transcore

Redcliffe Area Traffic Study

Existing Situation

Traffic Report

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REPORT FIGURES

1 Introduction

The Redcliffe Area Traffic Study is a strategic initiative commissioned by the City of Belmont (The City) to thoroughly assess traffic flow within the Redcliffe area for the short, medium and long term. The objective of this project is to identify preferred network improvements that would improve connectivity to the wider Belmont area and the regional road network and to establish necessary safety and amenity improvements to better serve the community.

Accordingly, Transcore has been commissioned to conduct microsimulation transport modelling. This advanced modelling technique allows for detailed analysis of traffic patterns and behaviours under various conditions, helping to predict how changes in the network might influence overall traffic flow.

In preparation for this modelling, extensive data collection and site observations have been carried out by Transcore, in collaboration with The City and Perth Airport. The data collection and site observations were used for calibrating the base case model, ensuring that the analysis is grounded in accurate and relevant data.

Additionally, Transcore liaised with Main Roads WA and the Department of Planning, Lands and Heritage (DPLH) to gather future land use data and information on road network upgrades within the modelling study area.

Recognising the importance of community input, The City has proactively gathered feedback from residents, workers, and visitors to better understand their experiences in the area. This engagement process included the use of a mapping tool and a survey, allowing community members to pinpoint locations of interest and share their insights. Furthermore, drop-in sessions held on 25 and 28 July 2024 provided additional opportunities for direct interaction, enabling community members to voice their concerns and suggestions in person.

Transcore prepared three different traffic reports for this study:

- **Existing Situation Report**;
- Calibration and Validation Report; and,
- Traffic Analysis Report.

This traffic report aims to document the collected data, existing road network details, and other relevant information that have been utilised as inputs for the microsimulation model. Additionally, it includes observations from Transcore's site visits and insights derived from community feedback, providing a comprehensive overview of the existing traffic situation in Redcliffe.

1.1 Modelling Study Area

The modelling study area is shown in Figure 1. The study area includes major distributor roads and the majority of the access streets within Redcliffe area, highlighting critical intersections and access points that influence traffic flow.

It extends to key adjacent areas within Belmont, ensuring a comprehensive understanding of how traffic in Redcliffe interacts with the broader regional road network.
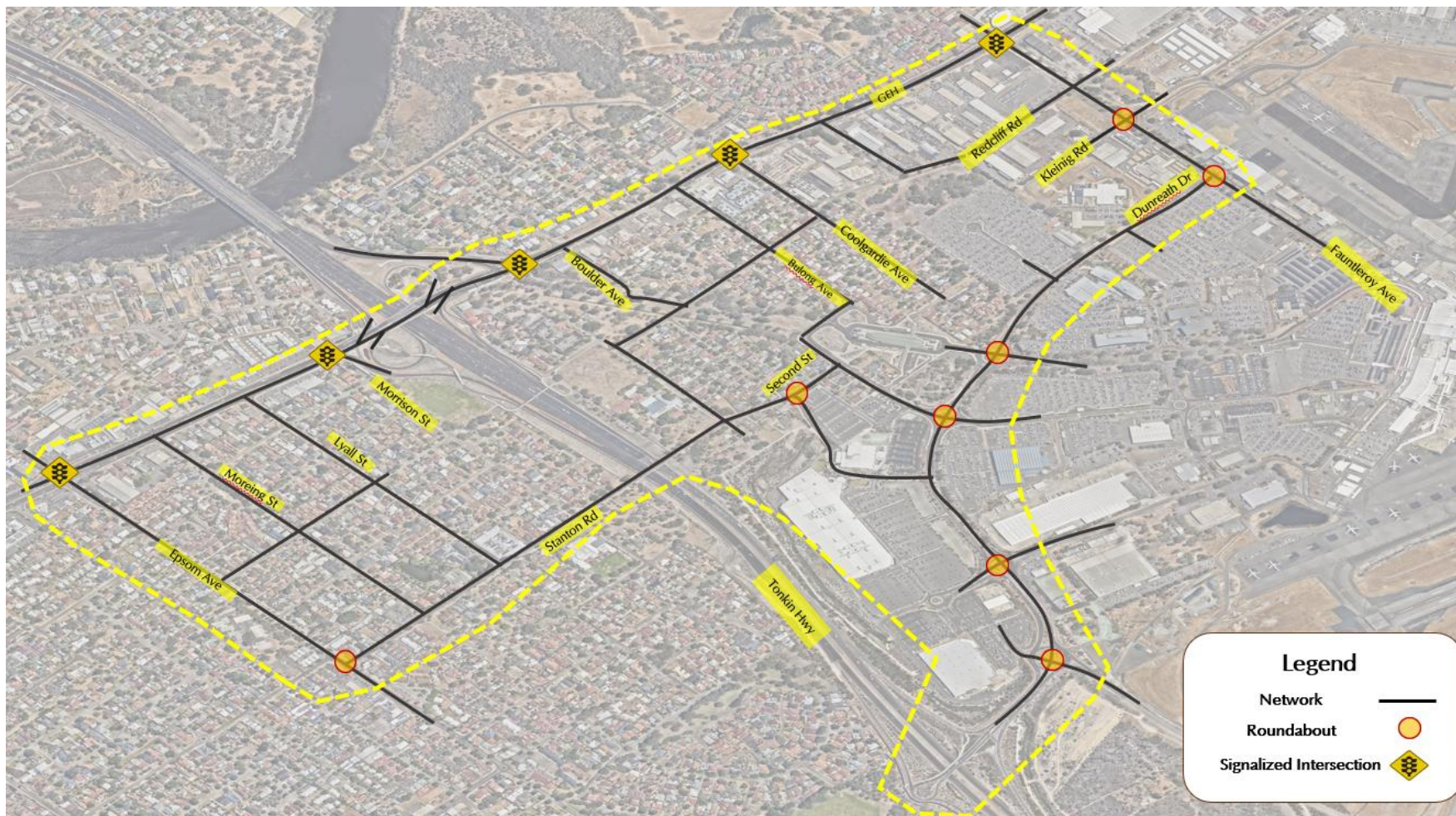
Figure 1: Modelling study area, key roads

2 Data Collection

2.1 Traffic counts

As part of the Redcliffe Area Traffic Study, video traffic counts were organised by The City and Perth Airport on Thursday, 23 May 2024. These video counts focused on key intersections within the modelling study area, providing valuable data for traffic analysis. Additionally, The City supplied the latest Sydney Coordinated Adaptive Traffic System (SCATS) data (sourced from Main Roads WA) for all signalised intersections within the modelling area, also corresponding to the same date.

Figure 2 illustrates the locations of the traffic counts. Transcore conducted a thorough review of the collected traffic counts and prepared detailed turning movement counts at these key intersections. The analysis covered two critical peak periods:

- Morning Peak: 8:00 AM to 9:00 AM
- Afternoon Peak: 4:00 PM to 5:00 PM

Appendix A shows the turning movement counts at the key intersections.

Figure 2: Location of the traffic counts

2.1.1 Signal Data (SCATS)

The SCATS history files for the nominated peak hours were sourced from Main Roads WA for signalised intersections. This data is crucial for understanding the operational characteristics of traffic signals during the peak hours for Thursday, 23 May 2024.

Figure 3 presents the phasing and timing information for the nominated peak hours, illustrating the operational patterns of traffic signals in the study area. This information was used for calibration of the base case model.

Phase duration during the peak hours – GEH / Fauntleroy Ave

Phase	Min		Max		Average	
	AM	PM	AM	PM	AM	PM
A	47	57	93	89	68	69
D	20	38	40	66	30	49
E	22	13	36	35	27	21

Phase duration during the peak hours – GEH / Tonkin Hwy

Phase	Min		Max		Average	
	AM	PM	AM	PM	AM	PM
A	39	57	1308	84	128	72
B	28	18	50	37	36	30
C	13	--	37	--	20	--

Phase duration during the peak hours – GEH / Coolgardie Ave

Phase	Min		Max		Average	
	AM	PM	AM	PM	AM	PM
A	65	87	125	117	85	100
D	15	17	28	28	22	22
E	14	14	26	23	19	18

Phase duration during the peak hours – GEH / Epsom Ave

Phase	Min		Max		Average	
	AM	PM	AM	PM	AM	PM
A	52	35	91	93	74	70
D	16	16	39	40	22	25
E	15	15	25	24	17	18
F	18	18	30	35	23	27

Phase duration during the peak hours – GEH / Tonkin Hwy SB on/off

Phase	Min		Max		Average	
	AM	PM	AM	PM	AM	PM
A	72	48	104	92	92	75
B	22	21	40	39	33	28
C	29	19	29	33	29	27
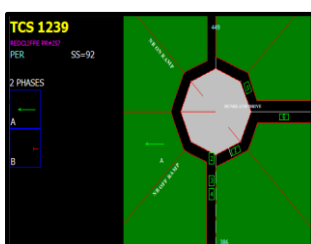
Phase duration during the peak hours – Dunreath Dr / Tonkin Hwy NB off

Phase	Min		Max		Average	
	AM	PM	AM	PM	AM	PM
A	15	14	819	294	171	45
B	14	23	36	61	31	40

Figure 3: SCATS history data for signalised intersections

2.1.2 *Speed limits*

Figure 4 illustrates the existing posted speed limits within the modelling study area. Most roads have a speed limit of 50 km/h, while Great Eastern Highway (GEH) and Dunreath Drive have a higher speed limit of 60 km/h.

