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Ferry Road Modelling- Gold Coast

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1 Introduction

This brief outline the requirements for Assessment 1 in the unit ENN482: Advanced Transport Modelling. Students are required to develop transport models for a real-world study site on the Ferry Road corridor in Southport, Gold Coast, using Aimsun (microsimulation) and SIDRA (intersection) software.

Assessment is criterion-referenced (CRA). Marks are awarded based on the quality, accuracy, and relevance of your submitted work. Students are strongly encouraged to be concise and purposeful, avoid padding your report with unnecessary content.

Key objectives of this assessment:

- Develop a calibrated Aimsun microsimulation model of the Ferry Road corridor.
- Build a SIDRA network model covering all seven study intersections.
- Document your modelling process clearly in a concise report.

Important: Read this brief carefully before starting. All required inputs are provided in Section 4. You are expected to use only the data supplied unless instructed otherwise.

2 Study site

2.1 Corridor Overview

Ferry Road is a key north-south arterial road in Southport on the Gold Coast, managed by the Queensland Department of Transport and Main Roads (TMR). It provides an important connection between the Southport CBD to the north and the residential suburbs of Benowa and Molendinar to the south, passing through an area that includes schools, retirement villages, shopping centres, and medium-density residential development.

Recent residential and commercial development in the surrounding catchment has contributed to increased traffic volumes along the corridor, resulting in notable delays during morning and afternoon peak periods. Transport and Main Roads have commissioned a transport modelling study to assess current corridor performance and explore potential improvements.

2.2 Study Area Boundary

The study area covers the section of Ferry Road running north to south, from its intersection with Queen Street in the north to its intersection with Dixon Drive in the south (via Drury Avenue). This segment includes all signalised intersections along the corridor as listed in Section 2.3.

The extent of the study area is illustrated in Figure 1(Google Maps extract) and Figure 2 (corridor layout plan). The corridor runs in a predominantly north-south direction, consistent with the Aimsun sketch plan orientation.

Note: Use Google Maps and Google Street View to familiarise yourself with the corridor before starting your model. Pay particular attention to lane configurations at each intersection, posted speed limits, median treatments, and turning restrictions.

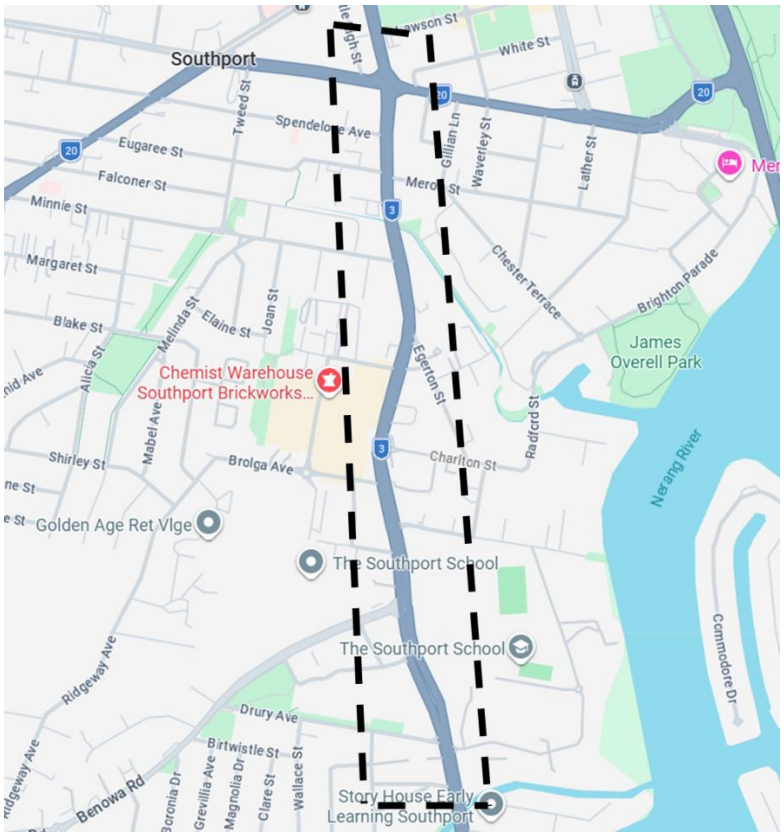


Figure 1 Ferry Road Study Corridor - Southport, Gold Coast (Source: Google Maps)

2.3 Study Intersections (Nodes)

Seven signalised intersections are included in the study network. All seven nodes must be modelled in both Aimsun and SIDRA. The intersections are listed below from north to south, consistent with Figure 2.

Node	Site ID	Intersection	Control	Phasing
Node 1	**5008**	Ferry Rd & Queen St	Signalised	5-phase
Node 2	**5015**	Ferry Rd & Minnie St	Signalised	4-phase
Node 3	**5016**	Ferry Rd & Harvest Crt	Signalised	5-phase
Node 4	**5017**	Ferry Rd & Brolga Ave	Signalised	3-phase
Node 5	**5022**	Ferry Rd & Winchester St	Signalised	2-phase
Node 6	**5018**	Ferry Rd & Benowa Rd	Signalised	3-phase
Node 7	**5019**	Ferry Rd & Drury Ave/Dixon Dr	Signalised	5-phase

Note: Node numbers and Site IDs correspond to those shown in the corridor layout plan (Figure 2). Use consistent numbering throughout your Aimsun model, SIDRA model, and report.

