Sturt Plateau Pipeline

Traffic Impact Assessment

APA SPP Pty Ltd

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SLR Project No.: 680.030294.00007

15 October 2024

Revision: v3.0

Revision Record

Revision	Date	Prepared By	Checked By	Authorised By
v1.0	13 August 2024	Naristi Neale	Anthony Kay	Natalie Calder
v2.0	26 August 2024	Naristi Neale	Anthony Kay	Natalie Calder
v3.0	15 October 2024	Naristi Neale	Anthony Kay	Natalie Calder

Basis of Report

This report has been prepared by SLR Consulting Australia (SLR) with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with APA SPP Pty Ltd (the Client). Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

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SLR disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the work.

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Acronyms and Abbreviations

Acronym/ Abbreviation	Definition
AADT	Annual Average Daily Traffic
AGP	Amadeus Gas Pipeline
APA	APA Group Limited
AUL	Auxiliary left turn
AUL(S)	Auxiliary left turn (short)
AUR	Auxiliary right turn
BAL	Basic left turn
BAR	Basic right turn
BCR	Benefit Cost Ratio
CH	Chainage
CHL	Channelised left turn
CHR	Channelised right turn
CHR(S)	Channelised right turn (short)
DLI	Department of Logistics and Infrastructure
DOS	Degree of Saturation
EMP	Environment Management Plan
FMS	Fatigue Management System
GML	General Mass Limits
km	kilometre
LGA	Local Government Area
NT	Northern Territory
NTG	Northern Territory Government
OSOM	Oversize Overmass
PPL	Perpetual Pastoral Lease
the Project	Sturt Plateau Pipeline
Project Area	The area to which the Project relates
ROW	Right of Way
RTA NSW	Roads and Traffic Authority New South Wales (superseded by TfNSW)
SA	South Australia
SIDRA	SIDRA Intersection
SISD	Safe Intersection Sight Distance
SL	Simple left turn
SLR	SLR Consulting Australia Pty Ltd
SPP	Sturt Plateau Pipeline

SR	Simple right turn
TIA	Traffic Impact Assessment
TfNSW	Transport for New South Wales
TMP	Traffic Management Plan

Glossary

Term	Definition	Source
95th Percentile Queue	The 95th percentile queue length is the value below which 95 per cent of all observed queue lengths fall, or 5 per cent of all observed queue lengths exceed.	SIDRA Intersection User Guide 9.1 (Akcelik and Associates Pty Ltd, 2023)
Annual Average Daily Traffic	The total volume of traffic passing a roadside observation point over the period of a calendar year, divided by the number of days in that year (365 or 366 days).	Austroads Glossary of Terms Sixth Edition (Austroads, August 2015)
Austroads	The association of Australian and New Zealand road transport and traffic authorities whose purpose is to contribute to the achievement of improved road transport outcomes.	https://austroads.com.au/about-austroads
Degree of Saturation	The ratio, usually expressed as a percentage, of the number of vehicles entering an intersection in a specified period, to the number which could enter if an approach was fully saturated (i.e. at capacity) during that period.	Austroads Glossary of Terms Sixth Edition (Austroads, August 2015)
iPAVE Data	Intelligent Pavement Assessment Vehicles (iPAVE) are comprised of a prime mover and trailer equipped with a heavy weight over a single rear axle. A series of lasers mounted in the trailer measures the deflection velocity of the pavement in the left-hand wheel path as the truck travels down the road. This information is used to assess the bearing capacity of the pavement, and can also measure roughness, texture, rutting, and provide digital imagery for visual rating and cracking.	https://www.arrb.com.au/ipave
SIDRA Intersection	Traffic analysis software developed by SIDRA Solutions which provides estimates of capacity and performance statistics for individual intersections and networks of intersections.	SIDRA Intersection User Guide 9.1 (Akcelik and Associates Pty Ltd, 2023)
Warrant	A criterion, usually numerical, used to determine whether the construction of a traffic facility or the installation of a traffic control device may be justified.	Austroads Glossary of Terms Sixth Edition (Austroads, August 2015)

1.0 Introduction

1.1 Overview

SLR Consulting Australia Pty Ltd (SLR) has been engaged by APA SPP Pty Ltd (APA) to prepare a Traffic Impact Assessment (TIA) for a proposed transmission pipeline known as the Sturt Plateau Pipeline (SPP) that will connect the Tamboran B2 Pty Ltd's (Tamboran) Sturt Plateau Compression Facility development sites in the southern Beetaloo Basin to the existing Amadeus Gas Pipeline (AGP), referred to herein as 'the Project'.

The SPP will be located approximately 80 km north of Elliott, in the Northern Territory. The Project will involve the construction, operation and maintenance of a buried, 300 mm diameter gas transmission pipeline approximately 37 km in length with a maximum allowable operating pressure of 9.6 megapascals (MPaG). The Project will include surface facilities comprising of a receipt station (Shenandoah Facility) and a delivery station (Sturt Plateau Facility).

1.2 Assessment Scope

This Traffic Impact Assessment (TIA) report assesses the consistency of the proposed project with Northern Territory (NT) planning, and the impacts of the proposed development on the surrounding road network. The TIA identifies measures required to support the Project and provides an assessment of the traffic and transport aspects of the Project proposals against the requirements of the Department of Logistics and Infrastructure (DLI) formerly the Department of Infrastructure, Planning and Logistics.

2.0 Project Description

2.1 Overview

The Project is situated in the Birdum region of the Northern Territory within the Roper Gulf Local Government Area (LGA) and bordering the Barkly LGA. The preferred pipeline alignment passes through Perpetual Pastoral Lease (PPL) land. The Project's disturbance footprint encompasses an area of approximately 146 ha. The development envelope within which the Project will be located, hereafter referred to as the 'Project Area', encompasses approximately 2002 ha and comprises of a number of land tenures, as well as the Stuart Highway road reserve. A summary of the land tenures by project element is provided in **Table 1** below, with further detail provided in **Figure 1**.

Table 1 Land Tenure and Project Element

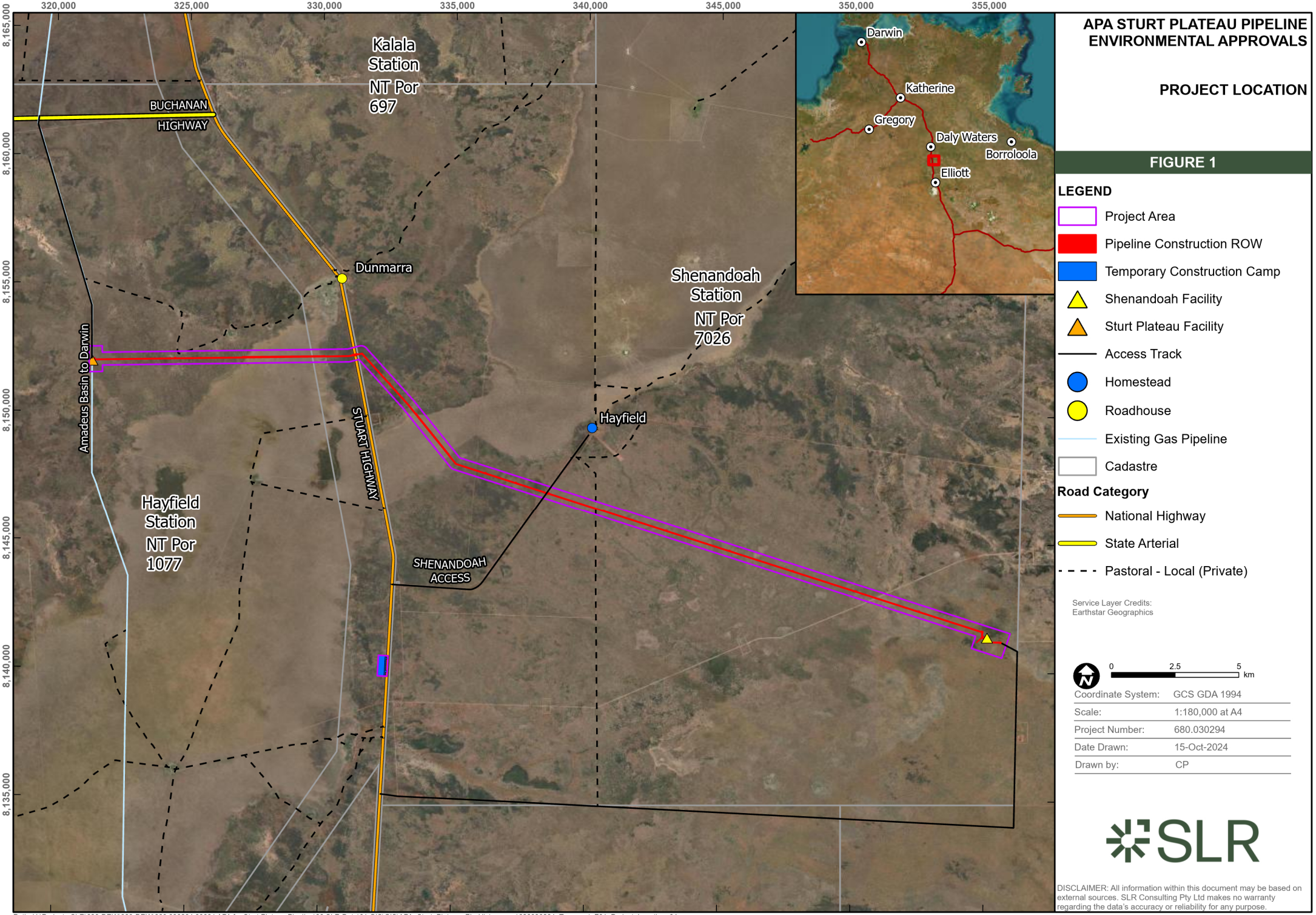
Land Tenure	Development Aspect
NT Portion 1077 (Hayfield PPL)	• a portion of the proposed transmission pipeline (approximately 8.2 km in length) • Sturt Plateau Facility where the proposed transmission pipeline connects to the AGP • light vehicle access corridor to the Sturt Plateau Facility, which is located in the existing AGP easement
NT Portion 7513 (Hayfield PPL)	• a portion of the proposed transmission pipeline (approximately 1.5 km in length) • the temporary construction camp and associated facilities
NT Portion 7026 (Shenandoah PPL)	• a portion of the proposed transmission pipeline (approximately 27 km in length) • construction access to the ROW to be provided via: - the existing Shenandoah Access, and - the existing unnamed pastoral property access to the proposed Tamboran facility. • Shenandoah Facility immediately adjacent to the proposed Tamboran facility
NT Portion 702	• a portion of the existing unnamed pastoral property access to the proposed Tamboran facility
The Stuart Highway road reserve	• a portion of the proposed transmission pipeline bored horizontally under the Stuart Highway road formation • access to the construction ROW

Source: APA, 2024

The Stuart Highway runs between Shenandoah PPL and Hayfield PPL. The Stuart Highway road corridor is approximately 200 m wide (100 m either side of the road centreline) in the vicinity of where the Project is proposed to cross. The pipeline is proposed to be bored horizontally under the Stuart Highway.

The Project area considered for this referral comprises:

- The construction right of way (ROW) for the transmission pipeline
- Construction footprints for the Shenandoah Facility and Sturt Plateau Facility
- A temporary accommodation camp and associated facilities, and
- Extra workspaces required for construction of the transmission pipeline for truck turnarounds, vegetation storage, horizontal bore entry and exit locations and plant and equipment storage areas.



APA STURT PLATEAU PIPELINE ENVIRONMENTAL APPROVALS

PROJECT LOCATION

FIGURE 1

LEGEND

- Project Area
- Pipeline Construction ROW
- Temporary Construction Camp
- Shenandoah Facility
- Sturt Plateau Facility
- Access Track
- Homestead
- Roadhouse
- Existing Gas Pipeline
- Cadastre

Road Category

- National Highway
- State Arterial
- Pastoral - Local (Private)

Service Layer Credits:
Earthstar Geographics

0 2.5 5 km

Coordinate System:	GCS GDA 1994
Scale:	1:180,000 at A4
Project Number:	680.030294
Date Drawn:	15-Oct-2024
Drawn by:	CP

SLR

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2.2 Project Program

2.2.1 Construction Phase

The anticipated start of the main construction activities is mid-2025 with an indicative timeframe of approximately six (6) months. Pipe lengths will be temporarily stored at a pipe yard, anticipated to be the Common User Facility, close to the Port of Darwin prior to transportation to site.

The probable construction program will involve the following stages, with further detail provided in **Table 2**, and the program of works provided in **Figure 2**:

- **Stage 1 –** Construction of the temporary accommodation camp, laydown facilities and construction facilities
- **Stage 2 –** Construction of the transmission pipeline, Shenandoah and Sturt Plateau facilities
- **Stage 3 –** Pipeline testing and commissioning, and
- **Stage 4 –** Demobilisation.

Table 2 Construction Staging and Timeframe

Stage	Description	Timeframe
Stage 1 Construction of temporary accommodation camp, laydown facilities and construction facilities	Construction of the temporary construction camp, laydown facilities and construction facilities include: • Clearing and grading of the various temporary footprints. • Mobilisation and installation of the purpose built accommodation modules and infrastructure.	1 month
Stage 2 Construction of the transmission pipeline, Shenandoah and Sturt Plateau facilities	Pipeline construction includes: • clearing and grading the ROW • trench excavation • hauling, stringing, bending and welding of pipe joints • lowering the pipeline into the trench • backfilling the trench, and • rehabilitating the ROW. Horizontal boring will be conducted where the pipeline intersects with the Stuart Highway, to ensure no interruption to the flow of traffic. Construction of the Shenandoah and Sturt Plateau facilities.	4-5 months
Stage 3 Pipeline testing and commissioning	The testing includes hydrostatic testing, drying and calliper pigging. The pipeline, stations and valves will be tested, and instruments calibrated for commissioning.	1 month
Stage 4 Demobilisation	Tear-down and demobilise the temporary construction camp, laydown facilities and construction facilities.	
Total		**6 months**

Source: APA, 2024

Figure 2 Program of Works

Stage	2025											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Stage 1 Construction of temporary accommodation camp, laydown facilities and construction facilities												
Stage 2 Construction of the transmission pipeline, Shenandoah and Sturt Plateau facilities												
Stage 3 Pipeline testing and commissioning												
Stage 4 Demobilisation												

2.2.2 Operational Phase

The Project is expected to be operational by the end of Q4 2025 and will operate for up to 40 years. It is anticipated that the proponent is obliged to decommission the transmission pipeline and rehabilitate the site at the end of its operational life. The exact process for decommissioning will be resolved at such a time as and when required.

2.3 Project Workforce

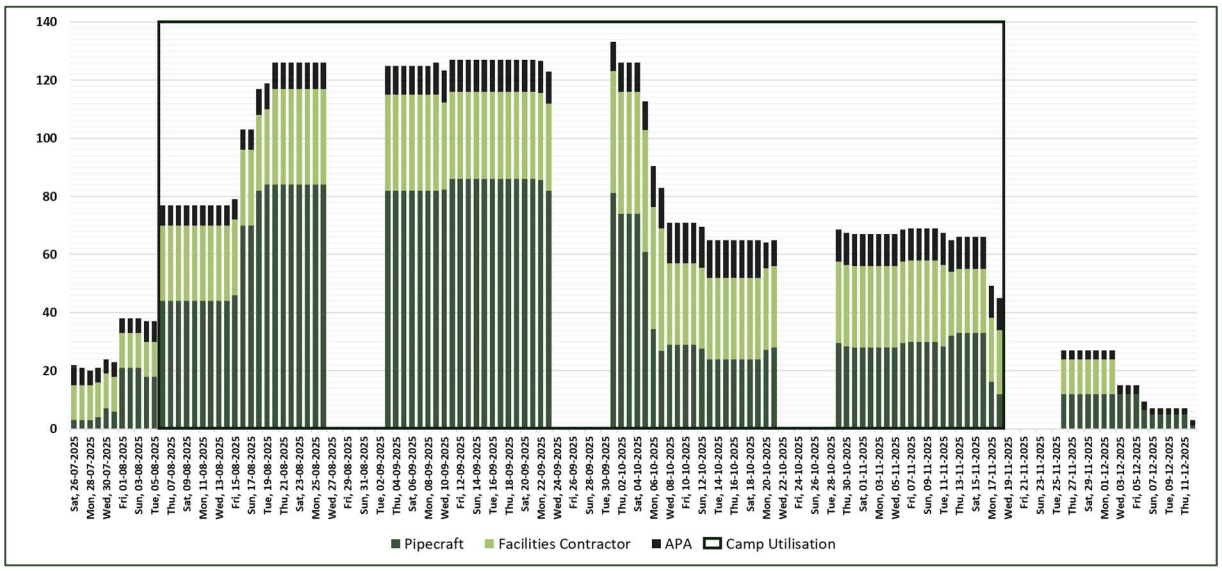
2.3.1 Construction Phase

The workforce will primarily be accommodated within the temporary accommodation camp located on the western side of the Stuart Highway, see **Figure 1**. This temporary accommodation camp will be utilised for the period from 6 August to 18 November 2025. For work outside of this period, accommodation will be via commercial premises.

Construction will occur in shifts of 21 days on and 7 days off, of which the first and last day of the shift are travel days. At peak construction, up to 133 workers will potentially be required on site. The anticipated construction workforce can be seen in **Figure 3**.

Construction crews will be transported from Darwin to the Project area via charter buses.

Figure 3 Construction Workforce



Source: APA, 2024

2.3.2 Operational Phase

Once the Project is operational and initial functional issues are managed, there will be no activities that require large workforce numbers on-site. The operational activities will be limited to routine inspections and maintenance. APA's existing operational workforce will operate the pipeline and associated surface facilities, consisting of two field staff as well as control room staff.

Field staff are likely to be based in either Tennant Creek or Katherine and will be responsible for day-to-day operations and maintenance activities, ground patrols, communication with local stakeholders and facilitating third-party access to the SPP easement.

Inspection of the SPP easement will be undertaken on a regular basis by ground and aerial patrols. These inspections are required to identify issues such as erosion, weeds, subsidence, revegetation and unauthorised third party activity.

Aerial patrols will typically be undertaken monthly with ground patrols conducted annually. Frequency of inspections may vary depending upon the particular issue being inspected, or in response to specific conditions such as major rainfall events. Ground patrols of the easement will be generally undertaken by travelling along accessible sections of the easement in light vehicles.

The pipeline and associated surface facilities will be monitored from APA's Integrated Operations Centre currently located at the APA office at Spring Hill, Brisbane. Control room staff will also coordinate maintenance and management activities.

2.4 Site Access

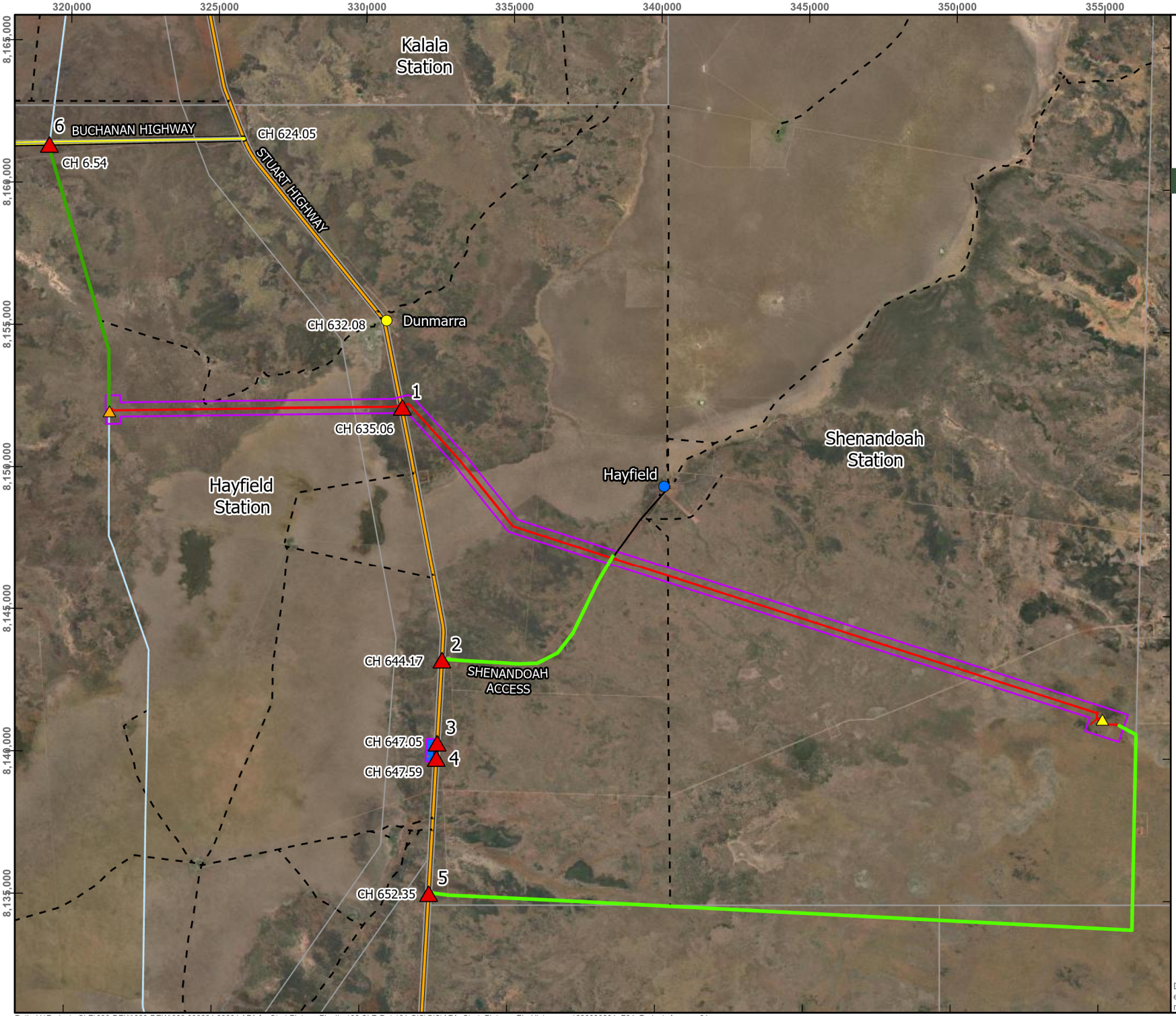
Equipment and personnel will require daily access to the construction ROW and worksites throughout construction. Access to the construction ROW will be achieved via existing access tracks through the pastoralist properties, the existing service track adjacent to the AGP, and the construction ROW itself as a throughfare.