In proximity to Redcliffe and St Maria Goretti Primary School, school zone speed limit of 40 km/h are in effect, as shown in Figure 5. This figure also indicates the locations of existing traffic calming measures and the advisory speed limits associated with them.
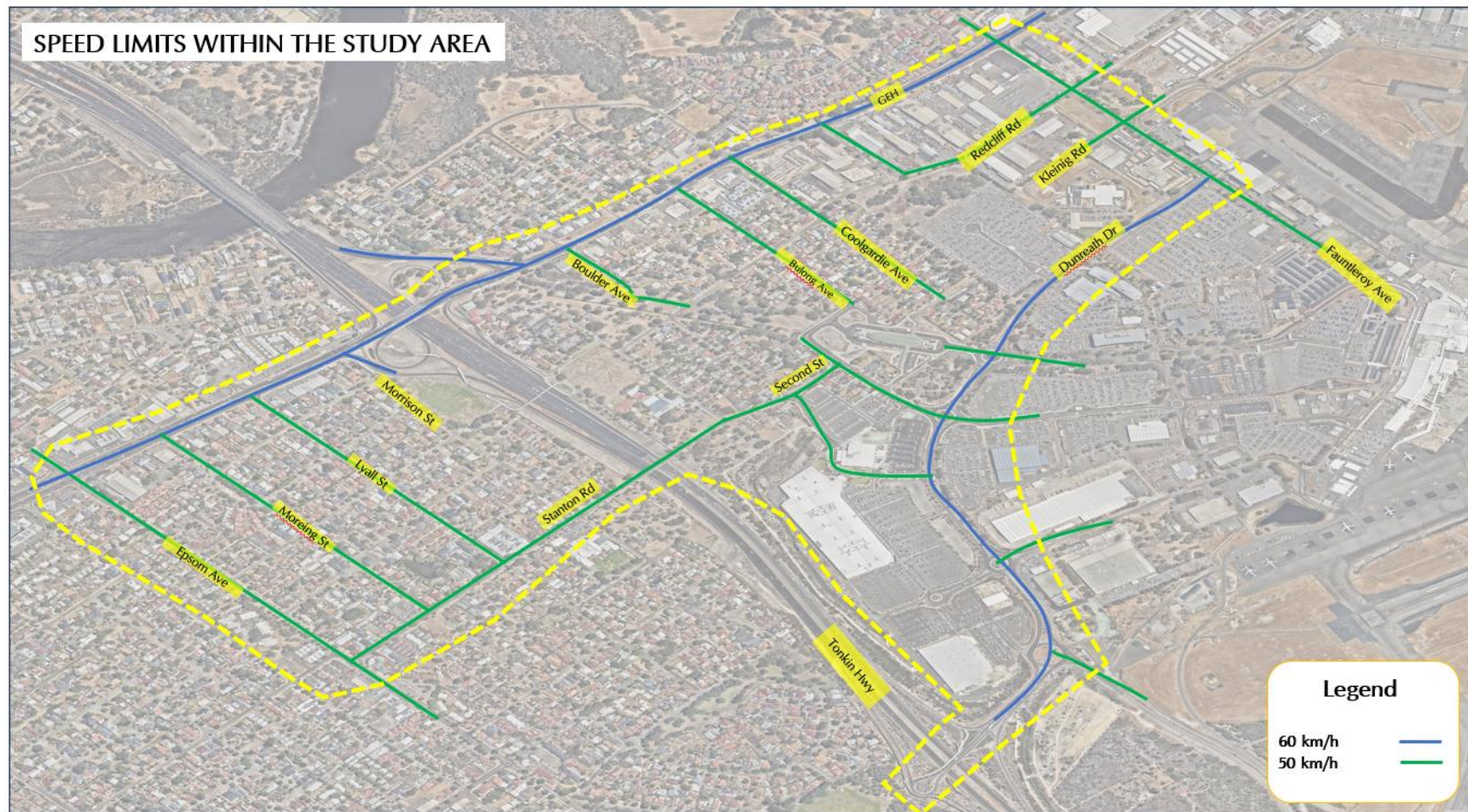
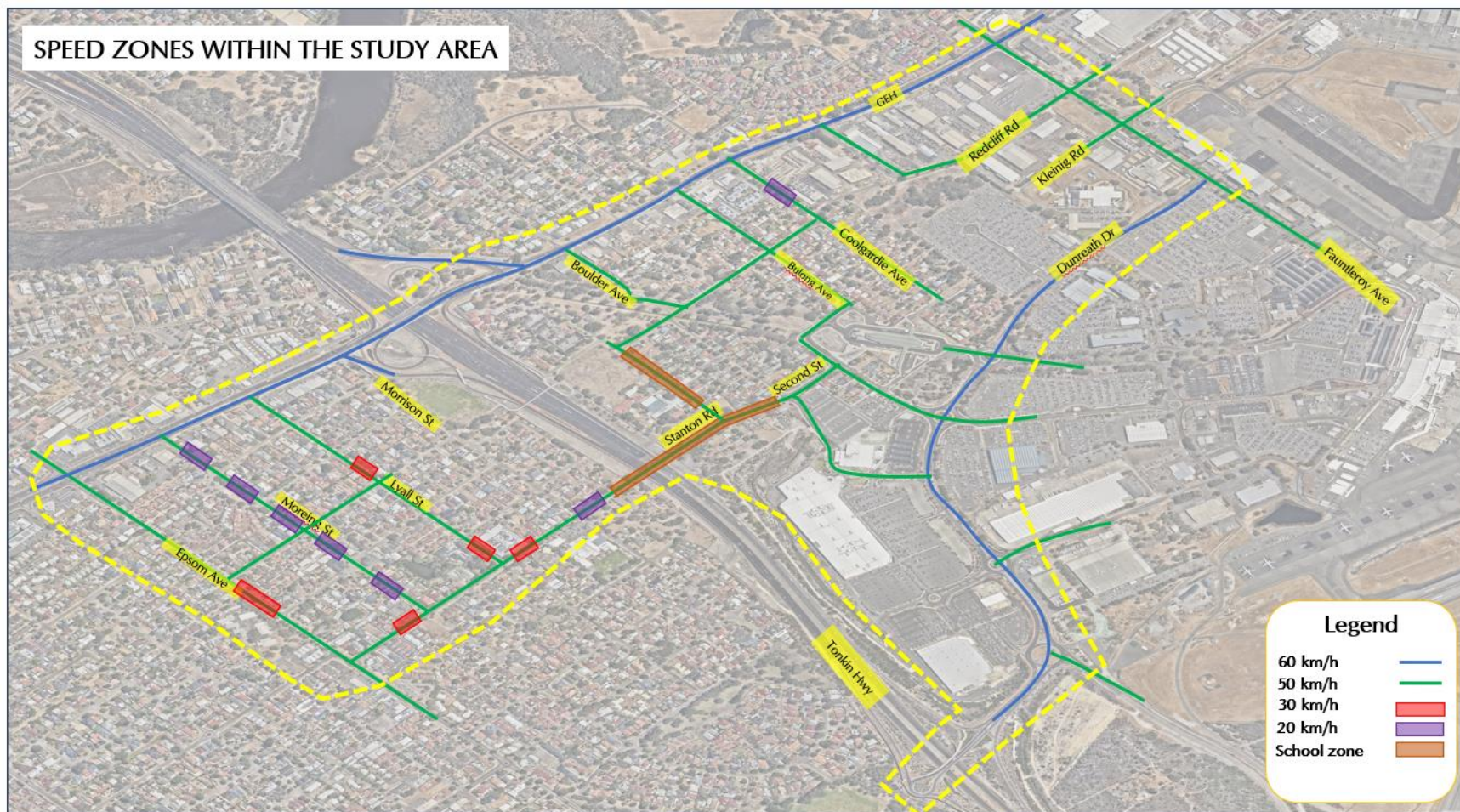Figure 4: Speed limits for the roads within the modelling study area

Figure 5: Speed zones within the modelling study area

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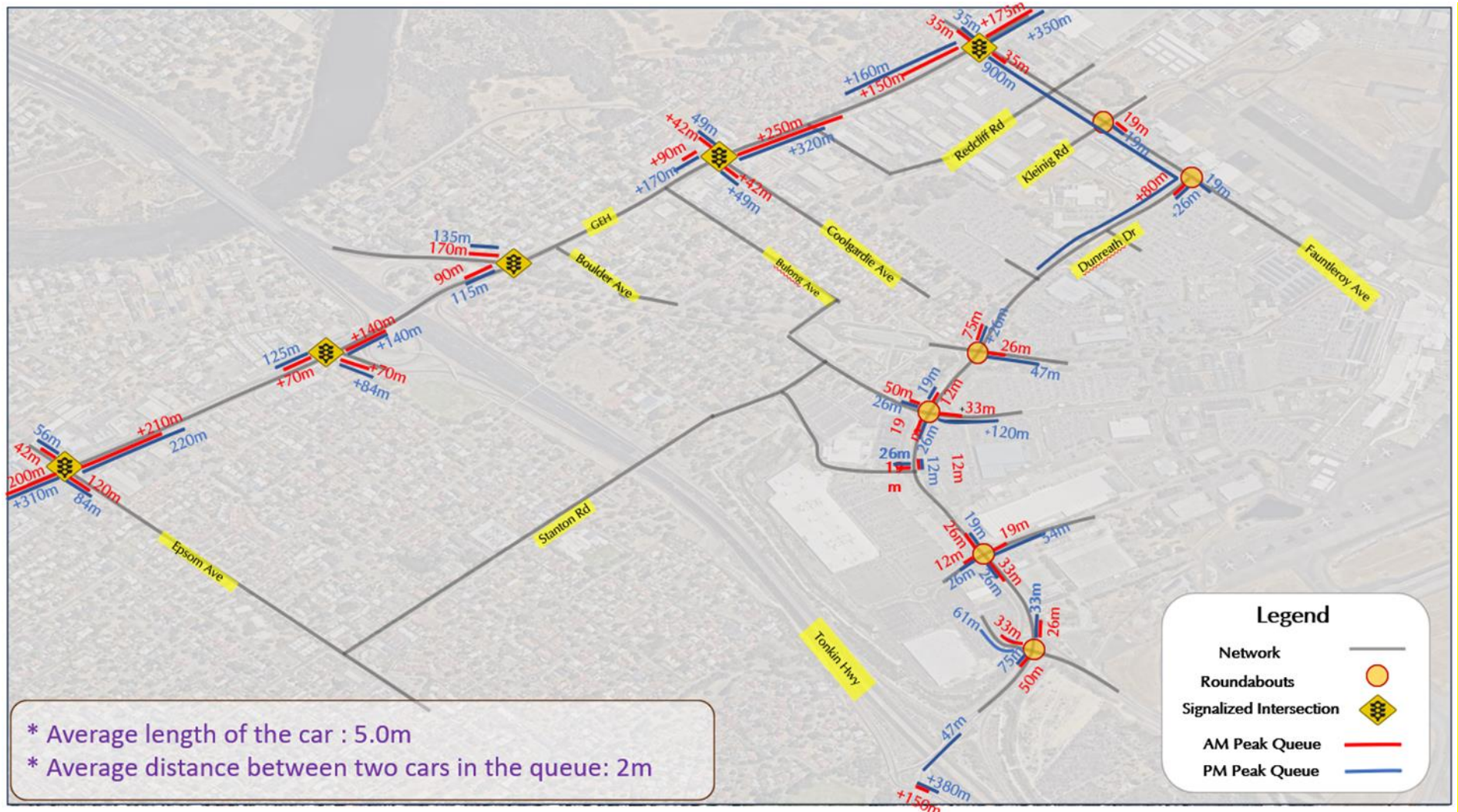
Figure 6: Maximum queue lengths observed at key intersections (Existing)

2.1.4 Observed Travel Times

Vehicle travel times on the following routes within the modelling study area were collected:

- GEH;
- Fauntleroy Avenue/ Dunreath Drive; and,
- Central Avenue/Second Street/ Stanton Road/ Epsom Avenue.

Travel times were recorded for both directions on roads during the peak hours and used for calibration and validation of the base case models (See Figure 7).
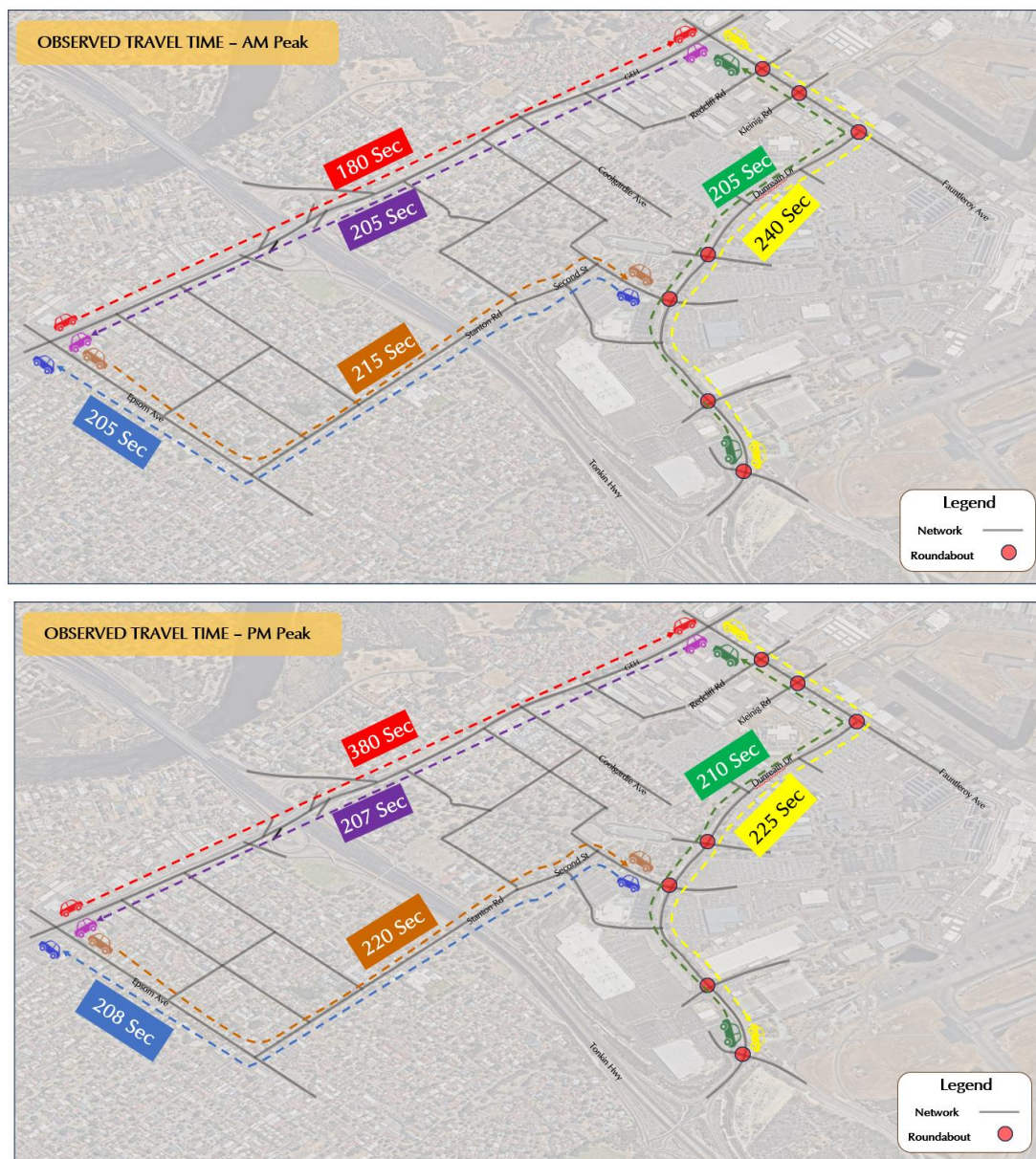
Figure 7: Observed AM/ PM travel times

