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Traffic and Parking Assessment Report

Queens Lane between Kings Way and Hanna Street, Melbourne

Project Number 220715
Final Report 07/08/2023

Client Port Phillip City Council

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Document control record

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Document control	
Report title	Queens Lane between Kings Way and Hanna Street, Melbourne
Project number	220715
Client	Port Phillip City Council
Client contact	Mohamed Nur (9209 6340)

Revision	**Date issued**	**Revision details / status**	**Prepared by**	**Authorised by**
Draft	21/06/2023	Preliminary draft	Ziad Nahas	Ali Abdou
Final	7/08/2023	Provide short, medium and long term recommendations.	Ziad Nahas	Ali Abdou

Executive summary

Port Phillip City Council engaged Trafficworks to undertake a traffic and parking assessment of Queens Lane between Kings Way and Hanna Street, Melbourne.

The project's purpose is to examine this length of road, following concerns regarding existing congestion, safety and parking raised by the community. The project is to provide Council with recommendations to address these concerns.

Additionally, Council has also requested that the assessment extend to include a review of the proposed re-development of the site at 464 Queens Lane, Melbourne.

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1 Introduction

Port Phillip City Council engaged Trafficworks to investigate congestion, safety and parking issues raised by the community, along Queens Lane between Kings Way and Hanna Street. This report includes the following:

- Assessment of existing congestion, safety and parking issues.
- Reporting on vehicle occupancy, turning movement and queues along the subject length.
- Assessment of data received and observations captured on site to determine site issues and constraints.
- Review of the impacts of the redevelopment site at 464 Queens Lane, Melbourne.
- Provide treatments to address or minimise the identified issues.

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2 Site description

2.1 Queens Lane

Queens Lane is a local road managed by Port Phillip City Council, providing a link between Hanna Street to the south and Kings Way to the north.

Queens Lane is configured as follows:

- Between Hanna Street and Arthur Street: one way traffic lane for northbound traffic only. Loading zone on the west kerbside and no parking along the east kerbside.
- Between Arthur Street and Kings Way: two-lane two-way carriageway. Loading zone on the west kerbside and no parking along the east kerbside. In addition to the loading zone, a clearway is provided along the west kerbside.

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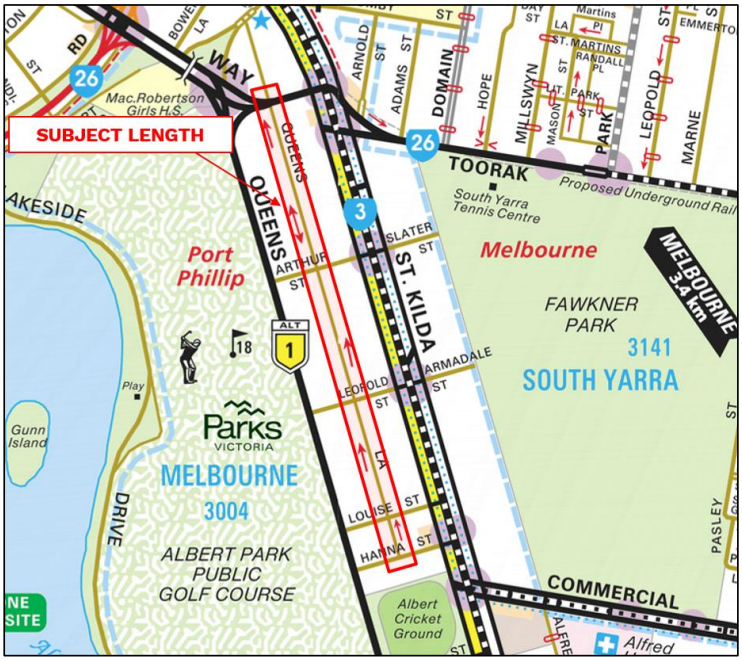

Figure 1: Site Location (reproduced with permission from Melway Publishing Pty Ltd)

There are various local access roads that intersect Queens Lane including; Hanna Street, Louise Street, Leopold Street and Arthur Street. These local roads are configured as two-lane two-way carriageways, with a posted speed limit of 40 km/h, providing a connection between St Kilda Road to the east and Queens Road to the west.

Queens Lane towards the northern end, intersects with Kings Way, an arterial road. A central median is constructed along Kings Way at the intersection, to limit access to left-in left-out.

3 Traffic Survey

3.1 Traffic Volumes and Speed Survey

Traffic volumes and vehicle speeds were recorded between 1/05/2023 and 8/05/2023 at multiple locations along Queens Lane. A summary of the data is represented in Table 1 below.

Table 1: Weekday Average Traffic volumes and speed along Queens Lane.

Location	Daily Average Vehicles Per Day (NB/SB)	Am Peak Volume (NB/SB)	PM Peak Volume (NB/SB)	85th Percentile Speed (km/h) (NB/SB)
North of Hanna Street	337	73	16	22
South of Louise Street	336	55	33	26
North of Louise Street	1,037	179	72	27
South of Leopold Street	992	113	122	31
North of Leopold Street	1,439	159	148	27
South of Arthur Street	1,123	90	145	19
North of Arthur Street	2,133/901	260/56	195/130	29/26
South of Kings Way	1,557/243	132/23	181/15	38/34

Northbound (NB) / Southbound (SB)

3.2 Turning Movement Counts

Turning movement counts (TMC) and pedestrian crossing volumes were also conducted at the intersecting roads along Queens Lane, on the 4/05/2023 between 6:00 am to 7:00 pm. A summary of the data during the AM and PM peaks are represented in Table 2 below.

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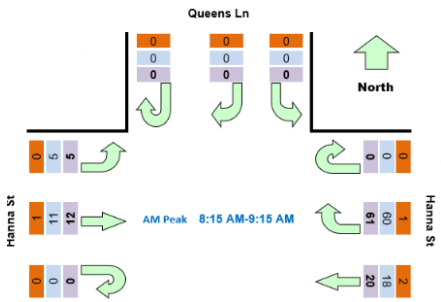
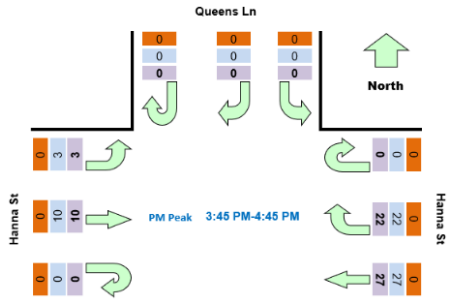
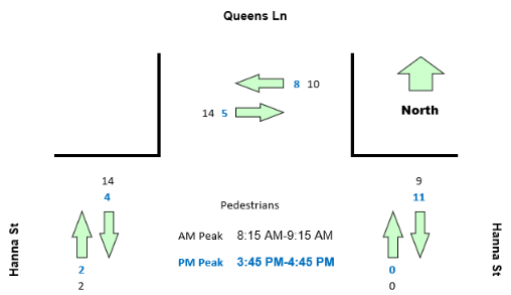
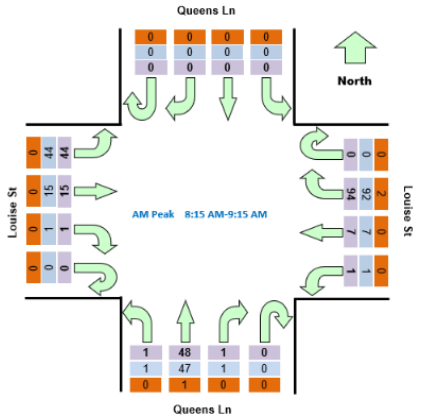
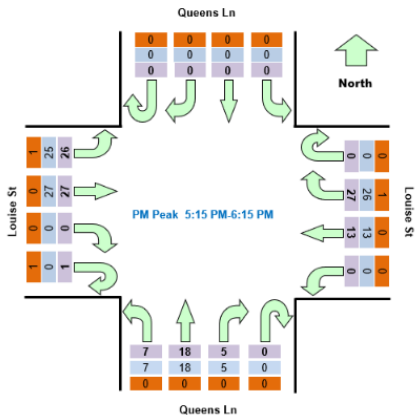
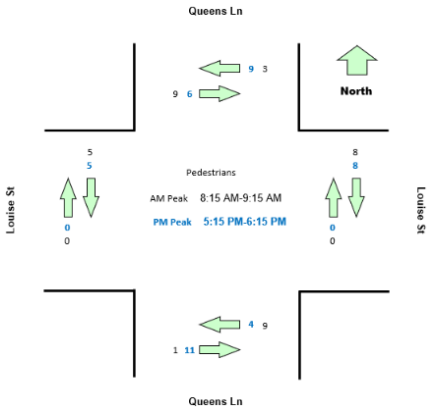
Table 2: Turning movement and pedestrian counts.

