Appendix 5:
Traffic Modelling Report

St John of God Health Campus Development Plan

Traffic Modelling Report

PREPARED FOR:
St John of God Health Care Inc
C/- Silver Thomas Hanley

October 2022

Document history and status

Author	Revision	Approved by	Date approved	Revision type
John Heydari	r01	M Rasouli	18/05/2020	Draft
John Heydari	r01a	M Rasouli	28/05/2020	Final
John Heydari	r01b	M Rasouli	14/12/2021	Revised final
John Heydari	r01c	M Rasouli	21/10/2022	Revised final

File name: t20.014.jh.r01c

Author: John Heydari

Project manager: Mohammad Rasouli

Client: St John of God Health Care Inc

Project: St John of God Health Campus Development Plan

Document revision: r01c

Project number: t20.014

TABLE OF CONTENTS

REPORT FIGURES

REPORT TABLES

1.0 Purpose

This Traffic Modelling Report has been prepared by Transcore as a supplement to the Transport Impact Assessment (TIA) report prepared October 2022 with respect to the Development Application (DA) for the St John of God Subiaco Hospital (SJGSH) located at Lot 800 (12) Salvado Road and Lots 147, 148 and 149 (177) Cambridge Street in Subiaco.

The purpose of the microsimulation modelling and analysis undertaken for this project is to assist with the finalisation of the development plan and to assess traffic operation of the existing and proposed crossovers and nearby intersections within the modelling study area.

1.1 Project Details

For the purpose of this project Transcore updated the original microsimulation models which were developed for the original Local Development Plan (LDP) using Vissim software to effectively investigate traffic operations of the proposed development.

The microsimulation model aims to reflect the real-world transport systems in detail which would investigate and assess the transport planning and traffic operational issues at the same time.

As part of the modelling process for the original LDP, Transcore developed an existing calibrated base case model (for year 2018) and a future base model for the original LDP (post development). A review of the 2022 SCATS data for signalised intersections within the modelling study area indicated that the 2022 traffic counts have not changed significantly compared to 2018 and therefore the calibrated 2018 base case scenario would reflect the 2022 situation so there was no need to update the 2018 calibrated base case model.

However, the future case model was updated to reflect the latest development plan. **Figure 1** shows the modelling study area.

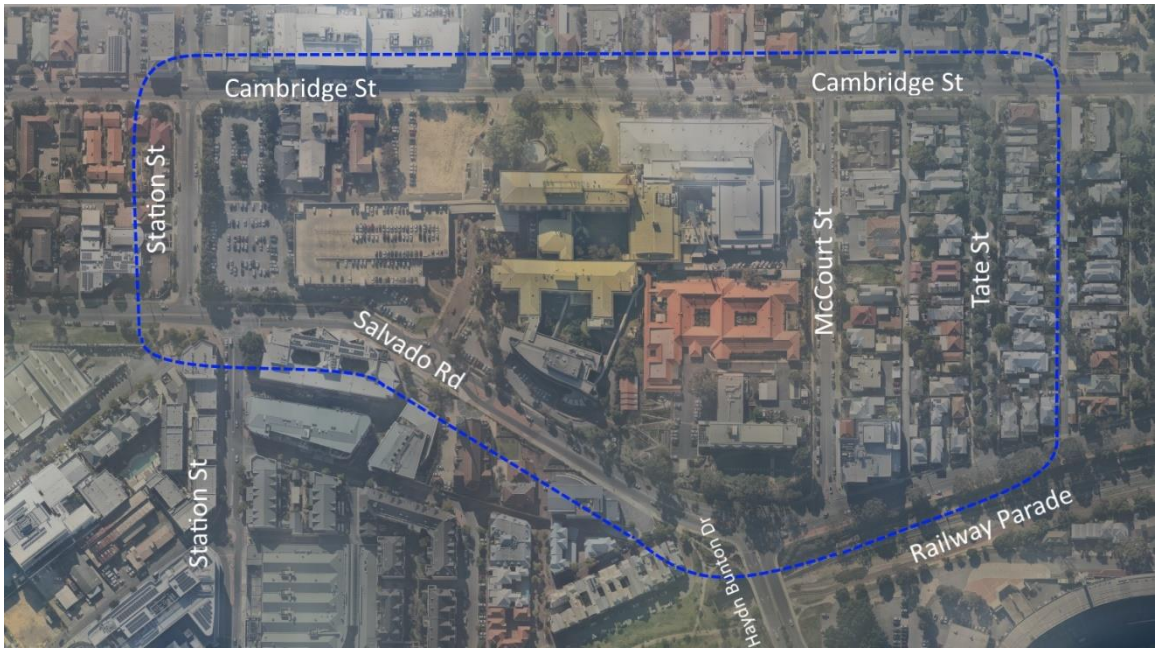


Figure 1: Modelling study area

1.2 Predefined Modelling Scenarios for the Study

VISSIM modelling and analysis was undertaken for the following scenarios:

- Existing base case scenario (2018) for AM and PM peak hours; and,
- Proposed development for the AM and PM peak hours.

The AM and PM peak hours for base and future traffic models were built for 8:00 – 9:00 and 17:00 – 18:00 respectively. A "warm up" and "cool down" periods of 15 minutes were used to allow for the traffic demands to get into a realistic level of operation at the beginning of analysis period and allow for vehicles to complete their trips at the end of the analysis period. 15% of the peak period demand matrix was loaded during the warm up and cool down periods.

2.0 Data Collection

2.1 Existing Situation

Transcore undertook a site visit in August 2018 to review, observe and collect data for the traffic operations of the surrounding road network and to establish any potential hot spots areas within the modelling study area. Transcore also undertook traffic surveys at key surrounding intersections for AM and PM peak hours and warm up periods (15 minutes before and after the AM and PM peak hours) within the modelling study area. Furthermore, the SCATS and traffic signal data for key signalised intersections (Salvado Rd / Station St and Salvado Rd / Railway Parade / Haydn Bunton Dr) within the modelling study area were obtained from Main Roads WA.

The 2018 video survey for the entry/exit points of the existing multi-level carpark were updated in November 2021.

In summary the data used to build and calibrate the models was collected from a number of sources as following:

Network inventory details such as number of lanes, lane widths, line markings, posted speed limits etc.

- Site inspections; and,
- Detailed aerial photography through Nearmap.

Weekday traffic counts

- SCATS;
- Manual Traffic Counts; and,
- Video Traffic Survey.

Turning volumes

- Manual traffic counts; and
- SCATS.

Traffic conditions

- Queues, travel times and conditions for the AM and PM peak period were obtained from site observations undertaken in August 2018.

Signal phasings and cycle times

- On site observations of phase and cycle times and SCATS data.

Pattern (seed) origin-destination vehicle demand matrix

- Derived from existing link and intersection traffic counts.

Figure 2 Shows the traffic data collection points.

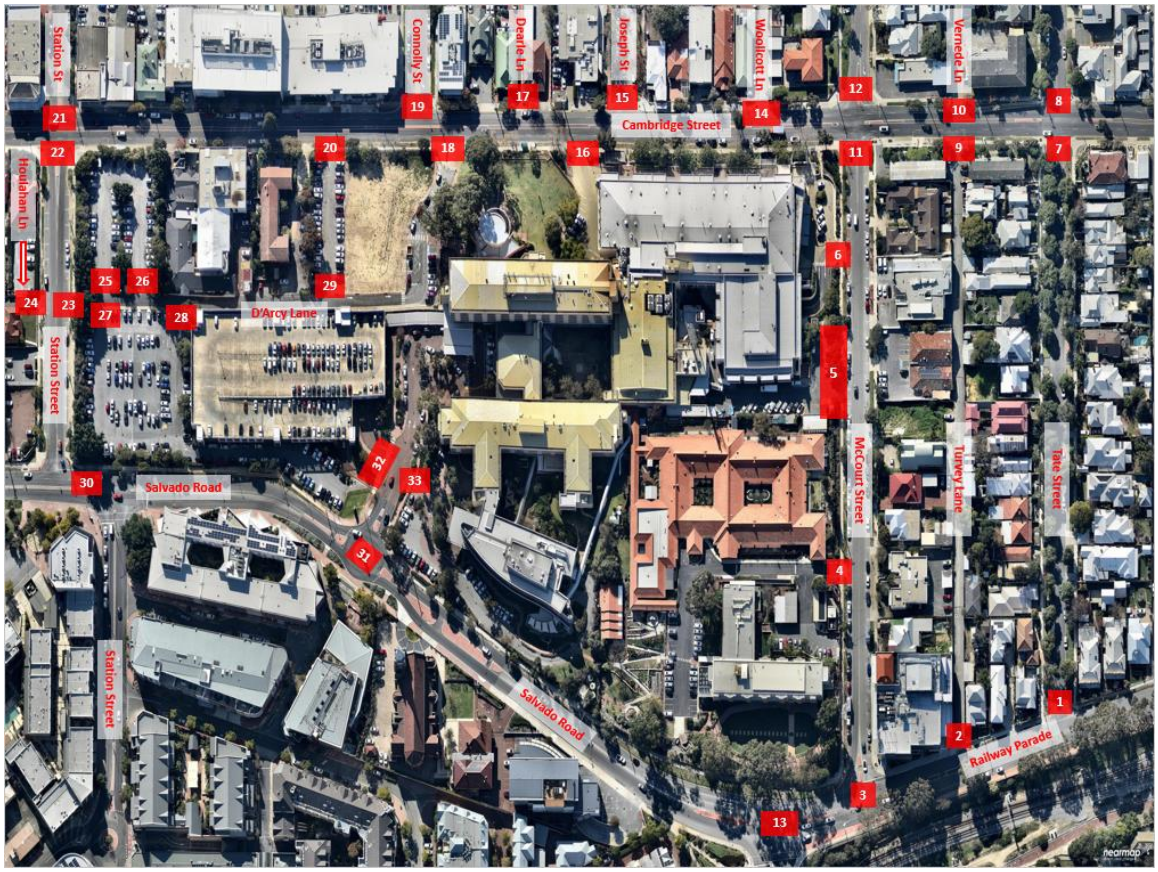


Figure 2: Traffic data collection points

2.1.1 Road Network

Figure 3, **Figure 4** and **Figure 5** show number of lanes, speed limits and existing signalized intersections within the study area, respectively.