2.1.5 Public Transport

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

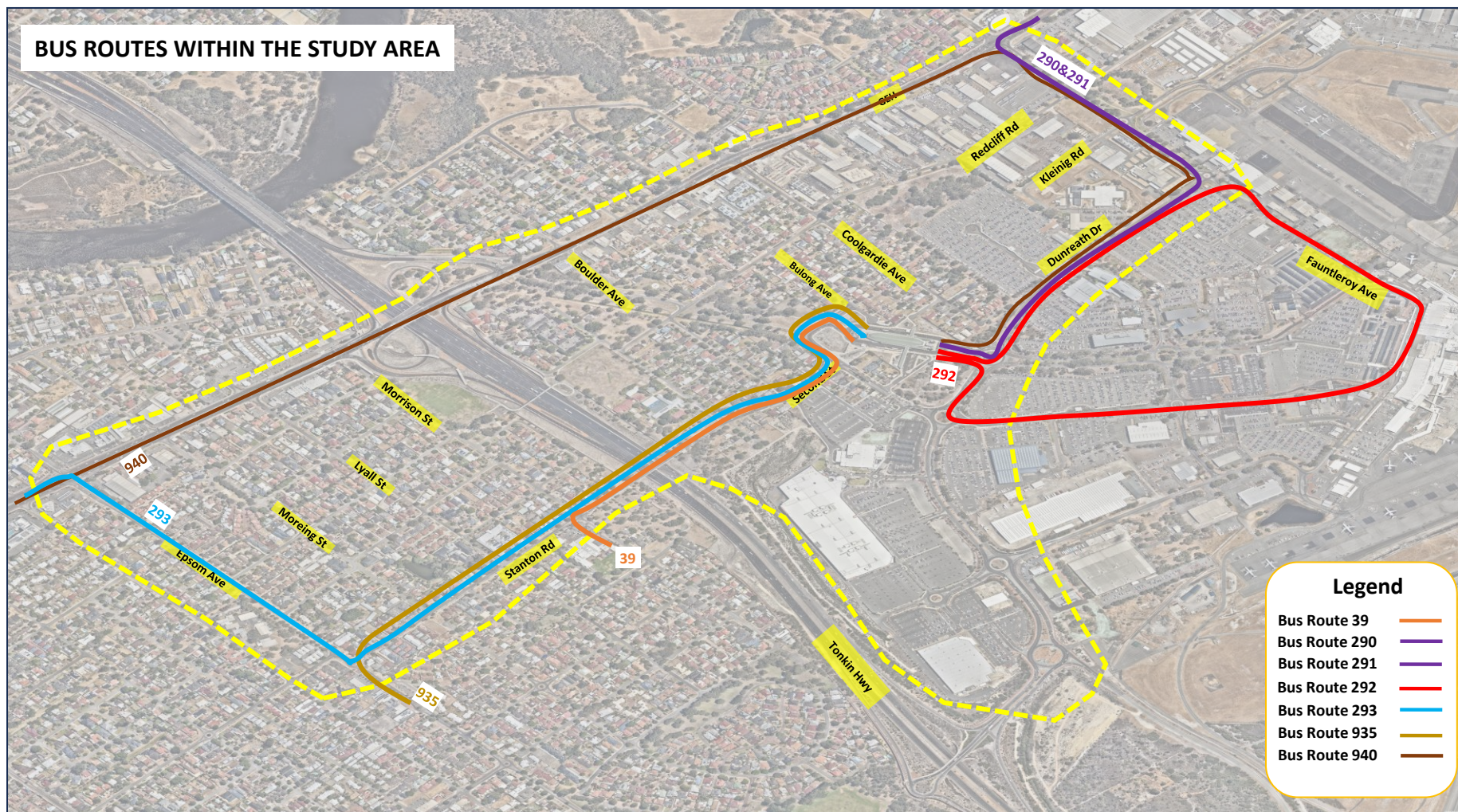Appendix B shows the time table for each bus stop during the nominated peak hours.

Figure 8: Existing public transport routes within the modelling study area
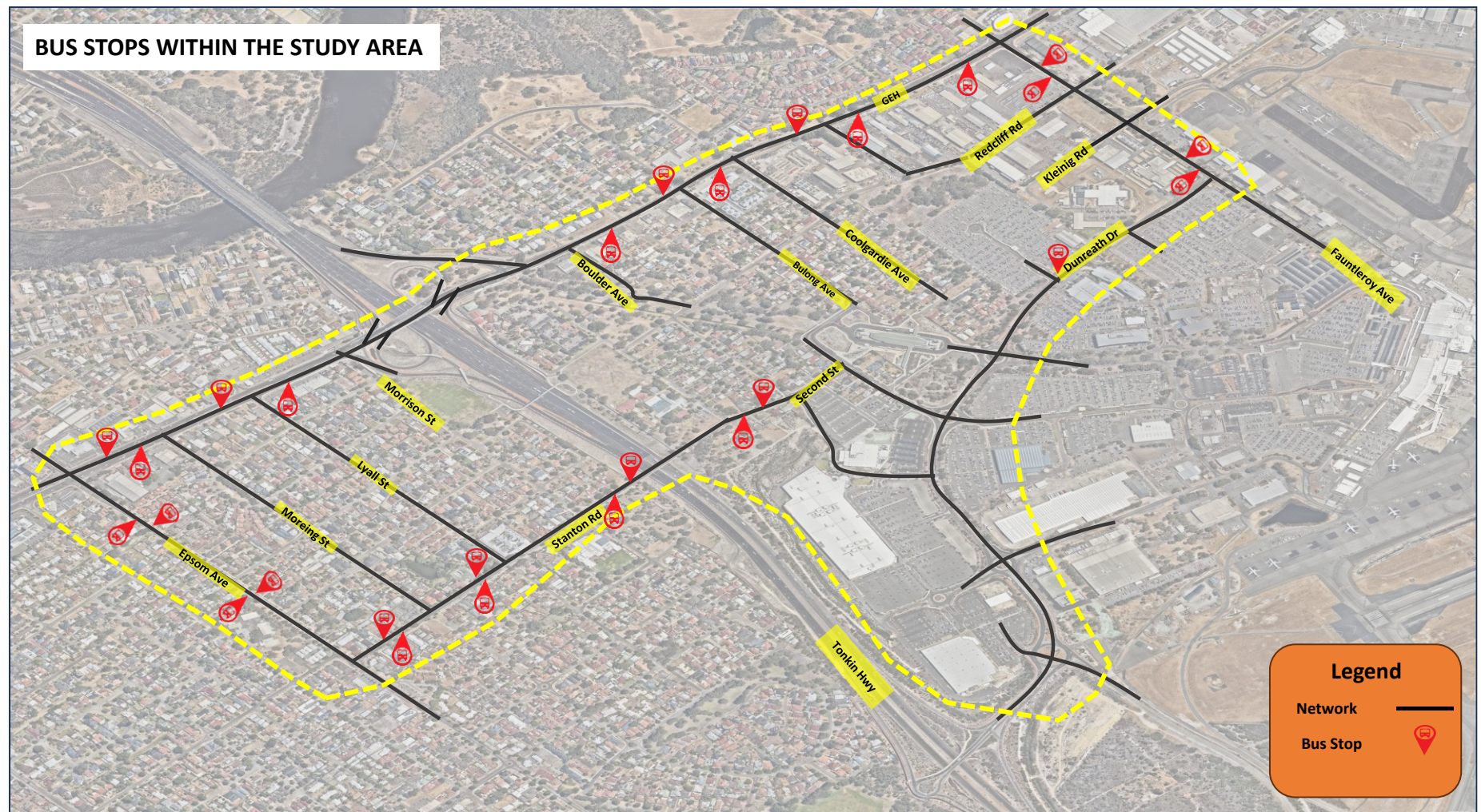
BUS STOPS WITHIN THE STUDY AREA

Legend
Network
Bus Stop

Figure 9: Existing bus stops within the modelling study area

3 Crash Analysis

To identify hazardous intersections within the modelling study area, the Main Roads crash analysis tool was utilised. Intersections with more than four accidents in the five-year period from 2019 to 2023 were filtered for analysis. Figure 10 illustrates the results of this crash analysis.

Most hazardous intersections are situated along busier roads, including GEH, Dunreath Drive, Fauntleroy Avenue, Stanton Road, and Epsom Avenue. Notably, the following intersections within local roads reported to have four or over four accidents:

- First Street/Bulong Avenue (4 crashes);
- Victoria Street/Moreing Street (5 crashes);
- Lyall Street/Stanton Road (6 crashes);
- Epsom Avenue/Durban Street (6 crashes);
- Redcliffe Road/Fauntleroy Avenue (14 crashes);
- Epsom Avenue/ Stanton Road (4 crashes);
- Epsom Avenue/ Victoria Street (4 crashes);
- Second Street/ Kanowna Avenue (4 crashes); and,
- Second Street/ Boulder Avenue (5 crashes).

These findings highlight areas that may require targeted safety improvements and traffic management interventions.
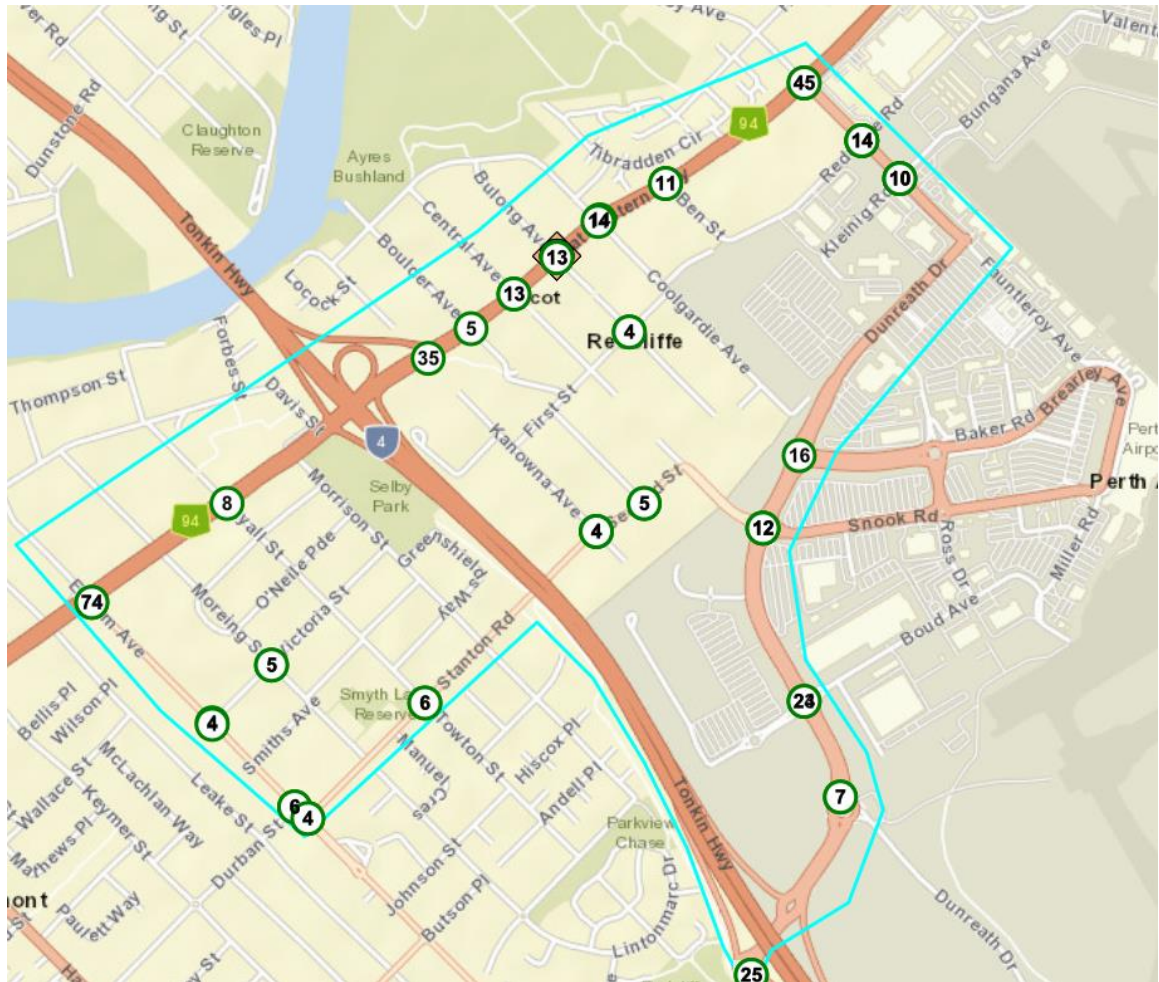
Figure 10: key intersections within the modelling study area with more than 4 crashes between 2019 and 2023

4 Observations

Based on site visits, data review, crash analysis and community feedback, the following key observations have been made regarding the current traffic situation in the Redcliffe area:

- **Through Traffic on local roads**: The proximity of the Redcliffe area to Perth Airport and new commercial developments, such as Costco and Direct Factory Outlet (DFO), has led to significant through traffic (mainly relevant to Perth Airport) on local roads, particularly Stanton Road and Second Street, with lesser impacts on Central Avenue, Bulong Avenue, First Street, and Coolgardie Avenue.
- **Over utilisation of Stanton Road**: Stanton Road features a 7m carriageway and an average 20m road reserve and would be classified as local distributor with upper threshold of 6,000 vehicles per day (vpd) in Main Roads WA Road hierarchy map. Traffic volumes on Stanton Road (at the bridge) are approximately 14,000 vpd. This volume exceeds the typical capacity for a local distributor Road.
- **Insufficient/ ineffective Traffic Calming Measures**: While some traffic calming measures are in place along Stanton Road and other local roads like Lyall Street and Moreing Street, these measures are either insufficient or ineffective in deterring through traffic.
- **Capacity of Main Distributor Roads**: The main distributor roads, GEH and Dunreath Drive, are operating at capacity during peak hours. This congestion affects the effectiveness of existing traffic calming measures on Stanton Road and surrounding local roads.
- **Safety**: Safety issues related to the intersections of:
  - First Street/Bulong Avenue;
  - Victoria Street/Moreing Street;
  - Lyall Street/Stanton Road;
  - Epsom Avenue/Durban Street;
  - Redcliffe Road/Fauntleroy Avenue;
  - Epsom Avenue/ Stanton Road;
  - Epsom Avenue/ Victoria Street;
  - Second Street/ Kanowna Avenue; and,
  - Second Street/ Boulder Avenue.
- **Signal Optimisation**: A lack of signal optimisation and coordination along GEH.
- **Traffic Congestion**: Notable congestion on GEH, Stanton Road, Central Avenue, Fauntleroy Avenue and Epsom Avenue.
- **Pedestrian Safety**: Concerns regarding pedestrian safety along GEH, Stanton Road, Coolgardie Avenue, Central Avenue, Dunreath Drive, Boulder Avenue, and Bulong Avenue.