Location	AM Peak Total Light Heavy	PM Peak Total Light Heavy	Pedestrian Movements
Queen Street / Hanna Street			
Queen Street / Louise Street			

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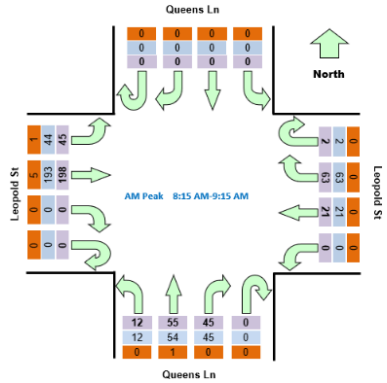
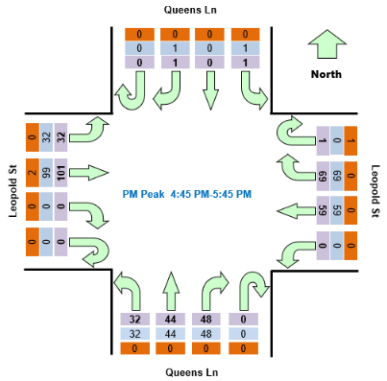
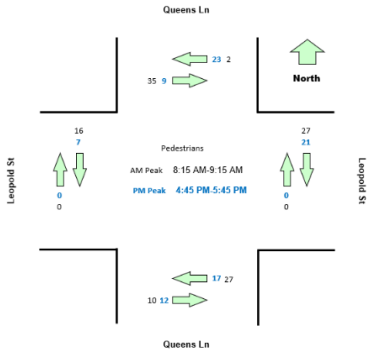
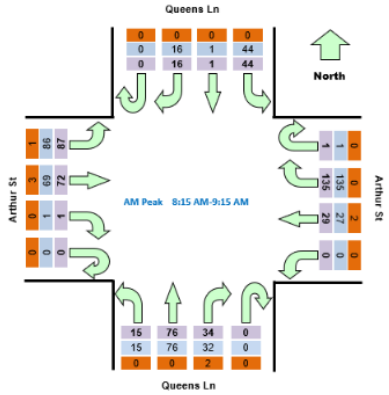
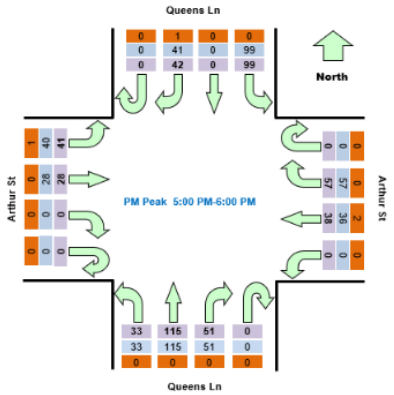
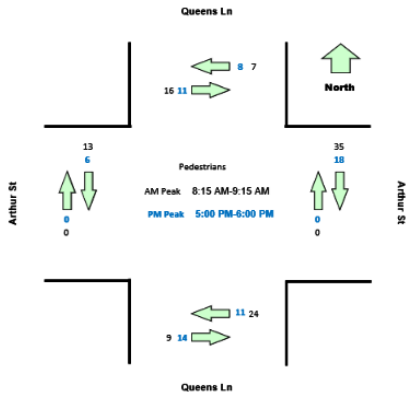
Location	AM Peak Total Light Heavy	PM Peak Total Light Heavy	Pedestrian Movements
Queen Street / Leopold street			
Queen Street / Arthur Street			

3.3 Parking Survey

A parking survey was conducted on Thursday 4 May 2023. Table 3 below shows the existing parking restrictions at various sections along Queens Lane and compliance. It is noted that there are multiple parking restrictions along the same section.

Table 3: Existing parking restrictions along Queens Lane.

Section	Side	Existing Parking Restriction	Compliance
Hanna Street to Louise Street	West	Loading Zone 15 mins 8 am - 6 pm Mon - Fri	Complaint
Louise Street to Leopold Street	West	Loading Zone 15 mins 7:30 am - 6:30 pm Mon - Fri Loading Zone 15 mins 8 am - 6 pm Mon - Fri Loading Zone 15 mins 9 am - 6:30 pm Mon - Fri	Non-complaint
Leopold Street to Arthur Street	West	Loading Zone 15 mins Limit 8 am - 6 pm Mon - Fri	Non-complaint
Arthur Street to Kings Way	West	Clearway 7 am - 9 am, 5 pm - 6:30 pm Mon - Fri; Loading Zone 15 mins 9 am - 5 pm Mon - Fri Clearway 7 am - 9 am, 3 pm - 6:30 pm Mon - Fri; No Stopping All Other Times Clearway 7 am - 9 am, 3 pm - 6:30 pm Mon - Fri; Loading Zone 15 mins 9 am - 3 pm Mon - Fri Clearway 7 am - 9 am, 3 pm - 6:30 pm Mon - Fri, No Stopping All Other Times	Non-complaint
Hanna Street to Kings Way	East	No Stopping	Generally, complaint. However, vehicles have been recorded parking along the east side.

3.4 Traffic Congestion

Queens Lane (Hanna Street to Arthur Street)

With the exception to the Queens Lane / Kings Way intersection, all intersections within the subject length have been observed to perform satisfactorily, with minimal delay and queues on all approaches.

Table 4 below summarises the highest queue lengths recorded within a five-minute segment, at various intersections along Queens Lane during peak periods. This data was extracted from queue length surveys conducted on 04/05/2023.

Table 4: Queue lengths at the intersections.

	Intersection Approach Vehicle Queue Highest Recorded within 5 min period during peaks AM (8:15 am – 9:15 am) / PM (5:00 pm – 6:00 pm)			
Intersection	**North (no. of vehicles)**	**South (no. of vehicles)**	**East (no. of vehicles)**	**West (no. of vehicles)**
Hanna Street	0 / 0	N/A	1 / 0	0 / 0
Louise Street	0 / 0	2 / 1	2 / 0	1 / 0
Leopold Street	0 / 0	3 / 3	2 / 2	0 / 1
Arthur Street	3 / 2	3 / 4	4 / 1	1 / 0
Kings Way *	0 / 0	2/15	-	-

** Based on observations*

Queens Lane / Kings Way

Kings Way is heavily congested during the PM peak, with queues from the Kings Way / Queens Road intersection extending further east and then south along St Kilda Road. This limits the ability for traffic to exit Queens Lane, resulting in a queue length extending approximately 100 m in length and a delay between two to three minutes.

Local Traffic

Any traffic accessing properties abutting Queens Lane or the local intersecting roads are discussed in this report are classified as local traffic.

While rat running may exist, based on observations and the traffic surveys obtained, it is unlikely that this makes up a high percentage of the total traffic on Queens Lane.

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4 Site Observations

A site inspection was conducted on 4/05/2023 during the PM peak and 11/05/2023 during the AM peak. Various issues were identified within the subject intersection, which include:

- Footpaths are obstructed by rubbish bins, during garbage collection. Consequently, pedestrians are walking along the traffic lane to manoeuvre around the bins.
- A time based 15-minute loading zone applies along the west kerbside of the subject length. There are various vehicles using this parking illegally, including tradesman and other non-loading vehicles. Refer to Table 3 above.
- There is a heavy demand for removalist trucks parking, particular north of Arthur Street. These trucks occupy the loading zone for more than the prescribed time and are usually also parked during the clearway.
- Between Arthur Street and Kings Way, a Clearway along the western kerbside is present during peak hours. Vehicles are illegally parking during the Clearway times. Queens Lane at this location is two-way. Consequently, during the peak times, southbound vehicles have been observed to mount the footpath, to allow opposing vehicles to pass as there is insufficient carriageway width.
- Speed data along the subject lengths indicate compliant vehicle speed, with the 85-percentile speed well below the 40 km/h posted speed limit. Refer to Table 1 above.
- Turning movement counts indicate a small portion of drivers are illegally turning from Louise Street, Leopold Street and Arthur Street intersections into Queens Lane heading southbound. This was also observed on-site.
- Sight lines at the Louise Street, Leopold Street and Arthur Street intersection are restricted by parked vehicles.
- There are various pram ramp deficiencies at the Hanna Street, Louise Street, Leopold Street and Arthur Street intersections including:
    - No opposing pram ramps for pedestrians to cross
    - Some pram ramps are aligned diagonally to the opposing pram ramp
    - No tactile ground surface indicators (TGSIs) present for visibility impaired pedestrians.
- The Give-way signs facing northbound traffic at the Louise Street and Arthur Street intersections, are placed too close to the kerb and appear to be struck by large vehicles.
- At the Queens Lane / Kings Way intersection:

- Excessive queuing and delay occurs during the PM peak, with queues extending mid-way south along Queens Lane towards Arthur Street intersection.
- Inpatient motorists have been observed to use the opposing southbound traffic lane to cut in front of the queue of vehicles turning left into Kings Way. This behaviour could result in a head on crash. This behaviour could be a result of the Keep Clear located on Kings Way, which creates a gap that is accessible from the southbound lane.
- There are a number of vehicles turning right out of the building on the south-west corner, to head south along Queens Lane. Due to the limited cross-section width of Queens Lane, vehicles have been observed to mount the kerb and encroach into the eastern footpath.
- Vehicles on Kings Way turning left into Queens Lane are mounting the kerb and pram ramp as they turn. This is due to an unsuitable kerb radius and is remanent of the old one-way arrangement, which was altered in 2017.

