![Positive Traffic — Engineering | Planning]

Proposed Residential Subdivision
407 & 457 Crookwell Road, Kingsdale

Traffic and Parking Assessment Report

Prepared for: IPG Invest Pty Ltd

December 2023

Report No: PT21013r01_Final_V5

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1. Introduction

This report has been prepared on behalf of IPG Invest Pty Ltd to present findings of a traffic and parking assessment of the proposed 277 residential lot staged construction of the site known as 407 & 457 Crookwell Road, Kingsdale.

The study has assessed existing traffic conditions, access arrangements, future traffic conditions and design compliance with applicable standards and policies.

The remainder of the report is set out as follows:

- Section 2 describes the existing traffic and parking conditions;
- Section 3 summarises the proposed development;
- Section 4 reviews the potential traffic impacts of the proposal;
- Section 5 reviews the design for compliance with relevant standards; and
- Section 6 presents the conclusions

2. Existing Development / Conditions

The following presents a summary of existing site and traffic conditions.

2.1   Site Location

The development site is currently a greenfield site located on the north-western corner of the intersection of Crookwell Road / Chinamans Lane with frontages to both. The location of the site is shown in **Figure 1**.

Figure 1 - Site Location
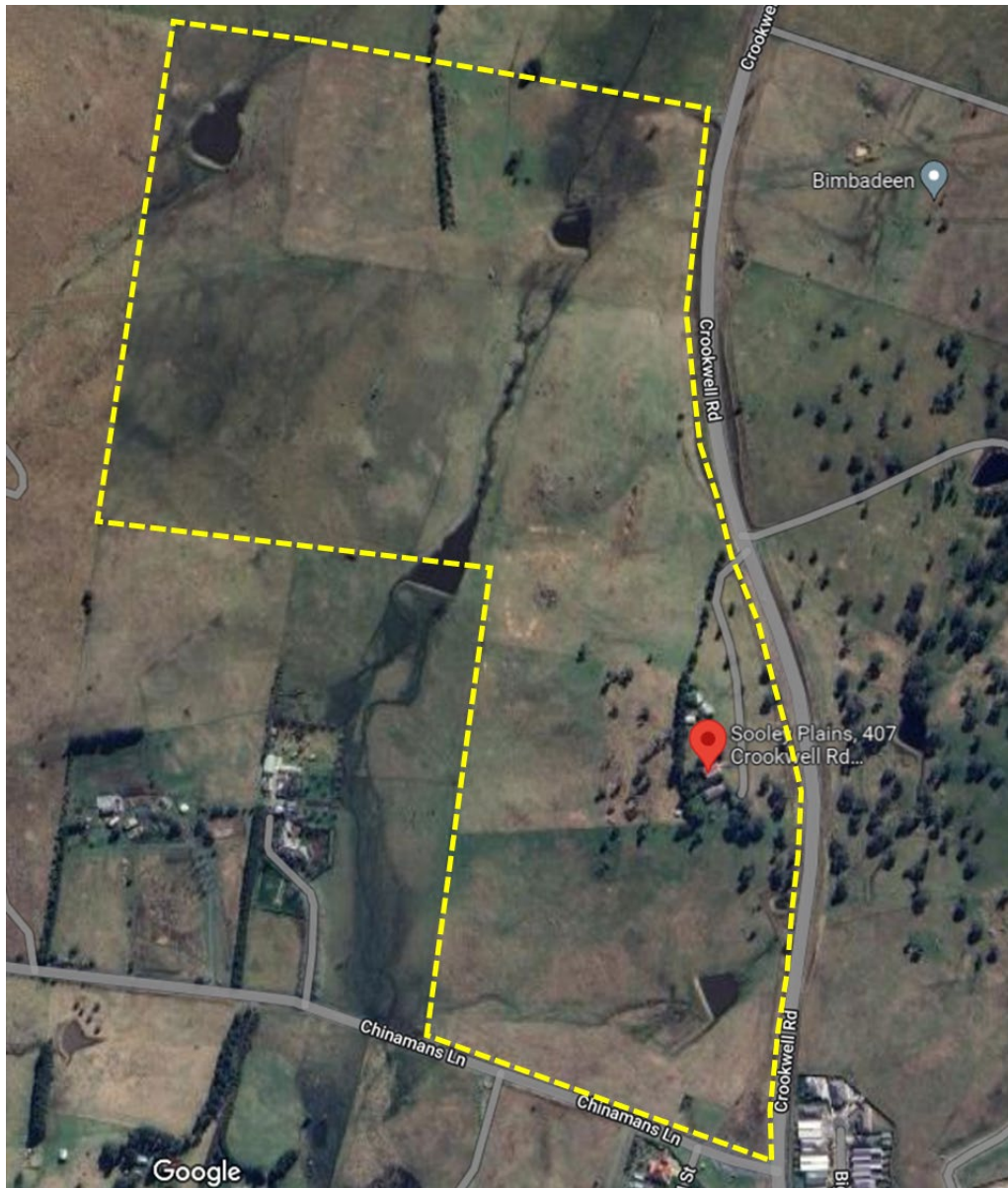
Source: Nearmap

2.2   Existing Site Traffic Generation

As stated above the existing site is a greenfield site and does not generate any traffic.

2.3   Goulburn Mulwaree Council Urban Fringe Strategy

It is noted that the subject site is remnant undeveloped land of an historical land release located in close proximity to further residential release areas as identified in the Goulburn Mulwaree Council Urban Fringe Strategy which is described below:

This Urban and Fringe Housing Strategy (Strategy) investigates and identifies areas suitable for the provision of additional housing to assist Goulburn Mulwaree Council (Council) meet the housing demands generated by expected continued population growth. The Strategy has been prepared in response to both the limited supply of residential land available to meet the short and medium term needs of the community and the directions of the South East and Tablelands Regional Plan 2036.

The scope of the Strategy includes looking at the urban areas of Goulburn and Marulan and identifying opportunities for an additional recommended 3,500 dwellings over the next 18 years to 2036.

The Strategy also considers land for large lot residential development (typically greater than 2ha and often referred to as rural residential development) particularly on the urban fringe of Goulburn. [1]

The location of the development site in the context of the overall areas identified for increased housing is shown below in **Figure 2**.

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[1] Goulburn Mulwaree Council Urban Fringe Strategy – Elton Consulting 2020

Figure 2 – Site Location Adjacent to Goulburn Mulwaree Council Urban Fringe Strategy Precincts
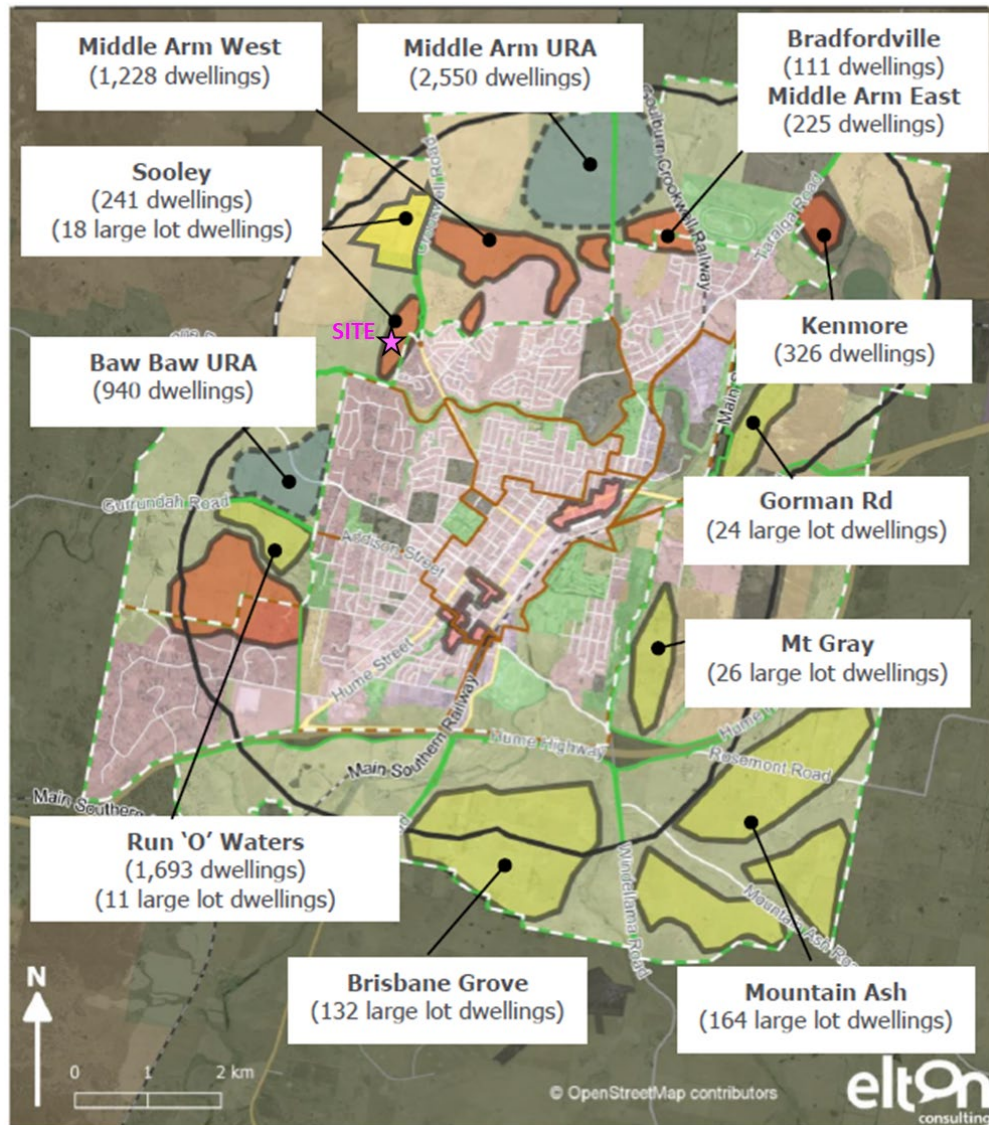
The Goulburn Mulwaree Council Urban Fringe Strategy – Elton Consulting 2020 indicates a total expected yield of 241 dwellings with 18 large lot dwellings resulting in a total of 259 lots.

Within this framework the site is located what is referred to as the 'Sooley Precinct', a rural precinct on Goulburn's northwest fringe, bounded by Crookwell Road and the Wollondilly River. The location of the site within this precinct is shown below in **Figure 3**.

Figure 3 – Site Location Within Sooley Precinct
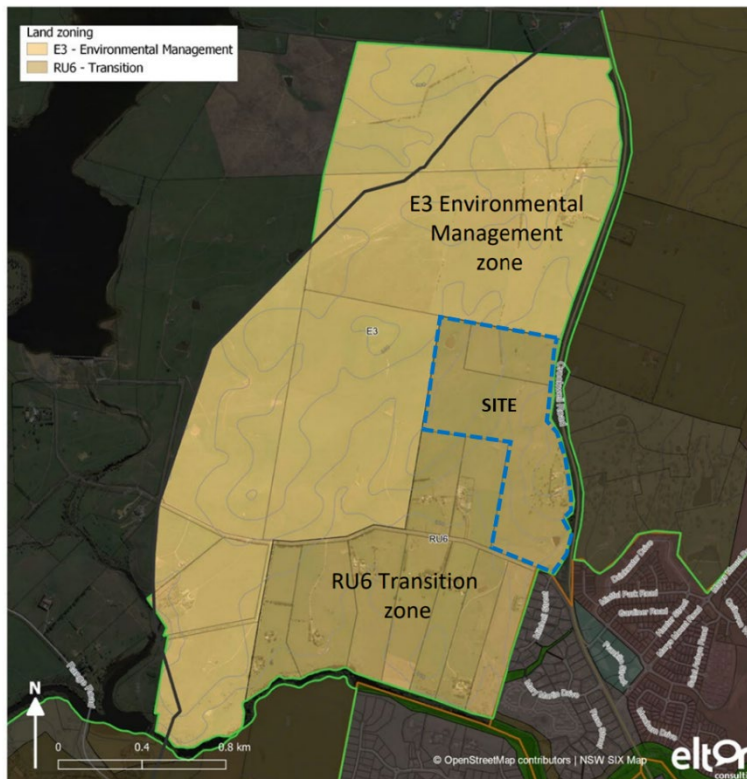
2.3.1   *Goulburn Mulwaree Local Infrastructure Contributions Plan*

The Goulburn Mulwaree Local Infrastructure Contributions Plan, which underpins the Goulburn Mulwaree Council Urban Fringe Strategy, has identified an upgrade of the intersection of Crookwell Road / Chinamans Lane to replace the existing priority controlled arrangements with a new roundabout. Further, a roundabout is proposed within Chinamans Lane to serve the redevelopment of the Sooley Precinct. However, it is noted that the location of this roundabout is not known nor is it known whether the roundabout was to serve the subject site or more suited to serve development on the southern edge of Chinamans Lane in the future.

A further roundabout is recommended within Council's contribution plan in Crookwell Road to serve the development site which will be funded by Council. However, the location of this roundabout is not known.

The recommended future intersection arrangements funded by Council's contributions plan are shown below in **Figure 4**.

Figure 4 – Future Funded Intersection Arrangements Surrounding Development Site

Thus it is observed that Council will be funding an upgrade of the intersection of Crookwell Road / Chinaman's Lane in the future for provision of a roundabout to replace the existing priority controlled intersection.

2.4   Classification Criteria

It is usual to classify roads according to a road hierarchy in order to determine their functional role within the road network. Changes to traffic flows on the roads can then be assessed within the context of the road hierarchy. Roads are classified according to the role they fulfil and the volume of traffic they should appropriately carry. The RTA has set down the following guidelines for the functional classification of roads.

- Arterial Road – typically a main road carrying over 15,000 vehicles per day and fulfilling a role as a major inter-regional link (over 1,500 vehicles per hour)
- Sub-arterial Road – defined as secondary inter-regional links, typically carrying volumes between 5,000 and 20,000 vehicles per day (500 to 2,000 vehicles per hour)
- Collector Road – provides a link between local roads and regional roads, typically carrying between 2,000 and 10,000 vehicles per day (250 to 1,000 vehicles per hour). At volumes greater than 5,000 vehicles per day, residential amenity begins to decline noticeably.
- Local Road – provides access to individual allotments, carrying low volumes, typically less than 2,000 vehicles per day (250 vehicles per hour).

2.5   **Existing Road Network**

Crookwell Road – is a local Collector Road with a single travel lane in each direction and formed shoulders across the frontage of the site. North of its priority controlled intersection with Chinamans Lane the road includes a 100km/hr speed limit northbound and 60km/hr speed limit southbound. Crookwell Road includes a carriageway width of approximately 10.0m.

Chinamans Lane – is a local east-west street linking Crookwell Road in the east (via a priority controlled intersection) with Range Road in the west. Across the frontage of the site the street includes a single lane of travel in each direction, a posted speed limit of 50km/hr and a carriageway width of approximately 8.0m.

The priority controlled intersection of Crookwell Road / Chinaman's Lane includes widening in the northbound driveway to allow left turning vehicles to move out of the way of northbound traffic in a similar fashion to a BAL intersection arrangement. The existing arrangements are shown below in **Figure 5**.

Figure 5 – Existing Intersection Arrangements for Northbound & Southbound Traffic in Crookwell Road at Chinaman's Lane

The recommended arrangements for a BAL from Austroads is shown below in **Figure 6**.

Figure 6 – AustRoads Figure 4.1 BAL Recommended Arrangements

**Basic Left Turn (BAL)
on the Major Road**

2.6   2021 Traffic Flows

To gauge existing traffic flows on the surrounding road network, the following counts were undertaken in November 2021:

Figure 7 – Weekday Peak Hour Intersection Count Locations
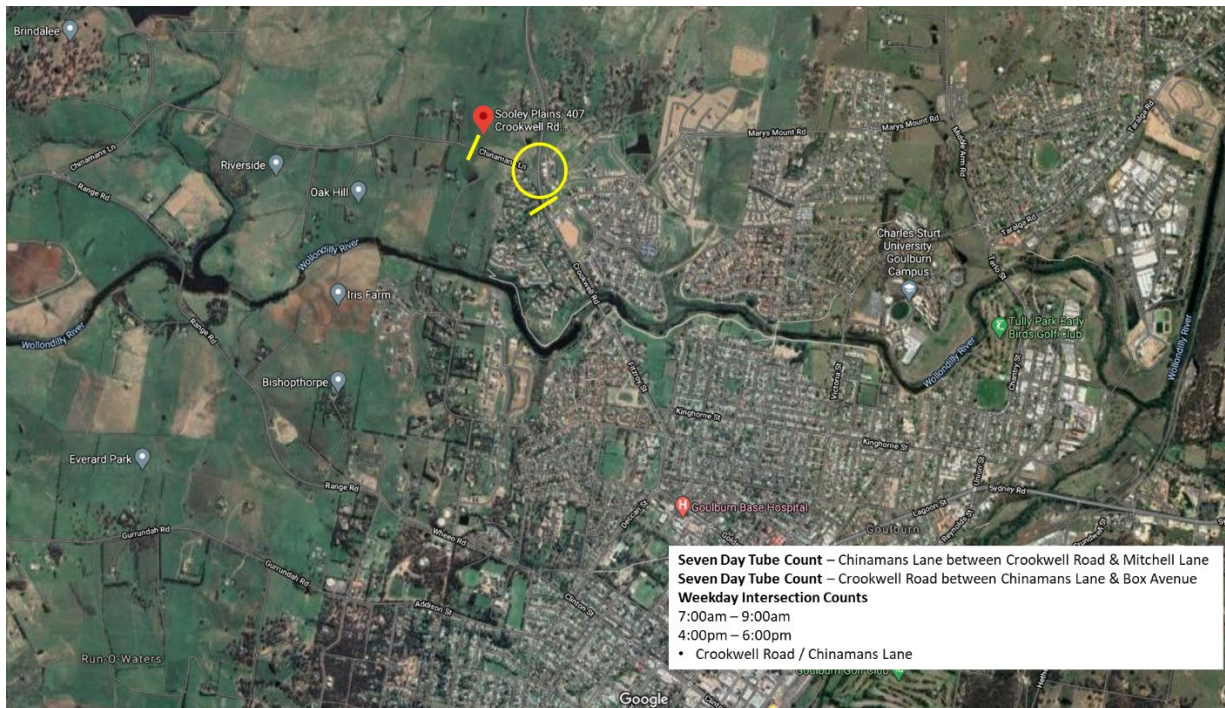
The data collection included two (2) seven day tube counts in both Chinamans Lane and Crookwell Road (south of its intersection with Chinamans Lane) and weekday peak hour counts of the intersection of Crookwell Road / Chinamans Lane. Copies of all counts count can be found in **Appendix A** of this report. The peak flows by direction in each street at the intersection (recorded from the intersection count) are summarised below.

Table 1 – November 2021 Weekday Peak Period Volumes in vicinity of site (veh/hr)

Road	Location	Weekday AM		Weekday PM	
		NB/EB	SB/WB	NB/EB	SB/WB
Crookwell Road	North of Chinamans Lane	74	180	162	98
	South of Chinamans Lane	90	226	199	118
Chinamans Lane	West of Crookwell Road	47	17	22	39

From **Table 1** it can be seen that existing flows on surrounding roads are in generally in line with their classification.

2.7   November 2021 Intersection Operating Conditions

All intersections surveyed have been analysed using the Sidra Intersection analysis program. Sidra Intersection determines the average delay that vehicles encounter, the degree of saturation of the intersection, and the level of service. The degree of saturation is the ratio of the arrival rate of vehicles to the capacity of the approach. Sidra Intersection provides analysis of the operating conditions which can be compared to the performance criteria set out in **Table 2**.

Table 2 – Level of Service Criteria

Level of Service	Average Delay per Vehicle (secs/veh)	Signals & Roundabouts	Give Way & Stop Signs
A	less than 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays & spare capacity	Acceptable delays & Spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Operating near capacity	Near capacity & accident study required
E	57 to 70	At capacity; at signals, incidents will cause excessive delays Roundabouts require other control mode	At capacity, requires other control mode
F	> 70	Extra capacity required	Extreme delay, traffic signals or other major treatment required

Adapted from RTA Guide to Traffic Generating Developments, 2002.

