr															
1	L2	All MCs	448	4.0	448	4.0	0.248	5.6	LOS A	0.0	0.0	0.00	0.57	0.00	52.6
2	T1	All MCs	257	2.0	257	2.0	0.427	6.0	LOS A	2.7	19.5	0.63	0.62	0.82	54.6
Approach			705	3.3	705	3.3	0.427	5.8	NA	2.7	19.5	0.23	0.59	0.30	53.3
North: Flanagans Dr															
8	T1	All MCs	121	2.0	121	2.0	0.336	8.3	LOS A	1.7	12.0	0.66	0.80	0.80	48.4
9	R2	All MCs	40	2.0	40	2.0	0.336	24.6	LOS C	1.7	12.0	0.66	0.80	0.80	48.0
Approach			161	2.0	161	2.0	0.336	12.4	LOS B	1.7	12.0	0.66	0.80	0.80	48.3
West: Lindsay Av															
10	L2	All MCs	85	2.0	85	2.0	0.047	5.6	LOS A	0.0	0.0	0.00	0.58	0.00	52.8
12	R2	All MCs	257	4.0	257	4.0	0.142	5.6	LOS A	0.0	0.0	0.00	0.59	0.00	52.6
Approach			342	3.5	342	3.5	0.142	5.6	NA	0.0	0.0	0.00	0.58	0.00	52.6
All Vehicles			1208	3.2	1208	3.2	0.427	6.6	NA	2.7	19.5	0.22	0.62	0.28	52.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Flanagans Drive/Streeton Drive - AM Peak Ultimate (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Flanagans Drive/Streeton Drive
AM Peak
Ultimate
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Flanagans Drive															
2	T1	All MCs	203	4.0	203	4.0	0.107	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
3	R2	All MCs	74	2.0	74	2.0	0.069	7.4	LOS A	0.3	2.0	0.50	0.69	0.50	51.1
Approach			277	3.5	277	3.5	0.107	2.0	NA	0.3	2.0	0.13	0.18	0.13	57.3
East: Streeton Drive															
4	L2	All MCs	243	2.0	243	2.0	0.424	8.9	LOS A	2.5	17.5	0.64	0.88	0.87	49.2
6	R2	All MCs	81	2.0	81	2.0	0.424	15.6	LOS C	2.5	17.5	0.64	0.88	0.87	49.0
Approach			324	2.0	324	2.0	0.424	10.6	LOS B	2.5	17.5	0.64	0.88	0.87	49.2
North: Flanagans Drive															
7	L2	All MCs	24	2.0	24	2.0	0.253	5.6	LOS A	0.0	0.0	0.00	0.03	0.00	57.0
8	T1	All MCs	456	4.0	456	4.0	0.253	0.1	LOS A	0.0	0.0	0.00	0.03	0.00	59.6
Approach			480	3.9	480	3.9	0.253	0.4	NA	0.0	0.0	0.00	0.03	0.00	59.4
All Vehicles			1081	3.2	1081	3.2	0.424	3.8	NA	2.5	17.5	0.23	0.32	0.30	55.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Flanagans Drive/Streeton Drive - PM Peak Ultimate (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Flanagans Drive/Streeton Drive
PM Peak
Ultimate
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Flanagans Drive															
2	T1	All MCs	588	4.0	588	4.0	0.310	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
3	R2	All MCs	257	2.0	257	2.0	0.192	6.7	LOS A	0.9	6.6	0.42	0.64	0.42	51.4
Approach			845	3.4	845	3.4	0.310	2.1	NA	0.9	6.6	0.13	0.19	0.13	57.0
East: Streeton Drive															
4	L2	All MCs	121	2.0	121	2.0	0.255	6.4	LOS A	1.0	7.3	0.58	0.64	0.58	49.3
6	R2	All MCs	40	2.0	40	2.0	0.255	23.0	LOS C	1.0	7.3	0.58	0.64	0.58	49.0
Approach			161	2.0	161	2.0	0.255	10.5	LOS B	1.0	7.3	0.58	0.64	0.58	49.2
North: Flanagans Drive															
7	L2	All MCs	85	2.0	85	2.0	0.158	5.6	LOS A	0.0	0.0	0.00	0.17	0.00	55.9
8	T1	All MCs	212	4.0	212	4.0	0.158	0.0	LOS A	0.0	0.0	0.00	0.17	0.00	58.4
Approach			297	3.4	297	3.4	0.158	1.6	NA	0.0	0.0	0.00	0.17	0.00	57.6
All Vehicles			1303	3.2	1303	3.2	0.310	3.0	NA	1.0	7.3	0.15	0.24	0.15	56.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [IN-08 Ultimate - AM Peak (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