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5 Treatments Considered:

5.1 Signalise the Queens Lane / Kings Way intersection

This option was discounted for the following reasons:

- There are two major intersections directly east and west of Queens Lane. Any reduction to capacity on Kings Way from new traffic signals, will significantly impact the operation of these two intersections, which will have a follow-on effect on St Kilda Road and Kings Way (north).
- It is unlikely that this treatment would address the congestion experienced during PM peaks, primarily due to downstream congestion on Kings Way that will limit capacity exiting Queens Lane.
- Any capacity gains outside the peak will be outweighed by a potential increase in rat running along Queens Lane.
- Based on the above, this option will unlikely be supported by the Department of Transport (DTP).

5.2 Convert Queens Lane between Arthur Street and Kings Way to One-Way

Converting Queens Lane between Arthur Street and Kings Way to One-Way means that all traffic intending to head south or east, will need to head north along Queens Lane and turn onto Kings Way. Consequently, the additional traffic turning left at the Queens Lane / Kings Way will further impact delays and queueing at this intersection.

5.3 Convert the Queens Lane / Kings Way intersection to One-Way

This option seeks to revert this intersection to one way, and covert the southbound lane into a third left turn lane. This is illustrated in the figure 2 below. This third lane could commence approximately 20 m south of Kings Way. While this treatment is envisaged to reduce the extent of the queue length and marginally improve capacity for vehicles exiting Queens Lane, the additional lane of traffic will obstruct sight lines to the adjacent lanes and increase the risk of cross traffic crashes at this intersection. Consequently, this option was discounted.

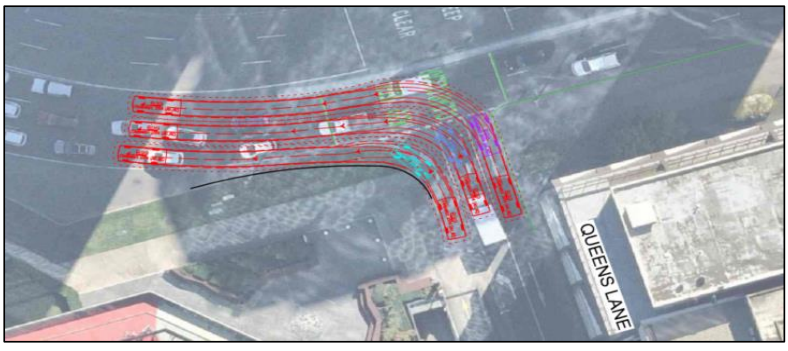

Figure 2: Keep Clear modification.

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6 Recommended Treatments

It is recommended that the following be implemented:

Short Term:

- Improve compliance of the clearway restrictions between Arthur Street and Kings Way, by means of additional enforcement. Consider, modifying the clearway to include a tow-away zone.
- Enforce the loading zone restrictions, ensuring they are occupied for only 15 min and only by loading vehicles.

Medium Term:

- Ban right turn movements exiting the Wilson Car Park south-west of the Queens Lane / Kings Way intersection.
- Shift the Keep Clear linemarking on Kings Way further west and increase the width of the Keep Clear by 10 m. This will allow more traffic from Queens Lane to turn when traffic along Kings Way is queued. This will also mean the queue will block the path of motorists from jumping the queue. This is illustrated in the figure 3 below.

Figure 3: Keep Clear modification.

- Rubbish Collection:

  Consider private rubbish collection, to be undertaken outside of clearways, to minimise impact on clearway restrictions between Arthur Street and Kings Way.

  Coordinate efforts to place all rubbish bins on one side of the road. This is to ensure at least one footpath is available for pedestrians to use. The following is suggested:

  - It is suggested that rubbish be collected on the west side between Hanna Street and Arthur Street. Most rubbish bins along this section are currently picked up from the westside.
  - The section between Arthur Street and Kings Way, rubbish collection could be on the east side.

Long Term:

- Modify the south-east kerb of the Kings Way / Queens Lane intersection, to ensure vehicles don't mount the kerb or encroach into the opposing lane. A swept path assessment had identified that even a car can't turn into Queens Lane, without mounting the kerb and footpath. Refer to figure 4 below.

  While the kerb could be modified to allow for cars to access Queens Lane, a significant area of the footpath would need to be converted to road to accommodate larger turning vehicles. Accordingly, a ban for large vehicles should be considered.

Figure 4: Swept path of a small vehicle.

- Construction of kerb outstands at the Louise Street, Leopold Street and Arthur Street intersections to improve sight lines at these intersections (may require the removal of kerbside parking). This will also reduce the crossing distance for pedestrians and traffic.

  Alternatively, provide raised safety platforms on the side streets to lower approach speeds, to negate the SISD requirements for higher speeds and reduce the impact on parking.

- Reconstruct the pram ramps at the Hanna Street, Louise Street, Leopold Street and Arthur Street intersections and include TGSIs.

- Modify the intersection of Queens Lane and Kings Way to:
  - Remove the Keep Clear at the intersection.
  - Provide a single continuous left turn lane into Kings Way.
  - Accommodate small vehicles (cars, small trucks) turning left from Kings Way into Queens Lane, without encroaching onto the footpath. A ban for large vehicles should be considered.

  This is illustrated in figure 5 below.

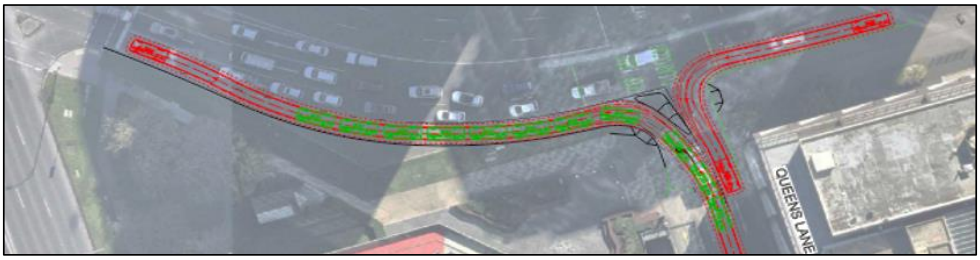

Figure 5: Queens Lane / Kings Way intersection modifications.

The impacts of this treatment will need to be assessed in conjunction with the adjoining major intersection.

7 Future Development

In addition to the original request, Council has requested that the assignment review the impacts of a new planning application for the redevelopment of 464 Queens Lane, Melbourne. This proposal will demolish the existing seven storey office building, to make way for a new 16 storey office building. This site is located approximately mid-way between Leopold Street and Arthur Street.

Council has provided an extract from the application's traffic impact assessment, prepared by Impact Traffic Engineering Pty Ltd. The information indicates that the new development could generate up to 33 additional vehicles, during the peak hours. Ten percent of which, will be generated in the counter peak direction.

Accordingly, it is anticipated that 30 additional vehicles would turn into Queens Lane to access the site from Leopold Street and the remaining three would exit the site, during the AM peak. Conversely, an additional 30 vehicles would exit the site during the PM peak and continue north towards the Arthur Street and Kings Way intersections.

7.1 Traffic Distribution

To determine the impacts of this development on these intersections during the peaks, the following was extracted from the intersection turning movement counts:

Queens Lane / Leopold Street

- 108 vehicles from Leopold Street currently turn into Queens Lane during the AM peak, of which 42 % turn left and 58 % turn right. Applying this percentage split to the additional traffic generated by this redevelopment, equates to an additional 13 and 17 left and right turning movements respectively.

Queens Lane / Arthur Street

- 199 vehicles were recorded on the Queens Lane / Arthur Street southern approach, during the PM peak. Of which, 17 % turn left, 58 % are through and 25 % turn right. Applying this percentage split to the traffic expected to depart from the redevelopment, equates to an additional 5 left, 17 through and 8 right movements at the southern approach of this intersection.

Queens Lane / Kings Way

- The 17 additional through movements generated by the development during the PM peak will continue north towards the Queens Lane / Kings Way intersection.

7.2 Traffic Impact

SIDRA software was used to analyse the existing intersections that are likely to be impacted and determine anticipated intersection operations by the new redevelopment. Typically, the main characteristics used to assess intersection operation are the:

- degree of saturation (DOS)
- 95th percentile queue lengths
- average delay.

Table 5 provides an explanation of the intersection operating characteristics.

Table 5: Definitions of intersection operation characteristics

Degree of Saturation (DOS)			**Operation**
Sign control	Roundabout	Traffic signals	
< 0.6	< 0.6	< 0.6	Excellent operating conditions, minimal delays
0.6 - 0.699	0.6 - 0.699	0.6 - 0.699	Very good operating conditions, minimal delays
0.7 - 0.799	0.7 - 0.849	0.7 - 0.899	Good operating conditions, delays and queuing increasing
0.8 - 0.899	0.85 - 0.949	0.9 - 0.949	Fair operating conditions, delays and queues growing. Any interruption to flow such as minor incidents causes increasing delays
0.9 – 1.0	0.95 – 1.0	0.95 – 1.0	Poor operating conditions, flows starting to breakdown and queues and delays increase rapidly.
> 1.0	> 1.0	> 1.0	Very poor operating conditions with queues and delays increasing rapidly. Once queues develop it takes a significant time for queues to dissipate resulting in long delays to traffic movements

The DOS of an intersection is the ratio between the arrival (demand) flow and the intersection capacity during a given flow period. A degree of saturation of 1.0 is the theoretical capacity of an intersection, achievable if all parameters are optimal. Inefficiencies in driver behaviour and specific site conditions (including sight lines, gap acceptances, follow-up headways) make this unrealistic in practice.