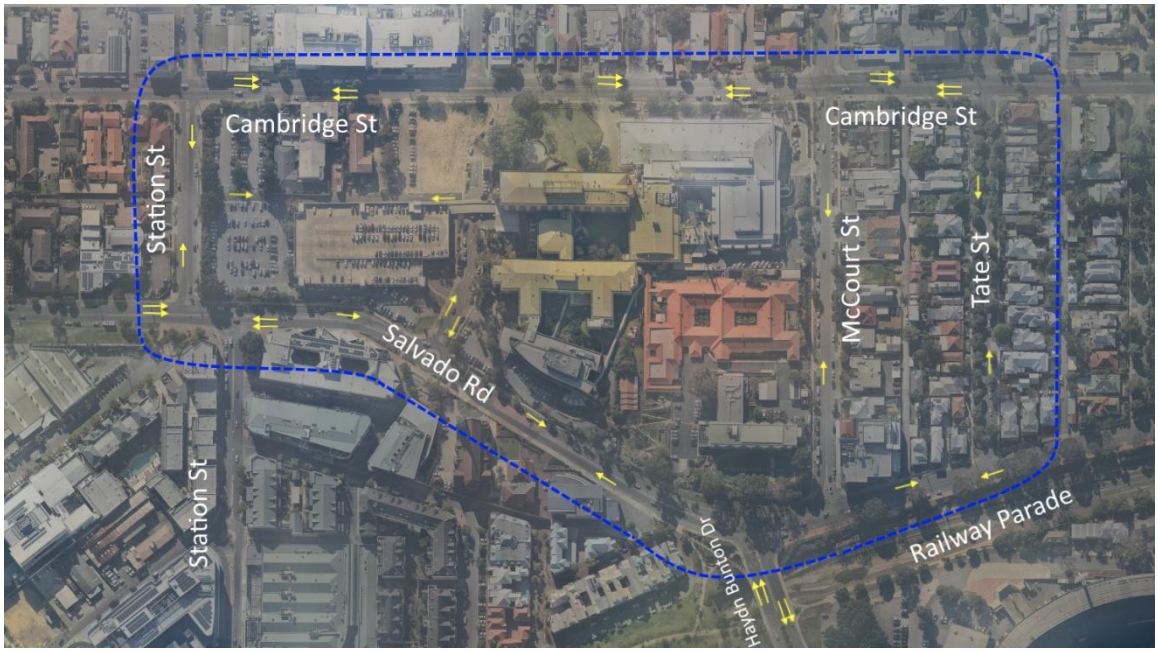


Figure 3: Number of Lanes for the roads within the study area

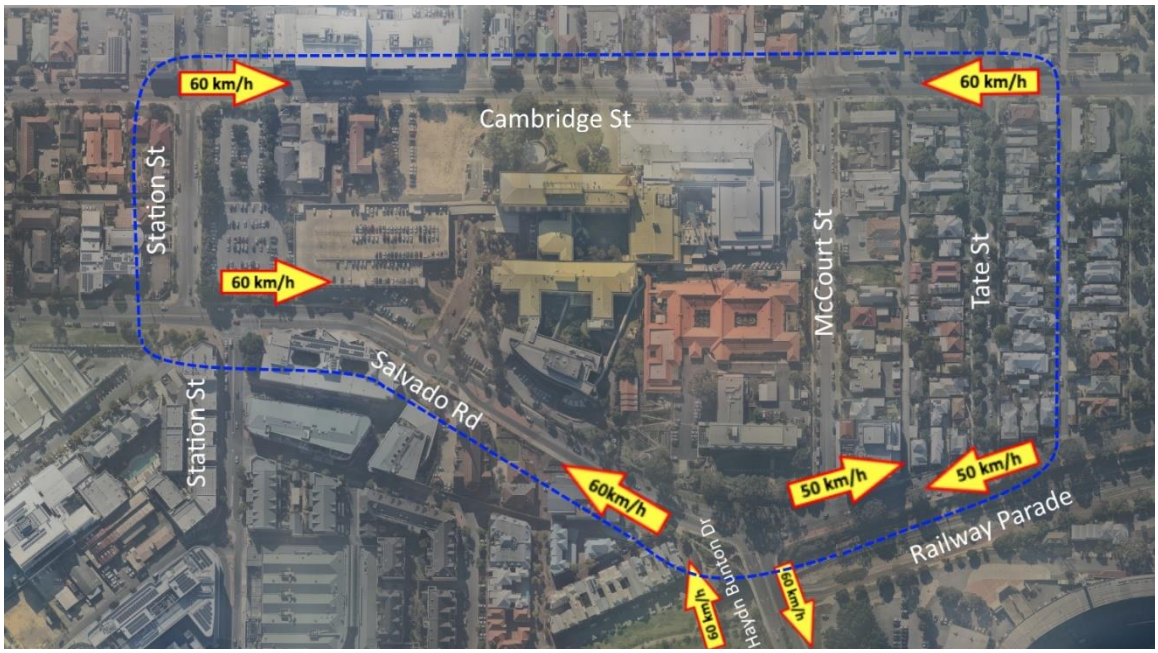


Figure 4: Speed limits for the roads within the study area

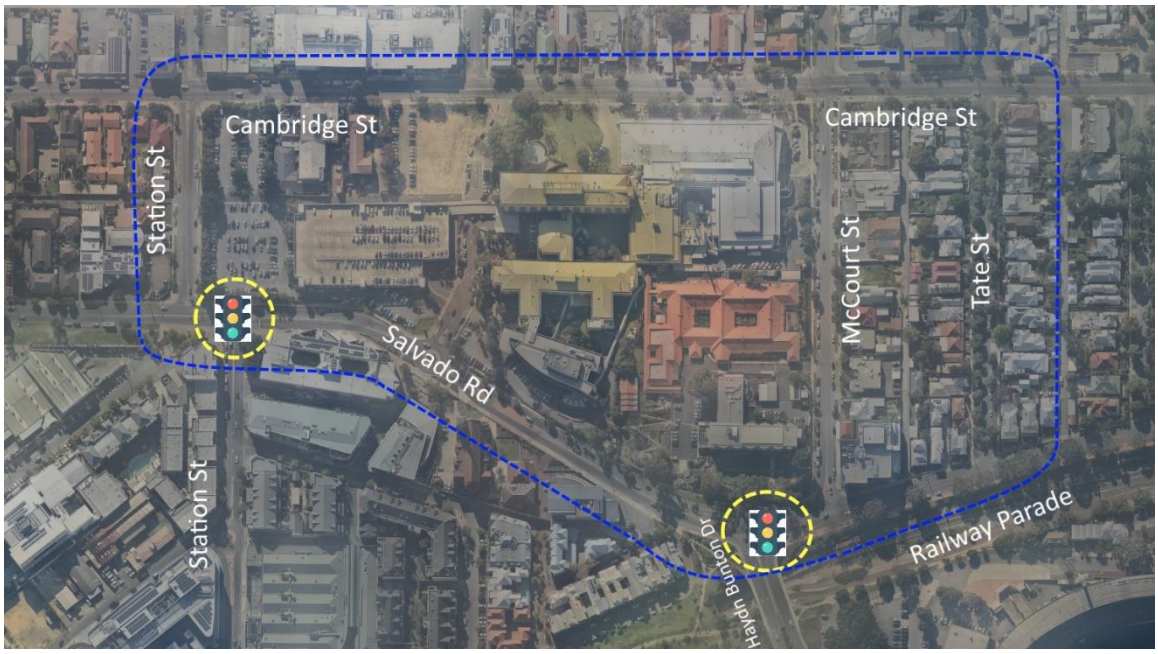


Figure 5: Signalized intersections within the study area

2.1.2 Traffic Flows

The traffic turn counts at the signalised intersections of Salvado Rd/ Station St and Salvado Rd / Railway Parade / Haydn Bunton Dr were extracted from SCATS data obtained from Main Roads WA from 14th August 2018 till 16th August 2018. Analysis of the SCATS data indicated the following peak hours for the existing condition:

- AM peak: 8:00 – 9:00; and
- PM peak: 17:00 – 18:00.

Appendix A shows the signal data obtained from Main Roads WA. For the rest of data collection points as shown in **Figure 2** traffic surveys were undertaken and the results are provided in **Appendix B**.

2.1.3 *Signal Data (SCATS)*

The SCATS history files for the nominated peak hours were sourced from Main Roads WA. **Table 1** and **Table 2** summarise the average cycle time and average phase time for each phase of the signalised intersections during the AM and PM peak hours.

Accordingly, the signalised intersections in Vissim model were coded to reflect the parameters in the base case calibrated model.