IN-08 Ultimate
AM Peak
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 100 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Flanagans Drive															
1	L2	All MCs	167	2.0	167	2.0	0.145	13.5	LOS B	3.3	23.2	0.43	0.69	0.43	47.4
2	T1	All MCs	303	2.0	303	2.0	0.250	8.6	LOS A	6.4	45.4	0.47	0.41	0.47	52.6
Approach			471	2.0	471	2.0	0.250	10.3	LOS B	6.4	45.4	0.46	0.51	0.46	50.6
North: Flanagans Drive															
8	T1	All MCs	882	2.0	882	2.0	* 0.732	19.8	LOS B	29.2	207.9	0.75	0.69	0.75	49.1
9	R2	All MCs	5	2.0	5	2.0	0.010	21.8	LOS C	0.1	0.8	0.45	0.63	0.45	46.2
Approach			887	2.0	887	2.0	0.732	19.8	LOS B	29.2	207.9	0.74	0.69	0.74	45.3
West: Escarpment Connector															
10	L2	All MCs	5	2.0	5	2.0	0.713	43.9	LOS D	15.0	107.0	0.97	0.86	1.00	34.0
12	R2	All MCs	647	2.0	647	2.0	* 0.713	43.9	LOS D	15.0	107.0	0.97	0.86	1.00	34.0
Approach			653	2.0	653	2.0	0.713	43.9	LOS D	15.0	107.0	0.97	0.86	1.00	34.0
All Vehicles			2011	2.0	2011	2.0	0.732	25.4	LOS C	29.2	207.9	0.75	0.70	0.76	41.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options 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.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
North: Flanagans Drive												
P3	Full	50	53	44.3	LOS E	0.1	0.1	0.94	0.94	198.1	200.0	1.01
West: Escarpment Connector												
P4	Full	50	53	44.3	LOS E	0.1	0.1	0.94	0.94	198.1	200.0	1.01
All Pedestrians		100	105	44.3	LOS E	0.1	0.1	0.94	0.94	198.1	200.0	1.01

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 101 [IN-08 Ultimate - PM Peak (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

IN-08 Ultimate
PM Peak
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 100 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Flanagans Drive															
1	L2	All MCs	645	2.0	645	2.0	0.470	10.7	LOS B	12.0	85.1	0.42	0.71	0.42	49.2
2	T1	All MCs	892	2.0	892	2.0	* 0.618	6.2	LOS A	19.9	141.9	0.51	0.47	0.51	54.5
Approach			1537	2.0	1537	2.0	0.618	8.1	LOS A	19.9	141.9	0.47	0.57	0.47	52.1
North: Flanagans Drive															
8	T1	All MCs	384	2.0	384	2.0	0.266	4.1	LOS A	5.7	40.8	0.34	0.29	0.34	56.2
9	R2	All MCs	5	2.0	5	2.0	0.035	17.8	LOS B	0.1	0.9	0.49	0.65	0.49	44.9
Approach			389	2.0	389	2.0	0.266	4.3	LOS A	5.7	40.8	0.34	0.30	0.34	56.0
West: Escarpment Connector															
10	L2	All MCs	5	2.0	5	2.0	0.489	50.7	LOS D	5.5	39.0	0.97	0.79	0.97	32.0
12	R2	All MCs	227	2.0	227	2.0	* 0.489	50.8	LOS D	5.5	39.0	0.97	0.79	0.97	32.0
Approach			233	2.0	233	2.0	0.489	50.8	LOS D	5.5	39.0	0.97	0.79	0.97	32.0
All Vehicles			2159	2.0	2159	2.0	0.618	12.0	LOS B	19.9	141.9	0.50	0.54	0.50	49.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options 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.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
North: Flanagans Drive												
P3	Full	50	53	44.3	LOS E	0.1	0.1	0.94	0.94	198.1	200.0	1.01
West: Escarpment Connector												
P4	Full	50	53	44.3	LOS E	0.1	0.1	0.94	0.94	198.1	200.0	1.01
All Pedestrians		100	105	44.3	LOS E	0.1	0.1	0.94	0.94	198.1	200.0	1.01