Access to the construction ROW (see **Figure 4**) will be provided by one unsealed private road and two existing access tracks, as well as directly from the Stuart Highway at the interface with the pipeline as follows:

- Stuart Highway – at CH 635.06 as measured from Darwin. Access to the construction ROW will be provided on both sides of the highway
- Shenandoah Access – unsealed private road located at CH 644.17 on the Stuart Highway
- Unnamed pastoral property access – unsealed track located at CH 652.35 on the Stuart Highway, and
- AGP easement operations service track – unsealed track commencing from the south side of Buchanan Highway, at CH 6.54 as measured from the Stuart Highway. This unsealed track will be used to access the construction ROW for light vehicles only.

APA will maintain the Shenandoah Access and AGP easement operations service track. Tamboran will maintain the unnamed pastoral property access. The formation of the construction right of way will consist of existing natural ground i.e. existing subsoil, with all vegetation being cleared to provide a trafficable surface.

Maintenance of the above access tracks will be ongoing during the pipeline construction works to ensure integrity and trafficability of the tracks are maintained at all times. APA will seek agreement from landholders to grant suitable access rights to these tracks for construction access and ongoing operational access where required.



APA STURT PLATEAU PIPELINE ENVIRONMENTAL APPROVALS

PROJECT ACCESS

FIGURE 4

LEGEND

- Project Area
- Pipeline Construction ROW
- Temporary Construction Camp
- Shenandoah Facility
- Sturt Plateau Facility
- Site Access
- Access Track
- HV Access
- LV Access
- Homestead
- Roadhouse
- Existing Gas Pipeline
- Cadastre

Road Category

- National Highway
- State Arterial
- Pastoral - Local (Private)
- CH 632.08 Chainage

Service Layer Credits: Earthstar Geographics

0 2.5 5 km

Coordinate System:	GCS GDA 1994
Scale:	1:180,000 at A4
Project Number:	680.030294
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3.0 Existing Road Conditions

3.1 Road Network

The typical categorisation of the key roads surrounding the subject site are shown in **Figure 1**, with further details of the road network servicing the Project provided in **Table 3**.

Table 3 Public Road Network Details

Road Name	Road Authority	Classification [1]	Posted Speed	Approved Heavy Vehicle Type [3]
Stuart Highway	DLI	A1 – Rural National Highway	130 km/h (80 km/h approx. 700m either side of Dunmarra)	B-double (25 m/ 26 m) Type 1 Road Train (36.5 m) Type 2 Road Train (53.5 m)
Buchanan Highway		D – Rural State Arterial (unsealed)	110 km/h [2]	B-double (25 m/ 26 m)

Source:
1. Roads Managed by the NT Government
2. NT Road Rules (Traffic Regs 1999)
3. NTG Road Train Routes

3.2 Crash History

The data for traffic crashes recorded in proximity to the site between 2018 and 2023 has been sourced from DLI's Road Safety team. An interrogation of the crash data including consideration of the potential for traffic associated with the Project to exacerbate any observed crash trends is presented in **Section 6.1** of this report.

4.0 Future Road Network Planning

DLI's project website[1] has been interrogated and it has been identified that no works are planned on the Northern Territory road network that are of relevance to the assessment documented herein.

[1] https://dipl.nt.gov.au/projects

5.0 Assessed Traffic Demands

5.1 Context

Considering the Project Area, and the proposed means of access from the surrounding public road network, the following intersections have been identified within the study area:

- I1 – Stuart Highway/ Buchanan Highway – existing 3-way priority-controlled intersection
- I2 – Stuart Highway/ Construction ROW Access – proposed 4-way priority-controlled access intersection
- I3 – Stuart Highway/ Shenandoah Access – existing 3-way priority-controlled intersection
- I4 – Stuart Highway/ Accommodation Camp (northern) Access – proposed 3-way priority-controlled access intersection
- I5 – Stuart Highway/ Accommodation Camp (southern) Access – proposed 3-way priority-controlled access intersection
- I6 – Stuart Highway/ unnamed pastoral property access – existing 3-way priority-controlled intersection, and
- I7 – Buchanan Highway/ AGP easement operations service track – existing 3-way priority-controlled access intersection.

5.2 Background Traffic Data

In order to ascertain existing traffic demands for the surrounding road network, traffic data was requested from DLI for those traffic count stations closest to the Project Area. Based on Figure 10 of DLI's Annual Traffic Report 2022, the following traffic count stations were identified:

- RKVDC023 – Stuart Highway, 10 km South of Carpentaria Highway, and
- RKVDC028 – Buchanan Highway, 32 km East of Top Springs

Annual Average Daily Traffic (AADT) volumes for each of the above traffic count stations, as provided by the department, are summarised in **Table A.1** and **Table A.2** (**Appendix A**).

The traffic flow diagram for the survey year 2023 is given in **Figure B.1** (**Appendix B**), noting that:

- For the Buchanan Highway, the maximum AADT volume (2018) was conservatively adopted for the year 2023
- Weekday AM and PM peak demand has been determined from the observed AADT demand based on the following formula:

  Peak Hour Volume = AADT * Peak Hour Factor / 2

  Where:

  Peak Hour Factor = 10.0 for the defined road type National Highway
- Heavy vehicles are based on the proportion of heavy vehicles from the AADT data, which for the year 2023 was observed to be 39%. This heavy vehicle percentage has been adopted for all background traffic volumes within the study area.

5.3 Background Traffic Growth

The linear growth rate to be applied to background traffic movements is based on the data summarised in **Section 5.2**. The annualised growth rate for the Stuart Highway has been derived by averaging the 5-year growth rates from the latest 5-year period available i.e. 2018 to 2023 for each site (excluding data from 2020 and 2021 due to traffic demand being impacted by lockdowns during the Covid-19 pandemic). The resulting linear growth rate is calculated to be 3.31% per annum as shown in **Appendix A**.

Surveyed data for Buchanan Highway is very limited, and therefore it has not been possible to determine growth factors in the same manner as determined for the Stuart Highway. Based on the limited amount of data available, it has been assumed that no growth in traffic volumes will occur on the Buchanan Highway.

The derived traffic growth rates have then been applied to the 2023 traffic movements to determine future forecast background traffic demand for the year of construction (2025), as shown in the traffic flow diagram in **Figure B.2** (**Appendix B**).

5.4 Cumulative Impacts

The publicly available Environment Management Plan (EMP) decisions by the Department of Lands, Planning and Environment formerly the Department of Environment, Parks and Water Security[2] has been reviewed to identify other land use developments in proximity to the study area which has the potential to generate traffic volumes during the year of construction (2025). The approved EMP for the Beetaloo Basin Shenandoah South Exploration and Appraisal (E&A) Program (Tamboran, 26 April 2024) identifies construction vehicle movements associated with the proposed development, as summarised in **Table 4** below.

Table 4 Beetaloo Basin Shenandoah South E&A – Peak Construction Vehicles

Vehicle Category	No. of Vehicles (vpd)
Short (light vehicles)	12
Long (heavy vehicles)	5
Large combination (heavy vehicles)	27

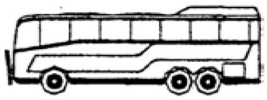
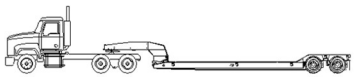
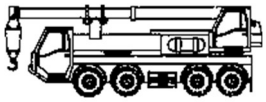
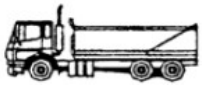
[2] https://depws.nt.gov.au/onshore-gas/environment-management-plan/approved-emps

5.5 Construction Phase Traffic Demands

5.5.1 Construction Vehicle Fleet

The anticipated vehicle fleet associated with the Project is given in **Table 5**.

Table 5 Project Vehicle Fleet

Vehicle Type	Typical Vehicle Profile	Workforce Travel/ Haulage Material and Equipment
Private Vehicle		Workforce travel
Bus (12 seats)		
Coach (53 seats)		
20m Low Loader (Float)		General equipment, Construction mobilisation and demobilisation
Crane		Construction mobilisation and demobilisation
Double Road Train (GML)		Accommodation modules (12m) General equipment
Double road train (OSOM)		Accommodation modules (15m) Prefabricated concrete plinths/ supports
Articulated Vehicle (19m, 5-axle)		Temporary crib room Ancillary equipment Fuel delivery
Double Extendable Road Train (OSOM)		Transmission pipe lengths
Medium Rigid Vehicle (2-axle)		Store provisions and camp supplies Non-potable water
Heavy Rigid Vehicle (3-axle)		Gravel Sand Waste removal

Source: APA, 2024

5.5.2 Trip Generation – Construction Material

5.5.2.1 Traffic Generation

The anticipated heavy vehicle traffic demands associated with transporting the necessary construction material during the 6-month construction phase is set out in **Table 6**.

The construction activities across the 6 month construction phase will result in a total of 974 trucks (1,948 trip movements). Of these, the greatest number of movements will occur during the construction of the transmission pipeline and the Shenandoah and Sturt Plateau facilities (Stage 2), and the testing and commissioning of the pipeline once constructed (Stage 3). During this four month construction period, 672 trucks will haul the required material and equipment to the Project Area, resulting in 1,344 trip movements.

As detailed in **Section 2.3.1**, the main construction activities occur during four 21-day construction shifts. Taking into consideration travel days at the start and end of each shift (day 1 and day 21), the total number of construction days during this four month period is 76 days. The average number of trucks occurring per work day is therefore 9 trucks per day, or 18 truck movements. Conservatively assuming all trips only occur during the peak periods results in 9 trucks arriving to the Project Area during the morning peak, and 9 trucks departing the Project Area during the afternoon peak.

5.5.2.2 Traffic Distribution

The majority of the construction materials for the Project are anticipated to be sourced from Darwin (including the Port), Katherine, and Perth. Construction plant and equipment from Perth is expected to travel via the Great Northern Highway and the Victoria Highway, as these roads are sealed. Therefore construction plant, equipment and materials from these sources will travel to the transmission pipeline Project Area along the Stuart Highway from the north.

The only exceptions are the accommodation modules and establishment equipment for the accommodation camp, which are expected to be sourced from Murray Bridge, South Australia and the non-potable water which will be transported from the proposed turkey nest located at the accommodation camp. Therefore construction materials from these sources will travel to the transmission pipeline Project Area along Stuart Highway from the south.

Table 6 Construction Material – Truck Types and Trip Movements

Construction Material/ Equipment	Vehicle Type	Origin/ Destination	No. of Trucks	Trip Movements
Accommodation Camp – Accommodation Modules	Double Road Train (OSOM)	Murray Bridge, SA	58	116
Accommodation Camp – General Equipment	Double Road Train (GML)	Murray Bridge, SA	46	92
Accommodation Camp – Forklift 16t	Low Loader	Murray Bridge, SA	2	4
Construction Facilities – Accommodation Modules	Double Road Train (OSOM)	Perth	10	20
		Darwin	8	16
Construction Facilities – General Equipment	Low Loader or Crane	Perth	4	8
		Darwin	4	8
Pipeline, Shenandoah and Sturt Plateau Facilities – Plant Mobilisation/ Demobilisation, Site Preparation, Earthworks	Low Loader or Crane	Perth	106	212
		Darwin	32	64
Shenandoah and Sturt Plateau Facilities – Temporary Crib Room and Ancillary Equipment	Articulated Vehicle (19m, 5-axle)	Perth	32	64
Sub-total (Stage 1 and Stage 4)			**302**	**604**
Shenandoah and Sturt Plateau Facilities – Gravel/ Sand	Heavy Rigid Vehicle (12.5m long)	Katherine	22	44
Shenandoah and Sturt Plateau Facilities – Prefabricated Concrete Plinths/ Supports	Double Road Train (OSOM)	Perth	2	4
Transmission Pipe Lengths	Double Extendable Road Train (OSOM)	Common User Facility, East Arm	86	172
Fuel [1]	Articulated Vehicle (19m, 5-axle)	Katherine	40	80
Store Provisions and Camp Supplies	Medium Rigid Vehicle (8.8m long)	Darwin	22	44
Waste	Heavy Rigid Vehicle (12.5m long)	Katherine	80	160
Potable Water	Medium Rigid Vehicle (8.8m long)	Sourced on-site	-	-
Non-potable Water		Turkey Nest (Accom. Camp)	420	840
Sub-total (Stage 2 and Stage 3)			**672**	**1,344**
		Total	**974**	**1,948**

Source: APA, 2024

5.5.3 Trip Generation – Construction Workforce

5.5.3.1 Traffic Generation

The anticipated construction workforce has been identified in **Section 2.3.1**. For the purpose of this traffic assessment, the peak number of people expected on a typical workday during the construction phase is 133 persons a day.

The daily travel of the construction crews between the temporary accommodation camp and the relevant work area will typically be undertaken by light vehicles. During work shifts, light vehicles will be parked on the construction footprint at the relevant work area. Use of buses to transport construction crews between the accommodation camp and the work area is not considered practicable due to the number and geographic spread of work areas that will be active at any one time. It is however noted that a 12-seater bus will transport the welding crew to the transmission pipeline.

The anticipated traffic demands generated by the workforce travelling between the temporary accommodation camp and the construction ROW during the construction phase is shown in **Table 7**.

Table 7 Construction Workforce – Traffic Generation

Vehicle Type	No. Staff (max per day)	Vehicle Occupancy	Trip Movements		
			AM Peak	PM Peak	Daily
Light Vehicle	121	2	61	61	122
12-seater bus	12	12	1	1	2
Total			**62**	**62**	**124**

5.5.3.2 Traffic Distribution

During the 21-day shift, the construction workforce will travel between the temporary accommodation camp and the construction ROW. It has been assumed that all trips will occur during the peak periods, with all staff travelling from the temporary accommodation camp to the site during the AM peak and returning during the PM peak.

5.6 Operational Stage Traffic Demands

Given that the workforce for the operational stage will consist of APA's existing operational staff, it is assumed that there will be no net increase in vehicle movements during the operational phase beyond those movements associated with APA's current operational needs.

5.7 Critical Scenario

Owing to the number and geographic coverage of work areas, access to the construction site will vary throughout the construction period with the workforce and the construction vehicles spread over the approximately 37 km long Project Area associated with the transmission pipeline. To ensure a conservative approach, a scenario in which traffic movements are consolidated to fewer intersections has been assessed. This seeks to conservatively increase the volume of opposing movements on the public road network and thereby maximise the construction movements at key intersections within the defined study area. The resulting distribution for construction vehicles has been adopted for the critical scenario as follows:

- All vehicles accessing the transmission pipeline Project Area to the west of the Stuart Highway do so via the Construction ROW access (Intersection I2)
- All vehicles accessing the transmission pipeline Project Area to the east of the Stuart Highway do so via the Shenandoah Access (Intersection I3)
- All vehicles accessing the temporary accommodation camp, do so via the Accommodation Camp (northern) Access (Intersection I4)
- Construction materials being transported by heavy vehicles to the transmission pipeline Project Area, including the Sturt Plateau and Shenandoah facilities, have been equally split east and west of the Stuart Highway
- All heavy vehicles transporting fuel, store provisions and camp supplies, travel to and from the temporary accommodation camp
- Haulage of waste is assumed to be split between the construction facilities at the transmission pipeline Project Area and the temporary accommodation camp, with the proportion of movements being split 25%/ 75% through Intersection 3 and 4 respectively
- All non-potable water from the turkey nest at the accommodation camp is assumed to travel to the transmission pipeline Project Area via the Construction ROW access (Intersection I2), and
- The construction workforce travelling to and from the temporary accommodation camp to the transmission pipeline Project Area is assumed to be equally split east and west of the Stuart Highway.

The resulting construction traffic movements can be seen in **Figure B.3** in **Appendix B**.

5.8 Impact Assessment Scope

5.8.1 Impact Assessment Area

The extent of the development's traffic impact on the surrounding road infrastructure has been undertaken in accordance with *Austroads Guide to Traffic Management Part 12: Integrated Transport Assessments for Developments (AGTM12-20)* as follows:

- Road Safety – Section 6.2.2 of the AGTM12-20 states that *'[a] road safety assessment as part of a TIA report should be undertaken for any project where the internal traffic layout consists of more than a short driveway leading to a single parking area of, say, 10 spaces*'
- Intersections – Section 2.1 of the Development Guidelines for Northern Territory Government Controlled Roads (Development Guidelines) and Appendix F of AGTM12-20 proposes that where development traffic exceeds 5% of existing turning volumes (by movement) at an intersection, then further assessment is warranted, and
- Road links – Section 2.1 of the Development Guidelines for Northern Territory Government Controlled Roads (Development Guidelines) and Appendix F of AGTM12-20 proposes that where development traffic exceeds 5% of existing volumes (in each direction) at a link, then further assessment is warranted.

Table 8 summarises the impact assessment area for the specified impact type.

Table 8 Impact Assessment Area by Impact Type

Impact Type	Impact Assessment Area
Road Safety	All intersections where the development traffic exceeds 5% of the base traffic for any movement in the design peak periods in the defined impact assessment year(s). All road links where the development traffic exceeds 5% of the base traffic in either direction on the link in the design peak periods in the defined impact assessment year(s).
Access and Frontage	The road corridor for the extent of the geometric frontage of the site, includes works on both the frontage side and potentially on the opposite side of the road.
Intersection Delay	All intersections where the development traffic exceeds 5% of the base traffic for any movement in the design peak periods in the defined impact assessment year(s).
Road Link Capacity	All road links where the development traffic exceeds 5% of the base traffic in either direction on the link's annual average daily traffic (AADT) in the defined impact assessment year(s)

Source: Development Guidelines Section 2.1 (DLI, April 2015)
AGTM12-20 Section F.1 (Austroads, April 2020)

5.8.2 Impact Assessment Scope

Table 9 summarises the impact assessment years when assessing each type of impact.

Table 9 Impact Assessment Year by Impact Type

Impact Type	Impact Assessment Year(s)
Road Safety	Year of construction. Year of opening of the operational phase, and 10 years after the year of opening.
Access and Frontage	Year of construction. Year of opening of the operational stage, and 10 years after the year of opening (includes both new and amended accesses).
Intersection Delay	Year of construction. Year of opening of the operational stage, and 10 years after the year of opening.
Road link capacity	Year of construction. Year of opening of the operational stage, and 10 years after the year of opening (includes both new and amended accesses).

Source: AGTM12-20 Section C5.3 (Austroads, April 2020)

Given that no additional vehicle movement will be generated by the transmission pipeline once operational, only the construction phase will generate additional trips. As a result, only the following scenarios have been assessed in detail to determine the scope of the impact assessment area for the given assessment years:

- **2025 Background Traffic:** to establish the background operating conditions of the Project in the absence of traffic associated with construction phase of works, and
- **2025 Background Traffic plus Construction Traffic:** this scenario identifies the incremental impact of construction traffic on operating conditions.

Traffic movements within the defined assessment area for the above scenarios are given in **Figure B.2** and **Figure B.4** (**Appendix B)**, noting that, in line with **Section 5.7**, it is conservatively assumed all construction related movements access the Project Area via the following access intersections:

- I1 – Stuart Highway/ Buchanan Highway T-intersection
- I2 – Stuart Highway/ Access to the construction ROW 4-way intersection
- I3 – Stuart Highway/ Shenandoah Access T-intersection, and
- I4 – Stuart Highway/ Accommodation Camp (northern) Access T-intersection.

The impact assessment scope for the construction year is considered in **Figure B.5** (**Appendix B**).

5.8.2.1 Impact Assessment Scope – Road Safety

The impact assessment shows that traffic associated with the construction of the SPP exceeds 5% of the baseline traffic on a number of movements at all intersections and links assessed as part of the critical scenario.