Key issues such as congestion, rat-running and signal optimisation have been confirmed through the microsimulation modelling of the existing calibrated base case scenario. The microsimulation modelling provides a quantitative assessment of traffic patterns, validating community concerns and previous observations. By analysing how
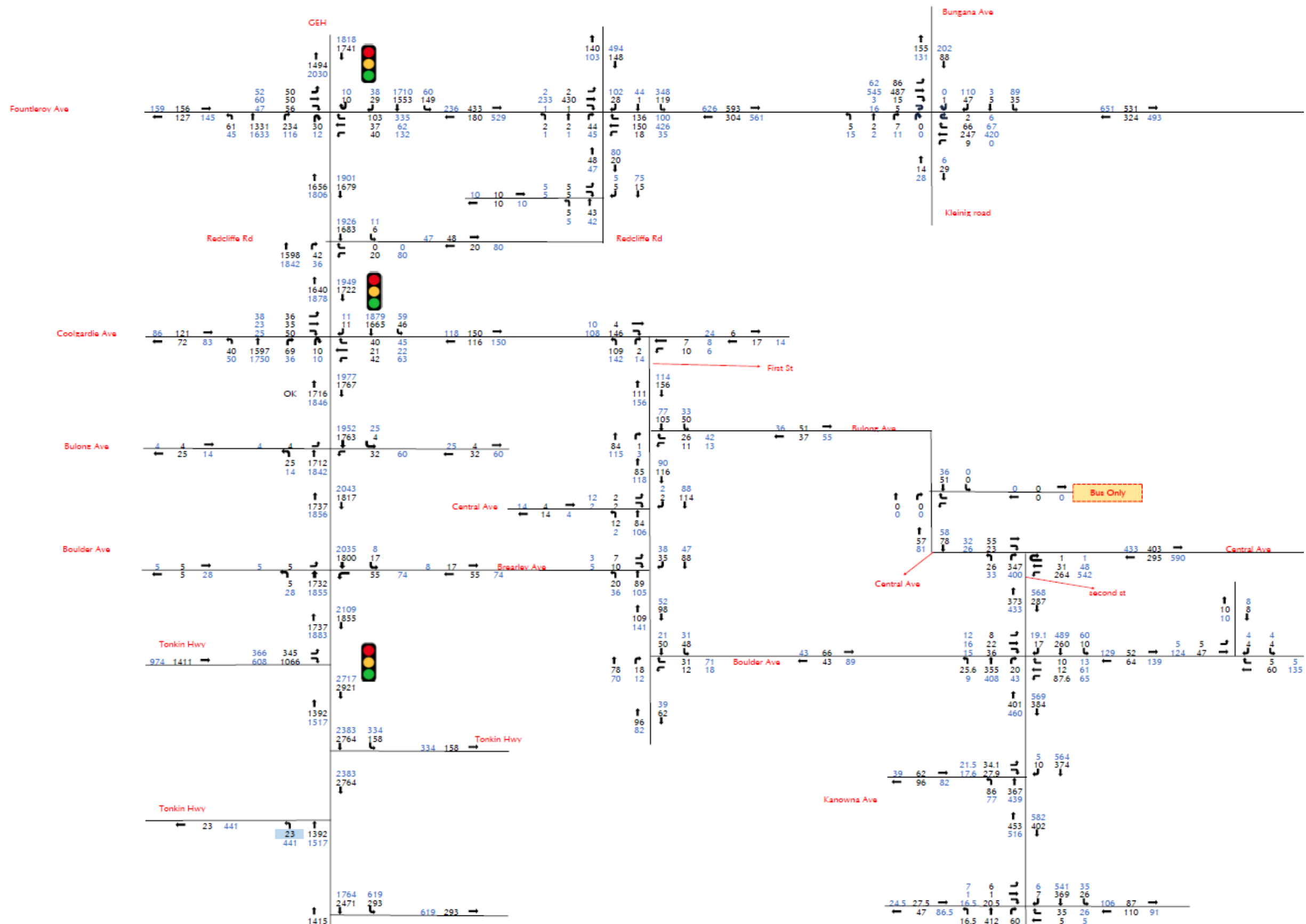
the current road network operates under peak conditions, the study can identify specific locations where enhancements are necessary, guiding future traffic management strategies and infrastructure investments to improve safety and efficiency in the Redcliffe area.

Appendix A

EXISTING TURNING COUNTS

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Traffic flow diagram — Redcliffe Area Traffic Study (Existing Situation)

Street labels: Morrison St, Tonkin Hwy, Stanton Rd, Lyall St, Moreing St, Victoria St, Epsom Ave, Durban St, GEH

1958

1764
2471

1240
1815

175 143   175 143

1764
2471

623 966

623 1240
966 1815

396 370   396 370

1863
2781
2134
2867

1863   5
2781   22

1868
2803
2167
2854

2098 69
2805 49

69 49   69 49
95 161   95 161

40 44
29 5

11 11
10 9

84 151
10 22

49 55
94 173

26 35
23 20

18 453
21 547

152 465
76 383

617
488 459
573

1868
2803
2259
2900

30 2229
40 2860

488
471 403
568

1828
2773

2200 29
2840 20

29 20   29 20
21 39   21 39

12 1
8 18

2 2
20 9

3 4 4
18 19
3 21
15 16
16 14

34 57
34 51

14 44
20 13

17 427
21 554

30 458
17 386

112 111   112 111
40 52

227
300 100
215

2239
1757 2861
2713

27
24 35
51

478
444 399
575

Victoria St

Epsom Ave

55 22
42 51
86 75

80 28 1875 256
50 55 2559 197
200 230
54 48
85 88

504 425   359 427

24 18
480 405
0 2

10 17
19 16
1 0
6 27
338 417

497 422   345 444

407 317
90.2 105

116 141
155 173

229 289
236 270

350 299
228 157
2 2

5 293 180
235 163

0 5
144 220
228 264

413 320   372 489

183 148   112 111
170 127

61 1485 182
51 2348 190

2049
1728 2719
2589

257 360
328 341

Durban St

GEH

Dunreath Dr

Fountlerov Ave

Central Ave

Bus Only

Brearley ave

Central Ave

Snook Rd

High St

Boud Ave

Costco Entry

29 14 → 29 14 ↰
40 51 40 884
51 938

974
924 529
989

132 40 ↰
14 15
175 14
2 0

8 123 784 59
3 35 428 63

323 69 → 289 372 →
70 226 368 498

28 812 293 1
89 797 215 4

1 1
69 52
7 12
291 433

1399
1148 737
1123

30 11 ↰
5 1
248 87
0 0

7 18 1364 10
2 8 719 8

283 99 → 34 12 →
135 343 11 37

127 1126 3 106
325 1058 19 71

0 0
9 28
0 0
2 9

1692
1362 914
1473

560 1132
252 662

560
252

Appendix B

EXISTING BUS ROUTES AND TIME TABLES

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Route No	Destination	Stops In Network	Average Time In Network
39	Redcliffe Stn	2	4 min

AM		PM	
Start	Finish	Start	Finish
8:02	8:06	4:03	4:07
8:26	8:30 (S)*	4:10	4:14 (B)***
8:26	8:30 (H)**	4:15	4:19
8:48	8:54	4:27	4:31
		4:35	4:40
		4:42	4:47
		4:51	4:55
		4:57	5:01

Notes:
*S : Operates on school days only and deviates via Belmont City College.
**H: Operates on school holidays only.
***B: Operates on school days only and departs from Ursula Frayne Catholic College at 3.41pm. Then travels express to Star St after Roberts Rd, Carlisle to resume normal route
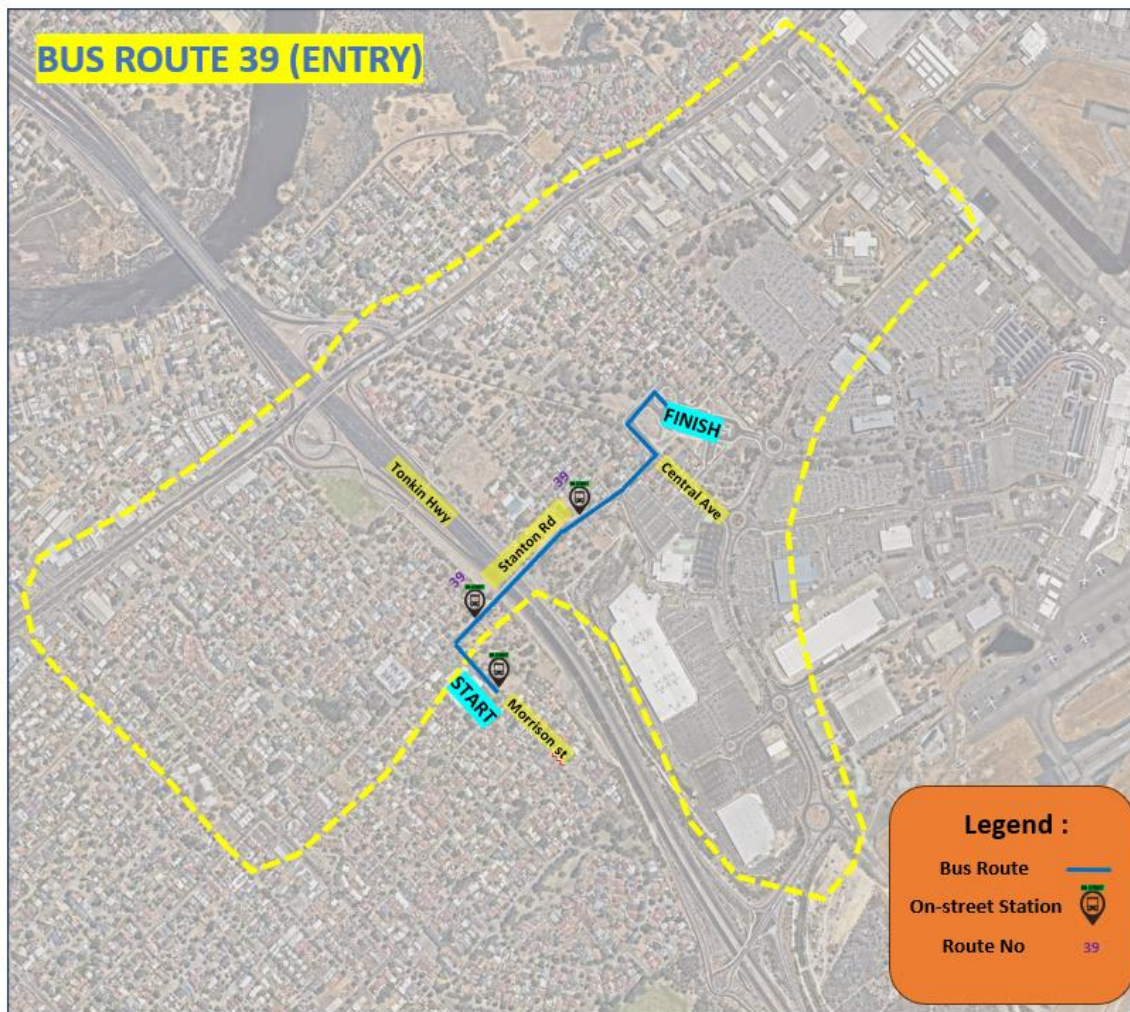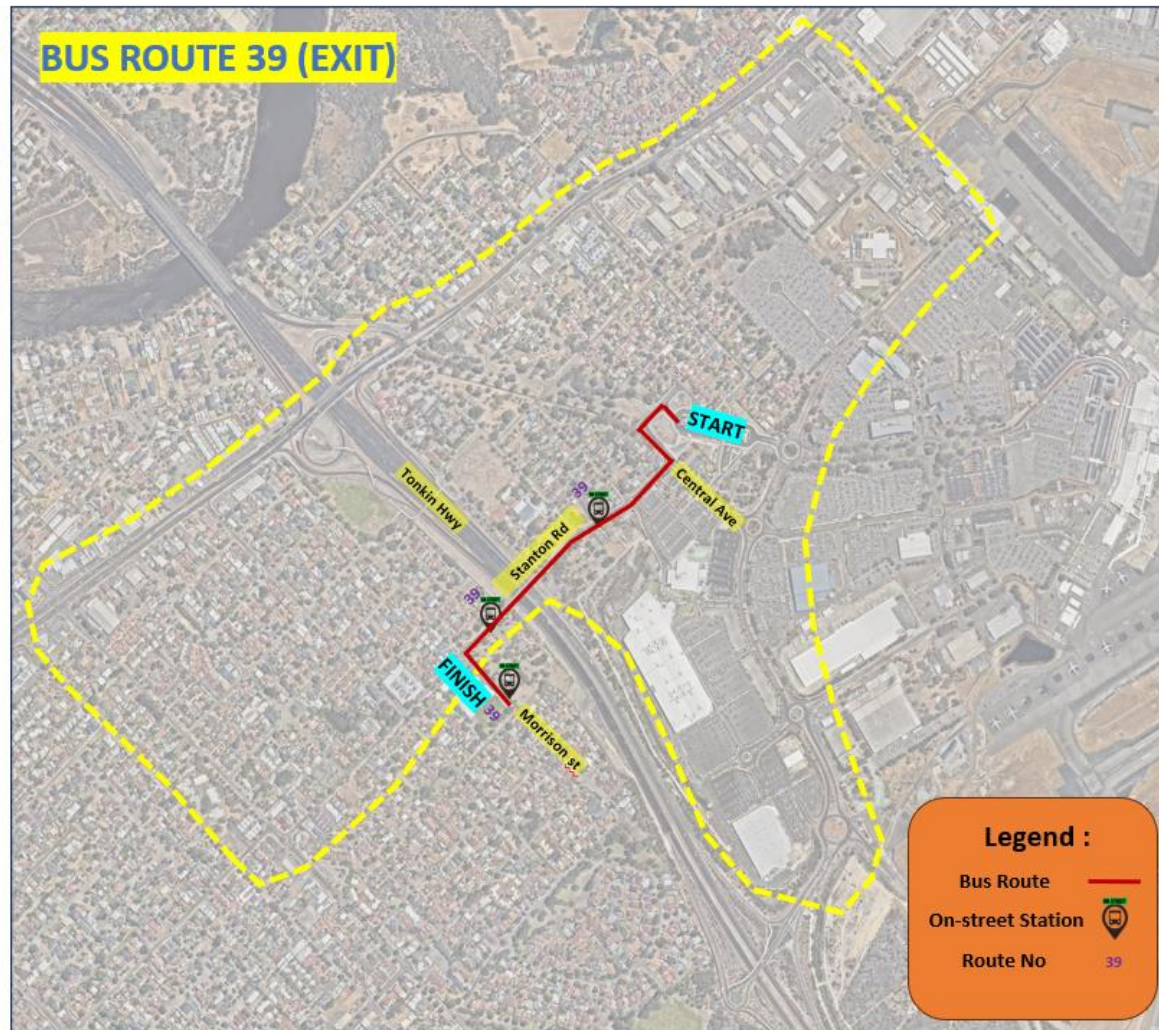
Route No	From	Stops In Network	Average Time In Network
39	Redcliffe Stn	2	3 min