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 101v [IN-09 Bacchus Marsh Road/Flanagans Drive - AM Peak - Ultimate (with ELR) - Modified (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Bacchus Marsh Road/Flanagans Drive
AM Peak
Ultimate (with ELR)
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Bacchus Marsh Road (E)															
5	T1	All MCs	495	5.0	495	5.0	0.719	36.1	LOS D	24.8	181.3	0.92	0.82	0.92	38.2
6	R2	All MCs	212	2.0	212	2.0	* 0.693	67.9	LOS E	6.4	45.9	1.00	0.85	1.10	28.0
Approach			706	4.1	706	4.1	0.719	45.6	LOS D	24.8	181.3	0.95	0.82	0.98	34.2
North: Flanagans Drive															
7	L2	All MCs	612	2.0	612	2.0	* 0.769	35.9	LOS D	28.0	199.1	0.85	0.86	0.85	39.4
9	R2	All MCs	918	2.0	918	2.0	0.470	26.5	LOS C	16.5	117.5	0.67	0.77	0.67	42.0
Approach			1529	2.0	1529	2.0	0.769	30.3	LOS C	28.0	199.1	0.74	0.81	0.74	39.5
West: Bacchus Marsh Road (W)															
10	L2	All MCs	264	2.0	264	2.0	0.088	7.8	LOS A	1.5	10.6	0.21	0.63	0.21	51.1
11	T1	All MCs	617	5.0	617	5.0	* 0.759	47.8	LOS D	19.0	138.5	0.98	0.85	1.01	34.0
Approach			881	4.1	881	4.1	0.759	35.8	LOS D	19.0	138.5	0.75	0.79	0.77	37.8
All Vehicles			3117	3.1	3117	3.1	0.769	35.3	LOS D	28.0	199.1	0.79	0.81	0.80	37.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options 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.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

MOVEMENT SUMMARY

Site: 101v [IN-09 Bacchus Marsh Road/Flanagans Drive - PM Peak - Ultimate (with ELR) - Modified (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Bacchus Marsh Road/Flanagans Drive
PM Peak
Ultimate (with ELR)
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Bacchus Marsh Road (E)															
5	T1	All MCs	758	5.0	758	5.0	* 0.595	11.2	LOS B	23.6	172.5	0.59	0.54	0.59	50.7
6	R2	All MCs	244	2.0	244	2.0	0.500	59.1	LOS E	6.8	48.6	0.98	0.79	0.98	29.9
Approach			1002	4.3	1002	4.3	0.595	22.9	LOS C	23.6	172.5	0.68	0.60	0.68	43.4
North: Flanagans Drive															
7	L2	All MCs	244	2.0	244	2.0	* 0.593	52.9	LOS D	12.9	92.1	0.95	0.83	0.95	31.9
9	R2	All MCs	367	2.0	367	2.0	0.446	49.1	LOS D	9.3	66.5	0.91	0.80	0.91	32.7
Approach			612	2.0	612	2.0	0.593	50.6	LOS D	12.9	92.1	0.93	0.81	0.93	32.4
West: Bacchus Marsh Road (W)															
10	L2	All MCs	1283	2.0	1283	2.0	0.457	10.9	LOS B	13.2	94.0	0.39	0.71	0.39	49.1
11	T1	All MCs	855	5.0	855	5.0	0.499	22.3	LOS C	18.1	131.8	0.71	0.62	0.71	44.5
Approach			2138	3.2	2138	3.2	0.499	15.4	LOS B	18.1	131.8	0.52	0.67	0.52	47.1
All Vehicles			3752	3.3	3752	3.3	0.595	23.2	LOS C	23.6	172.5	0.63	0.68	0.63	42.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options 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.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