5.8.2.2 Impact Assessment Scope – Intersection Delay

The impact assessment shows that traffic associated with the construction traffic exceeds 5% of the baseline traffic on a number of movements at all four intersections within the defined study area:

- I1 – Stuart Highway/ Buchanan Highway T-intersection
- I2 – Stuart Highway/ Access to the construction ROW 4-way intersection
- I3 – Stuart Highway/ Shenandoah Access T-intersection, and
- I4 – Stuart Highway/ Accommodation Camp Access Track T-intersection.

5.8.2.3 Impact Assessment Scope – Road Link Capacity

The links on the Stuart Highway from the temporary accommodation camp to the construction ROW are identified as exceeding 5% of the link's AADT in either direction.

The following section summarises the outcomes from technical assessments undertaken to confirm requirements (or otherwise) for any mitigation measures that may be required to accommodate the construction traffic demands at the intersections and links identified in the assessment scope for each of the above impact types. The assessments have been undertaken in line with the stated methodologies and intervention thresholds.

6.0 Impact Assessment

6.1 Road Safety Assessment

6.1.1 Overview

Historic traffic crashes recorded in proximity to the site were sourced from DLI. The latest available six-year period 2018-2023 was evaluated. A review of the existing crash data and aerial imagery was undertaken to identify any existing safety deficiencies within the study area and to assess the impacts of the proposed SPP on the safety of the road network.

6.1.2 Existing Conditions

A review of Nearmap aerial and Google Street View imagery was used to identify any existing safety deficiencies within the study area. The review showed that there were no significant issues (i.e. road safety deficiencies) within the existing road network.

6.1.3 Crash Data

Historic traffic crash data in the proximity of the SPP was sourced from DLI's Road Safety team for the period 2018 to 2023. Interrogation of this data, including consideration of the potential for traffic associated with the Project to exacerbate any observed crash trends, is discussed in the subsequent sections below. **Figure 5** shows the location and severity of the crashes that occurred within the defined road safety assessment area over the 6-year period of crash records with more detail on the crashes provided in **Table 10**.

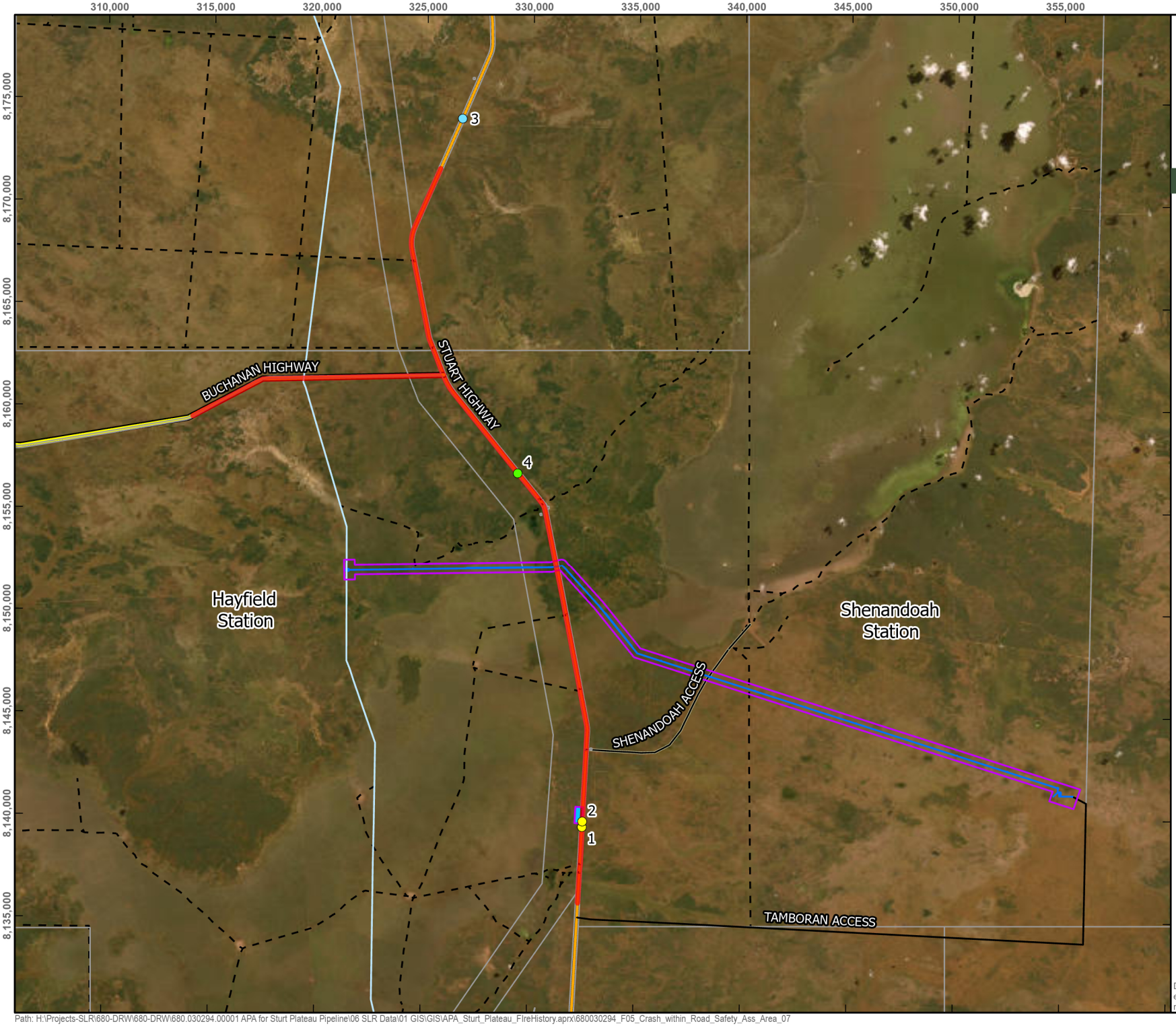
Table 10 Crashes Occurring within the Road Safety Assessment Area

SLR ID	Crash ID	Year	Description	No. of Vehicles	No. of People	Injury Type
1	155415	2018	Other	1	1	Not Injured
2	156920	2019	Out of control on the carriageway	1	1	Not Injured
3	162934	2021	Off the carriageway to the Right	1	2	Treated Not Admitted
4	165146	2022	Off the carriageway to the left	1	1	Treated Admitted

6.1.4 Review of Spatial Information and Crash Data

The DLI data indicates that a total of 4 crashes were recorded within the identified study area during the recorded 6-year period. Commentary on the crash type and severity of these crashes that occurred in the identified study area is outlined in further detail below:

- No fatalities occurred within the identified study area during the recorded 6-year period
- All crashes occurred on straight sections of road and involved a single vehicle only
- One crash (ID1) occurred at 04:30 in the morning in the dark, while all other crashes occurred in daylight, and
- Three (3) crashes (IDs 2-4) resulted in overturned vehicles of which only two (2) went off the carriageway (IDs 3 and 4).



APA STURT PLATEAU PIPELINE ENVIRONMENTAL APPROVALS

CRASHES WITHIN THE ROAD SAFETY ASSESSMENT AREA - LOCATION PLAN

FIGURE 5

LEGEND

- Road Safety Impact Area
- Project Area
- Pipeline Construction ROW
- Temporary Construction Camp
- Access Track
- Existing Gas Pipeline
- Cadastre

Crash Type

- Not Injured
- Treated Not Admitted
- Treated Admitted

Road Category

- National Highway
- State Arterial
- Pastoral - Local (Private)

Service Layer Credits:
Earthstar Geographics

0 2.5 5 km

Coordinate System:	GCS GDA 1994
Scale:	1:250,000 at A4
Project Number:	680.030294
Date Drawn:	15-Oct-2024
Drawn by:	CP

SLR

Path: H:\Projects-SLR\680-DRW\680-DRW\680.030294.00001 APA for Sturt Plateau Pipeline\06 SLR Data\01 GIS\GIS\APA_Sturt_Plateau_FIreHistory.aprx\680030294_F05_Crash_within_Road_Safety_Ass_Area_07

6.2 Access and Frontage Assessment

6.2.1 Sight Distance Assessment

A sight distance assessment has been undertaken in accordance with *Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersections* (AGRD04A-23). Safe Intersection Sight Distance (SISD) is the minimum sight distance which should be provided on the major road at any intersection. The SISD provides sufficient distance for a driver of a vehicle on the major road to observe a vehicle on the minor road moving into a collision situation (e.g. in the worst case, stalling across the traffic lanes), and to decelerate to a stop before reaching the collision point. The sight distances to and from the subject intersection based on a reaction time of 2.0 seconds for the proposed posted speed limit during construction (80 km/h) is identified in **Table 11**.

Table 11 Safe Intersection Sight Distance Requirements

Case Type	Case Code	Observation Time (Sec)	Reaction Time (sec)	Decision Time (sec)	Coefficient of Deceleration	SISD (m)
Car	Norm-day	3	2	5	0.36	214
Car at Night	Normal-night	2.6	2	4.6	0.46	185
Truck	Truck-day	3	2	5	0.24	258
Truck at Night	Truck-night	3	2	5	0.29	235

Source: Austroads

A review of Nearmap aerial and Google Street View imagery confirms that the required SISD values contained in **Table 11** can be achieved, with no constraints in the horizontal or vertical alignment of the existing road network within the road reserve.

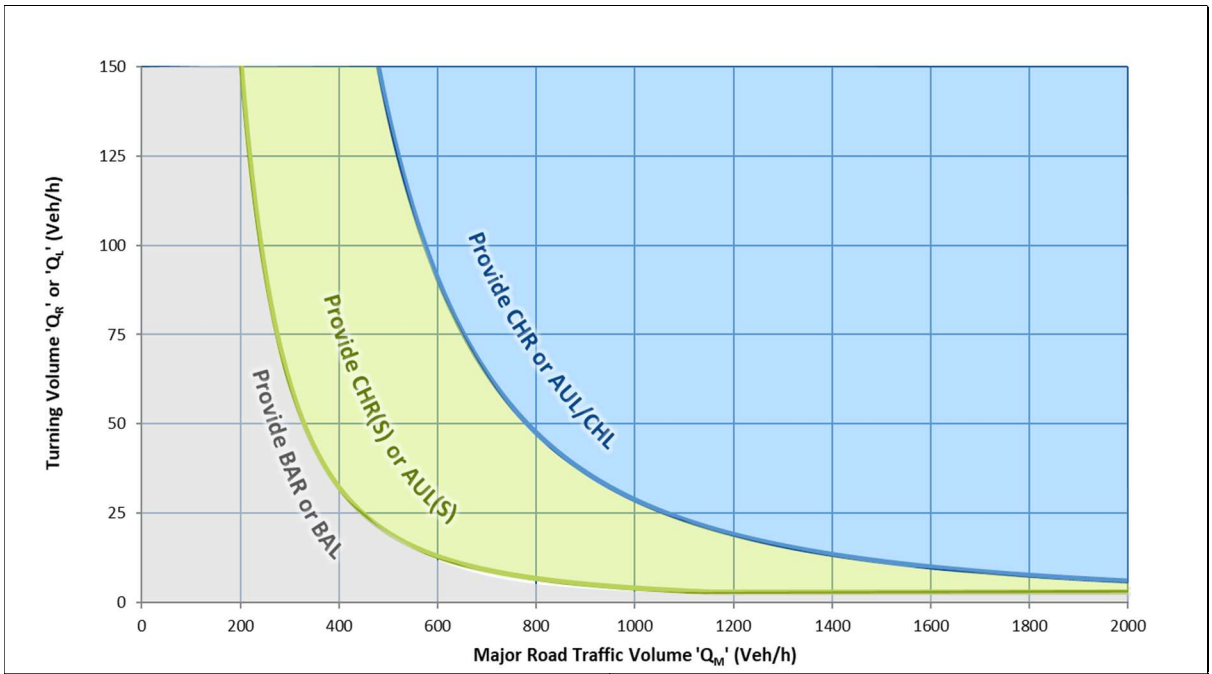
6.2.2 Turn Warrant Assessment

All the access intersections in the study area will operate as priority-controlled intersections. A turn warrant assessment has therefore been undertaken to confirm the appropriate turn treatment type based on the forecast traffic demand at each intersection.

The development of the warrants is described in Austroads Guide to Traffic Management Part 6: *Intersections, Interchanges and Crossings Management* (2020) with further detail on extended design domain warrants for intersection turn treatments provided in the Queensland Department for Transport and Main Roads' *Road Planning and Design Manual Edition 2 Volume 3: Supplement to Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersections* (2021).

The warrants provide guidance on the preferred minimum turn treatments for major roads, where a design life of 10 years and a benefit cost ratio (BCR) equal to one is assumed in the calculations, noting that an evaluation of the operational performance of the intersection should also be undertaken. If this indicates a higher level treatment is needed, then it should be adopted in lieu of the warrants. To assist with reader interpretation of the turn warrant assessment, a pictorial description of the various turn treatments is provided in **Figure 6**.

Figure 6 Turn Treatment Types



Right Turn Treatment	Left Turn Treatment
Basic Right Turn (**BAR**)	Basic Left Turn (**BAL**)
Channelised Right Turn [Short] (**CHR[S]**)	Auxiliary Left Turn [Short] (**AUL[S]**)
Channelised Right Turn (**CHR**)	Auxiliary Left Turn (**AUL**)
	Channelised Left Turn (**CHL**)

A summary of the required turn lane treatments based on the application of the turn warrant assessment is identified in **Table 12**, with more detailed output provided in **Appendix C**.

The results from the turn warrant assessment presented in **Table 12** demonstrates that:

- based on the low traffic volumes present on the Stuart Highway, the modest project related construction traffic volumes, and the temporary nature of the site access intersections effectively being used during the construction phase only, it is considered appropriate to provide Simple Right (SR) and Simple Left (SL) turn treatments at each of the Project access intersections (I2 to I7)

- for the Stuart Highway/ Buchanan Highway intersection (I1), given the existing turn treatments i.e. an Auxiliary Right Turn (AUR) treatment and Basic Left (BAL) treatment are of a higher order than that required from the turn warrant assessment, it is proposed that the existing treatments are retained.

Table 12 Turn Warrant Assessment Summary

ID	Intersection Name	Turn Treatment		
		Existing	Required	Recommended
I1	Stuart Highway/ Buchanan Highway	AUR/ BAL	SR/ SL	AUR/ BAL
I2	Stuart Highway/ Construction ROW Access	-	SR/ SL	SR/ SL
I3	Stuart Highway/ Shenandoah Access	SR/ SL	SR/ SL	SR/ SL
I4	Stuart Highway/ Accommodation Camp Access (north)	-	SR/ SL	SR/ SL
I5	Stuart Highway/ Accommodation Camp Access (south)	SR/ SL	SR/ SL	SR/ SL
I6	Stuart Highway/ unnamed pastoral property access	SR/ SL	SR/ SL	SR/ SL
I7	Buchanan Highway/ AGP easement operations service track	SR/ SL	SR/ SL	SR/ SL

6.3 Intersection Delay

6.3.1 Intersection Performance Thresholds

6.3.1.1 Degree of Saturation

The study intersections have been analysed for each of the traffic demand scenarios using SIDRA Intersection 9.1.6.228 (SIDRA). SIDRA is an industry recognised analysis tool used to estimate the capacity and performance of intersections based on input parameters, including geometry and traffic volumes. SIDRA provides an estimate of an intersection's Degree of Saturation (DOS), queues and delays.

The maximum DOS thresholds identified by the Austroads Guide to Traffic Management *Part 12: Integrated Transport Assessments for Developments* (AGTM12-20) for each intersection type are reproduced in **Table 13**.

Table 13 Degree of Saturation Thresholds

Intersection Type	DOS Threshold
Signalised intersections	Less than or equal to 0.90
Roundabouts	Less than or equal to 0.85
Priority controlled intersections	Less than or equal to 0.80

DOS values exceeding the thresholds presented in **Table 13** indicate that as an intersection is nearing its practical capacity, road users are likely to experience rapidly increasing delays and queuing, and that mitigation works may be required.

6.3.1.2 Average Delay (Level of Service)

Importantly, it is noted that DOS is not the only performance indicator and that other measures such as critical delay should also be considered when assessing the performance of an intersection, such as the use of the critical movement delay for assessing the performance of priority-controlled intersections.

Section 7.4.5 of AGTM03-20 provides a summary of level of service (LOS) criteria based on the average delay per vehicle at intersections and makes further reference to guidance contained in the *Guide to Traffic Generating Developments* (TfNSW, 2002). This guide recommends that the average delay statistic for the critical movement at an intersection provides an alternative indication of the overall safety and performance of priority-controlled intersections. A summary of the delay thresholds is provided in **Table 14**.

Table 14 LOS Criteria for Priority Controlled Intersections

LOS	Average Delay (sec/ vehicle)	Description
A	< 14	Good operation
B	15 – 28	Acceptable delays and spare capacity
C	29 – 42	Satisfactory, but accident study required
D	43 – 56	Operating near capacity and accident study required
E	57 – 70	At capacity, requires other control mode
F	> 70	Operating above capacity, requires other control mode

Source: Guide to Traffic Generating Developments Version 2.2 (TfNSW, 2002)

6.3.2 SIDRA Input

Standard SIDRA default values were utilised in the intersection assessment except for one parameter identified in **Table 15** below.

Table 15 Adopted SIDRA Parameters

Parameter	Default Value	Adopted Value	Justification
Vehicle Movements – Site Level of Service Method	Delay (SIDRA)	Delay (RTA NSW)	Preference is given to the RTA Method as it is based on TfNSW's Guide to Traffic Generating Developments, whereas the Delay (SIDRA) Method is based on the US Highway Capacity Manual 2000.

6.3.3 Operational Assessment

6.3.3.1 I1 Stuart Highway/ Buchanan Highway

The Stuart Highway/ Buchanan Highway intersection is a priority-controlled 3-way intersection. The existing site layout as extracted from the SIDRA model is presented in **Figure 7** and the summary output from the SIDRA assessment in **Table 16**, with more detailed SIDRA output provided in **Appendix D**.

Figure 7 I1 Stuart Highway/ Buchanan Highway – SIDRA Layout

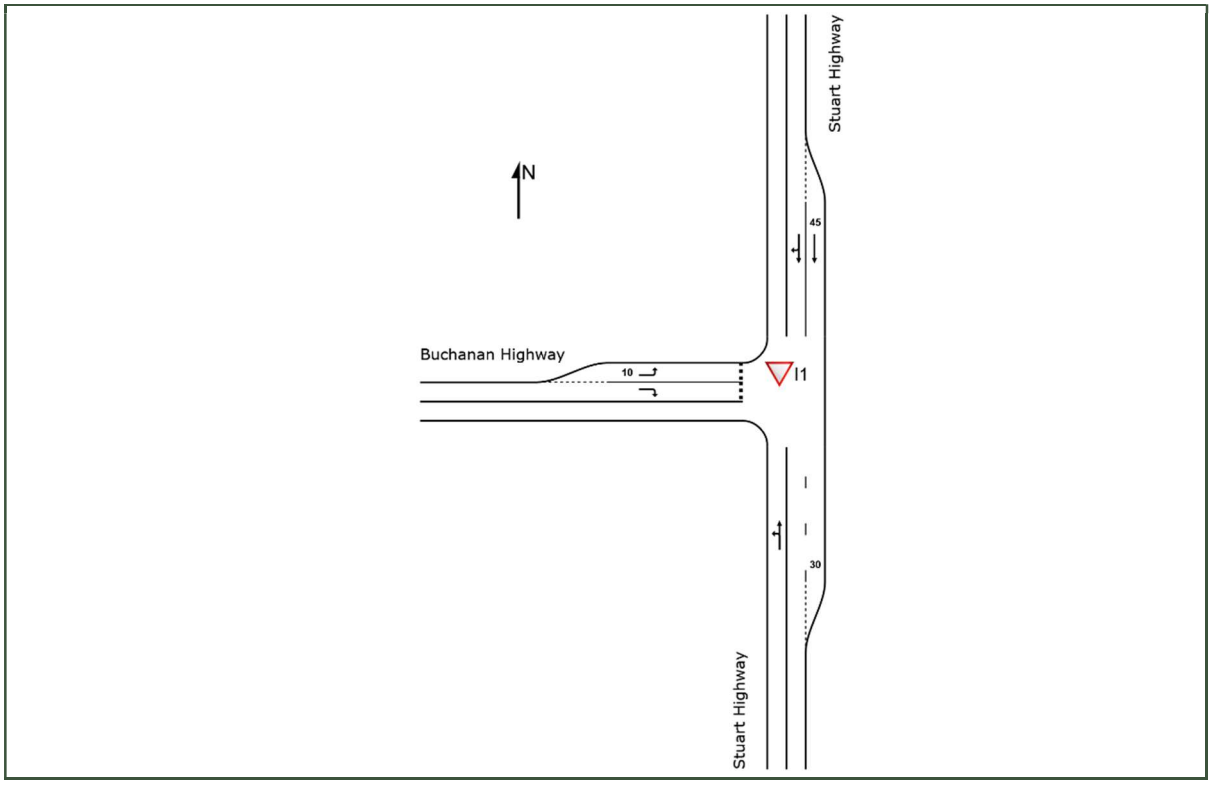


Table 16 I1 Stuart Highway/ Buchanan Highway – SIDRA Summary Output

Scenario	AM Peak			PM Peak		
	Maximum DOS	Max Delay (sec/ veh)	95th %ile Queue (m)	Maximum DOS	Max. Delay (sec/ veh)	95th %ile Queue (m)
2025 Background 'Without Construction'	0.01	10.0	0.1	0.01	10.2	0.1
2025 Background 'With Construction'	0.01	10.2	0.1	0.01	10.2	0.1

The output from the operational assessment, as summarised in **Table 16**, indicates that the Stuart Highway/ Buchanan Highway intersection operates well within the maximum desired operational thresholds even with the additional traffic demands associated with the construction of the proposed project.