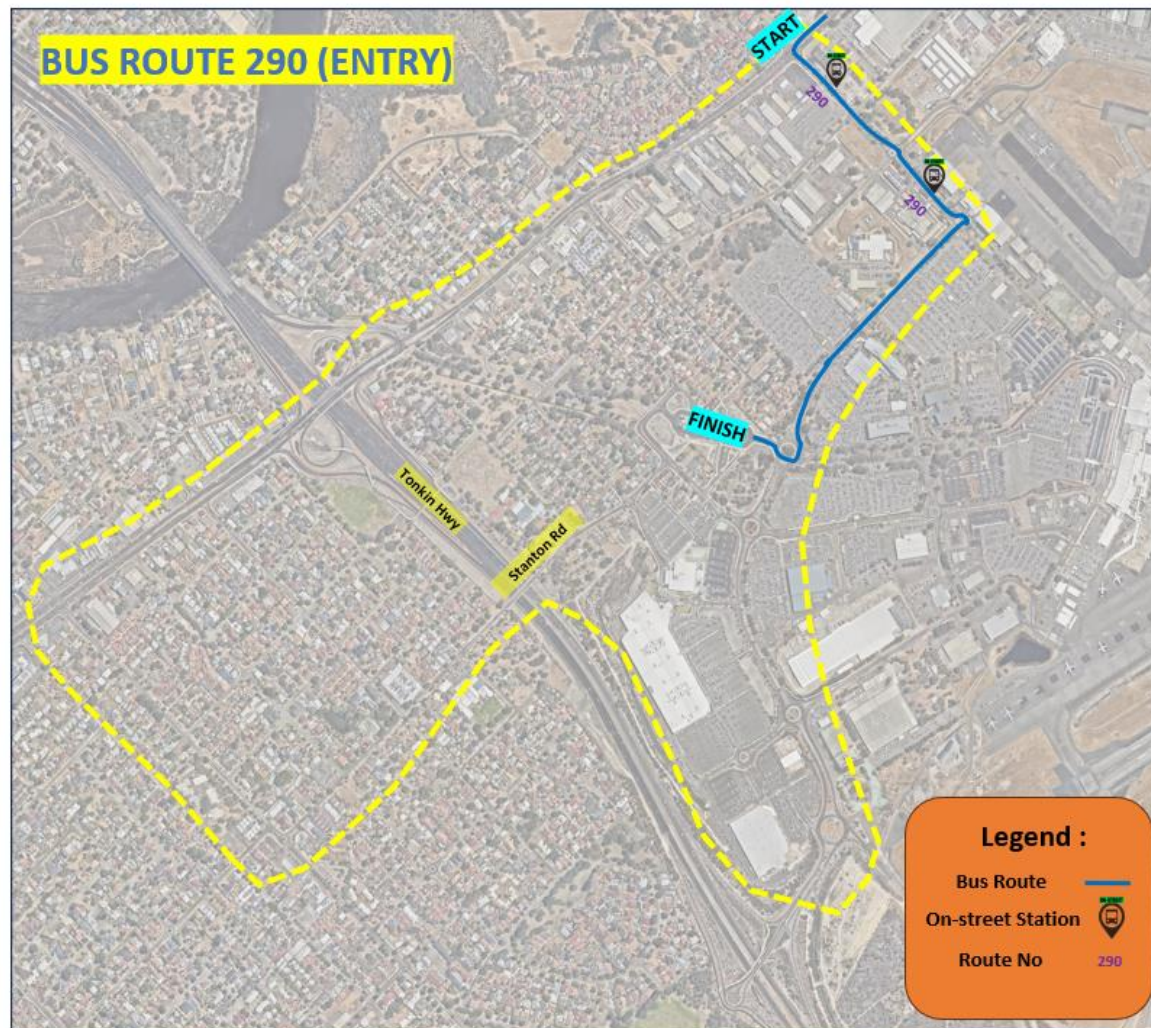| AM		PM	
Start	Finish	Start	Finish
8:01	8:03	4:01	4:03
8:06 (S)*	8:09 (S)*	4:25	4:27
8:09	8:12	4:49	4:52
8:17	8:20		
8:25	8:28		
8:36	8:39		
8:48	8:51		

Notes:
*S : Operates on school days only and deviates via Belmont City College.

BUS ROUTE 39 (EXIT)

Legend :
Bus Route
On-street Station
Route No 39

Route No	Destination	Stops In Network	Average Time In Network
290	Redcliffe Stn	2	5 min

AM		PM	
Start	Finish	Start	Finish
8:01	8:06	4:14	4:19
8:25	8:30	4:38	4:43
8:48	8:54		

BUS ROUTE 290 (ENTRY)

Legend :
Bus Route
On-street Station
Route No   290
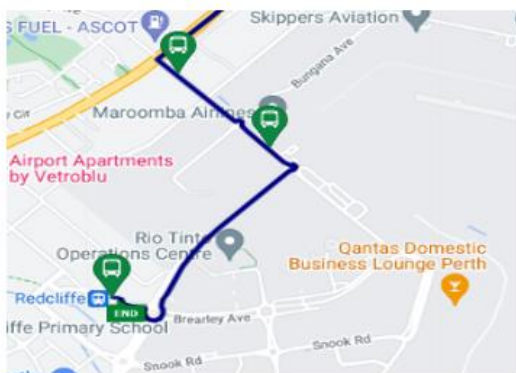
Route No	From	Stops In Network	Average Time In Network
290	Redcliffe Stn	3	3 min

AM		PM	
Start	Finish	Start	Finish
8:24	8:28	4:13	4:16
		4:37	4:40

BUS ROUTE 290 (EXIT)

Legend :
Bus Route
On-street Station
Route No — 290
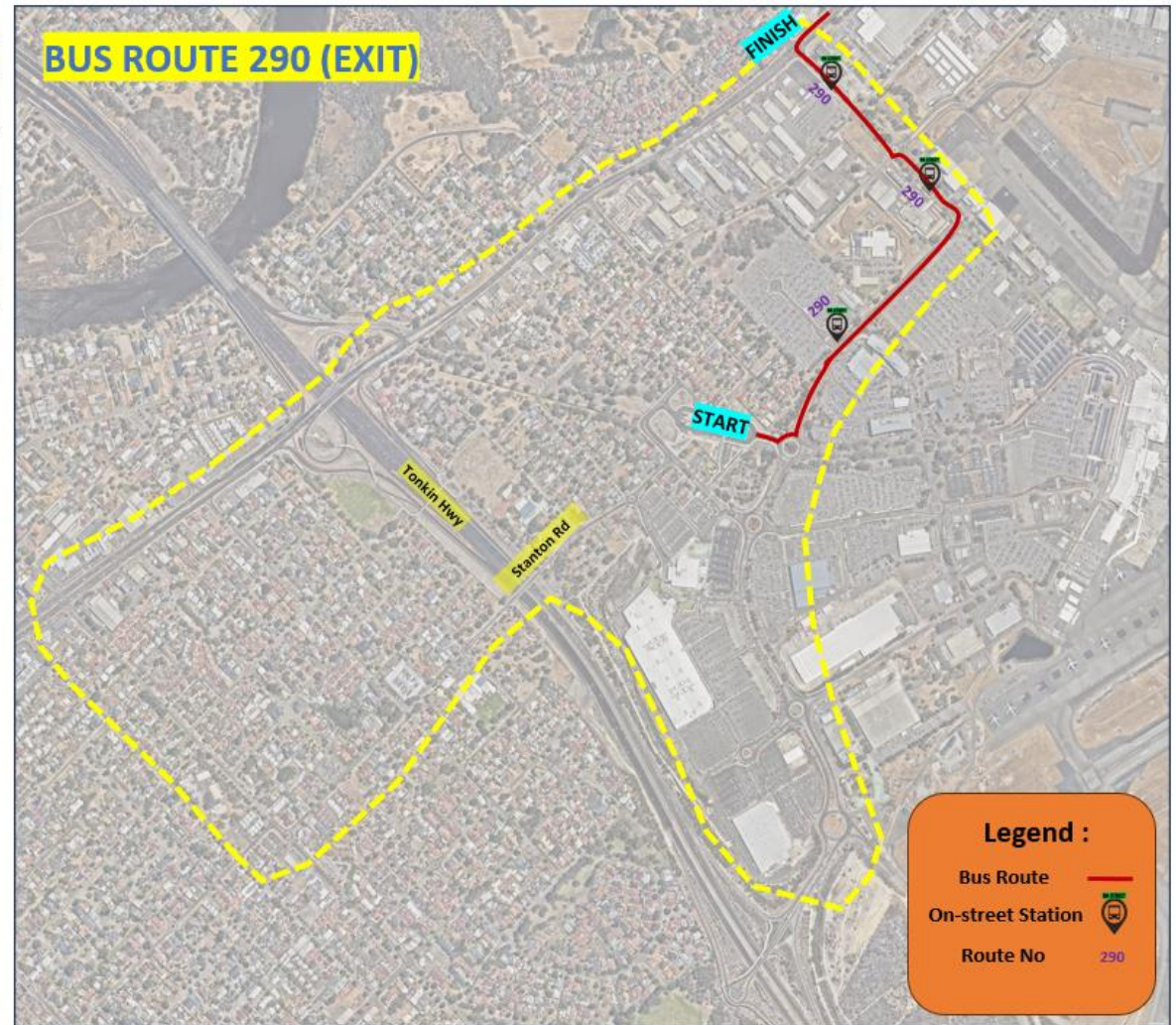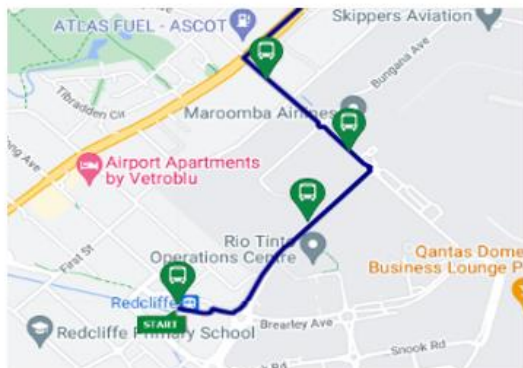
Route No	Destination	Stops In Network	Average Time In Network
291	Redcliffe Stn	2	5 min