For roundabouts and priority intersections, the reported average delay is for the individual movement with the highest average delay per vehicle. At signalised intersections, the reported average delay is over all movements. The two intersections surveyed have been modelled as a network given their close proximity to each other. The existing weekday and weekend day intersection operating conditions are presented in **Table 3**. Average delay is expressed in seconds per vehicle. It should be noted that given their close proximity the intersections have been modelled as a network within SIDRA.

Table 3 – Existing Weekday AM / PM Peak Intersection Operating Conditions

Intersection	Control	Weekday AM Peak		Weekday PM Peak	
		Av Delay	LOS	Av Delay	LOS
Crookwell Rd / Chinamans Lane	Priority	9.7	A	7.2	A

Avg Delay (sec/veh) is over all movements at signals, and for worst movement at priority and roundabouts

From **Table 3** it is noted that all intersections surveyed adjacent to the development site operated at a satisfactory level of service with spare capacity when counts were undertaken in November 2021

2.8   November 2021 Mid-Block Capacity Assessment

On the matter of mid-block capacity of roads surveyed versus demands, the following mid-block capacities are typical by road type.

Table 4 – Austroads 2020 Lane Mid-Block Capacities

Type of lane	One-way mid-block capacity (pc/h)
Median or inner lane	
Divided road	1000
Undivided road	900
Middle lane (of a 3 lane carriageway)	
Divided road	900
Undivided road	1000
Kerb lane	
Adjacent to parking lane	900
Occasional parked vehicles	600
Clearway conditions	900

Source: Austroads (2020)

Therefore, the existing volume capacity ratios of each road surveyed around the development site using the seven day tube count data is shown below in **Table 5**.

Table 5 – November 2021 Volume / Capacity Analysis of Roads Surrounding Development Site

Road	Two Way Mid-Block Capacity	AM Peak Hour Two Way Flow	AM Peak V/C	PM Peak Hour Two Way Flow	PM Peak V/C
Crookwell Rd – South of Chinamans Lane	1,200	284	0.234	300	0.250
Chinamans Ln – West of Crookwell Rd	1,200	32	0.027	35	0.029

From **Table 5** it is evident that roads immediately in the vicinity of the development site have significant spare mid-block capacity in November 2021.

2.9   2023 Traffic Flows / Intersection Operating Conditions

Following consultation with both Transport for NSW and Goulburn / Mulwaree Council it was requested that the intersection count at Crookwell Road / Chinamans Lane be repeated to gauge changes to traffic demands since the original counts in November 2021.

Copies of the 2023 intersection count are also provided in **Appendix A** of this report.

The resulting 2023 mid block traffic volumes are presented below in **Table 6**.

Table 6 – 2023 Weekday AM / PM Peak Period Volumes in vicinity of site (veh/hr)

Road	Location	Weekday AM		Weekday PM	
		NB/EB	SB/WB	NB/EB	SB/WB
Crookwell Road	North of Chinamans Lane	77	155	174	134
	South of Chinamans Lane	88	194	202	154
Chinamans Lane	West of Crookwell Road	41	13	21	29

From **Table 6** it is noted that traffic demands during the AM peak period on all legs of the intersection are *similar or less* in 2023 versus 2021. However, there has been an increase in traffic demands in Crookwell Road in the weekday PM peak but a decrease in traffic in Chinamans Lane traffic during the same period.

The AM / PM peak hour intersection operating conditions for the 2023 counts are presented below in **Table 7**.

Table 7 – June 2023 Weekday AM / PM Peak Intersection Operating Conditions

Intersection	Control	Weekday AM Peak		Weekday PM Peak	
		Av Delay	LOS	Av Delay	LOS
Crookwell Rd / Chinamans Lane	Priority	8.8	A	7.5	A

Avg Delay (sec/veh) is over all movements at signals, and for worst movement at priority and roundabouts

From **Table 7** it is noted that 2023 AM weekday intersection operating conditions are better than those recorded in November 2021. This reflects a reduction in side street traffic recorded in 2023 versus 2023. There is also a small increase in delay of 0.3 seconds in the weekday PM peak. However, in all instances the intersection operates at Level of Service A.

Thus, the 2023 intersection count / mid block flows whilst of minimal difference to those recorded in November 2021 will form the basis of this traffic assessment.

2.10   Public Transport - Buses

The Route 818 bus service between Crookwell and Goulburn operates past the site but does not include any bus stops within a convenient walking distance to the site. This service provides one morning peak service from Crookwell to Goulburn and ceases operation by 4pm on weekdays. No services are available on weekend days. The route of the 818 service is shown below in **Figure 8**.

Figure 8 – Route Map of Crookwell to Goulburn Route 818 Bus Service
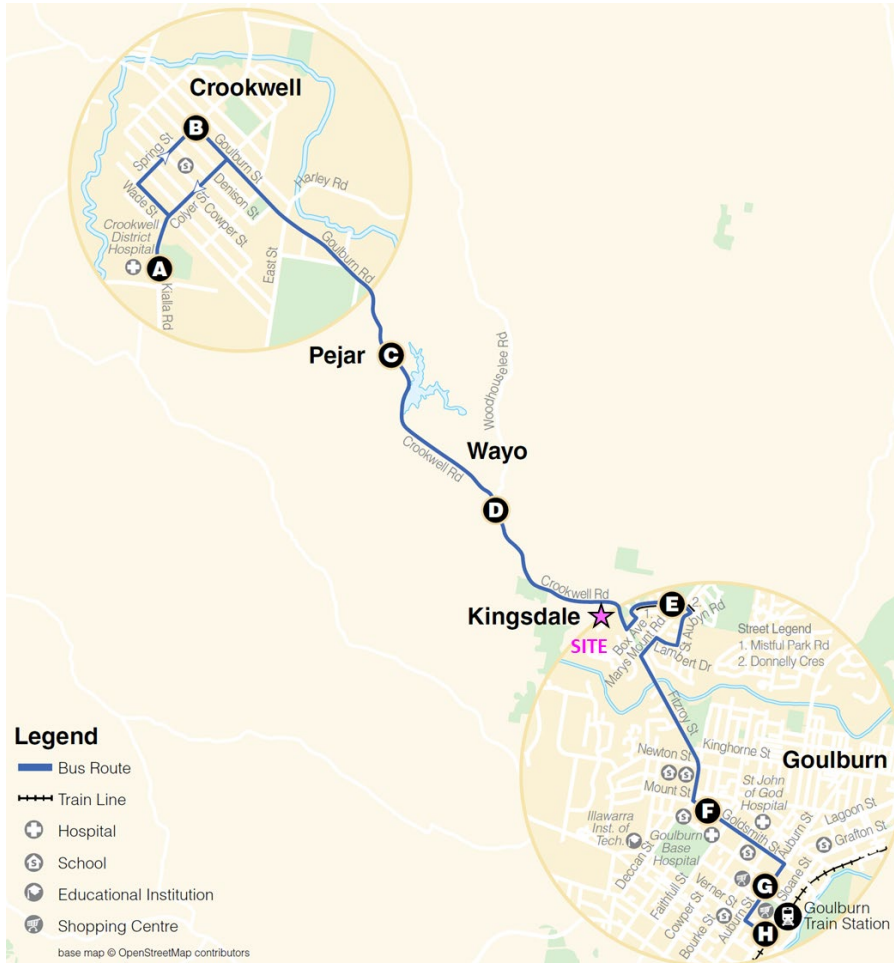
A further nearby service includes the PBC Goulburn Bus Route 821A / 821B operating along Mary Mount Road. This loop service provides direct access to the Goulburn CBD. The location of the site relative to the above service routes is shown below.

Figure 9 – Existing Bus Stops Near Site

Both Crookwell Road and Chinamans Lane include school bus services.

3.   The Proposed Development

The key components of the proposed development are summarised below

- Construction of **277** residential housing lots including:
  - 267 standard housing lots
  - 5 rural lots less than 2 hectares
  - 5 rural lots greater than 2 hectare
- Internal road network serving the lots with a single intersection connection in the form of a CHR / CHL intersection arrangement and a priority controlled intersection connection with Chinamans Lane.
- Internal road connection to the development site at No.515 Crookwell Road Kingsdale to provide second vehicle access to this development site.
- Internal road network to service adjacent residential dwellings.

As stated above, the site includes ten (10) large rural residential lots which are all located near the northern boundary of the site. The intent of the proposed access to Crookwell Road near the northern border of the site is to provide direct access to these larger residential lots. Further, the riparian / drainage corridor through the centre of the site results in a longer more convoluted route for the smaller lots to gain access to the Crookwell Road road connection.

The CHR / CHL intersection is seeking to replace the identified roundabout proposed in Council's Contribution Plan to provide a reduced number of access points to Crookwell Road whilst providing a more appropriate intersection control for the existing 100km/hr speed zone. That is, a roundabout is not considered a suitable intersection control for such a speed limit. Of further note, no change to the existing speed limit is proposed by Transport for NSW at this stage.

Thus arrangement is intentional with the main vehicle access to the small lots provided by the new intersection connection with Chinamans Lane with the large lots effectively provided their own road connection resulting in little to no traffic from the main subdivision using this access. This in turn reduces traffic volumes generated across the frontages of the large lots.

3.1   Other Known Development

As stated above, the site to the immediate north known as No.515 Crookwell Road also included a residential subdivision proposal but with a small total of 24 lots. Further, at the time of the original submission of the proposal, the development included two (2) separate vehicle access connections with Crookwell Road.

Following submission of the original DA for this proposal, Transport for NSW requested rationalisation of the vehicle access points for both development sites. Thus, the design of the two development sites combined includes the following adopted external and internal vehicle access points:

1. Priority controlled intersection with Chinamans Lane
2. Entry / exit access road in Crookwell Road near common boundary of both development sites.
3. Entry / exit access road in Crookwell Road serving development at No.515 Crookwell Road.

4. Internal local road connection between the two sites to allow all generated traffic from both development sites to gain access to all access roads to the surrounding road network.

Plans of the proposed subdivision and internal road network along with the development at No.515 Crookwell Road are provided in **Appendix B** of this report.

4. Potential Traffic Impacts

4.1   Introduction

The following presents an assessment of the potential traffic impacts of the proposal using the Roads and Traffic Authority Guide to Traffic Generating Developments standard approach.

4.2   Development Traffic Generation

As requested by Transport for NSW, the adopted traffic generation rates applied to the proposed development of each site are the *maximum* traffic generation rates for regional areas of 0.90 trips per dwelling in the AM peak and 0.85 trips per dwelling in the PM peak. The expected trip distribution as per the recommendations of the RTA Guide to Traffic Generating Developments would be 80% outbound in the AM peak and 20% inbound. The reverse would occur during the PM peak hour.

The resulting traffic generation of each site is presented below:

407 Crookwell Road (277 dwellings).
- Total AM peak traffic generation   250 vehicle trips two way
- Total Inbound AM peak traffic generation: 50 vehicle trips
- Total Outbound AM peak traffic generation: 200 vehicle trips
- Total PM peak traffic generation: 236 vehicle trips two way
- Total Inbound PM peak traffic generation: 189 vehicle trips
- Total Outbound PM peak traffic generation: 47 vehicle trips

515 Crookwell Road (24 dwellings).
- Total AM peak traffic generation   22 vehicle trips two way
- Total Inbound AM peak traffic generation: 4 vehicle trips
- Total Outbound AM peak traffic generation: 18 vehicle trips
- Total PM peak traffic generation: 20 vehicle trips two way
- Total Inbound PM peak traffic generation: 16 vehicle trips
- Total Outbound PM peak traffic generation: 4 vehicle trips

4.3   Secondary Dwelling Traffic Generation

As requested by Transport for NSW, traffic generation from potential secondary dwellings within the development site at No.407 Crookwell Road are to be included in the modelling assessment of potential impacts. Representatives of Goulburn / Mulwaree have confirmed a potential 60% of the proposed sites could include secondary dwellings.

Being small in nature it is unlikely that secondary dwellings would generate the same peak hour traffic generation of detached dwellings. However, to provide a conservative estimate of potential traffic generation, the metropolitan peak hour traffic generation rates have been adopted. This approach has been applied to both development sites.

No.407 Crookwell Road
- Total potential secondary dwellings: 60% (166 dwellings)
- Total AM peak traffic generation   150 vehicle trips two way
- Total Inbound AM peak traffic generation: 30 vehicle trips
- Total Outbound AM peak traffic generation: 120 vehicle trips
- Total PM peak traffic generation: 141 vehicle trips two way
- Total Inbound PM peak traffic generation: 113 vehicle trips
- Total Outbound PM peak traffic generation: 28 vehicle trips

515 Crookwell Road (24 dwellings).
- Total potential secondary dwellings: 60% (14 dwellings)
- Total AM peak traffic generation   13 vehicle trips two way
- Total Inbound AM peak traffic generation: 1 vehicle trips
- Total Outbound AM peak traffic generation: 12 vehicle trips
- Total PM peak traffic generation: 12 vehicle trips two way
- Total Inbound PM peak traffic generation: 10 vehicle trips
- Total Outbound PM peak traffic generation: 2 vehicle trips

4.4   Trip Distribution

It has been assumed that *all* generated traffic would travel to / from the south via Crookwell Road towards Goulburn.

As stated in **Section 3**, the design of the subdivision and internal road network seeks to have the majority of the small lots using the Chinamans Lane access to enter / exit the site with the large lots served by the Crookwell Road access. To provide context to the design approach, the distances from the drainage / riparian corridor through the site to the intersection of Crookwell Road / Chinamans Lane is shown below in **Figure 10** and confirms it is more than double the distance from this point via the Crookwell Road access compared to using the more direct route of Chinamans Lane..

Figure 10 – Assumed Route of Travel of Generated Trips
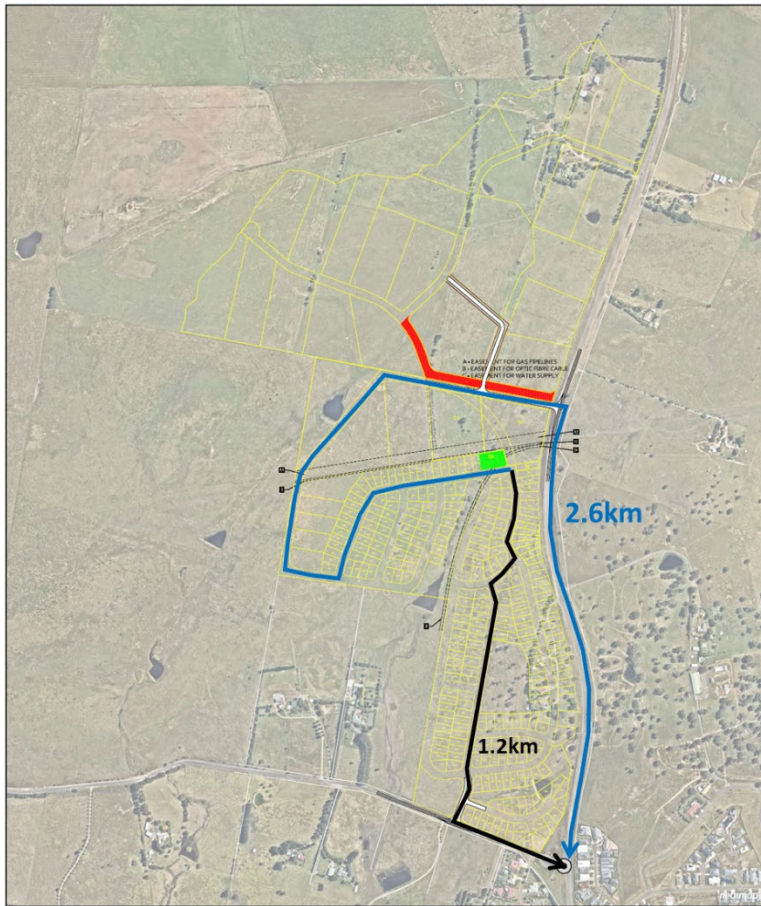
The proportion of lots using each access adopted in the assessment of intersection conditions are presented below in **Figure 11**.

Figure 11 – Adopted Distribution of Trips by Access Point
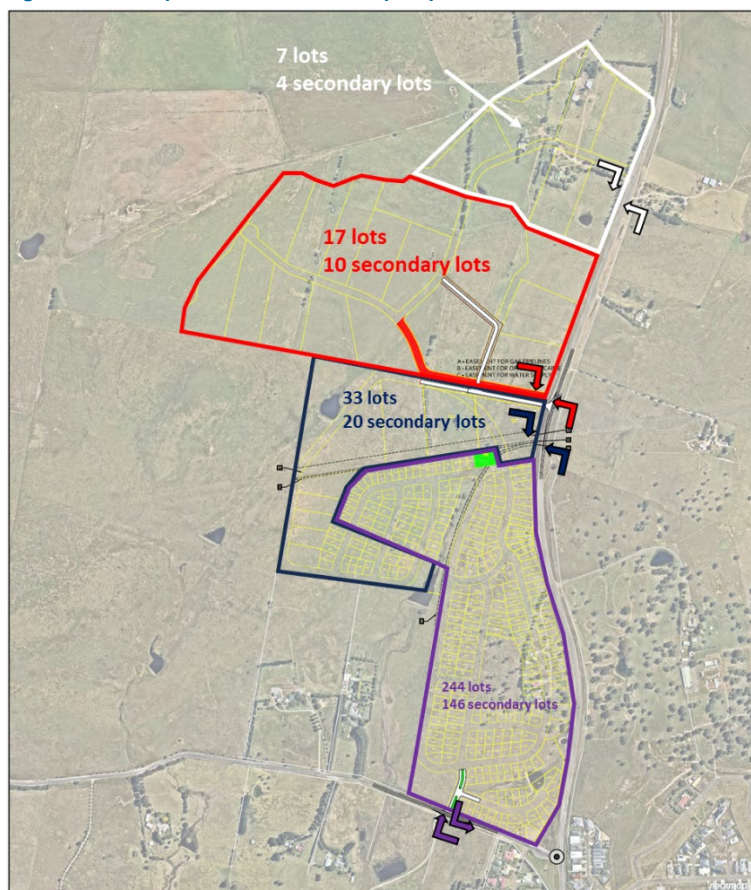
Thus, the resulting traffic generation by direction by access location is presented below in **Figure 12**.

Figure 12 – Overall Development Traffic Generation by Access
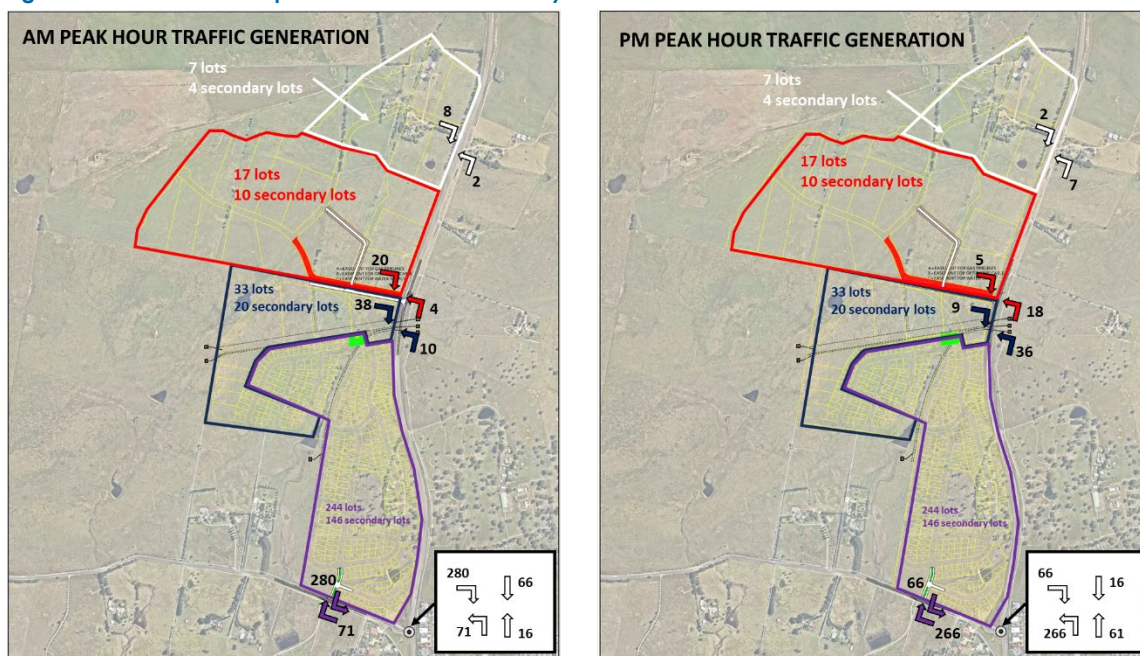
4.5   Future Intersection Operating Conditions

4.5.1   Crookwell Road / Chinamans Lane – SIDRA Assessment

The additional traffic generated by the proposal including potential secondary dwellings has been added to the surrounding road network in accordance with the adopted distribution of trips presented above in **Figure 11**.. The resulting future intersection operating conditions is presented below in **Table 8**. This includes a 10 year assessment of 2% per annum growth (compounded) on *all movements*.