Table 1: SCATS history data for Salvado Rd / Station St (AM and PM peak hours)

Thursday 16th August 2018			
(AM Peak: 8:00 – 9:00)		**(PM Peak: 17:00 – 18:00)**	
Average CT	74	Average CT	73
Phase Statistics	A, B	Phase Statistics	A, B
Phase A	Ave 50	Phase A	Ave 42
	Min 14		Min 22
	Max 73		Max 70
Phase B	Ave 24	Phase B	Ave 31
	Min 12		Min 13
	Max 40		Max 40

Table 2: SCATS history data for Salvado Rd / Railway Parade / Haydn Bunton Dr (AM and PM peak hours)

Tuesday 14th August 2018			
(AM Peak: 8:00 – 9:00)		**(PM Peak: 17:00 – 18:00)**	
Average CT	94	Average CT	87
Phase Statistics	A, B, C	Phase Statistics	A, B, C
Phase A	Ave 35	Phase A	Ave 34
	Min 18		Min 14
	Max 52		Max 59
Phase B	Ave 27	Phase B	Ave 30
	Min 12		Min 13
	Max 52		Max 52
Phase C	Ave 31	Phase C	Ave 19
	Min 18		Min 13
	Max 46		Max 39

Appendix A documents the signal data obtained from Main Roads WA.

2.1.4 *Existing Queue Length*

Queue lengths at the start of the green time for every movement/lane were observed and recorded for signalised intersections. Queue lengths also were collected for key unsignalized intersections. The collected queue data was used to calibrate and validate the base case models. **Figure 6** shows the maximum queue lengths observed for key intersections during the AM and PM peak hours.

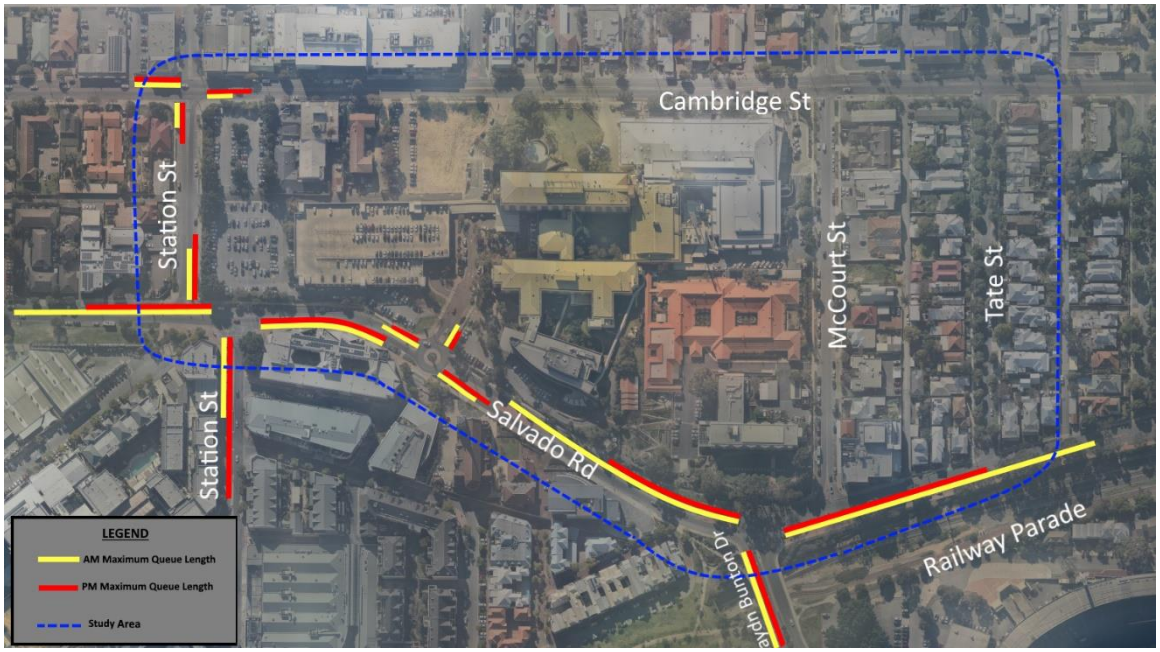


Figure 6: Maximum queue lengths observed at key intersections (Existing)

2.1.5 Travel Times

Vehicle travel times on Cambridge Street, Station Street, Salvado Road and McCourt Street were recorded to calibrate and validate the base models during the AM and PM peak hours.

Travel times were recorded for both directions (Trip 1 and Trip 2) during the peak hours and then were used for calibration and validation of the base case models (See **Figure 7**).

Figure 7: Selected key roads for recording vehicles travel time

2.1.6 *Public Transport*

Figure 8 and **Figure 9** show the existing public transport routes and bus stops along Cambridge Street within the modelling study area.

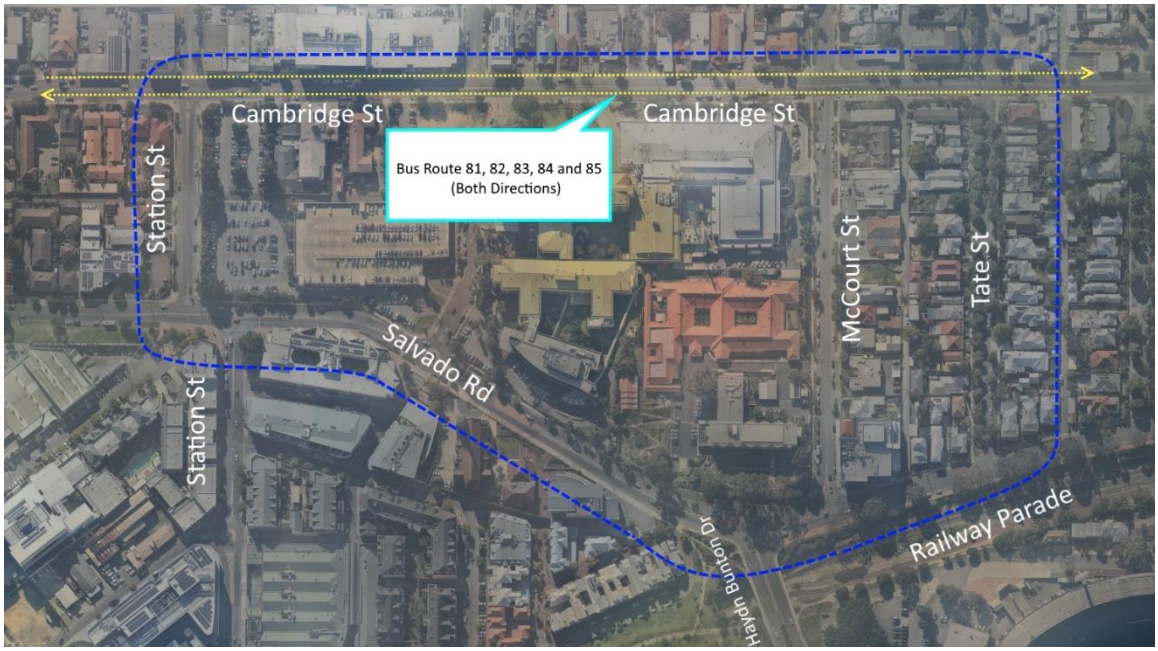


Figure 8: Existing public transport routes within the modelling study area

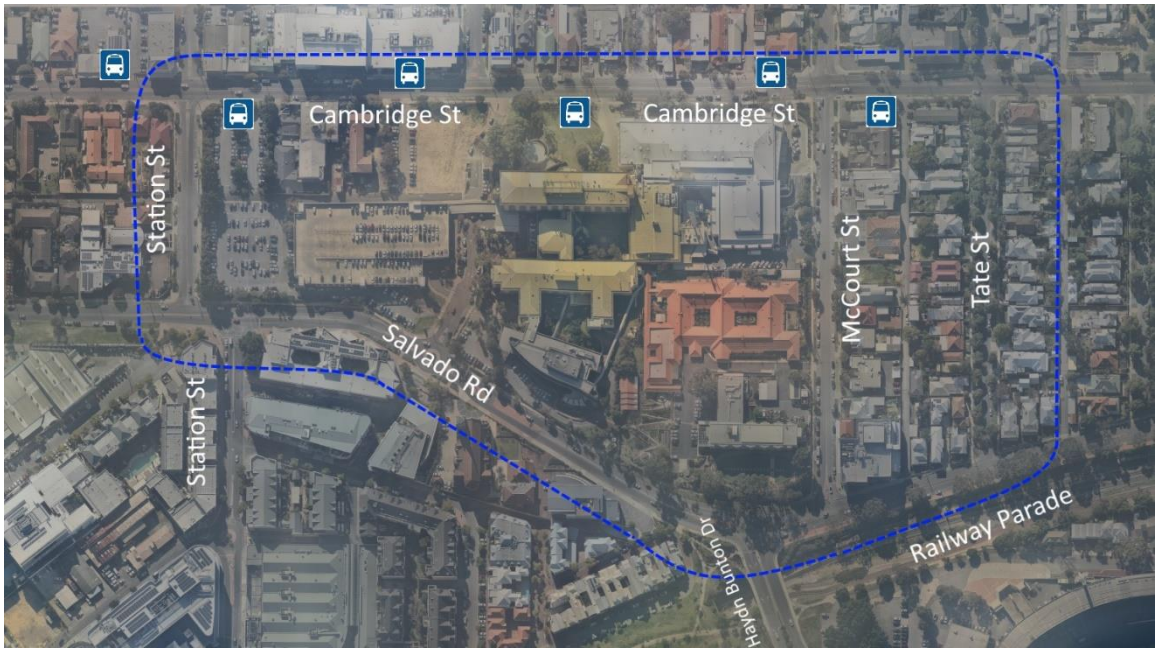


Figure 9: Existing bus stops within the study area

2.1.7 *Existing Access*

Existing vehicle access to and from the external road network is currently facilitated via multiple access crossovers on Cambridge Street, Station Street, Salvado Road and McCourt Street. The existing access crossovers are numbered in **Figure 10** and include:

1. Full movement intersection of D'arcy Lane / Station Street.
2. Roundabout intersection of an internal SJGSH road with Salvado Road, providing access to the main parking areas.
3. Dual crossover system (separate entry and exit to parking and delivery yard).
4. Full movement access into Subiaco Clinic and multi-level car park.
5. Full movement access to Sports Medicine parking and secondary access to Clinic multi-level car park.
6. Left-out only at D'arcy Lane / Cambridge Street (exit for temporary carpark).
7. Full movement crossover on Cambridge Street (currently gated).