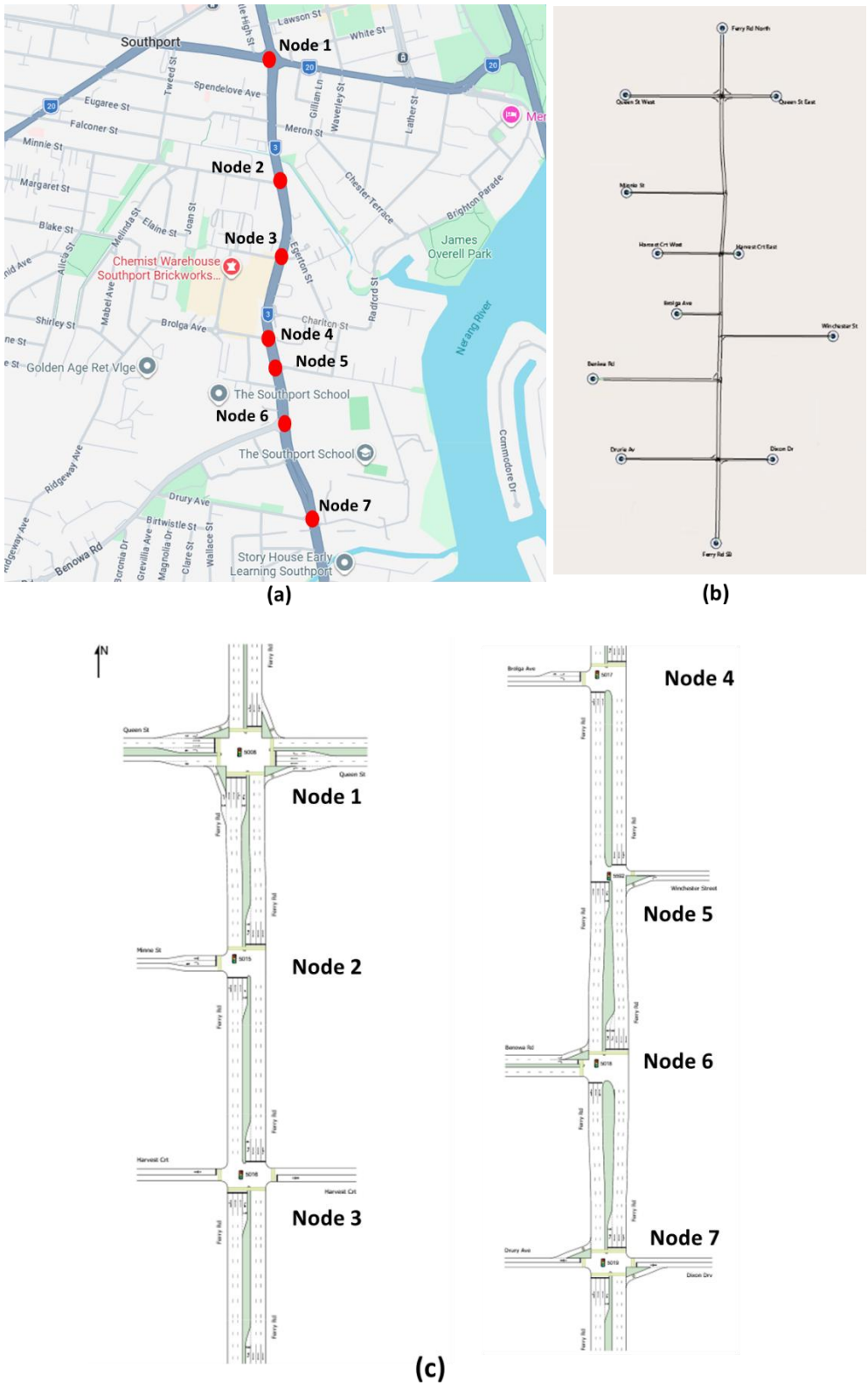


Figure 2 (a) 2D map of the study corridor highlighting the nodes (b) Aimsun sketch plan (not to scale) for the study network (c) Illustration of modelling in SIDRA

3 Assessment submissions

3.1 What to submit

Submit three deliverables via the CANVAS submission portal by the due date. Late submissions will be penalised in accordance with QUT policy.

#	Deliverable	File Format	Key Requirement
1	Aimsun microsimulation model file	Aimsun .ang file	Error-free dynamic simulation
2	SIDRA intersection network model file	SIDRA project file	Error-free, all 7 nodes included as individual site and as a corridor
3	Modelling report (max 2,000 words)	PDF or Word (.docx)	All 4 required sections present

3.2 Aimsun Microsimulation Model

Develop a dynamic microsimulation model of the Ferry Road study corridor in Aimsun. Your model must:

- Include all seven nodes (intersections) as shown in Figure 2.
- Simulate the afternoon peak period: 03:00 PM to 04:00 PM (one-hour simulation).
- Incorporate all modelling inputs from Section 4 - including the OD matrix, signal timings, and vehicle mix (95% passenger cars / 5% heavy vehicles).
- Be free of simulation errors. Run a dynamic simulation and confirm it completes without errors before submitting.
- Include appropriate warm-up time if required (refer to your lab notes for guidance).

Note: The corridor sketch plan in Figure 2 is a schematic layout. Use it for network topology reference only, base actual road geometry and lane widths on real-world data from Google Maps and Street View.

3.3 SIDRA Intersection Model

Develop a SIDRA Intersection network model covering all seven study intersections. Your model must:

- Reflect the network layout shown in Figure 2.
- Incorporate all SIDRA-specific inputs from Section 4 and the associated SIDRA input PDF document.
- Include correct lane configurations, turning movement volumes, and pedestrian crossing data at each intersection.
- Be fully functional and free of errors prior to submission.