Table 8 – Crookwell Road / Chinamans Lane Future Weekday AM / PM Peak Intersection Operating Conditions

Intersection	Control	Weekday AM Peak		Weekday PM Peak	
		Av Delay	LOS	Av Delay	LOS
2023 Volumes + Development					
Crookwell Rd / Chinamans Lane	Priority	14.9	B	9.9	A
2032 Volumes + Development					
Crookwell Rd / Chinamans Lane	Priority	20.9	B	13.6	A

Avg Delay (sec/veh) is over all movements at signals, and for worst movement at priority and roundabouts

From **Table 8** it is noted that the intersection of Crookwell Road / Chinamans Lane in its current form as a priority controlled intersection would operate at a satisfactory level of service in the future following full development of the site in its current form. As stated above, Council's contribution plan identifies this intersection for future roundabout provision which would provide ever greater capacity than in its current form.

4.5.2   Crookwell Road / Chinamans Lane – Austroads Assessment

As a comparison, the intersection has been assessed in accordance the requirements of Austroads for a posted speed limit less than 100km/hr (existing speed limit of 50km/hr). The values of Q(m) have been calculated in accordance with AustRoads as shown below.
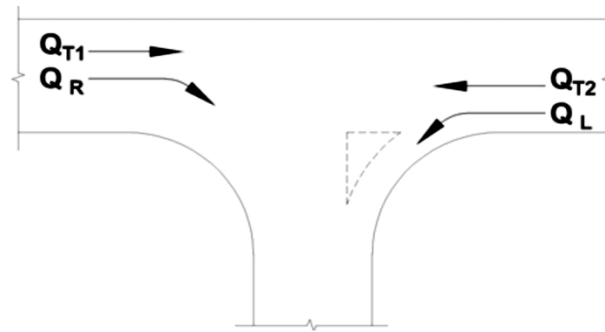
Road type	Turn type	Splitter island	Q_M (veh/h)
Two-lane two-way	Right	No	$= Q_{T1} + Q_{T2} + Q_L$
		Yes	$= Q_{T1} + Q_{T2}$
	Left	Yes or no	$= Q_{T2}$
Four-lane two-way	Right	No	$= 50\% \times Q_{T1} + Q_{T2} + Q_L$
		Yes	$= 50\% \times Q_{T1} + Q_{T2}$
	Left	Yes or no	$= 50\% \times Q_{T2}$
Six-lane two-way	Right	No	$= 33\% \times Q_{T1} + Q_{T2} + Q_L$
		Yes	$= 33\% \times Q_{T1} + Q_{T2}$
	Left	Yes or no	$= 33\% \times Q_{T2}$

The existing versus future Q(m) volumes for the application of Figure 4.9 b) are provided below:

Existing

AM

Left Turn Q(m) = 68

PM

Left Turn Q(m) = 182

Future

AM

Left Turn Q(m) = 84

PM

Left Turn Q(m) = 243

Existing

AM

Right Turn Q(m) = 242

PM

Right Turn Q(m) = 354

Future

AM

Right Turn Q(m) = 507

PM

Right Turn Q(m) = 697

The resulting application of Figure 2.25 of AustROADS Part 6 of this intersection for the AM and PM peak periods existing and in the future post development are shown below in **Figure 13** and **Figure 14**.

Figure 13 – Existing Chinaman's Lane / Crookwell Road Austroads Intersection Assessment
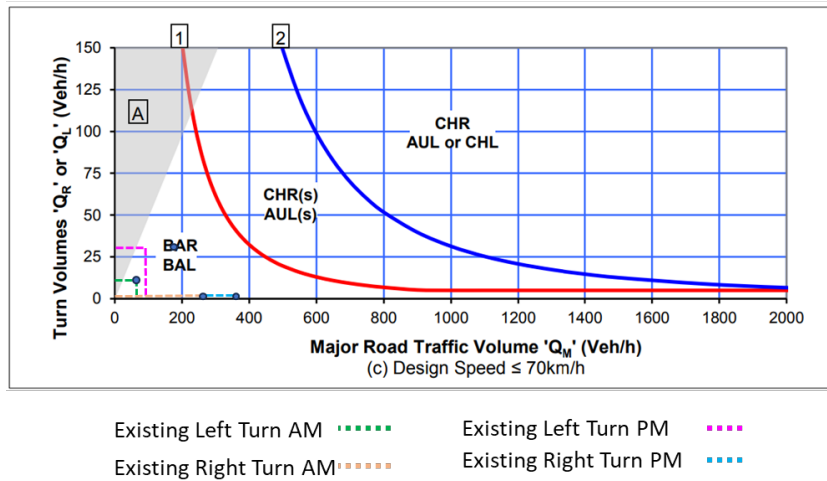
Figure 14 – Future Chinaman's Lane / Crookwell Road Austroads Intersection Assessment
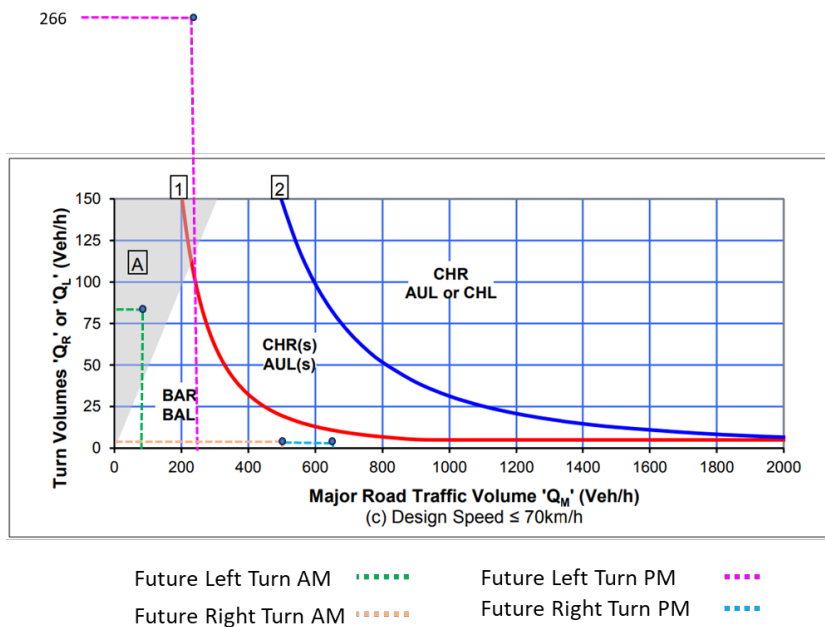
The application of Figure 2.25 of AustROADS Part 6 for future conditions indicates an expansion of the left turn BAL to a AUL with no change to a BAR requirement (compared to existing) which could be provided in the form of shoulder widening in Crookwell Road.

Overall, as the intersection has been identified as a roundabout intersection funded by contributions of this development (and this development forming one of the last development sites north of the Chinaman's Lane intersection) it would be prudent for the proponent and Council to deliver the roundabout through a funding / contribution agreement instead of constructing what will become redundant road works in the form of a AUL / BAR interim intersection. This is a matter for consideration as part of any future development application for the site.

4.5.3   Chinamans Lane / Site Access

The proposed access from Chinamans Lane, a 50km/hr posted speed limit local street, would take the form of a priority controlled intersection. The future intersection operating conditions of this new site access are presented below in **Table 9.**

Table 9 – Chinamans Lane / Site Access Future Weekday AM / PM Peak Intersection Operating Conditions

Intersection	Control	Weekday AM Peak		Weekday PM Peak	
		Av Delay	LOS	Av Delay	LOS
2023 Volumes + Development					
Chinamans Lane / Site Access	Priority	6.8	A	8.9	A
2032 Volumes + Development					
Chinamans Lane / Site Access	Priority	7.3	A	10.5	A

Avg Delay (sec/veh) is over all movements at signals, and for worst movement at priority and roundabouts

From **Table 9** it is observed that the proposed site access as a local priority controlled intersection in Chinamans Lane would operate satisfactory level of service in the future following full development of the site.

SIDRA outputs of all models are provided in **Appendix C** of this report.

4.5.4   Crookwell Road / Site Access

As prescribed by Transport for NSW, the assessment of the Crookwell Road site access has been determined using Figure 2.25 of the Austroads Guide to Road Design – Part 6.

The modelling has assumed all traffic would travel to / from Goulburn during peak road network periods and it is unlikely there would be any great attraction to the north (Crookwell) by peak hour commuter trips generated by the developments combined.

The AustRoads requirements are shown below in **Figure 15**.

Figure 15 - Austroads Crookwell Road / Site Access Requirement
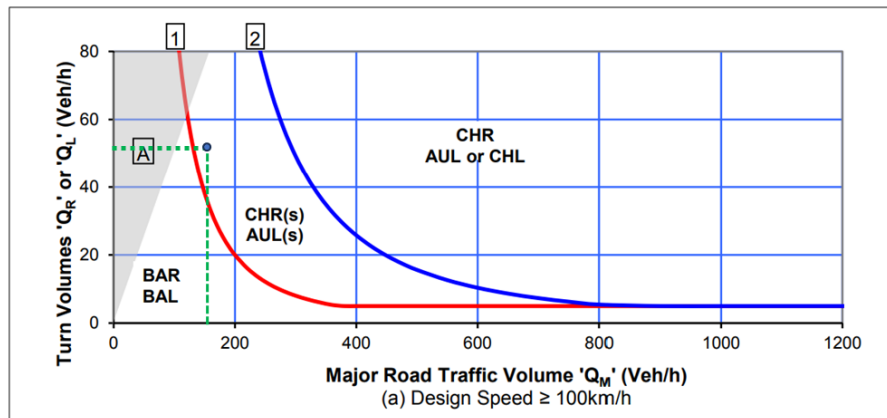
As the proposal includes a CHR / CHL intersection connection with Crookwell Road, the future access would comply with the requirements of AustRoads and would be considered satisfactory.

The final design / position of the intersection access would be determined following finer grain studies of the sites constraints as part of a future development application.

Overall, the traffic impacts of the proposal are considered acceptable.

5. Road Network Compliance Review

5.1 Goulburn Council Engineering Standard Requirements

The proposal includes the following road corridor widths by location:

- 4.5m/6.0m/4.5m Road 3
- 4.5m/11.0m/4.5m Roads 2, 5, 6, 7, 8, 10, 11, 12, 13, 14 & 16
- 6.0m/5.5m/2.0m/5.5m/6.0m Roads 1 & 9
- 6.5m/11.0m/4.5m Roads 4 & 15
- 6.5m/9.0m/4.5m (Rural) Road 17
- 8.5m/9.0m/4.5m (Rural) Road 18

Thus, all road reservations within the proposed staged subdivision comply with the minimum requirements of Goulburn Council and thus would be considered satisfactory.

6. Conclusions

This report has reviewed the potential traffic impacts of the proposed 277 lot residential subdivision of the site known 407 & 457 Crookwell Road, Kingsdale. The findings of this assessment are presented below:

1. The potential traffic generation of the development would not impact on the surrounding road network to a point of detriment.
2. The existing intersection of Crookwell Road / Chinamans Lane as a priority controlled intersection would continue to operate at a satisfactory level of service into the future following full development of the site at No.407, 457 and 515 Crookwell Road, Kingsdale using SIDRA modelling.
3. Applying AustRoads requirements the intersection would require provision of a CHR / AUL intersection arrangement which given the intersection has been identified in Council's contributions plans would be redundant work following provision of a roundabout at the location.
4. The option to provide a CHR / AUL intersection or a single lane roundabout is a matter for consideration as part of a future development application in consultation with Council / Transport for NSW. Both options would be considered viable in terms of intersection capacity requirements.
5. The proposed priority controlled intersection of Chinamans Lane and the site access would operate at a satisfactory level of service into the future following full development of the site at No.407, 457 and 515 Crookwell Road, Kingsdale.
6. The provision of a CHR / CHL intersection arrangement for the proposed site access from Crookwell Road would comply with the requirements of.
7. All proposed internal roads comply with the minimum requirements of Goulburn Council Engineering Standards.
8. Consideration should be given to extending the existing 60km/hr speed zone in Crookwell Road at Chinaman's Lane to the northern boundary of the site to better reflect the residential environment of Crookwell Road in the future.

Overall the traffic impacts of the proposal are considered acceptable.

7. Appendix A – Intersection Counts

Job No. : AUNSW1693

Client : The Trustee for Positive Traffic Trust

Suburb : Goulburn

Location : 1. Crookwell Rd / Chinamans Ln

Day/Date : Tue, 9th Nov 2021

Weather : Fine

Description : Classified Intersection Count

: 15 mins Data

	Class 1	Class 2	Class 3
Classifications	Cars	Trucks	Buses

Chinamans Ln

Crookwell Rd

Crookwell Rd

9U 9 8

10

12 12U

1 2 3U

N

Approach	Crookwell Rd												
Direction	Direction 1 (Left Turn)				Direction 2 (Through)					Direction 3U (U Turn)			
Time Period	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total		Cars	Trucks	Buses	Total
7:00 to 7:15	3	0	0	3	20	1	0	21		0	0	0	0
7:15 to 7:30	2	0	0	2	16	2	0	18		0	0	0	0
7:30 to 7:45	3	0	0	3	14	0	0	14		0	0	0	0
7:45 to 8:00	7	0	0	7	17	0	0	17		0	0	0	0
8:00 to 8:15	6	0	1	7	17	5	0	22		0	0	0	0
8:15 to 8:30	2	0	0	2	11	1	0	12		0	0	0	0
8:30 to 8:45	3	0	0	3	17	2	0	19		0	0	0	0
8:45 to 9:00	4	0	0	4	17	4	0	21		0	0	0	0
AM Totals	30	0	1	31	129	15	0	144		0	0	0	0
14:00 to 14:15	8	1	0	9	41	1	0	42		0	0	0	0
14:15 to 14:30	3	0	0	3	40	0	0	40		0	0	0	0
14:30 to 14:45	10	1	0	11	42	3	0	45		0	0	0	0
14:45 to 15:00	10	0	0	10	39	1	0	40		0	0	0	0
15:00 to 15:15	11	0	0	11	36	0	0	36		0	0	0	0
15:15 to 15:30	5	0	0	5	40	1	0	41		0	0	0	0
15:30 to 15:45	7	0	0	7	32	1	0	33		0	0	0	0
15:45 to 16:00	5	0	0	5	34	0	0	34		0	0	0	0
PM Totals	59	2	0	61	304	7	0	311		0	0	0	0

MATRIX
Traffic and Transport Data

Approach	Crookwell Rd																Chinamans Ln							
Direction	Direction 8 (Through)				Direction 9 (Right Turn)				Direction 9U (U Turn)				Direction 10 (Left Turn)					Direction 12 (Right Turn)				Direction 12U (U Turn)			
Time Period	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total		Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total
7:00 to 7:15	21	0	0	21	0	0	0	0	0	0	0	0	0	0	0	0		2	0	0	2	0	0	0	0
7:15 to 7:30	25	1	0	26	0	0	0	0	0	0	0	0	1	0	0	1		6	0	0	6	0	0	0	0
7:30 to 7:45	26	0	0	26	0	0	0	0	0	0	0	0	1	0	0	1		10	0	0	10	0	0	0	0
7:45 to 8:00	23	0	1	24	0	0	0	0	0	0	0	0	1	0	0	1		9	0	0	9	0	0	0	0
8:00 to 8:15	29	1	1	31	0	0	0	0	0	0	0	0	0	0	0	0		14	1	1	16	0	0	0	0
8:15 to 8:30	57	1	0	58	0	0	0	0	0	0	0	0	0	0	0	0		9	0	0	9	0	0	0	0
8:30 to 8:45	44	1	0	45	1	0	0	1	0	0	0	0	0	0	0	0		12	1	0	13	0	0	0	0
8:45 to 9:00	43	2	0	45	0	0	0	0	0	0	0	0	0	0	0	0		9	0	0	9	0	0	0	0
AM Totals	268	6	2	276	1	0	0	1	0	0	0	0	3	0	0	3		71	2	1	74	0	0	0	0
14:00 to 14:15	28	0	0	28	0	0	0	0	0	0	0	0	0	0	0	0		3	0	1	4	0	0	0	0
14:15 to 14:30	22	3	1	26	0	0	0	0	0	0	0	0	0	0	0	0		5	0	0	5	0	0	0	0
14:30 to 14:45	16	4	0	20	1	0	0	1	0	0	0	0	0	0	0	0		6	0	0	6	0	0	0	0
14:45 to 15:00	23	2	0	25	0	0	0	0	0	0	0	0	0	0	0	0		1	0	0	1	0	0	0	0
15:00 to 15:15	21	3	0	24	1	0	0	1	0	0	0	0	0	0	0	0		2	0	0	2	0	0	0	0
15:15 to 15:30	24	3	0	27	0	0	0	0	0	0	0	0	0	0	0	0		13	0	0	13	0	0	0	0
15:30 to 15:45	14	0	0	14	2	0	0	2	0	0	0	0	0	0	0	0		2	0	0	2	0	0	0	0
15:45 to 16:00	13	1	0	14	0	0	0	0	0	0	0	0	0	0	0	0		7	0	0	7	0	0	0	0
PM Totals	161	16	1	178	4	0	0	4	0	0	0	0	0	0	0	0		39	0	1	40	0	0	0	0

Job No.   : AUNSW1693

Client   : The Trustee for Positive Traffic Trust

Suburb   : Goulburn

Location   : 1. Crookwell Rd / Chinamans Ln

Day/Date   : Tue, 9th Nov 2021

Weather   : Fine

Description   : Classified Intersection Count

                  : Hourly Summary

Crookwell Rd

Chinamans Ln

Crookwell Rd

Approach	Crookwell Rd													
Direction	**Direction 1 (Left Turn)**				**Direction 2 (Through)**					**Direction 3U (U Turn)**			
Time Period	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total		Cars	Trucks	Buses	Total
7:00 to 8:00	15	0	0	15	67	3	0	70		0	0	0	0
7:15 to 8:15	18	0	1	19	64	7	0	71		0	0	0	0
7:30 to 8:30	18	0	1	19	59	6	0	65		0	0	0	0
7:45 to 8:45	18	0	1	19	62	8	0	70		0	0	0	0
8:00 to 9:00	15	0	1	16	62	12	0	74		0	0	0	0
AM Totals	**30**	**0**	**1**	**31**	**129**	**15**	**0**	**144**		**0**	**0**	**0**	**0**
14:00 to 15:00	31	2	0	33	162	5	0	167		0	0	0	0
14:15 to 15:15	34	1	0	35	157	4	0	161		0	0	0	0
14:30 to 15:30	36	1	0	37	157	5	0	162		0	0	0	0
14:45 to 15:45	33	0	0	33	147	3	0	150		0	0	0	0
15:00 to 16:00	28	0	0	28	142	2	0	144		0	0	0	0
PM Totals	**59**	**2**	**0**	**61**	**304**	**7**	**0**	**311**		**0**	**0**	**0**	**0**

Approach	Crookwell Rd																Chinamans Ln							
Direction	Direction 8 (Through)				Direction 9 (Right Turn)				Direction 9U (U Turn)				Direction 10 (Left Turn)					Direction 12 (Right Turn)				Direction 12U (U Turn)			
Time Period	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total		Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total
7:00 to 8:00	95	1	1	97	0	0	0	0	0	0	0	0	3	0	0	3		27	0	0	27	0	0	0	0
7:15 to 8:15	103	2	2	107	0	0	0	0	0	0	0	0	3	0	0	3		39	1	1	41	0	0	0	0
7:30 to 8:30	135	2	2	139	0	0	0	0	0	0	0	0	2	0	0	2		42	1	1	44	0	0	0	0
7:45 to 8:45	153	3	2	158	1	0	0	1	0	0	0	0	1	0	0	1		44	2	1	47	0	0	0	0
8:00 to 9:00	173	5	1	179	1	0	0	1	0	0	0	0	0	0	0	0		44	2	1	47	0	0	0	0
AM Totals	268	6	2	276	1	0	0	1	0	0	0	0	3	0	0	3		71	2	1	74	0	0	0	0
14:00 to 15:00	89	9	1	99	1	0	0	1	0	0	0	0	0	0	0	0		15	0	1	16	0	0	0	0
14:15 to 15:15	82	12	1	95	2	0	0	2	0	0	0	0	0	0	0	0		14	0	0	14	0	0	0	0
14:30 to 15:30	84	12	0	96	2	0	0	2	0	0	0	0	0	0	0	0		22	0	0	22	0	0	0	0
14:45 to 15:45	82	8	0	90	3	0	0	3	0	0	0	0	0	0	0	0		18	0	0	18	0	0	0	0
15:00 to 16:00	72	7	0	79	3	0	0	3	0	0	0	0	0	0	0	0		24	0	0	24	0	0	0	0
PM Totals	161	16	1	178	4	0	0	4	0	0	0	0	0	0	0	0		39	0	1	40	0	0	0	0