6.3.3.2 I2 Stuart Highway/ Construction ROW Access

The Stuart Highway/ and the construction ROW intersection is not an existing intersection and will function as a 4-way priority-controlled intersection only once construction commences. The proposed site layout as extracted from the SIDRA model are presented in **Figure 8** and the summary output from the SIDRA assessment in **Table 17**, with more detailed SIDRA output provided in **Appendix D**.

Figure 8 I2 Stuart Highway/ Construction ROW Access – SIDRA Proposed Layout

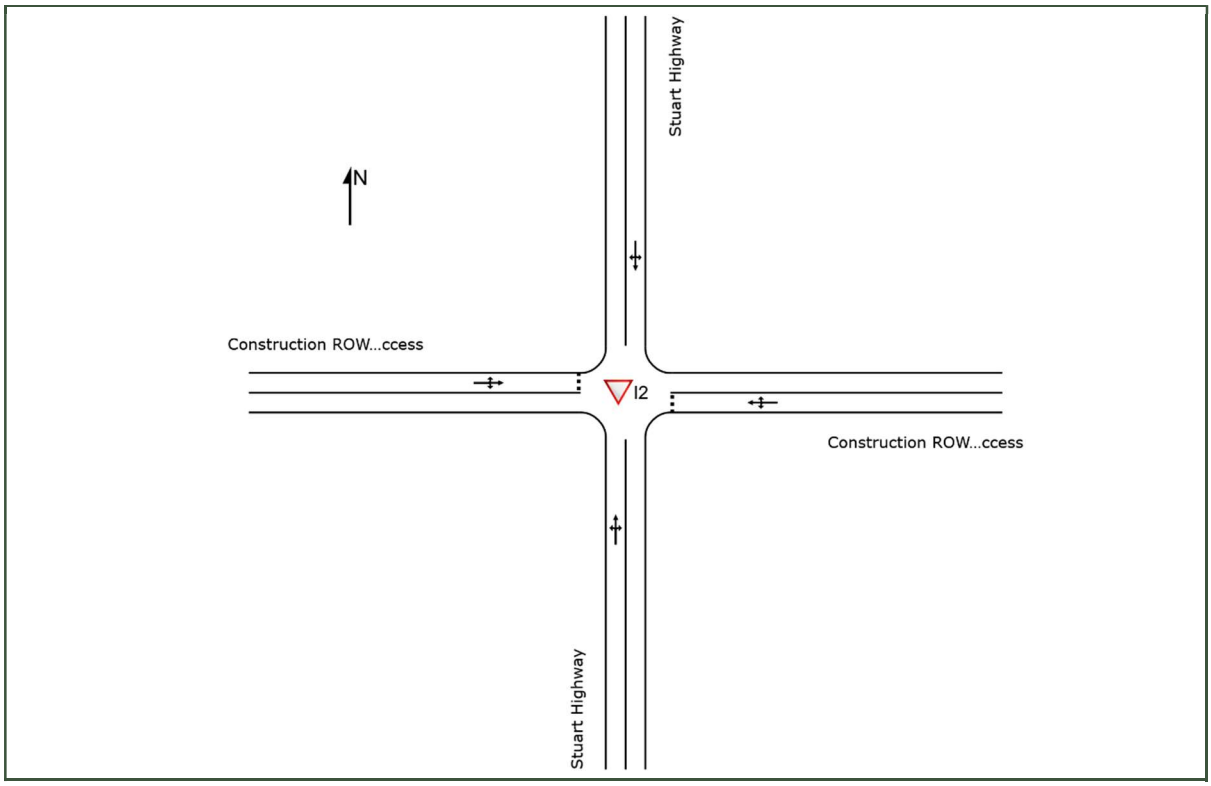


Table 17 I2 Stuart Highway/ Construction ROW Access – SIDRA Summary Output

Scenario	AM Peak			PM Peak		
	Maximum DOS	Max. Delay (sec/ veh)	95th %ile Queue (m)	Maximum DOS	Max. Delay (sec/ veh)	95th %ile Queue (m)
2025 Background 'With Construction'	0.04	7.7	0.1	0.05	7.7	1.4

The output from the operational assessment, as summarised in **Table 17**, indicates that the proposed Stuart Highway/ Construction ROW Access intersection operates well within the maximum desired operational thresholds even with the additional traffic demands associated with the construction of the proposed project.

6.3.3.3 I3 Stuart Highway/ Shenandoah Access

The Stuart Highway/ Shenandoah Access intersection is a priority-controlled 3-way intersection. The existing site layout as extracted form from the SIDRA model are presented in **Figure 9** and the summary output from the SIDRA assessment in **Table 18**, with more detailed SIDRA output provided in **Appendix D**.

Figure 9 I3 Stuart Highway/ Shenandoah Access – SIDRA Layout

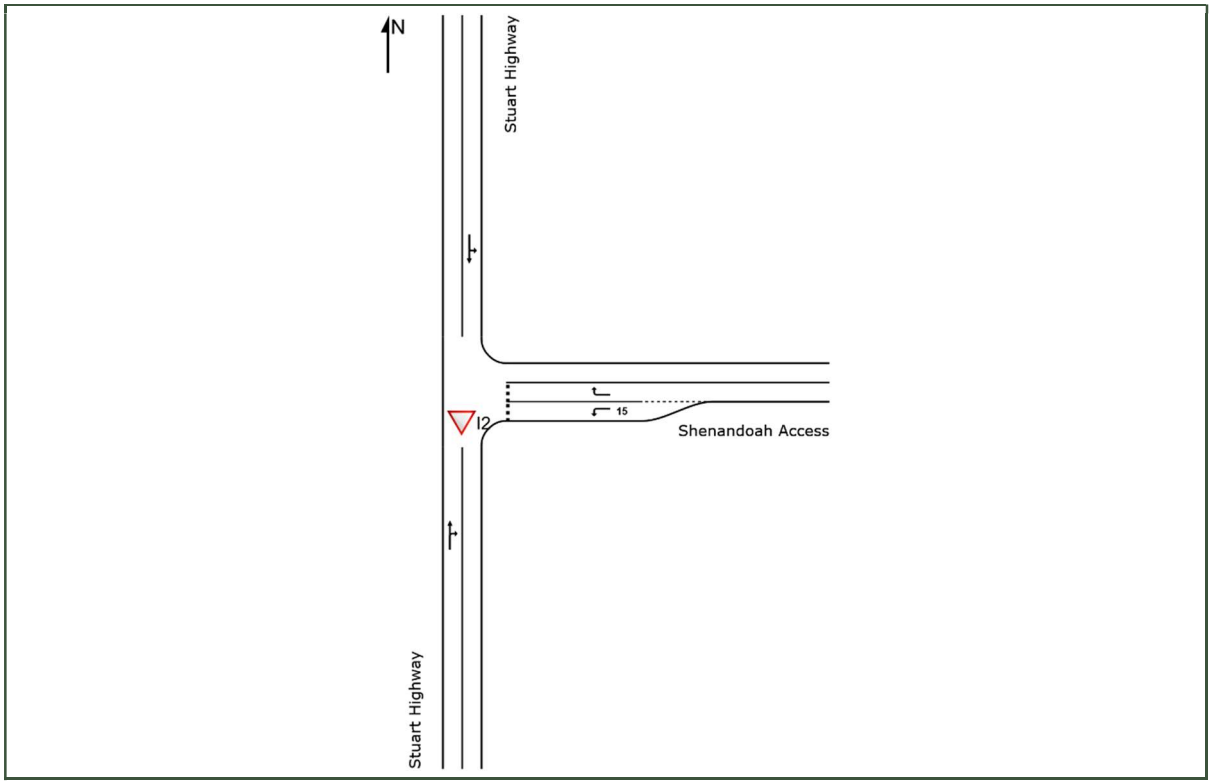


Table 18 I3 Stuart Highway/ Shenandoah Access – SIDRA Summary Output

Scenario	AM Peak			PM Peak		
	Maximum DOS	Max. Delay (sec/ veh)	95th %ile Queue (m)	Maximum DOS	Max. Delay (sec/ veh)	95th %ile Queue (m)
2025 Background 'Without Construction'	0.01	7.7	0.1	0.01	7.7	0.1
2025 Background 'With Construction'	0.06	7.7	1.8	0.04	7.7	0.9

The output from the operational assessment, as summarised in **Table 18**, indicates that the Stuart Highway/ Shenandoah Access intersection operates well within the maximum desired operational thresholds even with the additional traffic demands associated with the construction of the proposed project.

6.3.3.4 I4 Stuart Highway/ Accommodation Camp Access

The proposed Stuart Highway/ Accommodation Camp Access intersection will function as a 3-way priority-controlled intersection once construction commences. The proposed site layout as extracted from the SIDRA model is presented in **Figure 10** and the summary output from the SIDRA assessment in **Table 19**, with more detailed SIDRA output provided in **Appendix D**.

Figure 10 I4 Stuart Hwy/ Accom Camp (northern) Access – SIDRA Proposed Layout

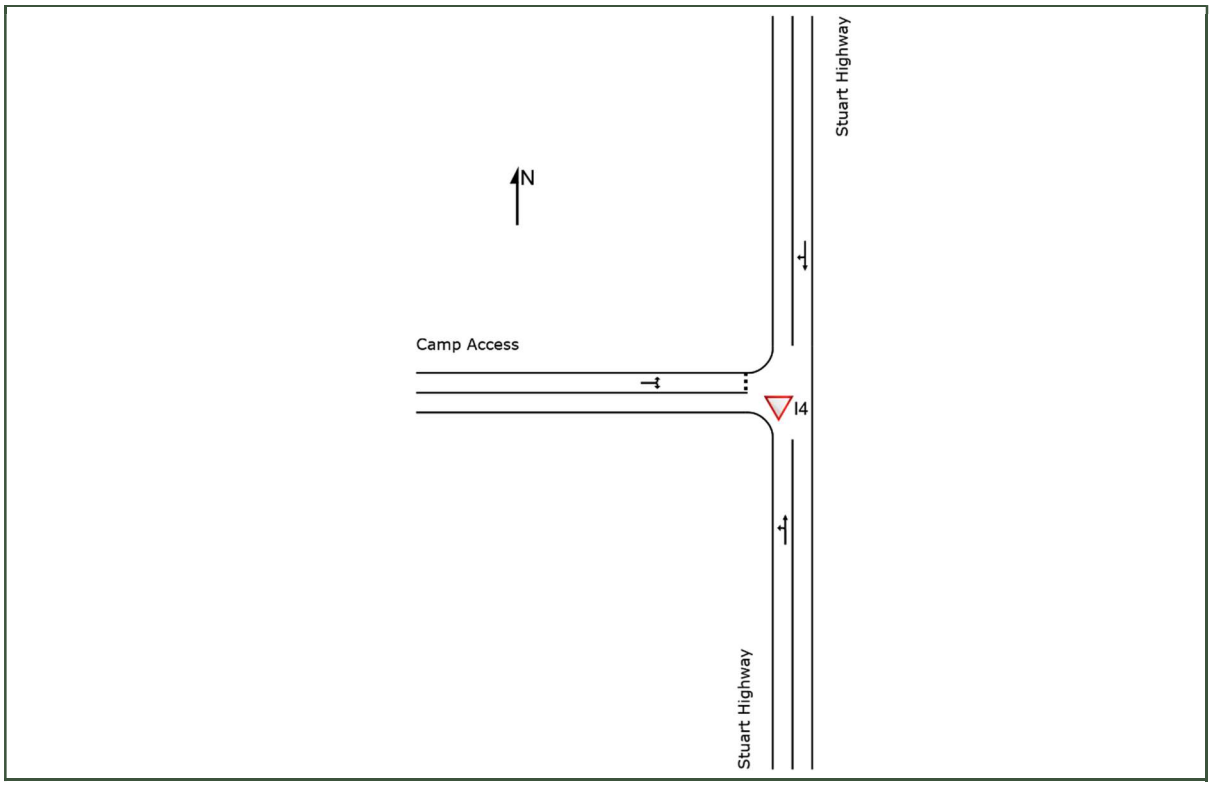


Table 19 I4 Stuart Hwy/ Accom Camp (northern) Access – SIDRA Summary Output

Scenario	AM Peak			PM Peak		
	Maximum DOS	Mean Delay (sec/ veh)	95th %ile Queue (m)	Maximum DOS	Mean Delay (sec/ veh)	95th %ile Queue (m)
2025 Background 'With Construction'	0.05	6.9	1.3	0.05	6.9	1.6

The output from the operational assessment, as summarised in **Table 19**, indicates that the Stuart Highway/ Accommodation Camp (northern) Access intersection operates well within the maximum desired operational thresholds even with the additional traffic demands associated with the construction of the proposed project.

6.4 Road Link Capacity

Section 5.8.2.3 of this report identifies the road links which have been impacted by the proposed development traffic as all being on the Stuart Highway. **Table 20** provides a summary of the road link capacity assessment for the construction phase with and without project traffic. The existing road hierarchy classifications have been identified and evaluated to determine whether they are sufficient to accommodate the expected future traffic volumes.

Table 20 Link Assessment, Stuart Highway – Daily Volumes (AADT)

Road Hierarchy		2025	
Road Type	AADT	Background	Background + Construction
A1 – Rural National Highway	30,000	499	632

Source: SLR 2024

The information contained in **Table 20** shows the that the road link capacity provided by the existing road hierarchy is sufficient to accommodate the future forecast traffic demand with and without the proposed project.

7.0 Impact Mitigation Measures

7.1 Road Safety

The Project-related traffic is not expected to exacerbate the risk of the observed crash types occurring within the identified study area, and therefore there is no requirement to upgrade the road network on this basis.

The posted speed limit on the Stuart Highway is currently 130 km/h. The heavy vehicle turning movements to and from the Stuart Highway during the construction phase creates a safety risk. It is therefore recommended that 80 km/h speed zones be introduced at each of the proposed construction accesses along the Stuart Highway when in use.

The proposed reduction in the posted speed limit will be considered as part of a detailed traffic management plan (see **Section 7.5**) and will consider, but not be limited to, the length of any temporary speed zones (including the need for speed buffer zones), whether any temporary speed limit should be self-enforcing or enforced, and associated roadwork signing.

Speed limits when road workers, traffic controllers and plant are not on site should be determined with consideration of the safe passage of road users. If no hazard to road users exists, the speed limit may be returned to the permanently posted speed limit.

7.2 Access and Frontage

A review of Nearmap aerial and Google Street View imagery confirms that the required Safe Intersection Sight Distance values contained in **Section 6.2.1** can be achieved, with no constraints in the horizontal or vertical alignment of the existing road network within the road reserve.

7.3 Intersections

It is considered that upgrades to the intersections within the defined study area will not be required as the network is predicted to be suitable for the forecast traffic demand during construction of the Project.

7.4 Links

No upgrades are required to any of the road links within the defined study area as the network is predicted to be suitable for the forecast traffic demand during construction of the Project.

7.5 Traffic Management

A detailed Traffic Management Plan (TMP) will be prepared and approved for the construction phase. The TMP will be prepared and approved prior to construction works taking place. The Construction TMP should take into consideration the following components for the construction phase:

- haulage routes and circulation within the Project Area
- requirement for over dimensional permits
- requirement for traffic controllers
- community consultation
- dates and duration of construction

- access and egress on construction site for design vehicle manoeuvring, and
- compliance with driver facility legislation.

7.6 Haulage Compliance Measures

7.6.1 Road Axle Limits

The Project is expected to increase the number of axle repetitions the road pavement is exposed to. It is assumed that the road pavements in the study area have been designed to withstand a certain number of axle repetitions which are forecast during the design life of the road due to the existing demand of heavy vehicles on the network.

However, the additional number of heavy vehicles forecast to be generated by the Project is expected to increase the wear on the pavement and increase the likelihood that minor maintenance might be required in proximity to the proposed construction accesses at the Project Area. With no assessment of the roads in the study area outlining the current condition or age of the pavement, it has not been possible to quantify the impact the Project might have on the road surfaces at this time.

It is recommended that a pavement condition program be implemented to monitor the impact and identify any deterioration to the road pavement over the duration of construction. In order to do this a baseline study must be completed to identify the existing conditions of the Stuart Highway as part of a baseline dilapidation report. It is further recommended that discussions be held with DLI to understand and make use of the department's iPAVE data, if deemed appropriate.

7.6.2 Securing Loads

It is assumed that all loads being transported to and from the site will be secured in accordance with the relevant legislation. All vehicles must be correctly licenced and compliant with relevant up to date legislation (NT Traffic Regulations 1999).

7.6.3 Management of Driver Fatigue

During construction there is the potential risk of driver fatigue due to the volume of materials required for completion of the works. This risk will be managed through the appropriate implementation of a Fatigue Management System (FMS) in accordance with the Northern Territory Road Transport Fatigue Management Code of Practice. The code of practice has been developed "*to assist transport operators to implement management systems which meet occupational health and safety obligations under the Work Health Act in relation to driver fatigue*".

7.6.4 Incident Management

Due to the nature of the Project, it is expected that relevant incident reporting guidelines will be adhered to. It is expected that an Incident Management Plan will be utilised in order to set out processes and response measures that are to be implemented in case of a non-compliance to relevant guidelines or should an emergency situation arise.

8.0 Summary and Conclusions

This Traffic Impact Assessment (TIA) report assesses the consistency of the proposed Project with Northern Territory planning, and the impacts of the proposed development on the surrounding road network. The TIA identifies measures required to support the development and provides an assessment of the traffic and transport aspects of the proposed development against the requirements of DLI.

Based on the analysis and discussion documented herein, the following is concluded:

- Given that the operational stage workforce will consist of APA's existing operational workforce, there will be no net increase in vehicle movements. As a result, only the construction phase has been reviewed herein.
- The project is estimated to generate 1,948 additional heavy vehicle trips over the duration of the 6-month construction phase.
- During the 6-month construction phase, up to 133 workers will be working on site in any one day when construction of the pipeline, Shenandoah and Sturt Plateau facilities are underway.
- Road safety is not expected to decrease disproportionally as a result of the increased traffic movements generated by the Project during the construction phase of the development.
- The additional trip movements created by the proposed construction schedule is not predicted to have a significant impact on intersection performance within the identified study area.
- Safety management plans are proposed in order to manage issues and incidents during construction.

To mitigate potential impacts caused by this development, the following recommendations have been proposed.

- The posted speed limit on the Stuart Highway is currently 130 km/h. The heavy vehicle turning movements to and from the Stuart Highway during the construction phase creates a safety risk. It is therefore recommended that 80 km/h speed zones be introduced at each of the proposed construction accesses along the Stuart Highway when in use.
- Speed limits when road workers, traffic controllers and plant are not on site should be determined with consideration of the safe passage of road users. If no hazard to road users exists, the speed limit may be returned to the permanently posted speed limit.
- A detailed Traffic Management Plan (TMP) should be prepared and approved for the construction phase. It should be prepared and approved prior to construction works taking place.
- The construction program should avoid scheduling delivery of multiple construction parts and materials wherever possible to reduce the risk of excessive deliveries and trips on the network.
- Safe access and egress from site should be a key focus for the appointed construction contractor due to slow moving large vehicles during the construction phase.

Appendix A AADT Volumes and Traffic Growth

Sturt Plateau Pipeline

Traffic Impact Assessment

APA SPP Pty Ltd

SLR Project No.: 680.030294.00007

15 October 2024

Table A.1 Stuart Highway [Count Site RKVD023] – AADT and Traffic Growth

Year	AADT	Growth Rate [2]			Average Growth Rate over 5 Year Period [3]	
		1-Year	5-Year	10-Year	1-Year	5-Year
2023	499	-2.73%	1.05%	3.67%	1.88%	3.31%
2022	513	64.95%	3.92%			
2021	311 [1]	-9.86%	-5.26%			
2020	345 [1]	-24.01%	-2.96%			
2019	454	-4.22%	2.31%			
2018	474	10.49%	5.97%			
2017	429	1.66%				
2016	422	4.20%				
2015	405	-0.49%				
2014	407	11.51%				
2013	365					

1. Traffic volumes impacted by Covid pandemic lockdowns. Surveyed traffic demand not considered to be representative.
2. Calculated traffic growth impacted by the 2020 and 2021 traffic volumes have been highlighted in grey.
3. Average traffic growth over the latest 5 year period (excluding those growth rates identified in [2]).