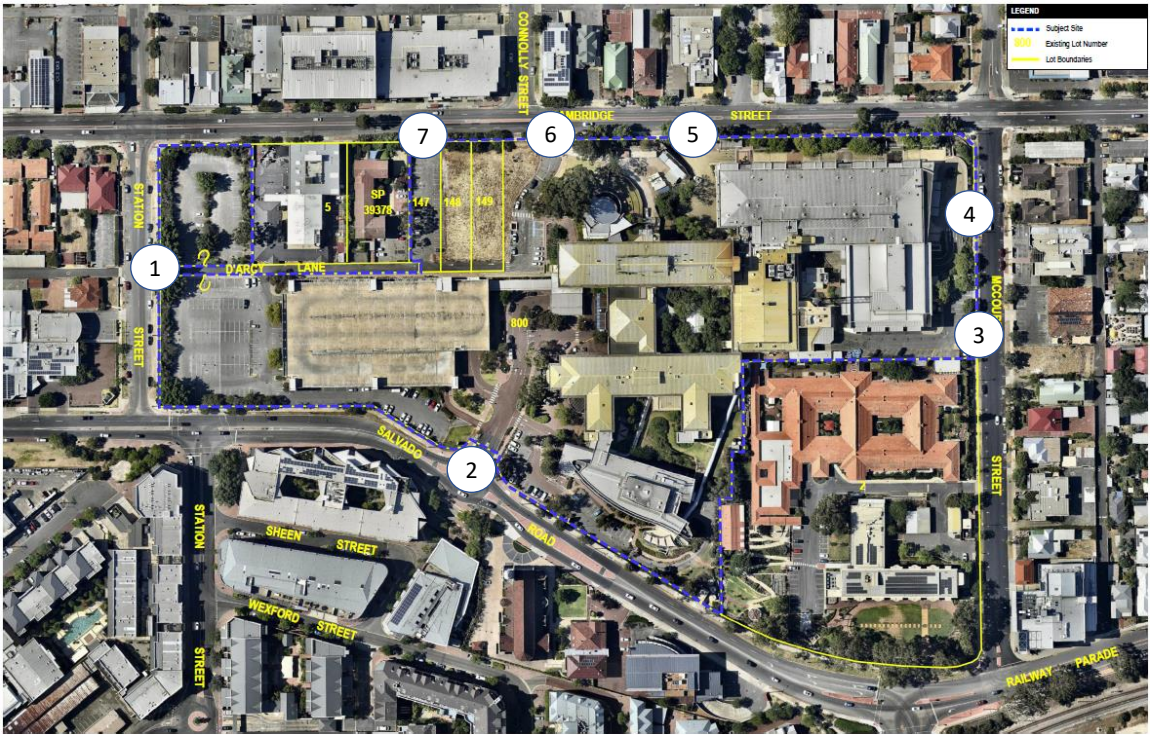


Figure 10: Existing vehicular access points

2.1.8 *Zone Structure*

Two types of zones were used in the existing base case and proposed development models:

- External zones: these zones are defined as an area within which vehicles are released into or removed from the network. They generally represent the 'cuts' in the external road network, where vehicles enter or exit from the model.
- Internal zones: these zones represent an internal destination within the study area. Vehicles enter into the study area from the external zones and drive to one of the internal zones.

Figure 11 shows the internal and external zoning map for the base models. The base case models consist of 17 internal zones (from 1 to 16 and 200) and 15 external zones (from 100 to 114).

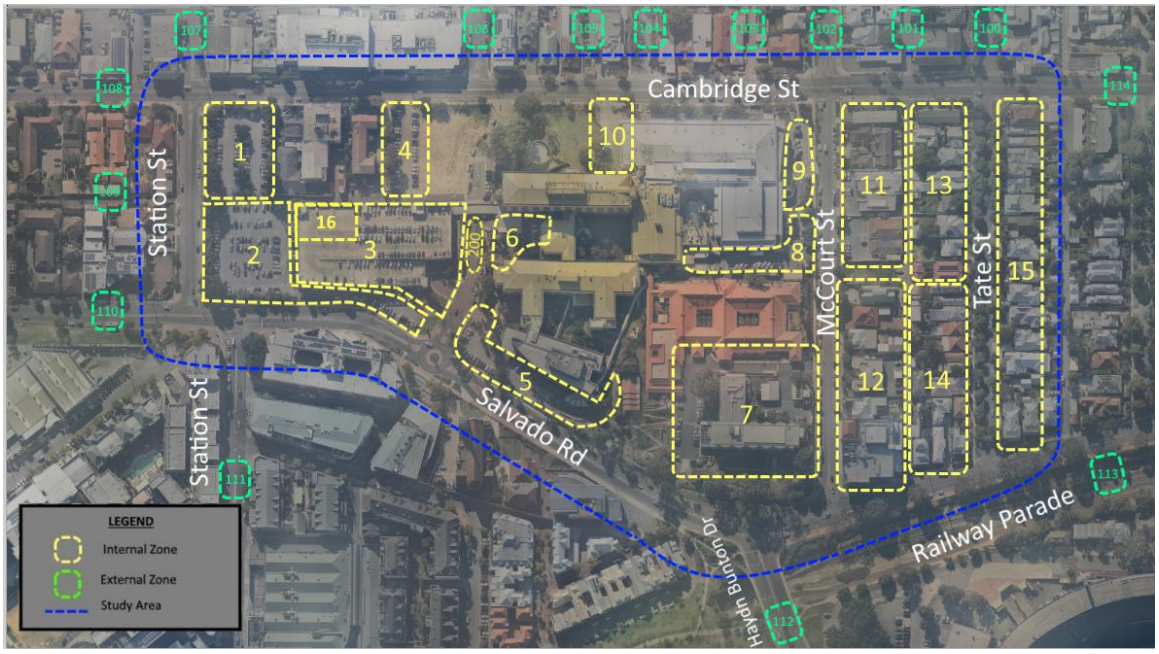


Figure 11: Internal and external zones for base models

3.0 Model Calibration and Validation

3.1.1 Existing Base Case Models

The existing AM and PM peak hour models were built for 8:00 – 9:00 and 17:00 – 18:00 periods respectively. For the Base case a "warm up" and "cool down" periods of 15 minutes were introduced to populate all road links prior to and after the model period.

3.1.2 Software Version

The software version which is used for this study is VISSIM 11.00 – 12.

3.1.3 Vehicle Types

The demand matrices were established using the Austroads Vehicle Classification System in accordance with Table 5.1 of Main Roads WA Operational Modelling Guidelines. The existing composition of heavy vehicle types on Cambridge Street is noted in **Table 3**. The desired heavy vehicle acceleration values were adopted using the values provided in Table 5-2 of Main Roads WA Operational Modelling Guidelines. The recommended power and weight for different vehicle types were adjusted using the values in Table 5.3 of the Main Roads WA Operational Modelling Guidelines.

Table 3: Existing vehicle classification on Cambridge Street

Austroads classification	Class 1	Class 2-5	Class 6-9	Class 10	Class 11
Vissim classification	Car/Short	Medium	Long	Medium combination	
Percentage	94.1%	5.7%	0.2%	0%	

The network coding, priority rules and conflict areas were coded in accordance with the recommendations of Main Roads WA Operational Modelling Guidelines.

3.1.4 Link Volumes

The observed and modelled link volumes were compared for the key roads within the modelling study area and the results are shown in **Table 4**. This table also shows the calculated GEH for each link. The locations of link volumes are shown in **Figure 12**.

The following equation was used for the GEH calculation:

$$GEH = \sqrt{\frac{2(M-C)^2}{M+C}}$$

Where M is the hourly traffic volume from the traffic model and C is the real-world hourly traffic count.

85% of the volumes in the base case model should have a GEH less than 5.0. A GEH of less than 5.0 is considered a good match between the modelled and observed hourly volumes. GEHs in the range of 5.0 to 10.0 may warrant investigation. If the GEH is greater than 10.0, there is a high probability that there is a problem with either the travel demand model or the data. As evident, the reported GEH is less than 5 for all links which confirms a good match between the modelled and observed hourly volumes.