Job No. : AUNSW1693
Client : The Trustee for Positive Traffic Trust
Suburb : Goulburn
Location : 1. Crookwell Rd / Chinamans Ln

Day/Date : Tue, 9th Nov 2021
Weather : Fine
Description : Classified Intersection Count
: Peak Hour Summary
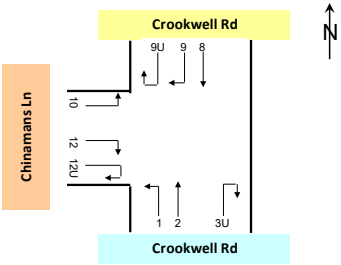
Crookwell Rd

Chinamans Ln

9U 9 8
10
12 12U
1 2 3U

N

Crookwell Rd

MATRIX
Traffic and Transport Data

Approach	Crookwell Rd					Crookwell Rd				Chinamans Ln				Grand Total
Time Period	Cars	Trucks	Buses	Total		Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	
AM 8:00 to 9:00	77	12	1	90		174	5	1	180	44	2	1	47	317
PM 14:30 to 15:30	193	6	0	199		86	12	0	98	22	0	0	22	319

Approach	Crookwell Rd					Crookwell Rd				Chinamans Ln				Grand Total
Time Period	Cars	Trucks	Buses	Total		Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	
7:00 to 8:00	82	3	0	85		95	1	1	97	30	0	0	30	212
7:15 to 8:15	82	7	1	90		103	2	2	107	42	1	1	44	241
7:30 to 8:30	77	6	1	84		135	2	2	139	44	1	1	46	269
7:45 to 8:45	80	8	1	89		154	3	2	159	45	2	1	48	296
8:00 to 9:00	77	12	1	90		174	5	1	180	44	2	1	47	317
AM Totals	159	15	1	175		269	6	2	277	74	2	1	77	529
14:00 to 15:00	193	7	0	200		90	9	1	100	15	0	1	16	316
14:15 to 15:15	191	5	0	196		84	12	1	97	14	0	0	14	307
14:30 to 15:30	193	6	0	199		86	12	0	98	22	0	0	22	319
14:45 to 15:45	180	3	0	183		85	8	0	93	18	0	0	18	294
15:00 to 16:00	170	2	0	172		75	7	0	82	24	0	0	24	278
PM Totals	363	9	0	372		165	16	1	182	39	0	1	40	594

MATRIX Traffic and Transport Data

Hour Starting: AM Totals

Vehicle Type: All Vehicles

Crookwell Rd

	Total Northbd	Selected Hour & Vehicle Type				Total Southbd
Selected Hour & Vehicle Type	147 100%	0 0%	1 0%	276 100%		277 100%
AM Peak (Vol) (%)	74 50%	0 0%	1 1%	179 99%		180 65%
PM Peak (Vol) (%)	162 52%	0 0%	2 2%	96 98%		98 54%
		9U	9	8		

Chinamans Ln

Total Eastbd	77 100%	47 61%	22 55%	
	3 4%	0 0%	0 0%	10
	74 96%	47 100%	22 100%	12
	0 0%	0 0%	0 0%	12U
		AM Peak (Vol)(%)	PM Peak (Vol)(%)	
Total Westbd	32 100%	17 53%	39 60%	

		AM Peak		to	9:00
		PM Peak	14:30	to	15:30

AM Peak 8:00 to 9:00
PM Peak 14:30 to 15:30

		1	2	3U			
AM Peak (Vol) (%)	90 51%	16 18%	74 82%	0 0%			226 65%
PM Peak (Vol) (%)	199 53%	37 19%	162 81%	0 0%			118 54%
	175 100%	31 18%	144 82%	0 0%			350 100%

Total Northbd   Total Southbd

Crookwell Rd

Summary of Turning Movement Counts - from Traffic Count on iOS
Study Name   Crookwell Rd / Chinamans Lane
Observer   JB
Date   Tue 20th June 2023
Weather   Sunny
Comments
Streets   NB   SB   EB   WB
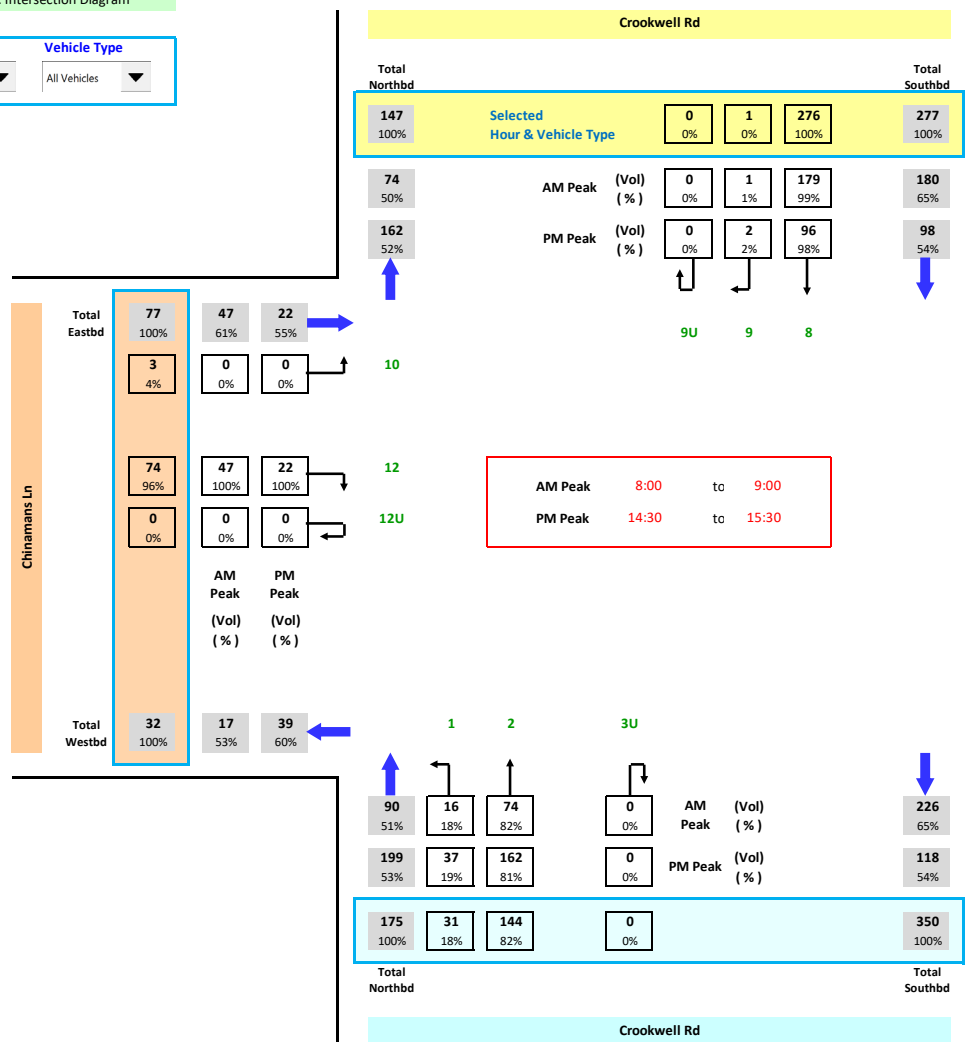
TRINITY TRAFFIC

Cars

Start Time	Northbound Left	Thru	Right	UTurn	Total	Southbound Left	Thru	Right	UTurn	Total	Eastbound Left	Thru	Right	UTurn	Total	Westbound Left	Thru	Right	UTurn	Total	Total All
7:00 AM	0	19	0	0	19	0	27	0	0	27	1	0	1	0	2	0	0	0	0	0	48
7:15 AM	1	16	0	0	17	0	20	1	0	21	0	0	0	0	0	0	0	0	0	0	38
7:30 AM	2	20	0	0	22	0	38	0	0	38	0	0	2	0	2	0	0	0	0	0	62
7:45 AM	1	27	0	0	28	0	28	0	0	28	1	0	6	0	7	0	0	0	0	0	63
8:00 AM	0	20	0	0	20	0	29	1	0	30	0	0	6	0	6	0	0	0	0	0	56
8:15 AM	3	14	0	0	17	0	32	0	0	32	0	0	8	0	8	0	0	0	0	0	57
8:30 AM	2	14	0	0	16	0	41	0	0	41	0	0	13	0	13	0	0	0	0	0	70
8:45 AM	5	15	0	0	20	0	42	0	0	42	1	0	12	0	13	0	0	0	0	0	75
9:00 AM	0	2	0	0	2	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	3
Total	14	147	0	0	161	0	258	2	0	260	3	0	48	0	51	0	0	0	0	0	472

Bicycles

Start Time	Northbound Left	Thru	Right	UTurn	Total	Southbound Left	Thru	Right	UTurn	Total	Eastbound Left	Thru	Right	UTurn	Total	Westbound Left	Thru	Right	UTurn	Total	Total All
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Light Trucks

Start Time	Northbound					Southbound					Eastbound					Westbound					Total All
	Left	Thru	Right	UTurn	Total	Left	Thru	Right	UTurn	Total	Left	Thru	Right	UTurn	Total	Left	Thru	Right	UTurn	Total	
7:00 AM	0	4	0	0	4	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	5
7:15 AM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
7:30 AM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
7:45 AM	0	2	0	0	2	0	1	0	0	1	0	0	2	0	2	0	0	0	0	0	5
8:00 AM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	2
8:15 AM	0	2	0	0	2	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	3
8:30 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
8:45 AM	0	1	0	0	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	2
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	1	10	0	0	11	0	6	0	0	6	0	0	3	0	3	0	0	0	0	0	20

Heavy Trucks

Start Time	Northbound					Southbound					Eastbound					Westbound					Total All
	Left	Thru	Right	UTurn	Total	Left	Thru	Right	UTurn	Total	Left	Thru	Right	UTurn	Total	Left	Thru	Right	UTurn	Total	
7:00 AM	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
7:15 AM	0	4	0	0	4	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	5
7:30 AM	0	1	0	0	1	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	4
7:45 AM	1	1	0	0	2	0	5	0	0	5	0	0	1	0	1	0	0	0	0	0	8
8:00 AM	0	2	0	0	2	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	3
8:15 AM	1	3	0	0	4	0	1	0	0	1	0	0	1	0	1	0	0	0	0	0	6
8:30 AM	0	3	0	0	3	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	4
8:45 AM	1	2	0	0	3	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	5
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	3	18	0	0	21	0	14	0	0	14	0	0	2	0	2	0	0	0	0	0	37

Pedestrians

Start Time	Northbound			Southbound			Eastbound			Westbound			Total All
	Counterclockwise	Clockwise	Total	Counterclockwise	Clockwise	Total	Counterclockwise	Clockwise	Total	Counterclockwise	Clockwise	Total	
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0

Summary of Turning Movement Counts - from Traffic Count on iOS
Study Name   Crookwell Rd / Chinamans Lane PM
Observer   JB
Date   Tue 20th June 2023
Weather   Sunny
Comments
Streets   NB   SB   EB   WB

TRINITY TRAFFIC

Cars

| Start Time | Northbound | | | | | Southbound | | | | | Eastbound | | | | | Westbound | | | | | Total All |
	Left	Thru	Right	UTurn	Total	Left	Thru	Right	UTurn	Total	Left	Thru	Right	UTurn	Total	Left	Thru	Right	UTurn	Total	
4:00 PM	7	45	0	0	52	0	25	2	0	27	1	0	3	0	4	0	0	0	0	0	83
4:15 PM	5	30	0	0	35	0	20	0	0	20	0	0	5	0	5	0	0	0	0	0	60
4:30 PM	7	42	0	0	49	0	48	0	0	48	0	0	5	0	5	0	0	0	0	0	102
4:45 PM	7	31	0	0	38	0	28	0	0	28	1	0	5	0	6	0	0	0	0	0	72
5:00 PM	7	45	0	0	52	0	25	0	0	25	0	0	3	0	3	0	0	0	0	0	80
5:15 PM	7	53	0	0	60	0	29	0	0	29	0	0	7	0	7	0	0	0	0	0	96
5:30 PM	7	25	0	0	32	0	27	0	0	27	0	0	2	0	2	0	0	0	0	0	61
5:45 PM	2	25	0	0	27	0	30	0	0	30	1	0	6	0	7	0	0	0	0	0	64
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	**49**	**296**	**0**	**0**	**345**	**0**	**232**	**2**	**0**	**234**	**3**	**0**	**36**	**0**	**39**	**0**	**0**	**0**	**0**	**0**	**618**

Bicycles

| Start Time | Northbound | | | | | Southbound | | | | | Eastbound | | | | | Westbound | | | | | Total All |
	Left	Thru	Right	UTurn	Total	Left	Thru	Right	UTurn	Total	Left	Thru	Right	UTurn	Total	Left	Thru	Right	UTurn	Total	
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Light Trucks

Start Time	Northbound					Southbound					Eastbound					Westbound					Total All
	Left	Thru	Right	UTurn	Total	Left	Thru	Right	UTurn	Total	Left	Thru	Right	UTurn	Total	Left	Thru	Right	UTurn	Total	
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
4:30 PM	1	0	0	0	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	2
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	1	0	0	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	2
5:30 PM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	2
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	**1**	**1**	**0**	**0**	**2**	**0**	**5**	**0**	**0**	**5**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**7**

Heavy Trucks

Start Time	Northbound					Southbound					Eastbound					Westbound					Total All
	Left	Thru	Right	UTurn	Total	Left	Thru	Right	UTurn	Total	Left	Thru	Right	UTurn	Total	Left	Thru	Right	UTurn	Total	
4:00 PM	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	3
4:15 PM	1	0	0	0	1	0	2	0	0	2	0	0	1	0	1	0	0	0	0	0	4
4:30 PM						0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	TriniTy	Traffic				0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
5:00 PM						0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM						0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	2
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	**1**	**1**	**0**	**0**	**2**	**0**	**8**	**0**	**0**	**8**	**0**	**0**	**1**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**11**

Pedestrians

Start Time	Northbound			Southbound			Eastbound			Westbound			Total All
	Counterclockwise	Clockwise	Total	Counterclockwise	Clockwise	Total	Counterclockwise	Clockwise	Total	Counterclockwise	Clockwise	Total	
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

8. Appendix B – Plans of Proposed Sub Division

NORTH

LOT 70
DP1006688

LOT 73
DP1006688

PROPOSED LOT BOUNDARY
TYPICAL

EXISTING CADASTRAL BOUNDARY
TYPICAL

LOT 77
DP1006688

PROPOSED SAFETY
BARRIER

300.000

350.000

CONTROL MC02

1.5m VERGE
3.0m SHOULDER
3.5m LANE
0-3m MEDIAN
3.5m LANE

EXISTING DISH DRAIN TO ADJUSTED
MAINTAIN EXISTING SHOULDER WIDTH

250.000

200.000

150.000

100.000

EXISTING SOUTH BOUND TRAFFIC
LANE GEOMETRY TO BE RETAINED

CONTROL MC01

CONTINUED ON SHEET SK-002

50.000

3.0m SHOULDER
3.5m LANE
3.5m LANE

CROOKWELL ROAD

TP 5 638

0.000

300.000

350.000

400.000

250.000

200.000

150.000

EXISTING CADASTRAL BOUNDARY
TYPICAL

100.000

TP 28.785

50.000

LOT 1
DP1223269

LOT 74
DP1006688

0.000

LOT 4
DP1231260

FINAL ROAD AND INTERSECTION
ALIGNMENT IS SUBJECT TO DETAILED
SURVEY AND GEOTECHNICAL ADVISE

SKETCH
NOT FOR CONSTRUCTION

Rev	Drawn	Design	Check	Appd.	Date	Revision Description
P3	MM	MM			5-12-23	ISSUED FOR INFORMATION
P2	MM	MM			30-11-23	ISSUED FOR INFORMATION
P1	MM	MM			21-11-23	ISSUED FOR INFORMATION

Scale:

0 5 10 15 20 25 30 35 40 45 50
SCALE 1:500 (A1)   SCALE 1:1000 (A3)

For:
IPG Invest Pty Ltd

By:
ORION

SUSTAINABLE   JAS-ANZ

ABN:25 604 069 981 PO Box:7936, BAULKHAM HILLS NSW 2153 T:(02) 8660 0035 E:info@theoriongroup.au

Project:
407 CROOKWELL ROAD
INTERSECTION ACCESS

Title:
PROPOSED INTERSECTION
LAYOUT PLAN
SHEET 1 OF 2

Project No.	Set No.	Milestone	Plan	Revision
23-0465	01	SK	001	P3

NORTH

LOT 73
DP1006688

LOT 103
DP1007433

PROPOSED ACCESS ROAD

100.000

50.000

400.000

450.000

PROPOSED LOT BOUNDARY
TYPICAL

PROPOSED SAFETY
BARRIER

PROPOSED KERB
AND GUTTER

PROPOSED KERB
AND GUTTER

PROPOSED SAFETY
BARRIER

EXISTING CADASTRAL BOUNDARY
TYPICAL

CONTINUED ON SHEET SK-001

1.5m VERGE
3.0m SHOULDER
3.5m TURN LANE
3.5m LANE
0.3m MEDIAN
3.5m LANE

EXISTING SOUTH BOUND TRAFFIC
LANE GEOMETRY TO BE RETAINED

1.5m VERGE
3.0m SHOULDER
3.5m LANE
3.5m TURN LANE
3.5m LANE

CONTROL MC02

CONTROL MC01

EXISTING CADASTRAL BOUNDARY
TYPICAL

1.0m VERGE
2.5m SHOULDER
3.5m LANE
3.5m LANE

CROOKWELL ROAD

LOT 74
DP1006688

LOT 75
DP1006688

4.5m VERGE
3.5m LANE
3.5m LANE
4.5m VERGE

CT 542.826
CT 565.973
CT 669.146

TP 616.090
TP 709.812

FINAL ROAD AND INTERSECTION
ALIGNMENT IS SUBJECT TO DETAILED
SURVEY AND GEOTECHNICAL ADVISE

SKETCH
NOT FOR CONSTRUCTION

Scale:

0 5 10 15 20 25 30 35 40 45 50
SCALE 1:500 (A1)   SCALE 1:1000 (A3)

For:
IPG Invest Pty Ltd

By:
ORION
SUSTAINABLE   JAS-ANZ
ABN:25 604 069 981 PO Box:7936, BAULKHAM HILLS NSW 2153 T:(02) 8660 0035 E:info@theoriongroup.au

Project:
407 CROOKWELL ROAD
INTERSECTION ACCESS

Title:
PROPOSED INTERSECTION
LAYOUT PLAN
SHEET 2 OF 2

Project No.	Set No.	Milestone	Plan	Revision
23-0465	01	SK	002	P3

Rev	Drawn	Design	Check	Appd.	Date	Revision Description
P3	MM	MM			5-12-23	ISSUED FOR INFORMATION
P2	MM	MM			30-11-23	ISSUED FOR INFORMATION
P1	MM	MM			21-11-23	ISSUED FOR INFORMATION

NORTH

LOT 73
DP1006688

LOT 103
DP1007433

100.000

50.000

PROPOSED ACCESS ROAD

300.000

350.000

400.000

450.000

500.000

550.000

600.000

650.000

700.000

PROPOSED SAFETY BARRIER

SAFE INTERSECTION SIGHT DISTANCE = 201m (90km/h)

MINIMUM GAP SIGHT DISTANCE = 125m (5 secs @ 90km/h)