Table A.2 Buchanan Highway [Count Site RKVDC028] – AADT

Year	AADT
2023	-
2022	15
2021	-
2020	10
2019	-
2018	40
2017	-
2016	21
2015	-
2014	16
2013	-

Appendix B Traffic Flow Diagrams

Sturt Plateau Pipeline

Traffic Impact Assessment

APA SPP Pty Ltd

SLR Project No.: 680.030294.00007

15 October 2024

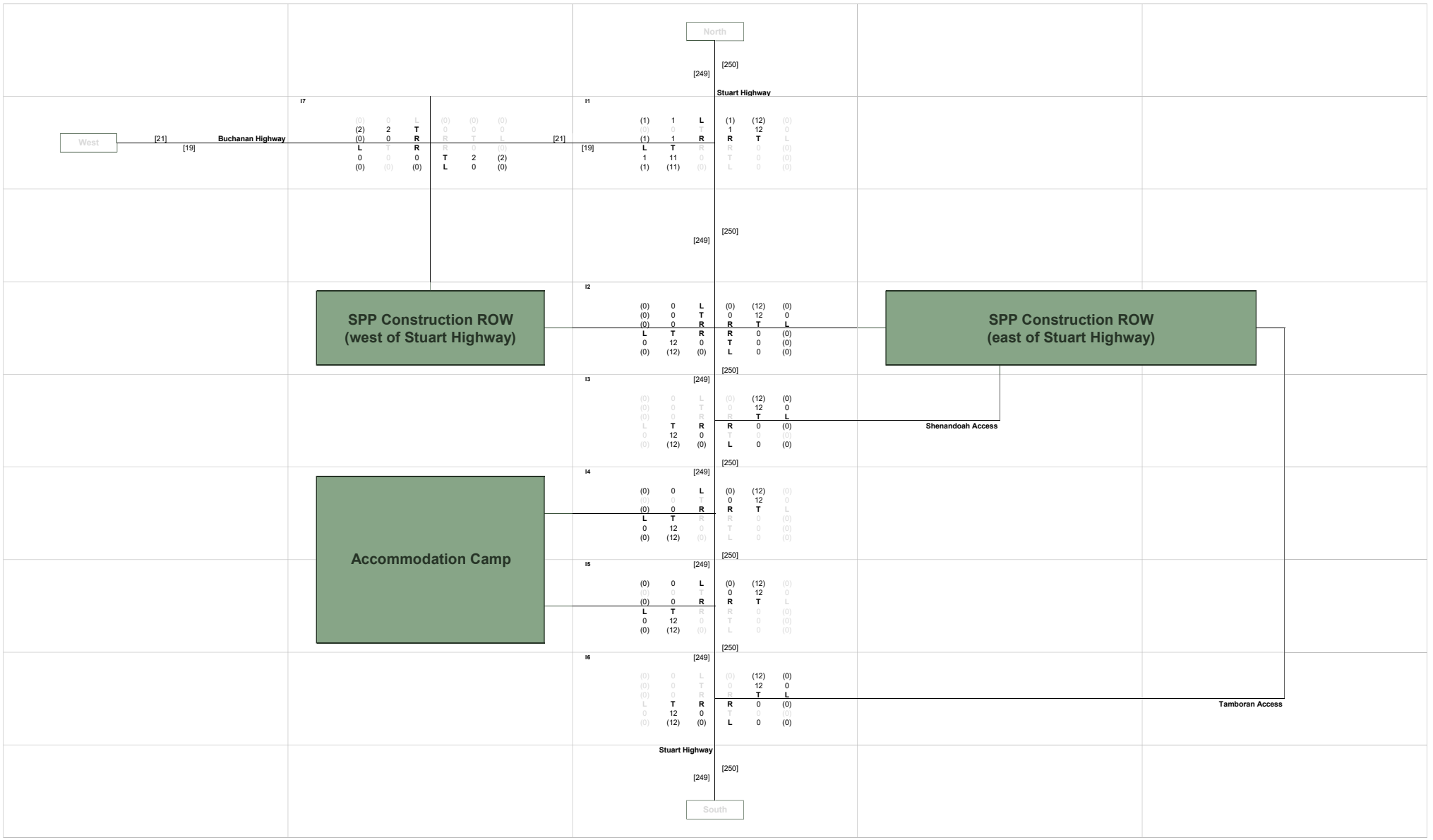


Figure B.1
2023 Survey
680.030294.000007
APA Sturt Plateau Pipeline

L	Left Turn
T	Through
R	Right Turn
U	U-Turn

Legend

00 Weekday AM Peak Hour Volumes
(00) Weekday PM Peak Hour Volumes
[00] AADT
Subject Site

N

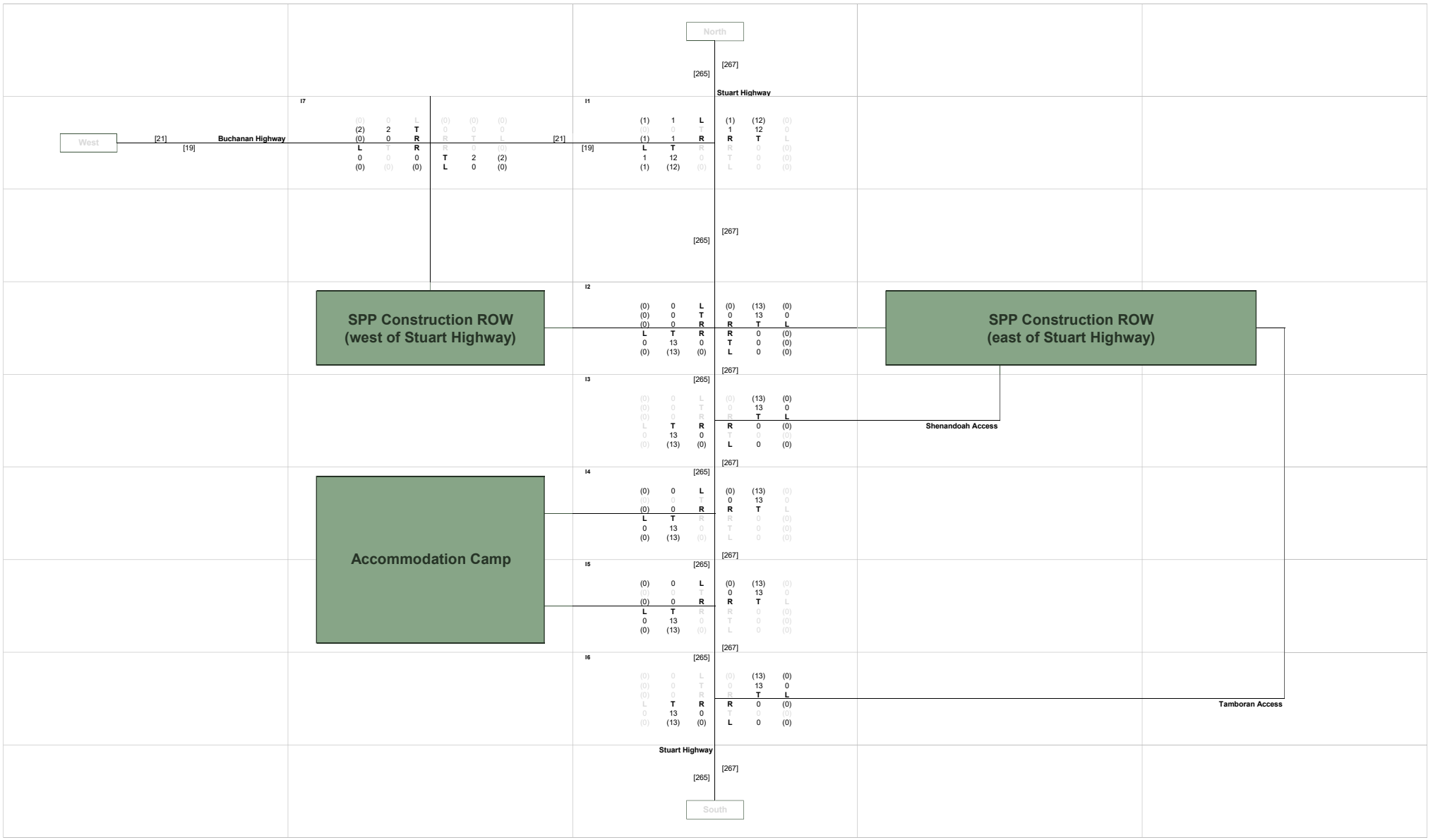


Figure B.2
2025 Background
680.030294.000007
APA Sturt Plateau Pipeline

L Left Turn
T Through
R Right Turn
U U-Turn

Legend
00 Weekday AM Peak Hour Volumes
(00) Weekday PM Peak Hour Volumes
[00] AADT
Subject Site

N

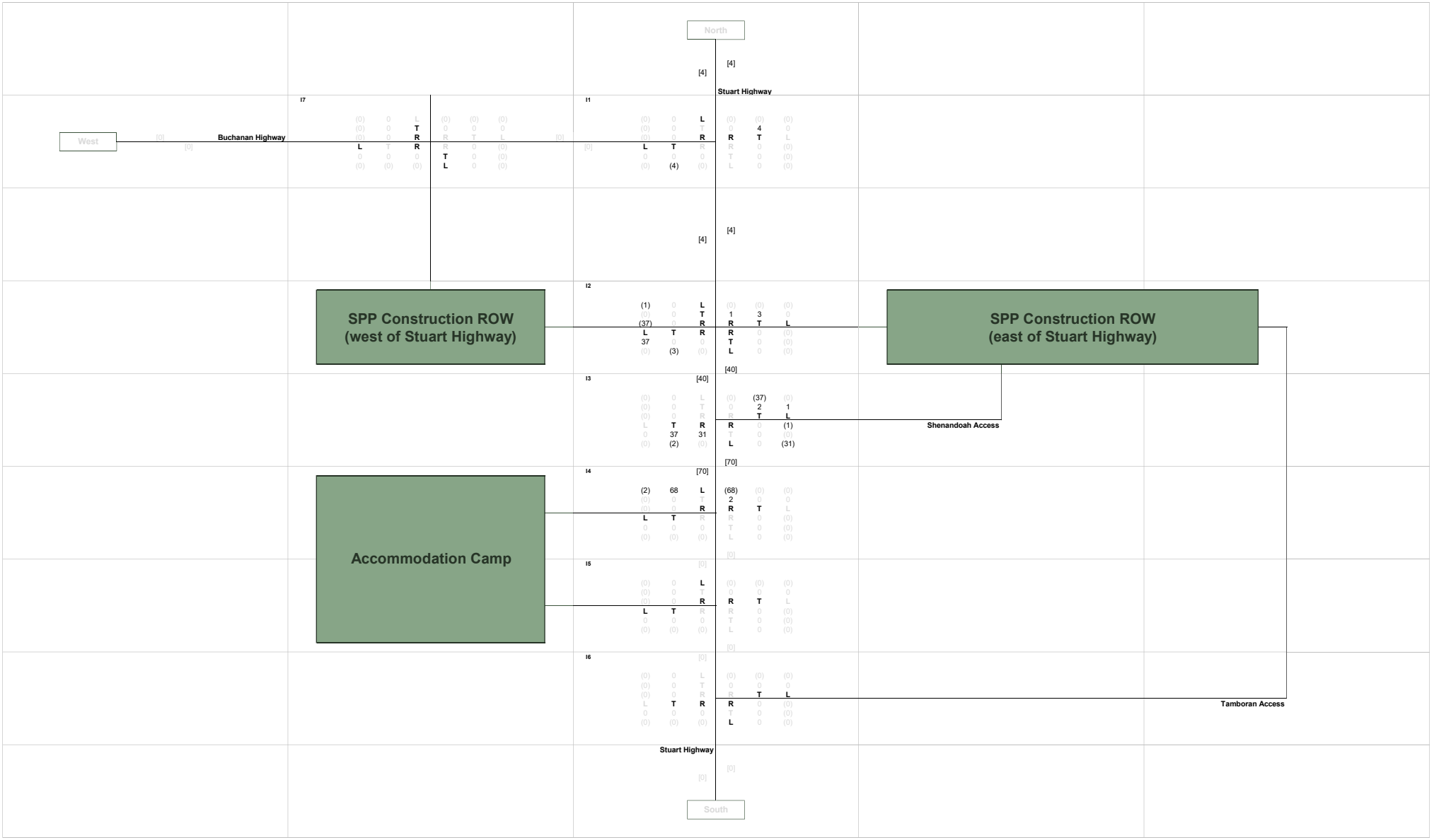


Figure B.3
Construction Traffic
680.030294.000007
APA Sturt Plateau Pipeline

L Left Turn
T Through
R Right Turn
U U-Turn

Legend
00 Weekday AM Peak Hour Volumes
(00) Weekday PM Peak Hour Volumes
[00] AADT
Subject Site

N

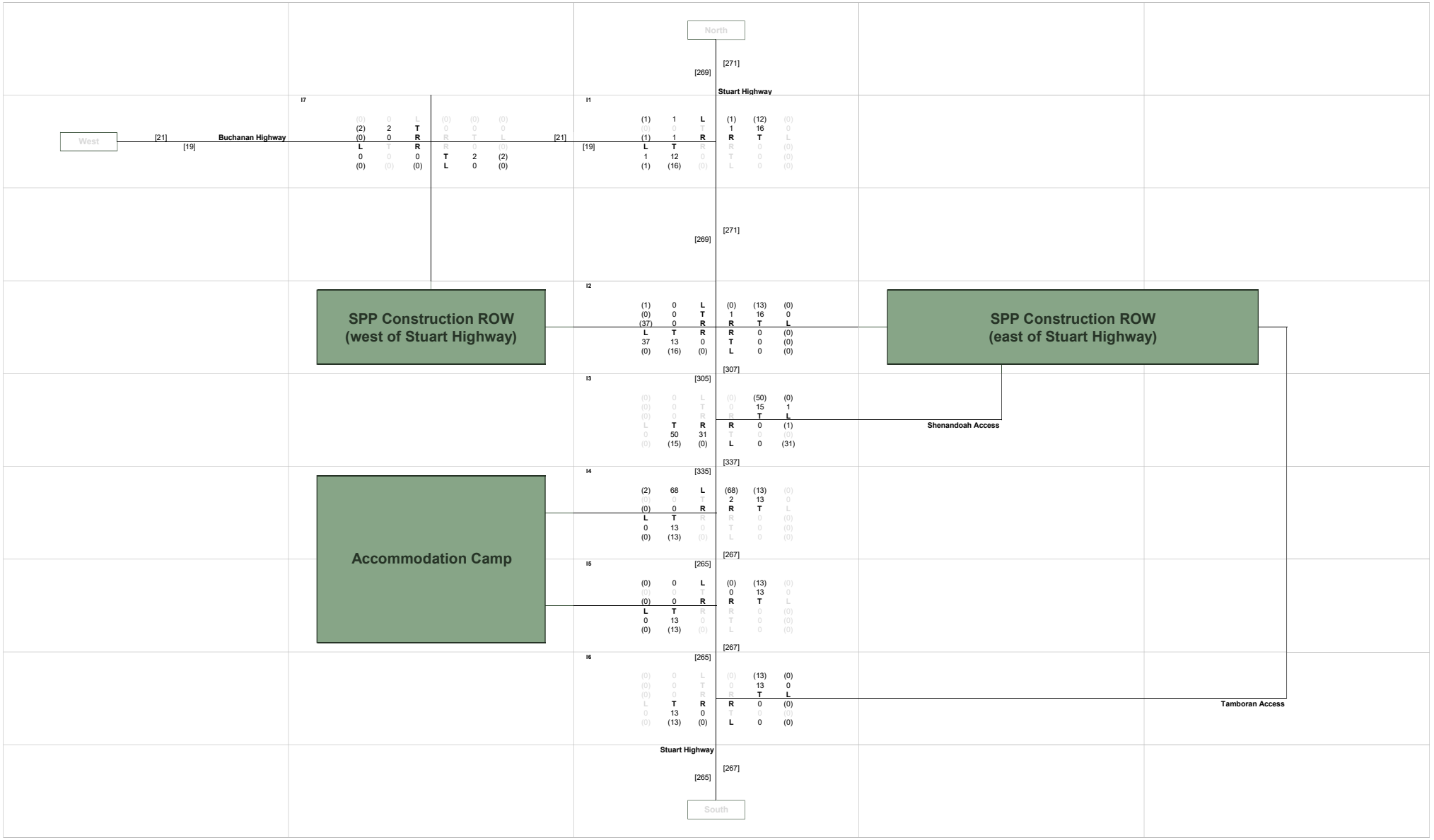


Figure B.4
2025 Background + Construction
680.030294.000007
APA Sturt Plateau Pipeline

L Left Turn
T Through
R Right Turn
U U-Turn

Legend
00 Weekday AM Peak Hour Volumes
(00) Weekday PM Peak Hour Volumes
[00] AADT
Subject Site

N

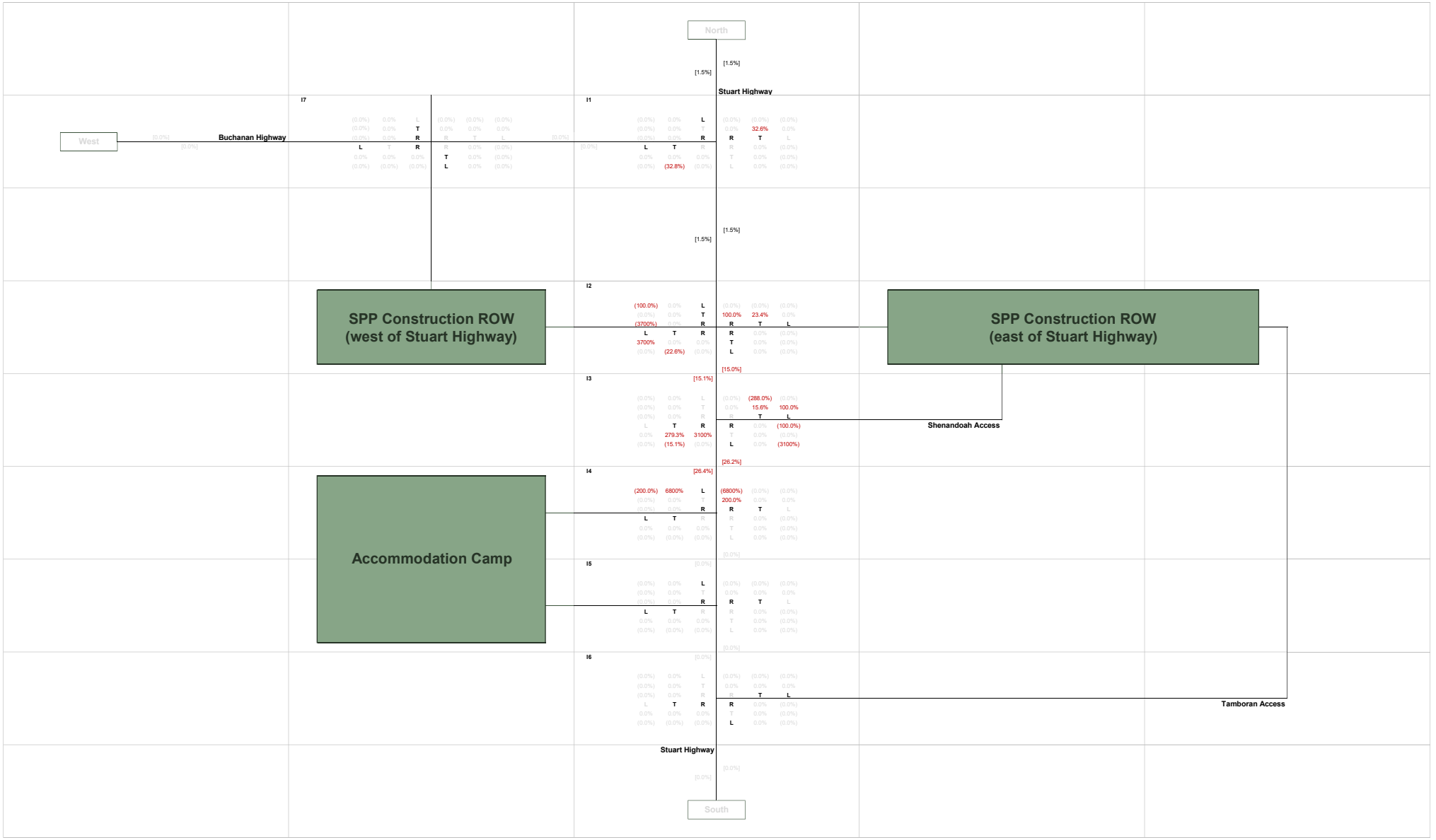


Figure B.5
2025 Impact Assessment Scope
680.030294.000007
APA Sturt Plateau Pipeline