Table 4: Comparison of observed and modelled traffic volumes for key roads (AM &PM)

Road Name	Location	Direction				AM			PM		
		N	E	S	W	Observed	Modelled	GEH	Observed	Modelled	GEH
Cambridge St	A		•			827	908	2.8	640	623	0.7
Cambridge St					•	683	686	0.1	816	789	1.0
Station St (North)	B	•				35	73	5.2	29	29	0.0
Station St (North)				•		100	98	0.2	105	70	3.7
Salvado Rd	C		•			866	734	4.7	424	485	2.9
Salvado Rd					•	487	511	1.1	794	811	0.6

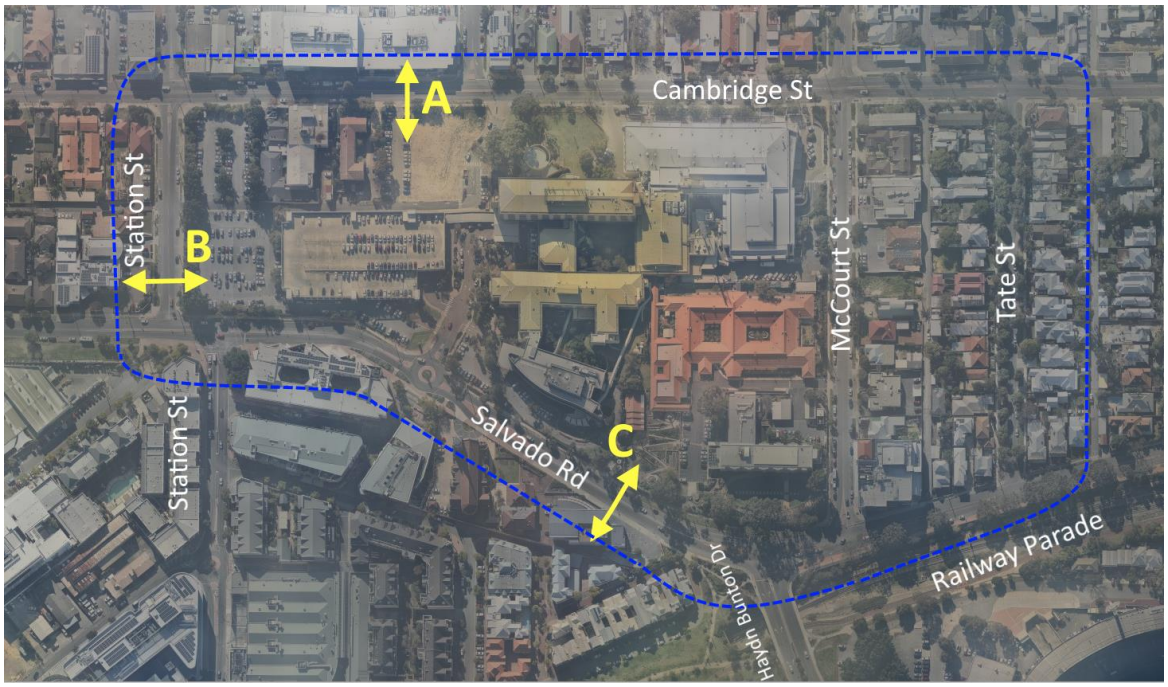


Figure 12: Link volume points for key roads within the study area

3.1.5 Turn Counts

To compare observed and modelled turning movements the GEH was calculated for each movement separately. **Appendix C** provides the estimated GEH for all turning movements at key intersections. As shown in Appendix C, more than 85% of movements were modelled with a GEH of less than 5 which confirms satisfactory model calibration.

3.2 Model Validation

3.2.1 Queue Lengths

Table 5 show the modelled maximum queues against the observed maximum queues during the AM and PM peak hours. During the calibration process, the maximum queue lengths were observed in the model and compared to queue length information collected from on-site observations. As shown in Table 5 queue lengths were observed to be in the correct order of magnitude for both AM and PM peak hours which confirms satisfactory validation of the base case model.

Table 5: Model validation queue lengths (AM and PM Peak)

AM Peak	Approach	Max Observed Queue (m)	Max Model Queue (m)
Cambridge St/ Station St	N	24	13
	E	20	14
	S	16	14
	W	30	20
Salvado Rd/ Station St (South)	E	56	56
	S	48	43
	W	100	98
Salvado Rd / Railway Pde/Haydn Bunton Dr	E	224	206
	S	104	90
	W	112	170
Salvado Rd/ Station St (North)	N	22	20

PM Peak	Approach	Max Observed Queue (m)	Max Model Queue (m)
Cambridge St/ Station St	N	32	14
	E	32	39
	S	24	13
	W	24	12
Salvado Rd/ Station St (South)	E	94	90
	S	105	99
	W	62	54
Salvado Rd / Railway Pde/Haydn Bunton Dr	E	245	230
	S	88	80
	W	80	63
Salvado Rd/ Station St (North)	N	23	15

3.2.2 Travel Times

Table 6 summarises the recorded vehicle travel times against the modelled travel times during the AM and PM peak hours respectively. Trip 1 and Trip 2 represent different travel directions on each road. As evident the calibrated base case model reflects reasonably the observed travel times for the key roads within the modelling study area.

Table 6: Comparison of observed and modelled vehicle travel times

		AM		PM	
		Recorded time(Sec)	Modelleded time(Sec)	Recorded time(Sec)	Modelleded time(Sec)
Station St	Trip 1	16	12	18	11
	Trip 2	16	11	20	11
Salvado Rd	Trip 1	64	74	94	55
	Trip 2	63	58	97	69
McCourt St	Trip 1	31	20	27	21
	Trip 2	28	19	30	20
Cambridge St	Trip 1	30	27	39	27
	Trip 2	29	28	32	26

Overall, the calibrated base case models were producing results that were well aligned to observed values for AM and PM peak period conditions. For the calibration and validation analysis, all of the available data was used; no data has been omitted or removed because of a poor fit.

Therefore, the base case models were considered to be accurate enough for developing the future models.

4.0 Proposed Development Scenarios

4.1 Proposed Development

The proposed development provides:

- New Clinical Block (NCB);
- Site Energy Plant (SEP);
- Medical suites;
- Additional car parking to the existing multi-level car park (addition of two new levels at the multi-level car park); and,
- Additional car parking under the proposed SEP in two levels.

Figure 13 illustrates the proposed redevelopment areas.

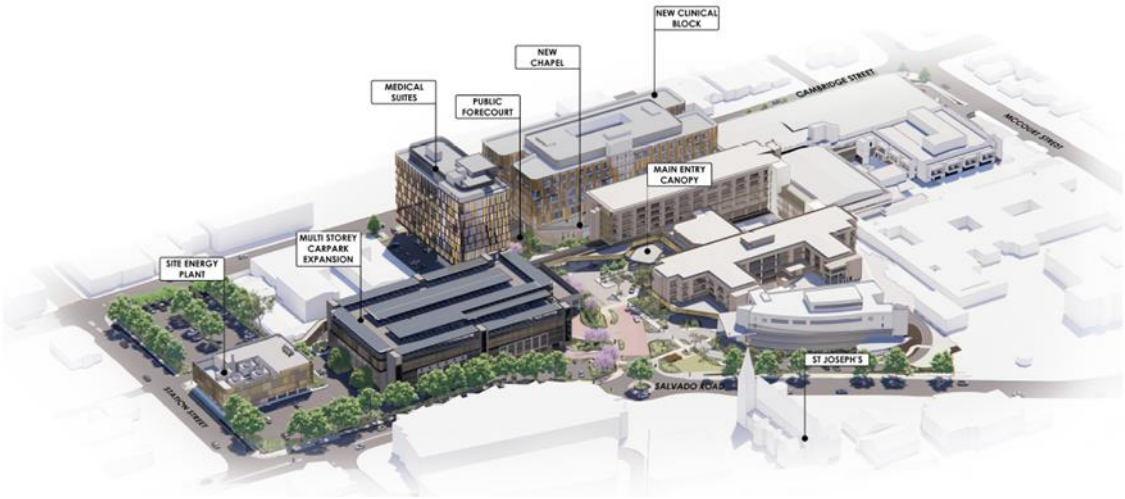


Figure 13: Proposed Development areas

The NCB is a new 260-bed clinical block located along Cambridge Street. The NCB will include a new 24/7 ED, including ambulance and public entry accessed at the Cambridge Street frontage.

The proposed medical suites building is an 11-level (plus basement parking and roof-top plant) structure which will provide medical consulting services. The proposed medical suites will be constructed along Cambridge Street with total of about 85 parking bays for staff and public which would be distributed in three levels.

As part of the development, the existing four-level multi-storey carpark will be extended by adding a further three levels on top of the structure, increase the number of car parking bays from existing 644 bays to 1,130 bays (net gain of 486 bays). Additional 175 parking bays will also be provided in two levels under the proposed SEP.

The proposed development continues to utilise the existing crossovers on surrounding roads for access/ egress to/ from the hospital compound with addition of two new crossovers on Cambridge Steet.

A new crossover will be constructed on Cambridge Street immediately west of the Subiaco Medical Clinic crossover, providing vehicle access the proposed eight (8) public parking bays and an access/ egress for the ambulance drop-off for NCB ED. The egress for the NCB public parking (8 bays) is from a modified existing crossover as shown in **Figure 14**.

A new controlled crossover is proposed on Cambridge Street about 40m to the east of Station Street which leads up to the existing parking area which is located at the south-east corner of the intersection of Cambridge Street/ Station Street (refer **Figure 14)**. This crossover would be utilised infrequently by service vehicles to provide access to the SEP. The SEP is a proposed two-level (plus roof-top plant) building located to the west of the multi-storey carpark adjacent to Station Street and D'Arcy Lane.