ALIGNMENT OF PROPOSED SAFETY BARRIERS TO BE CONFIRMED AT DETAILED DESIGN TO ENSURE SIGHT DISTANCE REQUIREMENTS ARE MET

MINIMUM GAP SIGHT DISTANCE ENVELOPE (GREEN) TYPICAL

PROPOSED SAFETY BARRIER

CONTROL MC01

SAFE INTERSECTION SIGHT DISTANCE ENVELOPE (BLUE) TYPICAL

CONTROL MC02

MINIMUM GAP SIGHT DISTANCE = 200m (8 secs @ 90km/h)
SAFE INTERSECTION SIGHT DISTANCE = 201m (90km/h)

CT 542.026

CT 566.973

CT 669.146

TP 616.160

350.000

400.000

450.000

500.000

550.000

600.000

650.000

LOT 74
DP1006688

LOT 75
DP1006688

FINAL ROAD AND INTERSECTION ALIGNMENT IS SUBJECT TO DETAILED SURVEY AND GEOTECHNICAL ADVISE

SKETCH
NOT FOR CONSTRUCTION

Rev	Drawn	Design	Check	Appd.	Date	Revision Description
P3	MM	MM			5-12-23	ISSUED FOR INFORMATION
P2	MM	MM			30-11-23	ISSUED FOR INFORMATION
P1	MM	MM			21-11-23	ISSUED FOR INFORMATION

Scale:
SCALE 1:500 (A1)
SCALE 1:1000 (A3)
0 5 10 15 20 25 30 35 40 45 50

For:
IPG Invest Pty Ltd

By:
ORION

JAS-ANZ
SUSTAINABLE
WWW.JAS-ANZ.ORG/REGISTER

ABN:25 604 069 981 PO Box:7936, BAULKHAM HILLS NSW 2153 T:(02) 8660 0035 E:info@theoriongroup.au

Project:
407 CROOKWELL ROAD
INTERSECTION ACCESS

Title:
PROPOSED INTERSECTION
SIGHT DISTANCE PLAN

Project No.	Set No.	Milestone	Plan	Revision
23-0465	01	SK	003	P3

NORTH

LOT 73
DP1006688

LOT 103
DP1007433

PROPOSED ACCESS ROAD

CROOKWELL ROAD

12.5m SU TRUCK - DESIGN VEHICLE
TURN PATH LAYOUT PLAN
SCALE 1:400

NORTH

LOT 73
DP1006688

LOT 103
DP1007433

PROPOSED ACCESS ROAD

CROOKWELL ROAD
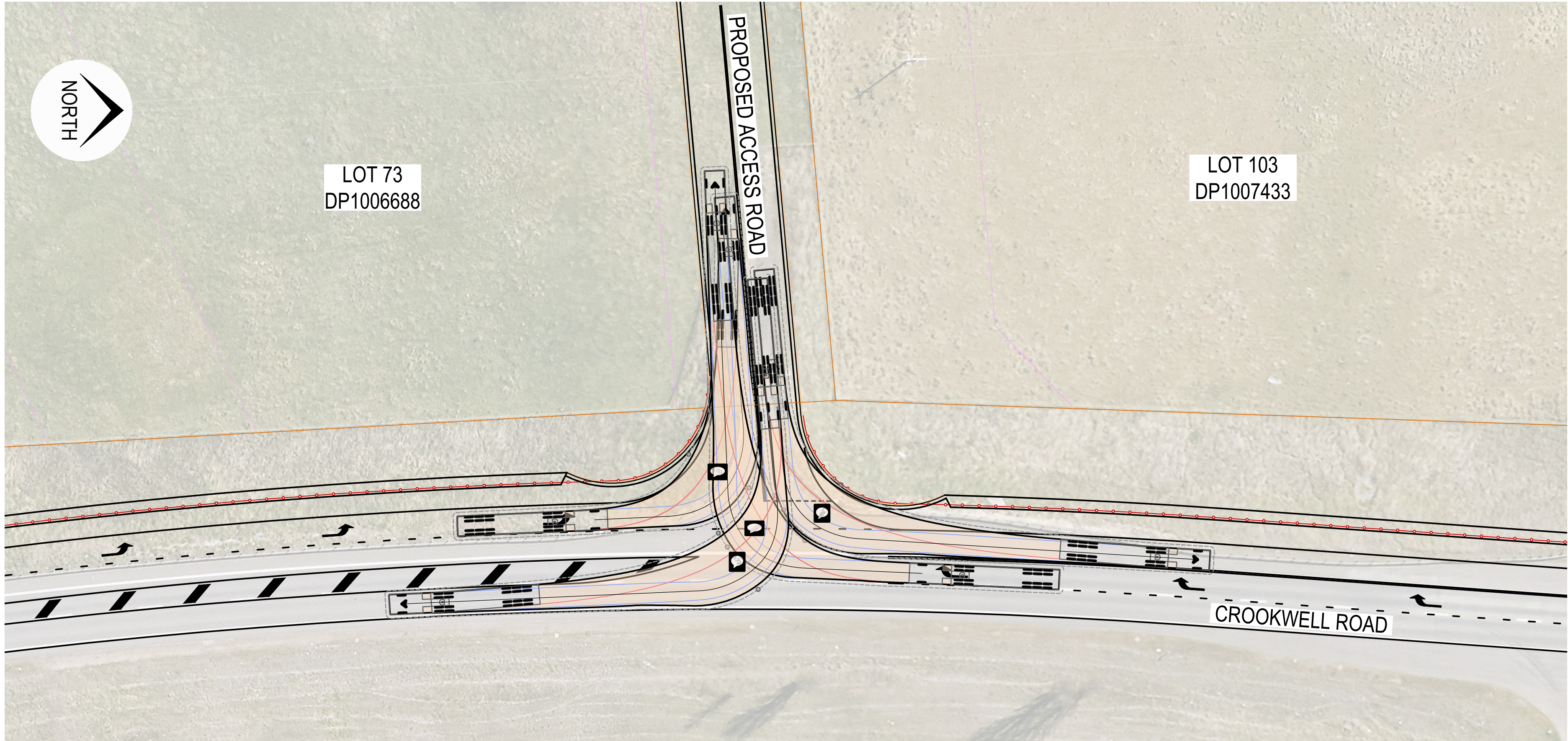
19m SEMI - CHECKING VEHICLE
TURN PATH LAYOUT PLAN
SCALE 1:400

FINAL ROAD AND INTERSECTION
ALIGNMENT IS SUBJECT TO DETAILED
SURVEY AND GEOTECHNICAL ADVISE

SKETCH
NOT FOR CONSTRUCTION

Rev	Drawn	Design	Check	Appd.	Date	Revision Description
P3	MM	MM			5-12-23	ISSUED FOR INFORMATION
P2	MM	MM			30-11-23	ISSUED FOR INFORMATION
P1	MM	MM			21-11-23	ISSUED FOR INFORMATION

Scale:

0 4 8 12 16 20 24 28 3.2 36 40

SCALE 1:400 (A1)   SCALE 1:800 (A3)

For:

IPG Invest Pty Ltd

By:

ORION

SUSTAINABLE   JAS-ANZ

ABN:25 604 069 981 PO Box:7936, BAULKHAM HILLS NSW 2153 T:(02) 8660 0035 E:info@theoriongroup.au

Project:

407 CROOKWELL ROAD
INTERSECTION ACCESS

Title:

VEHICLE TURN PATHS PLAN

Project No.	Set No.	Milestone	Plan	Revision
23-0465	01	SK	004	P3

9. Appendix C – SIDRA Outputs

MOVEMENT SUMMARY

▽ Site: 101 [Chinamans_Access_PM_2032 + Dev (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

New Site
Site Category: (None)
Give-Way (Two-Way)
Design Life Analysis (Final Year): Results for 10 years

Mov ID	Turn	Mov Class	Demand Flows [Total HV] veh/h	%	Arrival Flows [Total HV] veh/h	%	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: Chinamans Ln															
5	T1	All MCs	37	1.0	37	1.0	0.234	0.0	LOS A	1.3	9.2	0.11	0.52	0.11	55.1
		LV	36		36		0.234	0.0	LOS A	1.3	9.2	NA	NA	NA	55.1
		HV	0		0		0.234	0.0	LOS A	1.3	9.2	NA	NA	NA	55.1
6	R2	All MCs	374	1.0	374	1.0	0.234	5.6	LOS A	1.3	9.2	0.11	0.52	0.11	52.7
		LV	370		370		0.234	5.6	LOS A	1.3	9.2	NA	NA	NA	52.7
		HV	4		4		0.234	5.7	LOS A	1.3	9.2	NA	NA	NA	52.6
Approach			411	1.0	411	1.0	0.234	5.1	NA	1.3	9.2	0.11	0.52	0.11	52.9
North: Site Access															
7	L2	All MCs	93	1.0	93	1.0	0.060	5.6	LOS A	0.2	1.7	0.09	0.55	0.09	52.6
		LV	93		93		0.060	5.6	LOS A	0.2	1.7	NA	NA	NA	52.6
		HV	1		1		0.060	5.7	LOS A	0.2	1.7	NA	NA	NA	52.5
9	R2	All MCs	1	1.0	1	1.0	0.060	7.4	LOS A	0.2	1.7	0.09	0.55	0.09	52.3
		LV	1		1		0.060	7.4	LOS A	0.2	1.7	NA	NA	NA	52.3
		HV	0		0		0.060	10.5	LOS B	0.2	1.7	NA	NA	NA	50.1
Approach			95	1.0	95	1.0	0.060	5.7	LOS A	0.2	1.7	0.09	0.55	0.09	52.6
West: Chinamans Ln															
10	L2	All MCs	1	1.0	1	1.0	0.014	5.6	LOS A	0.0	0.0	0.00	0.03	0.00	57.2
		LV	1		1		0.014	5.6	LOS A	0.0	0.0	NA	NA	NA	57.2
		HV	0		0		0.014	5.6	LOS A	0.0	0.0	NA	NA	NA	57.2
11	T1	All MCs	27	1.0	27	1.0	0.014	0.0	LOS A	0.0	0.0	0.00	0.03	0.00	59.7
		LV	26		26		0.014	0.0	LOS A	0.0	0.0	NA	NA	NA	59.7
		HV	0		0		0.014	0.0	LOS A	0.0	0.0	NA	NA	NA	59.7
Approach			28	1.0	28	1.0	0.014	0.3	NA	0.0	0.0	0.00	0.03	0.00	59.6
All Vehicles			533	1.0	533	1.0	0.234	4.9	NA	1.3	9.2	0.10	0.50	0.10	53.1

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.

INTERSECTION SUMMARY

▽ Site: 101 [Crookwell_Chinamans_AM_2021 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

New Site
Site Category: (None)
Give-Way (Two-Way)

Intersection Performance - Hourly Values

Performance Measure	Vehicles:	All MCs	Persons
Travel Speed (Average)	km/h	58.0	58.0 km/h
Travel Distance (Total)	veh-km/h	338.3	406.0 pers-km/h
Travel Time (Total)	veh-h/h	5.8	7.0 pers-h/h
Desired Speed	km/h	60.0	
Speed Efficiency		0.97	
Travel Time Index		9.64	
Congestion Coefficient		1.03	
Demand Flows (Total)	veh/h	335	402 pers/h
Arrival Flows (Total)	veh/h	335	
Percent Heavy Vehicles (Demand)	%	6.9	
Percent Heavy Vehicles (Arrivals)	%	6.9	
Degree of Saturation		0.100	
Practical Spare Capacity	%	884.4	
Effective Intersection Capacity	veh/h	3362	
Control Delay (Total)	veh-h/h	0.13	0.16 pers-h/h
Control Delay (Average)	sec	1.4	1.4 sec
Control Delay (Worst Lane by MC)	sec	7.4	
Control Delay (Worst Movement by MC)	sec	9.7	9.7 sec
Geometric Delay (Average)	sec	1.1	
Stop-Line Delay (Average)	sec	0.3	
Idling Time (Average)	sec	0.0	
Intersection Level of Service (LOS)		NA	
95% Back of Queue - Veh (Worst Lane)	veh	0.2	
95% Back of Queue - Dist (Worst Lane)	m	1.7	
Ave. Que Storage Ratio (Worst Lane)		0.00	
Effective Stops (Total)	veh/h	42	50 pers/h
Effective Stop Rate		0.12	0.12
Proportion Queued		0.06	0.06
Performance Index		6.3	6.3
Cost (Total)	$/h	274.45	274.45 $/h
Fuel Consumption (Total)	L/h	27.0	
Carbon Dioxide (Total)	kg/h	64.8	
Hydrocarbons (Total)	kg/h	0.005	
Carbon Monoxide (Total)	kg/h	0.07	
NOx (Total)	kg/h	0.141	

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

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.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand effects.
In Network analysis, Arrival Flows will be reduced if Upstream Capacity Constraint exists.

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

Site Model Variability Index (Average value of largest changes in Lane Degrees of Saturation from the third to the last Main (Timing-Capacity) Iterations): 0.0 %

Number of Iterations: 3 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 53.2%   0.3%   0.0%

Intersection Performance - Annual Values

Performance Measure	Vehicles:	All MCs	Persons
Demand Flows (Total)	veh/y	160,674	192,808 pers/y
Delay (Total)	veh-h/y	63	76 pers-h/y

Effective Stops (Total)	veh/y	20,080	24,096	pers/y
Travel Distance (Total)	veh-km/y	162,406	194,887	pers-km/y
Travel Time (Total)	veh-h/y	2,798	3,358	pers-h/y
Cost (Total)	$/y	131,736	131,736	$/y
Fuel Consumption (Total)	L/y	12,976		
Carbon Dioxide (Total)	kg/y	31,100		
Hydrocarbons (Total)	kg/y	2		
Carbon Monoxide (Total)	kg/y	35		
NOx (Total)	kg/y	68		

1   Hours per Year: 480 (Site)

MOVEMENT SUMMARY

▽ **Site: 101 [Crookwell_Chinamans_AM_2021 (Site Folder: General)]**

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total HV] veh/h	%	Arrival Flows [Total HV] veh/h	%	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: Crookwell Rd															
1	L2	All MCs	17	6.3	17	6.3	0.009	5.6	LOS A	0.0	0.0	0.00	0.57	0.00	52.6
		LV	16		16		0.009	5.6	LOS A	0.0	0.0	NA	NA	NA	52.6
		HV	1		1		0.009	5.6	LOS A	0.0	0.0	NA	NA	NA	52.6
2	T1	All MCs	78	16.2	78	16.2	0.044	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
		LV	65		65		0.044	0.0	LOS A	0.0	0.0	NA	NA	NA	60.0
		HV	13		13		0.044	0.0	LOS A	0.0	0.0	NA	NA	NA	60.0
Approach			95	14.4	95	14.4	0.044	1.0	NA	0.0	0.0	0.00	0.10	0.00	58.5
North: Crookwell Rd															
8	T1	All MCs	188	3.4	188	3.4	0.100	0.0	LOS A	0.0	0.1	0.00	0.00	0.00	60.0
		LV	182		182		0.100	0.0	LOS A	0.0	0.1	NA	NA	NA	60.0
		HV	6		6		0.100	0.0	LOS A	0.0	0.1	NA	NA	NA	60.0
9	R2	All MCs	1	0.0	1	0.0	0.100	5.5	LOS A	0.0	0.1	0.00	0.00	0.00	57.1
		LV	1		1		0.100	5.5	LOS A	0.0	0.1	NA	NA	NA	57.1
		HV	0		0		-	-	-	-	-	NA	NA	NA	-
Approach			189	3.3	189	3.3	0.100	0.0	NA	0.0	0.1	0.00	0.00	0.00	59.9
West: Chinamans Ln															
10	L2	All MCs	1	0.0	1	0.0	0.061	5.8	LOS A	0.2	1.7	0.39	0.62	0.39	51.6
		LV	1		1		0.061	5.8	LOS A	0.2	1.7	NA	NA	NA	51.6
		HV	0		0		-	-	-	-	-	NA	NA	NA	-
12	R2	All MCs	49	6.4	49	6.4	0.061	7.4	LOS A	0.2	1.7	0.39	0.62	0.39	51.2
		LV	46		46		0.061	7.2	LOS A	0.2	1.7	NA	NA	NA	51.3
		HV	3		3		0.061	9.7	LOS A	0.2	1.7	NA	NA	NA	49.6
Approach			51	6.3	51	6.3	0.061	7.4	LOS A	0.2	1.7	0.39	0.62	0.39	51.2
All Vehicles			335	6.9	335	6.9	0.100	1.4	NA	0.2	1.7	0.06	0.12	0.06	58.0

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.

INTERSECTION SUMMARY

▽ Site: 101 [Crookwell_Chinamans_AM_2023 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

New Site
Site Category: (None)
Give-Way (Two-Way)

Intersection Performance - Hourly Values

Performance Measure	Vehicles:	All MCs	Persons
Travel Speed (Average)	km/h	58.2	58.2 km/h
Travel Distance (Total)	veh-km/h	289.4	347.3 pers-km/h
Travel Time (Total)	veh-h/h	5.0	6.0 pers-h/h
Desired Speed	km/h	60.0	
Speed Efficiency		0.97	
Travel Time Index		9.67	
Congestion Coefficient		1.03	
Demand Flows (Total)	veh/h	286	344 pers/h
Arrival Flows (Total)	veh/h	286	
Percent Heavy Vehicles (Demand)	%	5.1	
Percent Heavy Vehicles (Arrivals)	%	5.1	
Degree of Saturation		0.087	
Practical Spare Capacity	%	1020.9	
Effective Intersection Capacity	veh/h	3275	
Control Delay (Total)	veh-h/h	0.10	0.12 pers-h/h
Control Delay (Average)	sec	1.3	1.3 sec
Control Delay (Worst Lane by MC)	sec	6.9	
Control Delay (Worst Movement by MC)	sec	8.8	8.8 sec
Geometric Delay (Average)	sec	1.1	
Stop-Line Delay (Average)	sec	0.2	
Idling Time (Average)	sec	0.0	
Intersection Level of Service (LOS)		NA	
95% Back of Queue - Veh (Worst Lane)	veh	0.2	
95% Back of Queue - Dist (Worst Lane)	m	1.3	
Ave. Que Storage Ratio (Worst Lane)		0.00	
Effective Stops (Total)	veh/h	33	40 pers/h
Effective Stop Rate		0.12	0.12
Proportion Queued		0.06	0.06
Performance Index		5.3	5.3
Cost (Total)	$/h	230.14	230.14 $/h
Fuel Consumption (Total)	L/h	21.6	
Carbon Dioxide (Total)	kg/h	51.5	
Hydrocarbons (Total)	kg/h	0.004	
Carbon Monoxide (Total)	kg/h	0.06	
NOx (Total)	kg/h	0.089	

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

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.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand effects.
In Network analysis, Arrival Flows will be reduced if Upstream Capacity Constraint exists.