3.4 Modelling Report

Prepare a concise report (maximum 1500 words) documenting the development of your Aimsun and SIDRA models. The report must include all four sections below:

1. **Steps for Aimsun Modelling**

- Describe the key steps taken to build the Aimsun network (road geometry, centroid zoning, OD demand entry, signal configuration, simulation settings).
- Describe how you verified the model was error-free (test simulation, error checking).

2. **Assumptions for Aimsun Modelling**
   - List all modelling assumptions (e.g. entry/exit centroid locations, lane widths where not measured directly, warm-up period).
   - Briefly justify each assumption.
3. **Steps for SIDRA Modelling**
   - Describe the key steps to build the SIDRA network (intersection setup, lane configuration, signal phasing input, pedestrian crossing entry, network linking).
4. **Assumptions for SIDRA Modelling**
   - List and justify all assumptions made in SIDRA (e.g. approach cruise speed, median width, median island configuration).

Note: Word count applies to body text only. Tables, figures, captions, and the reference list are excluded from the 2,000-word limit.

4 Modelling inputs

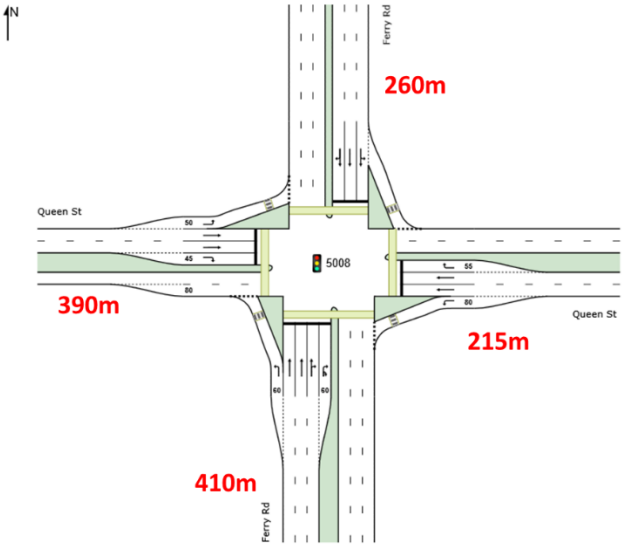
This section provides all numerical inputs required to build and run your models. Read each sub-section carefully and apply the data as directed. Where the table instructs you to examine the study site, you must use Google Maps / Street View, document what you observed, and justify your decision in your report.

4.1 SIDRA Modelling Inputs

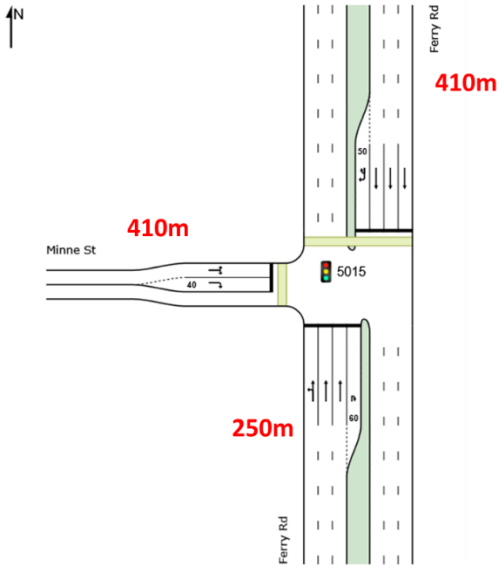
Table 1 SIDRA Modelling Input Parameters

Parameter	Details / Action Required
Approach Distance	Refer to Figure 3
Movement Class	Light and Heavy Vehicles
Lane Width	3.3 metres
Median Island Width	Examine the corridor via Google Street View and make a justified assessment. Document your reasoning in the report.
Median Island Configuration	Examine the corridor via Google Street View and make a justified assessment. Document your reasoning in the report.
Short Lane Length	Refer to the attached site layout and volumes PDF
Basic Saturation Flow	1,800 TCU/hr
Vehicle and Pedestrian Crossing Volume	Refer to the attached site layout and volumes PDF
Vehicle Volume Unit Time	60 minutes (peak flow period = 60 minutes)
Approach Cruise Speed	Identify from the study site, check posted speed limits on various approaches via Google Street View
Cycle Time	140 seconds
Phase Times	Refer to Table 3 - Phase Timing for Intersections