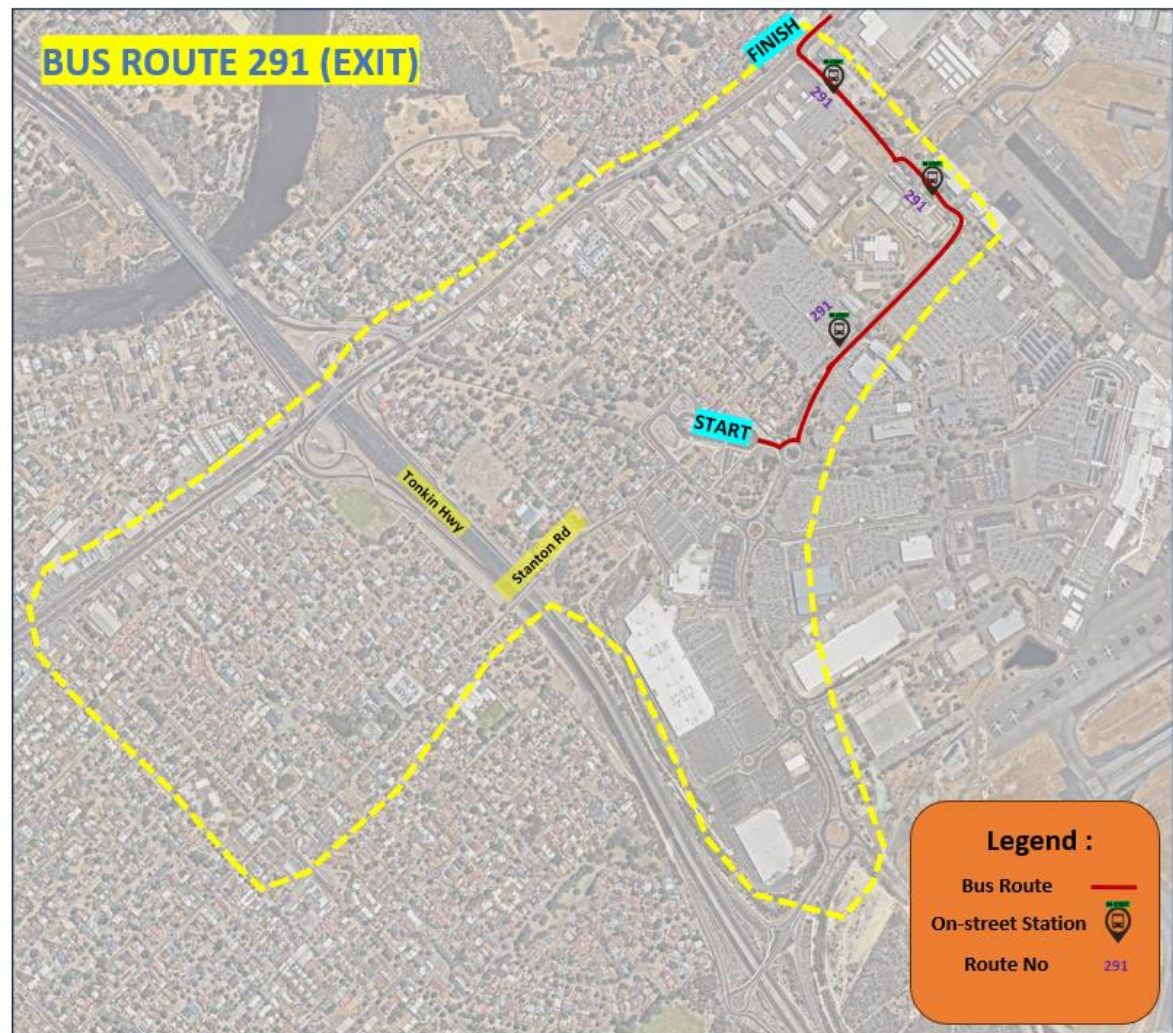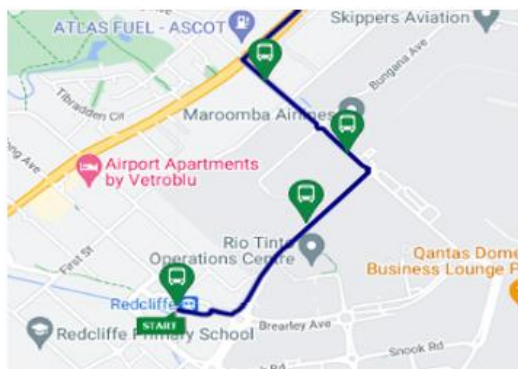| AM		PM	
Start	Finish	Start	Finish
8:13	8:18	4:04	4:09 (H)*
8:38	8:42	4:08	4:12 (B)**
		4:25	4:31
		4:50	4:55

Notes:
*H: Operates on school holidays only.
**B: Operates on school days only and departs Swan Christian College at 3.23pm. Travels via La Salle College at 3.31pm and then travels express to Midland Station.

BUS ROUTE 291 (ENTRY)

Legend :
Bus Route
On-street Station
Route No   291
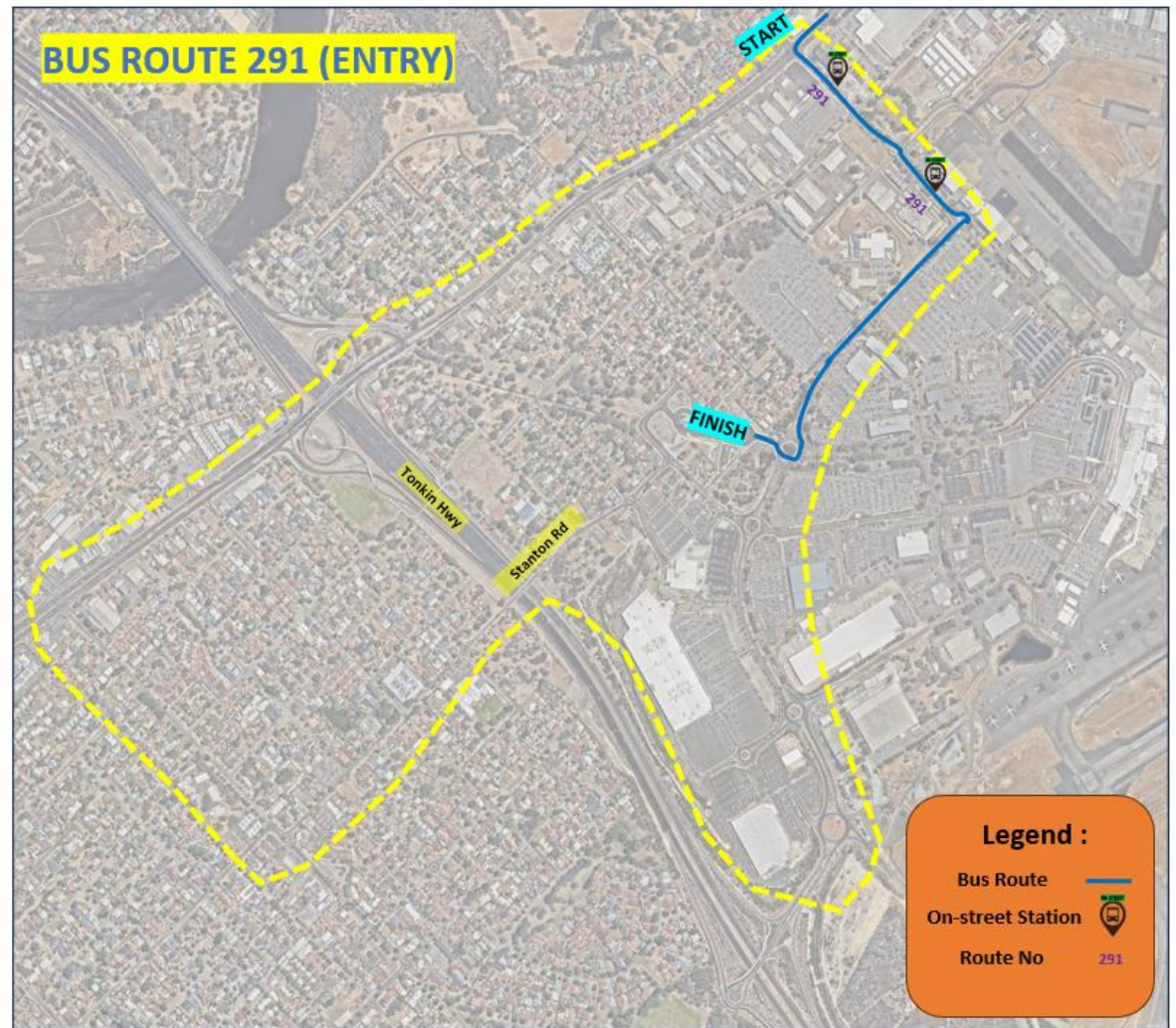
Route No	From	Stops In Network	Average Time In Network
291	Redcliffe Stn	3	4 min

AM		PM	
Start	Finish	Start	Finish
8:12	8:16	4:01	4:05
		4:25	4:30
		4:49	4:54

BUS ROUTE 291 (EXIT)

Legend :
Bus Route
On-street Station
Route No 291

Route No	From/Destination	Stops In Network	Average Time In Network
292	Redcliffe Stn	1	2 min

AM		PM	
Start	Finish	Start	Finish
8:00	8:11	4:01	4:12
8:12	8:23	4:13	4:24
8:24	8:35	4:25	4:36
8:36	8:47	4:37	4:48
8:48	8:59	4:49	5:00