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

Site Model Variability Index (Average value of largest changes in Lane Degrees of Saturation from the third to the last Main (Timing-Capacity) Iterations): 0.0 %

Number of Iterations: 3 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 50.5%   0.3%   0.0%

Intersection Performance - Annual Values

Performance Measure	Vehicles:	All MCs	Persons
Demand Flows (Total)	veh/y	137,432	164,918 pers/y
Delay (Total)	veh-h/y	49	59 pers-h/y

Effective Stops (Total)	veh/y	15,893	19,071	pers/y
Travel Distance (Total)	veh-km/y	138,906	166,687	pers-km/y
Travel Time (Total)	veh-h/y	2,387	2,864	pers-h/y
Cost (Total)	$/y	110,470	110,470	$/y
Fuel Consumption (Total)	L/y	10,365		
Carbon Dioxide (Total)	kg/y	24,728		
Hydrocarbons (Total)	kg/y	2		
Carbon Monoxide (Total)	kg/y	29		
NOx (Total)	kg/y	43		

1   Hours per Year: 480 (Site)

MOVEMENT SUMMARY

▽ Site: 101 [Crookwell_Chinamans_AM_2023 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	Demand Flows HV] %	Arrival Flows [Total veh/h	Arrival Flows HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	95% Back Of Queue Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Crookwell Rd															
1	L2	All MCs	12	9.1	12	9.1	0.007	5.6	LOS A	0.0	0.0	0.00	0.57	0.00	52.5
		LV	11		11		0.007	5.6	LOS A	0.0	0.0	NA	NA	NA	52.5
		HV	1		1		0.007	5.6	LOS A	0.0	0.0	NA	NA	NA	52.5
2	T1	All MCs	68	3.1	68	3.1	0.036	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
		LV	66		66		0.036	0.0	LOS A	0.0	0.0	NA	NA	NA	60.0
		HV	2		2		0.036	0.0	LOS A	0.0	0.0	NA	NA	NA	60.0
Approach			80	3.9	80	3.9	0.036	0.8	NA	0.0	0.0	0.00	0.08	0.00	58.8
North: Crookwell Rd															
8	T1	All MCs	162	6.5	162	6.5	0.087	0.0	LOS A	0.0	0.1	0.00	0.00	0.00	59.9
		LV	152		152		0.087	0.0	LOS A	0.0	0.1	NA	NA	NA	59.9
		HV	11		11		0.087	0.0	LOS A	0.0	0.1	NA	NA	NA	59.9
9	R2	All MCs	1	0.0	1	0.0	0.087	5.5	LOS A	0.0	0.1	0.00	0.00	0.00	57.1
		LV	1		1		0.087	5.5	LOS A	0.0	0.1	NA	NA	NA	57.1
		HV	0		0		-	-	-	-	-	NA	NA	NA	-
Approach			163	6.5	163	6.5	0.087	0.0	NA	0.0	0.1	0.00	0.00	0.00	59.9
West: Chinamans Ln															
10	L2	All MCs	1	0.0	1	0.0	0.048	5.7	LOS A	0.2	1.3	0.35	0.60	0.35	51.9
		LV	1		1		0.048	5.7	LOS A	0.2	1.3	NA	NA	NA	51.9
		HV	0		0		-	-	-	-	-	NA	NA	NA	-
12	R2	All MCs	42	2.5	42	2.5	0.048	6.9	LOS A	0.2	1.3	0.35	0.60	0.35	51.7
		LV	41		41		0.048	6.9	LOS A	0.2	1.3	NA	NA	NA	51.7
		HV	1		1		0.048	8.8	LOS A	0.2	1.3	NA	NA	NA	50.3
Approach			43	2.4	43	2.4	0.048	6.9	LOS A	0.2	1.3	0.35	0.60	0.35	51.7
All Vehicles			286	5.1	286	5.1	0.087	1.3	NA	0.2	1.3	0.06	0.12	0.06	58.2

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.

INTERSECTION SUMMARY

▽ **Site: 101 [Crookwell_Chinamans_AM_2023 + Dev (Site Folder: General)]**

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

New Site
Site Category: (None)
Give-Way (Two-Way)

Intersection Performance - Hourly Values

Performance Measure	Vehicles:	All MCs	Persons
Travel Speed (Average)	km/h	53.8	53.8 km/h
Travel Distance (Total)	veh-km/h	784.2	941.0 pers-km/h
Travel Time (Total)	veh-h/h	14.6	17.5 pers-h/h
Desired Speed	km/h	60.0	
Speed Efficiency		0.90	
Travel Time Index		8.84	
Congestion Coefficient		1.12	
Demand Flows (Total)	veh/h	775	930 pers/h
Arrival Flows (Total)	veh/h	775	
Percent Heavy Vehicles (Demand)	%	1.9	
Percent Heavy Vehicles (Arrivals)	%	1.9	
Degree of Saturation		0.471	
Practical Spare Capacity	%	70.0	
Effective Intersection Capacity	veh/h	1646	
Control Delay (Total)	veh-h/h	1.16	1.39 pers-h/h
Control Delay (Average)	sec	5.4	5.4 sec
Control Delay (Worst Lane by MC)	sec	9.9	
Control Delay (Worst Movement by MC)	sec	14.9	14.9 sec
Geometric Delay (Average)	sec	3.3	
Stop-Line Delay (Average)	sec	2.1	
Idling Time (Average)	sec	0.4	
Intersection Level of Service (LOS)		NA	
95% Back of Queue - Veh (Worst Lane)	veh	3.2	
95% Back of Queue - Dist (Worst Lane)	m	22.7	
Ave. Que Storage Ratio (Worst Lane)		0.02	
Effective Stops (Total)	veh/h	355	425 pers/h
Effective Stop Rate		0.46	0.46
Proportion Queued		0.28	0.28
Performance Index		20.1	20.1
Cost (Total)	$/h	667.52	667.52 $/h
Fuel Consumption (Total)	L/h	60.5	
Carbon Dioxide (Total)	kg/h	143.0	
Hydrocarbons (Total)	kg/h	0.012	
Carbon Monoxide (Total)	kg/h	0.17	
NOx (Total)	kg/h	0.117	

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

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.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand effects.
In Network analysis, Arrival Flows will be reduced if Upstream Capacity Constraint exists.

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

Site Model Variability Index (Average value of largest changes in Lane Degrees of Saturation from the third to the last Main (Timing-Capacity) Iterations): 0.0 %

Number of Iterations: 3 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 57.8%   0.3%   0.0%

Intersection Performance - Annual Values

Performance Measure	Vehicles:	All MCs	Persons
Demand Flows (Total)	veh/y	371,874	446,249 pers/y
Delay (Total)	veh-h/y	556	667 pers-h/y

Effective Stops (Total)	veh/y		170,189		204,227	pers/y
Travel Distance (Total)	veh-km/y		376,419		451,703	pers-km/y
Travel Time (Total)	veh-h/y		7,002		8,402	pers-h/y
Cost (Total)	$/y		320,408		320,408	$/y
Fuel Consumption (Total)	L/y		29,045			
Carbon Dioxide (Total)	kg/y		68,618			
Hydrocarbons (Total)	kg/y		6			
Carbon Monoxide (Total)	kg/y		81			
NOx (Total)	kg/y		56			

1 Hours per Year: 480 (Site)

MOVEMENT SUMMARY

▽ **Site: 101 [Crookwell_Chinamans_AM_2023 + Dev (Site Folder: General)]**

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total HV] veh/h	%	Arrival Flows [Total HV] veh/h	%	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: Crookwell Rd															
1	L2	All MCs	94	1.1	94	1.1	0.051	5.6	LOS A	0.0	0.0	0.00	0.58	0.00	52.8
		LV	93		93		0.051	5.6	LOS A	0.0	0.0	NA	NA	NA	52.8
		HV	1		1		0.051	5.6	LOS A	0.0	0.0	NA	NA	NA	52.8
2	T1	All MCs	83	2.5	83	2.5	0.043	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
		LV	81		81		0.043	0.0	LOS A	0.0	0.0	NA	NA	NA	60.0
		HV	2		2		0.043	0.0	LOS A	0.0	0.0	NA	NA	NA	60.0
Approach			177	1.8	177	1.8	0.051	3.0	NA	0.0	0.0	0.00	0.30	0.00	56.0
North: Crookwell Rd															
8	T1	All MCs	228	4.6	228	4.6	0.122	0.0	LOS A	0.0	0.1	0.00	0.00	0.00	60.0
		LV	218		218		0.122	0.0	LOS A	0.0	0.1	NA	NA	NA	60.0
		HV	11		11		0.122	0.0	LOS A	0.0	0.1	NA	NA	NA	60.0
9	R2	All MCs	1	0.0	1	0.0	0.122	5.6	LOS A	0.0	0.1	0.00	0.00	0.00	57.1
		LV	1		1		0.122	5.6	LOS A	0.0	0.1	NA	NA	NA	57.1
		HV	0		0		-	-	-	-	-	NA	NA	NA	-
Approach			229	4.6	229	4.6	0.122	0.0	NA	0.0	0.1	0.00	0.00	0.00	59.9
West: Chinamans Ln															
10	L2	All MCs	1	0.0	1	0.0	0.471	6.9	LOS A	3.2	22.7	0.60	0.81	0.80	49.8
		LV	1		1		0.471	6.9	LOS A	3.2	22.7	NA	NA	NA	49.8
		HV	0		0		-	-	-	-	-	NA	NA	NA	-
12	R2	All MCs	367	0.3	367	0.3	0.471	9.9	LOS A	3.2	22.7	0.60	0.81	0.80	49.6
		LV	366		366		0.471	9.9	LOS A	3.2	22.7	NA	NA	NA	49.7
		HV	1		1		0.471	14.9	LOS B	3.2	22.7	NA	NA	NA	46.5
Approach			368	0.3	368	0.3	0.471	9.9	LOS A	3.2	22.7	0.60	0.81	0.80	49.6
All Vehicles			775	1.9	775	1.9	0.471	5.4	NA	3.2	22.7	0.28	0.46	0.38	53.8

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.

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.

INTERSECTION SUMMARY

▽ **Site: 101 [Crookwell_Chinamans_AM_2032 + Dev (Site Folder: General)]**

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

New Site
Site Category: (None)
Give-Way (Two-Way)
Design Life Analysis (Final Year): Results for 10 years

Intersection Performance - Hourly Values

Performance Measure	Vehicles:	All MCs	Persons
Travel Speed (Average)	km/h	52.6	52.6 km/h
Travel Distance (Total)	veh-km/h	955.9	1147.1 pers-km/h
Travel Time (Total)	veh-h/h	18.2	21.8 pers-h/h
Desired Speed	km/h	60.0	
Speed Efficiency		0.88	
Travel Time Index		8.62	
Congestion Coefficient		1.14	
Demand Flows (Total)	veh/h	944	1133 pers/h
Arrival Flows (Total)	veh/h	944	
Percent Heavy Vehicles (Demand)	%	1.9	
Percent Heavy Vehicles (Arrivals)	%	1.9	
Degree of Saturation		0.637	
Practical Spare Capacity	%	25.5	
Effective Intersection Capacity	veh/h	1482	
Control Delay (Total)	veh-h/h	1.82	2.18 pers-h/h
Control Delay (Average)	sec	6.9	6.9 sec
Control Delay (Worst Lane by MC)	sec	13.1	
Control Delay (Worst Movement by MC)	sec	20.9	20.9 sec
Geometric Delay (Average)	sec	3.3	
Stop-Line Delay (Average)	sec	3.6	
Idling Time (Average)	sec	0.7	
Intersection Level of Service (LOS)		NA	
95% Back of Queue - Veh (Worst Lane)	veh	5.8	
95% Back of Queue - Dist (Worst Lane)	m	40.5	
Ave. Que Storage Ratio (Worst Lane)		0.03	
Effective Stops (Total)	veh/h	524	629 pers/h
Effective Stop Rate		0.56	0.56
Proportion Queued		0.34	0.34
Performance Index		27.6	27.6
Cost (Total)	$/h	830.09	830.09 $/h
Fuel Consumption (Total)	L/h	74.6	
Carbon Dioxide (Total)	kg/h	176.3	
Hydrocarbons (Total)	kg/h	0.014	
Carbon Monoxide (Total)	kg/h	0.21	
NOx (Total)	kg/h	0.144	

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

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.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand effects.
In Network analysis, Arrival Flows will be reduced if Upstream Capacity Constraint exists.

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

Site Model Variability Index (Average value of largest changes in Lane Degrees of Saturation from the third to the last Main (Timing-Capacity) Iterations): 0.0 %

Number of Iterations: 3 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 62.0%   0.3%   0.0%

Intersection Performance - Annual Values

Performance Measure	Vehicles:	All MCs	Persons
Demand Flows (Total)	veh/y	453,312	543,974 pers/y

Delay (Total)	veh-h/y		872	1,047	pers-h/y
Effective Stops (Total)	veh/y		251,649	301,979	pers/y
Travel Distance (Total)	veh-km/y		458,853	550,624	pers-km/y
Travel Time (Total)	veh-h/y		8,731	10,477	pers-h/y
Cost (Total)	$/y		398,444	398,444	$/y
Fuel Consumption (Total)	L/y		35,819		
Carbon Dioxide (Total)	kg/y		84,617		
Hydrocarbons (Total)	kg/y		7		
Carbon Monoxide (Total)	kg/y		100		
NOx (Total)	kg/y		69		

1   Hours per Year: 480 (Site)

MOVEMENT SUMMARY

▽ **Site: 101 [Crookwell_Chinamans_AM_2032 + Dev (Site Folder: General)]**

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

New Site
Site Category: (None)
Give-Way (Two-Way)
Design Life Analysis (Final Year): Results for 10 years

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total HV] veh/h	%	Arrival Flows [Total HV] veh/h	%	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: Crookwell Rd															
1	L2	All MCs	114	1.1	114	1.1	0.062	5.6	LOS A	0.0	0.0	0.00	0.58	0.00	52.8
		LV	113		113		0.062	5.6	LOS A	0.0	0.0	NA	NA	NA	52.8
		HV	1		1		0.062	5.6	LOS A	0.0	0.0	NA	NA	NA	52.8
2	T1	All MCs	101	2.5	101	2.5	0.053	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
		LV	99		99		0.053	0.0	LOS A	0.0	0.0	NA	NA	NA	60.0
		HV	3		3		0.053	0.0	LOS A	0.0	0.0	NA	NA	NA	60.0
Approach			216	1.8	216	1.8	0.062	3.0	NA	0.0	0.0	0.00	0.30	0.00	56.0
North: Crookwell Rd															
8	T1	All MCs	278	4.6	278	4.6	0.148	0.0	LOS A	0.0	0.1	0.00	0.00	0.00	60.0
		LV	266		266		0.148	0.0	LOS A	0.0	0.1	NA	NA	NA	60.0
		HV	13		13		0.148	0.0	LOS A	0.0	0.1	NA	NA	NA	60.0
9	R2	All MCs	1	0.0	1	0.0	0.148	5.7	LOS A	0.0	0.1	0.00	0.00	0.00	57.1
		LV	1		1		0.148	5.7	LOS A	0.0	0.1	NA	NA	NA	57.1
		HV	0		0		-	-	-	-	-	NA	NA	NA	-
Approach			280	4.6	280	4.6	0.148	0.0	NA	0.0	0.1	0.00	0.00	0.00	59.9
West: Chinamans Ln															
10	L2	All MCs	1	0.0	1	0.0	0.637	8.8	LOS A	5.8	40.5	0.72	1.02	1.27	47.6
		LV	1		1		0.637	8.8	LOS A	5.8	40.5	NA	NA	NA	47.6
		HV	0		0		-	-	-	-	-	NA	NA	NA	-
12	R2	All MCs	448	0.3	448	0.3	0.637	13.1	LOS B	5.8	40.5	0.72	1.02	1.27	47.5
		LV	447		447		0.637	13.1	LOS B	5.8	40.5	NA	NA	NA	47.5
		HV	1		1		0.637	20.9	LOS C	5.8	40.5	NA	NA	NA	43.2
Approach			449	0.3	449	0.3	0.637	13.1	LOS B	5.8	40.5	0.72	1.02	1.27	47.5
All Vehicles			944	1.9	944	1.9	0.637	6.9	NA	5.8	40.5	0.34	0.56	0.60	52.6

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.

INTERSECTION SUMMARY

▽ Site: 101 [Crookwell_Chinamans_PM_2021 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

New Site
Site Category: (None)
Give-Way (Two-Way)

Intersection Performance - Hourly Values

Performance Measure	Vehicles:	All MCs	Persons
Travel Speed (Average)	km/h	58.3	58.3 km/h
Travel Distance (Total)	veh-km/h	340.5	408.6 pers-km/h
Travel Time (Total)	veh-h/h	5.8	7.0 pers-h/h
Desired Speed	km/h	60.0	
Speed Efficiency		0.97	
Travel Time Index		9.68	
Congestion Coefficient		1.03	
Demand Flows (Total)	veh/h	337	404 pers/h
Arrival Flows (Total)	veh/h	337	
Percent Heavy Vehicles (Demand)	%	5.6	
Percent Heavy Vehicles (Arrivals)	%	5.6	
Degree of Saturation		0.089	
Practical Spare Capacity	%	998.6	
Effective Intersection Capacity	veh/h	3776	
Control Delay (Total)	veh-h/h	0.11	0.14 pers-h/h
Control Delay (Average)	sec	1.2	1.2 sec
Control Delay (Worst Lane by MC)	sec	7.2	
Control Delay (Worst Movement by MC)	sec	7.2	7.2 sec
Geometric Delay (Average)	sec	1.1	
Stop-Line Delay (Average)	sec	0.1	
Idling Time (Average)	sec	0.0	
Intersection Level of Service (LOS)		NA	
95% Back of Queue - Veh (Worst Lane)	veh	0.1	
95% Back of Queue - Dist (Worst Lane)	m	0.7	
Ave. Que Storage Ratio (Worst Lane)		0.00	
Effective Stops (Total)	veh/h	39	47 pers/h
Effective Stop Rate		0.12	0.12
Proportion Queued		0.03	0.03
Performance Index		6.1	6.1
Cost (Total)	$/h	270.87	270.87 $/h
Fuel Consumption (Total)	L/h	25.5	
Carbon Dioxide (Total)	kg/h	61.0	
Hydrocarbons (Total)	kg/h	0.005	
Carbon Monoxide (Total)	kg/h	0.07	
NOx (Total)	kg/h	0.107	

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

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.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand effects.
In Network analysis, Arrival Flows will be reduced if Upstream Capacity Constraint exists.

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

Site Model Variability Index (Average value of largest changes in Lane Degrees of Saturation from the third to the last Main (Timing-Capacity) Iterations): 0.0 %

Number of Iterations: 3 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 53.4%   1.1%   0.0%

Intersection Performance - Annual Values

Performance Measure	Vehicles:	All MCs	Persons
Demand Flows (Total)	veh/y	161,684	194,021 pers/y
Delay (Total)	veh-h/y	54	65 pers-h/y

Effective Stops (Total)	veh/y	18,639	22,367	pers/y
Travel Distance (Total)	veh-km/y	163,447	196,136	pers-km/y
Travel Time (Total)	veh-h/y	2,804	3,365	pers-h/y
Cost (Total)	$/y	130,016	130,016	$/y
Fuel Consumption (Total)	L/y	12,262		
Carbon Dioxide (Total)	kg/y	29,295		
Hydrocarbons (Total)	kg/y	2		
Carbon Monoxide (Total)	kg/y	34		
NOx (Total)	kg/y	51		

1   Hours per Year: 480 (Site)

MOVEMENT SUMMARY

▽ Site: 101 [Crookwell_Chinamans_PM_2021 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total HV] veh/h	Demand Flows [Total HV] %	Arrival Flows [Total HV] veh/h	Arrival Flows [Total HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh.] veh	95% Back Of Queue [Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Crookwell Rd															
1	L2	All MCs	39	2.7	39	2.7	0.021	5.6	LOS A	0.0	0.0	0.00	0.58	0.00	52.8
		LV	38		38		0.021	5.6	LOS A	0.0	0.0	NA	NA	NA	52.8
		HV	1		1		0.021	5.6	LOS A	0.0	0.0	NA	NA	NA	52.8
2	T1	All MCs	171	3.1	171	3.1	0.089	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
		LV	165		165		0.089	0.0	LOS A	0.0	0.0	NA	NA	NA	60.0
		HV	5		5		0.089	0.0	LOS A	0.0	0.0	NA	NA	NA	60.0
Approach			209	3.0	209	3.0	0.089	1.1	NA	0.0	0.0	0.00	0.11	0.00	58.5
North: Crookwell Rd															
8	T1	All MCs	101	12.5	101	12.5	0.058	0.0	LOS A	0.0	0.1	0.02	0.02	0.02	59.8
		LV	88		88		0.058	0.0	LOS A	0.0	0.1	NA	NA	NA	59.8
		HV	13		13		0.058	0.0	LOS A	0.0	0.1	NA	NA	NA	59.8
9	R2	All MCs	2	0.0	2	0.0	0.058	6.4	LOS A	0.0	0.1	0.02	0.02	0.02	57.0
		LV	2		2		0.058	6.4	LOS A	0.0	0.1	NA	NA	NA	57.0
		HV	0		0		-	-	-	-	-	NA	NA	NA	-
Approach			103	12.2	103	12.2	0.058	0.1	NA	0.0	0.1	0.02	0.02	0.02	59.7
West: Chinamans Ln															
10	L2	All MCs	1	0.0	1	0.0	0.028	6.0	LOS A	0.1	0.7	0.39	0.61	0.39	51.7
		LV	1		1		0.028	6.0	LOS A	0.1	0.7	NA	NA	NA	51.7
		HV	0		0		-	-	-	-	-	NA	NA	NA	-
12	R2	All MCs	23	0.0	23	0.0	0.028	7.2	LOS A	0.1	0.7	0.39	0.61	0.39	51.6
		LV	23		23		0.028	7.2	LOS A	0.1	0.7	NA	NA	NA	51.6
		HV	0		0		-	-	-	-	-	NA	NA	NA	-
Approach			24	0.0	24	0.0	0.028	7.2	LOS A	0.1	0.7	0.39	0.61	0.39	51.6
All Vehicles			337	5.6	337	5.6	0.089	1.2	NA	0.1	0.7	0.03	0.12	0.03	58.3

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.