Legend

L	Left Turn
T	Through
R	Right Turn
U	U-Turn

00 Weekday AM Peak Hour Volumes
(00) Weekday PM Peak Hour Volumes
[00] AADT
Subject Site

N

Appendix C Turn Warrant Assessment

Sturt Plateau Pipeline

Traffic Impact Assessment

APA SPP Pty Ltd

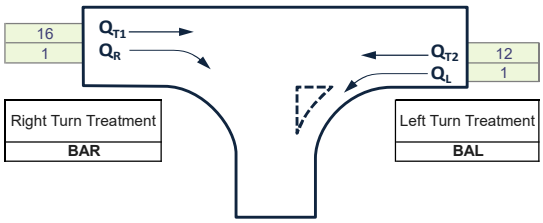
SLR Project No.: 680.030294.00007

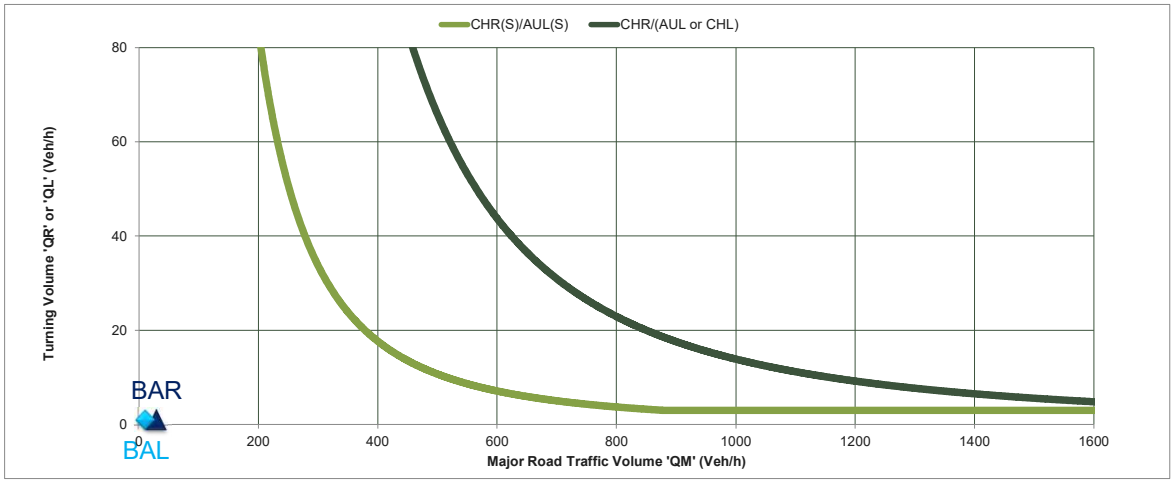
15 October 2024

Assessment Year	2025
Peak Period	AM
Scenario	Background + Construction

Design Domain	Extended Design Domain
Design Life	10
Lane Count	2L2W
Design Speed	>= 100km/h
Splitter Island?	No

Q_M	Q_R/Q_L	
29	1	Right
12	1	Left

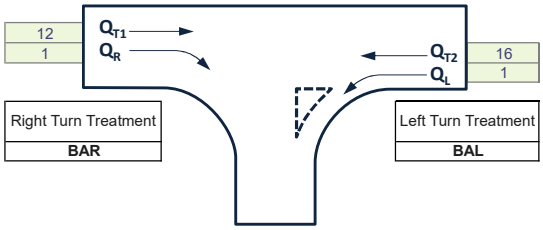


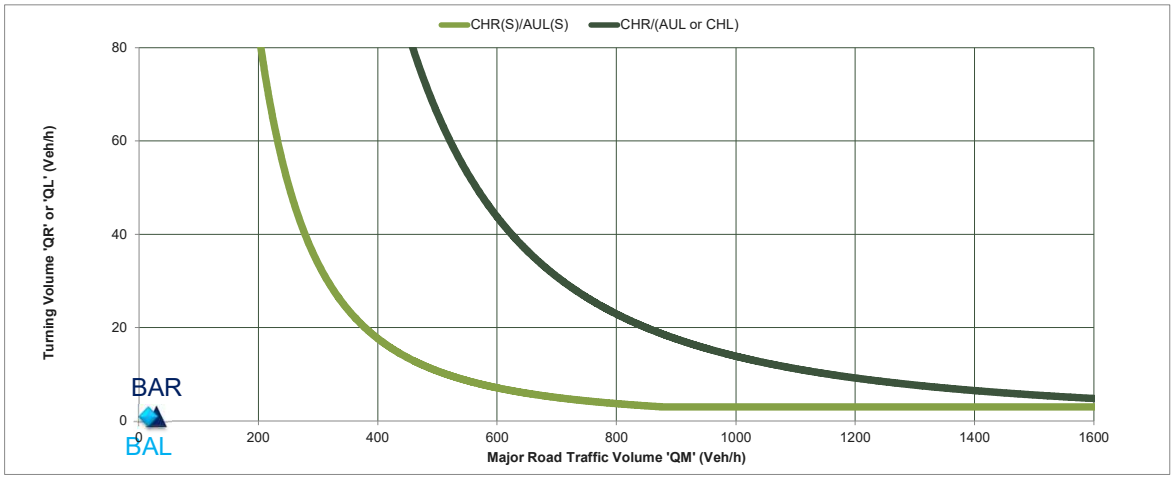


Assessment Year	2025
Peak Period	PM
Scenario	Background + Construction

Design Domain	Extended Design Domain
Design Life	10
Lane Count	2L2W
Design Speed	>= 100km/h
Splitter Island?	No

Q_M	Q_R/Q_L	
29	1	Right
16	1	Left





Reflects changes made in RPDM (Ed2: Vol3) Supplement to Austroads Part 4A (DTMR - August, 2014)

Turn Warrant Assessment

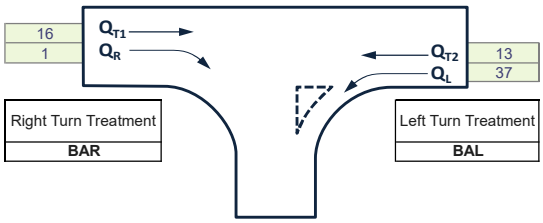
I1 Stuart Highway/ Buchanan Highway Intersection
680.030294.00007
15/10/2024

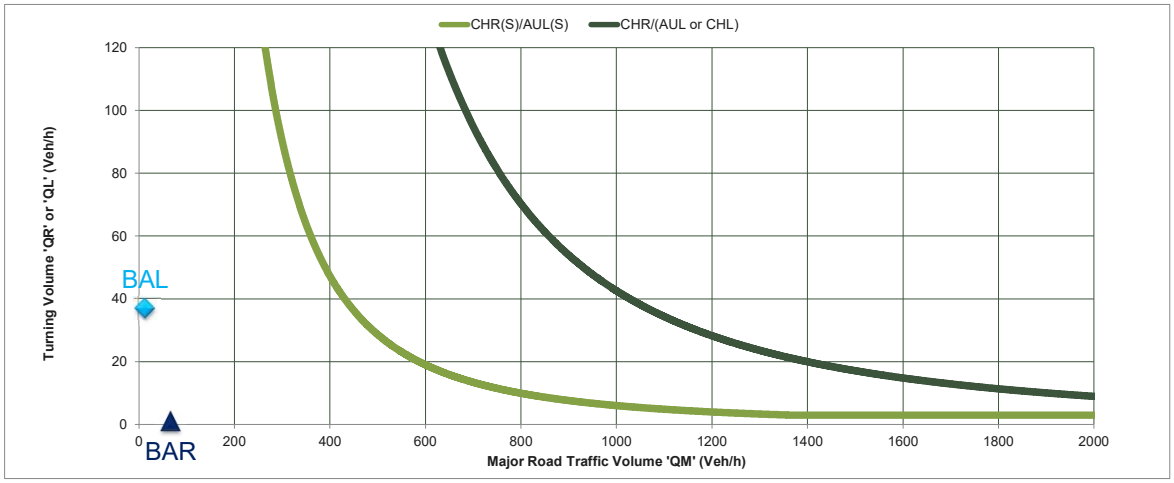
SLR

Assessment Year	2025
Peak Period	AM
Scenario	Background + Construction

Design Domain	Extended Design Domain
Design Life	10
Lane Count	2L2W
Design Speed	70km/h < Design Speed < 100km/h
Splitter Island?	No

Q_M	Q_R/Q_L	
66	1	Right
13	37	Left

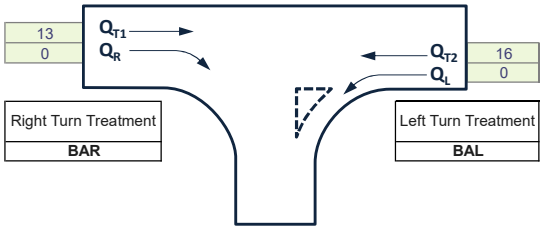


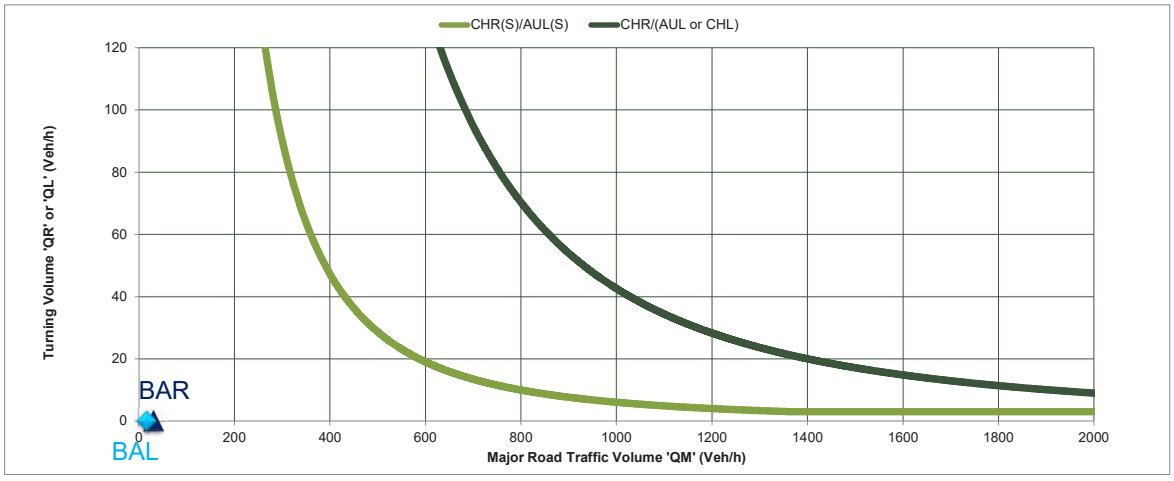


Assessment Year	2025
Peak Period	PM
Scenario	Background + Construction

Design Domain	Extended Design Domain
Design Life	10
Lane Count	2L2W
Design Speed	70km/h < Design Speed < 100km/h
Splitter Island?	No

Q_M	Q_R/Q_L	
29	0	Right
16	0	Left





Reflects changes made in RPDM (Ed2: Vol3) Supplement to Austroads Part 4A (DTMR - August, 2014)

Turn Warrant Assessment

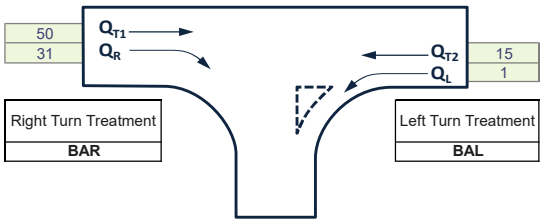
I2 Stuart Highway/ Construction ROW Access Intersection
680.030294.00007
15/10/2024

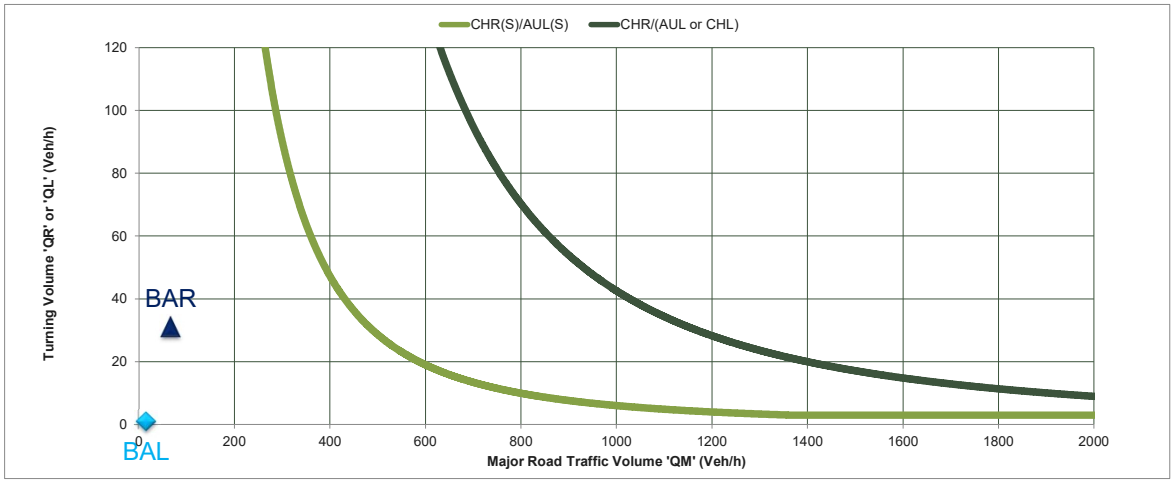
SLR

Assessment Year	2025
Peak Period	AM
Scenario	Background + Construction

Design Domain	Extended Design Domain
Design Life	10
Lane Count	2L2W
Design Speed	70km/h < Design Speed < 100km/h
Splitter Island?	No

Q_M	Q_R/Q_L	
66	31	Right
15	1	Left

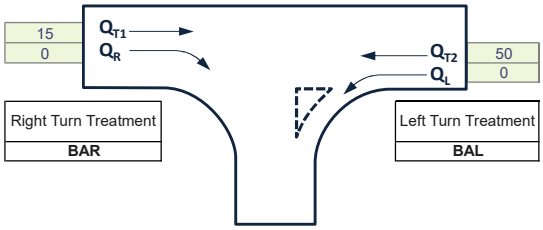


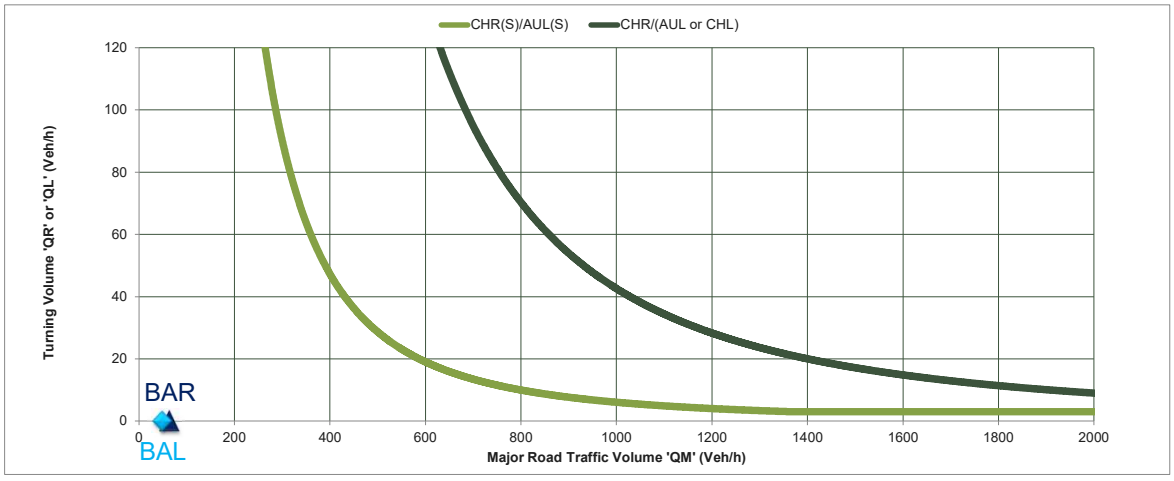


Assessment Year	2025
Peak Period	PM
Scenario	Background + Construction

Design Domain	Extended Design Domain
Design Life	10
Lane Count	2L2W
Design Speed	70km/h < Design Speed < 100km/h
Splitter Island?	No

Q_M	Q_R/Q_L	
65	0	Right
50	0	Left





Reflects changes made in RPDM (Ed2: Vol3) Supplement to Austroads Part 4A (DTMR - August, 2014)

Turn Warrant Assessment

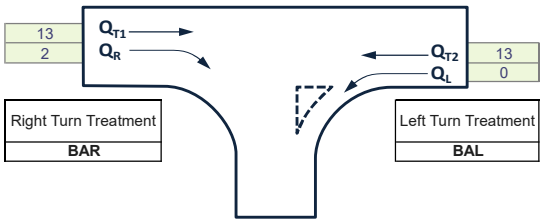
I3 Stuart Highway/ Shenandoah Access Intersection
680.030294.00007
15/10/2024

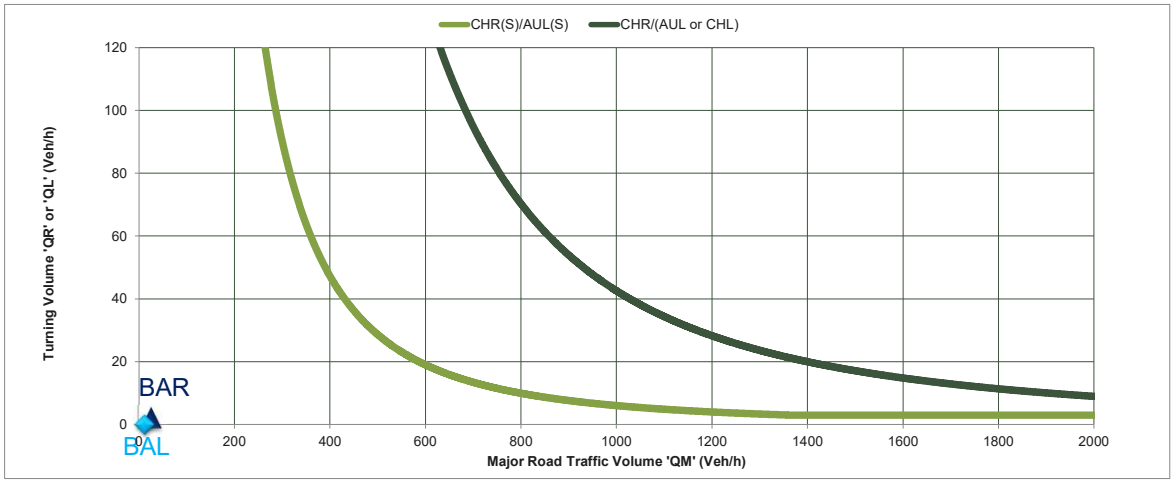
SLR

Assessment Year	2025
Peak Period	AM
Scenario	Background + Construction

Design Domain	Extended Design Domain
Design Life	10
Lane Count	2L2W
Design Speed	70km/h < Design Speed < 100km/h
Splitter Island?	No

Q_M	Q_R/Q_L	
26	2	Right
13	0	Left

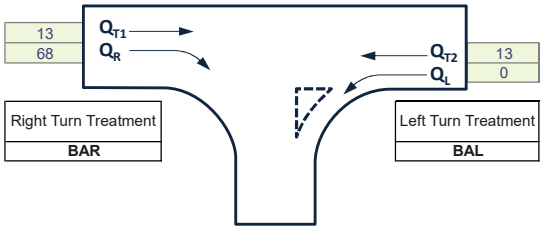


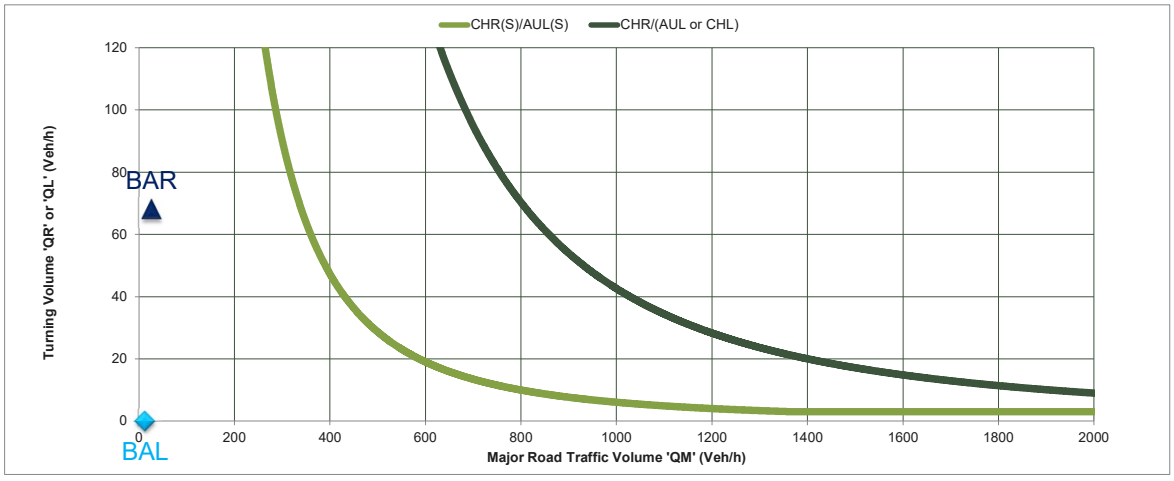


Assessment Year	2025
Peak Period	PM
Scenario	Background + Construction

Design Domain	Extended Design Domain
Design Life	10
Lane Count	2L2W
Design Speed	70km/h < Design Speed < 100km/h
Splitter Island?	No

Q_M	Q_R/Q_L	
26	68	Right
13	0	Left





Reflects changes made in RPDM (Ed2: Vol3) Supplement to Austroads Part 4A (DTMR - August, 2014)

Turn Warrant Assessment

I4 Stuart Highway/ Accommodation Camp (northern) Access Intersection
680.030294.00007
15/10/2024