The practical degree of saturation (or practical capacity) of an intersection is a more realistic measure of what can be achieved prior to an intersection becoming oversaturated and prior to traffic flows breaking down and queues and delays increasing rapidly.

Austroads Guide to Traffic Management Part 3 (AGTM3) specifies the following target DOS (practical degree of saturation / practical capacity) for different intersection types:

- 0.90 for traffic signals
- 0.85 for roundabouts
- 0.80 for unsignalised intersections.

7.2.1 Intersection analysis

Intersection modelling was completed at the intersections likely to be impacted by the redevelopment. A summary of the finding is documented below. Refer to the detailed SIDRA modelling outputs in Appendix A.

Queens Lane / Leopold Street

This intersection will only be impacted during the AM peak, as the additional traffic will arrive to the redeveloped site using Leopold Street. Accordingly, the modelling was only undertaken for this peak period. The modelling shows a negligible change at the intersection, with the intersection performing at a degree of saturation (DoS) of 0.13 and the 95th percentile back of queue of 3.0 m.

Queens Lane / Arthur Street

This intersection will only be impacted during the PM peak, as the additional traffic will depart from the redeveloped site and continue north towards Arthur Street. Accordingly, the modelling was only undertaken for this peak period. The modelling shows a negligible change at the intersection, with the intersection performing at a degree of saturation (DoS) of 0.25 and 95th percentile back of queue of 8.5 m.

Queens Lane / Kings Way

This intersection will only be impacted during the PM peak, as the additional traffic will depart from the redeveloped site and continue north towards Kings Way. Accordingly, the modelling was only undertaken for this peak period.

Due to limitations with the SIDRA software, it is not possible to accurately model this intersection during the PM peak in isolation. This is particularly due to the heavy traffic flow on Kings Way and the inability to filter safely when exiting Queens Lane.

Traffic can only exit Queens Lane when the traffic on Kings Way is held by the traffic signals to the west and the queue is at a standstill. Effectively, the Keep Clear marking at the intersection provides a gap for traffic to exit Queens Lane.

The initial Give Way control model at this intersection indicated a queue length and delay that was not consistent to what was observed on site. To replicate the existing conditions, this intersection was modelled as traffic signals, with the phase time for Queens Lane traffic and the cycle time adjusted to reflect the observed queue lengths and delay.

The modelling shows that the additional traffic from the redeveloped site could increase delays from 2-3 minutes to 4-5 minutes and is likely to increase the queue length on Queens Lane by 30%. Notwithstanding this, considering the additional delay, traffic may reroute away from this intersection and utilise St Kilda Road instead.

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8 Conclusion

The assignment reviewed existing conditions along Queens Lane and has made several recommendations to address the identified deficiencies along the route, these include:

- Improve compliance of the Clearway between Arthur Street and Kings Way
- Improve the overall compliance of the Loading Zone along Queens Lane
- Modify the “Keep Clear” linemarking on Kings Way
- Sight line improvements at the intersections along Queens Lane.

An assessment of the redeveloped site at 464 Queens Lane indicates that the additional traffic volumes is unlikely to impact the local intersections during the peaks, except for the Queens Lane / Kings Way intersection.

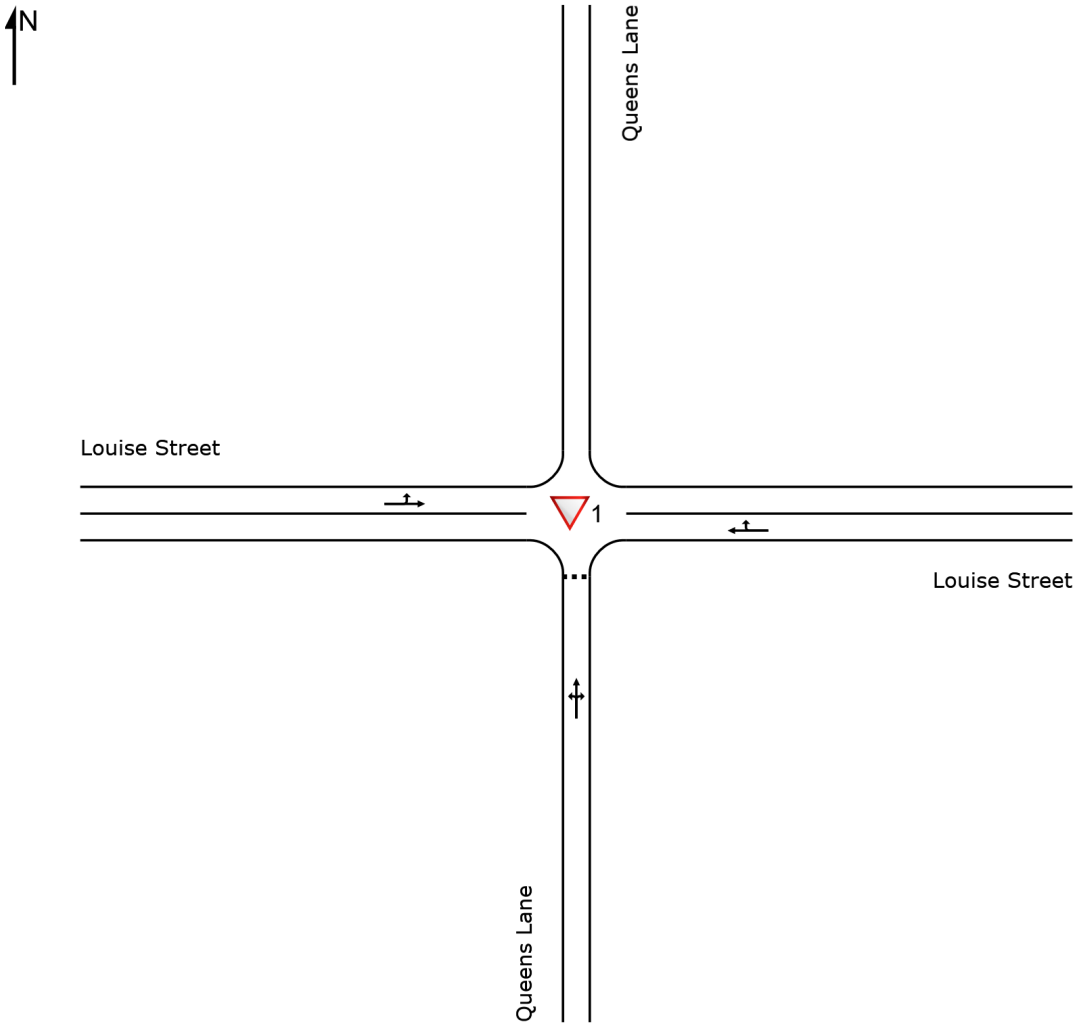
APPENDIX A – SIDRA Modelling

SITE LAYOUT

Site: 1 [Queens Lane/Louise Street AM (Site Folder: Existing AM Peak)]

Louise Street
Site Category: (None)
Give-Way (Two-Way)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



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LANE SUMMARY

▽ Site: 1 [Queens Lane/Louise Street AM (Site Folder: Existing AM Peak)]

Louise Street
Site Category: (None)
Give-Way (Two-Way)

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Queens Lane													
Lane 1	53	1.9	1131	0.047	100	2.8	LOS A	0.2	1.2	Full	500	0.0	0.0
Approach	53	1.9		0.047		2.8	LOS A	0.2	1.2				
East: Louise Street													
Lane 1	106	2.8	1690	0.063	100	5.5	LOS A	0.3	2.1	Full	500	0.0	0.0
Approach	106	2.8		0.063		5.5	NA	0.3	2.1				
West: Louise Street													
Lane 1	62	0.0	1880	0.033	100	4.1	LOS A	0.0	0.0	Full	500	0.0	0.0
Approach	62	0.0		0.033		4.1	NA	0.0	0.0				
Intersection	221	1.8		0.063		4.5	NA	0.3	2.1				

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

Approach Lane Flows (veh/h)

South: Queens Lane

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	1	51	1	53	1.9	1131	0.047	100	NA	NA
Approach	1	51	1	53	1.9		0.047			

East: Louise Street

Mov. From E To Exit:	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	7	99	106	2.8	1690	0.063	100	NA	NA
Approach	7	99	106	2.8		0.063			

West: Louise Street

Mov. From W To Exit:	L2 N	T1 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	46	16	62	0.0	1880	0.033	100	NA	NA
Approach	46	16	62	0.0		0.033			

	Total	%HV	Deg.Satn (v/c)

Intersection	221	1.8	0.063

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
East Exit: Louise Street Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
North Exit: Queens Lane Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
West Exit: Louise Street Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										

LANE SUMMARY

▽ Site: 1 [Queens Lane/Louise Street PM (Site Folder: Existing PM Peak)]

Louise Street
Site Category: (None)
Give-Way (Two-Way)