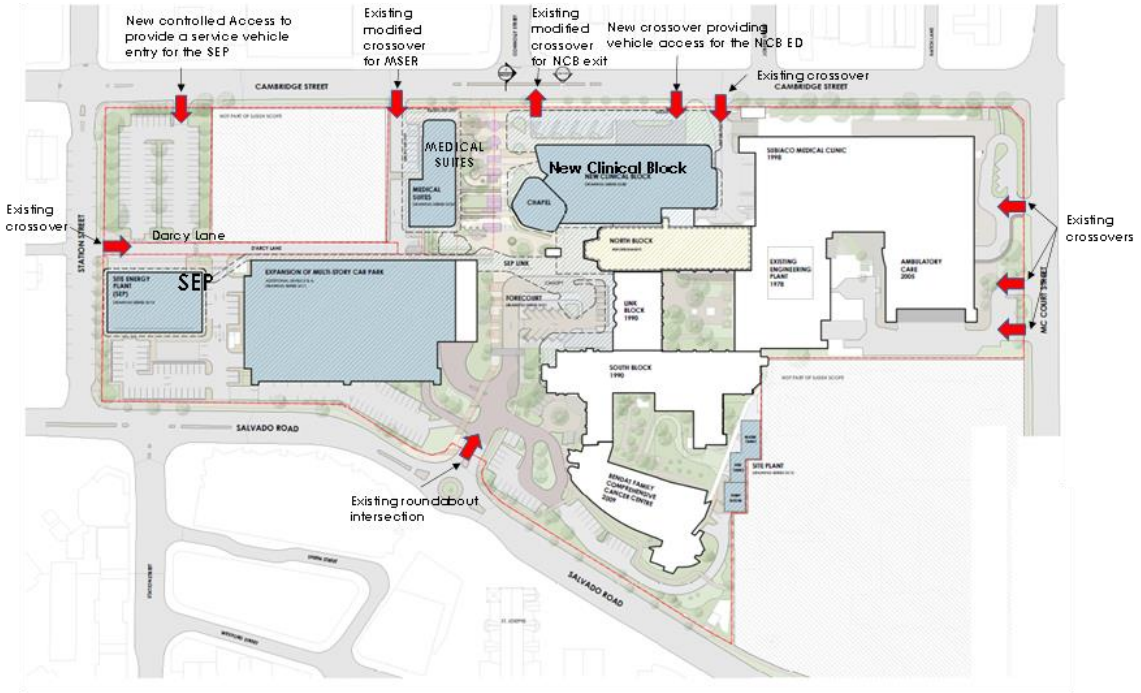


Figure 14: Proposed Development Plan (Existing and proposed access/egress)

4.1.1 Future Zone Structure

The same zoning map for the existing base case model was used for the future scenarios.

4.1.2 Public Transport

It was assumed that the current bus routes, bus stops and bus frequencies will remain unchanged for the future scenarios.

4.1.3 *Future Base Case Models*

In developing the future base case models, the core VISSIM variables were kept the same as the base case models. The AM and PM peak hour future traffic models were built for AM (8:00 – 9:00) and PM (17:00 – 18:00) periods. As for the base case, “warm up” and “cool down” periods of 15 minutes were used to populate all road links prior to and after the model period.

5.0 Future Scenarios Model Output

5.1 Traffic Flows

The trip generation of the proposed development was explained in the TIA report (October 2022). It is estimated that the proposed development would add approximately additional 196 and 173 trips to surrounding road network during the road network weekday AM and PM peak hours after development.

The estimated traffic generation of SJGSH after development assumes that the travel mode share of the hospital site will be consistent with the existing situation. It is our understanding that implementation of the recommendations proposed in "Integrated Transport and Parking Strategy" prepared by Urbii would reduce reliance on car mode share and encourage more sustainable transport choices for people who have access to these options. On this basis, the trip generation of the proposed hospital is expected to be less than what has been reported above.

5.2 Queues

Figure 15 and **Figure 16** show the maximum queue lengths reported by Vissim after the full development of the site.

Model observations indicate occasional queues on D'arcy Lane, Station Street and Salvado Road during the AM and PM peak hours as shown in
Figure 15 and **Figure 16**. Review of the Vissim models indicated that the maximum queues were occurring a few times and were dissipated quickly without blocking the nearby intersections or crossovers.

Model observations also indicate that the existing roundabout access intersection on Salvado Road will continue to operate satisfactorily for the redevelopment Scenario, however, occasional queues were observed during the AM and PM peak hours at the roundabout intersection on all approaches. However, the observed queues were observed to dissipate quickly and did not obstruct the nearby intersections and crossover.

The modelling results indicated that the reported queue at the Cambridge Street crossover which provides access to the proposed parking area of the new medical suites and new clinical building is minimal.

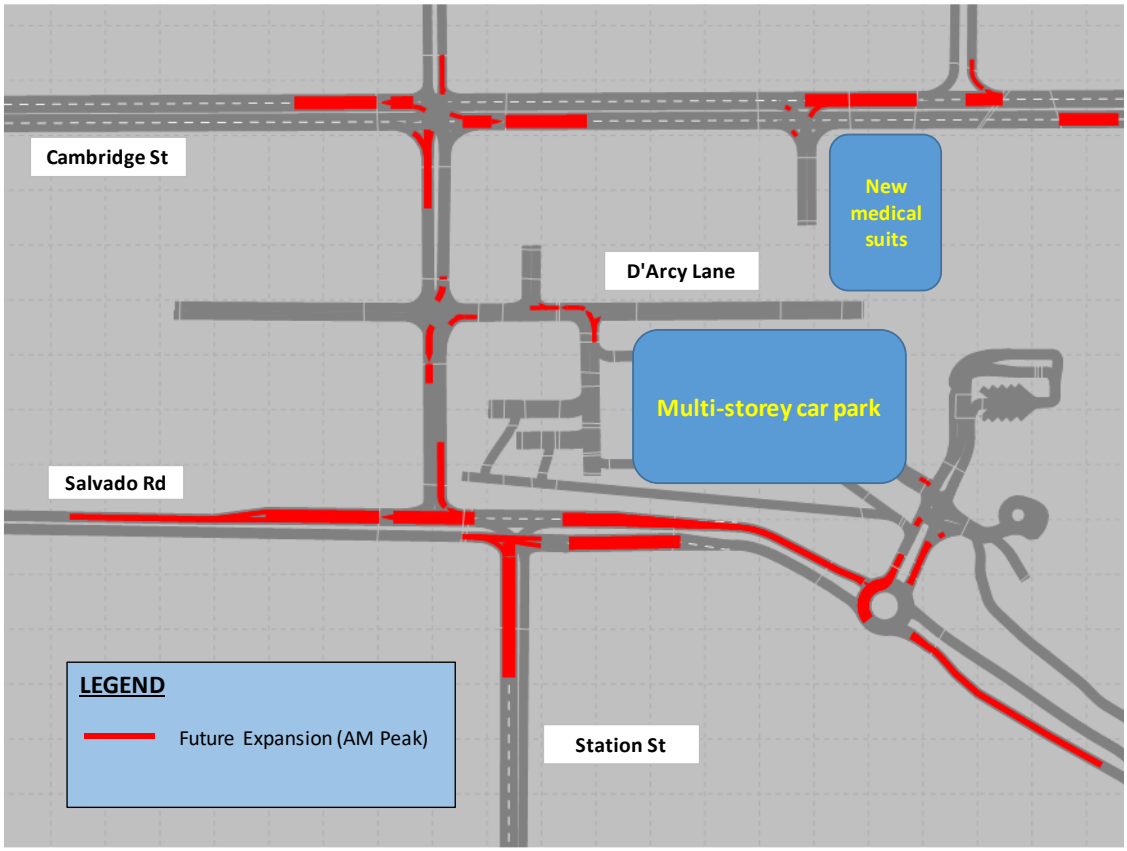


Figure 15: Maximum queues recorded during the AM peak hour after redevelopment

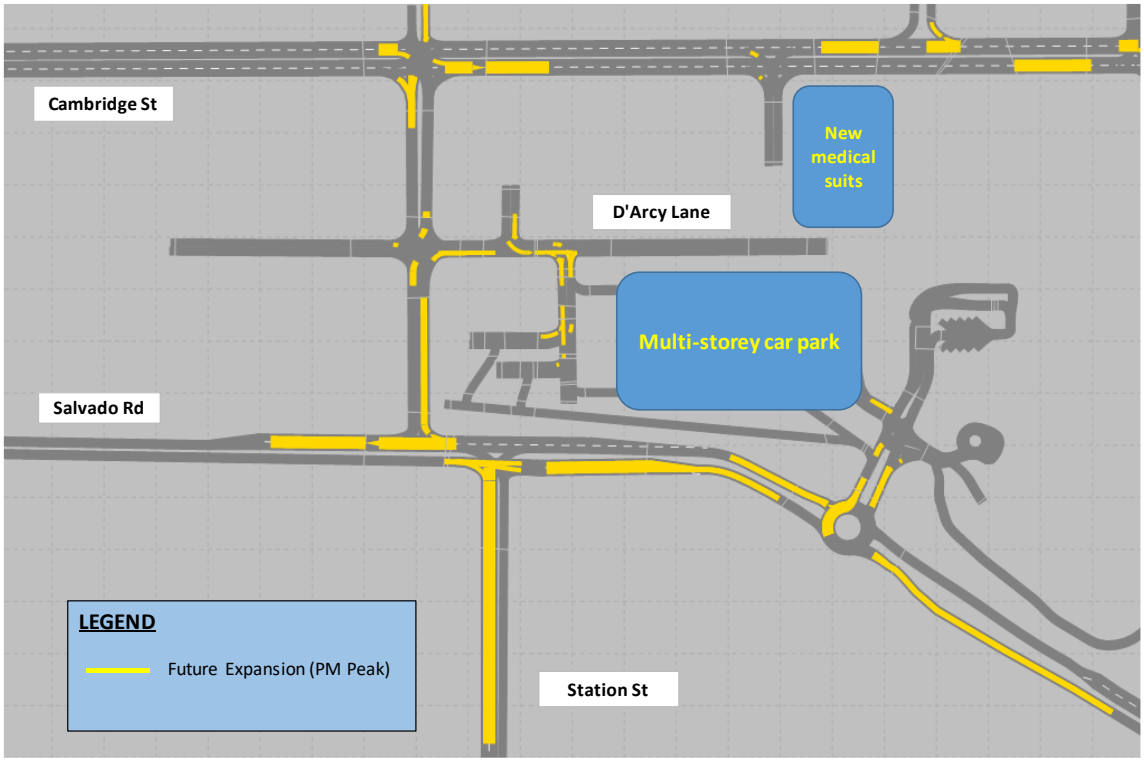


Figure 16: Maximum queues recorded during the PM peak hour after redevelopment

5.3 Network Performance

Table 7 summarise the network performance measures for existing and future scenarios. The network performance outputs were extracted from Vissim microsimulation models and reflect the average of 5 model runs with different random seed numbers.