SLR

Appendix D SIDRA Output

Sturt Plateau Pipeline

Traffic Impact Assessment

APA SPP Pty Ltd

SLR Project No.: 680.030294.00007

15 October 2024

USER REPORT FOR SITE

Project: 680.030294.00007-TM01-v0.2 SPP SIDRA 20241015

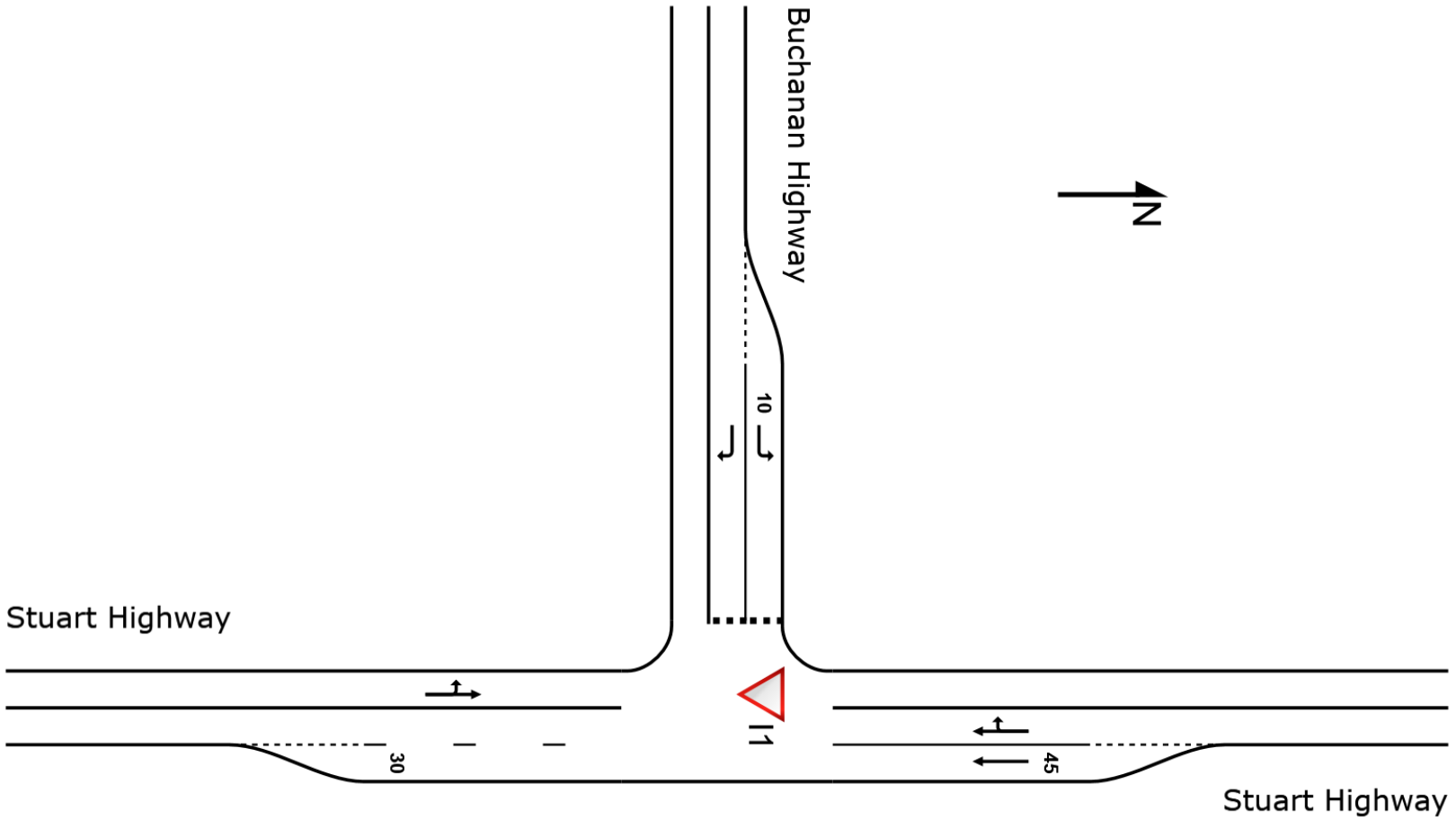
Output produced by SIDRA INTERSECTION Version: 9.1.6.228 **Template: SLR Report - P/C with Layout**

Site: I1 [I1 E 2025 AM BG (Site Folder: General)]

Stuart Highway/ Buchanan Highway
Prepared: NN
Checked: AK
Site Category: (None)
Give-Way (Two-Way)

Site Layout

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


Buchanan Highway
N
10
Stuart Highway
11
30
45
Stuart Highway

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Stuart Highway															
1	L2	All MCs	1	39.0	1	39.0	0.009	10.2	LOS A	0.0	0.0	0.00	0.05	0.00	59.3
2	T1	All MCs	13	39.0	13	39.0	0.009	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	126.9
Approach			14	39.0	14	39.0	0.009	0.8	NA	0.0	0.0	0.00	0.05	0.00	116.7
North: Stuart Highway															
8	T1	All MCs	13	39.0	13	39.0	0.007	0.0	LOS A	0.0	0.1	0.01	0.05	0.01	126.7
9	R2	All MCs	1	39.0	1	39.0	0.007	10.0	LOS A	0.0	0.1	0.02	0.07	0.02	68.3
Approach			14	39.0	14	39.0	0.007	0.8	NA	0.0	0.1	0.01	0.05	0.01	118.9
West: Buchanan Highway															
10	L2	All MCs	1	39.0	1	39.0	0.001	7.7	LOS A	0.0	0.0	0.07	0.60	0.07	57.9
12	R2	All MCs	1	39.0	1	39.0	0.001	7.6	LOS A	0.0	0.0	0.12	0.60	0.12	57.0
Approach			2	39.0	2	39.0	0.001	7.6	LOS A	0.0	0.0	0.09	0.60	0.09	57.4
All Vehicles			29	39.0	29	39.0	0.009	1.3	NA	0.0	0.1	0.01	0.09	0.01	109.6

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

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

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

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

USER REPORT FOR SITE

Project: 680.030294.00007-TM01-v0.2 SPP SIDRA 20241015

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Template: SLR Report - P/C no Layout

Site: I1 [I1 E 2025 PM BG (Site Folder: General)]

Stuart Highway/ Buchanan Highway
Prepared: NN
Checked: AK
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Stuart Highway															
1	L2	All MCs	1	39.0	1	39.0	0.009	10.2	LOS A	0.0	0.0	0.00	0.05	0.00	59.3
2	T1	All MCs	13	39.0	13	39.0	0.009	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	126.9
Approach			14	39.0	14	39.0	0.009	0.8	NA	0.0	0.0	0.00	0.05	0.00	116.7
North: Stuart Highway															
8	T1	All MCs	13	39.0	13	39.0	0.007	0.0	LOS A	0.0	0.1	0.01	0.05	0.01	126.7
9	R2	All MCs	1	39.0	1	39.0	0.007	10.0	LOS A	0.0	0.1	0.02	0.07	0.02	68.3
Approach			14	39.0	14	39.0	0.007	0.8	NA	0.0	0.1	0.01	0.05	0.01	118.9
West: Buchanan Highway															
10	L2	All MCs	1	39.0	1	39.0	0.001	7.7	LOS A	0.0	0.0	0.07	0.60	0.07	57.9
12	R2	All MCs	1	39.0	1	39.0	0.001	7.6	LOS A	0.0	0.0	0.12	0.60	0.12	57.0
Approach			2	39.0	2	39.0	0.001	7.6	LOS A	0.0	0.0	0.09	0.60	0.09	57.4
All Vehicles			29	39.0	29	39.0	0.009	1.3	NA	0.0	0.1	0.01	0.09	0.01	109.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Site: I1 [I1 E 2025 AM BG+C (Site Folder: General)]

Stuart Highway/ Buchanan Highway
Prepared: NN
Checked: AK
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Stuart Highway															
1	L2	All MCs	1	39.0	1	39.0	0.009	10.2	LOS A	0.0	0.0	0.00	0.05	0.00	59.3
2	T1	All MCs	13	39.0	13	39.0	0.009	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	126.9
Approach			14	39.0	14	39.0	0.009	0.8	NA	0.0	0.0	0.00	0.05	0.00	116.7
North: Stuart Highway															
8	T1	All MCs	17	39.0	17	39.0	0.009	0.0	LOS A	0.0	0.1	0.01	0.04	0.01	127.4
9	R2	All MCs	1	39.0	1	39.0	0.009	10.0	LOS A	0.0	0.1	0.01	0.05	0.01	68.6
Approach			18	39.0	18	39.0	0.009	0.6	NA	0.0	0.1	0.01	0.04	0.01	121.3
West: Buchanan Highway															
10	L2	All MCs	1	39.0	1	39.0	0.001	7.7	LOS A	0.0	0.0	0.07	0.60	0.07	57.9
12	R2	All MCs	1	39.0	1	39.0	0.001	7.6	LOS A	0.0	0.0	0.13	0.60	0.13	57.0
Approach			2	39.0	2	39.0	0.001	7.7	LOS A	0.0	0.0	0.10	0.60	0.10	57.4
All Vehicles			34	39.0	34	39.0	0.009	1.1	NA	0.0	0.1	0.01	0.08	0.01	111.8

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

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

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

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Site: I1 [I1 E 2025 PM BG+C (Site Folder: General)]

Stuart Highway / Buchanan Highway
Prepared: NN
Checked: AK
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Stuart Highway															
1	L2	All MCs	1	39.0	1	39.0	0.012	10.2	LOS A	0.0	0.0	0.00	0.04	0.00	59.5
2	T1	All MCs	17	39.0	17	39.0	0.012	0.0	LOS A	0.0	0.0	0.00	0.04	0.00	127.6
Approach			18	39.0	18	39.0	0.012	0.6	NA	0.0	0.0	0.00	0.04	0.00	119.6
North: Stuart Highway															
8	T1	All MCs	13	39.0	13	39.0	0.007	0.0	LOS A	0.0	0.1	0.01	0.05	0.01	126.6
9	R2	All MCs	1	39.0	1	39.0	0.007	10.1	LOS A	0.0	0.1	0.02	0.07	0.02	68.3
Approach			14	39.0	14	39.0	0.007	0.8	NA	0.0	0.1	0.02	0.05	0.02	118.8
West: Buchanan Highway															
10	L2	All MCs	1	39.0	1	39.0	0.001	7.7	LOS A	0.0	0.0	0.08	0.59	0.08	57.8
12	R2	All MCs	1	39.0	1	39.0	0.001	7.6	LOS A	0.0	0.0	0.13	0.60	0.13	57.0
Approach			2	39.0	2	39.0	0.001	7.7	LOS A	0.0	0.0	0.10	0.60	0.10	57.4
All Vehicles			34	39.0	34	39.0	0.012	1.1	NA	0.0	0.1	0.01	0.08	0.01	111.7

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

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

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

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

USER REPORT FOR SITE

Project: 680.030294.00007-TM01-v0.2 SPP SIDRA 20241015

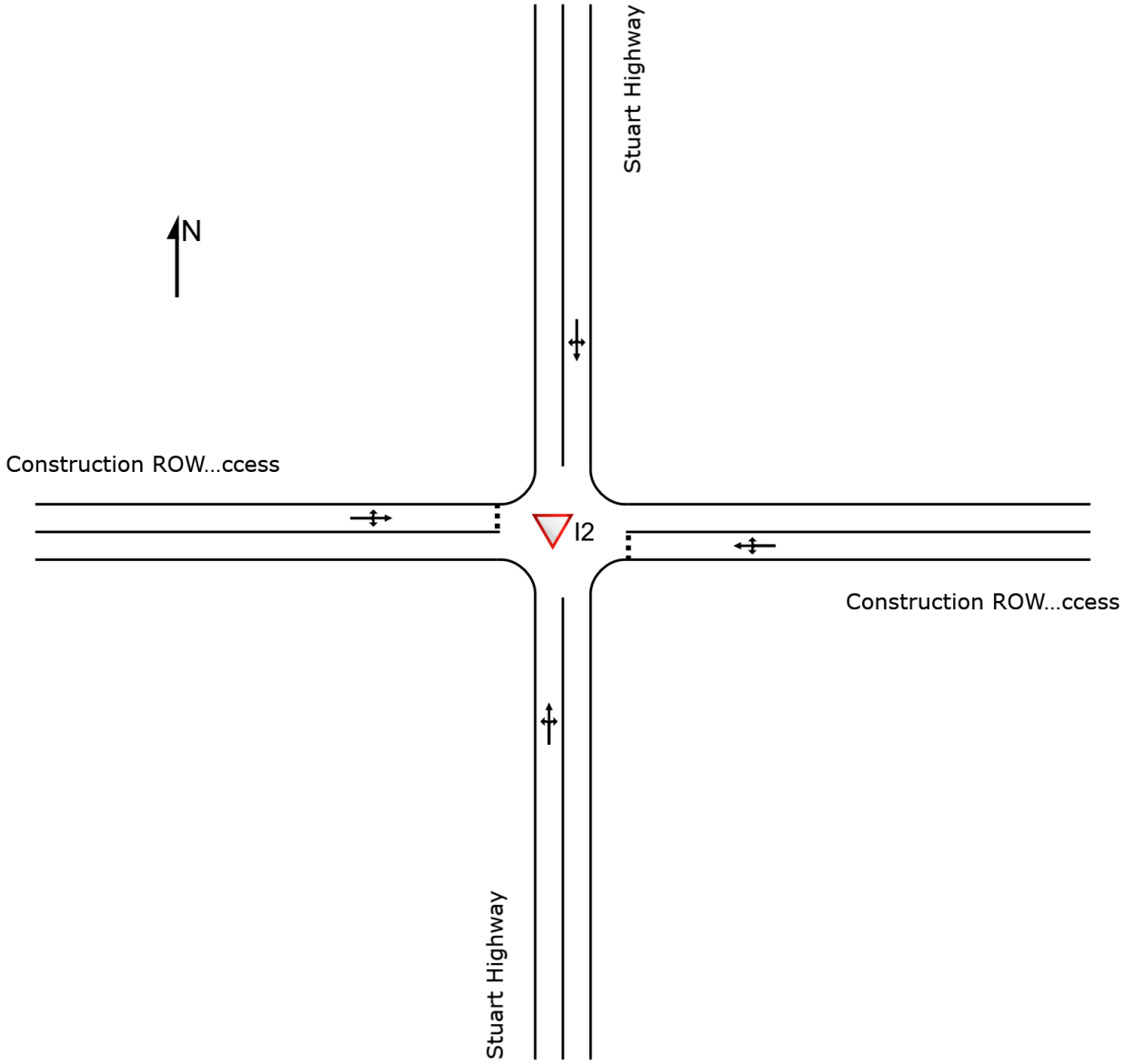
Output produced by SIDRA INTERSECTION Version: 9.1.6.228 **Template: SLR Report - P/C with Layout**

Site: I2 [I2 DS1 2025 AM BG+C (Site Folder: General)]

Stuart Highway/ Construction ROW Access
Prepared: NN
Checked: AK
Site Category: (None)
Give-Way (Two-Way)

Site Layout

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



Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Stuart Highway															
1	L2	All MCs	39	39.0	39	39.0	0.036	7.7	LOS A	0.0	0.1	0.01	0.47	0.01	41.1
2	T1	All MCs	14	39.0	14	39.0	0.036	0.0	LOS A	0.0	0.1	0.01	0.47	0.01	71.8
3	R2	All MCs	1	39.0	1	39.0	0.036	7.4	LOS A	0.0	0.1	0.01	0.47	0.01	41.0
Approach			54	39.0	54	39.0	0.036	5.7	NA	0.0	0.1	0.01	0.47	0.01	46.1
East: Construction ROW Access															
4	L2	All MCs	1	39.0	1	39.0	0.003	2.1	LOS A	0.0	0.1	0.11	0.28	0.11	35.9
5	T1	All MCs	1	39.0	1	39.0	0.003	1.2	LOS A	0.0	0.1	0.11	0.28	0.11	29.5
6	R2	All MCs	1	39.0	1	39.0	0.003	2.7	LOS A	0.0	0.1	0.11	0.28	0.11	35.7
Approach			3	39.0	3	39.0	0.003	2.0	LOS A	0.0	0.1	0.11	0.28	0.11	33.4
North: Stuart Highway															
7	L2	All MCs	1	39.0	1	39.0	0.012	7.7	LOS A	0.0	0.1	0.03	0.07	0.03	43.1
8	T1	All MCs	17	39.0	17	39.0	0.012	0.0	LOS A	0.0	0.1	0.03	0.07	0.03	78.5
9	R2	All MCs	1	39.0	1	39.0	0.012	7.5	LOS A	0.0	0.1	0.03	0.07	0.03	43.0
Approach			19	39.0	19	39.0	0.012	0.9	NA	0.0	0.1	0.03	0.07	0.03	71.9
West: Construction ROW Access															
10	L2	All MCs	1	39.0	1	39.0	0.003	2.1	LOS A	0.0	0.1	0.11	0.28	0.11	35.9
11	T1	All MCs	1	39.0	1	39.0	0.003	1.1	LOS A	0.0	0.1	0.11	0.28	0.11	29.5
12	R2	All MCs	1	39.0	1	39.0	0.003	2.8	LOS A	0.0	0.1	0.11	0.28	0.11	35.7
Approach			3	39.0	3	39.0	0.003	2.0	LOS A	0.0	0.1	0.11	0.28	0.11	33.4
All Vehicles			79	39.0	79	39.0	0.036	4.2	NA	0.0	0.1	0.02	0.36	0.02	48.8

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

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

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

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

USER REPORT FOR SITE

Project: 680.030294.00007-TM01-v0.2 SPP SIDRA 20241015

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Template: SLR Report - P/C no Layout

Site: I2 [I2 DS1 2025 PM BG+C (Site Folder: General)]

Stuart Highway/ Construction ROW Access
Prepared: NN
Checked: AK
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Stuart Highway															
1	L2	All MCs	1	39.0	1	39.0	0.012	7.7	LOS A	0.0	0.1	0.01	0.07	0.01	43.2
2	T1	All MCs	17	39.0	17	39.0	0.012	0.0	LOS A	0.0	0.1	0.01	0.07	0.01	78.6
3	R2	All MCs	1	39.0	1	39.0	0.012	7.4	LOS A	0.0	0.1	0.01	0.07	0.01	43.0
Approach			19	39.0	19	39.0	0.012	0.8	NA	0.0	0.1	0.01	0.07	0.01	72.0
East: Construction ROW Access															
4	L2	All MCs	1	39.0	1	39.0	0.003	2.1	LOS A	0.0	0.1	0.10	0.28	0.10	35.9
5	T1	All MCs	1	39.0	1	39.0	0.003	1.0	LOS A	0.0	0.1	0.10	0.28	0.10	29.5
6	R2	All MCs	1	39.0	1	39.0	0.003	2.7	LOS A	0.0	0.1	0.10	0.28	0.10	35.7
Approach			3	39.0	3	39.0	0.003	1.9	LOS A	0.0	0.1	0.10	0.28	0.10	33.4
North: Stuart Highway															
7	L2	All MCs	1	39.0	1	39.0	0.010	7.7	LOS A	0.0	0.1	0.02	0.09	0.02	43.1
8	T1	All MCs	14	39.0	14	39.0	0.010	0.0	LOS A	0.0	0.1	0.02	0.09	0.02	78.3
9	R2	All MCs	1	39.0	1	39.0	0.010	7.4	LOS A	0.0	0.1	0.02	0.09	0.02	42.9
Approach			16	39.0	16	39.0	0.010	1.0	NA	0.0	0.1	0.02	0.09	0.02	70.6
West: Construction ROW Access															
10	L2	All MCs	1	39.0	1	39.0	0.045	2.1	LOS A	0.2	1.4	0.13	0.37	0.13	35.7
11	T1	All MCs	1	39.0	1	39.0	0.045	1.0	LOS A	0.2	1.4	0.13	0.37	0.13	29.3
12	R2	All MCs	39	39.0	39	39.0	0.045	2.7	LOS A	0.2	1.4	0.13	0.37	0.13	35.5
Approach			41	39.0	41	39.0	0.045	2.6	LOS A	0.2	1.4	0.13	0.37	0.13	35.3
All Vehicles			79	39.0	79	39.0	0.045	1.8	NA	0.2	1.4	0.08	0.24	0.08	45.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