BUS ROUTE 292 CIRCULAR ROUTE

Legend :
Bus Route
On-street Station
Route No   292
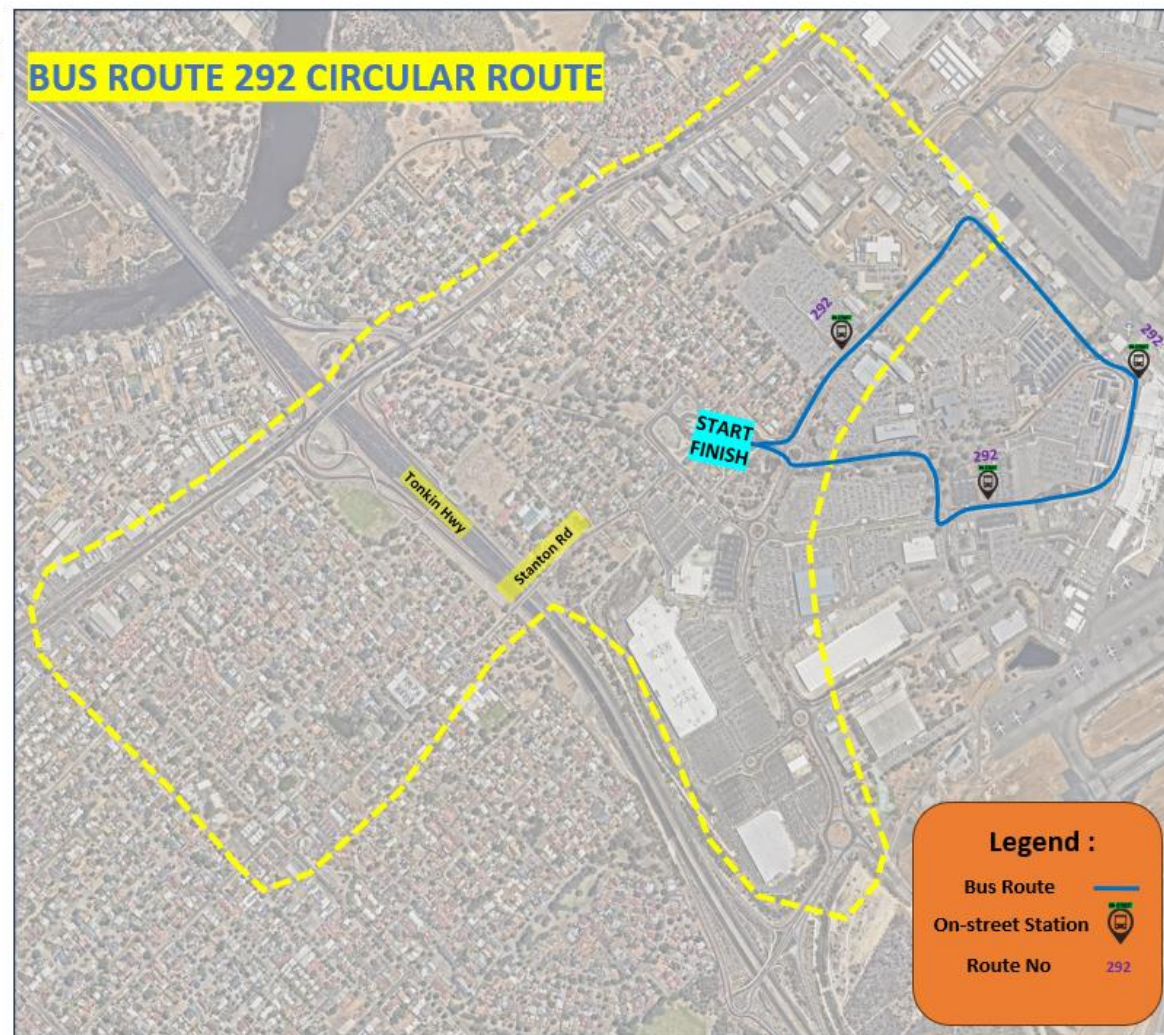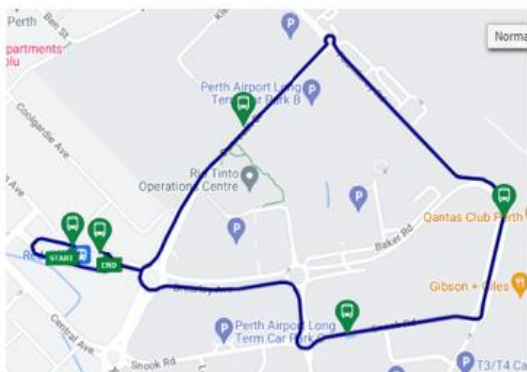
Route No	Destination	Stops In Network	Average Time In Network
293	Redcliffe Stn	6	7 min

AM		PM	
Start	Finish	Start	Finish
7:59	8:06	4:00	4:07
8:23	8:30	4:25	4:31
8:47	8:54	4:48	4:55

BUS ROUTE 293 (ENTRY)
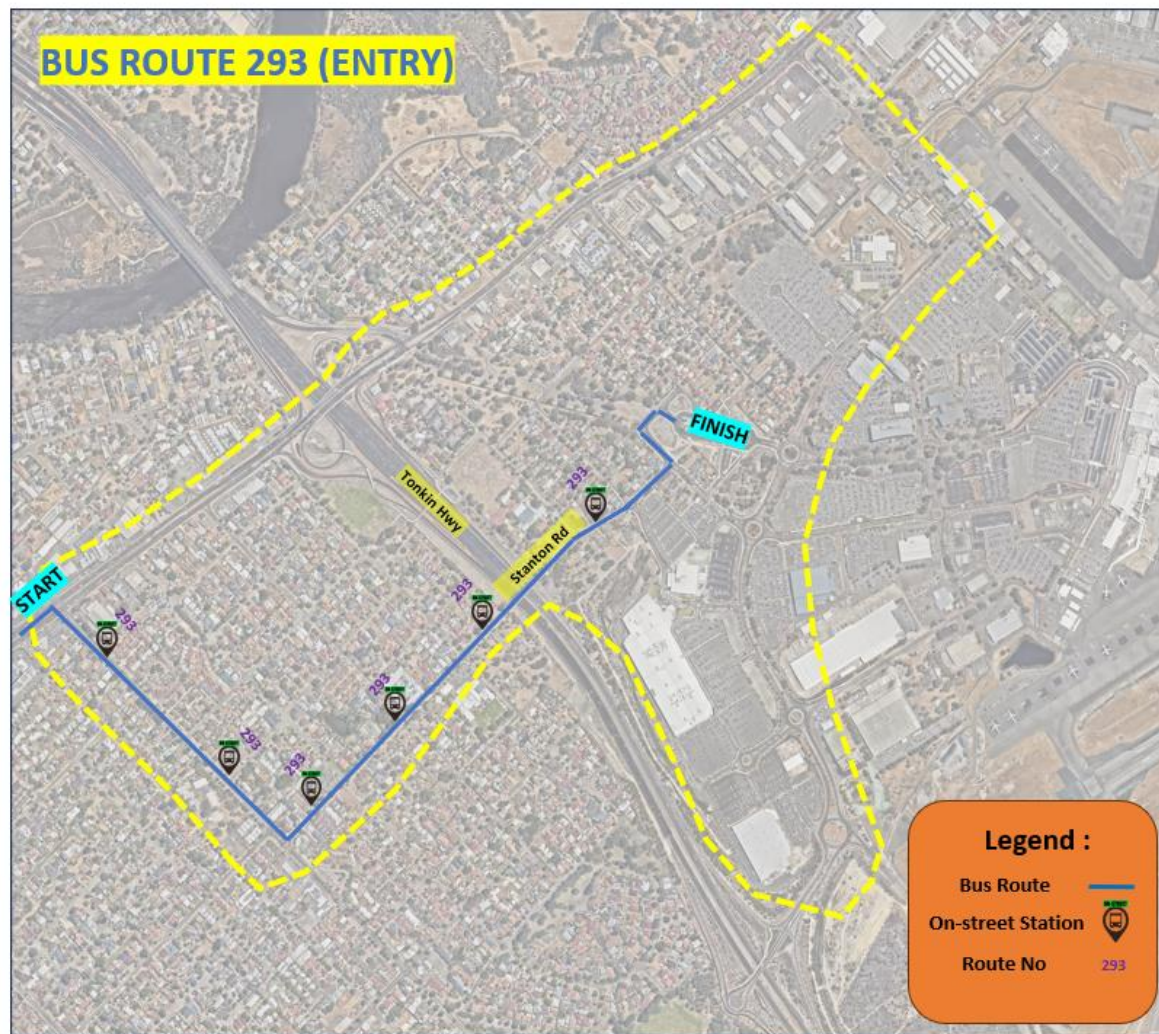
Route No	From	Stops In Network	Average Time In Network
293	Redcliffe Stn	6	5 min

AM		PM	
Start	Finish	Start	Finish
8:12	8:18	4:01	4:06
8:36 (D)*	8:41	4:25	4:30
		4:49	4:54

Notes:
*D : Terminates on Abernethy Rd, Cloverdale (near Belmont Forum).

BUS ROUTE 293 (EXIT)

Legend :
Bus Route
On-street Station
Route No 293
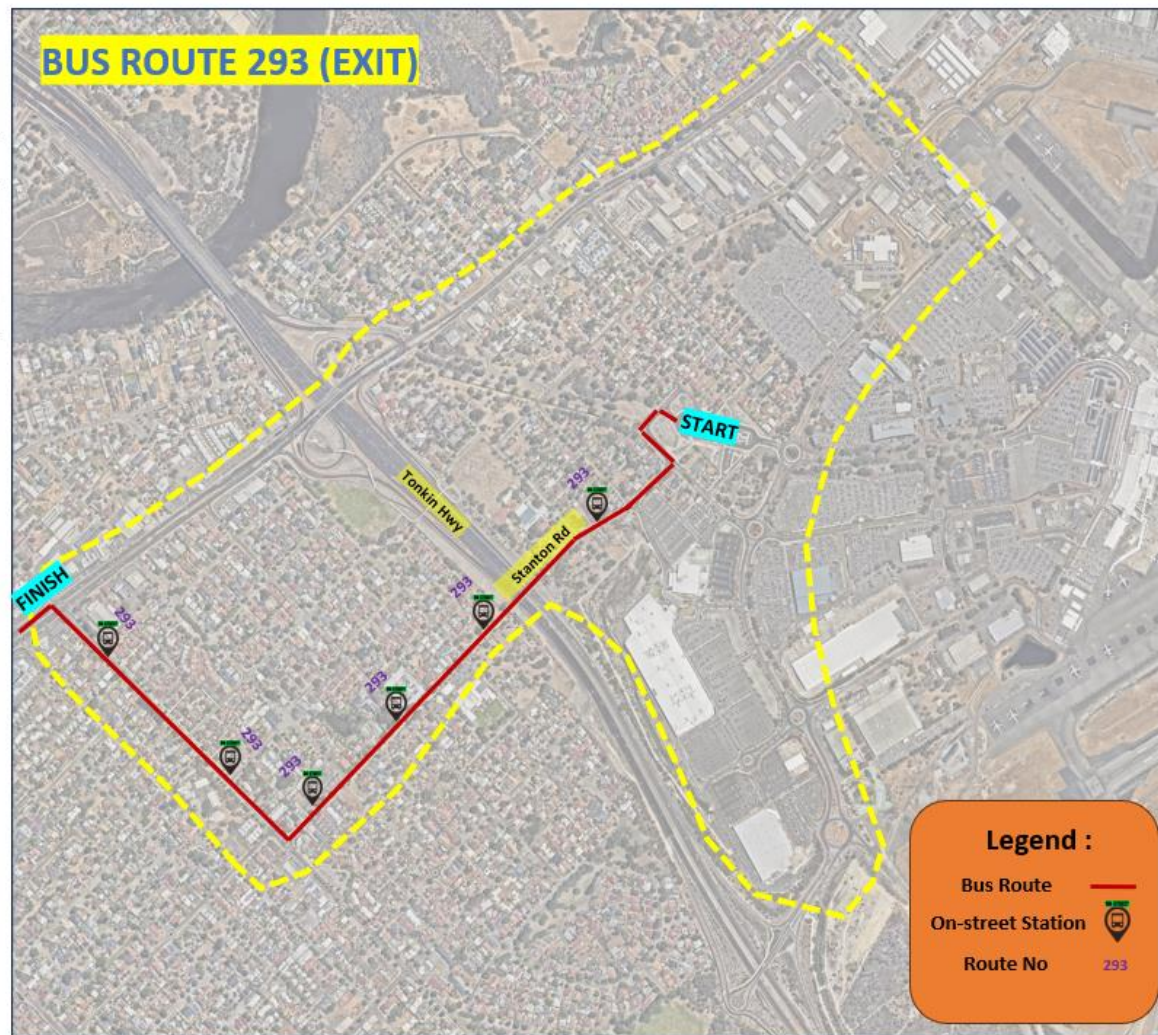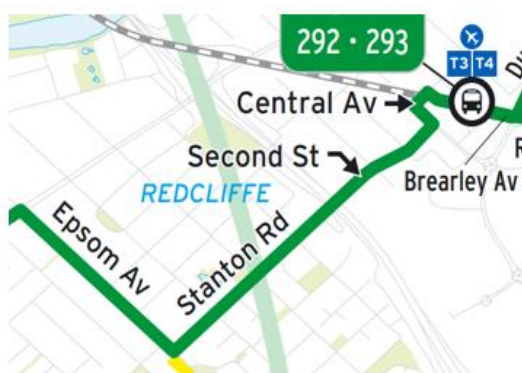
Route No	Destination	Stops In Network	Average Time In Network
935	Redcliffe Stn	4	7 min

AM		PM	
Start	Finish	Start	Finish
7:59	8:06	3:58	4:04
8:12	8:18	4:04	4:10
8:23	8:30	4:11	4:18
8:34	8:41	4:19	4:26
8:45	8:52	4:28	4:35
8:55	9:03	4:44	4:51

BUS ROUTE 935 (ENTRY)