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Queens Lane													
Lane 1	32	0.0	1258	0.025	100	3.0	LOS A	0.1	0.6	Full	500	0.0	0.0
Approach	32	0.0		0.025		3.0	LOS A	0.1	0.6				
East: Louise Street													
Lane 1	42	3.4	1723	0.024	100	4.0	LOS A	0.1	0.8	Full	500	0.0	0.0
Approach	42	3.4		0.024		4.0	NA	0.1	0.8				
West: Louise Street													
Lane 1	56	2.0	1876	0.030	100	2.7	LOS A	0.0	0.0	Full	500	0.0	0.0
Approach	56	2.0		0.030		2.7	NA	0.0	0.0				
Intersection	129	1.9		0.030		3.2	NA	0.1	0.8				

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

Approach Lane Flows (veh/h)

South: Queens Lane

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	7	19	5	32	0.0	1258	0.025	100	NA	NA
Approach	7	19	5	32	0.0		0.025			

East: Louise Street

Mov. From E To Exit:	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	14	28	42	3.4	1723	0.024	100	NA	NA
Approach	14	28	42	3.4		0.024			

West: Louise Street

Mov. From W To Exit:	L2 N	T1 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	27	28	56	2.0	1876	0.030	100	NA	NA
Approach	27	28	56	2.0		0.030			

Total	%HV	Deg.Satn (v/c)

Intersection	129	1.9		0.030

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

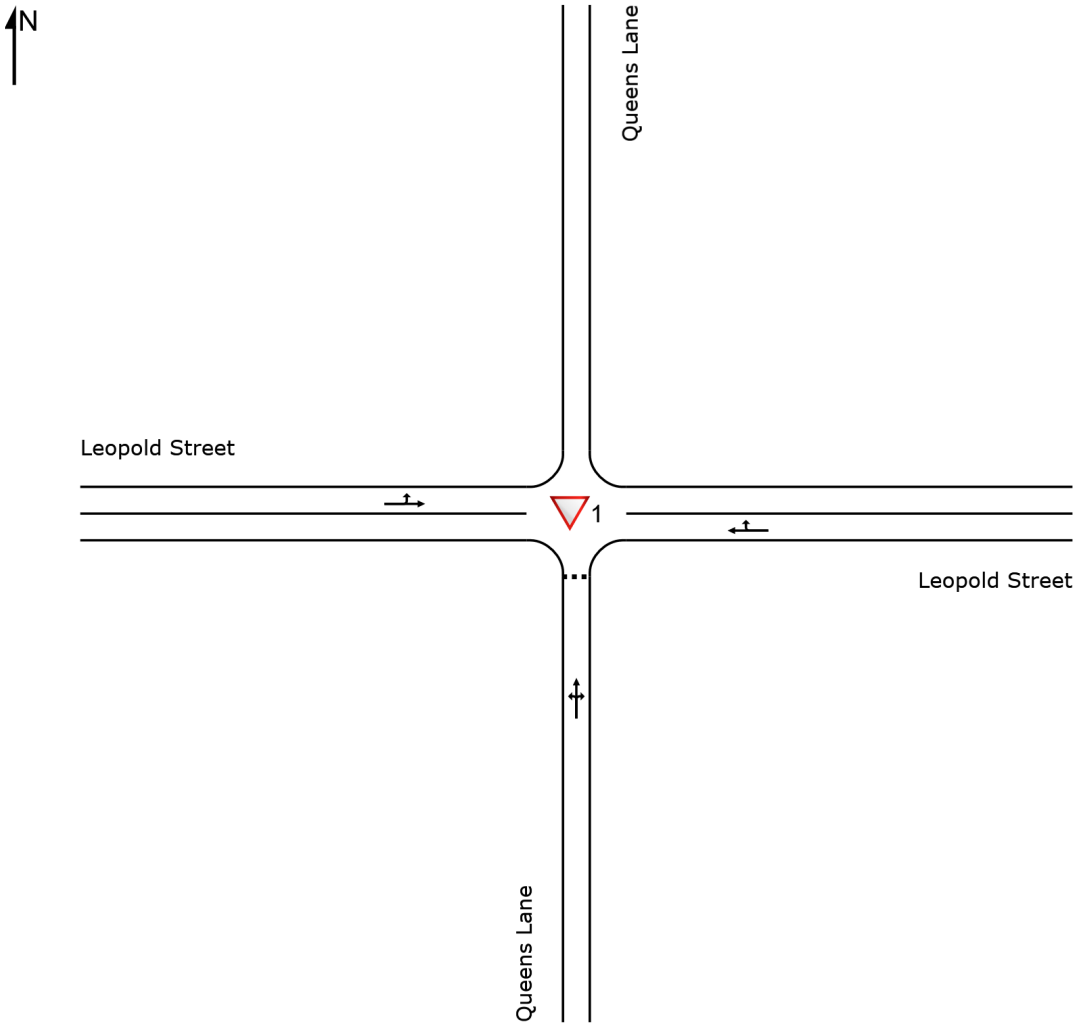
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
East Exit: Louise Street Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
North Exit: Queens Lane Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
West Exit: Louise Street Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										

SITE LAYOUT

Site: 1 [Queens Lane/Leopold Street AM (Site Folder: Existing AM Peak)]

Louise Street
Site Category: (None)
Give-Way (Two-Way)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Organisation: TRAFFICWORKS PTY LTD | Licence: NETWORK / 1PC | Created: Wednesday, 21 June 2023 10:00:17 AM
Project: T:\2223 Projects\220715\Analysis\SIDRA\220715_Queens Lane_230522.sip9

LANE SUMMARY

▽ Site: 1 [Queens Lane/Leopold Street AM (Site Folder: Existing AM Peak)]

Louise Street
Site Category: (None)
Give-Way (Two-Way)

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Queens Lane													
Lane 1	118	1.0	925	0.127	100	4.5	LOS A	0.5	3.3	Full	500	0.0	0.0
Approach	118	1.0		0.127		4.5	LOS A	0.5	3.3				
East: Leopold Street													
Lane 1	88	2.3	1484	0.060	100	5.1	LOS A	0.3	2.0	Full	500	0.0	0.0
Approach	88	2.3		0.060		5.1	NA	0.3	2.0				
West: Leopold Street													
Lane 1	256	2.4	1902	0.134	100	1.1	LOS A	0.0	0.0	Full	500	0.0	0.0
Approach	256	2.4		0.134		1.1	NA	0.0	0.0				
Intersection	462	2.0		0.134		2.7	NA	0.5	3.3				

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

Approach Lane Flows (veh/h)

South: Queens Lane

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	13	58	47	118	1.0	925	0.127	100	NA	NA
Approach	13	58	47	118	1.0		0.127			

East: Leopold Street

Mov. From E To Exit:	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	22	66	88	2.3	1484	0.060	100	NA	NA
Approach	22	66	88	2.3		0.060			

West: Leopold Street

Mov. From W To Exit:	L2 N	T1 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	47	208	256	2.4	1902	0.134	100	NA	NA
Approach	47	208	256	2.4		0.134			

Total	%HV	Deg.Satn (v/c)

Intersection	462	2.0	0.134

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
East Exit: Leopold Street Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
North Exit: Queens Lane Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
West Exit: Leopold Street Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										

LANE SUMMARY

▽ Site: 1 [Queens Lane/Leopold Street PM (Site Folder: Existing PM Peak)]

Louise Street
Site Category: (None)
Give-Way (Two-Way)

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Queens Lane													
Lane 1	131	0.0	1050	0.124	100	4.1	LOS A	0.5	3.3	Full	500	0.0	0.0
Approach	131	0.0		0.124		4.1	LOS A	0.5	3.3				
East: Leopold Street													
Lane 1	135	2.7	1677	0.080	100	3.5	LOS A	0.4	2.6	Full	500	0.0	0.0
Approach	135	2.7		0.080		3.5	NA	0.4	2.6				
West: Leopold Street													
Lane 1	140	1.9	1904	0.074	100	1.3	LOS A	0.0	0.0	Full	500	0.0	0.0
Approach	140	1.9		0.074		1.3	NA	0.0	0.0				
Intersection	405	1.6		0.124		3.0	NA	0.5	3.3				

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

Approach Lane Flows (veh/h)

South: Queens Lane

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	34	46	51	131	0.0	1050	0.124	100	NA	NA
Approach	34	46	51	131	0.0		0.124			

East: Leopold Street

Mov. From E To Exit:	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	62	73	135	2.7	1677	0.080	100	NA	NA
Approach	62	73	135	2.7		0.080			

West: Leopold Street

Mov. From W To Exit:	L2 N	T1 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	34	106	140	1.9	1904	0.074	100	NA	NA
Approach	34	106	140	1.9		0.074			

	Total	%HV	Deg.Satn (v/c)