USER REPORT FOR SITE

Project: 680.030294.00007-TM01-v0.2 SPP SIDRA 20241015

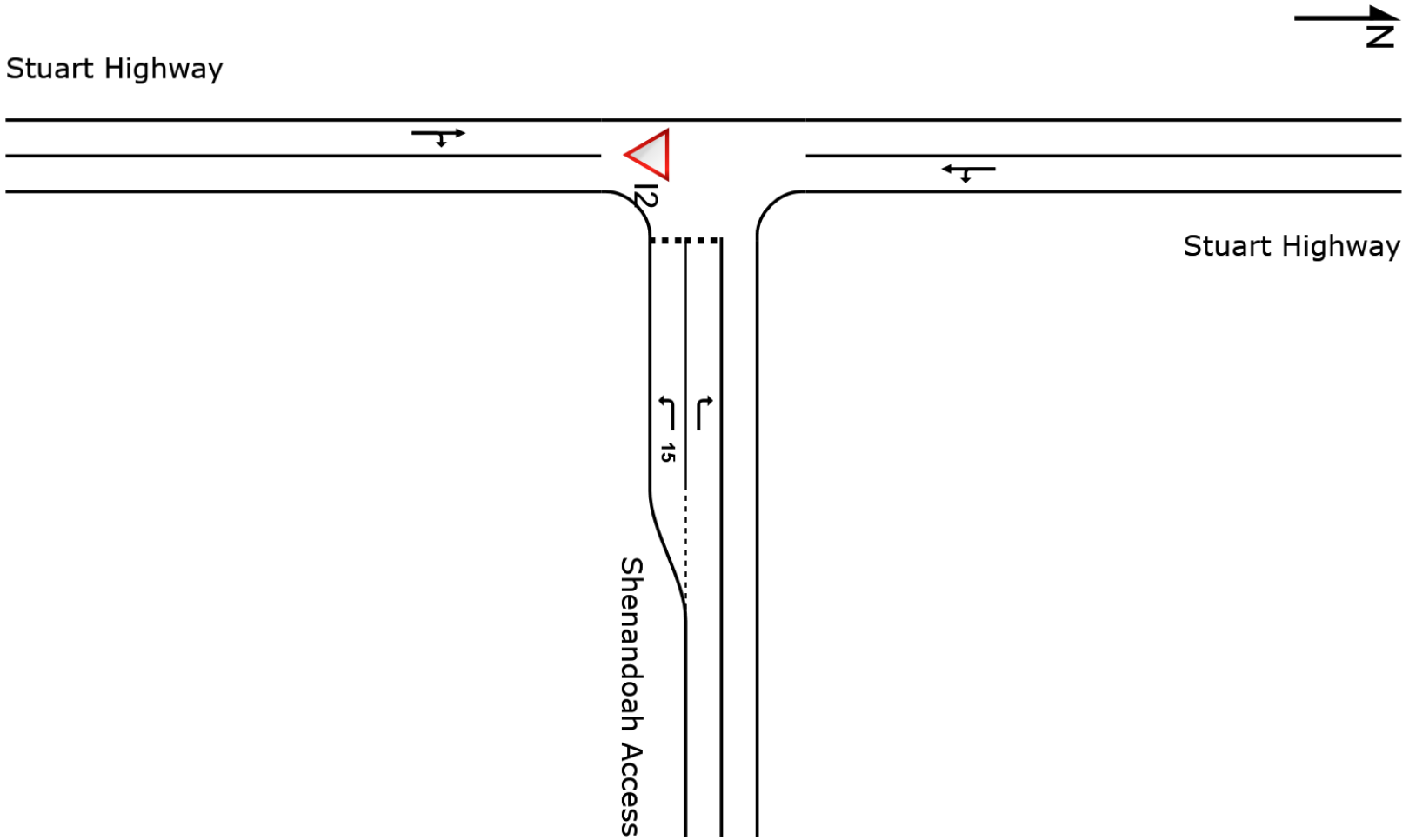
Output produced by SIDRA INTERSECTION Version: 9.1.6.228 **Template: SLR Report - P/C with Layout**

Site: I2 [I3 E 2025 AM BG (Site Folder: General)]

Stuart Highway/ Shenandoah Access
Prepared: NN
Checked: AK
Site Category: (None)
Give-Way (Two-Way)

Site Layout

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


N
Stuart Highway
I2
Stuart Highway
15
Shenandoah Access

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Stuart Highway															
2	T1	All MCs	14	39.0	14	39.0	0.010	0.0	LOS A	0.0	0.1	0.01	0.05	0.01	79.1
3	R2	All MCs	1	39.0	1	39.0	0.010	7.5	LOS A	0.0	0.1	0.01	0.05	0.01	58.2
Approach			15	39.0	15	39.0	0.010	0.5	NA	0.0	0.1	0.01	0.05	0.01	77.1
East: Shenandoah Access															
4	L2	All MCs	1	39.0	1	39.0	0.001	5.0	LOS A	0.0	0.0	0.07	0.49	0.07	45.7
6	R2	All MCs	1	39.0	1	39.0	0.001	5.1	LOS A	0.0	0.0	0.10	0.53	0.10	45.3
Approach			2	39.0	2	39.0	0.001	5.0	LOS A	0.0	0.0	0.08	0.51	0.08	45.5
North: Stuart Highway															
7	L2	All MCs	1	39.0	1	39.0	0.010	7.7	LOS A	0.0	0.0	0.00	0.05	0.00	59.3
8	T1	All MCs	14	39.0	14	39.0	0.010	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	79.1
Approach			15	39.0	15	39.0	0.010	0.5	NA	0.0	0.0	0.00	0.05	0.00	77.3
All Vehicles			32	39.0	32	39.0	0.010	0.8	NA	0.0	0.1	0.01	0.08	0.01	73.8

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

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

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

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

USER REPORT FOR SITE

Project: 680.030294.00007-TM01-v0.2 SPP SIDRA 20241015

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Template: SLR Report - P/C no Layout

Site: I2 [I3 E 2025 PM BG (Site Folder: General)]

Stuart Highway/ Shenandoah Access
Prepared: NN
Checked: AK
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Stuart Highway															
2	T1	All MCs	14	39.0	14	39.0	0.010	0.0	LOS A	0.0	0.1	0.01	0.05	0.01	79.1
3	R2	All MCs	1	39.0	1	39.0	0.010	7.5	LOS A	0.0	0.1	0.01	0.05	0.01	58.2
Approach			15	39.0	15	39.0	0.010	0.5	NA	0.0	0.1	0.01	0.05	0.01	77.1
East: Shenandoah Access															
4	L2	All MCs	1	39.0	1	39.0	0.001	5.0	LOS A	0.0	0.0	0.07	0.49	0.07	45.7
6	R2	All MCs	1	39.0	1	39.0	0.001	5.1	LOS A	0.0	0.0	0.10	0.53	0.10	45.3
Approach			2	39.0	2	39.0	0.001	5.0	LOS A	0.0	0.0	0.08	0.51	0.08	45.5
North: Stuart Highway															
7	L2	All MCs	1	39.0	1	39.0	0.010	7.7	LOS A	0.0	0.0	0.00	0.05	0.00	59.3
8	T1	All MCs	14	39.0	14	39.0	0.010	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	79.1
Approach			15	39.0	15	39.0	0.010	0.5	NA	0.0	0.0	0.00	0.05	0.00	77.3
All Vehicles			32	39.0	32	39.0	0.010	0.8	NA	0.0	0.1	0.01	0.08	0.01	73.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Site: I2 [I3 E 2025 AM BG+C (Site Folder: General)]

Stuart Highway/ Shenandoah Access
Prepared: NN
Checked: AK
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Stuart Highway															
2	T1	All MCs	53	39.0	53	39.0	0.057	0.0	LOS A	0.2	1.8	0.06	0.24	0.06	75.2
3	R2	All MCs	33	39.0	33	39.0	0.057	7.6	LOS A	0.2	1.8	0.06	0.24	0.06	56.1
Approach			85	39.0	85	39.0	0.057	2.9	NA	0.2	1.8	0.06	0.24	0.06	66.6
East: Shenandoah Access															
4	L2	All MCs	1	39.0	1	39.0	0.001	5.0	LOS A	0.0	0.0	0.08	0.49	0.08	45.7
6	R2	All MCs	1	39.0	1	39.0	0.001	5.5	LOS A	0.0	0.0	0.21	0.52	0.21	45.1
Approach			2	39.0	2	39.0	0.001	5.2	LOS A	0.0	0.0	0.14	0.50	0.14	45.4
North: Stuart Highway															
7	L2	All MCs	1	39.0	1	39.0	0.011	7.7	LOS A	0.0	0.0	0.00	0.04	0.00	59.3
8	T1	All MCs	16	39.0	16	39.0	0.011	0.0	LOS A	0.0	0.0	0.00	0.04	0.00	79.2
Approach			17	39.0	17	39.0	0.011	0.5	NA	0.0	0.0	0.00	0.04	0.00	77.6
All Vehicles			104	39.0	104	39.0	0.057	2.6	NA	0.2	1.8	0.06	0.22	0.06	67.5

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

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

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

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Site: I2 [I3 E 2025 PM BG+C (Site Folder: General)]

Stuart Highway/ Shenandoah Access
Prepared: NN
Checked: AK
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Stuart Highway															
2	T1	All MCs	16	39.0	16	39.0	0.011	0.0	LOS A	0.0	0.1	0.02	0.04	0.02	79.1
3	R2	All MCs	1	39.0	1	39.0	0.011	7.7	LOS A	0.0	0.1	0.02	0.04	0.02	58.2
Approach			17	39.0	17	39.0	0.011	0.5	NA	0.0	0.1	0.02	0.04	0.02	77.3
East: Shenandoah Access															
4	L2	All MCs	33	39.0	33	39.0	0.025	5.2	LOS A	0.1	0.9	0.16	0.49	0.16	45.5
6	R2	All MCs	1	39.0	1	39.0	0.001	5.3	LOS A	0.0	0.0	0.17	0.52	0.17	45.2
Approach			34	39.0	34	39.0	0.025	5.2	LOS A	0.1	0.9	0.16	0.49	0.16	45.5
North: Stuart Highway															
7	L2	All MCs	1	39.0	1	39.0	0.035	7.7	LOS A	0.0	0.0	0.00	0.01	0.00	59.6
8	T1	All MCs	53	39.0	53	39.0	0.035	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	79.7
Approach			54	39.0	54	39.0	0.035	0.2	NA	0.0	0.0	0.00	0.01	0.00	79.2
All Vehicles			104	39.0	104	39.0	0.035	1.8	NA	0.1	0.9	0.06	0.17	0.06	63.7

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

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

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

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

USER REPORT FOR SITE

Project: 680.030294.00007-TM01-v0.2 SPP SIDRA 20241015

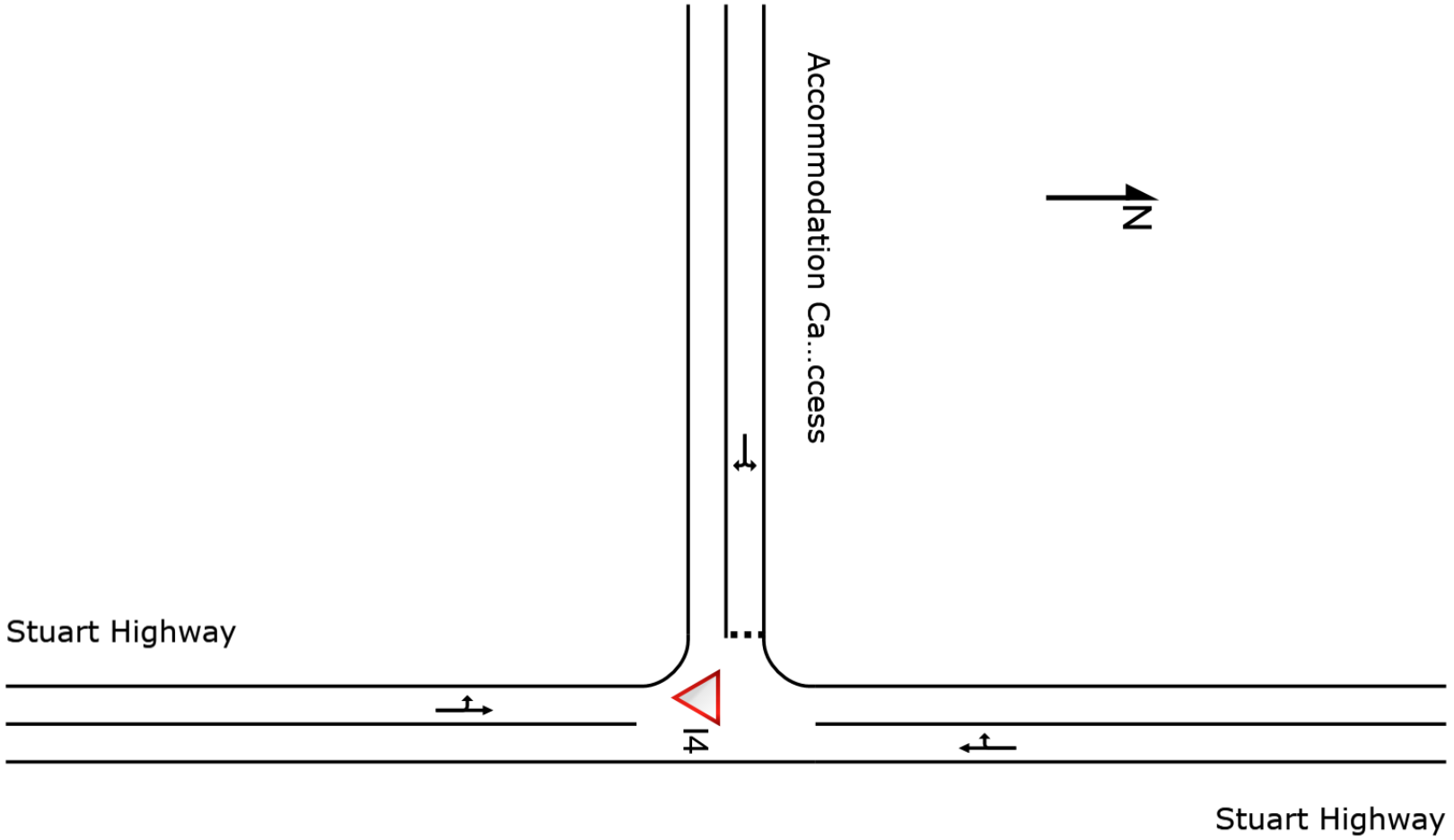
Output produced by SIDRA INTERSECTION Version: 9.1.6.228 **Template: SLR Report - P/C with Layout**

Site: I4 [I4 DS1 2025 AM BG+C (Site Folder: General)]

Stuart Highway/ Accommodation Camp (northern) Access
Prepared: NN
Checked: AK
Site Category: (None)
Give-Way (Two-Way)

Site Layout

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


Accommodation Ca...ccess
N
Stuart Highway
14
Stuart Highway

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Stuart Highway															
1	L2	All MCs	1	0.0	1	0.0	0.009	6.9	LOS A	0.0	0.0	0.00	0.05	0.00	72.4
2	T1	All MCs	14	39.0	14	39.0	0.009	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	78.6
Approach			15	36.2	15	36.2	0.009	0.5	NA	0.0	0.0	0.00	0.05	0.00	78.2
North: Stuart Highway															
8	T1	All MCs	14	39.0	14	39.0	0.010	0.0	LOS A	0.0	0.1	0.02	0.09	0.02	77.6
9	R2	All MCs	2	0.0	2	0.0	0.010	6.6	LOS A	0.0	0.1	0.02	0.09	0.02	42.8
Approach			16	33.8	16	33.8	0.010	0.9	NA	0.0	0.1	0.02	0.09	0.02	70.0
West: Accommodation Camp (northern) Access															
10	L2	All MCs	72	0.0	72	0.0	0.045	2.0	LOS A	0.2	1.3	0.06	0.32	0.06	40.4
12	R2	All MCs	1	0.0	1	0.0	0.045	2.4	LOS A	0.2	1.3	0.06	0.32	0.06	40.3
Approach			73	0.0	73	0.0	0.045	2.0	LOS A	0.2	1.3	0.06	0.32	0.06	40.4
All Vehicles			103	10.3	103	10.3	0.045	1.6	NA	0.2	1.3	0.05	0.24	0.05	46.6

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

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

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

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

USER REPORT FOR SITE

Project: 680.030294.00007-TM01-v0.2 SPP SIDRA 20241015

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Template: SLR Report - P/C no Layout

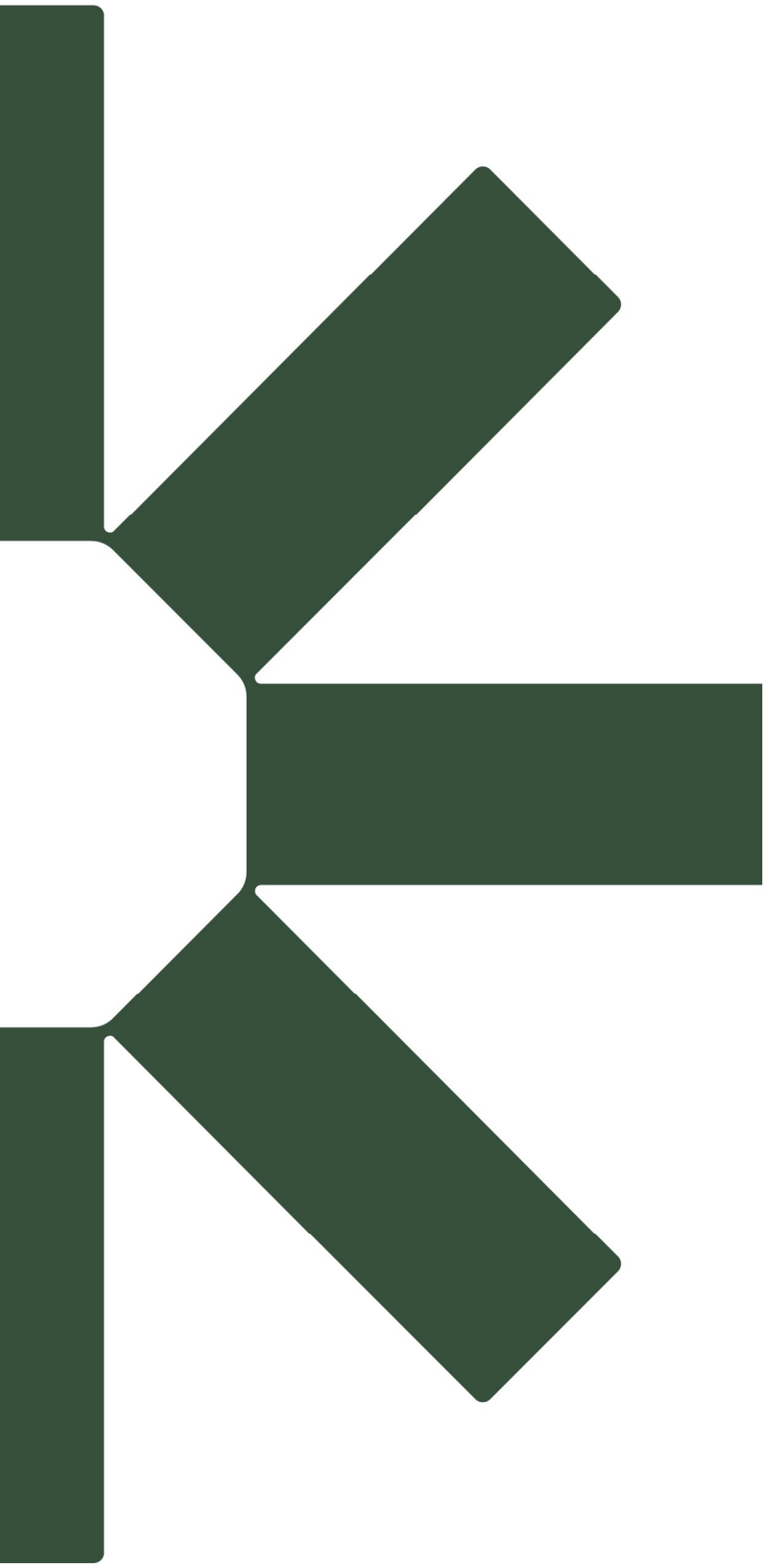
Site: I4 [I4 DS1 2025 PM BG+C (Site Folder: General)]

Stuart Highway/ Accommodation Camp (northern) Access
Prepared: NN
Checked: AK
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Stuart Highway															
1	L2	All MCs	1	0.0	1	0.0	0.009	6.9	LOS A	0.0	0.0	0.00	0.05	0.00	72.4
2	T1	All MCs	14	39.0	14	39.0	0.009	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	78.6
Approach			15	36.2	15	36.2	0.009	0.5	NA	0.0	0.0	0.00	0.05	0.00	78.2
North: Stuart Highway															
8	T1	All MCs	14	39.0	14	39.0	0.048	0.0	LOS A	0.2	1.6	0.07	0.52	0.07	70.4
9	R2	All MCs	72	0.0	72	0.0	0.048	6.6	LOS A	0.2	1.6	0.07	0.52	0.07	40.5
Approach			85	6.3	85	6.3	0.048	5.6	NA	0.2	1.6	0.07	0.52	0.07	43.5
West: Accommodation Camp (northern) Access															
10	L2	All MCs	2	0.0	2	0.0	0.002	2.0	LOS A	0.0	0.1	0.08	0.33	0.08	40.3
12	R2	All MCs	1	0.0	1	0.0	0.002	2.6	LOS A	0.0	0.1	0.08	0.33	0.08	40.3
Approach			3	0.0	3	0.0	0.002	2.2	LOS A	0.0	0.1	0.08	0.33	0.08	40.3
All Vehicles			103	10.3	103	10.3	0.048	4.8	NA	0.2	1.6	0.06	0.45	0.06	46.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.



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