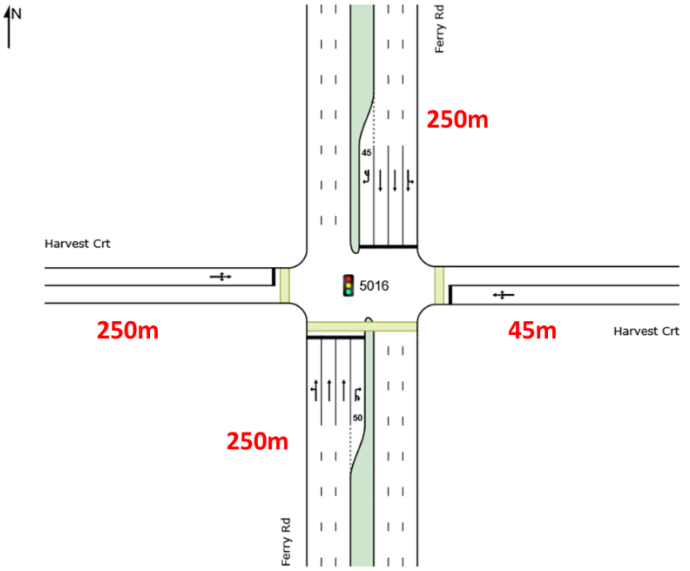
Node 1



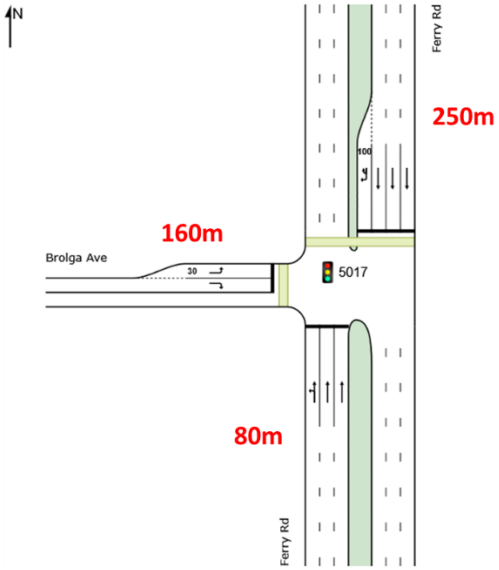
Node 2



Node 3



Node 4



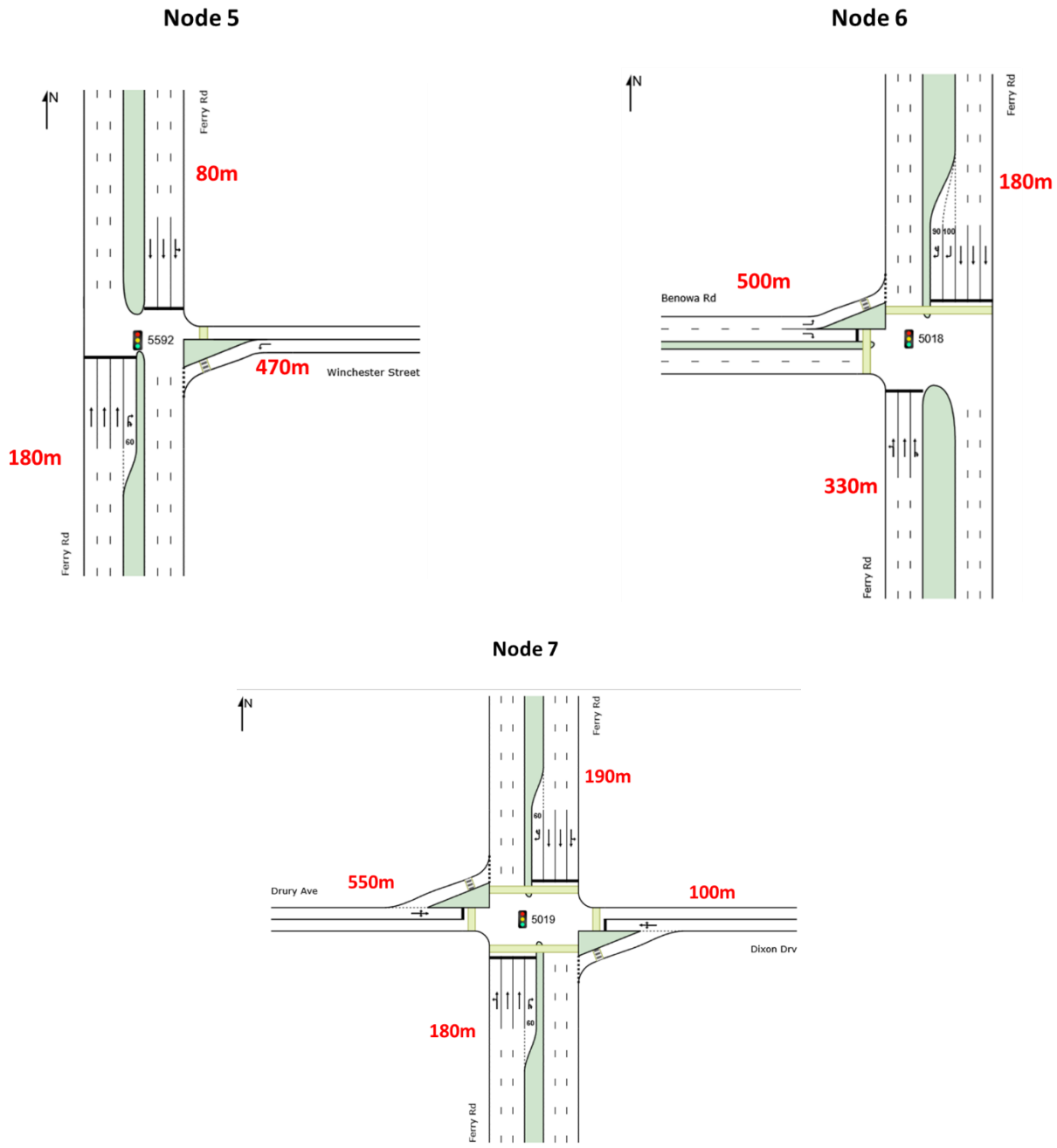


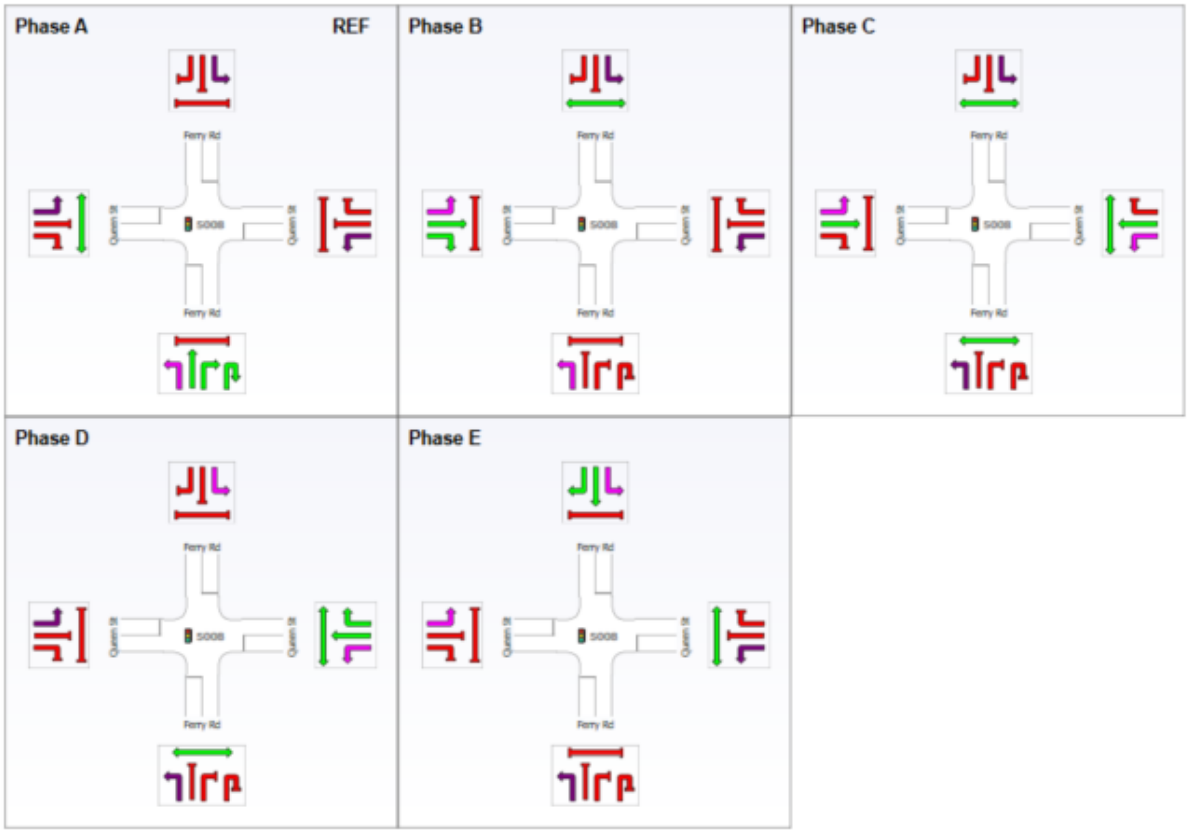
Figure 3: SIDRA intersection geometry diagrams showing approach distances for Nodes 1–7