Intersection	405	1.6	0.124

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

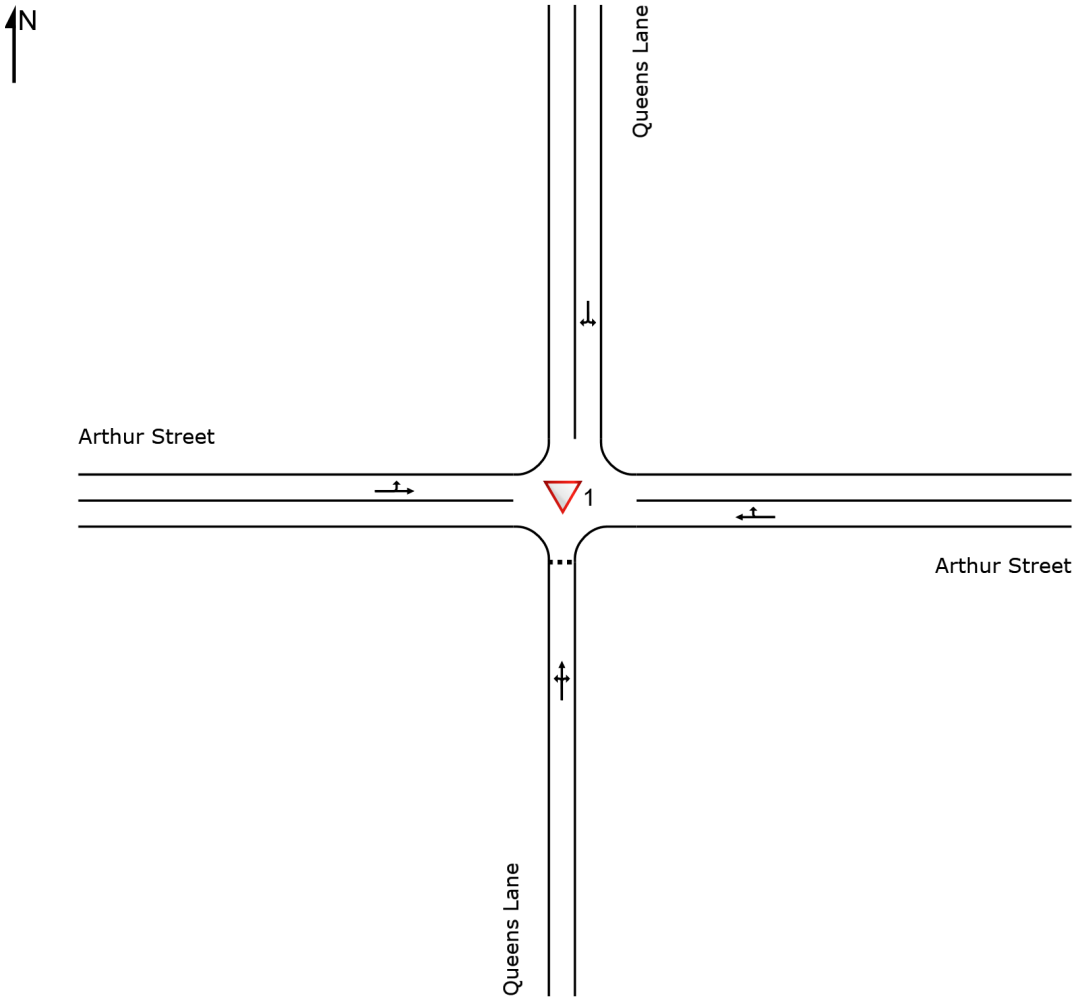
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
East Exit: Leopold Street Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
North Exit: Queens Lane Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
West Exit: Leopold Street Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										

SITE LAYOUT

Site: 1 [Queens Lane/Arthur Street AM (Site Folder: Existing AM Peak)]

Louise Street
Site Category: (None)
Give-Way (Two-Way)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Organisation: TRAFFICWORKS PTY LTD | Licence: NETWORK / 1PC | Created: Wednesday, 21 June 2023 10:00:17 AM
Project: T:\2223 Projects\220715\Analysis\SIDRA\220715_Queens Lane_230522.sip9

LANE SUMMARY

▽ Site: 1 [Queens Lane/Arthur Street AM (Site Folder: Existing AM Peak)]

Louise Street
Site Category: (None)
Give-Way (Two-Way)

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Queens Lane													
Lane 1	132	2.2	809	0.163	100	5.1	LOS A	0.7	5.0	Full	500	0.0	0.0
Approach	132	2.2		0.163		5.1	LOS A	0.7	5.0				
East: Arthur Street													
Lane 1	173	1.6	1283	0.135	100	5.3	LOS A	0.6	4.3	Full	500	0.0	0.0
Approach	173	1.6		0.135		5.3	NA	0.6	4.3				
North: Queens Lane													
Lane 1	63	0.0	1329	0.048	100	5.8	LOS A	0.2	1.3	Full	500	0.0	0.0
Approach	63	0.0		0.048		5.8	NA	0.2	1.3				
West: Arthur Street													
Lane 1	167	3.1	1860	0.090	100	3.1	LOS A	0.0	0.0	Full	500	0.0	0.0
Approach	167	3.1		0.090		3.1	NA	0.0	0.0				
Intersection	535	2.0		0.163		4.6	NA	0.7	5.0				

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

Approach Lane Flows (veh/h)

South: Queens Lane

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	16	80	36	132	2.2	809	0.163	100	NA	NA
Approach	16	80	36	132	2.2		0.163			

East: Arthur Street

Mov. From E To Exit:	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	31	142	173	1.6	1283	0.135	100	NA	NA
Approach	31	142	173	1.6		0.135			

North: Queens Lane

Mov. From N To Exit:	L2 E	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	46	17	63	0.0	1329	0.048	100	NA	NA

Approach	46	17	63	0.0		0.048			
West: Arthur Street									
Mov. From W To Exit:	L2 N	T1 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	92	76	167	3.1	1860	0.090	100	NA	NA
Approach	92	76	167	3.1		0.090			
	Total	%HV	Deg.Satn (v/c)						
Intersection	535	2.0		0.163					

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
East Exit: Arthur Street Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
North Exit: Queens Lane Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
West Exit: Arthur Street Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										

LANE SUMMARY

▽ Site: 1 [Queens Lane/Arthur Street PM (Site Folder: Existing PM Peak)]

Louise Street
Site Category: (None)
Give-Way (Two-Way)

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Queens Lane													
Lane 1	209	1.2	957	0.219	100	4.3	LOS A	1.0	7.2	Full	500	0.0	0.0
Approach	209	1.2		0.219		4.3	LOS A	1.0	7.2				
East: Arthur Street													
Lane 1	100	2.0	1473	0.068	100	3.7	LOS A	0.3	2.1	Full	500	0.0	0.0
Approach	100	2.0		0.068		3.7	NA	0.3	2.1				
North: Queens Lane													
Lane 1	148	0.7	1380	0.108	100	5.7	LOS A	0.5	3.2	Full	500	0.0	0.0
Approach	148	0.7		0.108		5.7	NA	0.5	3.2				
West: Arthur Street													
Lane 1	73	1.5	1874	0.039	100	3.3	LOS A	0.0	0.0	Full	500	0.0	0.0
Approach	73	1.5		0.039		3.3	NA	0.0	0.0				
Intersection	531	1.2		0.219		4.4	NA	1.0	7.2				

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

Approach Lane Flows (veh/h)

South: Queens Lane

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	35	121	54	209	1.2	957	0.219	100	NA	NA
Approach	35	121	54	209	1.2		0.219			

East: Arthur Street

Mov. From E To Exit:	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	40	60	100	2.0	1473	0.068	100	NA	NA
Approach	40	60	100	2.0		0.068			

North: Queens Lane

Mov. From N To Exit:	L2 E	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	104	44	148	0.7	1380	0.108	100	NA	NA

Approach	104	44	148	0.7		0.108			
West: Arthur Street									
Mov. From W To Exit:	L2 N	T1 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	43	29	73	1.5	1874	0.039	100	NA	NA
Approach	43	29	73	1.5		0.039			
	Total	%HV	Deg.Satn (v/c)						
Intersection	531	1.2		0.219					