INTERSECTION SUMMARY

▽ Site: 101 [Crookwell_Chinamans_PM_2023 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

New Site
Site Category: (None)
Give-Way (Two-Way)

Intersection Performance - Hourly Values

Performance Measure	Vehicles:	All MCs	Persons
Travel Speed (Average)	km/h	58.7	58.7 km/h
Travel Distance (Total)	veh-km/h	383.0	459.6 pers-km/h
Travel Time (Total)	veh-h/h	6.5	7.8 pers-h/h
Desired Speed	km/h	60.0	
Speed Efficiency		0.98	
Travel Time Index		9.75	
Congestion Coefficient		1.02	
Demand Flows (Total)	veh/h	379	455 pers/h
Arrival Flows (Total)	veh/h	379	
Percent Heavy Vehicles (Demand)	%	1.9	
Percent Heavy Vehicles (Arrivals)	%	1.9	
Degree of Saturation		0.094	
Practical Spare Capacity	%	941.6	
Effective Intersection Capacity	veh/h	4028	
Control Delay (Total)	veh-h/h	0.10	0.12 pers-h/h
Control Delay (Average)	sec	1.0	1.0 sec
Control Delay (Worst Lane by MC)	sec	7.4	
Control Delay (Worst Movement by MC)	sec	7.5	7.5 sec
Geometric Delay (Average)	sec	0.8	
Stop-Line Delay (Average)	sec	0.1	
Idling Time (Average)	sec	0.0	
Intersection Level of Service (LOS)		NA	
95% Back of Queue - Veh (Worst Lane)	veh	0.1	
95% Back of Queue - Dist (Worst Lane)	m	0.8	
Ave. Que Storage Ratio (Worst Lane)		0.00	
Effective Stops (Total)	veh/h	33	40 pers/h
Effective Stop Rate		0.09	0.09
Proportion Queued		0.03	0.03
Performance Index		6.8	6.8
Cost (Total)	$/h	293.02	293.02 $/h
Fuel Consumption (Total)	L/h	25.0	
Carbon Dioxide (Total)	kg/h	59.0	
Hydrocarbons (Total)	kg/h	0.004	
Carbon Monoxide (Total)	kg/h	0.07	
NOx (Total)	kg/h	0.052	

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

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.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand effects.
In Network analysis, Arrival Flows will be reduced if Upstream Capacity Constraint exists.

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

Site Model Variability Index (Average value of largest changes in Lane Degrees of Saturation from the third to the last Main (Timing-Capacity) Iterations): 0.0 %

Number of Iterations: 3 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 55.6%   0.5%   0.0%

Intersection Performance - Annual Values

Performance Measure	Vehicles:	All MCs	Persons
Demand Flows (Total)	veh/y	181,895	218,274 pers/y
Delay (Total)	veh-h/y	48	58 pers-h/y

Effective Stops (Total)	veh/y	16,001	19,201	pers/y
Travel Distance (Total)	veh-km/y	183,836	220,603	pers-km/y
Travel Time (Total)	veh-h/y	3,134	3,761	pers-h/y
Cost (Total)	$/y	140,649	140,649	$/y
Fuel Consumption (Total)	L/y	11,979		
Carbon Dioxide (Total)	kg/y	28,332		
Hydrocarbons (Total)	kg/y	2		
Carbon Monoxide (Total)	kg/y	35		
NOx (Total)	kg/y	25		

1   Hours per Year: 480 (Site)

MOVEMENT SUMMARY

▽ **Site: 101 [Crookwell_Chinamans_PM_2023 (Site Folder: General)]**

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows [Total HV] veh/h	%	Arrival Flows [Total HV] veh/h	%	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: Crookwell Rd															
1	L2	All MCs	31	3.4	31	3.4	0.017	5.6	LOS A	0.0	0.0	0.00	0.58	0.00	52.7
		LV	29		29		0.017	5.6	LOS A	0.0	0.0	NA	NA	NA	52.7
		HV	1		1		0.017	5.6	LOS A	0.0	0.0	NA	NA	NA	52.7
2	T1	All MCs	182	1.2	182	1.2	0.094	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
		LV	180		180		0.094	0.0	LOS A	0.0	0.0	NA	NA	NA	60.0
		HV	2		2		0.094	0.0	LOS A	0.0	0.0	NA	NA	NA	60.0
Approach			213	1.5	213	1.5	0.094	0.8	NA	0.0	0.0	0.00	0.08	0.00	58.8
North: Crookwell Rd															
8	T1	All MCs	141	3.0	141	3.0	0.075	0.0	LOS A	0.0	0.1	0.01	0.01	0.01	59.9
		LV	137		137		0.075	0.0	LOS A	0.0	0.1	NA	NA	NA	59.9
		HV	4		4		0.075	0.0	LOS A	0.0	0.1	NA	NA	NA	59.9
9	R2	All MCs	1	0.0	1	0.0	0.075	5.8	LOS A	0.0	0.1	0.01	0.01	0.01	57.1
		LV	1		1		0.075	5.8	LOS A	0.0	0.1	NA	NA	NA	57.1
		HV	0		0		-	-	-	-	-	NA	NA	NA	-
Approach			142	3.0	142	3.0	0.075	0.0	NA	0.0	0.1	0.01	0.01	0.01	59.9
West: Chinamans Ln															
10	L2	All MCs	1	0.0	1	0.0	0.029	6.1	LOS A	0.1	0.8	0.42	0.62	0.42	51.5
		LV	1		1		0.029	6.1	LOS A	0.1	0.8	NA	NA	NA	51.5
		HV	0		0		-	-	-	-	-	NA	NA	NA	-
12	R2	All MCs	23	0.0	23	0.0	0.029	7.5	LOS A	0.1	0.8	0.42	0.62	0.42	51.4
		LV	23		23		0.029	7.5	LOS A	0.1	0.8	NA	NA	NA	51.4
		HV	0		0		-	-	-	-	-	NA	NA	NA	-
Approach			24	0.0	24	0.0	0.029	7.4	LOS A	0.1	0.8	0.42	0.62	0.42	51.4
All Vehicles			379	1.9	379	1.9	0.094	1.0	NA	0.1	0.8	0.03	0.09	0.03	58.7

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.

INTERSECTION SUMMARY

▽ Site: 101 [Crookwell_Chinamans_PM_2023 + Dev (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

New Site
Site Category: (None)
Give-Way (Two-Way)

Intersection Performance - Hourly Values

Performance Measure	Vehicles:	All MCs	Persons
Travel Speed (Average)	km/h	55.5	55.5 km/h
Travel Distance (Total)	veh-km/h	854.9	1025.9 pers-km/h
Travel Time (Total)	veh-h/h	15.4	18.5 pers-h/h
Desired Speed	km/h	60.0	
Speed Efficiency		0.93	
Travel Time Index		9.17	
Congestion Coefficient		1.08	
Demand Flows (Total)	veh/h	844	1013 pers/h
Arrival Flows (Total)	veh/h	844	
Percent Heavy Vehicles (Demand)	%	0.9	
Percent Heavy Vehicles (Arrivals)	%	0.9	
Degree of Saturation		0.185	
Practical Spare Capacity	%	376.8	
Effective Intersection Capacity	veh/h	4573	
Control Delay (Total)	veh-h/h	0.81	0.98 pers-h/h
Control Delay (Average)	sec	3.5	3.5 sec
Control Delay (Worst Lane by MC)	sec	9.8	
Control Delay (Worst Movement by MC)	sec	9.9	9.9 sec
Geometric Delay (Average)	sec	2.9	
Stop-Line Delay (Average)	sec	0.6	
Idling Time (Average)	sec	0.3	
Intersection Level of Service (LOS)		NA	
95% Back of Queue - Veh (Worst Lane)	veh	0.7	
95% Back of Queue - Dist (Worst Lane)	m	4.6	
Ave. Que Storage Ratio (Worst Lane)		0.00	
Effective Stops (Total)	veh/h	279	335 pers/h
Effective Stop Rate		0.33	0.33
Proportion Queued		0.07	0.07
Performance Index		17.2	17.2
Cost (Total)	$/h	697.37	697.37 $/h
Fuel Consumption (Total)	L/h	61.1	
Carbon Dioxide (Total)	kg/h	144.0	
Hydrocarbons (Total)	kg/h	0.011	
Carbon Monoxide (Total)	kg/h	0.18	
NOx (Total)	kg/h	0.077	

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

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.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand effects.
In Network analysis, Arrival Flows will be reduced if Upstream Capacity Constraint exists.

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

Site Model Variability Index (Average value of largest changes in Lane Degrees of Saturation from the third to the last Main (Timing-Capacity) Iterations): 0.0 %

Number of Iterations: 3 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 67.2% 1.0% 0.0%

Intersection Performance - Annual Values

Performance Measure	Vehicles:	All MCs	Persons
Demand Flows (Total)	veh/y	405,221	486,265 pers/y
Delay (Total)	veh-h/y	391	469 pers-h/y

Effective Stops (Total)	veh/y	133,972	160,767	pers/y
Travel Distance (Total)	veh-km/y	410,370	492,444	pers-km/y
Travel Time (Total)	veh-h/y	7,393	8,872	pers-h/y
Cost (Total)	$/y	334,739	334,739	$/y
Fuel Consumption (Total)	L/y	29,344		
Carbon Dioxide (Total)	kg/y	69,138		
Hydrocarbons (Total)	kg/y	6		
Carbon Monoxide (Total)	kg/y	84		
NOx (Total)	kg/y	37		

1 Hours per Year: 480 (Site)

MOVEMENT SUMMARY

▽ **Site: 101 [Crookwell_Chinamans_PM_2023 + Dev (Site Folder: General)]**

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total HV] veh/h		Arrival Flows [Total HV] veh/h		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
			veh/h	%	veh/h	%									
South: Crookwell Rd															
1	L2	All MCs	342	0.3	342	0.3	0.185	5.6	LOS A	0.0	0.0	0.00	0.58	0.00	52.8
		LV	341		341		0.185	5.6	LOS A	0.0	0.0	NA	NA	NA	52.8
		HV	1		1		0.185	5.6	LOS A	0.0	0.0	NA	NA	NA	52.8
2	T1	All MCs	243	0.9	243	0.9	0.125	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
		LV	241		241		0.125	0.0	LOS A	0.0	0.0	NA	NA	NA	59.9
		HV	2		2		0.125	0.0	LOS A	0.0	0.0	NA	NA	NA	59.9
Approach			585	0.5	585	0.5	0.185	3.3	NA	0.0	0.0	0.00	0.34	0.00	55.6
North: Crookwell Rd															
8	T1	All MCs	156	2.7	156	2.7	0.083	0.0	LOS A	0.0	0.1	0.01	0.01	0.01	59.9
		LV	152		152		0.083	0.0	LOS A	0.0	0.1	NA	NA	NA	59.9
		HV	4		4		0.083	0.0	LOS A	0.0	0.1	NA	NA	NA	59.9
9	R2	All MCs	1	0.0	1	0.0	0.083	9.8	LOS A	0.0	0.1	0.01	0.01	0.01	57.1
		LV	1		1		0.083	9.8	LOS A	0.0	0.1	NA	NA	NA	57.1
		HV	0		0		-	-	-	-	-	NA	NA	NA	-
Approach			157	2.7	157	2.7	0.083	0.1	NA	0.0	0.1	0.01	0.01	0.01	59.9
West: Chinamans Ln															
10	L2	All MCs	1	0.0	1	0.0	0.168	6.4	LOS A	0.7	4.6	0.57	0.79	0.57	49.8
		LV	1		1		0.168	6.4	LOS A	0.7	4.6	NA	NA	NA	49.8
		HV	0		0		-	-	-	-	-	NA	NA	NA	-
12	R2	All MCs	101	0.0	101	0.0	0.168	9.9	LOS A	0.7	4.6	0.57	0.79	0.57	49.7
		LV	101		101		0.168	9.9	LOS A	0.7	4.6	NA	NA	NA	49.7
		HV	0		0		-	-	-	-	-	NA	NA	NA	-
Approach			102	0.0	102	0.0	0.168	9.8	LOS A	0.7	4.6	0.57	0.79	0.57	49.7
All Vehicles			844	0.9	844	0.9	0.185	3.5	NA	0.7	4.6	0.07	0.33	0.07	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.

INTERSECTION SUMMARY

▽ **Site: 101 [Crookwell_Chinamans_PM_2032 + Dev (Site Folder: General)]**

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

New Site
Site Category: (None)
Give-Way (Two-Way)
Design Life Analysis (Final Year): Results for 10 years

Intersection Performance - Hourly Values

Performance Measure	Vehicles:	All MCs	Persons
Travel Speed (Average)	km/h	55.3	55.3 km/h
Travel Distance (Total)	veh-km/h	1042.2	1250.6 pers-km/h
Travel Time (Total)	veh-h/h	18.8	22.6 pers-h/h
Desired Speed	km/h	60.0	
Speed Efficiency		0.92	
Travel Time Index		9.13	
Congestion Coefficient		1.09	
Demand Flows (Total)	veh/h	1029	1235 pers/h
Arrival Flows (Total)	veh/h	1029	
Percent Heavy Vehicles (Demand)	%	0.9	
Percent Heavy Vehicles (Arrivals)	%	0.9	
Degree of Saturation		0.243	
Practical Spare Capacity	%	229.4	
Effective Intersection Capacity	veh/h	4237	
Control Delay (Total)	veh-h/h	1.06	1.27 pers-h/h
Control Delay (Average)	sec	3.7	3.7 sec
Control Delay (Worst Lane by MC)	sec	11.7	
Control Delay (Worst Movement by MC)	sec	13.6	13.6 sec
Geometric Delay (Average)	sec	2.9	
Stop-Line Delay (Average)	sec	0.8	
Idling Time (Average)	sec	0.4	
Intersection Level of Service (LOS)		NA	
95% Back of Queue - Veh (Worst Lane)	veh	1.0	
95% Back of Queue - Dist (Worst Lane)	m	6.9	
Ave. Que Storage Ratio (Worst Lane)		0.01	
Effective Stops (Total)	veh/h	351	421 pers/h
Effective Stop Rate		0.34	0.34
Proportion Queued		0.08	0.08
Performance Index		21.2	21.2
Cost (Total)	$/h	852.83	852.83 $/h
Fuel Consumption (Total)	L/h	74.6	
Carbon Dioxide (Total)	kg/h	175.8	
Hydrocarbons (Total)	kg/h	0.014	
Carbon Monoxide (Total)	kg/h	0.21	
NOx (Total)	kg/h	0.094	

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

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.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand effects.
In Network analysis, Arrival Flows will be reduced if Upstream Capacity Constraint exists.

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

Site Model Variability Index (Average value of largest changes in Lane Degrees of Saturation from the third to the last Main (Timing-Capacity) Iterations): 0.0 %

Number of Iterations: 3 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 72.4%   1.3%   0.0%

Intersection Performance - Annual Values

Performance Measure	Vehicles:	All MCs	Persons
Demand Flows (Total)	veh/y	493,962	592,755 pers/y

Delay (Total)	veh-h/y	510	612	pers-h/y
Effective Stops (Total)	veh/y	168,294	201,952	pers/y
Travel Distance (Total)	veh-km/y	500,238	600,286	pers-km/y
Travel Time (Total)	veh-h/y	9,046	10,855	pers-h/y
Cost (Total)	$/y	409,359	409,359	$/y
Fuel Consumption (Total)	L/y	35,823		
Carbon Dioxide (Total)	kg/y	84,402		
Hydrocarbons (Total)	kg/y	7		
Carbon Monoxide (Total)	kg/y	103		
NOx (Total)	kg/y	45		

1   Hours per Year: 480 (Site)

MOVEMENT SUMMARY

▽ **Site: 101 [Crookwell_Chinamans_PM_2032 + Dev (Site Folder: General)]**

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

New Site
Site Category: (None)
Give-Way (Two-Way)
Design Life Analysis (Final Year): Results for 10 years

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: Crookwell Rd															
1	L2	All MCs	417	0.3	417	0.3	0.225	5.6	LOS A	0.0	0.0	0.00	0.58	0.00	52.8
		LV	416		416		0.225	5.6	LOS A	0.0	0.0	NA	NA	NA	52.8
		HV	1		1		0.225	5.6	LOS A	0.0	0.0	NA	NA	NA	52.8
2	T1	All MCs	296	0.9	296	0.9	0.153	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
		LV	294		294		0.153	0.0	LOS A	0.0	0.0	NA	NA	NA	59.9
		HV	3		3		0.153	0.0	LOS A	0.0	0.0	NA	NA	NA	59.9
Approach			713	0.5	713	0.5	0.225	3.3	NA	0.0	0.0	0.00	0.34	0.00	55.5
North: Crookwell Rd															
8	T1	All MCs	190	2.7	190	2.7	0.101	0.0	LOS A	0.0	0.2	0.01	0.02	0.01	59.9
		LV	185		185		0.101	0.0	LOS A	0.0	0.2	NA	NA	NA	59.9
		HV	5		5		0.101	0.0	LOS A	0.0	0.2	NA	NA	NA	59.9
9	R2	All MCs	1	0.0	1	0.0	0.101	13.6	LOS B	0.0	0.2	0.01	0.02	0.01	57.1
		LV	1		1		0.101	13.6	LOS B	0.0	0.2	NA	NA	NA	57.1
		HV	0		0		-	-	-	-	-	NA	NA	NA	-
Approach			191	2.7	191	2.7	0.101	0.1	NA	0.0	0.2	0.01	0.02	0.01	59.9
West: Chinamans Ln															
10	L2	All MCs	1	0.0	1	0.0	0.243	6.9	LOS A	1.0	6.9	0.64	0.86	0.68	48.5
		LV	1		1		0.243	6.9	LOS A	1.0	6.9	NA	NA	NA	48.5
		HV	0		0		-	-	-	-	-	NA	NA	NA	-
12	R2	All MCs	123	0.0	123	0.0	0.243	11.8	LOS B	1.0	6.9	0.64	0.86	0.68	48.4
		LV	123		123		0.243	11.8	LOS B	1.0	6.9	NA	NA	NA	48.4
		HV	0		0		-	-	-	-	-	NA	NA	NA	-
Approach			124	0.0	124	0.0	0.243	11.7	LOS B	1.0	6.9	0.64	0.86	0.68	48.4
All Vehicles			1029	0.9	1029	0.9	0.243	3.7	NA	1.0	6.9	0.08	0.34	0.09	55.3

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.

INTERSECTION SUMMARY

▽ Site: 101 [Chinamans_Access_AM_2023 + Dev (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

New Site
Site Category: (None)
Give-Way (Two-Way)

Intersection Performance - Hourly Values

Performance Measure	Vehicles:	All MCs	Persons
Travel Speed (Average)	km/h	53.2	53.2 km/h
Travel Distance (Total)	veh-km/h	472.9	567.4 pers-km/h
Travel Time (Total)	veh-h/h	8.9	10.7 pers-h/h
Desired Speed	km/h	60.0	
Speed Efficiency		0.89	
Travel Time Index		8.74	
Congestion Coefficient		1.13	
Demand Flows (Total)	veh/h	466	560 pers/h
Arrival Flows (Total)	veh/h	466	
Percent Heavy Vehicles (Demand)	%	1.0	
Percent Heavy Vehicles (Arrivals)	%	1.0	
Degree of Saturation		0.208	
Practical Spare Capacity	%	284.7	
Effective Intersection Capacity	veh/h	2242	
Control Delay (Total)	veh-h/h	0.65	0.78 pers-h/h
Control Delay (Average)	sec	5.0	5.0 sec
Control Delay (Worst Lane by MC)	sec	5.7	
Control Delay (Worst Movement by MC)	sec	6.8	6.8 sec
Geometric Delay (Average)	sec	4.9	
Stop-Line Delay (Average)	sec	0.1	
Idling Time (Average)	sec	0.0	
Intersection Level of Service (LOS)		NA	
95% Back of Queue - Veh (Worst Lane)	veh	1.0	
95% Back of Queue - Dist (Worst Lane)	m	7.0	
Ave. Que Storage Ratio (Worst Lane)		0.01	
Effective Stops (Total)	veh/h	224	269 pers/h
Effective Stop Rate		0.48	0.48
Proportion Queued		0.12	0.12
Performance Index		11.8	11.8
Cost (Total)	$/h	411.27	411.27 $/h
Fuel Consumption (Total)	L/h	38.6	
Carbon Dioxide (Total)	kg/h	90.9	
Hydrocarbons (Total)	kg/h	0.008	
Carbon Monoxide (Total)	kg/h	0.11	
NOx (Total)	kg/h	0.067	

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

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.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand effects.
In Network analysis, Arrival Flows will be reduced if Upstream Capacity Constraint exists.