4.2 Signal Phase Diagrams (SIDRA)

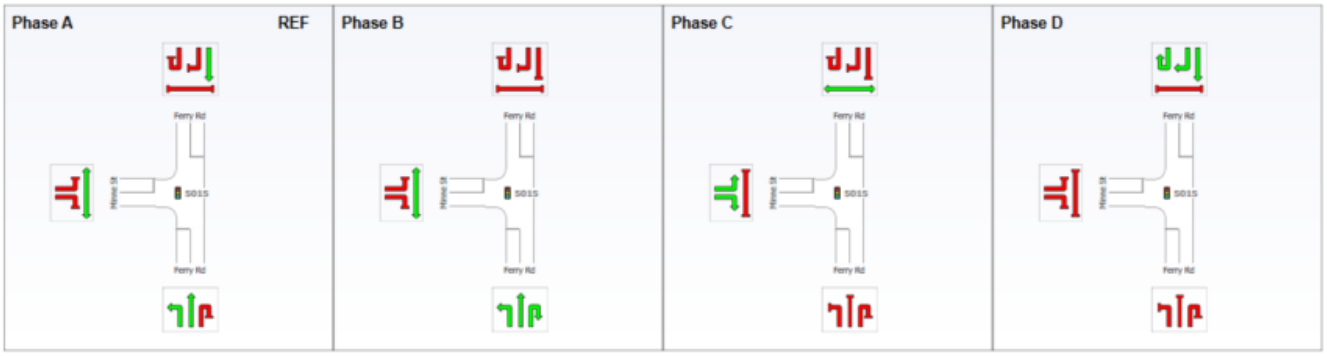
Table 2 provides the signal phase diagrams (movement groups) for each node. Enter these phases into SIDRA and Aimsun exactly as shown. Use the phase timing values from Table 3.