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

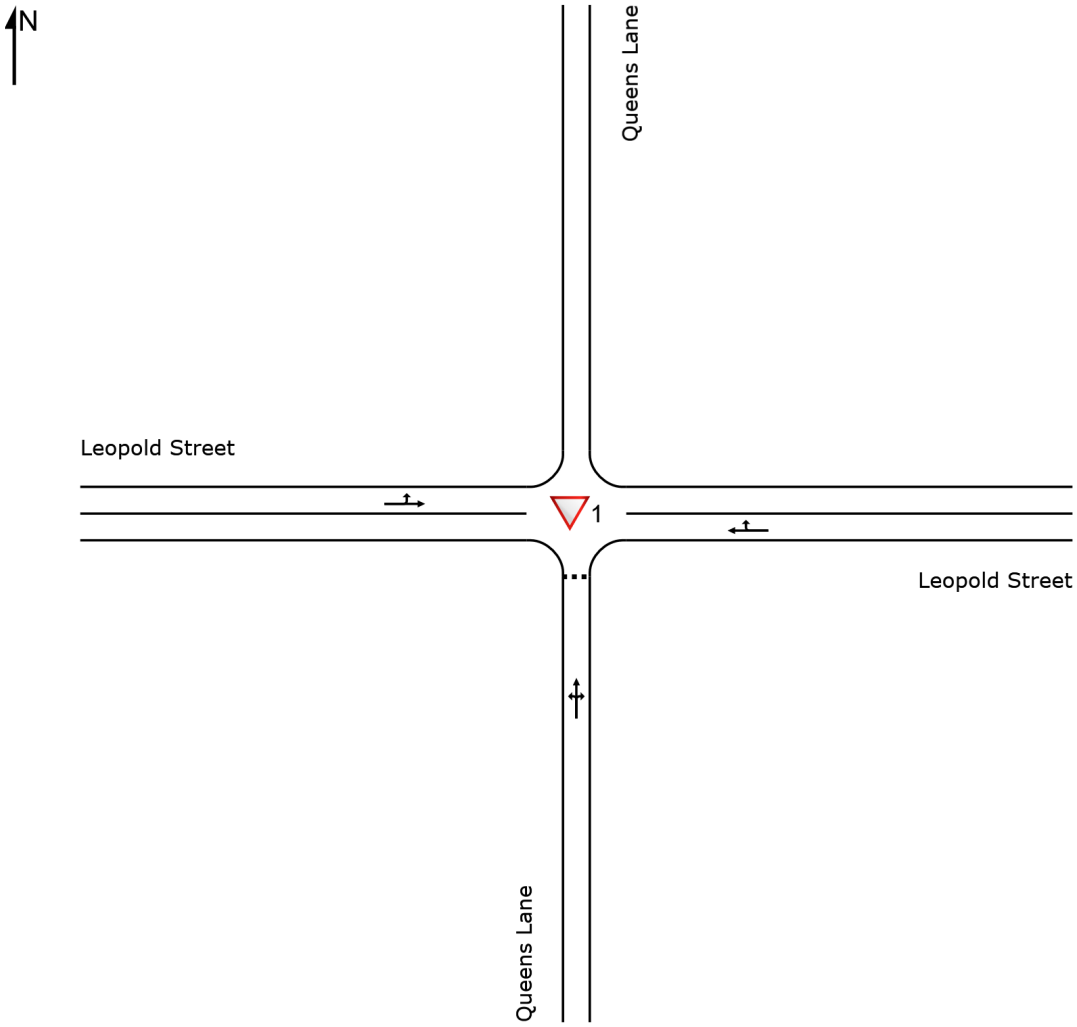
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
East Exit: Arthur Street Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
North Exit: Queens Lane Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
West Exit: Arthur Street Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										

SITE LAYOUT

Site: 1 [Queens Lane/Leopold Street AM - Add 464 Traffic (Site Folder: Add 464 Traffic)]

Louise Street
Site Category: (None)
Give-Way (Two-Way)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Organisation: TRAFFICWORKS PTY LTD | Licence: NETWORK / 1PC | Created: Wednesday, 21 June 2023 10:13:33 AM
Project: T:\2223 Projects\220715\Analysis\SIDRA\220715_Queens Lane TS option_230606.sip9

LANE SUMMARY

▽ Site: 1 [Queens Lane/Leopold Street AM - Add 464 Traffic (Site Folder: Add 464 Traffic)]

Louise Street
Site Category: (None)
Give-Way (Two-Way)

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Queens Lane													
Lane 1	118	1.0	902	0.131	100	4.6	LOS A	0.5	3.4	Full	500	0.0	0.0
Approach	118	1.0		0.131		4.6	LOS A	0.5	3.4				
East: Leopold Street													
Lane 1	106	2.4	1450	0.073	100	5.5	LOS A	0.3	2.5	Full	500	0.0	0.0
Approach	106	2.4		0.073		5.5	NA	0.3	2.5				
West: Leopold Street													
Lane 1	269	2.4	1898	0.142	100	1.3	LOS A	0.0	0.0	Full	500	0.0	0.0
Approach	269	2.4		0.142		1.3	NA	0.0	0.0				
Intersection	494	2.0		0.142		3.0	NA	0.5	3.4				

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

Approach Lane Flows (veh/h)

South: Queens Lane

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	13	58	47	118	1.0	902	0.131	100	NA	NA
Approach	13	58	47	118	1.0		0.131			

East: Leopold Street

Mov. From E To Exit:	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	22	84	106	2.4	1450	0.073	100	NA	NA
Approach	22	84	106	2.4		0.073			

West: Leopold Street

Mov. From W To Exit:	L2 N	T1 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	61	208	269	2.4	1898	0.142	100	NA	NA
Approach	61	208	269	2.4		0.142			

	Total	%HV	Deg.Satn (v/c)

Intersection	494	2.0	0.142

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

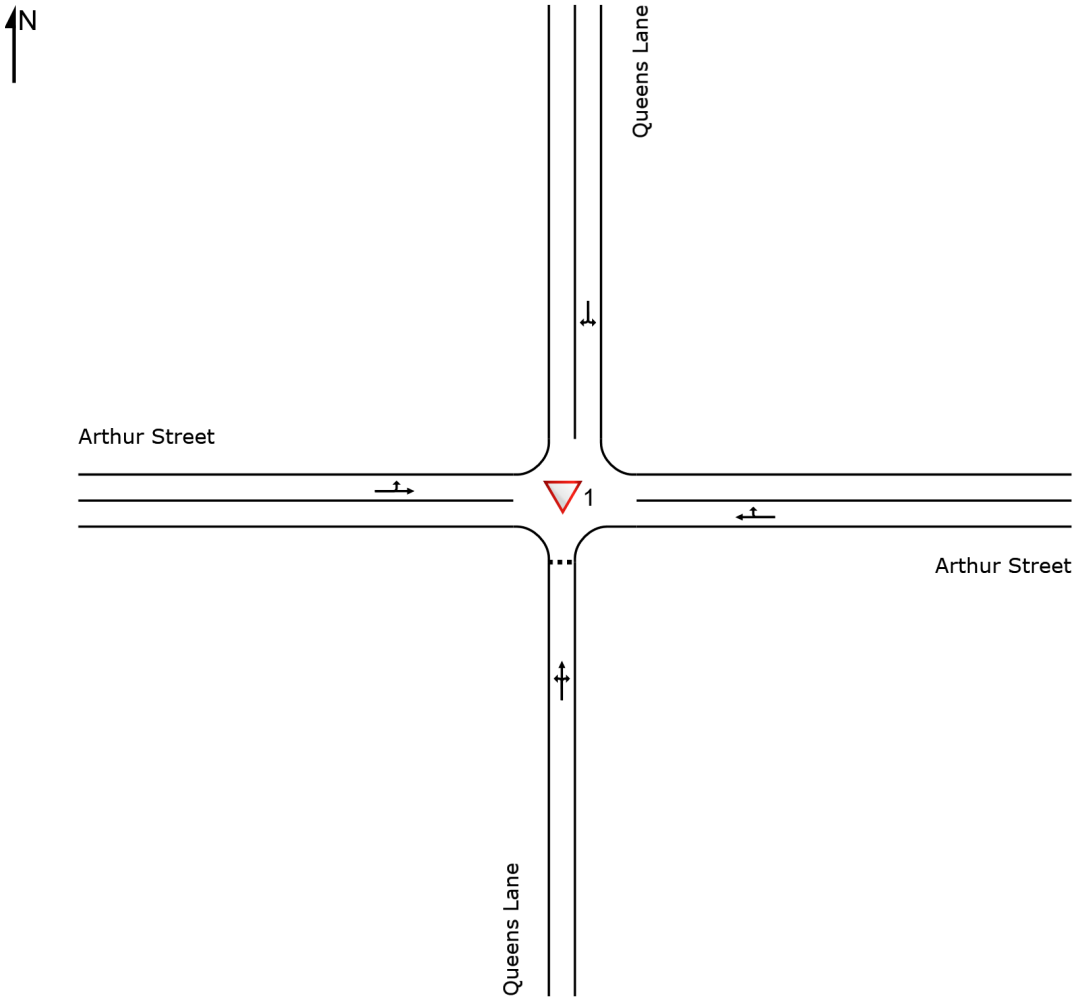
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
East Exit: Leopold Street Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
North Exit: Queens Lane Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
West Exit: Leopold Street Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										

SITE LAYOUT

Site: 1 [Queens Lane/Arthur Street PM - Add 464 Traffic (Site Folder: Add 464 Traffic)]

Louise Street
Site Category: (None)
Give-Way (Two-Way)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



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Project: T:\2223 Projects\220715\Analysis\SIDRA\220715_Queens Lane TS option_230606.sip9

LANE SUMMARY

Site: 1 [Queens Lane/Arthur Street PM - Add 464 Traffic (Site Folder: Add 464 Traffic)]

Louise Street
Site Category: (None)
Give-Way (Two-Way)

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Queens Lane													
Lane 1	241	1.2	957	0.252	100	4.3	LOS A	1.2	8.5	Full	500	0.0	0.0
Approach	241	1.2		0.252		4.3	LOS A	1.2	8.5				
East: Arthur Street													
Lane 1	100	2.0	1473	0.068	100	3.7	LOS A	0.3	2.1	Full	500	0.0	0.0
Approach	100	2.0		0.068		3.7	NA	0.3	2.1				
North: Queens Lane													
Lane 1	148	0.7	1380	0.108	100	5.7	LOS A	0.5	3.2	Full	500	0.0	0.0
Approach	148	0.7		0.108		5.7	NA	0.5	3.2				
West: Arthur Street													
Lane 1	73	1.5	1874	0.039	100	3.3	LOS A	0.0	0.0	Full	500	0.0	0.0
Approach	73	1.5		0.039		3.3	NA	0.0	0.0				
Intersection	562	1.2		0.252		4.4	NA	1.2	8.5				