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

Site Model Variability Index (Average value of largest changes in Lane Degrees of Saturation from the third to the last Main (Timing-Capacity) Iterations): 0.0 %

Number of Iterations: 3 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 14.9%   6.2%   0.0%

Intersection Performance - Annual Values

Performance Measure	Vehicles:	All MCs	Persons
Demand Flows (Total)	veh/y	223,832	268,598 pers/y
Delay (Total)	veh-h/y	311	373 pers-h/y

Effective Stops (Total)	veh/y	107,653	129,184	pers/y
Travel Distance (Total)	veh-km/y	226,979	272,374	pers-km/y
Travel Time (Total)	veh-h/y	4,266	5,119	pers-h/y
Cost (Total)	$/y	197,409	197,409	$/y
Fuel Consumption (Total)	L/y	18,513		
Carbon Dioxide (Total)	kg/y	43,631		
Hydrocarbons (Total)	kg/y	4		
Carbon Monoxide (Total)	kg/y	52		
NOx (Total)	kg/y	32		

1   Hours per Year: 480 (Site)

MOVEMENT SUMMARY

▽ Site: 101 [Chinamans_Access_AM_2023 + Dev (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total HV] veh/h	%	Arrival Flows [Total HV] veh/h	%	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: Chinamans Ln															
5	T1	All MCs	14	1.0	14	1.0	0.055	0.0	LOS A	0.3	1.8	0.13	0.49	0.13	55.3
		LV	14		14		0.055	0.0	LOS A	0.3	1.8	NA	NA	NA	55.3
		HV	0		0		0.055	0.0	LOS A	0.3	1.8	NA	NA	NA	55.3
6	R2	All MCs	82	1.0	82	1.0	0.055	5.6	LOS A	0.3	1.8	0.13	0.49	0.13	52.9
		LV	81		81		0.055	5.6	LOS A	0.3	1.8	NA	NA	NA	52.9
		HV	1		1		0.055	5.8	LOS A	0.3	1.8	NA	NA	NA	52.7
Approach			96	1.0	96	1.0	0.055	4.8	NA	0.3	1.8	0.13	0.49	0.13	53.2
North: Site Access															
7	L2	All MCs	325	1.0	325	1.0	0.208	5.7	LOS A	1.0	7.0	0.13	0.54	0.13	52.4
		LV	322		322		0.208	5.7	LOS A	1.0	7.0	NA	NA	NA	52.4
		HV	3		3		0.208	5.9	LOS A	1.0	7.0	NA	NA	NA	52.3
9	R2	All MCs	1	1.0	1	1.0	0.208	6.1	LOS A	1.0	7.0	0.13	0.54	0.13	52.2
		LV	1		1		0.208	6.1	LOS A	1.0	7.0	NA	NA	NA	52.2
		HV	0		0		0.208	6.8	LOS A	1.0	7.0	NA	NA	NA	51.6
Approach			326	1.0	326	1.0	0.208	5.7	LOS A	1.0	7.0	0.13	0.54	0.13	52.4
West: Chinamans Ln															
10	L2	All MCs	1	1.0	1	1.0	0.023	5.6	LOS A	0.0	0.0	0.00	0.01	0.00	57.3
		LV	1		1		0.023	5.6	LOS A	0.0	0.0	NA	NA	NA	57.3
		HV	0		0		0.023	5.6	LOS A	0.0	0.0	NA	NA	NA	57.3
11	T1	All MCs	43	1.0	43	1.0	0.023	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	59.9
		LV	43		43		0.023	0.0	LOS A	0.0	0.0	NA	NA	NA	59.9
		HV	0		0		0.023	0.0	LOS A	0.0	0.0	NA	NA	NA	59.9
Approach			44	1.0	44	1.0	0.023	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.8
All Vehicles			466	1.0	466	1.0	0.208	5.0	NA	1.0	7.0	0.12	0.48	0.12	53.2

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.

INTERSECTION SUMMARY

▽ Site: 101 [Chinamans_Access_AM_2032 + Dev (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

New Site
Site Category: (None)
Give-Way (Two-Way)
Design Life Analysis (Final Year): Results for 10 years

Intersection Performance - Hourly Values

Performance Measure	Vehicles:	All MCs	Persons
Travel Speed (Average)	km/h	53.1	53.1 km/h
Travel Distance (Total)	veh-km/h	576.4	691.7 pers-km/h
Travel Time (Total)	veh-h/h	10.8	13.0 pers-h/h
Desired Speed	km/h	60.0	
Speed Efficiency		0.89	
Travel Time Index		8.73	
Congestion Coefficient		1.13	
Demand Flows (Total)	veh/h	568	682 pers/h
Arrival Flows (Total)	veh/h	568	
Percent Heavy Vehicles (Demand)	%	1.0	
Percent Heavy Vehicles (Arrivals)	%	1.0	
Degree of Saturation		0.256	
Practical Spare Capacity	%	213.0	
Effective Intersection Capacity	veh/h	2224	
Control Delay (Total)	veh-h/h	0.79	0.95 pers-h/h
Control Delay (Average)	sec	5.0	5.0 sec
Control Delay (Worst Lane by MC)	sec	5.8	
Control Delay (Worst Movement by MC)	sec	7.3	7.3 sec
Geometric Delay (Average)	sec	4.9	
Stop-Line Delay (Average)	sec	0.2	
Idling Time (Average)	sec	0.0	
Intersection Level of Service (LOS)		NA	
95% Back of Queue - Veh (Worst Lane)	veh	1.3	
95% Back of Queue - Dist (Worst Lane)	m	9.0	
Ave. Que Storage Ratio (Worst Lane)		0.01	
Effective Stops (Total)	veh/h	273	327 pers/h
Effective Stop Rate		0.48	0.48
Proportion Queued		0.14	0.14
Performance Index		14.5	14.5
Cost (Total)	$/h	501.93	501.93 $/h
Fuel Consumption (Total)	L/h	47.1	
Carbon Dioxide (Total)	kg/h	110.9	
Hydrocarbons (Total)	kg/h	0.009	
Carbon Monoxide (Total)	kg/h	0.13	
NOx (Total)	kg/h	0.081	

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

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.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand effects.
In Network analysis, Arrival Flows will be reduced if Upstream Capacity Constraint exists.

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

Site Model Variability Index (Average value of largest changes in Lane Degrees of Saturation from the third to the last Main (Timing-Capacity) Iterations): 0.0 %

Number of Iterations: 3 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 15.6%   6.9%   0.0%

Intersection Performance - Annual Values

Performance Measure	Vehicles:	All MCs	Persons
Demand Flows (Total)	veh/y	272,849	327,419 pers/y

Delay (Total)	veh-h/y	382	458	pers-h/y
Effective Stops (Total)	veh/y	130,998	157,198	pers/y
Travel Distance (Total)	veh-km/y	276,686	332,023	pers-km/y
Travel Time (Total)	veh-h/y	5,206	6,247	pers-h/y
Cost (Total)	$/y	240,928	240,928	$/y
Fuel Consumption (Total)	L/y	22,594		
Carbon Dioxide (Total)	kg/y	53,249		
Hydrocarbons (Total)	kg/y	4		
Carbon Monoxide (Total)	kg/y	63		
NOx (Total)	kg/y	39		

1   Hours per Year: 480 (Site)

MOVEMENT SUMMARY

▽ **Site: 101 [Chinamans_Access_AM_2032 + Dev (Site Folder: General)]**

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

New Site
Site Category: (None)
Give-Way (Two-Way)
Design Life Analysis (Final Year): Results for 10 years

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows [Total HV] veh/h	%	Arrival Flows [Total HV] veh/h	%	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: Chinamans Ln															
5	T1	All MCs	17	1.0	17	1.0	0.068	0.0	LOS A	0.3	2.3	0.14	0.49	0.14	55.3
		LV	17		17		0.068	0.0	LOS A	0.3	2.3	NA	NA	NA	55.3
		HV	0		0		0.068	0.0	LOS A	0.3	2.3	NA	NA	NA	55.3
6	R2	All MCs	100	1.0	100	1.0	0.068	5.6	LOS A	0.3	2.3	0.14	0.49	0.14	52.8
		LV	99		99		0.068	5.6	LOS A	0.3	2.3	NA	NA	NA	52.8
		HV	1		1		0.068	5.9	LOS A	0.3	2.3	NA	NA	NA	52.6
Approach			117	1.0	117	1.0	0.068	4.8	NA	0.3	2.3	0.14	0.49	0.14	53.1
North: Site Access															
7	L2	All MCs	396	1.0	396	1.0	0.256	5.8	LOS A	1.3	9.0	0.16	0.54	0.16	52.4
		LV	393		393		0.256	5.8	LOS A	1.3	9.0	NA	NA	NA	52.4
		HV	4		4		0.256	6.0	LOS A	1.3	9.0	NA	NA	NA	52.2
9	R2	All MCs	1	1.0	1	1.0	0.256	6.3	LOS A	1.3	9.0	0.16	0.54	0.16	52.1
		LV	1		1		0.256	6.3	LOS A	1.3	9.0	NA	NA	NA	52.1
		HV	0		0		0.256	7.3	LOS A	1.3	9.0	NA	NA	NA	51.3
Approach			398	1.0	398	1.0	0.256	5.8	LOS A	1.3	9.0	0.16	0.54	0.16	52.4
West: Chinamans Ln															
10	L2	All MCs	1	1.0	1	1.0	0.028	5.6	LOS A	0.0	0.0	0.00	0.01	0.00	57.3
		LV	1		1		0.028	5.6	LOS A	0.0	0.0	NA	NA	NA	57.3
		HV	0		0		0.028	5.6	LOS A	0.0	0.0	NA	NA	NA	57.3
11	T1	All MCs	53	1.0	53	1.0	0.028	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	59.9
		LV	52		52		0.028	0.0	LOS A	0.0	0.0	NA	NA	NA	59.9
		HV	1		1		0.028	0.0	LOS A	0.0	0.0	NA	NA	NA	59.9
Approach			54	1.0	54	1.0	0.028	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.8
All Vehicles			568	1.0	568	1.0	0.256	5.0	NA	1.3	9.0	0.14	0.48	0.14	53.1

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.

INTERSECTION SUMMARY

▽ Site: 101 [Chinamans_Access_PM_2023 + Dev (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

New Site
Site Category: (None)
Give-Way (Two-Way)

Intersection Performance - Hourly Values			
Performance Measure	**Vehicles:**	**All MCs**	**Persons**
Travel Speed (Average)	km/h	53.2	53.2 km/h
Travel Distance (Total)	veh-km/h	449.2	539.1 pers-km/h
Travel Time (Total)	veh-h/h	8.4	10.1 pers-h/h
Desired Speed	km/h	60.0	
Speed Efficiency		0.89	
Travel Time Index		8.74	
Congestion Coefficient		1.13	
Demand Flows (Total)	veh/h	444	533 pers/h
Arrival Flows (Total)	veh/h	444	
Percent Heavy Vehicles (Demand)	%	1.0	
Percent Heavy Vehicles (Arrivals)	%	1.0	
Degree of Saturation		0.194	
Practical Spare Capacity	%	405.4	
Effective Intersection Capacity	veh/h	2291	
Control Delay (Total)	veh-h/h	0.60	0.73 pers-h/h
Control Delay (Average)	sec	4.9	4.9 sec
Control Delay (Worst Lane by MC)	sec	5.6	
Control Delay (Worst Movement by MC)	sec	8.9	8.9 sec
Geometric Delay (Average)	sec	4.8	
Stop-Line Delay (Average)	sec	0.1	
Idling Time (Average)	sec	0.0	
Intersection Level of Service (LOS)		NA	
95% Back of Queue - Veh (Worst Lane)	veh	1.0	
95% Back of Queue - Dist (Worst Lane)	m	7.3	
Ave. Que Storage Ratio (Worst Lane)		0.01	
Effective Stops (Total)	veh/h	222	266 pers/h
Effective Stop Rate		0.50	0.50
Proportion Queued		0.09	0.09
Performance Index		11.3	11.3
Cost (Total)	$/h	391.41	391.41 $/h
Fuel Consumption (Total)	L/h	36.8	
Carbon Dioxide (Total)	kg/h	86.8	
Hydrocarbons (Total)	kg/h	0.007	
Carbon Monoxide (Total)	kg/h	0.10	
NOx (Total)	kg/h	0.064	

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

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.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand effects.
In Network analysis, Arrival Flows will be reduced if Upstream Capacity Constraint exists.

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

Site Model Variability Index (Average value of largest changes in Lane Degrees of Saturation from the third to the last Main (Timing-Capacity) Iterations): 0.0 %

Number of Iterations: 3 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 14.2%   4.7%   0.0%

Intersection Performance - Annual Values			
Performance Measure	**Vehicles:**	**All MCs**	**Persons**
Demand Flows (Total)	veh/y	213,221	255,865 pers/y
Delay (Total)	veh-h/y	290	348 pers-h/y

Effective Stops (Total)	veh/y	106,466	127,759	pers/y
Travel Distance (Total)	veh-km/y	215,625	258,750	pers-km/y
Travel Time (Total)	veh-h/y	4,055	4,866	pers-h/y
Cost (Total)	$/y	187,876	187,876	$/y
Fuel Consumption (Total)	L/y	17,683		
Carbon Dioxide (Total)	kg/y	41,674		
Hydrocarbons (Total)	kg/y	3		
Carbon Monoxide (Total)	kg/y	49		
NOx (Total)	kg/y	31		

1   Hours per Year: 480 (Site)

MOVEMENT SUMMARY

▽ **Site: 101 [Chinamans_Access_PM_2023 + Dev (Site Folder: General)]**

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance																
Mov ID	Turn	Mov Class	Demand Flows [Total HV]		Arrival Flows [Total HV]		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue [Veh. Dist]		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
East: Chinamans Ln															
5	T1	All MCs	31	1.0	31	1.0	0.194	0.0	LOS A	1.0	7.3	0.10	0.52	0.10	55.2
		LV	30		30		0.194	0.0	LOS A	1.0	7.3	NA	NA	NA	55.2
		HV	0		0		0.194	0.0	LOS A	1.0	7.3	NA	NA	NA	55.2
6	R2	All MCs	312	1.0	312	1.0	0.194	5.5	LOS A	1.0	7.3	0.10	0.52	0.10	52.7
		LV	308		308		0.194	5.5	LOS A	1.0	7.3	NA	NA	NA	52.7
		HV	3		3		0.194	5.6	LOS A	1.0	7.3	NA	NA	NA	52.6
Approach			342	1.0	342	1.0	0.194	5.0	NA	1.0	7.3	0.10	0.52	0.10	52.9
North: Site Access															
7	L2	All MCs	78	1.0	78	1.0	0.050	5.6	LOS A	0.2	1.4	0.08	0.55	0.08	52.6
		LV	77		77		0.050	5.6	LOS A	0.2	1.4	NA	NA	NA	52.6
		HV	1		1		0.050	5.7	LOS A	0.2	1.4	NA	NA	NA	52.6
9	R2	All MCs	1	1.0	1	1.0	0.050	6.9	LOS A	0.2	1.4	0.08	0.55	0.08	52.3
		LV	1		1		0.050	6.8	LOS A	0.2	1.4	NA	NA	NA	52.4
		HV	0		0		0.050	8.9	LOS A	0.2	1.4	NA	NA	NA	50.9
Approach			79	1.0	79	1.0	0.050	5.6	LOS A	0.2	1.4	0.08	0.55	0.08	52.6
West: Chinamans Ln															
10	L2	All MCs	1	1.0	1	1.0	0.012	5.6	LOS A	0.0	0.0	0.00	0.03	0.00	57.2
		LV	1		1		0.012	5.6	LOS A	0.0	0.0	NA	NA	NA	57.2
		HV	0		0		0.012	5.6	LOS A	0.0	0.0	NA	NA	NA	57.2
11	T1	All MCs	22	1.0	22	1.0	0.012	0.0	LOS A	0.0	0.0	0.00	0.03	0.00	59.7
		LV	22		22		0.012	0.0	LOS A	0.0	0.0	NA	NA	NA	59.7
		HV	0		0		0.012	0.0	LOS A	0.0	0.0	NA	NA	NA	59.7
Approach			23	1.0	23	1.0	0.012	0.3	NA	0.0	0.0	0.00	0.03	0.00	59.6
All Vehicles			444	1.0	444	1.0	0.194	4.9	NA	1.0	7.3	0.09	0.50	0.09	53.2

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.

INTERSECTION SUMMARY

▽ Site: 101 [Chinamans_Access_PM_2032 + Dev (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

New Site
Site Category: (None)
Give-Way (Two-Way)
Design Life Analysis (Final Year): Results for 10 years

Intersection Performance - Hourly Values

Performance Measure	Vehicles:	All MCs	Persons
Travel Speed (Average)	km/h	53.1	53.1 km/h
Travel Distance (Total)	veh-km/h	539.1	646.9 pers-km/h
Travel Time (Total)	veh-h/h	10.1	12.2 pers-h/h
Desired Speed	km/h	60.0	
Speed Efficiency		0.89	
Travel Time Index		8.73	
Congestion Coefficient		1.13	
Demand Flows (Total)	veh/h	533	640 pers/h
Arrival Flows (Total)	veh/h	533	
Percent Heavy Vehicles (Demand)	%	1.0	
Percent Heavy Vehicles (Arrivals)	%	1.0	
Degree of Saturation		0.234	
Practical Spare Capacity	%	319.6	
Effective Intersection Capacity	veh/h	2282	
Control Delay (Total)	veh-h/h	0.73	0.88 pers-h/h
Control Delay (Average)	sec	4.9	4.9 sec
Control Delay (Worst Lane by MC)	sec	5.7	
Control Delay (Worst Movement by MC)	sec	10.5	10.5 sec
Geometric Delay (Average)	sec	4.8	
Stop-Line Delay (Average)	sec	0.1	
Idling Time (Average)	sec	0.0	
Intersection Level of Service (LOS)		NA	
95% Back of Queue - Veh (Worst Lane)	veh	1.3	
95% Back of Queue - Dist (Worst Lane)	m	9.2	
Ave. Que Storage Ratio (Worst Lane)		0.01	
Effective Stops (Total)	veh/h	265	318 pers/h
Effective Stop Rate		0.50	0.50
Proportion Queued		0.10	0.10
Performance Index		13.7	13.7
Cost (Total)	$/h	470.05	470.05 $/h
Fuel Consumption (Total)	L/h	44.2	
Carbon Dioxide (Total)	kg/h	104.3	
Hydrocarbons (Total)	kg/h	0.009	
Carbon Monoxide (Total)	kg/h	0.12	
NOx (Total)	kg/h	0.077	

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

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.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand effects.
In Network analysis, Arrival Flows will be reduced if Upstream Capacity Constraint exists.

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

Site Model Variability Index (Average value of largest changes in Lane Degrees of Saturation from the third to the last Main (Timing-Capacity) Iterations): 0.0 %

Number of Iterations: 3 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 14.6% 5.1% 0.0%

Intersection Performance - Annual Values

Performance Measure	Vehicles:	All MCs	Persons
Demand Flows (Total)	veh/y	255,865	307,038 pers/y

Delay (Total)	veh-h/y	350	420	pers-h/y
Effective Stops (Total)	veh/y	127,203	152,643	pers/y
Travel Distance (Total)	veh-km/y	258,750	310,500	pers-km/y
Travel Time (Total)	veh-h/y	4,869	5,843	pers-h/y
Cost (Total)	$/y	225,622	225,622	$/y
Fuel Consumption (Total)	L/y	21,236		
Carbon Dioxide (Total)	kg/y	50,048		
Hydrocarbons (Total)	kg/y	4		
Carbon Monoxide (Total)	kg/y	59		
NOx (Total)	kg/y	37		

1 Hours per Year: 480 (Site)