Table 2 Signal Phase Diagrams for Nodes 1 to 7

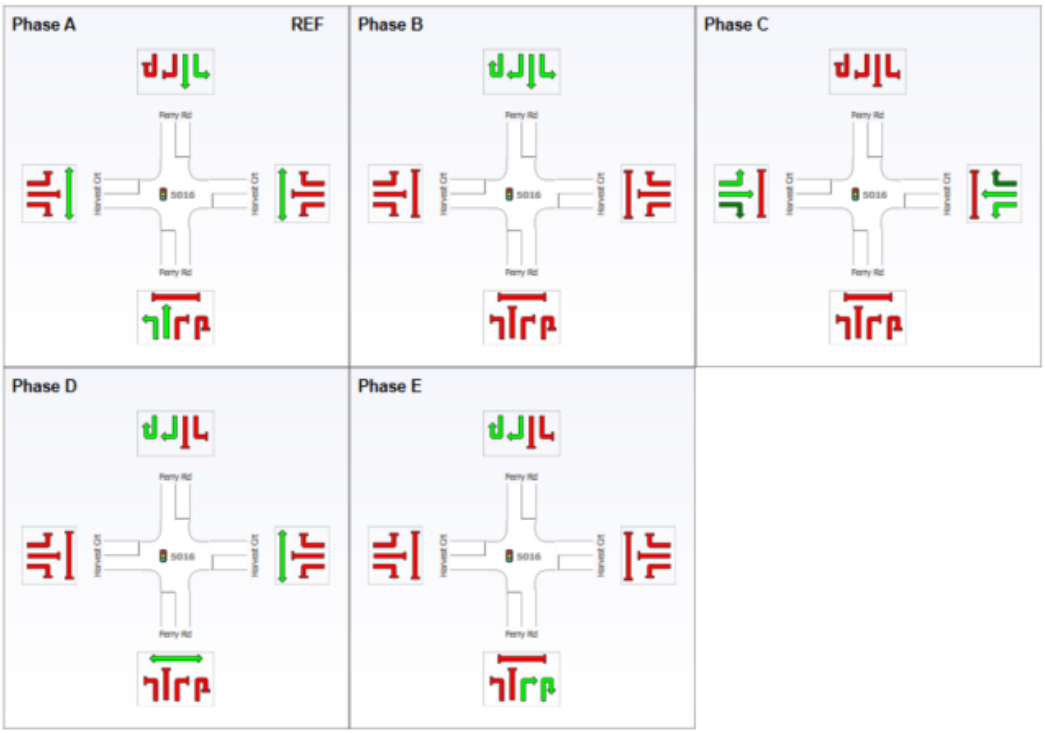
Phasing for Node 1:



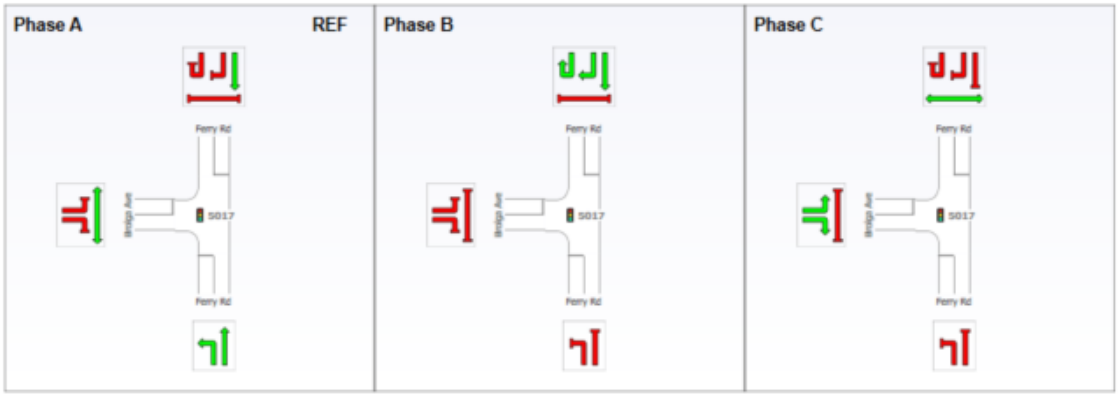
Phasing for Node 2:



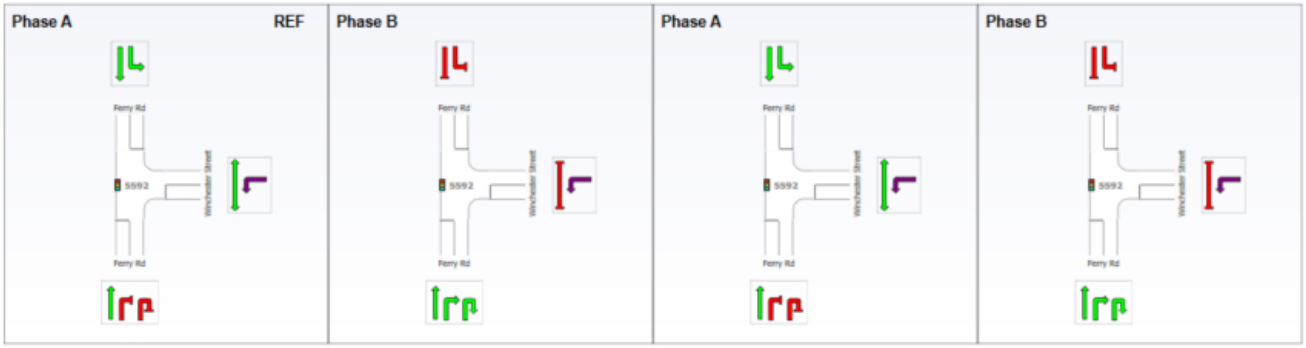
Phasing for Node 3:



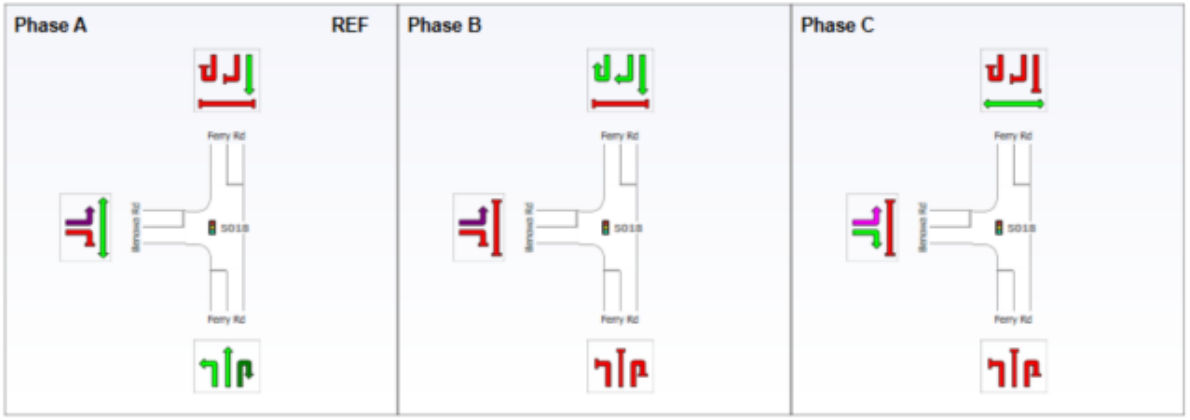
Phasing for Node 4:



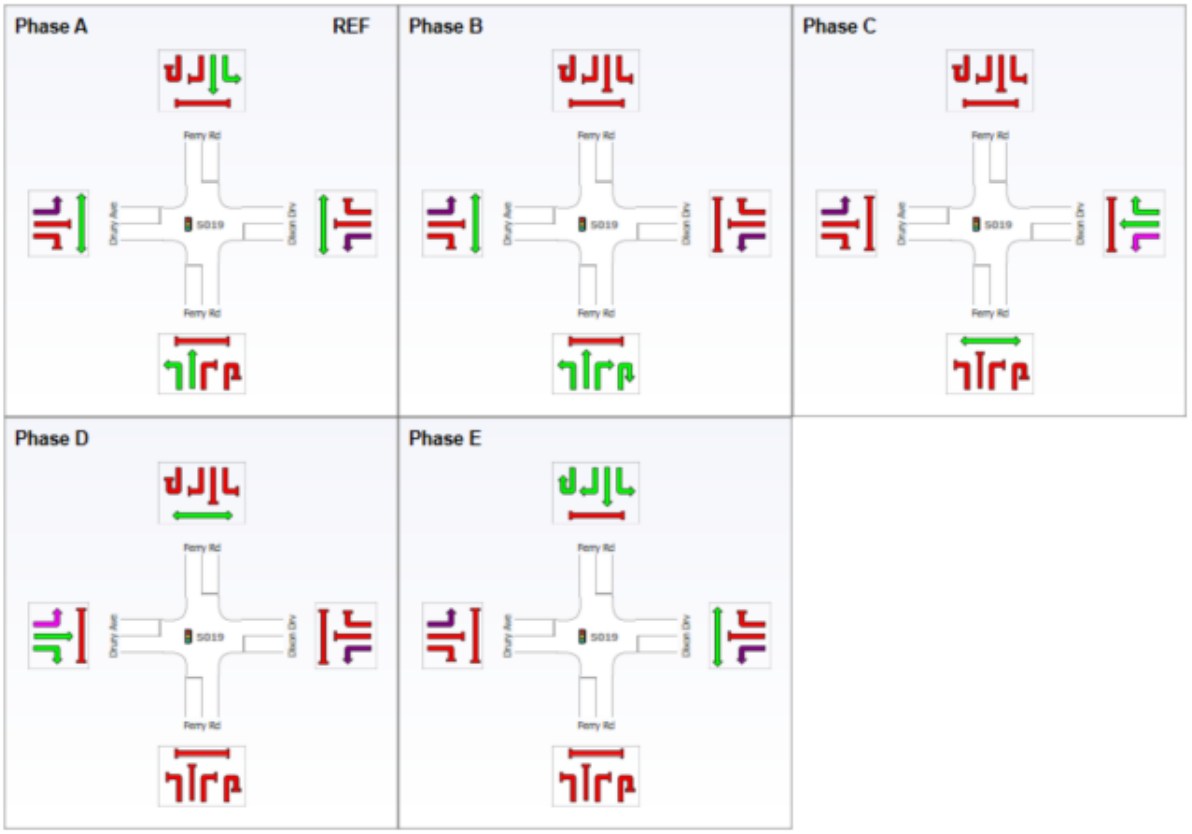
Phasing for Node 5:



Phasing for Node 6:



Phasing for Node 7:



4.3 Signal Phase Timing

Table 3 provides signal phase timing for all seven intersections. These timings apply to both your Aimsun and SIDRA models. All phase times include a 5-second inter green period (3 s amber + 2 s all-red). The total cycle time at every intersection is 120 seconds.

Table 3 Signal Phase Timing for All Nodes

Node / Intersection	Phase A (s)	Phase B (s)	Phase C (s)	Phase D (s)	Phase E (s)	Cycle Time (s)
Node 1- Ferry Rd & Queen St	48	20	16	18	38	140
Node 2- Ferry Rd & Minnie St	77	20	16	27	_	140
Node 3- Ferry Rd & Harvest Crt	56	22	28	6	15	140
Node 4- Ferry Rd & Brolga Ave	88	27	25	_	_	140
Node 5- Ferry Rd & Winchester St	58 & 32	32 & 24	_	_	_	140
Node 6- Ferry Rd & Benowa Rd	81	31	28	_	_	140
Node 7- Ferry Rd & Drury Ave/Dixon Dr	53	19	24	27	17	140

4.4 Origin-Destination Matrix (Aimsun)

Table 4 provides the Origin-Destination (OD) matrix for the Aimsun microsimulation. Values represent total vehicle trips over the one-hour afternoon peak simulation period (03:00–04:00 PM).