Legend :
Bus Route
On-street Station
Route No   935
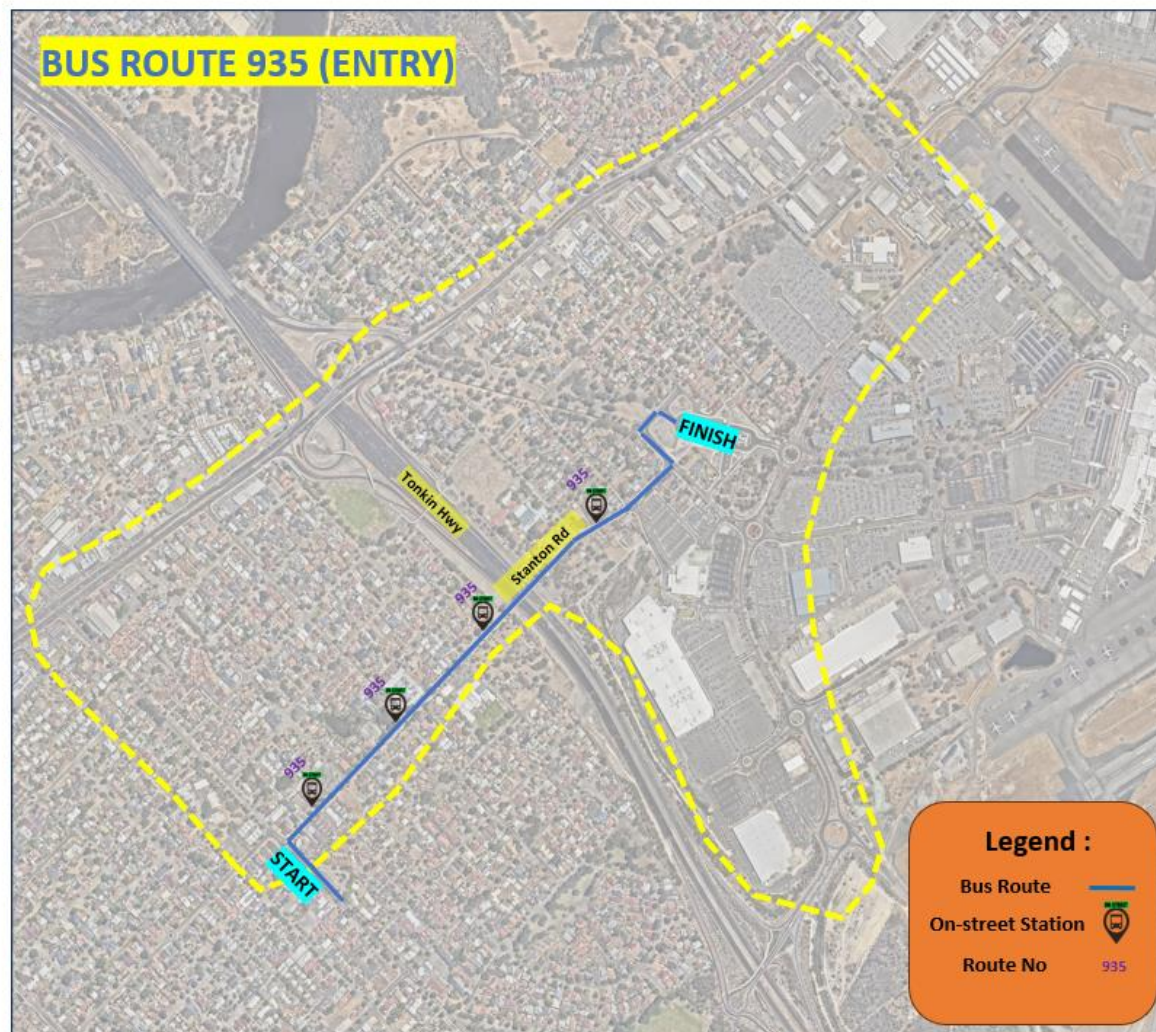
Route No	From	Stops In Network	Average Time In Network
935	Redcliffe Stn	4	4 min

AM		PM	
Start	Finish	Start	Finish
7:59	8:03	4:03	4:07
8:10	8:13	4:13	4:17
8:22	8:25	4:23	4:27
8:34	8:37	4:33	4:37
8:43	8:46	4:43	4:47
8:53	8:56	4:53	4:57

BUS ROUTE 935 (EXIT)

Legend :
- Bus Route
- On-street Station
- Route No 935
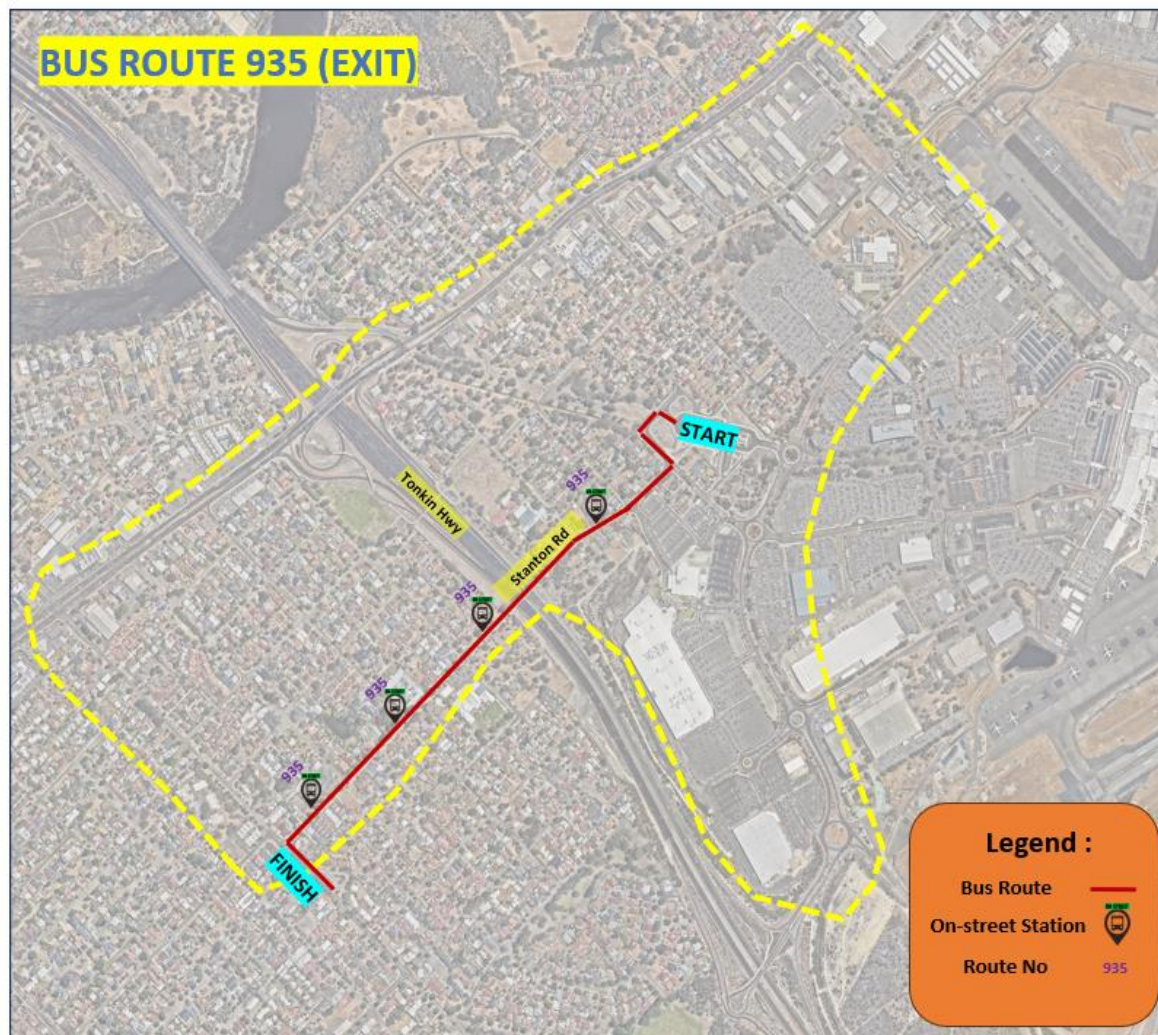
Route No	Destination	Stops In Network	Average Time In Network
940	Redcliffe Stn	6	11 min

AM		PM	
Start	Finish	Start	Finish
7:55	8:06	3:50	4:01
8:07	8:18	3:58	4:09
8:19	8:30	4:10	4:19
8:29	8:40	4:17	4:27
8:43	8:52	4:26	4:38
8:48	8:59	4:35	4:46
		4:43	4:54

BUS ROUTE 940 (ENTRY)

Legend :
- Bus Route
- On-street Station
- Route No — 940
- Off-street Station
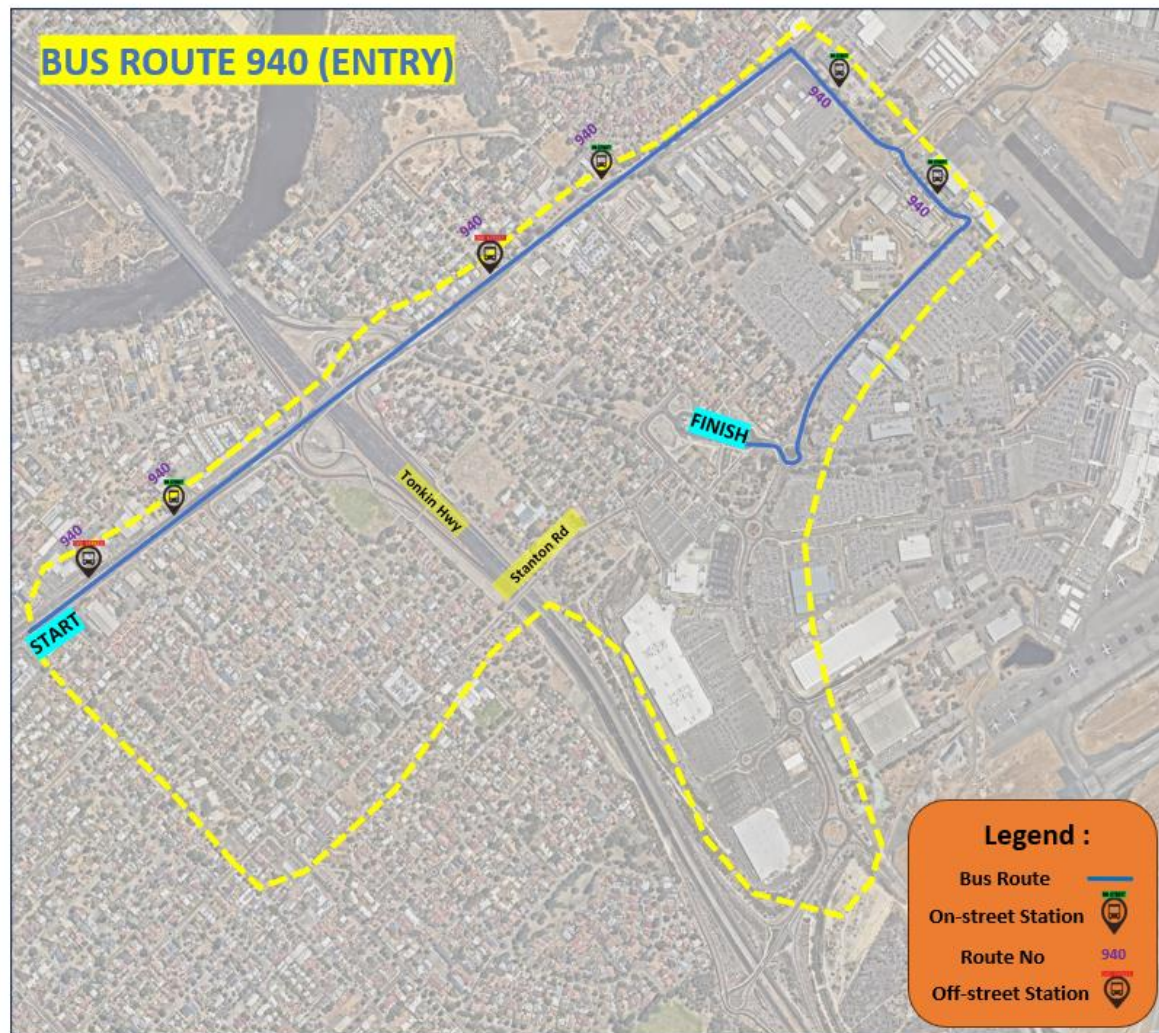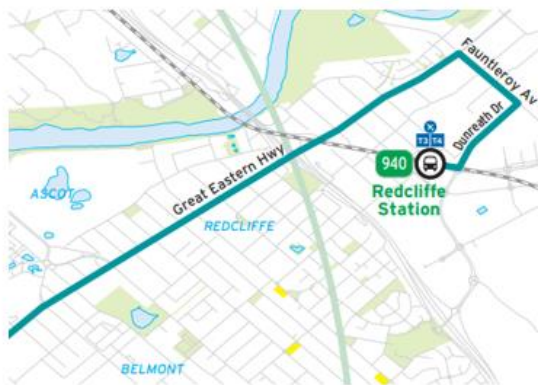
Route No	From	Stops In Network	Average Time In Network
940	Redcliffe Stn	6	6 min

AM		PM	
Start	Finish	Start	Finish
8:00	8:06	4:03	4:09
8:07	8:13	4:11	4:017
8:14	8:20	4:21	4:27
8:21	8:27	4:31	4:37
8:29	8:36	4:41	4:48
8:37	8:43	4:52	4:58
8:45	8:51		
8:55	9:01		

BUS ROUTE 940 (EXIT)

Legend :
Bus Route
On-street Station
Route No 940
Off-street Station