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

Approach Lane Flows (veh/h)

South: Queens Lane

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	40	139	62	241	1.2	957	0.252	100	NA	NA
Approach	40	139	62	241	1.2		0.252			

East: Arthur Street

Mov. From E To Exit:	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	40	60	100	2.0	1473	0.068	100	NA	NA
Approach	40	60	100	2.0		0.068			

North: Queens Lane

Mov. From N To Exit:	L2 E	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	104	44	148	0.7	1380	0.108	100	NA	NA

Approach	104	44	148	0.7		0.108				
West: Arthur Street										
Mov. From W To Exit:	L2 N	T1 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
Lane 1	43	29	73	1.5	1874	0.039	100	NA	NA	
Approach	43	29	73	1.5		0.039				
	Total	%HV	Deg.Satn (v/c)							
Intersection	562	1.2		0.252						

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

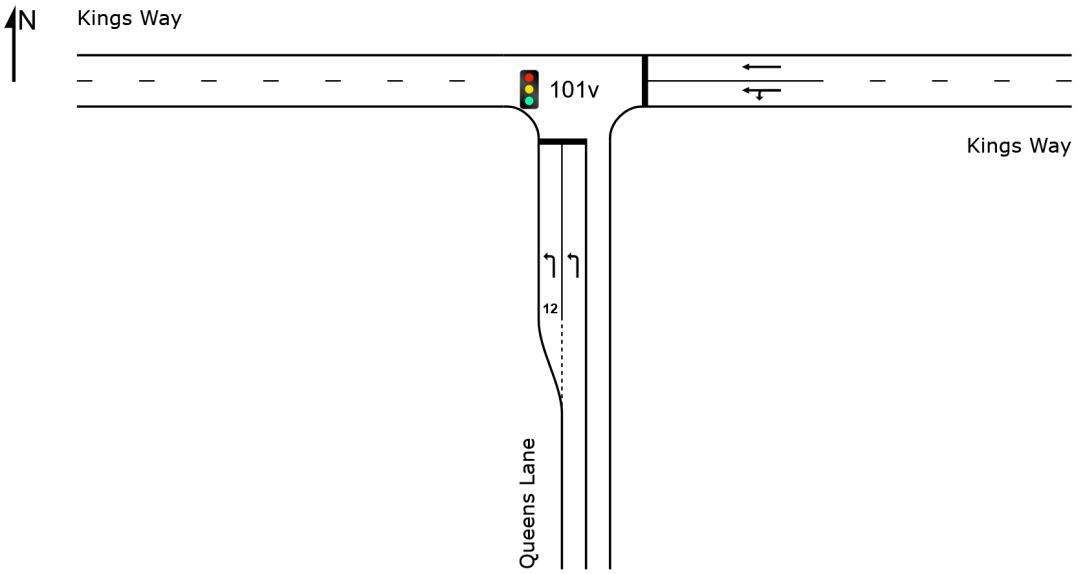
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
East Exit: Arthur Street Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
North Exit: Queens Lane Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
West Exit: Arthur Street Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										

SITE LAYOUT

Site: 101v [Queens Lane/Kings Way PM - Modelled as TS (Site Folder: Existing PM Peak)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



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LANE SUMMARY

Site: 101v [Queens Lane/Kings Way PM - Modelled as TS (Site Folder: Existing PM Peak)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 111 seconds (Site User-Given Phase Times)

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Queens Lane													
Lane 1	85	2.0	76[1]	1.112	100	174.4	LOS F	9.0	64.3	Short	12	0.0	NA
Lane 2	85	2.0	76[1]	1.112	100	174.4	LOS F	9.1	64.5	Full	315	0.0	0.0
Approach	169	2.0		1.112		174.4	LOS F	9.1	64.5				
East: Kings Way													
Lane 1	447	0.2	1646	0.272	100	2.0	LOS A	4.7	32.9	Full	75	0.0	0.0
Lane 2	449	0.0	1651	0.272	100	1.8	LOS A	4.7	33.0	Full	75	0.0	0.0
Approach	896	0.1		0.272		1.9	LOS A	4.7	33.0				
Intersection	1065	0.4		1.112		29.3	LOS C	9.1	64.5				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

Approach Lane Flows (veh/h)

South: Queens Lane

Mov. From S To Exit:	L2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	85	85	2.0	76[1]	1.112	100	100.0	2
Lane 2	85	85	2.0	76[1]	1.112	100	NA	NA
Approach	169	169	2.0		1.112			

East: Kings Way

Mov. From E To Exit:	L2 S	T1 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	17	430	447	0.2	1646	0.272	100	NA	NA
Lane 2	-	449	449	0.0	1651	0.272	100	NA	NA
Approach	17	879	896	0.1		0.272			

	Total	%HV	Deg.Satn (v/c)
Intersection	1065	0.4	1.112

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

Merge Analysis

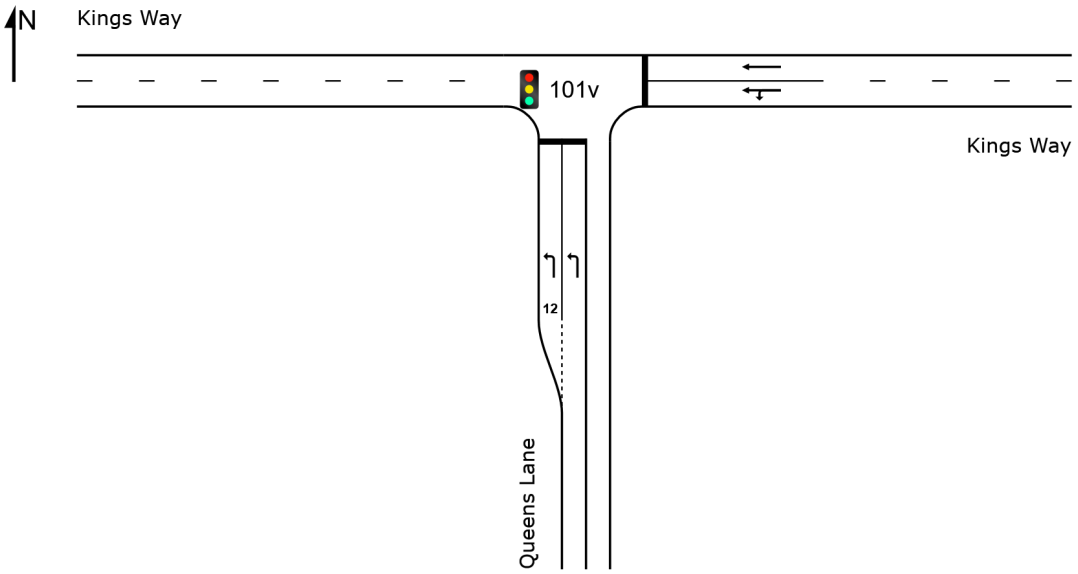
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Queens Lane Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
West Exit: Kings Way Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										

SITE LAYOUT

Site: 101v [Queens Lane/Kings Way PM - TS - - Add 464 Traffic (Site Folder: Add 464 Traffic)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



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LANE SUMMARY

Site: 101v [Queens Lane/Kings Way PM - TS - - Add 464 Traffic (Site Folder: Add 464 Traffic)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 111 seconds (Site User-Given Phase Times)

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Queens Lane													
Lane 1	94	2.0	76[1]	1.230	100	270.4	LOS F	13.0	92.8	Short	12	0.0	NA
Lane 2	94	2.0	76[1]	1.230	100	270.4	LOS F	13.1	93.0	Full	315	0.0	0.0
Approach	187	2.0		1.230		270.4	LOS F	13.1	93.0				
East: Kings Way													
Lane 1	447	0.2	1646	0.272	100	2.0	LOS A	4.7	32.9	Full	75	0.0	0.0
Lane 2	449	0.0	1651	0.272	100	1.8	LOS A	4.7	33.0	Full	75	0.0	0.0
Approach	896	0.1		0.272		1.9	LOS A	4.7	33.0				
Intersection	1083	0.4		1.230		48.3	LOS D	13.1	93.0				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

Approach Lane Flows (veh/h)

South: Queens Lane

Mov. From S To Exit:	L2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	94	94	2.0	76[1]	1.230	100	100.0	2
Lane 2	94	94	2.0	76[1]	1.230	100	NA	NA
Approach	187	187	2.0		1.230			

East: Kings Way

Mov. From E To Exit:	L2 S	T1 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	17	430	447	0.2	1646	0.272	100	NA	NA
Lane 2	-	449	449	0.0	1651	0.272	100	NA	NA
Approach	17	879	896	0.1		0.272			

	Total	%HV	Deg.Satn (v/c)
Intersection	1083	0.4	1.230

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

Merge Analysis											
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Queens Lane Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
West Exit: Kings Way Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										