Vehicle mix: Apply 95% passenger cars and 5% heavy vehicles uniformly across all OD pairs will be useful for SIDRA modelling. **Error! Reference source not found.** will be useful for both Aimsun and SIDRA modelling while Table 4 will be essential for Aimsun modelling.

Table 4 Origin Destination matrix for Aimsun simulation (vehicles for one hour simulation; Assume 95% of cars and 5% Heavy vehicles)

Origin/ Destination	***Ferry Rd North***	***Queen St West***	***Queen St East***	***Minnie St***	***Harcest Crt West***	***Brolga Ave***	***Winchester St***	***Beniwa Rd***	***Drurie Av***	***Dixon Dr***	***Ferry Rd SB***	***Harvest Crt East***	***Total***
Ferry Rd North	0	95	80	25	90	30	35	395	0	15	550	0	1315
Queen St West	70	0	350	10	30	20	20	10	10	5	100	10	635
Queen St East	110	405	0	15	30	20	0	20	10	5	370	20	1005
Minnie St	40	10	10	0	10	10	0	0	0	0	270	0	350
Harcest Crt West	110	35	25	20	0	0	5	0	5	5	20	40	265
Brolga Ave	20	10	10	5	0	0	30	40	10	10	190	5	330
Winchester St	0	0	0	0	5	0	0	15	10	0	55	0	85
Beniwa Rd	100	80	200	20	5	5	60	0	10	5	110	10	605
Drurie Av	10	0	5	0	5	0	5	0	0	15	50	5	95
Dixon Dr	20	5	5	5	5	5	0	5	20	0	75	0	145
Ferry Rd SB	620	40	190	120	10	150	225	55	60	35	0	20	1525
Harvest Crt East	90	0	0	0	45	10	0	0	0	0	90	0	235
Total	1190	680	875	220	235	250	380	540	135	95	1880	110	6590

5 Criterion-referenced assessment

Table 5 CRA for Assessment-1

Criteria	Assessment weight	7	6	5	4	3	2	1
Network modelling in Aimsun	50% (Maximum Score 10)	Geometry, signal timing, and OD demand all correct. Simulation runs error-free.	A working model with less than three major errors, and two minor errors.	A working model with less than five major errors, and three minor errors.	A working model with less than seven major errors, and three minor errors.	A non-working model with several errors.		
Network modelling in SIDRA	40% (Maximum Score 8)	Correct lanes, turning movements, pedestrian crossings, and all inputs. No errors.	A working model with less than three major errors, and two minor errors.	A working model with less than five major errors, and three minor errors	A working model with less than seven major errors, and three minor errors	Non-A non-working model with several errors.		
Report explaining the procedure of AIMSUN and SIDRA model development	10% (Maximum Score 2)	All steps present and well-structured.	The solution process is complete, neat, and easily followed presentation of all steps.	The solution process is complete and comprehensible, but an unsystematic presentation of steps.	Only minor steps are absent in the solution process, and comprehensible but unsystematic or incomplete presentation of steps.	Major steps absent in the solution process, or incomprehensible or indecipherable presentation of the solution.		

5.1 Grade Descriptors

The grade levels in Table 5 are interpreted as follows:

- Grade 7 (High Distinction): All inputs correct, model error-free, report clearly structured and comprehensive.
- Grade 6 (Distinction): Strong work with only minor issues; model functional and largely correct.
- Grade 5 (Credit): Competent work with some inaccuracies; model runs with moderate errors.
- Grade 4 (Pass): Adequate work; model functional but with multiple errors or omissions.
- Grade 3 (Marginal Fail): Model does not run correctly; significant errors throughout.
- Grades 1–2 (Fail): Model non-functional or substantially incomplete.

5.2 Common Errors to Avoid

Based on previous cohorts, the following errors are most frequently observed:

- Incorrect signal phase sequence or phase times in Aimsun or SIDRA.
- Missing or incorrectly entered OD demand pairs in Aimsun.
- Wrong vehicle mix (must be 95% car / 5% HV. not the software default).
- Lane configuration errors at complex intersections (e.g. dual-turn lanes, channelised movements).
- Failing to run and check a test simulation before submission.
- Report sections that describe generic software steps rather than what was done for this specific corridor.
- Site-based assumptions (median width, approach speed) stated without justification.

6 Submission Checklist

Use the checklist below to verify your submission is complete before uploading to CANVAS.

- Aimsun model (.ang file)- all 7 nodes included dynamic simulation runs error-free for 03:00 - 04:00 PM.
- SIDRA model file - all 7 intersections included with correct phasing, pedestrian volumes, and lane configurations.
- Report (max 2,000 words)- all four required sections present (Aimsun Steps, Aimsun Assumptions, SIDRA Steps, SIDRA Assumptions).
- Vehicle mix: 95% cars, 5% heavy vehicles applied in Aimsun.
- OD matrix entered correctly- row and column totals verified against Table 4.
- Phase timings from Table 3 applied correctly in both Aimsun and SIDRA.
- Site-specific parameters (median configuration, approach speed) documented and justified in the report.

---- End of the brief