Table 7: Network performance comparison

		Time	DelayAvg(S)	Speed Avg(km/h)	DistTot(km)	TravTmTot(hh)	DelayTot(hh)	VehArr(veh)	DemandLatent(veh)
Existing	AM	8:00 - 9:00	26	35	2925	82	30	4137	0
	PM	17:00 - 18:00	25	35	2709	76	28	3875	0
Future Expansion	AM	8:00 - 9:00	25	35	3024	87	30	4319	0
	PM	17:00 - 18:00	26	34	2793	82	30	4089	0

According to **Table 7**, the change to the overall network performance is insignificant for the full development of the site and overall, the additional level of delays or queues due to the proposed development are minimal in the context of the modelling study area. Therefore, the level of impact due to the proposed development is reported to be local with minimum traffic disruption on major surrounding roads.

6.0 Conclusions

This Traffic Modelling Report has been prepared by Transcore as a supplement to the Transport Impact Assessment (TIA) report prepared in October 2022 with respect to the Development Application (DA) for the St John of God Subiaco Hospital (SJGSH) located at Lot 800 (12) Salvado Road and Lots 147, 148 and 149 (177) Cambridge Street in Subiaco.

Extensive video traffic surveys and manual traffic counts were undertaken to establish the existing traffic and parking situation at SJGSH and to accurately inform development of the site and to calibrate the base case microsimulation models developed for the proposal.

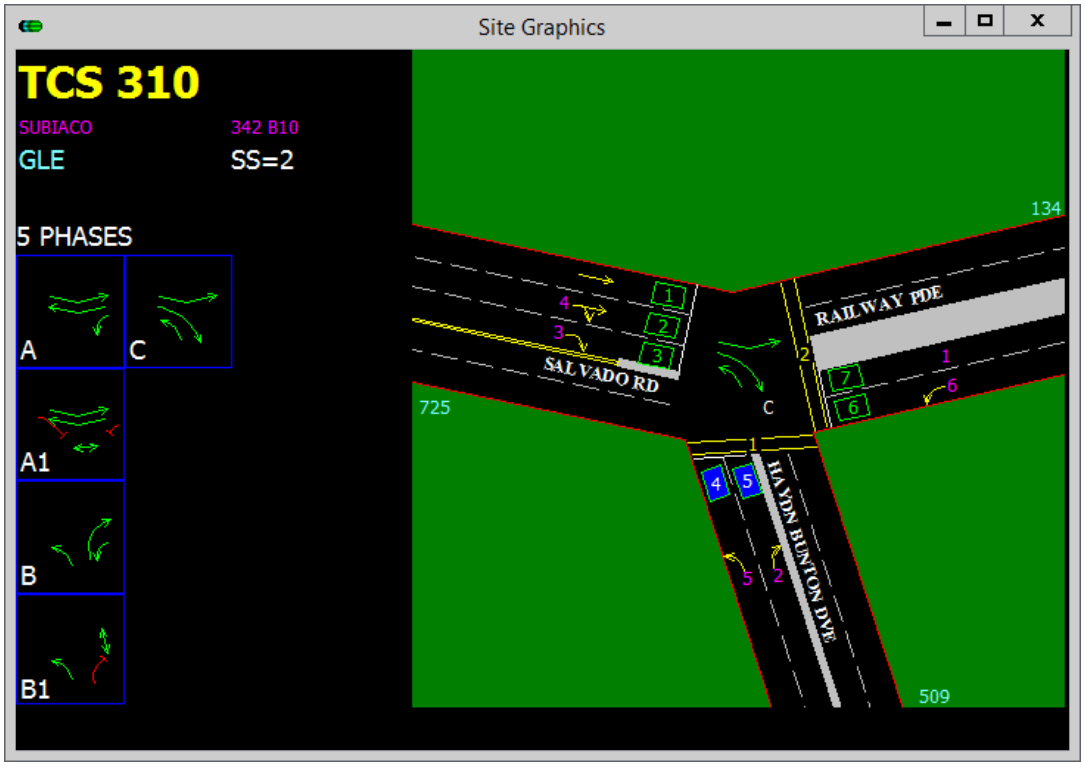
it is estimated that the proposed development would add approximately additional 196 and 173 trips to surrounding road network during the road network weekday AM and PM peak hours after development respectively.

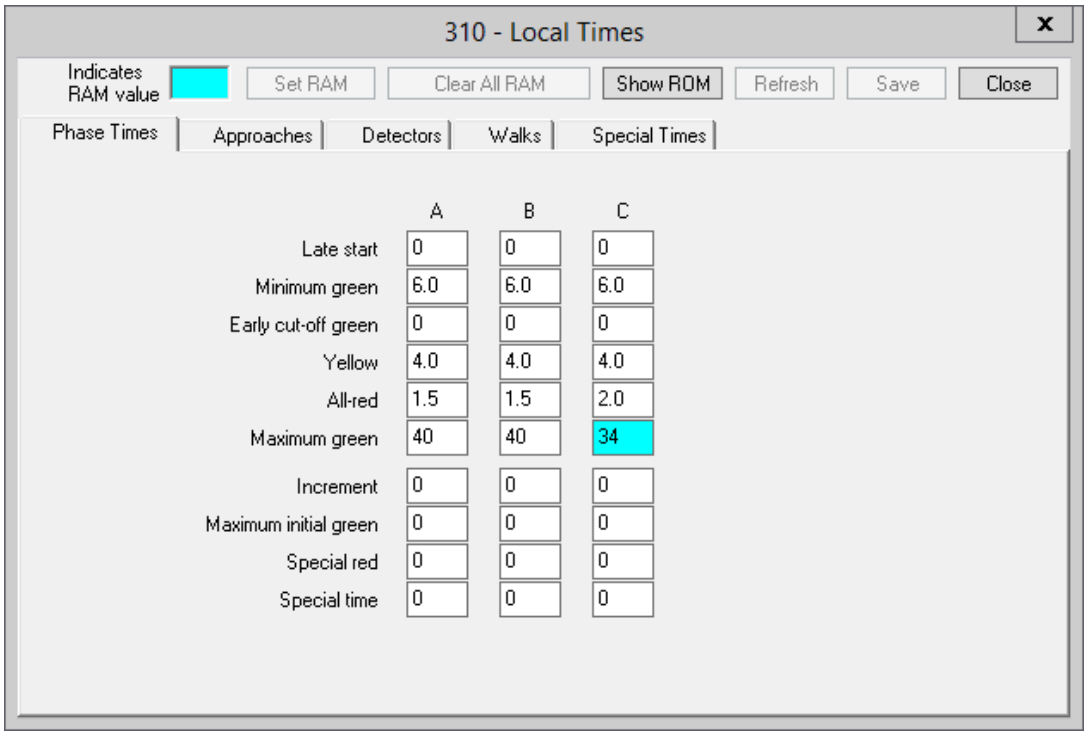
Model observations indicated that:

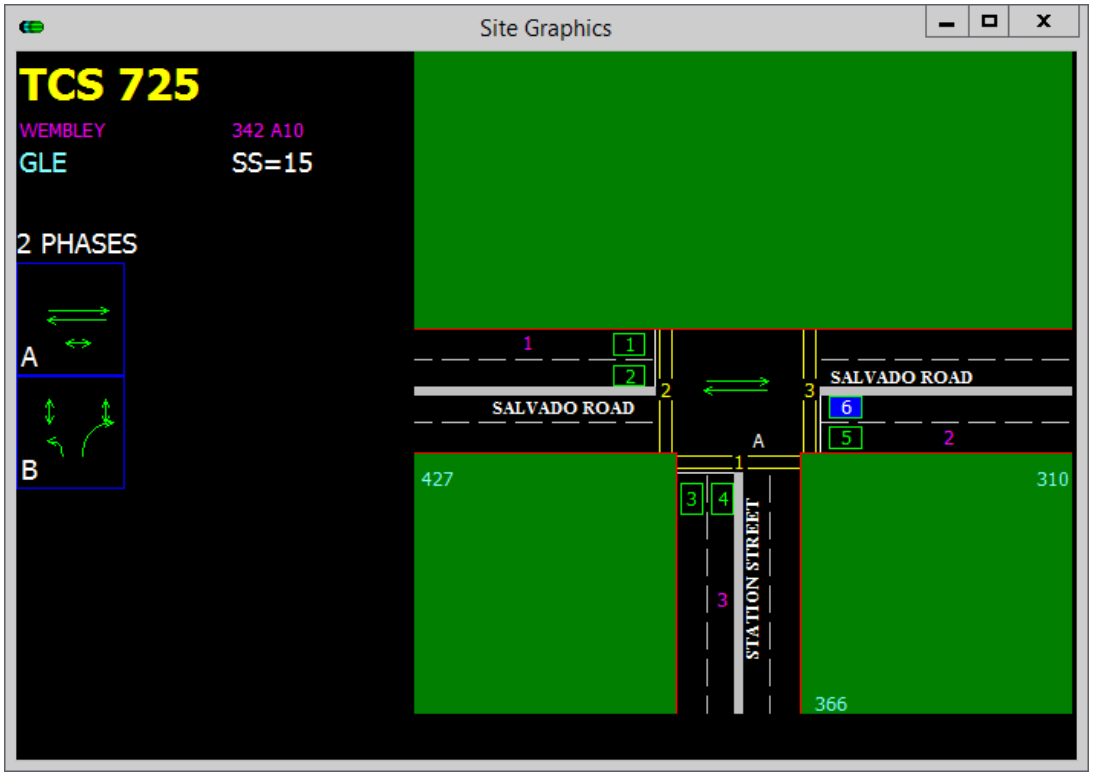
- The additional traffic on surrounding roads and intersections as a result of the proposed development would be relatively low and the level of impact due to the proposed development is expected to be local with minimum traffic disruption on major surrounding roads; and,
- The overall network performance for the modelling study area would not change significantly as a result of the proposed development and the additional level of delays and queue were reported to be manageable.