MOVEMENT SUMMARY

Site: 101 [IN-10 Bences Road/Diggers Rest-Coimadai Rd - AM Peak - 2056 No ELR (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Bences Road/Diggers Rest-Coimadai Rd
AM Peak
2056 No ELR
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Bences Rd (S)															
1	L2	All MCs	28	2.0	28	2.0	0.705	14.1	LOS B	5.1	36.0	0.86	1.22	1.81	42.3
3	R2	All MCs	259	2.0	259	2.0	0.705	23.6	LOS C	5.1	36.0	0.86	1.22	1.81	42.2
Approach			287	2.0	287	2.0	0.705	22.7	LOS C	5.1	36.0	0.86	1.22	1.81	42.3
East: Diggers Rest-Coimadai Rd (E)															
4	L2	All MCs	102	2.0	102	2.0	0.056	5.6	LOS A	0.0	0.0	0.00	0.58	0.00	52.8
5	T1	All MCs	359	5.0	359	5.0	0.190	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach			461	4.3	461	4.3	0.190	1.3	NA	0.0	0.0	0.00	0.13	0.00	58.2
West: Diggers Rest-Coimadai Rd (W)															
11	T1	All MCs	413	5.0	413	5.0	0.232	0.1	LOS A	0.2	1.1	0.04	0.05	0.04	59.6
12	R2	All MCs	12	2.0	12	2.0	0.232	8.3	LOS A	0.2	1.1	0.04	0.05	0.04	56.9
Approach			424	4.9	424	4.9	0.232	0.4	NA	0.2	1.1	0.04	0.05	0.04	59.6
All Vehicles			1173	4.0	1173	4.0	0.705	6.2	NA	5.1	36.0	0.23	0.37	0.46	53.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [IN-10 Bences Road/Diggers Rest-Coimadai Rd - PM Peak - 2056 No ELR (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Bences Road/Diggers Rest-Coimadai Rd
PM Peak
Stage 3
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Bences Rd (S)															
1	L2	All MCs	12	2.0	12	2.0	0.338	9.2	LOS A	1.4	10.0	0.77	0.96	0.97	45.2
3	R2	All MCs	108	2.0	108	2.0	0.338	18.0	LOS C	1.4	10.0	0.77	0.96	0.97	45.1
Approach			120	2.0	120	2.0	0.338	17.1	LOS C	1.4	10.0	0.77	0.96	0.97	45.1
East: Diggers Rest-Coimadai Rd (E)															
4	L2	All MCs	277	2.0	277	2.0	0.151	5.6	LOS A	0.0	0.0	0.00	0.58	0.00	52.8
5	T1	All MCs	486	5.0	486	5.0	0.257	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach			763	3.9	763	3.9	0.257	2.1	NA	0.0	0.0	0.00	0.21	0.00	57.1
West: Diggers Rest-Coimadai Rd (W)															
11	T1	All MCs	260	5.0	260	5.0	0.191	1.3	LOS A	0.6	4.4	0.22	0.26	0.22	57.7
12	R2	All MCs	31	2.0	31	2.0	0.191	10.9	LOS B	0.6	4.4	0.22	0.26	0.22	55.1
Approach			291	4.7	291	4.7	0.191	2.4	NA	0.6	4.4	0.22	0.26	0.22	57.5
All Vehicles			1174	3.9	1174	3.9	0.338	3.7	NA	1.4	10.0	0.13	0.30	0.15	55.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [IN-10 Bences Road/Diggers Rest-Coimadai Rd - AM Peak - 2056 With ELR (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Bences Road/Diggers Rest-Coimadai Rd
AM Peak
2056 With ELR
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Bences Rd (S)															
1	L2	All MCs	18	2.0	18	2.0	0.326	7.8	LOS A	1.5	10.9	0.64	0.88	0.77	48.5
3	R2	All MCs	165	2.0	165	2.0	0.326	12.2	LOS B	1.5	10.9	0.64	0.88	0.77	48.4
Approach			183	2.0	183	2.0	0.326	11.7	LOS B	1.5	10.9	0.64	0.88	0.77	48.4
East: Diggers Rest-Coimadai Rd (E)															
4	L2	All MCs	116	2.0	116	2.0	0.063	5.6	LOS A	0.0	0.0	0.00	0.58	0.00	52.8
5	T1	All MCs	351	5.0	351	5.0	0.186	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach			466	4.3	466	4.3	0.186	1.4	NA	0.0	0.0	0.00	0.14	0.00	58.0
West: Diggers Rest-Coimadai Rd (W)															
11	T1	All MCs	198	5.0	198	5.0	0.120	0.3	LOS A	0.2	1.1	0.09	0.10	0.09	59.3
12	R2	All MCs	13	2.0	13	2.0	0.120	8.0	LOS A	0.2	1.1	0.09	0.10	0.09	56.5
Approach			211	4.8	211	4.8	0.120	0.7	NA	0.2	1.1	0.09	0.10	0.09	59.1
All Vehicles			860	3.9	860	3.9	0.326	3.5	NA	1.5	10.9	0.16	0.29	0.19	55.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [IN-10 Bences Road/Diggers Rest-Coimadai Rd - PM Peak - 2056 With ELR (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Bences Road/Diggers Rest-Coimadai Rd
PM Peak
2056 With ELR
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Bences Rd (S)															
1	L2	All MCs	14	2.0	14	2.0	0.226	6.4	LOS A	0.9	6.5	0.58	0.78	0.58	49.6
3	R2	All MCs	126	2.0	126	2.0	0.226	10.3	LOS B	0.9	6.5	0.58	0.78	0.58	49.5
Approach			140	2.0	140	2.0	0.226	10.0	LOS A	0.9	6.5	0.58	0.78	0.58	49.5
East: Diggers Rest-Coimadai Rd (E)															
4	L2	All MCs	220	2.0	220	2.0	0.120	5.6	LOS A	0.0	0.0	0.00	0.58	0.00	52.8
5	T1	All MCs	234	5.0	234	5.0	0.124	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach			454	3.5	454	3.5	0.124	2.7	NA	0.0	0.0	0.00	0.28	0.00	56.2
West: Diggers Rest-Coimadai Rd (W)															
11	T1	All MCs	201	5.0	201	5.0	0.134	0.5	LOS A	0.3	2.1	0.15	0.17	0.15	58.7
12	R2	All MCs	24	2.0	24	2.0	0.134	7.9	LOS A	0.3	2.1	0.15	0.17	0.15	56.0
Approach			225	4.7	225	4.7	0.134	1.3	NA	0.3	2.1	0.15	0.17	0.15	58.4
All Vehicles			819	3.6	819	3.6	0.226	3.6	NA	0.9	6.5	0.14	0.33	0.14	55.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Traffix Group

G23398R-03A