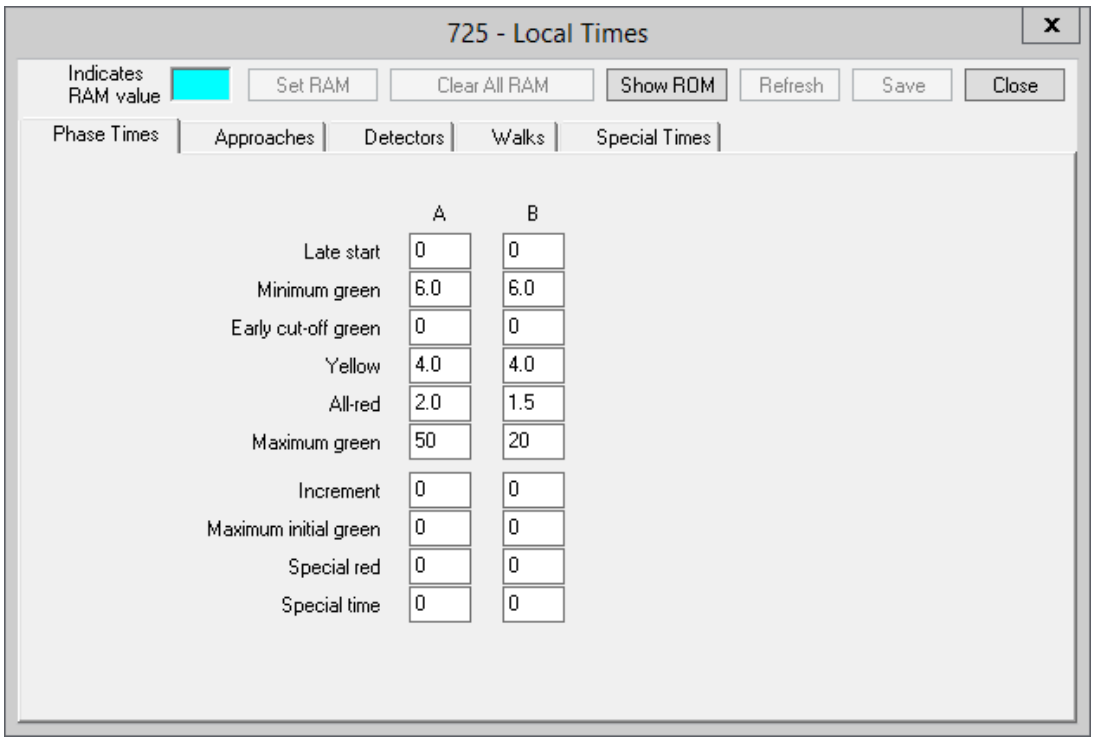
Appendix A

SIGNAL DATA OBTAINED FROM MAINROADS WA


Site Graphics
TCS 310
SUBIACO
342 B10
GLE
SS=2
5 PHASES
A
C
A1
B
B1
134
RAILWAY PDE
SALVADO RD
725
509
HAYDN BUNTON DVE


310 - Local Times
Indicates RAM value
Set RAM
Clear All RAM
Show ROM
Refresh
Save
Close
Phase Times
Approaches
Detectors
Walks
Special Times
A
B
C
Late start 0 0 0
Minimum green 6.0 6.0 6.0
Early cut-off green 0 0 0
Yellow 4.0 4.0 4.0
All-red 1.5 1.5 2.0
Maximum green 40 40 34
Increment 0 0 0
Maximum initial green 0 0 0
Special red 0 0 0
Special time 0 0 0


Site Graphics
TCS 725
WEMBLEY
342 A10
GLE
SS=15
2 PHASES
A
B
SALVADO ROAD
SALVADO ROAD
STATION STREET
427
310
366


725 - Local Times
Indicates RAM value
Set RAM
Clear All RAM
Show ROM
Refresh
Save
Close
Phase Times
Approaches
Detectors
Walks
Special Times
A
B
Late start 0 0
Minimum green 6.0 6.0
Early cut-off green 0 0
Yellow 4.0 4.0
All-red 2.0 1.5
Maximum green 50 20
Increment 0 0
Maximum initial green 0 0
Special red 0 0
Special time 0 0

Appendix B

Existing traffic turn counts (AM & PM)


Joseph St
Dearle Ln
Connolly St
Station St
Cambridge St
D'Arcy Ln
Salvado Rd
Station St
Salvado Rd

Appendix C

GEH values during AM and PM peak hours

AM Peak	Movement	From	To	Observed Vehicles	Model Output	GEH
Cambridge St / Station Street	Left Turn	West	North	34	34	0.07
	Through	West	East	786	761	0.91
	Right Turn	West	South	100	96	0.40
	Left Turn	North	East	32	33	0.24
	Right Turn	North	West	7	7	0.15
	Through	North	South	16	11	1.24
	Left Turn	East	South	97	145	4.33
	Right Turn	East	North	56	33	3.48
	Through	East	West	530	509	0.91
	Left Turn	South	West	21	16	1.16
	Right Turn	South	East	9	47	7.21
	Through	South	North	2	2	0.00
Salvado Road / Station Street(N)	Left Turn	West	North	35	72	5.10
	Left Turn	North	East	100	109	0.88
Salvado Road / Station Street(S)	Right Turn	West	South	262	255	0.44
	Through	West	East	776	690	3.19
	Right Turn	South	East	90	92	0.17
	Left Turn	South	West	103	102	0.08
	Left Turn	East	South	272	244	1.73
	Through	East	West	216	209	0.45
Salavado Road Roundabout		all	North	182	158	1.86
		North	all	56	63	0.96
		all	West	487	455	1.46
		West	all	866	774	3.21
		East	all	523	492	1.38
		all	East	776	716	2.21
Haydn Bunton Dr / Salvado Rd / Railway Prd	Left Turn	South	West	101	89	1.19
	Right Turn	South	East	194	190	0.32
	Right Turn	West	South	275	228	2.98
	Left Turn	East	South	399	397	0.10
	Through	East	West	422	406	0.79
	Through	West	East	537	476	2.69
Railway Prd / McCourt Street	Left Turn	West	North	91	100	0.90
	Through	West	East	640	567	2.99
	Left Turn	North	East	56	20	5.88
	Right Turn	North	West	38	64	3.62
	Right Turn	East	North	18	32	2.83
	Through	East	West	783	741	1.52
Cambridge Street / McCourt Street	Right Turn	West	South	69	72	0.40
	Through	West	East	756	854	3.44
	Left Turn	West	North	11	9	0.70
	Left Turn	North	East	25	21	0.92
	Left Turn	East	South	62	65	0.38
	Right Turn	East	North	16	16	0.00
	Through	East	West	654	658	0.17
	Left Turn	South	West	64	75	1.30
	Right Turn	South	East	17	43	4.80
	Through	South	North	9	7	0.63

PM Peak	Movement	From	To	Observed Vehicles	Model Output	GEH
Cambridge St / Station Street	Left Turn	West	North	17	17	0.10
	Through	West	East	573	532	1.75
	Right Turn	West	South	27	25	0.43
	Left Turn	North	East	40	38	0.39
	Right Turn	North	West	17	17	0.00
	Through	North	South	16	6	3.09
	Left Turn	East	South	47	61	1.91
	Right Turn	East	North	26	23	0.61
	Through	East	West	743	721	0.82
	Left Turn	South	West	43	37	0.92
	Right Turn	South	East	27	59	4.86
	Through	South	North	7	1	3.00
Salvado Road / Station Street(N)	Left Turn	West	North	29	30	0.26
	Left Turn	North	East	105	84	2.16
Salvado Road / Station Street(S)	Right Turn	West	South	153	180	2.11
	Through	West	East	249	201	3.17
	Right Turn	South	East	175	163	0.95
	Left Turn	South	West	347	333	0.75
	Left Turn	East	South	325	257	3.97
	Through	East	West	469	421	2.29
Salavado Road Roundabout		all	North	103	98	0.46
		North	all	151	152	0.10
		all	West	758	685	2.73
		West	all	424	361	3.17
		East	all	762	735	1.00
		all	East	475	463	0.54
Haydn Bunton Dr / Salvado Rd / Railway Prd	Left Turn	South	West	301	281	1.18
	Right Turn	South	East	286	291	0.28
	Right Turn	West	South	112	83	2.98
	Left Turn	East	South	195	184	0.78
	Through	East	West	461	464	0.12
	Through	West	East	396	382	0.71
Railway Prd / McCourt Street	Left Turn	West	North	77	143	6.31
	Through	West	East	605	532	3.04
	Left Turn	North	East	33	22	2.06
	Right Turn	North	West	29	61	4.82
	Right Turn	East	North	20	25	1.05
	Through	East	West	627	587	1.63
Cambridge Street / McCourt Street	Right Turn	West	South	38	46	1.23
	Through	West	East	635	651	0.63
	Left Turn	West	North	8	0	4.00
	Left Turn	North	East	13	8	1.54
	Left Turn	East	South	30	17	2.68
	Right Turn	East	North	12	12	0.00
	Through	East	West	726	698	1.06
	Left Turn	South	West	98	131	3.07
	Right Turn	South	East	35	69	4.74
	Through	South	North	9	1	3.45